THP1217
PT100 Temperature Transmitter

Introduction

- PT100 sensor input
- 4 to 20 mA analog output
- High measurement accuracy
- NAMUR NE 43 fault detection
- Configurable over PC

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.

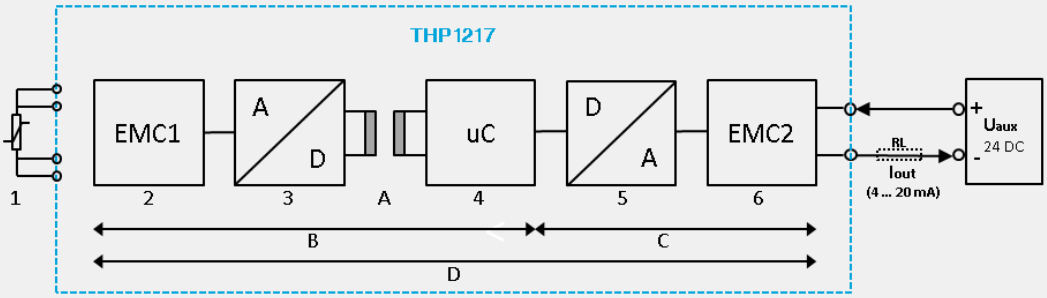
The THP1217 is an ultra-flexible universal temperature transmitter which accepts the most commonly used temperature sensors (Resistance thermometers: 2, 3 or 4-wire system, Thermocouples, Resistance-based sensors and DC voltage sources), and generates a linear 4 to 20 mA current signal with high stability 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 THP1217 user friendly free software “Tekon Configurator”.

Key Features

- PT100 sensor input
- Analogic output: 4 to 20 mA
- Installation in the connection head type DIN B
- Configurable over PC
- Fault detection and signaling 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 temperatur drift compensation
- Sensor cable resistance compensation
- Output signal compensation
- Wide measurement range

Block Diagram



1 – Sensor PT100
2 – Módulo de protecção das entradas
3 – Conversor Analógico-Digital (16 Bits)
4 – Microcontrolador
5 – Conversor Digital-Analógico (16 Bits)
6 – Módulo de protecção da saída

RL – Carga do loop
Uaux – Fonte de alimentação
Iout – Corrente de saída
A – Isolamento Galvânico (dependente do modelo)
B – Precisão de medição Digital
C – Precisão de medição Digital / Analógica
D – Precisão de medição global

Technical Specifications

Input Resistance thermometer (RTD)	
Measured variable	Temperature
Sensor type	Pt100, Pt500, Pt1000
Units	ºC or ºF
Connection	1 Resistance thermometer (RTD) in 2-wire, 3-wire or 4-wire system Resistance compensation in 2-wire systems available through software
Sensor current	<0.05 mA (50 µA) pulsed
Response time	<500 ms
Open-circuit monitoring	Always active (cannot be disabled)
Short-circuit monitoring	Always active (cannot be disabled)
Measuring range	Parameterizable (see table "Digital measuring errors")
Minimum measured span	50 ºC (90 ºF)
Characteristic curve	Temperature-linear

Output	
Output signal	4 to 20 mA
Power supply (Uaux)	9 to 30 V DC
Max. load	(Uaux – 9) / 0.022 A
Overrange	3 to 22 mA
Error signal (e.g. following sensor fault) (conforming to NE43)	Software configurable ≤3,6 mA ou ≥21 mA
Sample cycle	<1 s
Protection	Against reversed polarity Surge protection

Measuring accuracy	
Reference conditions:	
Auxiliary power	24 V DC ± 1%
Ambient temperature	23 ºC (73,4 ºF)
Warming-up time	> 5 min
Error in the analog output (digital/ analog converter)	< 0.08 % of span
Digital measuring errors	See table "Digital measuring errors"
Influence of ambiente temperature	
with resistance thermometers	0,06 ºC (0,11 °F) / 10 ºC (18 ºF)
with thermocouples	0,6 ºC (1,1 ºF) / 10 ºC (18 ºF)
Analog measuring error	0.02 % of span/10°C (18 °F)

Digital measuring accuracy Resistance thermometer (RTD)		
Sensor	Range ºC (ºF)	Digital accuracy ºC (ºF)
Pt100	-200 to 850 (-328 to 1562)	0,1 (0,18)

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 20 mA 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).

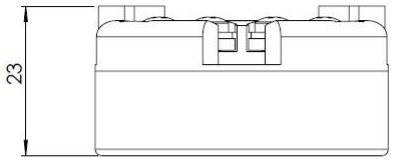
Ambient conditions	
Ambient temperature range	-20 to 80 ºC (-4 a 176 ºF)
Storage temperature range	-20 to 80 ºC (-4 a 176 ºF)
Relative humidity	≤ 95 %, without condensation

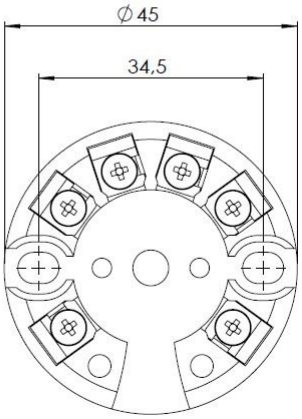
Casing	
Material	Nylon 66
Weight	Approx. 50 g
Dimentions	See “Dimensional drawings”
Cross-section of cables	2.5 mm^2
Protection type	IP40

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
IEC 61000-4-5	Surge Immunity Test

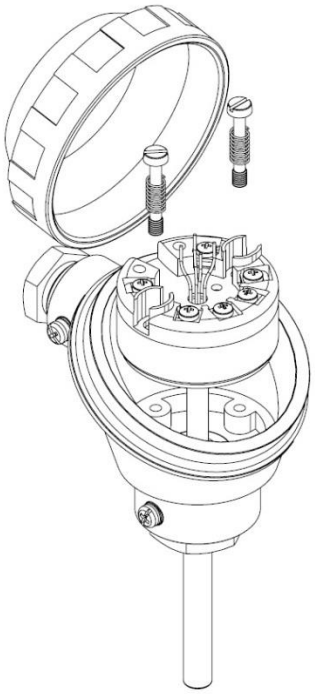
Factory settings	
Sensor	Pt100 with 3-wire circuit
Measuring range	0…100 ºC (32 … 212 ºF)
Fault current	NAMUR NE 43
Sensor offset	0 °C (0 °F)
Damping	0.0 s

Dimensional drawings



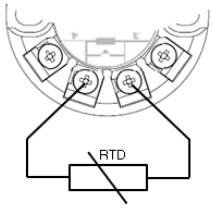


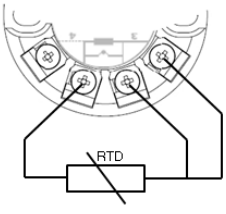
Installation diagram

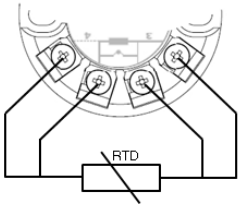


Electrical connections

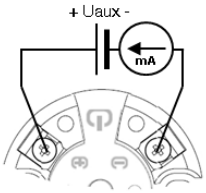
Termómetro de resistência







Fonte de alimentação (Uaux)



Selection and ordering data

Image	Partnumber	Partname
	PA121700100	THP1217 PT100 Temperature Transmitter
	Related products	
	PA110050100	SARC1105 USB Configurator
	PA110020100	THU1102 Universal Temperature Transmitter
	PA110030100	THUW1103 Universal Wireless Temperature Transmitter

Tekon [1]
Quinta do Simão - EN109 - Esgueira
Apartado 3080
3801-101 Aveiro
PORTUGAL
Phone +351 234 303 320
Fax +351 234 303 328/9
e-mail sales@tekonelectronics.com
site www.tekonelectronics.com

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