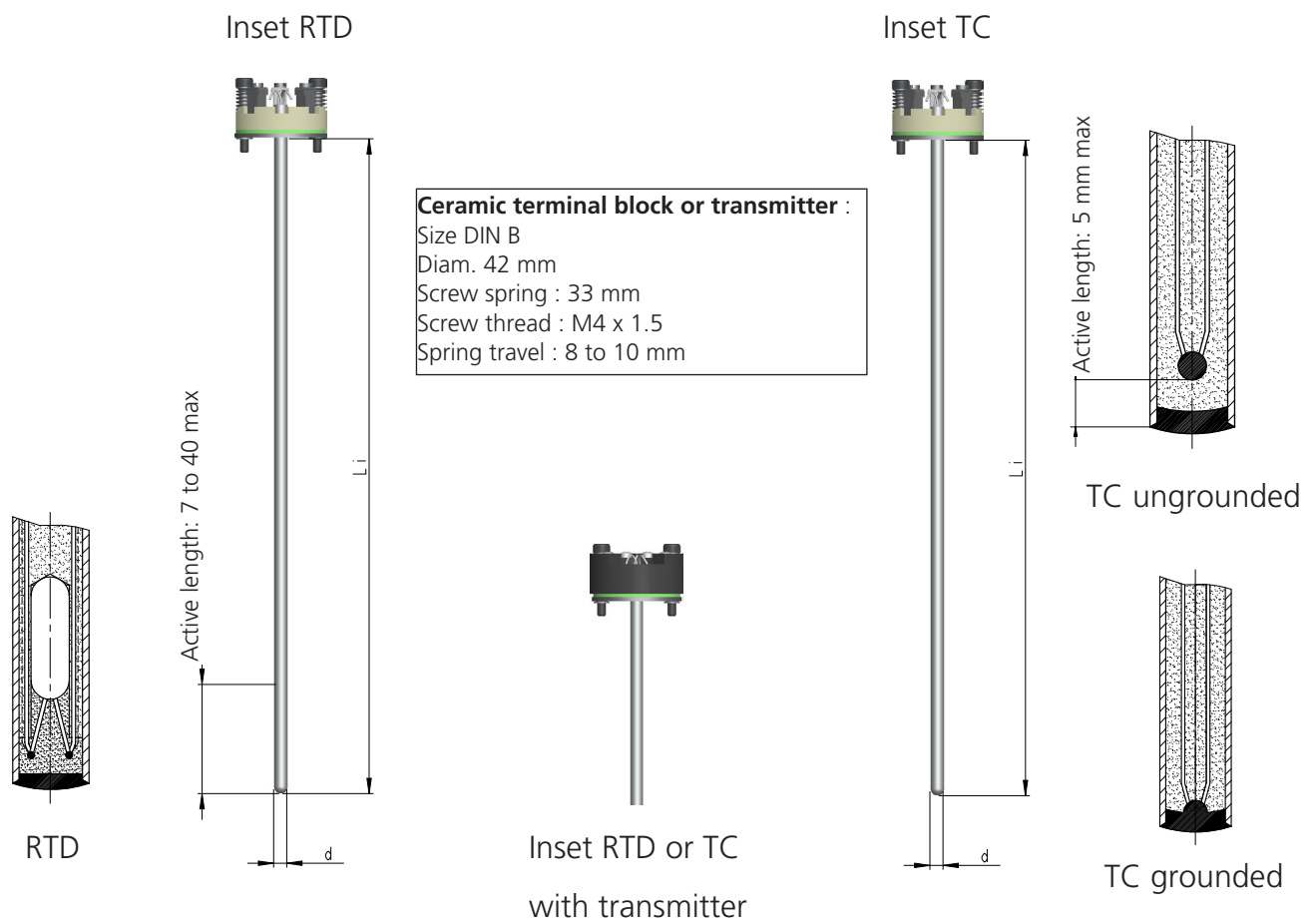


**Insets (RTDs and thermocouples) with mineral insulation,  
with ceramic terminal block or with transmitter  
IEC 60751 (RTD) and IEC 60584-2 (TC) or ISA MC 96.1 (TC).**

Type **S 01**



## Applications

- For mounting in thermowells.
- Insets may also be mounted in direct contact with the medium, on condition that the electrical terminal block is protected against environmental influences (working conditions to be checked!)
- Special executions for explosive environments certified. **ATEX** **IECEx** **SIL2** **INMETRO** **PG**

## Description

The sensors incorporated in all these insets are protected by a metal sheath. They can be of 2 types: resistance temperature detectors (RTDs) or thermocouples (TCs). In each case, the sensor supplies an electrical

signal corresponding to the temperature. The connection head carries a ceramic terminal block for connecting the wires, attached by 2 screws with springs. The travel of this spring mounting assures best thermal conductivity, compensation of length tolerances in thermowells and protection against vibration.

When mounted in thermowells, insets can be simply replaced, without removing the thermowell from the pipe and without any process interruption.

Special executions for explosive environments, executions meeting the requirements EN / IEC 60079-0: «electrical apparatus for potentially explosive atmospheres (general requirements)»  
EN / IEC 60079-1: «flameproof enclosure (d)»  
EN / IEC 60079-11: «intrinsic safety (i)»  
EN 60079-7: «increased safety (e)».

## Technical data

### 1. Limiting temperatures (°C) for insets:

Sensors	ø 1.5 to 3.18 mm	ø 4.5 to 12.7 mm	Exi, Exd, Exe all dia.
Pt 100 *	- 200...+ 550	- 200...+ 600	- 200...+ 500
Pt 1000	- 40...+ 400	- 40...+ 600	-
J	- 40...+ 600	- 40...+ 750	- 40...+ 500
E	- 200...+ 700	- 200...+ 800	- 200...+ 500
K, N	- 200...+ 800	- 200...+ 1000	- 200...+ 500

\* Pt100 -200+850°C, Class B as option

Other sensors diameters on request

### 2. Precision classes:

RTD	according to IEC 60751
class A	+/- (0.15 + 0.002 ltl)
class B	+/- (0.3 + 0.005 ltl)
class AA	+/- (0.1 + 0.0017 ltl)

TC according to IEC 60584-2

class 1	
E	-40 ... + 800 [°C] +/- 1.5°C or +/- (0.004 ltl) (1)
J	-40 ... + 750 [°C] +/- 1.5°C or +/- (0.004 ltl) (1)
K/N	-40 ... +1000 [°C] +/- 1.5°C or +/- (0.004 ltl) (1)
class 2	
E	-40 ... + 900 [°C] +/- 2.5°C or +/- (0.0075 ltl) (1)
J	-40 ... + 750 [°C] +/- 2.5°C or +/- (0.0075 ltl) (1)
K/N	-40 ... +1200 [°C] +/- 2.5°C or +/- (0.0075 ltl) (1)
class 3	
E	-200 ... + 40 [°C] +/- 2.5°C or +/- (0.015 ltl) (1)
J	n/a
K/N	-200 ... + 40 [°C] +/- 2.5°C or +/- (0.015 ltl) (1)

ltl = absolute value of measuring range

Between -130°C and -40°C, tolerances could be higher than class 3.

ISA MC 96.1 on request.

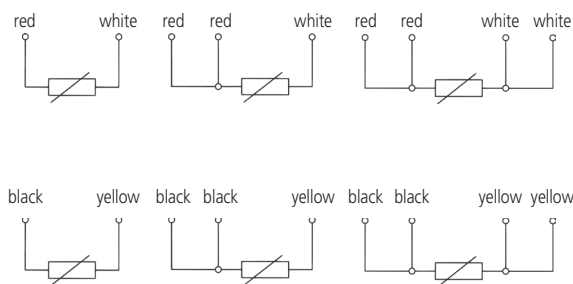
(1) Highest of the two values applicable.

3. Ambient temperature: -40+85°C, -50 on request.

### 4. Identification of measurement circuits on terminal block and/or marking plate:

#### RTD:

(with color identification marking, according to IEC 60751)



Remark: "yellow" and "black" are used for double element.

Thermocouple: type of thermocouple is identified by color code.

### Colors for thermocouples IEC 60584-2

Type	conductor "+"	conductor "-"
E	violet	white
J	black	white
K	green	white
N	pink	white

on request according to ISA MC 96.1.

### 5. Inset sheath:

The sensors (RTDs or TC) within the insets are embedded in a compacted MgO powder of purity over 99% and protected by a metal sheath. This sheath is free of pores, and can be bent at limited curvature. Avoid bending metal sheath less than 50 mm from the tip. Other executions on request.

### 6. Ceramic terminal block:

Fixed to connection head by two M4 screws with springs, giving 8 to 10 mm travel. The diameter and spacing of the screws correspond to head types DIN A and DIN B.

### 7. Resistance of insulation at +15 to +35°C:

For RTD $\geq 100 \text{ M}\Omega$	with U = 250 VDC
For TC $\geq 1 \text{ G}\Omega$	with U = 500 VDC

### 8. Sensitive length of inset:

For RTDs: 7 to 40 mm max. for all diameters of inset sheath. For thermocouples: approximately equal to the external diameter of the inset sheath, but not more than 5 mm.

### 9. Response time:

The values given are for insets only. This is the time by which the reaction of the inset change in temperature; t0,5 time to reach 50% of its total temperature value. t0,9 time to reach 90% of its total temperature value. The response times given below are indicative only.

#### Response time:

Inset	in water approx. 0.2 m/s		in air approx. 1 m/s	
	t0.5	t0.9	t0.5	t0.9
RTD 3 mm dia.	1.6 s	5.5 s	25 s	86 s
TC 3 mm dia.	1.2 s	3.2 s	22 s	70 s
RTD 6 mm dia.	5 s	16 s	60 s	200 s
TC 6 mm dia.	3.5 s	10 s	55 s	170 s

### 10. Minimum immersion length:

Recommended minimum immersion length:

Inset	in liquid		in gas/vapour	
	in liquid	in gas/vapour	in liquid	in gas/vapour
RTD 3 mm dia.	45 mm	55 mm	45 mm	55 mm
TC 3 mm dia.	15 mm	25 mm	15 mm	25 mm
RTD 6 mm dia.	60 mm	75 mm	60 mm	75 mm
TC 6 mm dia.	30 mm	50 mm	30 mm	50 mm

Modifications reserved,  
 All technical data serves as a guideline  
 and does not guarantee particular  
 properties to any products.

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### Manufacturer of Sensors and Gauges for Temperature & Pressure

**RÜEGER SA**  
Ch. de Mongevon 9  
P.O.Box 98  
1023 CRISSIER 1  
SWITZERLAND

**RÜEGER GmbH**  
Plieninger Strasse 58  
70567 STUTTGART  
GERMANY

**RÜEGER Sdn Bhd**  
No 22-5, Jalan Wangsa Delima 10  
D'Wangsa, Wangsa Maju  
53300 KUALA LUMPUR  
MALAYSIA

**BEIJING RÜEGER PRECISION INSTRUMENT Co. Ltd**  
No. A135 Chengshou Road  
Nansanhuan, Chaoyang District  
100164 BEIJING, P.R. CHINA

Tel + 41 (0)21 637 32 32  
Fax + 41 (0)21 637 32 00  
E-mail [info@rueger.ch](mailto:info@rueger.ch)

Tel + 49 (0)711 16-163-0  
Fax + 49 (0)711 16-16333  
E-mail [rgmbh@rueger.com](mailto:rgmbh@rueger.com)

Tel + 603 - 4142 3808  
Fax + 603 - 4142 3909  
E-mail [sales@rueger.com.my](mailto:sales@rueger.com.my)

Tel + 86 10 8767 7502 / 3379  
Fax + 86 10 8761 3727  
E-mail [sales@bjrueger.com](mailto:sales@bjrueger.com)