

THT201 THERMOCOUPLE TEMPERATURE TRANSMITTER



INTRODUCTION

The TekOn Electronics In Head 2-Wire Temperature Transmitters are specifically designed to meet the most rigorous requirements of operation in the industrial process environments. Due to their reduced dimensions they can be installed in the DIN Form B sensor connection head in place of traditional terminal blocks.

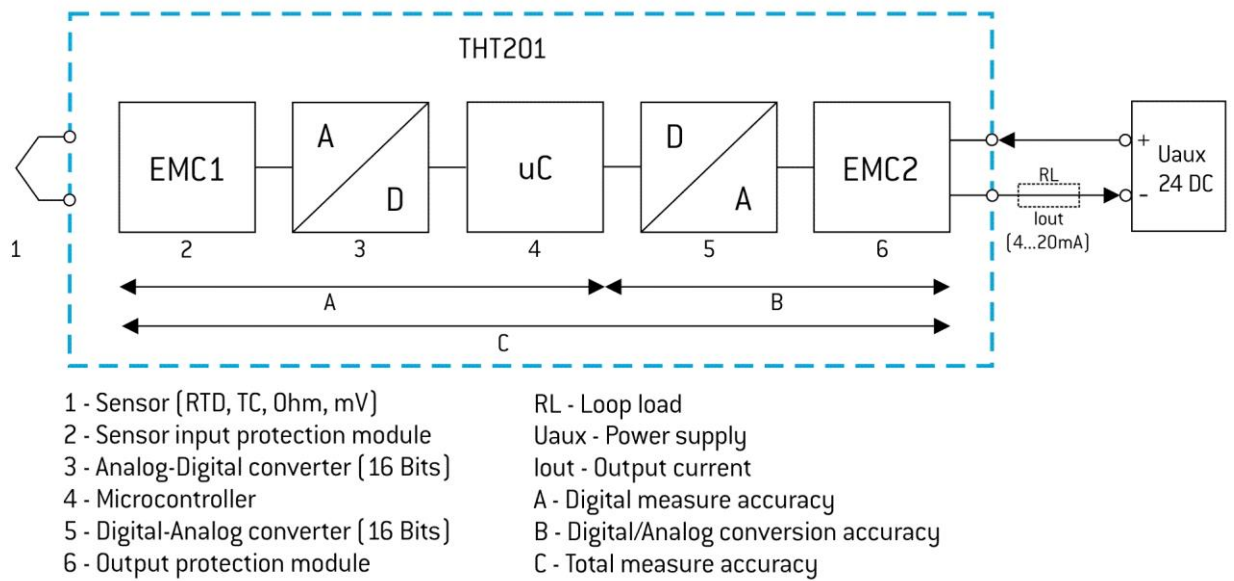
The THT201 is an ultra-flexible thermocouple transmitter which accepts the most commonly used thermocouple temperature sensors, and generates a linear 4 to 20 mA current signal with high stability as output.

The operating parameters like the sensor probe type, connection method, measuring range, output signal range or fault value can be configured using the THT201 user friendly free software "TekOn Configurator".

KEY FEATURES

- Universal thermocouple sensor input: E, J, K, N, R, S, T
- Analogic output: 4 to 20 mA
- 2 status LEDs
- Test pads
- Installation in the connection head type DIN B
- Configurable over PC
- Fault detection and signalling according to NAMUR NE43 recommendation
- Continuous operating status monitoring and self-diagnostic
- High precision and accuracy in the whole range of operating temperatures
- Internal temperature sensor for temperature drift compensation
- Sensor cable resistance compensation
- Output signal compensation
- Wide measurement range

BLOCK DIAGRAM



TECHNICAL SPECIFICATIONS

Input

Thermocouples (TC)

Measured variable	Temperature
Sensor type	Thermocouples: E, J, K, N, R, S, T
Units	°C or °F
Connection	Thermocouple (TC)
Response time	<500 ms
Open-circuit monitoring	Always active (cannot be disabled)
Short-circuit monitoring	Not available
Cold junction compensation (CJC)	Integrated resistance thermometer
Measuring range	Configurable (see table "Digital measuring errors")
Minimum measured span	50°C (90°F)
Characteristic curve	Temperature-linear

Output

Output signal	4 to 20 mA
Power supply (Uaux)	9 to 30 V DC
Max. load	$(U_{aux} - 9)/0.022A$
Over range	3 to 22 mA
Error signal (eg. following sensor fault) (conforming to NE43)	Software configurable $\leq 3,6mA$ or $\leq 21mA$
Sample cycle	<1s
Protection	Against reversed polarity – Surge protection

Measuring accuracy

Reference conditions:

Auxiliary power	24V DC \pm 1%
Ambient temperature	23°C (73,4°F)
Warming-up time	>5min
Error in the analog output (digital/analog converter)	<0.08% of span
Digital measuring errors	See table "digital measuring errors"

Error due to internal cold junction	<0.5°C (0.9°F)
Influence of ambient temperature	
with resistance thermometers	0.06°C (0.11°F)/10°C (18°F)
with thermocouples	0.6°C (1.1°F)/10°C (18°F)
analog measuring error	0.02% of span/10°C (18°F)

Ambient conditions

Ambient temperature range	-20 to 80°C (-4 a 176°F)
Storage temperature range	-20 to 80°C (-4 a 176°F)
Relative humidity	≤95%, without condensation

Casing

Material	Nylon 66
Weight	Approx. 50g
Dimensions	See "Dimensional drawings"
Cross-selection of cables	2.5mm ²
Protection type	IP40

Certificates and approvals

EN 61326	Electrical equipment for measurement, control and laboratory use. EMC requirements.
IEC 61000-4-2	Electrostatic discharge immunity test
IEC 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test
IEC 61000-4-4	Electrical fast transient/burst/immunity test
IEC61000-4-5	Surge immunity test

Factory settings

Sensor	PT100 with 3-wire circuit
Measuring range	0...100°C (32...212°F)
Fault current	NAMUR NE 43
Sensor offset	0°C (0°F)
Damping	0.0s

Digital measuring accuracy Thermocouples (TC)

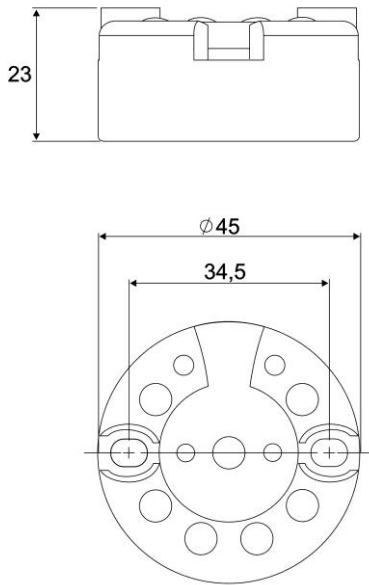
Sensor	Range °C (°F)	Digital accuracy °C (°F)
E	-200 to 1000 (-328 to 1832)	1
J	-210 to 1200 (-346 to 2192)	1
K	-230 to 1370 (-382 to 2498)	1
N	-200 to 1300 (-328 to 2372)	1
R	-50 to 1760 (-58 to 3200)	2
S	-50 to 1760 (-58 to 3200)	2
T	-200 to +400 (-328 to 752)	1

The digital accuracy is the accuracy after the analog/digital conversion including linearization and calculation of the measured value.

An additional error is generated in the output current 4 to 20mA as a result of the digital/analog conversion of 0.025% of the set span (digital-analog error).

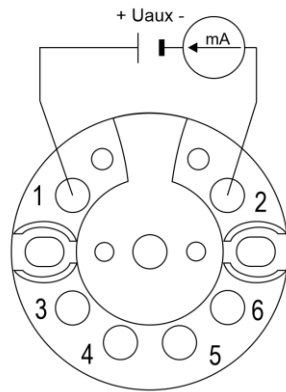
The total error under reference conditions at the analog output is the sum from the digital error and the digital-analog error (poss. With the addition of cold junction errors in the case of thermocouple measurements).

DIMENSIONAL DRAWINGS & INSTALLATION DIAGRAM

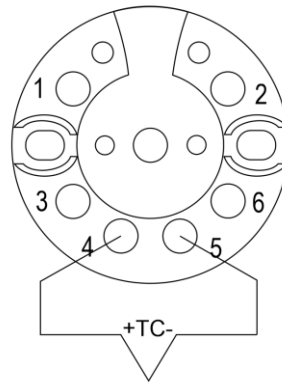


ELECTRICAL CONNECTIONS

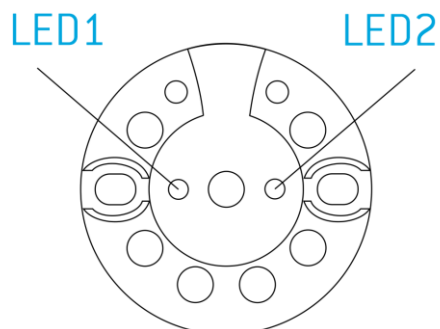
POWER SUPPLY



THERMOCOUPLE



STATUS LEDs

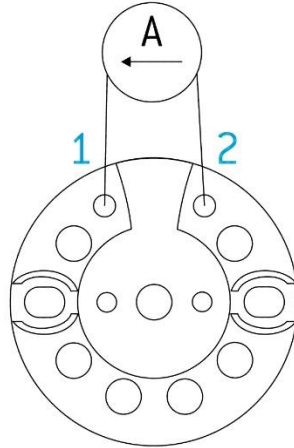


LED1 (RED)	LED2 (BLUE)	
OFF	ON	NORMAL MODE
BLINK	ON	SENSOR ERROR
OFF	BLINK	CONFIGURATION MODE

TEST POINTS

The test points may be used to measure the transmitter current consumption.

Please connect the test probes of multimeter with the DC current measurement option to the test points according to the following image:



SELECTION AND ORDERING DATA

Partnumber	Partname
PA132720210	THT201 TC TEMP. TRANSMITTER
Related Products	
PA132720110	THP101 PT100 TEMP. TRANSMITTER
PA132720310	SARC 2 USB CONFIGURATOR
PA110020100	TRANSM. TEMP. UNIVERSAL THU1102 V01.00
PA110030100	THUW1103 Universal Wireless Temperature Transmitter

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