



GÜNTHER GmbH

Temperature Measurement Technology



Intrinsically Safe Temperature Sensors

pursuant to ATEX Directive 94/9/EG

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45 Years of Passion and Precision

Starting with the founding year in 1968, the name Günther remains symbolic of state-of-the-art solutions in temperature measurement technology. Having started with the production of electronic temperature sensors for industrial furnaces, we have continually developed and expanded our expertise, offering services to an increasing variety of industry sectors. Today, GÜNTHER Temperaturmesstechnik is among the worldwide leaders in manufacturing of temperature measurement technology.

Early in 2012, we have begun manufacturing explosion resistant thermocouples and resistance thermometers for business and industry sectors utilizing flammable substances in either gaseous form, as mists or dust particles. These are available in a wide variety of make and design.

Certified Production Facility

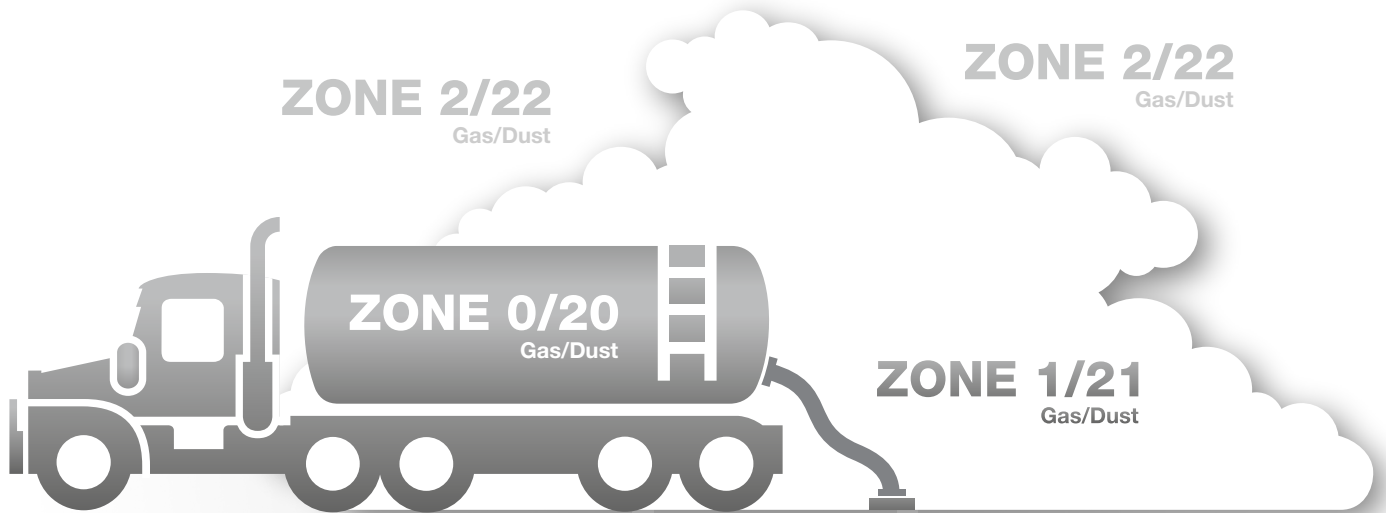
In 2011 the quality management system at both GÜNTHER GmbH production facilities was certified pursuant to ATEX (**A**tmosphères **E**xplosibles) directive 94/9/EG, a requirement for the production of type-approved sensors.

To satisfy future requirements and technological variety, continuous development of our products, as well as their adaptation for individual application scenarios is a matter of course. As a result, our current product line was expanded to include a wide range of ATEX Sensors for **gas-Ex-** and **dust-Ex-areas**.





Application Areas for Our Intrinsically Safe Temperature Sensors



Series R1/T1



Series R2/T2



Series R3/T3



Series R4/T4



Series R5/T5



Series R6/T6

Approved for zones / hazard areas:

0, 1 and 2 (Gas-Ex-Area)
20, 21 and 22 (Dust-Ex-Area)

1 and 2 (Gas-Ex)
21 and 22 (Dust-Ex)

1 and 2 (Gas-Ex-Area)
No Application in Dust-Ex-Areas

Intrinsically Safe Temperature Sensors pursuant to ATEX Directive 94/9/EG

Function, Construction and Application



Our intrinsically safe sensors are implemented as resistance thermometers or thermocouples. They convert the temperature at the point of measurement into an electric variable (voltage, resistance) and, in combination with corresponding secondary devices, serve to measure, register and regulate temperatures in the region between - 200°C and approx. +1200°C.

Resistance thermometers in series R1 to R6, as well as thermocouple thermometers in series T1 to T6, are constructed so that they do not – and this includes provision for possible errors – provide a source of ignition.



GÜNTHER Ex-sensors find application in many industry sectors as intrinsically safe equipment for temperature measurement in liquid and gaseous environments. The sensors in series R1/T1 to R4/T4 consist of a protective fitting with varying process connectors, a connector head and exchangeable gauge slide. The sensors in series R5/T5 and R6/T6 consist of gauge slides with connector head or connection box with various process connectors. They are implemented either with protective tubing or mineral-insulated wiring and cable connectors.

GÜNTHER GmbH Ex-sensors find application in classic industry sectors such as chemical, petrochemical, and food sectors, in machine and equipment construction as well as gas and crude oil production.

Depending on application and measurement requirements, our sensors may be fitted with a variety of process connectors. The devices may only be operated with the designated protective tubing, as all protective fittings (process contacting parts) are leakage tightness tested in our certified test laboratory. These sensors with the Ex ignition protection type “i”, are certified for connection to intrinsically safe category “ia” circuits. When connecting to an intrinsically safe circuit, the operator is required to limit the incoming power to the point where the maximum electric surface heat corresponding to the temperature class, minus the protection ratio distance, is not exceeded.





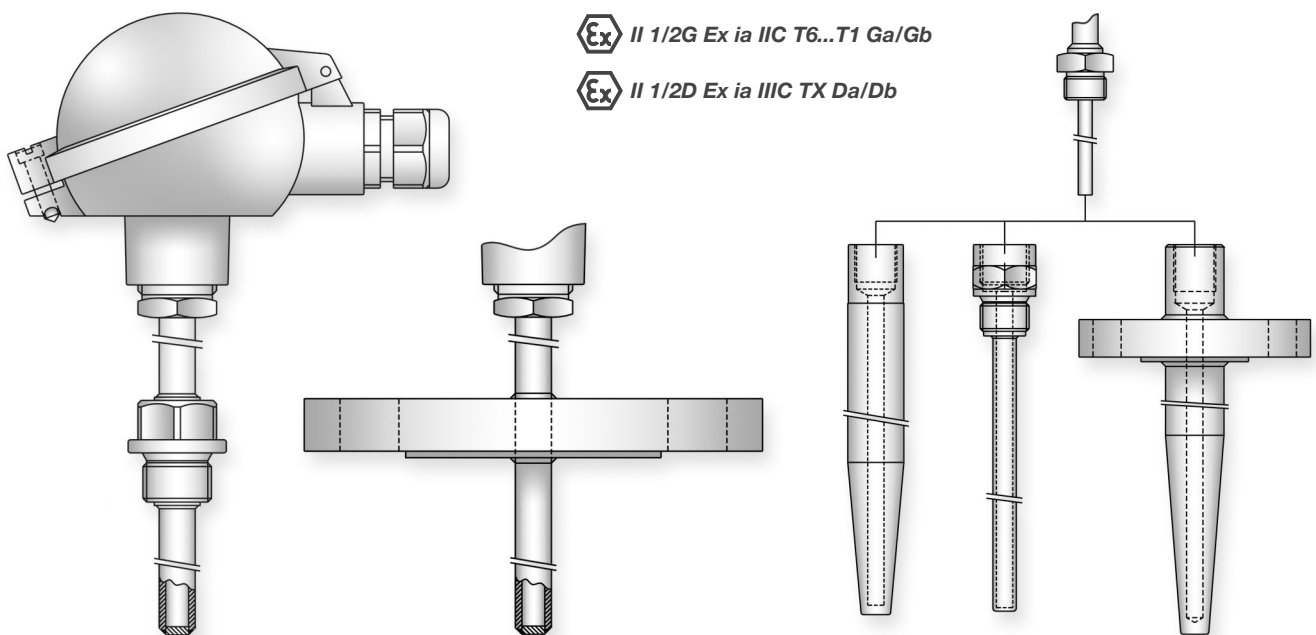
Common platinum and nickel resistors are used for these resistance thermometers (R1-R6). These sensors are manufactured pursuant to DIN EN 60 751 and are available in all prevalent tolerance classes, as two-, three- or four-wire systems. Models with two measurement circuits are also possible.

The thermocouple assemblies (T1-T6) are optionally fitted with thermocouples T, J, K, E and N pursuant to DIN EN 60584-1,

in tolerance class 1 or 2, as single or double measurement circuits.

They fulfill the requirements for explosion group II of categories 1/2G and/or 2G, several types also meet the requirements for categories 1/2D and/or 2D. As a result, they are suited for application in explosion hazard areas zone 1 for gas, zone 21 for dust.

Product Series R1/T1 to R3/T3



To meet requirements for any number of application scenarios, a wide range of materials (e.g. 1.4571, 1.4541, 1.4404, 2.4816, Hastelloy, etc.) and measurements (outer diameter, wall thickness, installation length, etc.) are available for the production of our temperature sensors.

In series R1-R3 and T1- T3 temperature sensors, any protective tubing in contact with the measured substance (zone 0 or 20) are delivered with wall thickness $\geq 1\text{mm}$ in order to assure zone separation.

These protective tubes serve to protect the gauge slides from chemical and physical attack. Additionally, the selection of appropriate protection tubes increases the required mechanical stability.

The process connectors installed in these series are screwed sockets with a diverse range of connecting threads or blank flanges, with measurements in accordance with national and international standard specifications. For welding sleeves, the customer must ensure that zone separation is professionally implemented as part of the welding process.

Tapered protective tube tips for increased reaction time at the point of measurement are available.

Intrinsically Safe Temperature Sensors pursuant to ATEX Directive 94/9/EG

Product Series R4/T4

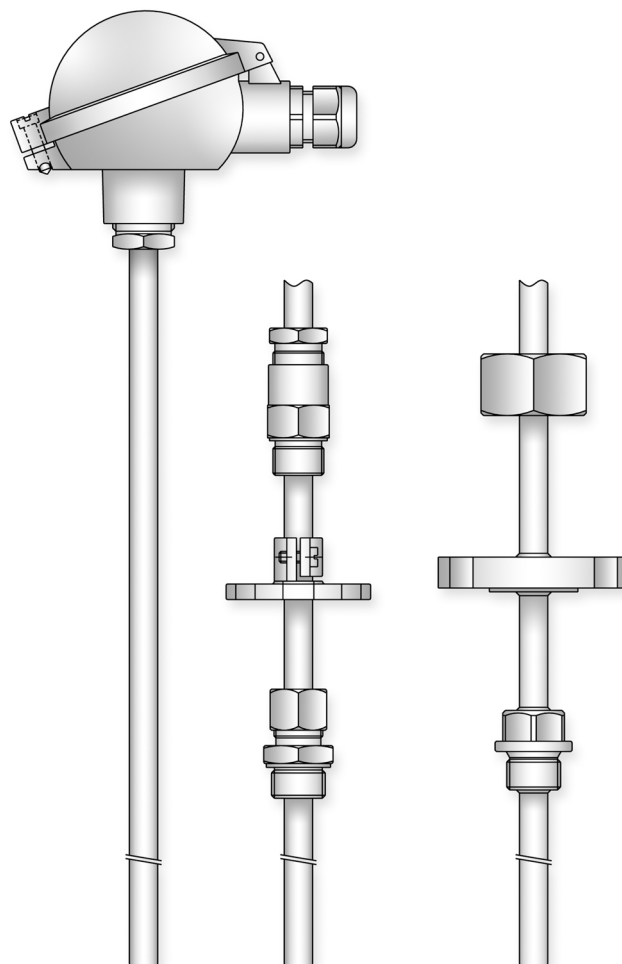
Temperature sensors of series R4/T4 are fitted with protective tubes of varying wall thickness. When custom fitting the protective tubes to the gauge slides short response times can be effected.

These devices are always closed protective tubes fitted either without, with moveable or with welded process connectors. Available standard process connectors include stop flanges, screw sockets and couplings, as well as welded blank flanges, sleeves and double-ended unions.

The process connectors in series R4/T4 do not constitute a zone separation. These temperature sensors can be applied in zone 1 (Gas-Ex) and zone 21 (Dust-Exs).

Thermal Resistance R_{TH} (in K/W) in relation to the Protective Tube Diameter (in mm):

Protective Tube Diameter	Thermal Resistance R_{TH} (Protective Tube Surface at Point of Measurement for Zone 0)
6,0 / 8,0 / 9,0 mm	85 K/W
10,0 / 11,0 / 12,0 / 15,0 mm and larger	55 K/W



 II 2G Ex ia IIC T6...T1 Gb

 II 2D Ex ia IIIC TX Db

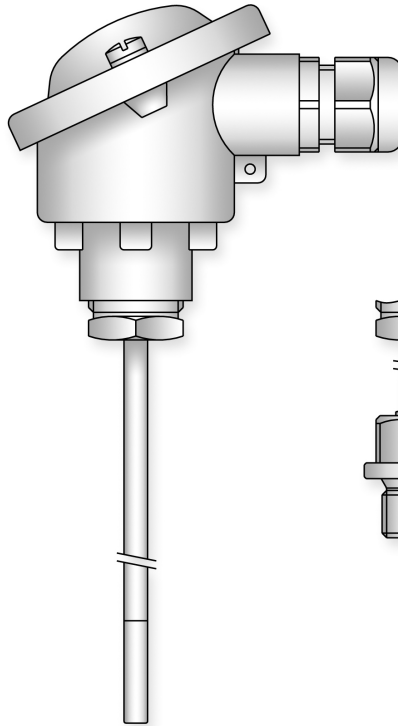




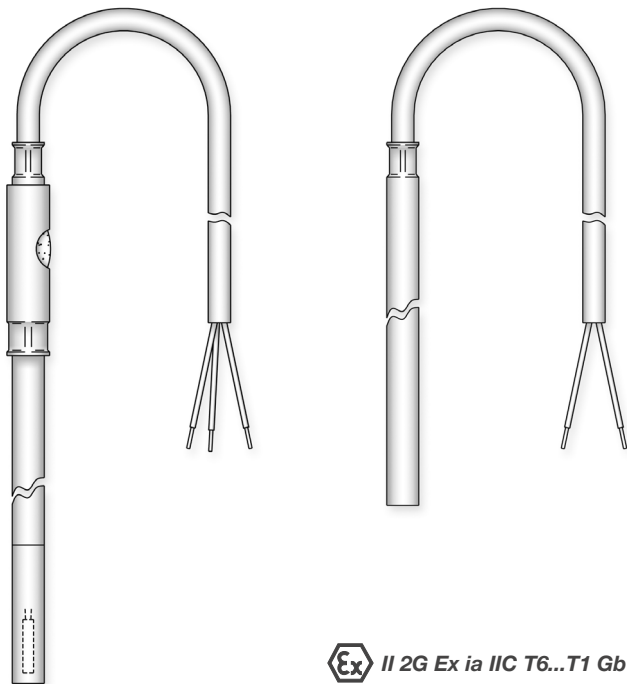
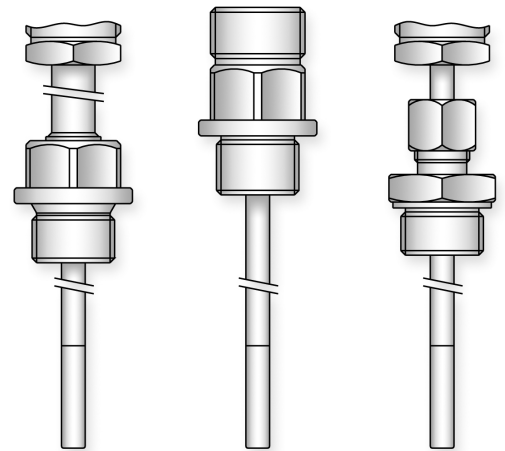
Product Series R5/T5

The screw-in temperature sensors of series R5 (resistance thermometer) and T5 (thermocouple assembly) essentially consist of a gauge slide protruding from the connecting head. We deliver measurements of 3 mm, 4,5 mm and 6 mm diameters ex works. Moveable compression fittings, clamping ring couplings or fixed threaded connectors with or without neck pipe are used as process connectors.

These process connectors do not serve as zone separation. This product series can only be applied in zone 1 (Gas-Ex).



II 2G Ex ia IIC T6...T1 Gb



II 2G Ex ia IIC T6...T1 Gb

Product Series R6/T6

Series R6/T6 temperature sensors were developed as cable sensors with varying diameters for zone 1 (Gas-Ex) and are available as pipe constructions or as mineral-insulated wiring.

Their small dimensions, a broad spectrum of possible process connectors and high flexibility allow for temperature measurement at inaccessible locations.

Sheath Diameter	Thermal Resistance R_{TH} (Measuring Point Surface of Gauge Slide for Zone 1)
3,0 mm	165 K/W
4,5 mm	110 K/W
6,0 mm	90 K/W
Pipe Construction (not related to diameter)	300 K/W



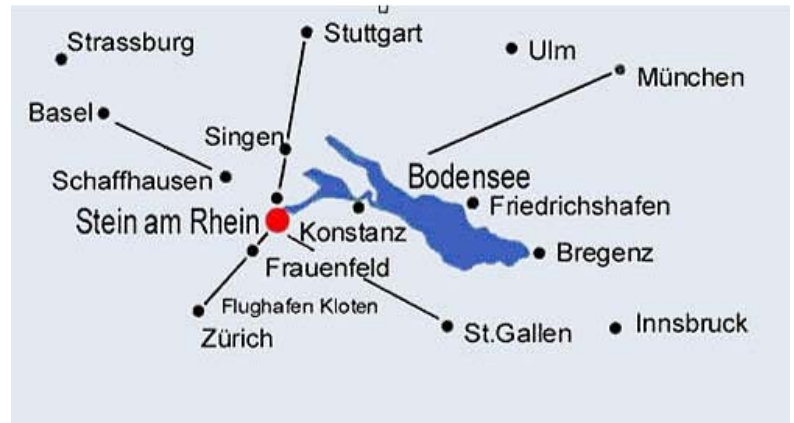
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Our Certifications



Several of our product ranges are currently being **IECEx certified** to facilitate supplying customers outside of the European Union with intrinsically safe temperature sensors. Additionally, expansion of the **GOST-R**- and respectively **TR-certification** are currently in planning in order to supply GÜNTHER temperature sensors for eastern europe.

GÜNTHER GmbH has a large modular system of individual parts available, enabling us to produce and deliver highly customized ATEX temperature sensors. We are able to cover an extremely extensive spectrum of intrinsically safe temperature sensors. Please contact us!



GÜNTHER GmbH
Temperaturmesstechnik

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