

Application

- General industrial services
- Laboratories

Features

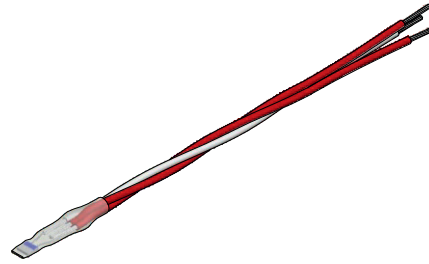
- Single RTD
- 2-, 3-, 4-wire connection
- Sensing element:
Pt100, Pt500, Pt1000 (IEC751),
Ni100, Ni500, Ni1000 (DIN43760),
Cu50, Cu100 (GOST 6651-2009)

Description

Resistance thermometers TOPE610 are designed for temperature measurement of machine parts or other construction elements.

TOPE610 sensor consists of thermometric resistor and connection cable.

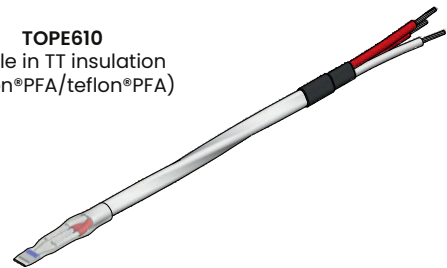
Accuracy, cable length and insulation can be selected individually for the respective application.



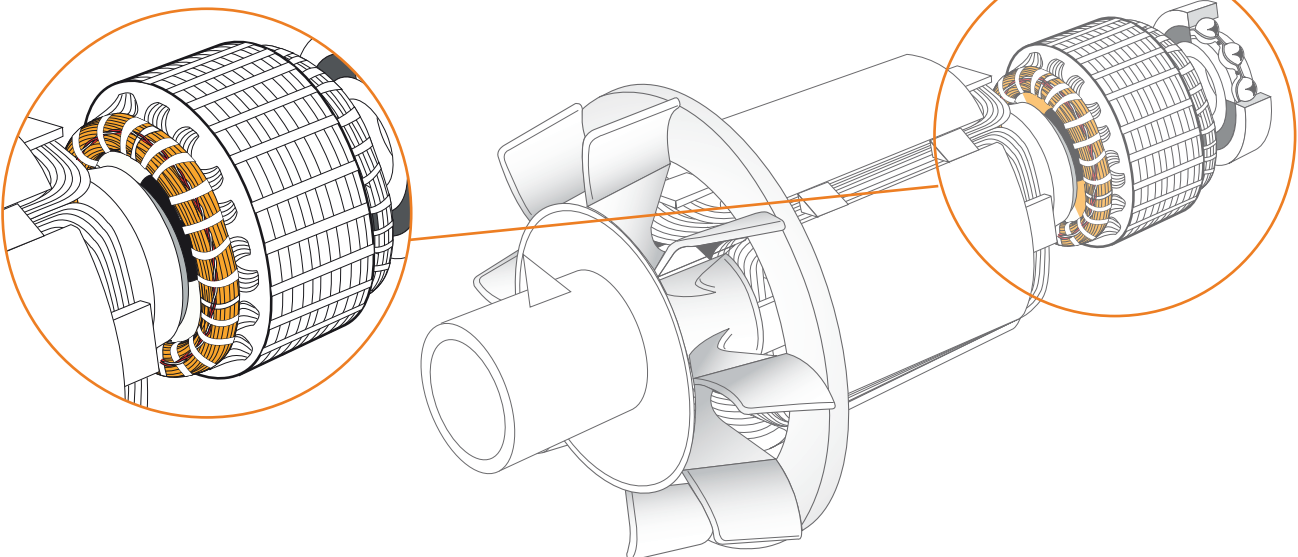
TOPE610
Cable in TW insulation
(teflon®PFA)



TOPE610
Cable in TT insulation
(teflon®PFA/teflon®PFA)



TOPE610
Cable in TCuT insulation
(teflon®PFA/Cu braid/teflon®PFA)



Temperature transmitter (Option)

There is possibility of using standard temperature transmitter(4÷20mA, 0÷10V) or temperature transmitter with HART® , Profibus® PA , Foundation Fieldbus communication protocol, mounted inside electrical control cabinet.

ATEX, IECEx, EAC Ex versions

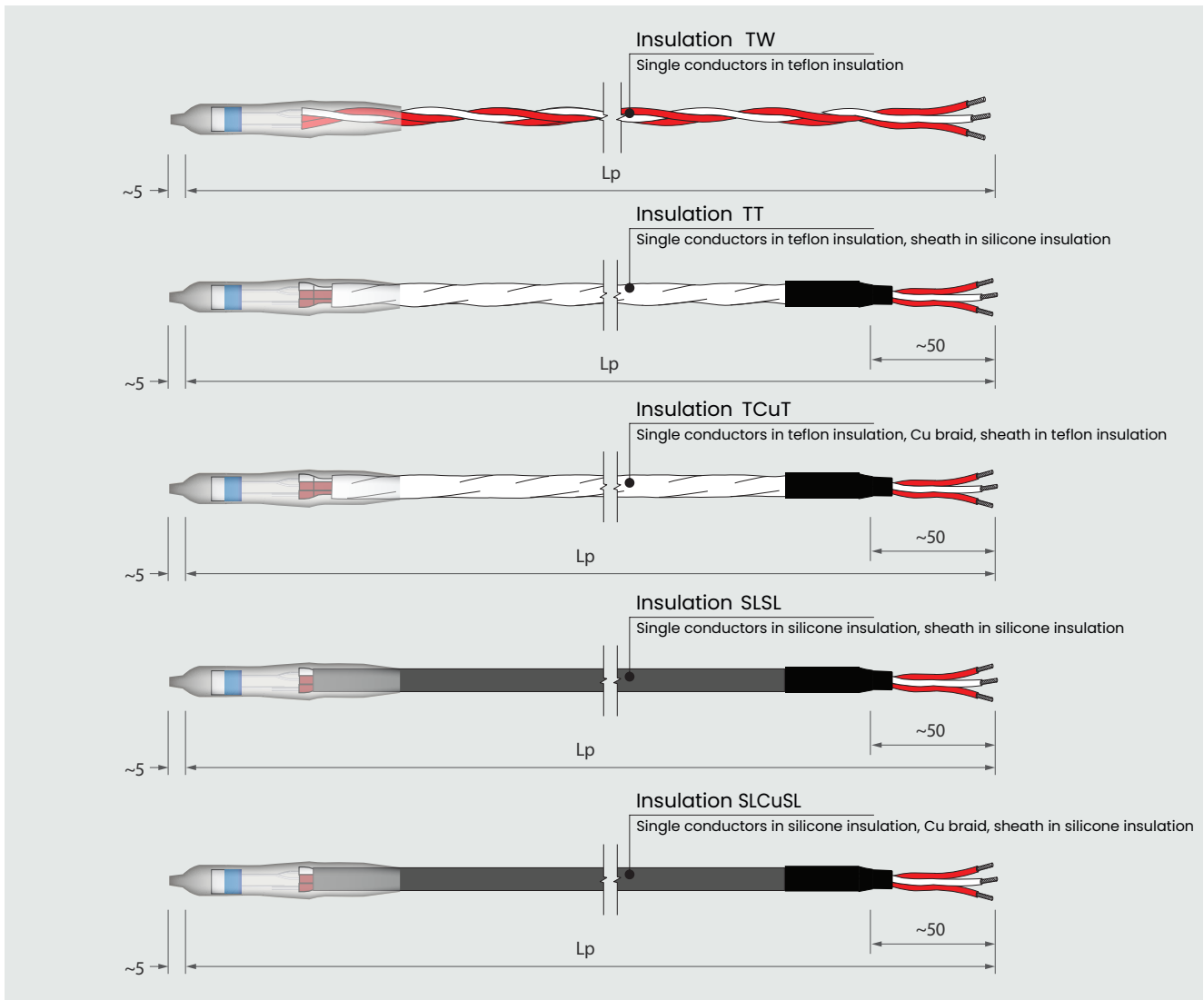


Intrinsically safe designs are available for applications in hazardous areas. These models are provided with certificate for „intrinsically safe“ type of protection according to Directive 2014/34/UE (ATEX), IECEx scheme.

CABLE RESISTANCE THERMOMETER

TYPE TOPE610

Construction



Measuring range	Code	Insulation material
-50 .. +180°C	SLSL, TSL, TPSL	silicone
-50 .. +260°C	TT, TP, TCuT	teflon® PFA

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

Electrical parameters

Measuring current nom. 0,1 mA to 1 mA

Isolation resistance $>10 \text{ G}\Omega$ (test 500 VDC)

PN-EN 60751 standard defines the formulas for calculating acceptable measure tolerance.

Class of tolerance	Tolerance
A	$\pm 0.15 + (0.002 \times t)$
B	$\pm 0.30 + (0.005 \times t)$

Insulation types of connection cable

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

TPSL insulation (Optional)

1 Conductor	Teflon® FEP
2 Screen	copper braid
3 Sheath	Silicone

KFK insulation

1 Conductor	Kapton
2 Screen	Alu-foil
3 Sheath	Kapton

KK insulation

1 Conductor	Kapton
2 Sheath	Kapton

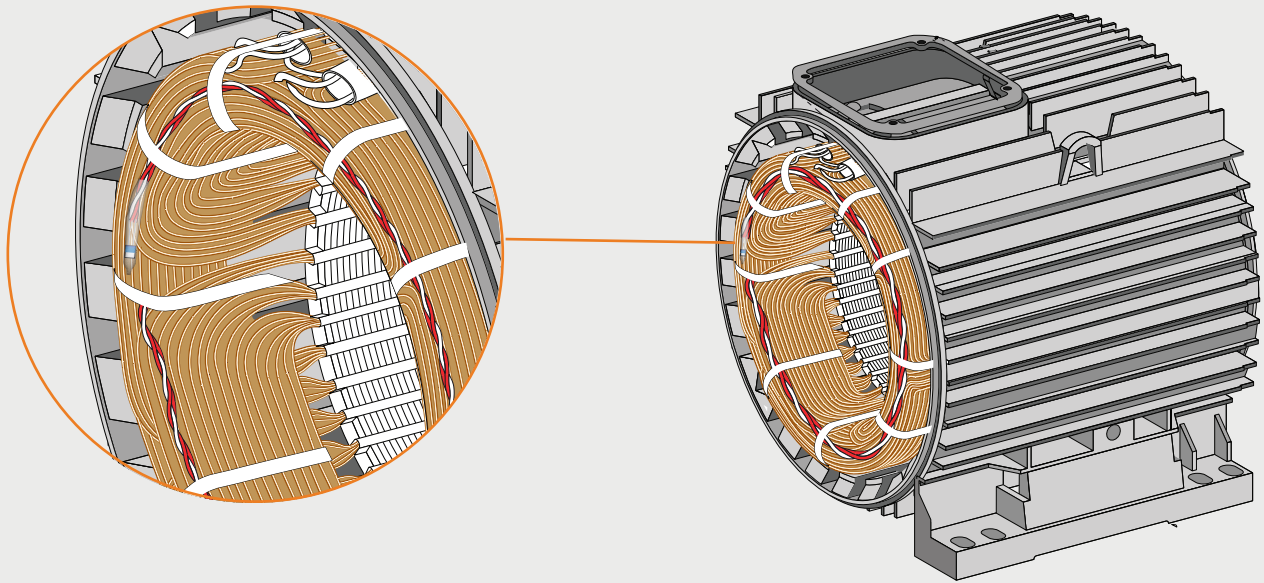
External cable diameters

Cross section [mm²]	Insulation	Outer diameter
2 x 0.22 mm² 3 x 0.22 mm² 4 x 0.22 mm² 3 x 0.50 mm² 4 x 0.50 mm²	TW insulation teflon® PFA	Ø2.5 Ø2.6 Ø2.6 Ø3.1 Ø3.5
2 x 0.22 mm² 3 x 0.22 mm² 4 x 0.22 mm²	TT insulation teflon® PFA / teflon® PFA	Ø2.5 Ø2.6 Ø2.6
3 x 0.22 mm² 4 x 0.22 mm² 6 x 0.22 mm² 8 x 0.22 mm² 6 x 0.05 mm² 8 x 0.05 mm²	TCuT insulation teflon® PFA / Cu braid / teflon® PFA	Ø3.1 Ø3.9 Ø4.1 Ø4.6 Ø2.6 Ø3.0
3 x 0.22 mm²	SLSL insulation silicone / silicone	Ø3.4

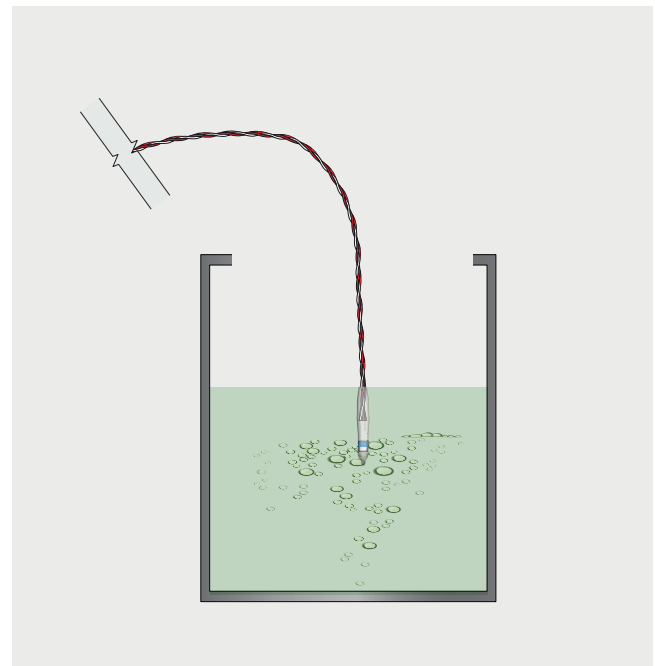
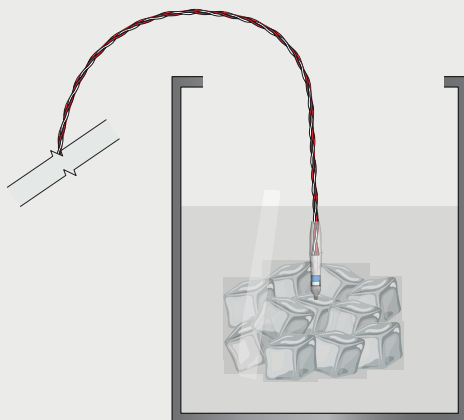
Cross section [mm²]	Insulation	Outer diameter
3 x 0.22 mm² 6 x 0.22 mm²	SLCuSL insulation silicone /copper braid/ silicone	Ø3.4 Ø5.8
4 x 0.22 mm²	KK insulation kapton / kapton	Ø2.3
4 x 0.22 mm²	KFK insulation kapton / Alu-foil /kapton	Ø2.1
3 x 0.22 mm² 4 x 0.22 mm² 6 x 0.22 mm² 8 x 0.22 mm²	TPSL insulation teflon® FEP/Cu braid/silicone optional	Ø3.9 Ø4.0 Ø4.2 Ø4.4

Installation examples

Electric motor



Chemical industry temperature measurement



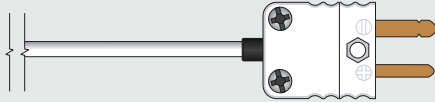
Connectors (Optional)

Sensors with connection cable can be equipped with connector.

Available options:

Connector S-010-Cu-W

Miniature plug, 2-pin.



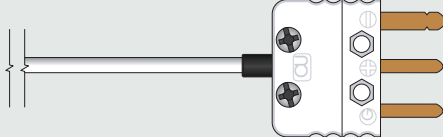
Connector S-010-Cu-G

Miniature socket, 2-pin.



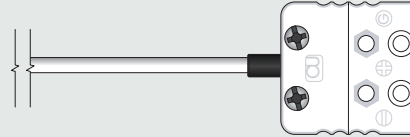
Connector S-013-Cu-W

Miniature plug, 3-pin.



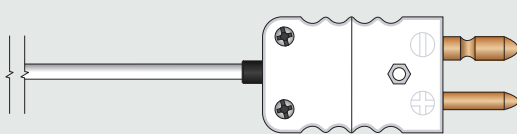
Connector S-013-Cu-G

Miniature socket, 3-pin.



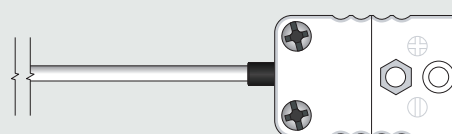
Connector S-020-Cu-W

Standard plug, 2-pin.



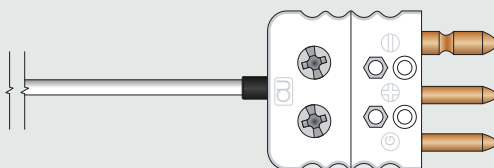
Connector S-020-Cu-G

Standard socket, 2-pin.



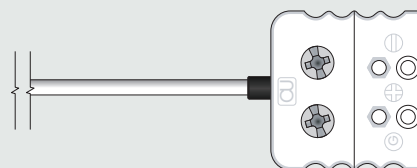
Connector S-023-Cu-W

Standard plug, 3-pin.



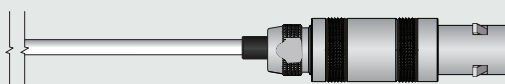
Connector S-023-Cu-G

Standard socket, 3-pin.



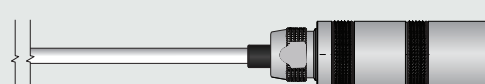
Connector LEMO® FFA

Plug size from 0S to 3S. 2-, 3-, 4-, 6-pin.



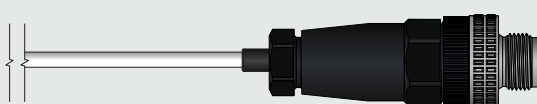
Connector LEMO® PCA

Plug size from 0S to 3S. 2-, 3-, 4-, 6-pin.



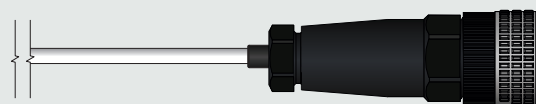
Hirschmann M12 series

4-pin.



Hirschmann M12 series

Standard socket, 4-pin.



Ordering code

TOPE610 - - - - -

Order	Parameter	Code	<input checked="" type="checkbox"/>	Description
1	Type of sensing element	1xPt100	<input type="checkbox"/>	Single Pt100 IEC 751, $\alpha=0.00385$
		1xNi100	<input type="checkbox"/>	Single Ni100 DIN43760, $\alpha =0.00618$
		xxx	<input type="checkbox"/>	Other, please specify
2	Connecting cable length Lp	1000	<input type="checkbox"/>	1000mm
		2500	<input type="checkbox"/>	2500mm
		xxx	<input type="checkbox"/>	Other, please specify
3	Tolerance 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
4	Measuring circuit	2	<input type="checkbox"/>	2-wire (only available in accuracy class B)
		3	<input type="checkbox"/>	3-wire
		4	<input type="checkbox"/>	4-wire
5	Connecting cable type		<input type="checkbox"/>	Temperature range of sensor
		TW	<input type="checkbox"/>	Teflon® PFA -40 .. +200°C
		TT	<input type="checkbox"/>	Teflon® PFA / Teflon® PFA -40 .. +260°C
		TCuT	<input type="checkbox"/>	Teflon® PFA / Cu braid / Teflon® PFA -40 .. +260°C
		TSL	<input type="checkbox"/>	Teflon® FEP / Silicone -50 .. +180°C
		TPSL	<input type="checkbox"/>	Teflon® FEP / Cu braid / Silicone -50 .. +180°C
		TT	<input type="checkbox"/>	Teflon® PFA / Teflon® PFA -50 .. +260°C
		SLSL	<input type="checkbox"/>	Silicone / Silicone -50 .. +180°C
6	Connector (optional)	SLCuSL	<input type="checkbox"/>	Silicone /Cu braid / Silicone -50 .. +180°C
			<input type="checkbox"/>	without connector, free end conductors of connection cable
		S-013-Cu-W	<input type="checkbox"/>	Miniature plug, 3-pin
		FFA.1S	<input type="checkbox"/>	Connector LEMO® FFA size 1S
		xxx	<input type="checkbox"/>	Other, please specify

Example
TOPE610-1xPt100-2000-A-3-TW

RTD sensor 1xPt100, connection cable length Lp=2000 mm, A tolerance class, 3-wire measuring circuit, single conductors in teflon insulation.

TOPE610-1xPt100-2500-B-2-TT-LEMO® FFA.1S

RTD sensor 1xPt100, connection cable length Lp=2500 mm, B tolerance class, 2-wire measuring circuit, single conductors in teflon insulation, sheath in teflon insulation, connection cable equipped with LEMO® FFA plug size 1S.