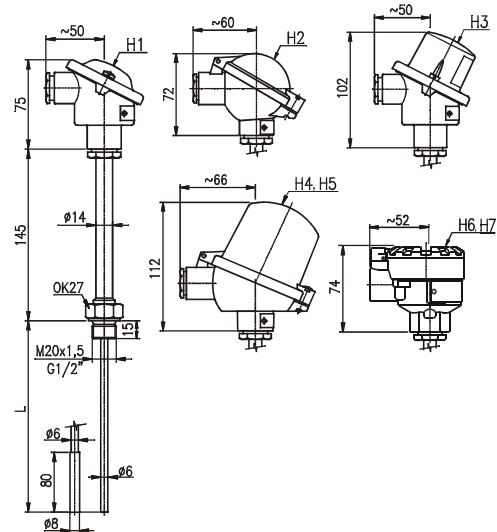


# T1002

## Resistance Temperature Sensors into Thermowells without/with Transmitters 4 to 20 mA

- Measuring resistor Pt100
- Measuring range -50 to +600 °C <sup>1)</sup>
- Accuracy class A, B according to EN 60751
- Head form B according to DIN (Al alloy or stainless steel)
- Stem and extension piece material: stainless steel DIN 1.4541
- Available including thermowell
- Housing IP 54, IP 65, IP 68
- Optional headmounted programmable transmitter with output 4 to 20 mA, including circuit isolation version and II 1G EEx ia IIC T4 ... T6 (ATEX) version
- Explosion proof II 1/2GD EEx d IIC T1 ... T6 ΔT5 °C (ATEX)



### Application

Resistance temperature sensors T1002 are designed for remote measuring of temperature of flowing liquid and gaseous mediums in pipings, tanks and the like in non-hazardous or in hazardous locations with potentially explosive atmosphere of gases or dusts. Sensors in EExd version can be mounted into thermowells situated in Zone 0 (20), which meet requirements according to EN 50248 and in Zone 1 (21) and Zone 2 (22) (according to EN 60079-10). Other parts of sensors (head, extension piece, connecting screw, measurement insert) can be situated in Zone 1 (21) and Zone 2 (22). They can be supplied with or without 4 to 20 mA headmounted transmitter or terminal board for connection wire. Using without thermowell is not recommended and it is prohibited for EExd version.

### Description

A sensor of the thermometer is one or two measuring resistors which are placed in the measuring insert stem and connected to a terminal board inside the head. There is made use of sensor resistance-temperature dependence. With a version with a transmitter the resistance signal is converted to a unified linear current signal of 4 to 20 mA. The thermometer should be mounted on piping by a connecting pipe union into thermowell which can be supplied too.

### Technical Specifications

#### Measuring Resistor:

1xPt100, accuracy class A, B according to EN 60751, four-wire inside wiring or two-wire inside wiring  
 2xPt100, accuracy class B according to EN 60751, two-wire inside wiring or three-wire inside wiring

**Measuring Range:** -50 to +600 °C (according to temperature resistance of used thermowell)  
 -50 to +450 °C EExd version (Code ED)

**Measuring Current <sup>2)</sup>:** recommended ≤1 mA  
 maximal 3 mA

**Output signal:** linearized 4 to 20 mA <sup>3)</sup>

**Dielectric Strength:** 500 V eff

#### Electrical insulation resistance:

min. 100 MΩ according to EN 60751,  
 for temperature (25 ±10)°C, max. 80 % relative humidity

#### Response Time (in water v = 0.4 m/s):

stem Ø 6:  $T_{0.5} = 4 \text{ s}$   $T_{0.9} = 13 \text{ s}$   
 stem with distance sleeve Ø 8:  $T_{0.5} = 9.5 \text{ s}$   $T_{0.9} = 28 \text{ s}$

**Materials:** Head - Aluminium alloy (H1, H2, H3, H4, H5, H6)  
 - Stainless steel DIN 1.4312 (H7)  
 Stem - Stainless steel DIN 1.4541  
 Inside wiring - Cu

**Housing:** IP 54, IP 65, IP 68 (according to head)

### Operation conditions

#### Maximal Temperature of Head:

100 °C (without transmitter)  
 80 °C (with transmitter PT-011 and P3301)  
 85 °C (with transmitter P5102, P5201 and P5310)

#### Ambient temperature for EExd version (Code ED):

-40 to +65 °C

<sup>1)</sup>... Measuring insert is applicable up to 600 °C. The range of measurement of whole sensor depends on temperature resistance of thermowell applied or on measuring range of EExd version.

<sup>2)</sup>... Only for sensor without transmitter

<sup>3)</sup>... Only for sensor with transmitter

# Resistance Temperature Sensors T1002 into Thermowells without/with Transmitters

## Ambiente temperature for EExd version (Code ED):

Customers have to assure installation of temperature sensors to do not increase of maximal surface temperature and temperature of armature influenced by outside temperature (measured medium, sun heating, etc.) defined by EN 50014 (for gases) and EN 50281 (for dusts). Customers have to calculate plus 5 °C (self heating of maximal operating energy output,  $P_{\text{imax}}=1 \text{ W}$ ) for defining of ambient temperature. Maximal ambient temperature for electrical device of explosion group II for explosive atmosphere of gases, steams and foges see Table 1.

Maximal ambient temperature for electrical device of explosion group II for explosive atmosphere of dusts is lower value of:

- ignition temperature of dust in layer decreased of 75 °C,
- 2/3 of ignition temperature of dust in turbulent state

Table 1

Temperature Class	Max. Ambient Temperature	Max. Temperature of Measured Medium
T1	450 °C	445 °C
T2	300 °C	295 °C
T3	200 °C	195 °C
T4	135 °C	130 °C
T5	100 °C	95 °C
T6	85 °C	80 °C

## Other specifications

### EMC (Electromagnetic Compatibility):

According to EN 61326-1:98 / A1:99

### Explosion proof (Code ED):

⊕ II 1/2GD EEx d IIC T1 ... T6  $\Delta T5^{\circ}\text{C}$

only for head H6, H7

Maximal permissible operating properties:

$I_{\text{imax}}$ : 30 mA

$P_{\text{imax}}$ : 1 W

## CAUTION!

Temperature sensor has to be mounted into protection thermowell. Construction and material of thermowell have to protect measuring stem against undesired effects of measured medium (abrasion, chemical aggressivity, etc.).

It is possible to use for EExd version other cable gland with connection thread M20x1.5 and with approving ⊕ II 2G EEx d IIC for explosion proof version and for ambient temperature -40 to +65 °C.

It is due to lock cable against possible rotation and displacement for using with cable glands (KME1, KME2).

**ATTENTION! Temperature sensors in EExd version (code ED) have not to be removed in operation, cover of head and cable gland keep tight when circuit alive!**

**Any construction changes of EExd version are prohibited and can be cause of explode!**

Information and attention of EExd head

FTZÚ 03ATEX0297

⊕ II 1/2GD EExd IIC T1 ... T6  $\Delta T5^{\circ}\text{C}$

(-40°C ≤ Ta ≤ +65°C)

KEEP TIGHT WHEN CIRCUIT ALIVE!

### Weight:

a) without transmitters with head H1:

Nominal lenght L: 100 ... 0.52 kg  
 160 ... 0.53 kg  
 250 ... 0.55 kg  
 400 ... 0.58 kg  
 630 ... 0.63 kg

b) with head H2 plus 0.04 kg

H3 plus 0.05 kg

H4, H5 plus 0.20 kg

H6 plus 0.16 kg

H7 plus 0.70 kg

c) with transmitter PT-011 plus 0.02 kg

with transmitter P5102 plus 0.04 kg

with transmitter P5201 plus 0.05 kg

with transmitter P5310 plus 0.04 kg

with transmitter P3301 plus 0.04 kg

## Electrical Connections

R - red

