# Programmable Transmitters

TT520


TT530

## Overview

Models TT520 and TT530 are programmable transmitters designed for process control and other applications. Both transmitters use a 4-20mA current loop output and are PC programmable to accept a signal from a thermocouple, a Resistance Temperature Detector (RTD), or a millivolt signal. Model TT520 can be mounted at the field location in a standard DIN form B head or on a DIN rail inside a local box (with an AC807 Minco DIN rail adapter), whereas model TT530 can be mounted vertically or horizontally on a DIN rail.

- T/C, RTD, or mV input
- Accurate, Stable 4-20mA Output
- PC and field-programmable
- Galvanically isolated
- FM Approved Intrinsically Safe
- Single temperature measurement

## Specifications

### Common Specifications:

**Supply voltage:** 7.2 - 30 VDC

**Temperature coefficient:** < ± 0.01% of span/ °C

**Effect of supply voltage change:** < 0.005% of span/ VDC

**Max. wire size:** AWG14 (1.5 mm$^2$)

**Air humidity:** 0 - 95% RH

**Dimensions:**
TT520: Ø1.73 x 0.84 in (Ø44 x 20.2mm)

TT530: 4.29 x .0.93 x 4.09 in (109 x 23.5 x 104mm)

**AC205817 USB Loop Link Programmer:**
TT520 and TT530 transmitters are preconfigured for ease of use. The AC205817 USB Loop Link Programmer allows the user to reconfigure the transmitter using free, Windows-based software.

**Tightness (enclosure/terminal):**
TT520: IP 68 / IP00
TT530: IP50 / IP20

**Weight:**
TT520: 50 g
TT530: 145 g

**TC Input:**

**Minimum measurement range:**
Type E, J, K, T: 50°C
Max. offset: 50% of selected max. value

**Basic accuracy:**
Type E, J, K, T: ≤1°C
Cold junction compensation (CJC): ≤1.0°C

**Temperature coefficient:**
Type E, J, K, T: ≤± 0.05 °C / °C$_{amb}$
Sensor error detection: yes

| RTD type | Minimum value | Maximum value | Minimum span. |
|---|---|---|---|
| PD (Pt100) | -200°C | +850°C | 25°C |
| PF (Pt1000) | -200°C | +850°C | 25°C |

**RTD-input:**
Basic accuracy PD/PF (Pt100/1000): ≤±0.2°C
Temperature coefficient: ≤±0.01°C / °C

**Current output:**
Signal range: 4 - 20 mA
Load resistance: < (Vsup. - 7.2) / 0.023 [Ω ]

**Intrinsic Safety data:** FM Approved Intrinsically Safe for Class 1, Div. 1, Groups A-D, Entity Approval (pending)

$V_{max}$: 30.0 VDC
$I_{max}$: 120 mADC
$P_{max}$: 0.84 W
$C_i$: 1 nF
$L_i$: 10 $\mu$H

Europe: ATEX II 1 G

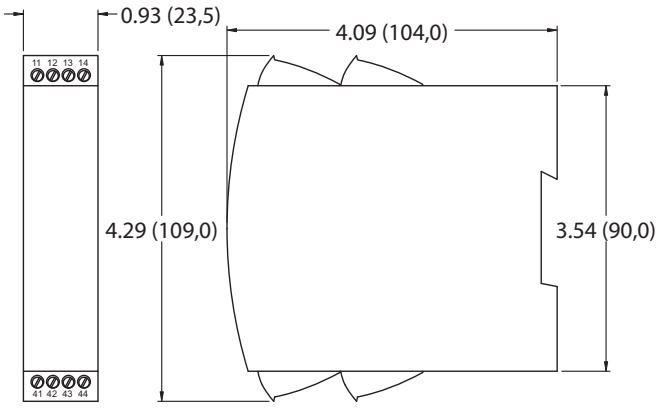
**Meets these European requirements:**
EMC 2004/108/EC: Standard EN 61326

*Specifications subject to change*

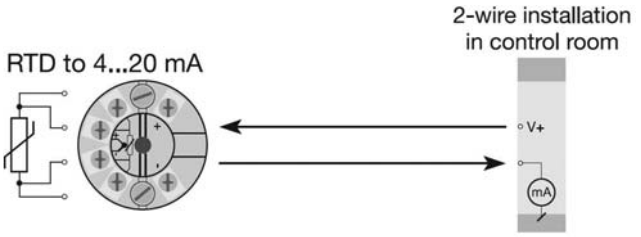
## Specifications and order options

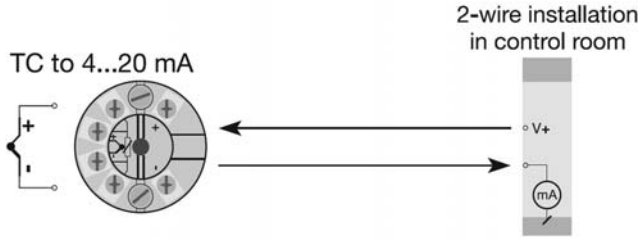
| | |
|---|---|
| TT520 | Model Number:<br>TT520 Temperature Transmitter<br>TT530 DIN Rail Temperature Transmitter |
| PD | Sensor Type:<br>PD = 100Ω Platinum RTD (0.00385)<br>PF = 1000Ω Platinum RTD (0.00385)<br>E = Type E Thermocouple<br>J = Type J Thermocouple<br>K = Type K Thermocouple<br>T = Type T Thermocouple |
| (-25/200) | Temperature Range:<br>Specify temperature range in either °C or °F.<br>For example, -25° to +200°C = 4 to 20 mA. |
| C | Temperature Units:<br>C = Celsius<br>F = Fahrenheit |
| 1 | Calibration:<br>1 = Nominal<br>2 = Matched to sensor ±0.75% span<br>For other calibration options, contact Minco |
| Y | Sensor Leads:<br>Y = 2-lead RTD (or thermocouple)<br>Z = 3-lead RTD<br>X = 4-lead RTD |
| TT520PD(-25/200)C1Y = Sample part number | |

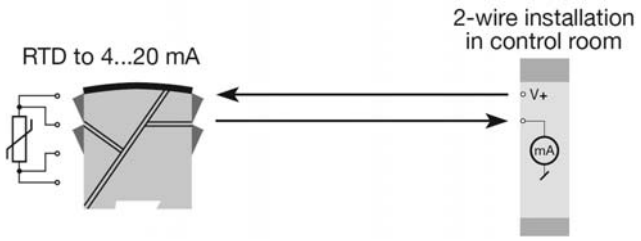
## Dimensions in inches (mm)

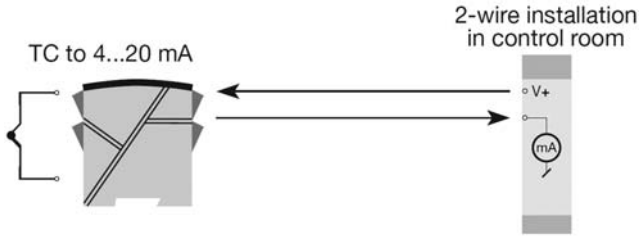



## Wiring Diagrams

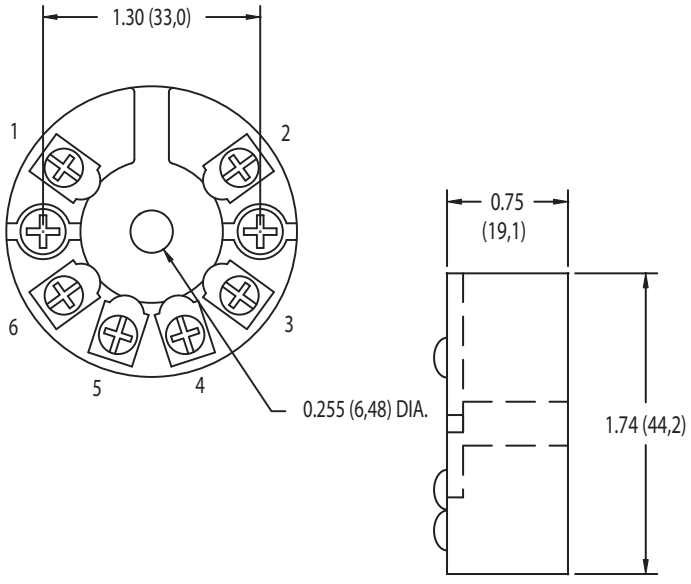



## Dimensions in inches (mm)




*Specifications subject to change*

# TT518 Programmable Temperature Transmitter


## Overview

This transmitter amplifies a signal from a RTD or linear resistance, 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.

- RTD or Ohm input
- Accurate, Stable 4–20mA Output
- PC and field-programmable
- FM Approved Intrinsically Safe

## Converts multiple inputs

Temperature measurement can be done with one of several RTD's: 100 Ω, 1000 Ω platinum, 100 Ω Nickel and 1000 Ω Nickel.

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 TT518 is delivered configured to the customer's specifications, including the transmitter's measurement range and RTD type.

## PC Programming

The TT518 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.

## Electrical Specifications

**Ambient temperature range:** -40°C to +85°C

## Common Specifications

**Supply voltage:** 8 -30 VDC

**Warm-up time:** 5 min.

**Communication interface:** PC Interface/Loop Link

**Signal/noise ratio:** Min. 60 dB

**Response time (programmable):** 0.33 sec. to 60 sec.

**Update time:** 135 msec.

**Calibration temperature:** 20 to 28°C

**Effect of supply voltage change:** < 0.005% of span/ VDC

**EMC-Immunity influence:** < ±0.5% of span

**Vibration:** IEC 600 68-2-6 Test FC

**Lloyd's specification no. 1:** 4 g / 2 - 100 Hz

**Max. wire size:** AWG14 (1.5 $mm^2$)

**Air humidity:** 0 - 95% RH

**Dimensions:** ∅1.73 x 0.84 in (∅44 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

**Cable resistance per wire (max.):** 10Ω

**Sensor current:** >0.2mA, <0.4mA

**Effect of sensor cable resistance:**
(3-wire): < 0.002 Ω/Ω

**Input:**

| Type | Minimum Value | Maximum Value | Minimum Span |
|---|---|---|---|
| PD (Pt100) | -200°C | +850°C | 25°C |
| PF (Pt1000) | -200°C | +850°C | 25°C |
| Linear Res. | 0 Ω | 10000 Ω | 30 Ω |

**Basic accuracy:**
PD/PF (Pt100/1000): <±0.3°C
Linear Resistance: <±0.2Ω

**Temperature coefficient:**
PD/PF (Pt100/1000): <±0.01°C/°C
Linear Resistance: <±20mΩ/°C

**Current output:**
Signal range: 4 - 20 mA
Min. signal range: 16 mA
Load resistance : < (Vsup. – 8) / 0.023 [Ω]
Load stability: ± 0.01% of span / 100 Ω

**Sensor error detection:**
Programmable: 3.5 - 23 mA, or no action
Namur NE43 Downscale/Upscale: 3.5 mA/ 23 mA

**Approvals:**
EMC: EN 61326-1
ATEX.: KEMA 03ATEX1535
FM: 2D5A7
CSA: 1125003
GOST R: Yes
GOST Ex: Yes
DNV Marine: Stand. F. Certification No. 2.4

## Input

The input type is selected to be one of these types:

- RTD (3-wire): PT100, PT1000
- High level

## Output

The 4-20 mA output follows the TT518 input configuration, reflecting the temperature and/or resistance. 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:

| TT518 | Model Number: TT518 Temperature Transmitter |
|---|---|
| PD | Sensor Type:<br>PD = 100 Ω Platinum RTD (0.00385)<br>PF = 1000 Ω Platinum RTD (0.00385) |
| (-25/200) | Ranging:<br>Specify temperature range in either °C or °F.<br>For example, -25° to +200°C = 4 to 20 mA. |
| C | Display Units:<br>C = Celsius<br>F = Fahrenheit |
| 1 | Calibration:<br>1 = Nominal<br>2 = Matched to sensor ±0.75% of span<br>For other calibration options, contact Minco |
| Z | Sensor Leads:<br>Z = 3-lead RTD |
| TT518PD(-25/200)C1Z : Sample part number | |

# 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 TT519 is delivered configured to the customer's specifications, including the transmitter's measurement range and thermocouple type.

## PC programming

The 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.

## Electrical Specifications

**Ambient temperature range:** -40°C to +85°C

## Common Specifications

**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 $mm^2$)

**Air humidity:** 0 - 95% RH

**Dimensions:** ∅1.73 x 0.84 in (∅44 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

**Input:**

| Type | Minimum Value | Maximum Value | Minimum Span |
|---|---|---|---|
| E | -100°C | +1000°C | 50°C |
| J | -100°C | +1200°C | 50°C |
| K | -180°C | +1372°C | 50°C |
| T | -200°C | +400°C | 50°C |
| B | +400°C | +1820°C | 100°C |
| N | -180°C | +1300°C | 50°C |
| R | -50°C | +1760°C | 100°C |
| S | -50°C | +1760°C | 100°C |

**Basic accuracy:**

TC type E, J, K, L, N, T: <±1°C
TC type B, R, S: <±2°C

**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 Downscale/Upscale: 3.5 mA/ 23 mA

**Approvals:**

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

## Input

The input type is selected to be one of these types:

- Type E, J, K, T, B, N, R, S Thermocouple
- Voltage Input

## 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:

| TT519 | Model Number: TT519 Temperature Transmitter |
|---|---|
| K | Sensor Type:<br>E=Type E Thermocouple<br>J=Type J Thermocouple<br>K=Type K Thermocouple<br>T=Type T Thermocouple<br>B=Type B Thermocouple<br>N=Type N Thermocouple<br>R=Type R Thermocouple<br>S=Type S Thermocouple<br>V = Voltage Input |
| (-25/200) | Ranging:<br>Specify temperature range in either °C or °F.<br>For example, -25° to +200°C = 4 to 20 mA. |
| C | Display Units:<br>C = Celsius<br>F = Fahrenheit |
| 1 | Calibration:<br>1 = Nominal |
| Y | Sensor Leads:<br>Y = 2-lead Thermocouple |
| TT519K(-25/200)C1Y: Sample part number | |