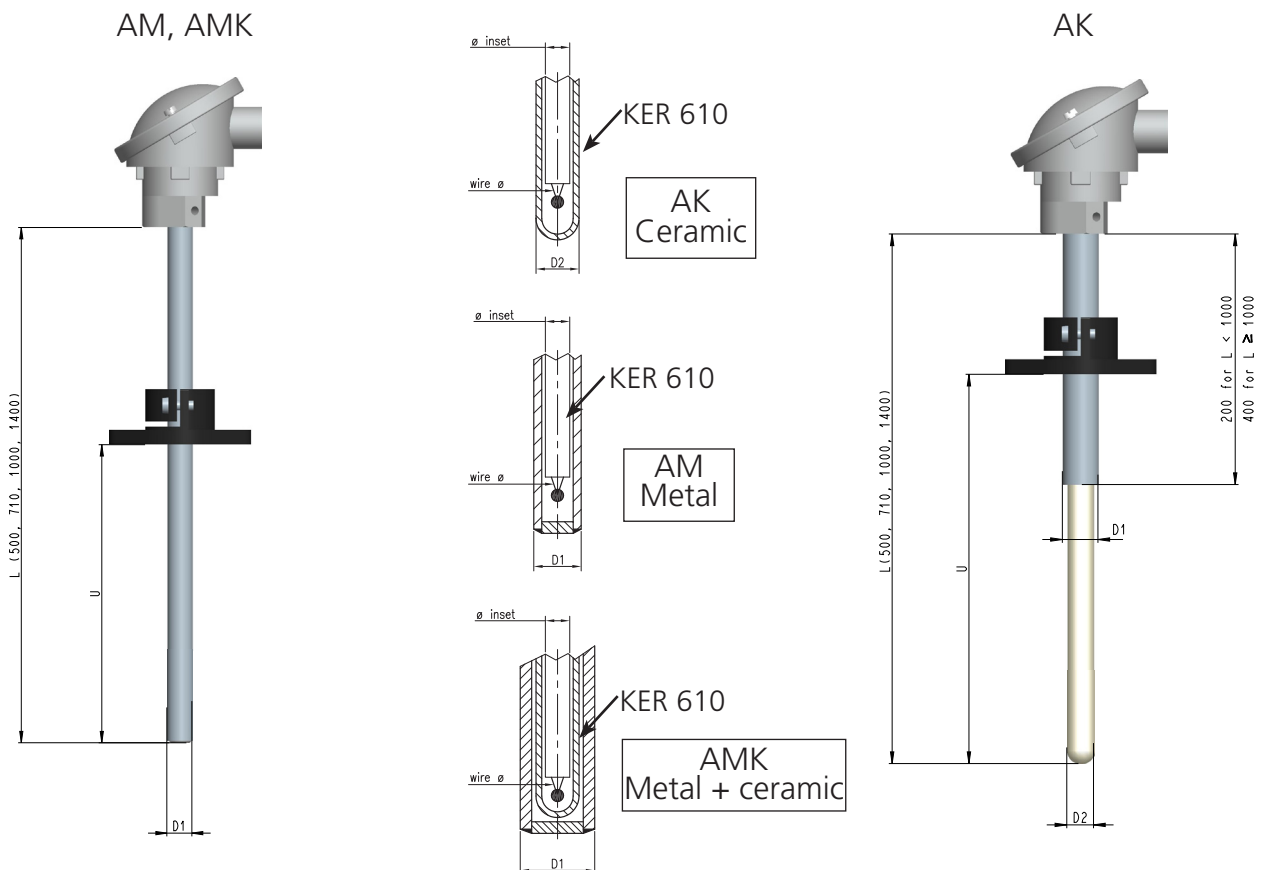


Thermocouples probes types J, K or N, for temperatures up to maximal 1200°C, with common metal sensors in ceramic insets, and with thermowells in metal (AMK, AM) or in ceramic (AK) according to DIN EN 50446.

Type **S 40**



## Applications

- Industrial ovens (heat treatment, incineration).
- Power engineering, reactors.
- Chimneys (combustion gases).
- Annealing and heat treatment process.
- Fusion baths for metal and glass.
- Special executions for explosive environments certified.



## Description

These RÜEGER "Thermo-Sensor" probes are designed specially for measurement of temperatures up to +1200°C but under low pressures only, for high pressure on request. They comprise a ceramic or metal

thermowell (in contact with the medium) which houses a ceramic inset containing either one or two thermocouple sensors in common metal. Each probe also comprises a process connection (adjustable flange or welded flange), and a connection head. The insets can be replaced without removing the thermowell (provided this is undamaged) and without any process interruption.

Three types of thermowell are available:

AM = metal thermowell

AMK = thermowell consisting of a metal outer tube and ceramic inner tube

AK = thermowell consisting of one ceramic tube and a metal process connection tube.

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

## Technical data

### 1. Limiting temperatures (°C) for thermocouples according to wire diameters:

The permissible temperatures given below are for exposure to gases. The operating temperature is generally the maximum temperature permitted for the thermowell.

Type of sensor	J	K	N
Temperature (°C)			
for 2.3 mm dia. wire	750	1100	1100
for 3.2 mm dia. wire	800	1200	1200

### 2. Precision classes:

TC	according to IEC 60584-2		
class 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			
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)		

*ltl = absolute value of measuring range  
ISA MC 96.1 on request.  
(1) Highest of the two values applicable.*

### 3. Identification of measurements circuits:

#### Colors for thermocouples IEC 60584-2:

Type of thermocouple is identified by color code.

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

on request according to ISA MC 96.1.

### 4. Maximum operating temperatures for thermowells:

Consult also DIN EN 50446.

Material of thermowell	Temperature of gas (°C)	Applications	Critical Conditions
AISI 310/1.4841	1150	N2; low O2	S; oxidizing or reducing medium
AISI 446/1.4762	1200	S2; oxidizing medium	N2; low O2
KER 610 (C610)	1500	Gas; medium free of alkali and fluorhydric acid	Temperature shocks medium
KER 710 (C799)	1600	Fusion baths For glass	Temperature shocks medium

### Materials for ceramic thermowells:

Ceramic KER 610 (C610) gastight up to 1500°C, not resistant to alkali vapours.

Ceramic KER 710 (C799) gastight, high-purity up to 1600°C, however only partially resistant to changes in temperature, not resistant to alkali vapours, other materials on request.

### 5. Connection head:

Form A or equivalent, according to DIN EN 50446.

For ambient temperatures: -40+85°C, -50 on request.

Degree of protection: IP 54.

Thermowell and process connection tube fixed by two screws.

Cable gland with PG 16 thread or M20 x 1.5, to be chosen according to the cable entry.

Terminal block: ceramic, with 2 or 4 screw terminals.

### 6. Mounting instruction:

Because these probes are used for high temperatures which may also cover a wide range, it is advisable to mount them vertically, or at an angle not exceeding 30° from the vertical.

The connection head should be located as far as possible from the hot medium.

### 7. Process connection tube:

The process connection metallic tube can be fitted either with an adjustable flange or a compression fitting, and gives extra protection for the ceramic thermowell (AK).

The flange according to DIN EN 50446 cannot fulfil any sealing requirements. In the case that sealing is required for AK execution, a compression fitting must be used, and the space between the process connection tube and the thermowell must be sealed with an appropriate material on request.

With AM and AMK thermowells, the flange can be mounted directly on the metal process connection tube. The sealing function is assured by a compression fitting.

### 8. Nominal length "L":

500 mm
710 mm
1000 mm
1400 mm

### 9. Transmitters:

Because this type of probe is used for high temperatures, it is preferable to install transmitters outside the connection head. For the AUZH head however, which has a raised cover, a transmitter may be placed inside, provided that the temperature attained by the connection head does not exceed the 85°C mentioned in point 5 above. The advantage of transmitter is an increased reliability of the signal. No need of extension or compensating cable. The cold junction compensation is included in all universal transmitter.

### 10. Important:

The ceramic thermowells are sensitive to knocks, so should be handled with the greatest of care. The metal thermowell can be used up to 1200°C, for higher temperature on request.

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

# RÜEGER



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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  
Nanshuan, 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)