

Analogue Temperature Transmitter

PC configurable, Head Mounting

Electrical Temperature Measurement



Model T24.10

Applications

- Machine Industry and Plant Construction
- 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

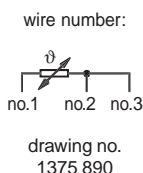
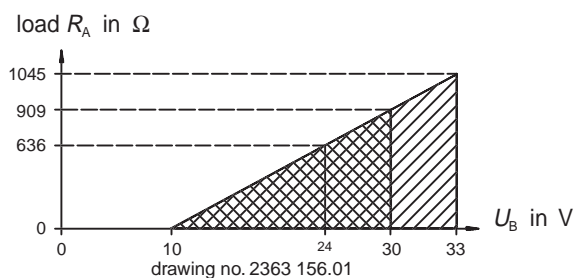
Model T24.10

Input	measuring range configurable with Windows PC		
model T24.10.2P*	Pt 100	DIN EN 60751	3 wire max. measuring range -200 ...+850 °C
initial value of measuring range	configurable between -200 °C and +200 °C		
end of measuring range	configurable, dependent from initial value of measuring range, see diagram		
measuring span	minimum 50 K with initial value of measuring range between -100 °C and +100 °C		
basic configuration	3 wire 0 ... 150 °C		
sensor current	approx. 0.5 mA		
connection leads	effect	± 0.2 K / 10 Ω each wire ¹⁾	
	permissible load resistance	30 Ω each wire, 3 wire symmetric	
Analogue output	4 ... 20 mA 2 wire design		
measuring deviation per DIN EN 60770, 23 °C ± 5 K	± 0.2 % ²⁾		
linearization	linear to temperature per DIN EN 60751		
linearity error	± 0.1 % ³⁾		
temperature coefficient T_c	zero	± 0.1 % / 10 K _{Ta} or ⁴⁾ ± 0.2 K / 10 K _{Ta}	
	span	0.2 % / 10 K _{Ta}	
rising time t_{90}	< 1 ms		
switch-on delay, electric	< 10 ms		
signalling	sensor burnout	configurable: NAMUR downscale < 3.6 mA (typ. 3 mA) ⁵⁾ NAMUR up scale > 21.0 mA (typ. 23 mA)	
	sensor short circuit	not configurable, in general NAMUR downscale < 3.6 mA (typ. 3 mA) ⁵⁾	
load R_A	$R_A \leq (U_B - 10V) / 0.022A$ with R_A in Ω and U_B in V		
load effect	± 0.05 % / 100 Ω		
power supply effect	± 0.025 % / V		
Power supply U_B	by the 4 ... 20 mA-loop		
model T24.10.**0 (without Ex-protection)	DC 10 ... 33 V		
model T24.10.**2 (with  , intrinsic safe ia)	DC 10 ... 30 V		
model T24.10.**4 (with  , intrinsic safe ib)	DC 10 ... 30 V		
model T24.10.**9 (with  , energy-limited)	DC 10 ... 33 V		
input power supply protection	reverse polarity		
max. permissible ripple	10 % with 24 V / maximum load 300 Ω		
 -protection per Directive 94/9/EC (ATEX 100a) Intrinsic Safety per EN 50 020	EC Type Test DMT 02 ATEX E 025 X		
model T24.10.**2	II 1G EEx ia IIB / IIC T4 / T5 / T6		
model T24.10.**4	II 2G EEx ib IIB / IIC T4 / T5 / T6		
permissible ambient temperature	-50 °C ... +85 °C with T4 -50 °C ... +75 °C with T5 -50 °C ... +60 °C with T6		
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: Group II C:	$I_o = 42.6 mA$ $C_o = 500 \mu F$ $C_o = 20 \mu F$	$P_o = 37.1 mW$ $L_o = 50 mH$ $L_o = 10 mH$

- for 3 wire sensor connection, with 2 wire connection a total lead resistance up to 20 Ω is compensatable, otherwise the lead resistance causes additional error
 - with measuring span higher than 450 K additional: ± 0.1 % / 100 K • (ME - MA - 450 K) with initial value of measuring range lower than -100 °C or higher than +100 °C additional: ± 0.25 % / 100 K • (|MA| - 100 K)
- legend: MA = initial value of measuring range
ME = end of measuring range
- ± 0.2 % with measuring ranges with initial value lower than 0 °C
 - whichever is greater
 - temperature value, in case of short between wire no. 2 and no. 3 (operation of sensor in 2 wire connection)

Load diagram

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



Specifications in % refers to the measuring span

R_A load
 T_a ambient temperature
 T_c temperature coefficient
 U_B loop power supply voltage, see power supply

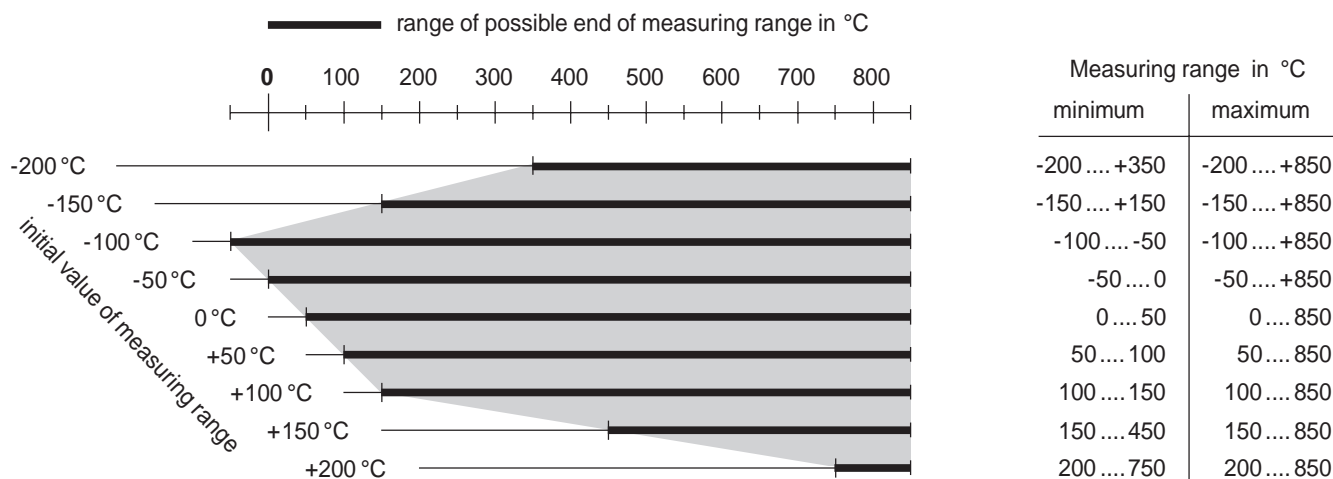
Ex -protection, energy-limited per EN 50 021	EC Type Test applied
model T24.10.**9	II 3G EEx nL IIC T4 / T5 / T6
permissible ambient temperature	-50 °C ... +85 °C with T4 -50 °C ... +65 °C with T5 -50 °C ... +50 °C with T6
maximum values for connection of the current loop circuit (connections + and -)	$U_i = DC 33 V$ $C_i = 6.2 nF$ $L_i = 110 \mu H$
maximum values for connection of the sensor circuit (connections 1 up to 3)	$U_o = DC 5.4 V$ $I_o = 0.5 mA$ $C_o =$ $L_o =$
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 $g_N = 35$
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 mm ²
weight	ca. 0.03 kg
dimensions	see drawings

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

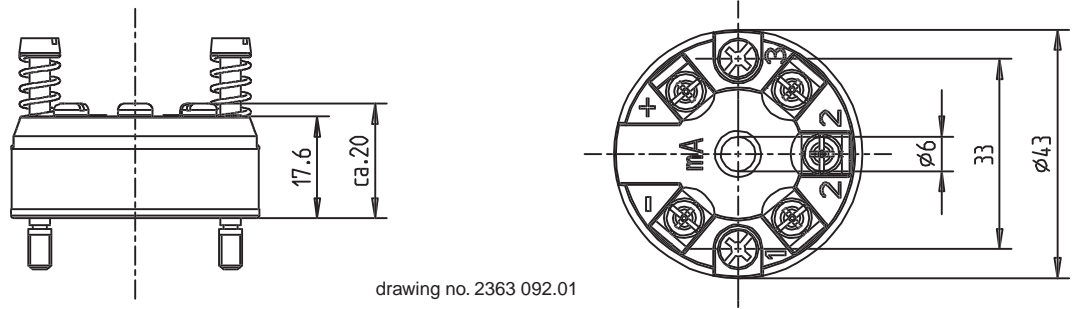
The end of measuring range is dependent upon the respective initial value of measuring range. This is shown in the diagram below.

The configuration software checks the desired measuring range. Only permissible values are accepted.

Intermediate values are configurable, the smallest resolution is 0.1 °C.

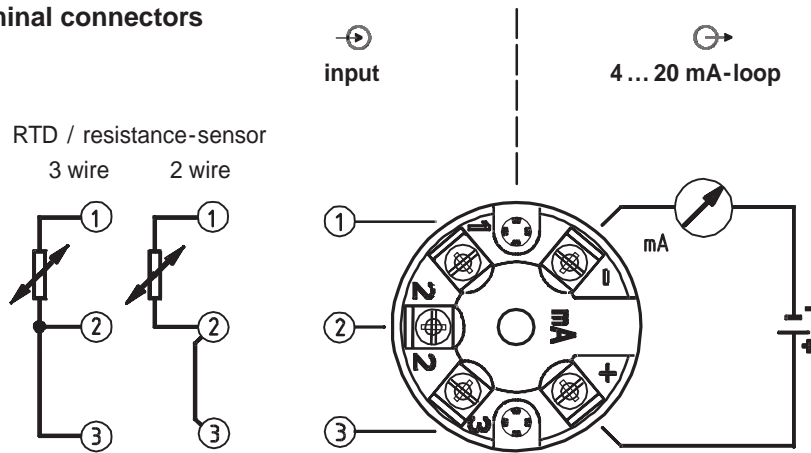


Dimensions in mm



drawing no. 2363 092.01

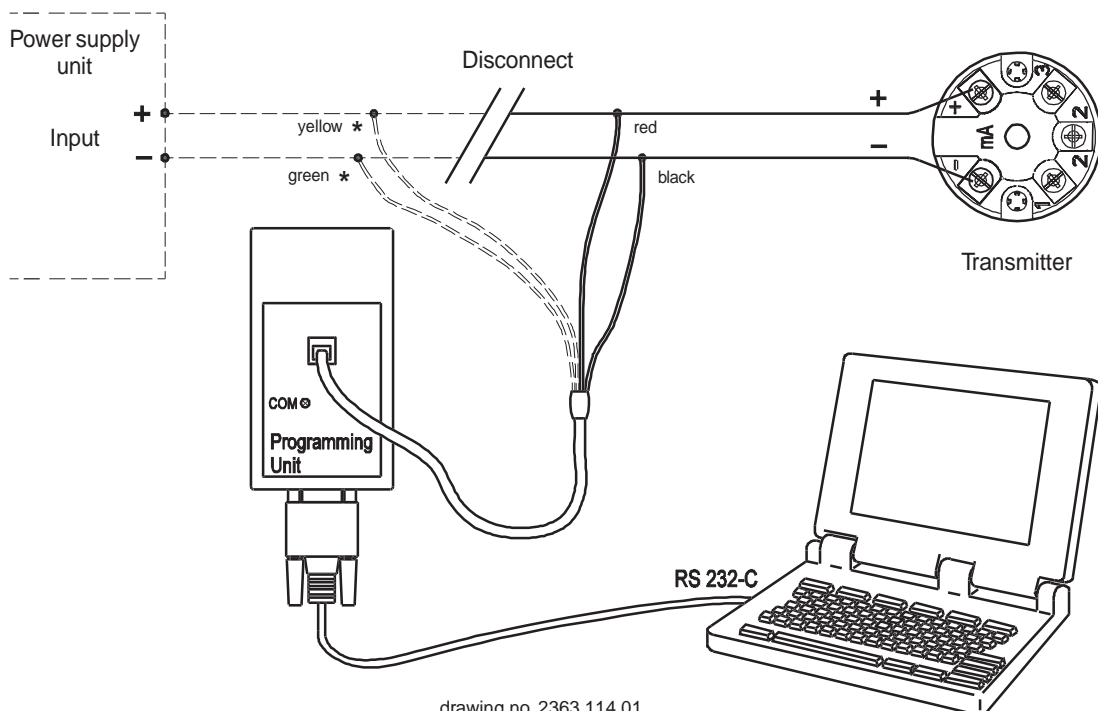
Designation of terminal connectors



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.

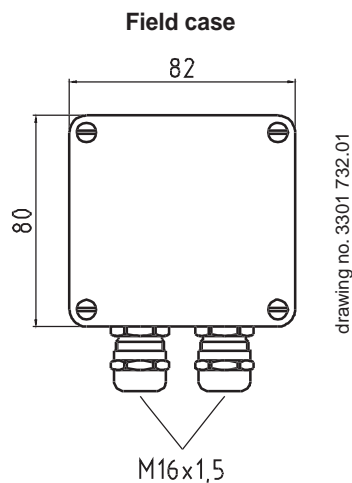
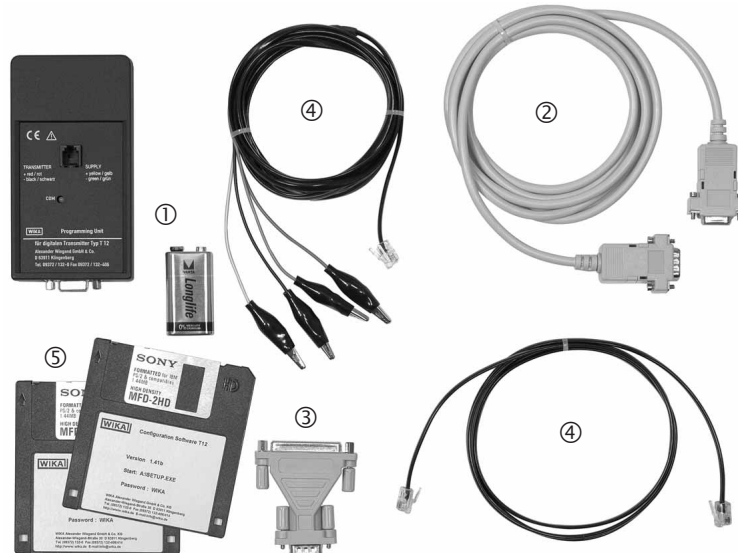


drawing no. 2363 114.01

Accessory

The **Configuration-Set** contains

- ① 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)
- ④ Two connection cables Programming Unit ↔ transmitter
- ⑤ Configuration Software (3.5" disk, multi-lingual, Online Help)
(free of charge download from the [WIKAI](http://www.wika.de) 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 transmitter, permissible ambient temperature: -40 °C ... +80 °C, 82x80x55 mm (WxLxH), with two cable glands M16x1.5	33 01732
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](http://www.wika.de) Homepage www.wika.de

Order information for temperature transmitter Model T24.10

Field No.	Code	Features		
1	2P	Input		
		resistance thermometer Pt 100, large measuring ranges (minimum span 50 K)		
	0	Explosion protection		
		without		
		2	II 1G EEx ia IIC T4/T5/T6 <i>(available march 2002)</i>	
		4	II 2G EEx ib IIC T4/T5/T6 <i>(available march 2002)</i>	
		6	CSA Class I, Division 1, Groups A, B, C and D <i>on request</i>	
		8	FM Class I, Division 1, Groups A, B, C and D <i>on request</i>	
		2	9	II 3G EEx nL IIC T4/T5/T6 <i>(available march 2002)</i>
			Approvals	
3	Z	without		
	G	GL-Approval <i>on request</i>		
4	Measuring range			
	GK	basic configuration (3 wire, 0...150 °C, signalling down scale < 3.6 mA)		
	KK	customer's specification 1)		
5	Additional order info			
	YES	NO		
	T	Z	additional text <i>Please state as clearly understandable text !</i>	

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	-	<input type="text"/>	<input type="text"/>	-	<input type="text"/>	<input type="text"/>	-	<input type="text"/>

Additional text: _____



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