

Application

- Electric motors
- Generators

Features

- Single and double sensing element
- Measuring circuit 2-, 3-, 4-wire
- Sensing element:
Pt100, Pt500, Pt1000 (IEC751),
Ni100, Ni500, Ni1000 (DIN43760),
Cu50 (GOST 6651-2009)
- Design of sensing element:
bifilar wound
- Temperature class F (+155°C) or H (+180°C)
- Non-standard parameters available upon request:
 - customized housing shape and dimensions
 - cables according to the customer's specifications
- Dielectrical strength 2.5 kVAC/60 sec.,
optionally 5.0 kVAC/60 sec.

Description

Insert these thin, laminated RTDs in winding slots to detect high temperatures before insulation damage occurs. Six sensors are recommended for each motor, two per phase. Locate sensors near the hottest point of the windings for best performance.

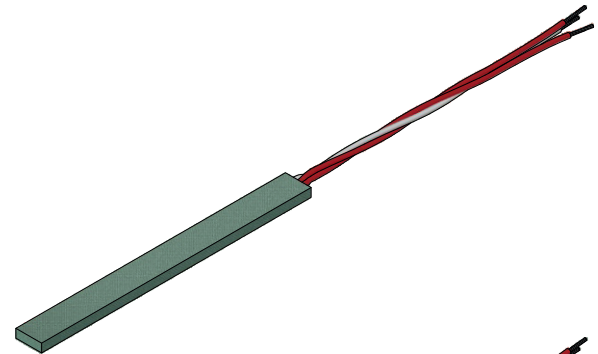
Temperature sensors are bifilary wound, they allow measuring temperature on almost entire length of the housing. This eliminates the danger of missing hot (or overheated) part of insulation by the point sensor (CHIP).

Platinum wire bifilary wound is placed inside the laminated epoxy glass sheet. Connecting cables are connected with bifilar wiring, they are typically delivered in teflon insulation. The sensor has a high mechanical stability and does not require additional insulation for high-voltage of 2.5 kV and optionally 5.0 kV.

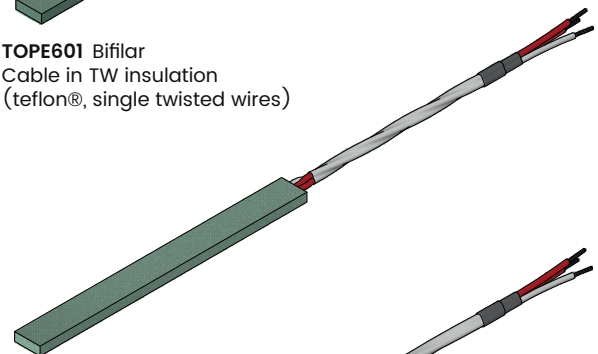
Dimensions of the laminated sheet, length and insulation of the connecting cable, accuracy class, may be selected depending on the application needs/requirements.

ATEX, IECEx, EAC Ex versions

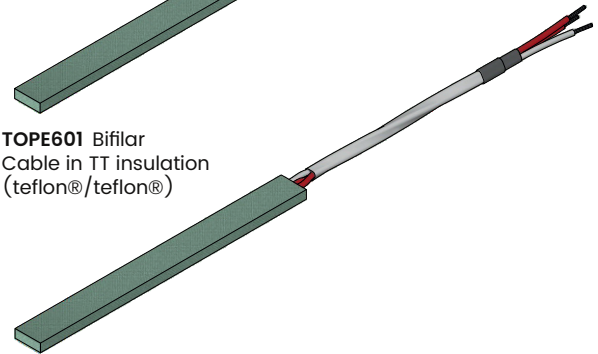
Intrinsically safe and increased safety designs are available for applications in hazardous areas. These models are provided with certificate according to Directive 2014/34/UE (ATEX), IECEx scheme and EAC Ex TR-CU 012/2011 (Eurasian Economic Union).



TOPE601 Bifilar
Cable in TW insulation
(teflon®, single twisted wires)



TOPE601 Bifilar
Cable in TT insulation
(teflon®/teflon®)

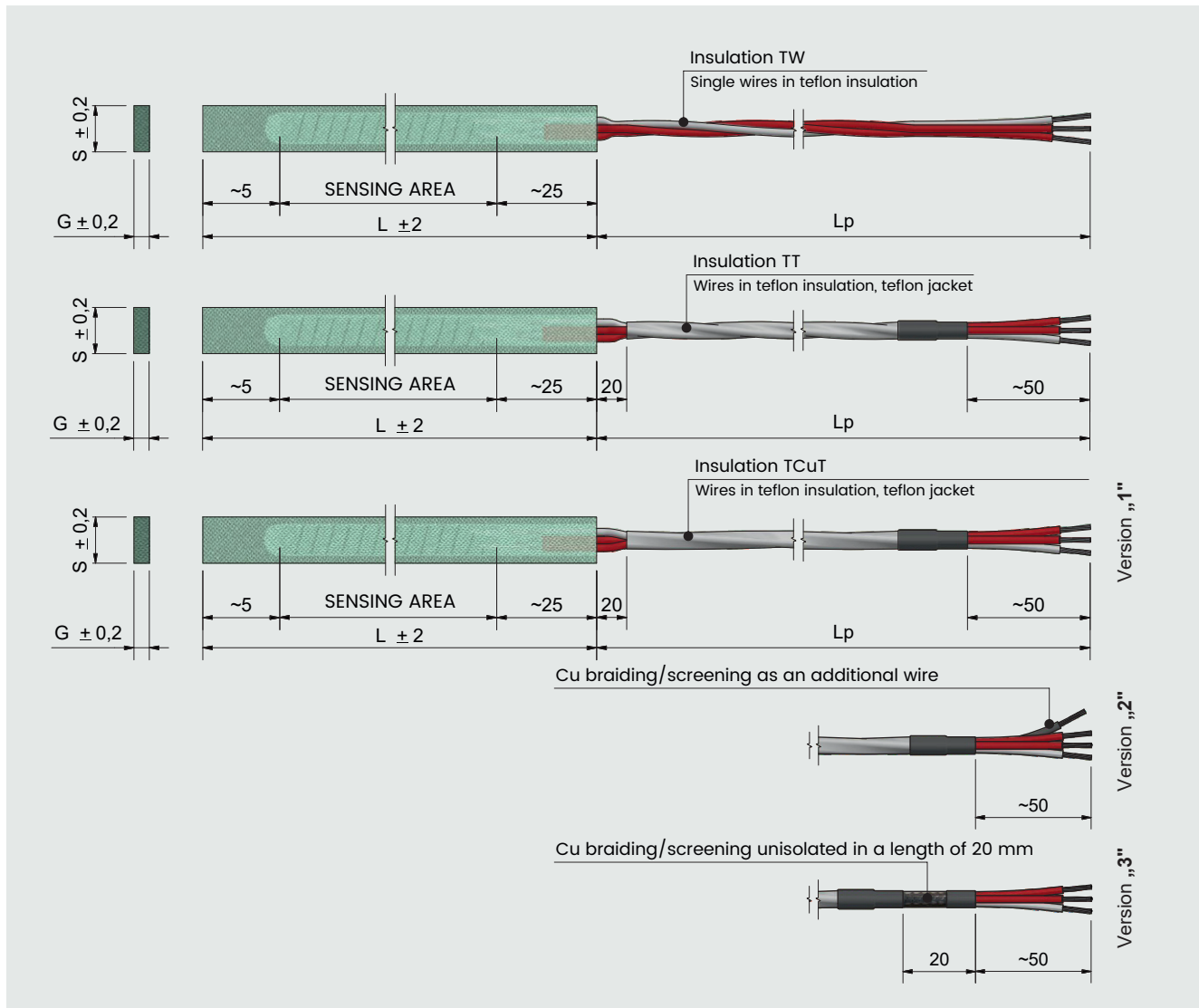


TOPE601 Bifilar
Cable in TCuT insulation
(teflon®/Cu braid/teflon®)

Advantages of our Stator RTDs:

- Low heat capacity, which guarantees an immediate response to temperature changes
- Excellent electrical insulation, high thermal conductivity, resistance to deformation occurring during long shifts
- Bifilar design prevents the voltage induction
- Resistant to shock, pressure and vibration
- Resistant to common impregnating agents, curing and drying processes
- Supplied with factory test certificate in accordance with EN 10204

Construction



Measuring ranges

from -40°C to $+155^{\circ}\text{C}$ - temperature class F
from -40°C to $+180^{\circ}\text{C}$ - temperature class H

Sensing element

Single or double

Pt100, Pt500, Pt1000 (IEC 751, $\alpha = 0.00385$)

Option:

Ni100, Ni500, Ni1000 (DIN43760, $\alpha = 0.00618$)

Cu50, Cu100 (GOST 6651-94, $\alpha = 0.00426$)

Tolerances

Platinum Class A ($\pm 0.15^{\circ}\text{C}$ in temp. 0°C)
Class B ($\pm 0.30^{\circ}\text{C}$ in temp. 0°C)

Nickel ($\pm 0.40^{\circ}\text{C}$ in 0°C)
Copper ($\pm 0.30^{\circ}\text{C}$ in 0°C)

Electrical parameters

Measuring current	nom. 0,1 mA to 5 mA
Isolation resistance	$>10 \text{ G}\Omega$
Dielectrical strength	2.5 kVAC (50Hz/60 sec.) 5.0 kVAC (50Hz/60 sec.)

Housing material

Epoxy glass laminate provides good mechanical strength at elevated temperatures and very good chemical resistance.

IEC 60893	EP GC 203 EP GC 308
NEMA LI 1	G II



NOTE!

It is possible to install TOPE601 series sensors in epoxy glass sheets with total length up to 5 m – see model TOPE603.

RESISTANCE THERMOMETER


STATOR SLOT RTD BIFILAR WINDED, TYPE **TOPE601**

Insulation types of connection cable

Cable insulation plays a crucial role in ensuring the durability of the stator slot temperature sensor. Among the many available insulation materials, several stand out for their versatility and ability to work across a wide range of applications, considering factors such as temperature resistance, chemical resistance, and mechanical properties. Below presented the most popular versions of cables.


TW insulation

① Conductor	Teflon® PFA
	Teflon® PFA



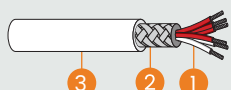
TT insulation

① Conductor	Teflon® PFA
② Sheath	Teflon® PFA



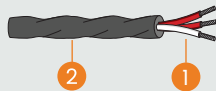
TCuT insulation

① Conductor	Teflon® PFA
② Screen	Copper braid
③ Sheath	Teflon® PFA




SLSL insulation

① Conductor	Silicone
② Sheath	Silicone



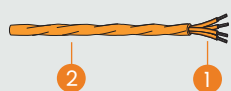
SLCuSL insulation

① Conductor	Silicone
② Screen	copper braid
③ Sheath	Silicone



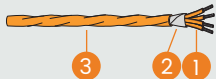
KK insulation

① Conductor	Kapton®
② Sheath	Kapton®



KFK insulation

① Conductor	Kapton®
② Screen	Alu-foil
③ Sheath	Kapton®



Possible housing dimensions

Connecting Cable No. of wires x section	Insulation	Outer diameter	Housing thickness G [mm] ±0.2	Housing width S [mm] ±0.2	Housing length L [mm] ±2
2 x 0.22 mm ²	TT	∅ 2.5	2.0 ÷ 8.0	8.0 ÷ 14.0	80 ÷ 2600
3 x 0.22 mm ²	TT TCuT	∅ 2.6 ∅ 3.1	2.0 ÷ 8.0	8.0 ÷ 14.0	
4 x 0.22 mm ²	TW TT TCuT	∅ 2.5 ∅ 2.6 ∅ 3.9	2.0 ÷ 8.0	10.0 ÷ 14.0	
6 x 0.22 mm ²	TT	∅ 4.1	2.0 ÷ 8.0	12.0 ÷ 14.0	
3 x 0.50 mm ²	TW TCuT	∅ 3.1 ∅ 4.2	2.0 ÷ 8.0	8.0 ÷ 14.0	
4 x 0.50 mm ²	TW TCuT	∅ 3.5 ∅ 4.5	2.0 ÷ 8.0	10.0 ÷ 14.0	
6 x 0.50 mm ²	TW TCuT	∅ 4.4 ∅ 5.4	2.0 ÷ 8.0	12.0 ÷ 14.0	
8 x 0.50 mm ²	TW TCuT	∅ 4.8 ∅ 6.0	2.0 ÷ 8.0	14.0	

RESISTANCE THERMOMETER

STATOR SLOT RTD BIFILAR WINDED, TYPE **TOPE601**



Data sheet TOPE601 | Edition 2023

Ordering code

TOPE601 - ¹ - ² - ³ - ⁴ - ⁵ - ⁶ - ⁷ - ⁸ - ⁹

Order	Parameter	Code	<input checked="" type="checkbox"/>	Description		
1	Type of sensing element	1xPt100	<input type="checkbox"/>	Single Pt100	IEC 751, $\alpha = 0.00385$	
		2xPt100	<input type="checkbox"/>	Double Pt100	IEC 751, $\alpha = 0.00385$	
		1xNi100	<input type="checkbox"/>	Single Ni100	DIN43760, $\alpha = 0.00618$	
		2xNi100	<input type="checkbox"/>	Double Ni100	DIN43760, $\alpha = 0.00618$	
		xxx	<input type="checkbox"/>	Other, please specify		
3	Dimension S [mm]	6	<input type="checkbox"/>	6 mm		
		8	<input type="checkbox"/>	8 mm		
		10	<input type="checkbox"/>	10 mm		
		12	<input type="checkbox"/>	12 mm		
		14	<input type="checkbox"/>	14 mm		
		xxx	<input type="checkbox"/>	Other, please specify		
4	Dimension L [mm]	80	<input type="checkbox"/>	80 mm		
		150	<input type="checkbox"/>	150 mm		
		200	<input type="checkbox"/>	200 mm		
		xxx	<input type="checkbox"/>	Other, please specify		
5	Thickness G [mm]	2.5	<input type="checkbox"/>	2.5 mm		
		3	<input type="checkbox"/>	3 mm		
		xxx	<input type="checkbox"/>	Other, please specify		
			<input type="checkbox"/>			
6	Cable length Lp [mm]	1000	<input type="checkbox"/>	1000mm		
		2000	<input type="checkbox"/>	2000mm		
		xxx	<input type="checkbox"/>	Other, please specify		
7	RTD class	A	<input type="checkbox"/>	Class A acc. to PN-EN 60751 / IEC 751 (available only for Pt sensing elements)		
		B	<input type="checkbox"/>	Class B acc. to PN-EN 60751 / IEC 751 / DIN43760 / GOST 6651-94		
8	Connection line	2	<input type="checkbox"/>	2-wire		
		3	<input type="checkbox"/>	3-wire		
		4	<input type="checkbox"/>	4-wire		
9	Connecting cable type			Conductor	Screen	Sheath
		2x0.22-TT	2x0.22 mm ²	Teflon® PFA		Teflon® PFA
		3x0.22-TT	3x0.22 mm ²	Teflon® PFA		Teflon® PFA
		3x0.22-TCuT	3x0.22 mm ²	Teflon® PFA	Cu Braid	Teflon® PFA
		4x0.22-TW	4x0.22 mm ²	Teflon® PFA		
		4x0.22-TT	4x0.22 mm ²	Teflon® PFA		Teflon® PFA
		4x0.22-TCuT	4x0.22 mm ²	Teflon® PFA	Cu Braid	Teflon® PFA
		6x0.22-TCuT	6x0.22 mm ²	Teflon® PFA	Cu Braid	Teflon® PFA
		3x0.50-TW	3x0.50 mm ²	Teflon® FEP		
		3x0.50-TCuT	3x0.50 mm ²	Teflon® FEP	Cu Braid	Teflon® FEP
		4x0.50-TW	4x0.50 mm ²	Teflon® FEP		
		4x0.50-TCuT	4x0.50 mm ²	Teflon® FEP	Cu Braid	Teflon® FEP
		6x0.50-TW	6x0.50 mm ²	Teflon® FEP		
		6x0.50-TCuT	6x0.50 mm ²	Teflon® FEP	Cu Braid	Teflon® FEP
8x0.50-TW	8x0.50 mm ²	Teflon® FEP				
8x0.50-TCuT	8x0.50 mm ²	Teflon® FEP	Cu Braid	Teflon® FEP		

Example

TOPE601-1xPt100-10-250-2.5-10000-B-3-3x0.22-TCuT

Slot RTD 1xPt100, housing width S=10 mm, length L=250 mm, thickness G=2.5 mm, connecting cable length Lp=10000 mm, class B, 3-wire connection line, cable 3x0.22mm² in insulation TCuT.