



# **Analogue Temperature Transmitter**

PC configurable, Head Mounting



Model T24.10

TE 24.01

#### Applications

• Machine Industry and Plant Construction

**Electrical Temperature Measurement** 

· Process Industry



#### Features

- Configurable with Windows PC without sensor simulation, remote configuration also possible from the control room via the current loop
- · Analogue signal processing, ideal for multiplex-systems
- For Pt 100 and resistance-sensors, 3 wire
- Analogue output 4...20 mA, 2 wire design
- EMC Conformity per EN 61 326 and NAMUR NE 21
- Sensor burnout monitoring in accordance with NAMUR NE 43
- Compact design suitable for any DIN connection head of form B

#### Description

The temperature transmitter T24 combines the known quick response of an analogue transmitter with the flexibility of configuration by means of Windows PC. The quick stabilisation of the output current after feeding the power supply enables the use of this transmitter in multiplex systems.

Setting of the measuring range, type of sensor and sensor burnout behaviour takes only a matter of seconds thanks to the easy-to-use Windows configuration software. Time-consuming adjustment and sensor simulation are not required for this transmitter.

Possible measuring errors which might for example, result from poor thermometer position, can be compensated by means of the function 'sensor correction'.

Due to its flexibility and reliability the temperature transmitter T24 is suited for a wide range of applications in the machine industry and plant construction. Versions with explosion protection approval in accordance with ATEX are available for applications in the process industry.

As a result of its extremely compact design this WIKA temperature transmitter can be fitted into any DIN connection head of form B.

#### Specification

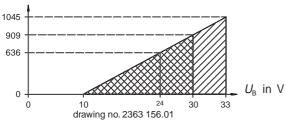
#### Model T24.10

Input         measuring range configurable with Nindows PC.           model T24.10.2P*         Pt 100         DIN EN 60751 3 wire         max. measuring range -200 …4650 °C.           initial value of measuring range         configurable between -200 °C and +200 °C.         ed of measuring range. see diagram.           measuring range         configurable, dependent from initial value of measuring range. see diagram.         minimum 50 K           measuring range         uith initial value of measuring range between -100 °C and +100 °C.         as wire         0150 °C           basic configurable, dependent from initial value of measuring range between -100 °C and +100 °C.         approx.05 mA         approx.05 mA           connection leads         effect         ± 0.2 K / 10 Ω each wire <sup>1</sup> approx.05 mA           connection leads         effect         ± 0.2 K / 10 Ω each wire <sup>1</sup> approx.05 mA           connection leads         effect         ± 0.2 K / 10 Ω each wire <sup>1</sup> approx.05 mA           insarization         linearization         linearization         innearce tep ro DIN EN 60751         innearce tep ro DIN EN 60751           insarization         sensor short circuit         not configurable: NAMUR downscale < 3.6 mA (typ. 3 mA) <sup>50</sup> rising time <i>l<sub>0</sub></i> <1 ms         sensor short circuit         not configurable: NAMUR downscale < 3.6 mA (typ. 3 mA) <sup>50</sup>	opeomoditon					
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	model T24.10.**4					
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	permissible ambie	ent temperature	-	50 °C +85 °C with T4		
maximum values for connection of the current loop circuit (connections + and -) $U_i = DC 30 V$ $C_i = 6.2 nF$ $I_i = 120 mA$ $L_i = 110 \mu H$ $P_i = 800 mW$ maximum values for connection of the sensor circuit (connections 1 up to 3) $U_o = DC 6.4 V$ Group II B: $I_o = 42.6 mA$ $C_o = 500 \mu F$ $P_o = 37.1 mW$						
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maximum values for connection of the sensor circuit (connections 1 up to 3) $U_o = DC \ 6.4 \ V$ Group II B: $I_o = 42.6 \ mA$ $C_o = 500 \ \mu F$ $P_o = 37.1 \ mW$ $L_o = 50 \ mH$	maximum values	for connection of the				
sensor circuit (connections 1 up to 3) Group II B: $C_{\circ} = 500 \mu\text{F}$ $L_{\circ} = 50 \text{mH}$	current loop circu	it (connections + and -)				
	maximum values	for connection of the				
Group II C: $C_{\circ} = 20 \ \mu\text{F}$ $L_{\circ} = 10 \ \text{mH}$	sensor circuit ( c	onnections 1 up to 3)		· · ·		
			Group II C:	$C_{\rm o} = 20 \ \mu \text{F}$ $L_{\rm o} = 10 \ \text{mH}$		

# Load diagram

The permissible load is dependent upon the loop power supply voltage.





1) for 3 wire sensor connection,

with 2 wire connection a total lead resistance up to  $20\,\Omega$  is compensatable, otherwise the lead resistance causes additional error

2) with measuring span higher than 450 K additional:  $\pm 0.1 \% / 100 \text{ K} \cdot (\text{ME} - \text{MA} - 450 \text{ K})$  with initial value of measuring range lower than  $-100 \degree \text{C}$  or higher than  $+100 \degree \text{C}$  additional:  $\pm 0.25 \% / 100 \text{ K} \cdot (|\text{MA}| - 100 \text{ K})$ 

legend: MA = initial value of measuring range ME = end of measuring range

3)  $\pm 0.2\%$  with measuring ranges with initial value lower than 0 °C

4) whichever is greater

5) temperature value, in case of short between wire no. 2 and no. 3

(operation of sensor in 2 wire connection)

wire number:



drawing no. 1375 890 Specifications in % refers to the measuring span

R<sub>A</sub> load

T<sub>a</sub> ambient temperature

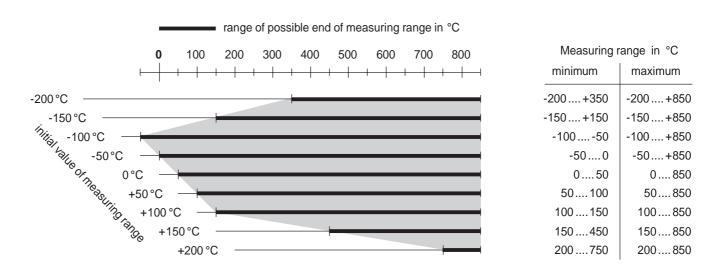
T<sub>c</sub> temperature coefficient

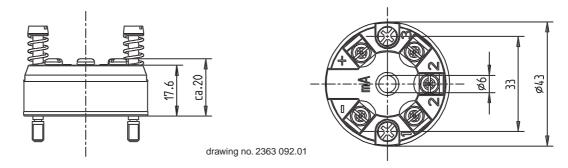
 $U_{\rm B}$  loop power supply voltage, see power supply

-protection, energy-limited per EN 50 021	EC Type Test applied		
model T24.10.**9	II 3G EEx nL IIC T4 / T5 / T6		
permissible ambient temperature	-50 °C +85 °C with T4		
	-50 °C +65 °C with T5		
	-50 °C +50 °C with T6		
maximum values for connection of the	$U_{i} = DC 33 V$		
current loop circuit (connections + and -)	$C_{\rm i} = 6.2  {\rm nF}$ $L_{\rm i} = 110  {\rm \mu H}$		
maximum values for connection of the	$U_{\rm o} = {\rm DC} \; 5.4 \; {\rm V} \qquad I_{\rm o} = 0.5 \; {\rm mA}$		
sensor circuit (connections 1 up to 3)	$C_{o} = L_{o} =$		
Electromagnetic compatibility (EMC)	per EMC Directive 89/336/EEC EN 61326:1997/A1:1998		
	and additional NAMUR NE 21 (August 98)		
Ambient conditions			
ambient and storage temperature	-40 +85 °C		
climate class	Cx (-40 +85 °C, 5 % up to 95 % relative humidity) DIN EN 60654-1		
maximum permissible humidity	100 % relative humidity, moisture condensation permissible DIN EN 60068-2-30 Var. 2		
vibration	10 2000 Hz 10 g DIN EN 60068-2-6		
shock	DIN EN 60068-2-27 $g_{\rm N} = 35$		
salt fog	DIN EN 60068-2-11		
Special features			
temperature units	configurable: K, °C, °F		
resistance-sensor	linear resistance-sensors are connectable		
sensor connection	configurable: 3 wire or 2 wire		
	configurable compensation of lead resistance with 2 wire connection		
info data	TAG-No., Descriptor and Message via configuration storeable into transmitter		
configuration and calibration data	permanently stored in EEPROM		
guarantee	5 years for performance		
Case	head mounting design, incl. spring-loaded mounting screws		
material	plastic, PBT, glass fibre reinforced		
degree of protection case	IP 50 IEC 529 / EN 60 529		
terminal connections	IP 00 IEC 529 / EN 60 529		
cross section of terminal connectors	0.14 1.5 mm²		
weight	ca. 0.03 kg		
dimensions	see drawings		

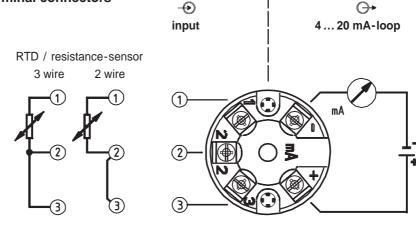
# Possible combinations of initial value of measuring range / end of measuring range

The end of measuring range is dependent upon the respective initial value of measuring range. This is shown in the diagram below. The configuration software checks the desired measuring range. Only permissible values are accepted. Intermediate values are configurable, the smallest resolution is 0.1 °C.





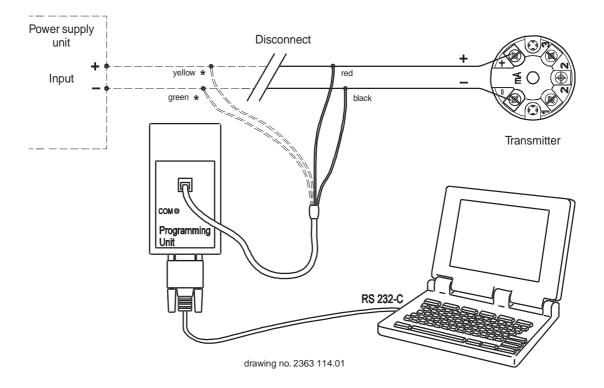
# **Designation of terminal connectors**



drawing no. 2363 122.01

# **Connection of Programming Unit**

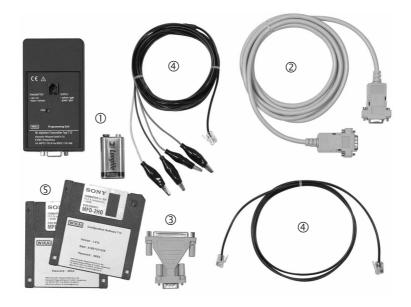
\* Yellow and green are connected only if configuration of the transmitter is to be made when the transmitter is on-line. When configuring in the workshop, an external power supply is not required as the Programming Unit provides the power.

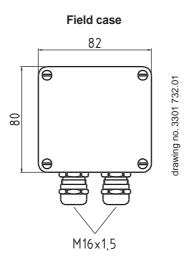


#### Accessory

#### The Configuration-Set contains

- 0  $\mbox{ Programming Unit for the connection to a Windows PC, incl. 9 V battery }$
- ② Connection cable, RS 232-C (9-pin sub-D-plug)
- ③ Plug adapter (9-pin/25-pin plug)
- $\textcircled{ \ }$  Two connection cables  $\mbox{ Programming Unit} \leftrightarrow \mbox{ transmitter }$
- ⑤ Configuration Software (3.5" disk, multi-lingual, Online Help) (free of charge download from the WIKAI Homepage www.wika.de)





Accessory (please order separately)	Order No.
Configuration-Set for T12 and T24	36 34842
Configuration Software T24 on 3.5" disk 1)	23 75385
Field case, plastic (ABS), IP 65, for mounting of a head mounting tran	nsmitter,
permissible ambient temperature: -40 °C +80 °C,	33 01732
82x80x55 mm (WxLxH), with two cable glands M16x1.5	
Adapter for mounting on a DIN rail, plastic/stainless steel	35 93789
Adapter for mounting on a DIN rail, steel tin galvanized	36 19851
Adapter for mounting on a DIN rail, steel zinc galvanized	23 73633

1) Free of charge download from the WIKAI Homepage www.wika.de

# Order information for temperature transmitter Model T24.10

ield No.	•	Code	Feature	25				
			Input					
1		2P	resistan	ce thermometer Pt 100, large measuring ranges (minimum span 50 K)				
			Explos	ion protection				
		0	without					
		2	II 1G EI	Ex ia IIC T4/T5/T6	(available march 2002)			
	4			Ex ib IIC T4/T5/T6	(available march 2002)			
		6	CSA	CSA Class I, Division 1, Groups A, B, C and D on reque				
		8	FM	Class I, Division 1, Groups A, B, C and D	on request			
2		9	II 3G EI	II 3G EEx nL IIC T4/T5/T6 (available ma				
			Approv	als				
		Z	without					
3		G	GL-Approval c					
			Measu	ing range				
	<u>.                                    </u>	GK	basic configuration (3 wire, 0150 °C, signalling down scale < 3.6 mA)					
4		KK	customer's specification 1)					
			nal order	info				
	<u>.</u>	YES	NO					
5		Т	Z	additional text Please state as cle	early understandable text !			

1) Please use sheet "Help to Order" of the price list, when ordering temperature transmitter configured to customer's specification.

Order code:								
		1	2	3	4	5		
T24.10	-			-		_		
Additional text:								



