

COMPACT  
DESIGN

# UNIVERSAL TEMPERATURE TRANSMITTER THU1102

REF.: PA110020100



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 the DIN Form B sensor connection head in place of traditional terminal blocks.

The THU1102 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 20mA current signal with high stability as output.

Dimensions: 23 mm x 45 mm

Weight: Approx. 50g

Material: Nylon 66

Protection Index: IP40

## KEY FEATURES

UNIVERSAL SENSOR INPUT

4 TO 20 MA ANALOG OUTPUT

HIGH MEASUREMENT ACCURACY

NAMUR NE 43 FAULT DETECTION

CONFIGURABLE OVER PC  
THROUGH THE TEKON CONFIGURATOR SOFTWARE

PA110020100\_DS.ENG.V01.2018

**TECHNICAL SPECIFICATIONS**

**INPUT  
RESISTANCE THERMOMETER (RTD)**

Measured variable	Temperature
Sensor type	PT100, PT500, PT1000
Connection	1 Resistance thermometer (RTD) in 2-wire, 3-wire or 4-wire system Resistance compensation in 2-wire systems available through software
Units	°C or °F
Sensor current	<0.05 mA (50 uA)
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°C (90°F)
Characteristic curve	Temperature-linear

**INPUT  
RESISTANCE-BASED SENSORS (R)**

Measured variable	Resistance
Sensor type	Resistance, potentiometers
Units	Ω
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 uA)
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	25 Ω
Characteristic curve	Resistance-linear

**INPUT  
THERMOCOUPLES (TC)**

Measured variable	Temperature
Sensor type	E, J, K, N, R, S, T
Units	°C or °F
Connection	1 Thermocouple (TC)
Sensor current	<0.05 mA (50 uA)
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	Parameterizable (see table "Digital measuring errors")
Minimum measured span	50°C (90°F)
Characteristic curve	Temperature-linear

INPUT (MV)	
Measured variable	DC Voltage
Sensor type	DC Voltage source
Units	mV
Response time	< 500 ms
Open-circuit monitoring	Always active (cannot be disabled)
Short-circuit monitoring	Not available
Measuring range	- 100mV to 100mV
Minimum measured span	2mV or 20mV
Overload capability of the input	-1,2V to 3V
Input resistance	> 1MΩ
Characteristic curve	Voltage-linear

OUTPUT	
Output signal	4 to 20 mA
Power supply (Uaux)	9 to 30V 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 ≤ 3,6mA or ≥ 21mA
Sample cycle	< 1s
Protection	Against reversed polarity Surge protection

MEASUREMENT ACCURACY	
Reference conditions	
Auxiliary power	24V DC ± 1%
Ambient temperature	23°C (73,4°F)
Warming-up time	> 5min
Error in the analog output (digital/analog converter)	< 0.025% 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	< 0.006° C/°C
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)

OPERATING ENVIRONMENT	
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

HOUSING	
Material	Nylon 66
Weight	Approx. 50g
Dimensions	See "Dimensional drawings"
Cross-selection of cables	2.5 mm <sup>2</sup>
Protection type	IP40
Antenna connection	SMB connector

**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/brust/immunity test
IEC61000-4-5	Surge immunity test

**FACTORY SETTINGS**

Sensor	PT100 with 3-wire circuit
Measuring range	0 to 100°C [32°F to 212°F]
Transmission interval	30s
Node ID	1
Net ID	1

**DIGITAL MEASURING ACCURACY**

**RESISTANCE THERMOMETER (RTD)**

SENSOR	RANGE °C (°F)	DIGITAL ACCURACY °C (°F)
PT100	-200 to 850 [-328 to 1562]	0,1 (0,18)
PT500	-200 to 850 [-328 to 1562]	0,2 (0,40)
PT1000	-200 to 350 [-328 to 662]	0,2 (0,40)

**THERMOCOUPLES (TC)**

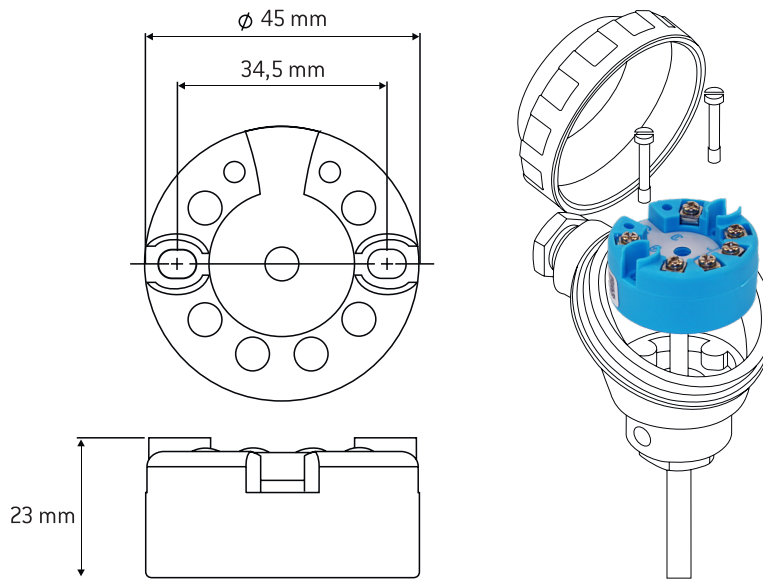
SENSOR	RANGE °C (°F)	DIGITAL ACCURACY °C (°F)
E	-200 to 1000 [-328 to 1832]	1
J	-210 to 1200 [-346 to 2192]	1
K	-230 to 1370 [-382 to 2498]	1
N	-200 to 1300 [-328 to 2372]	1
R	-50 to 1760 [-58 to 3200]	2
S	-50 to 1760 [-58 to 3200]	2
T	-200 to 400 [-328 to 752]	1

**RESISTANCE-BASED SENSORS (R)**

SENSOR	RANGE Ω	DIGITAL ACCURACY Ω
Resistance	0 to 2200	0,25

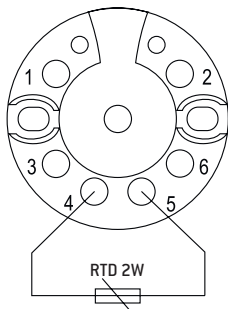
TECHNICAL DRAWINGS AND INFORMATION

DIMENSIONAL DRAWINGS & INSTALLATION DIAGRAM

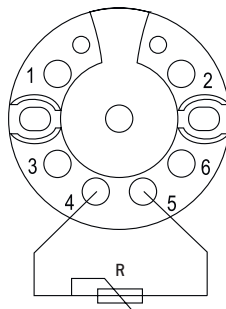


ELECTRICAL CONNECTIONS

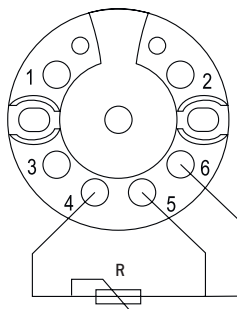
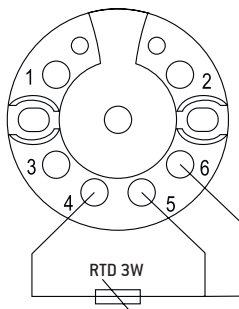
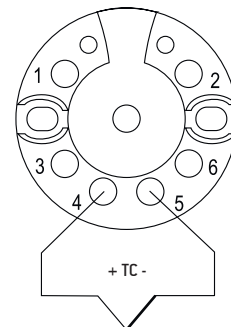
RESISTANCE THERMOMETER



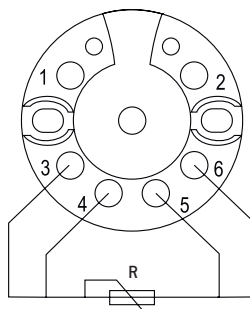
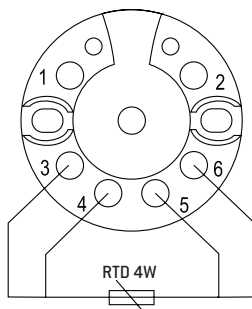
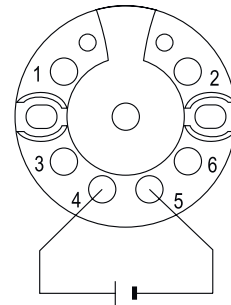
RESISTANCE



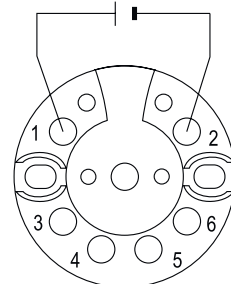
THERMOCOUPLE



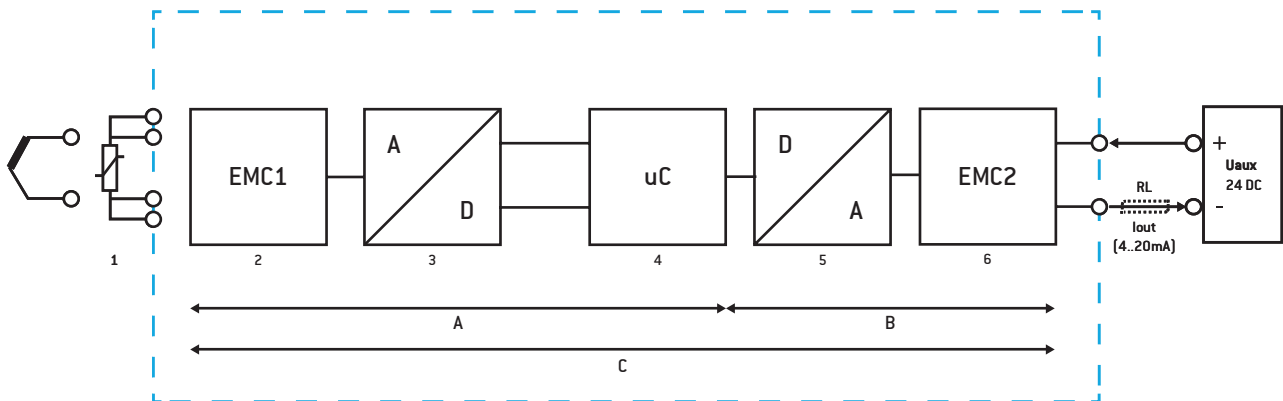
VOLTAGE



POWER SUPPLY



**BLOCK DIAGRAM**



- 1 - Sensor (RTD, TC, Ohm, mV)
- 2 - Sensor input protection module
- 3 - Analog-Digital converter ( 16 Bits)
- 4 - Microcontroller
- 5 - Digital-Analog converter ( 16 bits)
- 6- Output protection module

- RL - Loop load
- Uaux - Power supply
- Iout - Output current
- A - Digital measure accuracy
- B - Digital / Analog conversion accuracy
- C - Total measure accuracy

**RELATED PRODUCTS**



**SARC1105 - USB CONFIGURATOR**

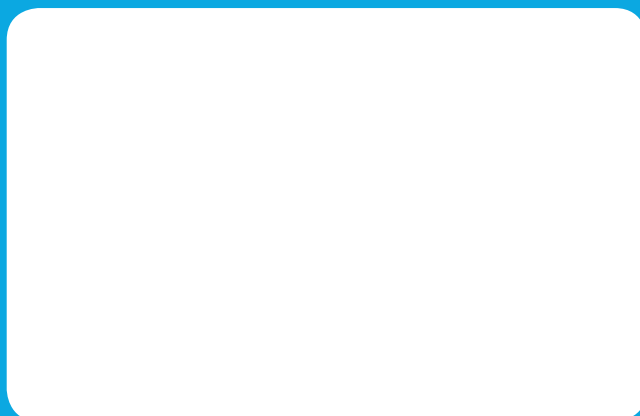
REF.: PA110050100

Connection between a PC USB port and THU1102 universal temperature head transmitter.  
USB powered for easy off-process configuration

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