

Cable temperature probe

For general industrial applications

Model TF45

WIKA data sheet TE 67.15

For approvals, see page 5

Applications

- Heating, ventilation and air-conditioning
- Refrigeration technology
- Furnace and equipment manufacturing
- Laboratory technology
- Machine building

Special features

- Measuring ranges from -50 ... +260 °C [-58 ... +500 °F]
- Connection lead made of PVC, silicone, PTFE
- In 2-wire connection
- Probe sleeve from stainless steel
- Proof against dust- and splash-proof IP65



Cable temperature probe, model TF45

Description

The model TF45 cable temperature probe is mainly used to measure the temperature of gaseous media and also of the surfaces of solids in the range of -50 ... +260 °C [-58 ... +500 °F]. In conjunction with an additional thermowell, the cable temperature probe can also be used in liquid media.

The measuring element is connected to a connection lead and installed into a probe sleeve made of stainless steel in a manner that allows heat conduction. The probe sleeve is crimped onto the connection lead, making it proof against dust and jets of water.

Depending on the version, the connection leads are suited to different temperature ranges and operating conditions.

Configurator



Specifications

Measuring element	
Measuring range ¹⁾	
Pt1000, class F 0.3 per IEC/EN 60751	-50 ... +260 °C [-58 ... +500 °F]
Pt100, class F 0.3 per IEC/EN 60751	-50 ... +260 °C [-58 ... +500 °F]
PTC-2000	-50 ... +150 °C [-58 ... +302 °F]
NTC 10 kΩ, B(25/85) = 3,976	-30 ... +130 °C [-22 ... +266 °F]
NTC 10 kΩ, B(25/85) = 3,435	-30 ... +130 °C [-22 ... +266 °F]
NTC 5 kΩ, B(25/85) = 3,976	-30 ... +130 °C [-22 ... +266 °F]
	→ Other measuring elements on request
Connection method	2-wire connection
Permissible temperature ranges for the connection lead ¹⁾	
PVC	-20 ... +105 °C [-4 ... +221 °F]
Silicone	-50 ... +200 °C [-58 ... +392 °F]
PTFE	-50 ... +260 °C [-58 ... +500 °F]

1) Due to the direct electrical connection of the measuring element to the connection lead, the measuring range of the cable temperature probe is determined by both the measuring element and the insulation material of the connection lead.

Accuracy specifications	
Influence of lead resistance	With the 2-wire connection, the lead resistance of the connection lead affects the measured value and must be taken into consideration. 0.162 Ω/m (guideline value for copper cable with cross-section 0.22 mm²) Example Pt100: 0.42 °C/m, Pt1000: 0.042 °C/m
Reference conditions	
Ambient temperature	15 ... 25 °C [59 ... 77 °F]
Atmospheric pressure	860 ... 1,060 mbar [12.47 ... 15.37 psi]
Humidity	50 ... 70 % relative humidity
Condensation	Condensation permissible
Mounting position	As required

Probe sleeve	
Sleeve diameter 6 mm [0.236 in]	Standard length A 32, 40, 50, 80, 110, 135 mm [1.260, 1.575, 1.969, 3.150, 4.331, 5.315 in]
Sleeve diameter 5 mm [0.197 in]	Standard length A 50 mm [1.969 in]
Sleeve diameter 4 mm [0.157 in]	Standard length A 50 mm [1.969 in]

Output signal		
Dynamic behaviour per IEC/EN 60751		
Response time	The response time is essentially influenced by the probe sleeve (dimensions, material), the heat transfer to the measuring element and the flow rate of the medium	
	Due to the design of the model TF45, there is optimum heat transfer from the medium to the measuring element	
	Probe sleeve from stainless steel (with Ø 6 mm [0.236 in])	t _{0,5} : 2.7 s
		t _{0,9} : 7 s
	Probe sleeve from stainless steel (with Ø 5 mm [0.197 in])	t _{0,5} : 2.2 s
		t _{0,9} : 6 s

Electrical connection	
Connection type	■ Stripped stranded wires ■ End splices → Customer-specific connectors are available on request
Insulation material of the connection lead	■ PVC ■ Silicone ■ PTFE
Ingress protection of the transition between thermowell and connection lead (IP code)	
PVC insulation material	IP65
Silicone insulation material	IP66/IP67
PTFE insulation material	IP65
Connection lead	500 ... 10,000 mm [19.7 ... 393.7 in], in 500 mm [19.7 in] increments → Other lengths on request

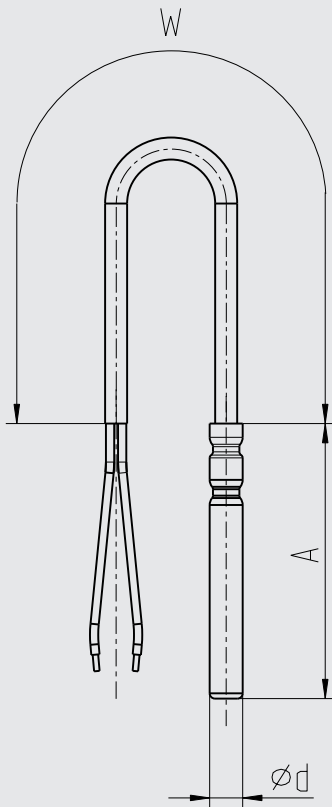
Further details on: Electrical connection				
Insulation material		PVC	Silicone	PTFE
Highest working temperature		105 °C [221 °F]	200 °C [392 °F]	260 °C [500 °F]
Flammability		Self-extinguishing	Self-extinguishing	Not flammable
Water absorption		Low	Low	None
Suitability for steam		Good	Limited	Very good
Chemical resistance to	Weak bases	Yes	Yes	Yes
	Weak acids	Yes	Yes	Yes
	Alcohol	Yes	Yes	Yes
	Petrol	Yes	No	Yes
	Benzene	No	No	Yes
	Mineral oil	Yes	Yes	Yes

The values given in the table are only given as guide values, and are not to be used as the minimum requirements in specifications.

Operating conditions	
Storage temperature range	-40 ... +85 °C [-40 ... +185 °F]
Ambient temperature range	The max. permissible ambient temperature range depends upon the insulation material of the connection lead and on the connector fitted, as required.
PVC	-20 ... +105 °C [-4 ... +221 °F]
Silicone	-50 ... +200 °C [-58 ... +392 °F]
PTFE	-50 ... +260 °C [-58 ... +500 °F]
Static operating pressure	Atmospheric pressure
Vibration resistance per IEC 60068-2-6:2007	Depending on the design, mounting situation, medium and temperature To 6g
Shock resistance per IEC 60068-2-27:2007	Depending on the design, mounting situation and temperature To 100g
Ingress protection (IP code) per IEC 60529	→ For ingress protection, see table „Elektrischer Anschluss“

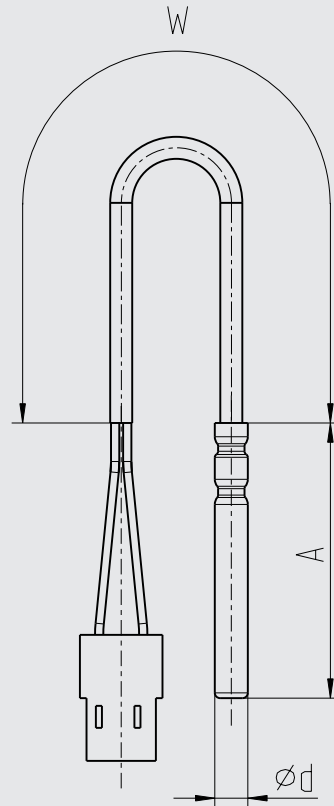
Dimensions

Model TF45 with stripped stranded wires, with end splices



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Model TF45 with plug connection



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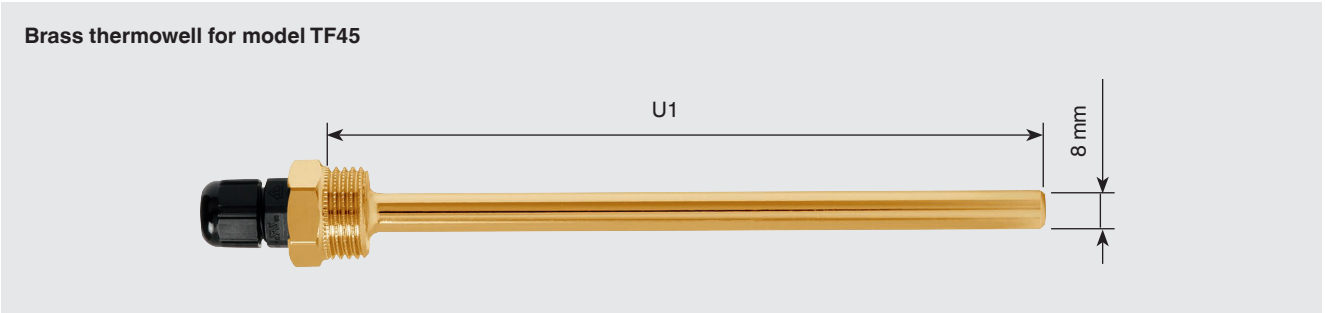
Legend:

- Ø d Probe sleeve diameter
- A Sleeve length
- W Cable length

Accessories

Description	Order number
Brass thermowell (mounting thread G 1/2) ¹⁾	
Insertion length of the thermowell U1 = 50 mm [1.97 in]	14238211
Insertion length of the thermowell U1 = 100 mm [3.94 in]	14238212
Insertion length of the thermowell U1 = 150 mm [5.91 in]	14238213
Insertion length of the thermowell U1 = 200 mm [7.87 in]	14238214

1) The thermowells are designed for static operating pressures up to a maximum of 16 bar [232 psi]. The cable gland is suitable for ambient temperatures from -40 ... +100 °C [-40 ... +121 °F]



Approvals

Logo	Description	Region
	EU declaration of conformity	European Union
	RoHS directive	

Ordering information

Model / Measuring range / Measuring element / Connection method / Tolerance / Material, diameter and length of the probe sleeve / Insulation and length of the connection lead / Cable length W / Electrical connection



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