

# Mineral Insulated Thermocouple model CDM

## MIT Measuring Insert

### In general

Reckmann GmbH temperature sensors (R58®) are used exclusively for measuring process temperatures in solid, liquid or gaseous media. The measuring insert (fig.1) is, so to speak, the carrier of the sensor element and the exchangeable unit of our thermometers of the design with protection fitting.

#### Range of application:

Installed as standard in protective fittings to or similar to DIN 43772 or for non-critical measurements in the laboratory with connection head (CD version).

**For installation-specific data, see installation instructions for MTE.**

**Type code 1R9-H1.**

### Technical datas

- **Measuring insert** (fig. 1) similar to DIN 43735

Sensor depending on temperature range and application:  
with 1 or 2 thermocouples according to IEC / EN 60584-1.

Type J (Fe-CuNi),

Type K (NiCr-Ni),

Type N (NiCrSi-NiSi),

Type E (NiCr-CuNi),

Type T (Cu-CuNi),

Type S (Pt10%Rh-Pt),

Type R (Pt13%Rh-Pt),

Recommended operating temperature at measuring tip depending on thermocouple type and diameter -50 °C to:

Type J: Ø 1.5 and 2.0 mm up to 440 °C, Ø 3.0 mm up to 520 °C, Ø 4.5 up to 620 °C, Ø 6.0 mm up to 720 °C.

Type K: Ø 1.5 and 2.0 mm up to 920 °C, Ø 3.0 mm up to 1070 °C, Ø 4.5; 6.0 and 8.0 mm up to 1100 °C.

Type N: Ø 1.5 and 2.0 mm up to 920 °C, Ø 3.0 mm up to 1070 °C, Ø 4.5; 6.0 and 8.0 mm up to 1100 °C.

Type E: Ø 1.5 and 2.0 mm up to 510 °C, Ø 3.0 mm up to 650 °C, Ø 4.5 up to 730 °C, 6.0 and 8.0 mm up to 820 °C.

Type T: Ø 1.5 and 2.0 mm up to 260 °C, Ø 3.0 mm up to 315 °C, Ø 4.5 / 6.0 and 8.0 mm up to 350 °C.

Type S/R: Ø 1.5 / Ø 3.0 and 6.0 mm up to 1300 °C.

#### Note:

Type S/R only makes sense with sheath made of Pt10%Rh for 0°C up to max. 1300°C.

- **Sheath material** design according to or similar to IEC / EN 61515.

Preferred material 2.4816.

Preferred diameter 3, 6 or 8 mm.

- **Optional:** Class 3 requirements (-200 °C to 40 °C) on request. For requirements of class 1 and class 3 only possible with specially selected sheath material, high expense and not with type T.

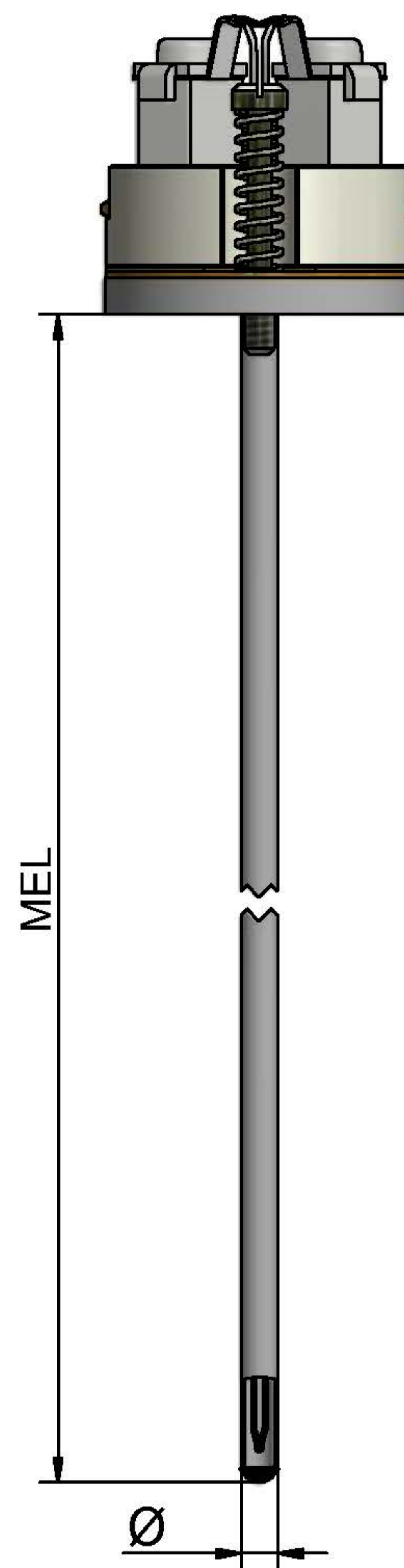


fig. 1

## Deviations according to the sensor type

### Thermocouples

table 1

Thermocouple type	Permitted deviations <sup>1)</sup> (±°C) and the validity for the temperature		
	class 1	class 2	class 3 <sup>2)</sup>
<b>by Type T</b>	0,5 °C oder 0,004 x  t	1 °C oder 0,0075 x  t	1 °C oder 0,015 x  t
<b>Type T</b>	-40 °C bis +350 °C	-40 °C bis +350 °C	-200 °C bis +40 °C
<b>bei Typ E,J,K,N</b>	1,5 °C oder 0,004 x  t	2,5 °C oder 0,0075 x  t	2,5 °C oder 0,015 x  t
<b>Type E</b>	-40 °C bis +800 °C	-40 °C bis +900 °C	-200 °C bis +40 °C
<b>Type J</b>	-40 °C bis +750 °C	-40 °C bis +750 °C	/
<b>Type K</b>	-40 °C bis +1000 °C	-40 °C bis +1200 °C	-200 °C bis +40 °C
<b>Type N</b>	-40 °C bis +1000 °C	-40 °C bis +1200 °C	-200 °C bis +40 °C
<b>by Typ R oder S</b>	1 °C für t < 1100 °C [1 + 0,003 x (t - 1100)] für t > 1100 °C	1,5 °C oder 0,0025 x  t	4 °C oder 0,005 x  t
<b>by Type B</b>	/	0,01 x  t	/
<b>Type B</b>	/	600 °C bis 1700 °C	600 °C bis 1700 °C

1) The deviation limit is either given as the difference in °C or as a function of temperature (°C from IST-90) according to the above mentioned table. For each the greater value is valid.  
2) The normally available material for thermocouples keeps the limit deviation according to Table 1 for temperatures above -40°C. At low temperatures, these materials do not necessarily meet the class 3 limit deviations. If thermocouples of types T, E, K and N are required, which comply with both the class 3 and class 1 or 2 limit deviations, this must be specified by the user because therefore a special selection of the available material is usually necessary.

Source: Technical dates from IEC / EN 60584-1:2014-07 chapter 5