

Operating Instructions Temperature Transmitter Model T42


1 Models 2 Safety Warnings

3 Mounting

3.1 Mounting on the Measuring Insert 3.2 Mounting in Connection Head



Specifications according to WIKA data sheet
TE 42.01

Model	Ex protection
T42.10.000	without
 002	EEx ia
004	EEx ib

2 Safety Warnings

When mounting, initiating and operating these transmitters it is important to observe the safety precautions and regulations (e.g.: IEC 60 364-6-61). Nonobservance of the applicable regulations may cause severe injury to persons or damage to equipment. Only staff with suitable qualification should work with these transmitters.

We draw your attention to the following which must be observed for transmitters with Ex protection:

- Observe the applicable regulations for the use of Ex-class instruments (e.g.: EN 50 014, EN 50 020, EN 50 021).
- Observe the notes for mounting and operating in hazardous area described in section 7.
- It is forbidden to use a transmitter that is damaged externally.
- Repairs are forbidden.

Note

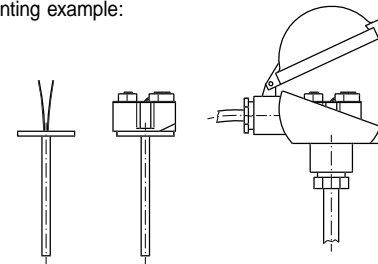
Before initial operation check the suitability for the intended application. In particular, it is important to fulfill the ambient and operation conditions as specified in the WIKA data sheet TE 42.01 respectively.

3 Mounting

3.0 General

The transmitters are designed to be mounted on a measuring insert in a DIN connection head, form B, with extended mounting space. The connection wires of the measuring insert must be approx. 40 mm long and insulated.

mounting example:



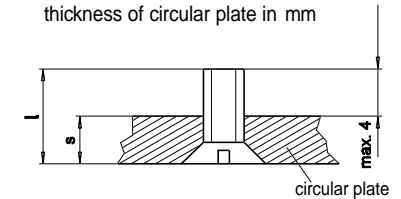
3.1 Mounting on the Measuring Insert

The transmitter can be mounted on the circular plate of the measuring insert using two countersunk head M3 screws per DIN 963. Appropriate threaded inserts have been press-fitted in the underside of the case.

Assuming the countersinking is carried out correctly, the permissible screw length can be calculated as follows:

$$l_{\max} = s + 4 \text{ mm}$$

legend: l_{\max} length of screw in mm
 s thickness of circular plate in mm



Check the screw length before affixing the transmitter to the measuring insert:

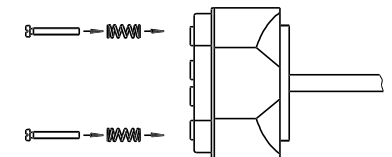
stick the screw in the circular plate and verify additional length of 4 mm!

WARNING


Do not exceed the maximum permissible screw length!
The transmitter will be damaged if the screws are screwed further than 4 mm into the bottom of the transmitter.

3.2 Mounting in Connection Head

Insert the measuring insert with the mounted transmitter in the protective sheath and affix in the connecting head using screws in pressure springs.



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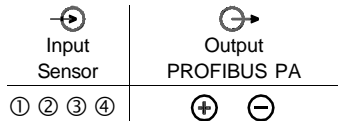
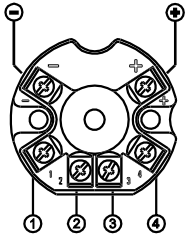
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4 Electrical Connections
4.0 General

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4.0 General

The electrical connections are made through connection terminals. We recommend the use of crimped connector sleeves in the case of flexible leads.

The transmitter is supplied with a shorting jumper. This jumper is either functionless and mounted at the (+) terminal or it is mounted at the terminals (2) and (3) for the purpose of shorting these terminals, see section 4.2.1 and 4.3.1.



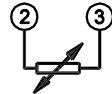
4.1 Connect Pt 100 / Resistance-Sensor
4.1.0 General

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4.1.0 General

It is possible to connect a Pt 100 resistance thermometer to DIN IEC 751 or any resistance sensor in a 2, 3 or 4 wire connection method.

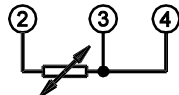
Configure the input of the transmitter in accordance with the actual method of connection used. Otherwise you will not fully exploit the possibilities of connection lead compensation and, as a result, possibly cause additional measuring errors.

4.1.1 2 wire connection method



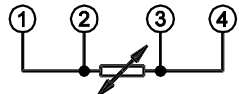
Configuration: Sensor connection 2 wire

4.1.2 3 wire connection method



Configuration: Sensor connection 3 wire

4.1.3 4 wire connection method



Configuration: Sensor connection 4 wire

4.2 Connect Thermocouple
4.3 Connect mV-Sensor

4.2 Connect Thermocouple
4.2.0 General

Make sure that the thermocouple is connected with the correct polarity. Only use thermal or compensation cable in accordance with the connected type of thermocouple should the lead have to be lengthened between the thermocouple and transmitter.

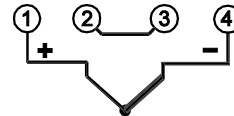
Configure the input of the transmitter in accordance with the type of thermocouple and cold junction that is to be used. Otherwise false measurements will be given.

Cold junction compensation

Should the cold junction compensation be operated with an external resistance thermometer (2 wire connection method) connect this to terminals (2) and (3).

4.2.1 Connect Thermocouple

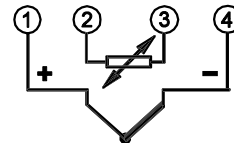
Cold junction comp. internal / none / Thermostat



Configuration: - type of thermocouple
- cold junction: internal / none / Thermostat

Shorting: terminals (2) and (3)

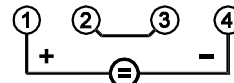
Cold junction comp. external with Pt 100



Configuration: - type of thermocouple
- cold junction: external with Pt 100

4.3 Connect mV-Sensor

Make sure that the mV-sensor is connected with the correct polarity.



Configuration: mV-Sensor
Shorting: terminals (2) and (3)

4.4 Connect PROFIBUS PA
5 Maintenance **6 Configuration**

4.4 Connect PROFIBUS PA
(bus connection and power supply)

The electrical connections are made through the connection terminals (+) and (-). When connecting the transmitters bus / power supply, cable connections can be made to (+) and (-) terminals or vice versa. Polarity is not important.

We recommend the use of crimped connector sleeves in the case of flexible leads.

Connection to the bus has to be done according to the PROFIBUS guidance (technical guidance PROFIBUS PA Installation Guideline, draft).

Bus cable must be used of cable type A or type B according to DIN EN 61158-2, section 11.7.2 (annex C). The bus must be provided with a terminator (terminating resistor).

Note

- maximum permissible terminal voltage
without Ex protection : 32V
with Ex protection : 25V, see section 7

5 Maintenance

The temperature transmitters described here are absolutely maintenance-free!

The electronics are completely encapsulated and incorporate no components which could be repaired or replaced.

6 Configuration

Configuration is done via Bus Master (DP V1), segment coupler and suitable software, e.g. SIMATIC PDM or Freelance 2000.

Input, measuring range, signalling and diverse parameters can be configured, see data sheet TE 42.01.

The transmitters are delivered with a basic configuration or configured according to customer's specifications within the given configuration possibilities. With the later case, input and measuring range is given in clear text on the rating plate.

7 Notes for Mounting and Operating in Hazardous Area

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7.0 General

Use only such a transmitter in a hazardous area that have the corresponding approval for this hazardous area.


The transmitter Model T42.1*.**2 correspond to ignition protection type **intrinsically safe apparatus** II 1G EEx ia IIB / IIC T4/T5/T6.

The EC Type Examination Certificate DMT 99 ATEX E 033 X can be obtained separately, if required.



The transmitter Model T42.1*.**4 correspond to ignition protection type **intrinsically safe apparatus** II 2G EEx ib IIB / IIC T4/T5/T6.

The EC Type Examination Certificate DMT 99 ATEX E 033 X can be obtained separately, if required.

The approval is stated on the rating plate. Example:

Model: T42.10.002
 Ex protection class: II 1G EEx ia IIB / IIC T4/T5/T6
 Approval No.: DMT 99 ATEX E 033 X
 Symbol: 

7.1 Connect PROFIBUS PA

The electrical connections are made through the connection terminals  and . Connecting the transmitter to the bus there is no need to worry about the polarity (as 4.4). Transmitters for use in hazardous area are supplied only with intrinsically safe apparatus that are approved for this hazardous area.

The transmitter Model T42 is in accordance with the FISCO-Model (report PTB-W53):

effective internal capacity C_i = negligible
 effective internal inductivity L_i = negligible

The safe technical maximum value for the bus connection must not be exceeded:

$$U_i = 25 \text{ V}$$

Current circuits of the category „ia“ (Model T42.1*.**2) resp. of the category „ib“ (Model T42.1*.**4), according and certified to the FISCO-Model (report PTB-W53), are connectable to the intrinsically safe input current circuit of the transmitter Model T42. The used apparatus belonging to the transmitter must not exceed the following safe technical maximum values:

power supply with trapezoid characteristic	$U_o = \text{DC } 24 \text{ V}$ $I_o = 250 \text{ mA}$ $P_o = 1200 \text{ mW}$
power supply with square wave characteristic	$U_o = \text{DC } 17.5 \text{ V}$ $I_o = 280 \text{ mA}$ $P_o = 4900 \text{ mW}$

Connection to the bus has to be done according to the PROFIBUS guidance (technical guidance PROFIBUS PA Installation Guideline, draft).

Bus cable must be used of cable type A or type B according DIN EN 61158-2, section 11.7.2 (annex C). The bus must be provided with a terminator (terminating resistor).

7.2 Connect Sensor

Connect the sensor according to section 4 to the connection terminals ① up to ④.

The connected sensor must not warm up inadmissably according to the temperature class of the respective hazardous area for the following values for voltage, current and power:

Model T42.**.**2 Model T42.**.**4 EEx ia / EEx ib
maximum possible values
$U_o = \text{DC } 8.6 \text{ V}$
$I_o = 10 \text{ mA}$
$P_o = 22 \text{ mW}$

The sum of the values of the connected sensor and the connection line must not exceed the following values for the maximum permissible capacity and inductivity:

Model T42.**.**2 Model T42.**.**4	EEx ia EEx ib	Group IIB Group IIB
$C_{\text{sensor}} + C_{\text{line}} < C_o$ $L_{\text{sensor}} + L_{\text{line}} < L_o$	$C_o = 40 \mu\text{F}$ $L_o = 10 \text{ mH}$	
Model T42.**.**2 Model T42.**.**4	EEx ia EEx ib	Group IIC Group IIC
$C_{\text{sensor}} + C_{\text{line}} < C_o$ $L_{\text{sensor}} + L_{\text{line}} < L_o$	$C_o = 5 \mu\text{F}$ $L_o = 10 \text{ mH}$	

7.3 Special Conditions for Safe Use

7.3.1 Mounting in the Hazardous Area



Temperature Transmitter Model T42.1*.*** must be mounted in a case that must at least correspond to IP 20 ingress protection according to IEC 529 / EN 60529.

7.3.2 Permissible Ambient Temperature T_{amb}

According to the temperature class, the transmitter may be used in the following ambient temperature ranges:



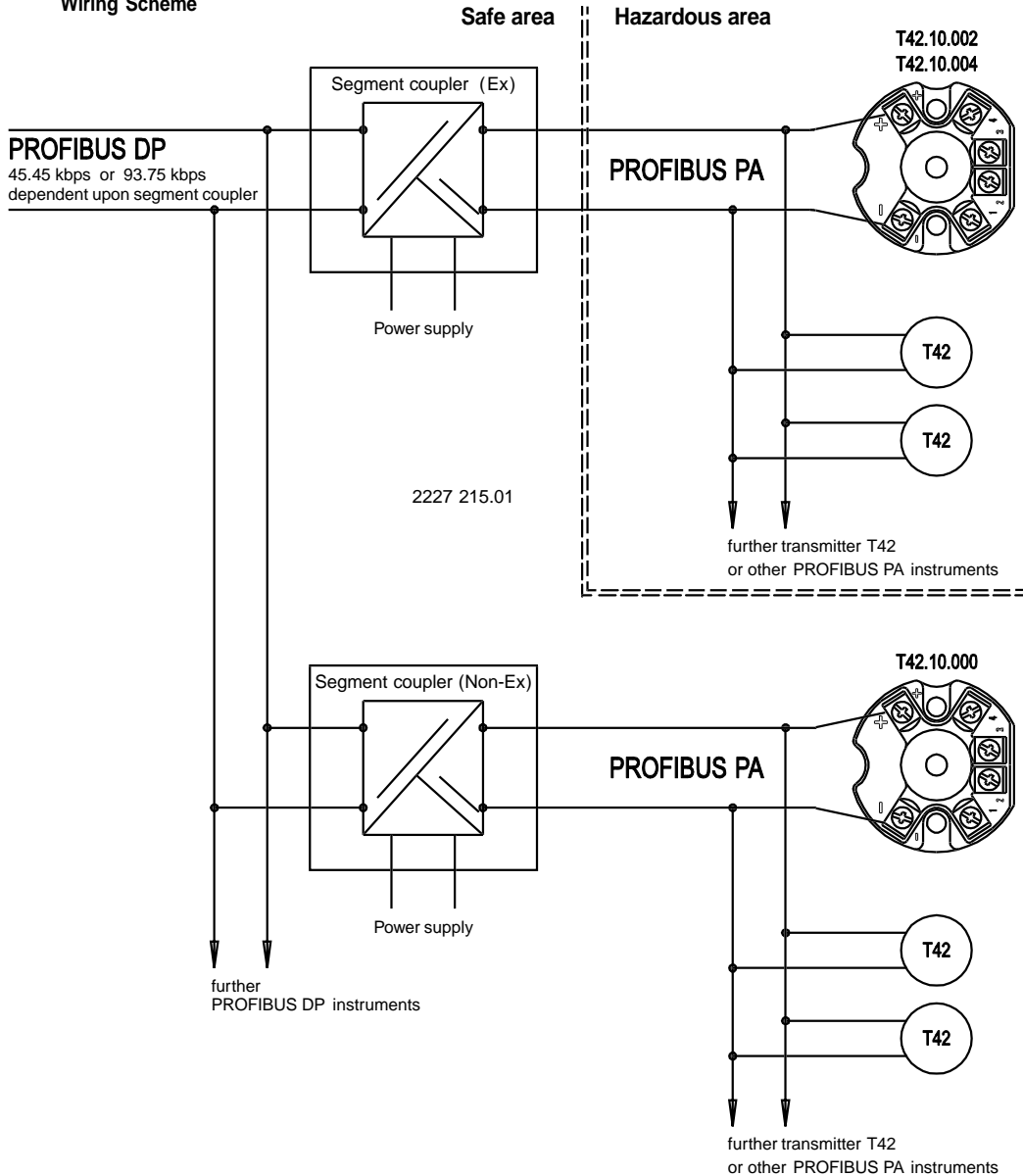
Model T42.1*.**2 → Ex protection EEx ia
 Model T42.1*.**4 → Ex protection EEx ib

with temperature class T4 $-50^\circ\text{C} \leq T_{\text{amb}} \leq +85^\circ\text{C}$
 with temperature class T5 $-50^\circ\text{C} \leq T_{\text{amb}} \leq +70^\circ\text{C}$
 with temperature class T6 $-50^\circ\text{C} \leq T_{\text{amb}} \leq +50^\circ\text{C}$

8 Connection to PROFIBUS

8 Connection to PROFIBUS

Wiring Scheme



9 Declaration of Conformity

10 GSD-File

9 Declaration of Conformity

Declaration of Conformity
Document No.: 5001903

We declare that the **CE** marked products

Model: license
T42.10.000
T42.10.002 EEx ia
T42.10.004 EEx ib

Description:
Digital temperature transmitter,
head mounting

according to the actual data sheet
TE 42.01

fulfils the regulations of the EMC Directive 89/336/EEC,
92/31/EEC and 94/9/EC.

The following types of construction of the instruments
T42.10.002 EEx ia
T42.10.004 EEx ib

are in accordance with EC Type Examination Certificates
DMT 99 ATEX E 033 X i.a.w. directive 94/9/EC

The devices have been tested according to the Explosion Protection Standards
EN 50 014: 1992
EN 50 020: 1994
prEN 50 284: 1997

by the notified body No. 0158 :
DMT
Deutsche Montan Technologie GmbH
D 45307 Essen

WIKA Alexander Wiegand GmbH & Co. KG

Klingenberg, 7. July 2000

The devices have been tested according to the EMC norm:

EN 50 081-1 (03/93)
EN 50 082-2 (02/96)

Company division
TRONIC
Quality Assurance
TRONIC

Stefan Richter
i. V. Stefan Richter

Klaus Frosch
i. A. Klaus Frosch

10 GSD-File

The GSD-File can be downloaded free of charge from the WIKA homepage www.wika.de / Service / Software / electrical Temperature Measurement / T42 PROFIBUS PA GSD-File