



# GÜNTHER

## ATEX

### Assembly and operating instructions



Product group RE6

Ex e – Increased safety

Ex t – Protection by enclosure

## **ATEX Assembly and operating instructions – Product group RE6**

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### 1. General remarks

#### 1.1 Introduction

This manual contains basic and essential instructions for the installation, operation and maintenance of the RE 6 series resistance thermometers.

- The document should be read thoroughly before installation and commissioning of the equipment by the installer, as well as by the personnel responsible for the unit.
- These operating instructions must be available and accessible at the site at all times.
- It must also be ensured that the temperature sensors are operated exclusively in the undamaged and clean condition.

The following sections contain important safety instructions, whose non-observance may lead to risks for humans and animals, things and objects.

#### 1.2 Staff qualifications

The equipment may be operated only by qualified personnel that has been familiarised with installation, commissioning and operation of this product which was assembled and put into operation.

Qualified persons are those that due to their specialised training, know-how and experience and their knowledge of the relevant standards assess the work assigned to them and recognise possible dangers and hazards.

In the case of explosion-proof equipment, the staff must have appropriate education or training, or authorisation to work on explosion-protected equipment in explosion-hazard areas.

#### **Dangers related to the failure to comply with safety instructions**

Failure to comply with these safety instructions, foreseen applications or limiting values provided in the technical data of the unit may lead to dangers and damages of persons, environment or the installation.

**In such a case damages claims against GÜNTHER GmbH Temperaturmesstechnik shall be excluded.**

#### 1.3 General

Temperature sensors are used to convert temperature at a measuring location into an electrical quantity (voltage, resistance). They are used for the measurement, registration, regulation and limit value monitoring of temperatures in the range from -40 °C to +200 °C

The resistance thermometers are used as equipment with increased safety for temperature measurements in liquid and gaseous media and environments.

The resistance thermometers are equipped with Pt100, Pt500 or Pt1000 temperature sensors compliant with DIN EN 60751 in tolerance classes A, AA or B in two-, three- or four-wire technology. Models with two measuring circuits are also possible.

They are in type of protection Ex eb or certified and are suitable according to their design for use in hazardous areas of zone 1 in gaseous environments.

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### 1.4 Installation and use

During installation relevant standards must be complied with, e.g. EN 60079-14  
“Electrical equipment for potentially explosive atmospheres”.

- Defective temperature sensors must not be used.
- Repairs must be performed only by appropriately authorised persons.
- Repairs may be done only using original spare parts from the original supplier, otherwise the requirements of the approval are not guaranteed.
- If a component of electrical unit which is of vital importance for the protection against explosion has been repaired, the unit may be put into operation again only after an expert has determined that its features vital for explosion protection comply with the requirements.

### 1.5 Installation and connection instructions

- In principle, the Regulation on the Use of Electrical Installations in Hazardous Areas (BetrSichV) must be observed!
- Ensure that the specified permissible ambient temperature values are not exceeded. When laying a connection cable, ensure that the cable insulation does not come into contact with parts which have a higher surface temperature than the insulation resistance.
- It must also be ensured that the required degrees of protection (IP rate) are met for the complete temperature sensors. A galvanic connection (grounding) must be ensured by permanent installation of the sensor in the system.

Required for type of protection  II 2 G Ex eb IIC T6-T1 Gb

 II 2 D Ex tb IIIC T80°C...T440°C Db

- Sliding compression fittings or adjustable flanges are provided as process connections. Pressure rings are made of metal or PTFE. Modified versions (thermal decoupling) are to be used as process connections for temperature sensors for surface measurements.

## 2. Electrical and thermal characteristics

### 2.1 Electric limiting characteristics

- Electric strength test:  
U = 500 V/AC Measuring circuit/sheath and between measuring circuits for double measuring circuit
- Maximum values:  $I_N = 2 \text{ mA}$  (Nominal current)  
 $U_{\text{max}} = 30 \text{ V}$   
 $P_{\text{max}} = 102 \text{ mW}$

A current limiter must be provided as overcurrent protection.  $I_{\text{max}} = 1,7 \times I_N$  ( $I_N$  = Nominal safety current according to IEC 60127)

With these temperature sensors in type of protection Ex e, design measures are taken to prevent impermissible high temperatures and the occurrence of sparks and arcs during normal operation or under specified exceptional conditions.

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### 2.2 Thermal characteristics

- $P_0$  can be taken from the name plate of the associated equipment.
- Thermal resistance (power loss)  $R_{TH}$  (to determine the self-heating at the sensor surface):
  - Sensor tube with cable connection 300 K/W

The table shows the maximum permissible media temperature (°C) in relation to the respective power supplied as an example for cable sensors

As the surface temperature of the sensor can be higher than the permissible ambient temperature due to heat dissipation, the operator must ensure that the maximum continuous temperature resistance of +60 °C is not exceeded at the epoxy resin potting points (see drawings)!

The temperature measuring range for resistance thermometers RE6 can be -40 °C to +200 °C at the measuring tip.

Cable sensor	Temperature class	Max. media temperature $T_M$ at maximum power $P_i$ at sensor	
		$P_i \leq 25 \text{ mW}$	$P_{i(\text{max})} \leq 102 \text{ mW}$
	T1; +450 °C	+432.5 °C	+409.4 °C
	T2; +300 °C	+282.5 °C	+259.4 °C
	T3; +200 °C	+187.5 °C	+164.4 °C
	T4; +135 °C	+122.5 °C	+99.4 °C
	T5; +100 °C	+87.5 °C	+64.4 °C
	T6; +85 °C	+72.5 °C	+49.4 °C

The operator must take suitable measures to ensure that the temperature class indicated in the Ex area and the permissible operating temperatures are complied with.

### 2.3 Cables and wires



Shielded cables with different cross-sections and insulation materials are used for connection. The cross-sections primarily used are 0.22 mm<sup>2</sup> up to 1.5 mm<sup>2</sup>.

The insulation materials used are:

- PVC (high quality) for temp. up to 105 °C
- FEP for temp. up to 200 °C
- Silicone for temp. up to 180 °C
- PTFE/PFA for temp. up to 260 °C
- Glass silk for temp. up to 300 °C

## 3. Types of protection and coding of individual series

Product group: **RE6 / TE6** (Heat shrink tubing)

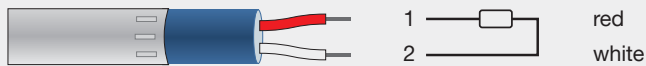
	II 2 G Ex eb IIC T6...T1 Gb
	II 2 D Ex tb IIIC T80°C...T440°C Db
Type: >>> Article number <<<	
 0637	IBExU20 ATEX1011X

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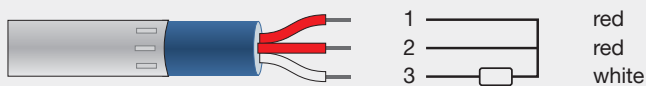
### 4. Connection options

#### 4.1 Cable sensors – Resistance thermometers (Colour coding according to DIN EN 60751)

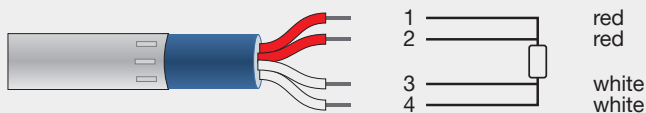
##### 1x Pt100 2-wire connection



##### 1x Pt100 3-wire connection



##### 1x Pt100 4-wire connection



##### 2x Pt100 2-wire connection



##### 2x Pt100 3-wire connection



Depending on the connecting cable used, deviations in the conductor colours are possible, if the measuring circuits remain clearly assignable.



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