

Hot runner thermocouple Model TC46

WIKA data sheet TE 65.46



for further approvals
see page 6

Applications

- Plastics and rubber industry
- Hot runner bushings and nozzles
- Hot runner manifolds
- Moulds used in injection moulding machines
- For direct installation into the process

Special features

- Exclusion of potential faults during installation and operation in hot runner systems thanks to plastic-encapsulated transition
- The thermocouple can be installed without any fixing through bending or forming the sheathed cable or with a rotatable (if required, spring-loaded) union screw
- Probe diameter 0.5 ... 3.0 mm [0.020 ... 0.118 in]
- Kapton®, as the industry standard insulating material for connection cables



Hot runner thermocouples, model TC46

Description

The TC46 series thermocouples are custom-designed to suit all applications where sheathed thermocouples are required. An extensive range of elements, transition sleeves and process connections can be individually selected for the appropriate application. With the flexibility and small diameters in which they are available, model TC46 thermocouples can be used in locations that are not easily accessible.

Thanks to their unique design, the hot runner thermocouples are especially suited for applications where the metal sensor tip is fitted directly into a drilled hole or press-fitted into a grooved channel along the machined parts.

In the standard version the thermocouples are manufactured without process connections. Fastening elements such as a union screw, a compression fitting, or a spring-loaded or customer-specific hold down device can be attached and are available as options.

Measuring element

Measuring element		
Type of measuring element	Thermocouple per IEC 60584-1 or ASTM E230	
	<ul style="list-style-type: none"> ■ Type K ■ Type J 	
Probe tip designs	Ungrounded (ungrounded measuring location)	
	Grounded (grounded measuring location)	
Marking of the polarity		
Single thermocouple		
Validity limits of the class accuracy per EN 60584-1		
Type K	Class 2	-40 ... +1,200 °C [-40 ... +2,192 °F]
	Class 1	-40 ... +1,000 °C [-40 ... +1,832 °F]
Type J	Class 2	-40 ... +750 °C [-40 ... +1,382 °F]
	Class 1	-40 ... +750 °C [-40 ... +1,382 °F]
Validity limits of the class accuracy per ASTM-E230		
Type K	Standard	0 ... 1,260 °C [32 ... 2,300 °F]
	Special	0 ... 1,260 °C [32 ... 2,300 °F]
Type J	Standard	0 ... 760 °C [32 ... 1,400 °F]
	Special	0 ... 760 °C [32 ... 1,400 °F]

→ For detailed specifications for thermocouples, see IEC 60584-1 or ASTM E230 and Technical information IN 00.23 at www.wika.com.

The table shows the temperature ranges listed in the respective standards, in which the tolerance values (class accuracies) are valid.


The actual operating temperature of the thermometer is limited both by the maximum permissible working temperature and the diameter of the thermocouple and the sheathed cable.

For the tolerance value of thermocouples, a cold junction temperature of 0 °C [32 °F] has been taken as the basis.





Sheathed cable

Sheathed cable	
Design	Mineral-insulated cable (sheathed cable) Thermocouple wires embedded in highly compressed ceramic powder
Max. permissible bending tolerance in accordance with ASTM E839 - 8.5.2 standard	Can be closely wrapped three full turns on a mandrel with a diameter twice the sheath diameter
Diameter	<ul style="list-style-type: none"> ■ 1.5 mm [0.059 in] ■ 1.6 mm [0.063 in] ■ 0.5 mm [0.019 in] ■ 1.0 mm [0.039 in] ■ 2.0 mm [0.079 in] ■ 3.0 mm [0.118 in] Other diameters on request
Material	Stainless steel <ul style="list-style-type: none"> ■ Up to 800 °C [1,472 °F] (air) ■ Good resistance against aggressive media and also against vapour and combustion gases in chemical media Other materials on request

Transition

Transition	
Version	<ul style="list-style-type: none"> ■ Plastic-moulded ■ Brazed ■ Crimped ■ Embedded in potting compound Further customer-specific versions on request Note: Should not be immersed within the process! Must not be kinked! Do not secure any compression fittings or mounting screws at the transition!
Plastic-encapsulated transition	<ul style="list-style-type: none"> ■ A unique design highly recommended and used in the hot runner industry ■ The transition, which is plastic-encapsulated at high temperatures, eliminates all potential issues that may cause failures during installation or production processes. ■ The plastic-encapsulated transition eliminates moisture leakage into the sheathed cable or connection leads.  <p style="text-align: center;">Plastic-encapsulated transition</p>
Tensile strength	Up to 9 kg [20 lbs]
Dimensions	Ø 5 x 20 mm [0.197 x 0.787 in]

Connection cable




Connection cable	
Version	Jointly insulated individual strands, ready for connection
Cross-section	Min. 0.20 mm ² [24 awg]
Cable length	1,000 mm [39 in] with additional intervals of 500 mm [20 in]
	Other lengths on request
Insulating material	Kapton® / Kapton®  Polyamide tape sheath for improved electrical properties and high-temperature applications. Polyamide tape sheath for excellent abrasion and perforation resistance and very high resistance to moisture and chemicals.
	Glass fibre / glass fibre  Wound glass fibre insulation for improved moisture and abrasion resistance at high temperatures. Braided glass fibre for additional flexibility and abrasion resistance at high temperatures.
	PVC / PVC  PVC insulation for cost effectiveness, durability and mechanical strength PVC jacket for cost effectiveness, durability and mechanical strength. It is also tough and resistant to heat, abrasion and moisture.
	PTFE / PTFE  PFA insulation for improved electrical properties and high-temperature applications. PFA jacket for chemical inertness to solvents, acids and oils.
Stainless steel braid	<input type="checkbox"/> Without <input type="checkbox"/> With
Permissible temperatures	
Transition	-20 ... +425 °C [-4 ... +797 °F]
Kapton	-50 ... +260 °C [-58 ... +500 °F]
Glass fibre	-50 ... +400 °C [-58 ... +752 °F]
PVC	-20 ... +100 °C [-4 ... +212 °F]
PTFE	-50 ... +260 °C [-58 ... +500 °F]

Kapton® is a registered trademark of DuPont Performance Elastomers.

Thermocouple and compensating cable colour codes

	ASTM E230 Thermocouple cable	ASTM E230 Compensating cable	BS 1843	DIN 43714	ISC1610-198	NF C42-323	IEC 60584-3	IEC 60584-3 intrinsic safety
J								
K								

Process connection

Process connection		
Version	Without process connection	
	Formed/bent probe	Individually specified as per drawings 
	Union screw connection	For fitting the probe into a threaded connection with a female thread. 
	Spring-loaded connection	Allows simple adjustments to the required insertion length at the installation point ensures a positive contact between the medium and the thermocouple junction. 
Customer-specific mounting options on request		

Marking


Customer-specific marking available on request

- Individual identification label
- Product description
- Sensor type, wiring
- Information on production order





Operating conditions

Operating conditions	
Ambient and storage temperature	-40 ... +80 °C [-40 ... +176 °F]
Vibration resistance	50 g (probe tip)
	The information on vibration resistance refers to the tip of the sensor.

Approvals

Logo	Description	Country
	EU declaration of conformity	European Union
	EMC directive ¹⁾	
	EN 61326 emission (group 1, class B) and immunity (industrial application)	
	RoHS directive	

Optional approvals

Logo	Description	Country
	GOST Metrology, measurement technology	Russia
	KazInMetr Metrology, measurement technology	Kazakhstan
-	MTSCHS Permission for commissioning	Kazakhstan
	UkrSEPRO Metrology, measurement technology	Ukraine
	Uzstandard Metrology, measurement technology	Uzbekistan

Certificates (option)

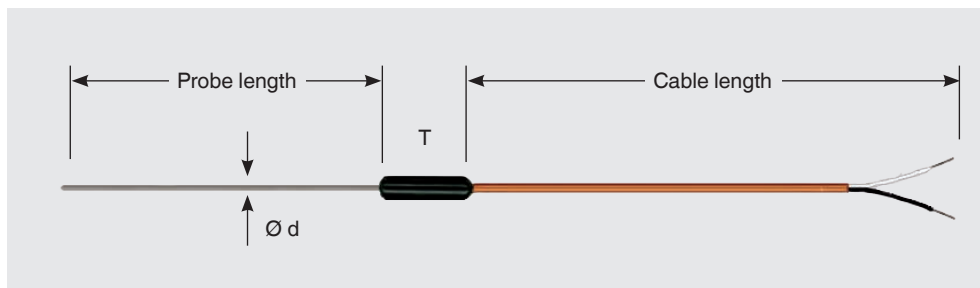
Certification type	Measurement accuracy	Material certificate
2.2 test report	x	x
3.1 inspection certificate	x	x
DKD/DAkkS calibration certificate	x	-

The different certifications can be combined with each other.

The minimum length (metal part of the probe or the length of the probe below the process connection) for carrying out a measurement accuracy test 3.1 or DKD/DAkkS is 100 mm.

→ Approvals and certificates, see website

Dimensions



Legend:

T Transition

Ø d Sheath diameter

Ordering information

Model / Probe diameter / Thermocouple type / Tolerance value / Design of the measuring location / Connection cable, sheath / Colour coding of the connection lead / Options

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