



GÜNTHER

ATEX

Assembly and operating instructions



Product group RT TT

Ex ec – Increased safety

Ex tc – Protection by enclosure

ATEX Assembly and operating instructions – Protection level EPL Gc Dc

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ATEX Assembly and operating instructions – Protection level EPL Gc Dc

1. General remarks

1.1 Introduction

This manual contains basic and essential instructions for the installation, operation and maintenance of resistance thermometers and thermocouples with protection level EPL Gc and Dc (ATEX Zone 2/22).

- 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 -50 °C to +450 °C (thermocouples from -40 °C to +1000 °C).

Resistance thermometers and thermocouples are used as pressure-resistant equipment for temperature measurements in liquid and gaseous media.

The temperature sensors consist of a protective fitting with various process connections, and a connection head or connecting cable.

All fittings (parts in contact with the process environment) are subjected to a leak test.

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

Thermocouples are optionally equipped with thermocouples type T, J, K, E and N according to DIN EN 60584-1 in tolerance classes 1 or 2 as single, double or triple measuring circuit. They meet the requirements for explosion group II category 3G and explosion group III category 3D.

They are therefore suitable for gas in the potentially explosive area of zone 2 and for dust in zone 22.

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Depending on the application requirements and the measurement task, the temperature sensors can be supplied with various connection heads or as cable sensors in a rigid or mineral-insulated version.

These temperature probes do not generate sparks, arcs, or hot surfaces. They fulfil the requirements of the type of protection ec according to DIN EN 60079-7 and type of protection tc according to DIN EN 60079-31, but do not have a type examination certificate.

1.4 Installation and operation

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

- If the temperature sensor is mounted on parts of the unit that constitute a zone separator, the installation must be appropriately tight.
- 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.

Required for type of protection  **II 3 G Ex ec IIC T6...T1 Gc**

Required for type of protection  **II 3 D Ex tc IIIB T135 °C Dc**

2. Limiting temperatures in the Ex area - dust

- Without dust deposition, the surface temperature may not exceed 2/3 of the ignition temperature in °C of the respective dust/air mixture.
- With dust deposition of a combustible dust with a layer thickness of up to 5 mm, the maximum surface temperature must not exceed the glowing temperature of the respective dust minus 75 K.

	Highest measured temperature at sensor surfaces, which can come into contact with dust			
Power	25 mW	100 mW	250 mW	750 mW
Temperature	+25 °C	+30 °C	+40 °C	+70 °C

For layer thicknesses above 5 mm, a further reduction of the surface temperature is required.

Table 4 of DIN EN 60079-11 (maximum permissible power conversion with complete dust spillage) is to be applied here.

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3. Type of protection and marking

Product group: RN/TN (3G; 3D) (Label / Heat shrink tubing)

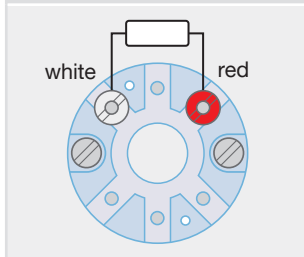
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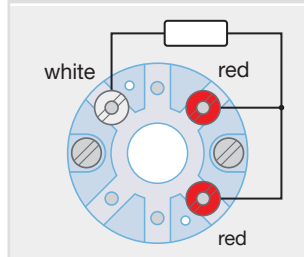
4. Connection options

4.1 Resistance thermometers (Colour coding)

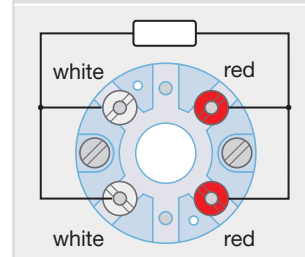
1x Pt100 2-wire connection



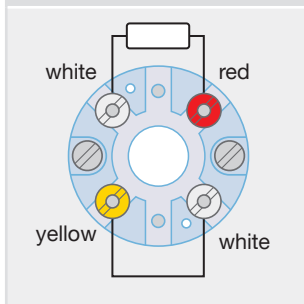
1x Pt100 3-wire connection



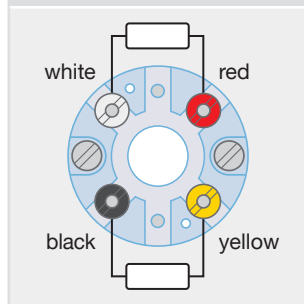
1x Pt100 4-wire connection



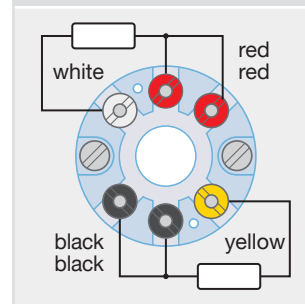
1x Pt100 with tape



2x Pt100 2-wire connection

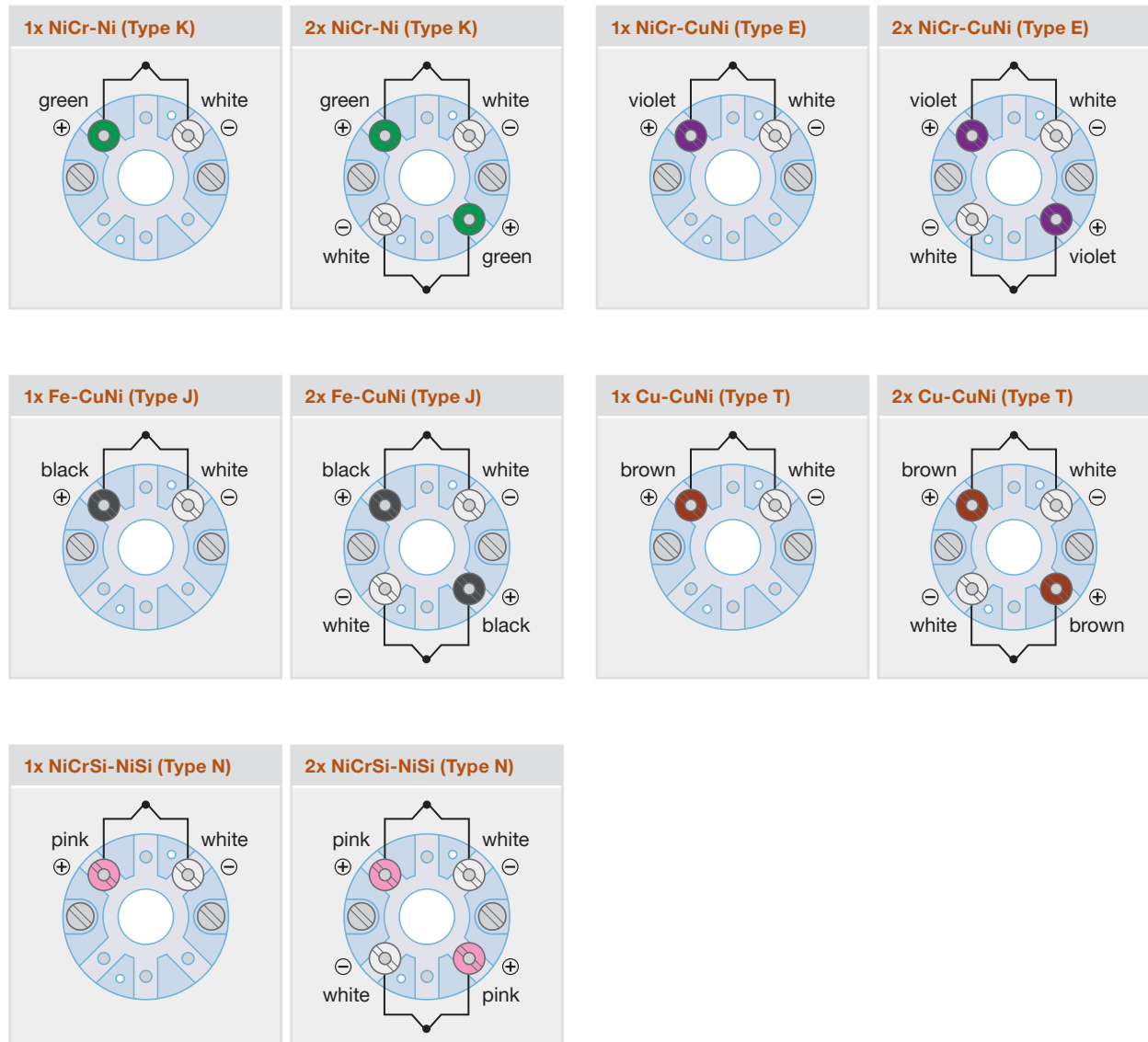


2x Pt100 3-wire connection



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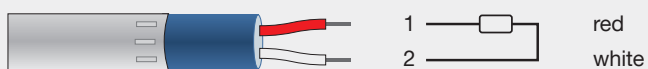
4.2 Thermocouples (Colour coding acc. to DIN EN 60584)



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

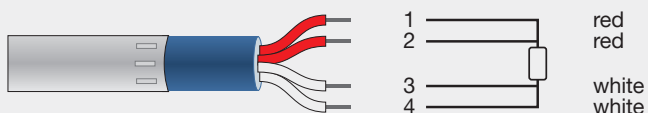
1x Pt100 2-wire connection



1x Pt100 3-wire connection



1x Pt100 4-wire connection



2x Pt100 2-wire connection



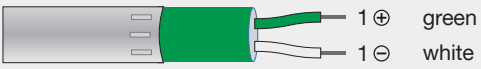
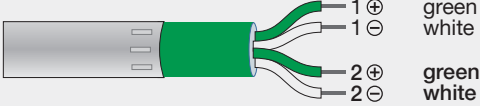
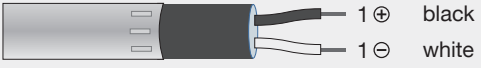
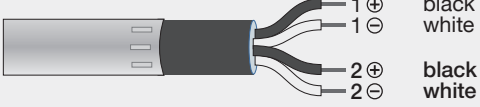
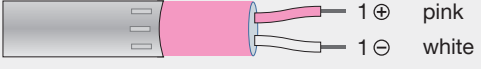
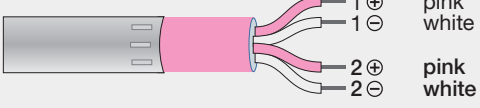
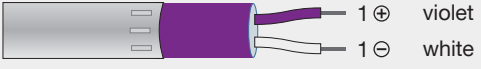
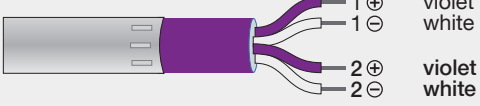
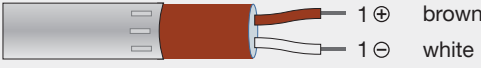
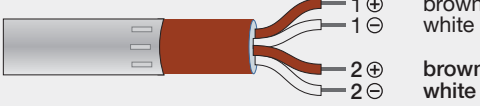
2x Pt100 3-wire connection



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

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4.4 Cable sensors - Thermocouples (Colour coding acc. to DIN EN 60584)

<p>1x NiCr-Ni (Type K)</p>  <p>1⁺ green 1⁻ white</p>	<p>2x NiCr-Ni (Type K)</p>  <p>1⁺ green 1⁻ white 2⁺ green 2⁻ white</p>
<p>1x Fe-CuNi (Type J)</p>  <p>1⁺ black 1⁻ white</p>	<p>2x Fe-CuNi (Type J)</p>  <p>1⁺ black 1⁻ white 2⁺ black 2⁻ white</p>
<p>1x NiCrSi-NiSi (Type N)</p>  <p>1⁺ pink 1⁻ white</p>	<p>2x NiCrSi-NiSi (Type N)</p>  <p>1⁺ pink 1⁻ white 2⁺ pink 2⁻ white</p>
<p>1x NiCr-CuNi (Type E)</p>  <p>1⁺ violet 1⁻ white</p>	<p>2x NiCr-CuNi (Type E)</p>  <p>1⁺ violet 1⁻ white 2⁺ violet 2⁻ white</p>
<p>1x Cu-CuNi (Type T)</p>  <p>1⁺ brown 1⁻ white</p>	<p>2x Cu-CuNi (Type T)</p>  <p>1⁺ brown 1⁻ white 2⁺ brown 2⁻ white</p>



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