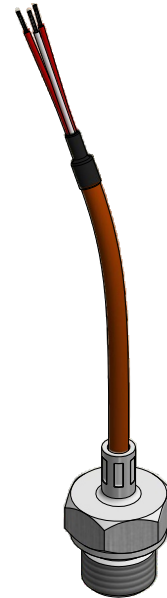


Applications

- Fine chemical industry
- General industrial services

Features

- Single or double RTD
- Connection line 2-, 3-, 4-wire
- Single or double RTD:
Pt100, Pt500, Pt1000 (IEC751),
Ni100, Ni500, Ni1000 (DIN43760),
Cu50, Cu100 (GOST 6651-2009)
- Non-standard sensor versions
available upon customer's request:
 - cable type according to client's specification
 - thermowell spring protection against
excessive cable bending



TOPE414
TSL cable insulation
(teflon®FEP/silicone)

Resistance thermometers TOPE414 are designed for screw-fitting directly into process or into machine parts.

TOPE414 sensor consists of thermometric resistor, threaded process connection made out of stainless steel, and connection cable.

Process connection thread, number of sensors, accuracy, cable length and insulation can be selected individually for the respective application.

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 and EAC Ex TR-CU 012/2011 (Eurasian Economic Union).

Intrinsically safe (Exi) XI-TOPE414

Designs

TOPE414

TSL insulation
Single conductors in teflon insulation sheath in silicone insulation

~50

L_1 L_p G K

Thread	Dimension K
thread 1/8"NPT	5.9 mm
thread 1/4"NPT	6.3 mm
thread 3/8"NPT	7.3 mm
thread 1/2"NPT	8.1 mm
thread 3/4"NPT	8.6 mm

Thread	Length L_1 [mm]
M8x1	10
M10x1	10
M12x1	10
M16x1.5	15
M20x1.5	20

Thread	Length L_1 [mm]
G1/8"	10
G1/4"	12
G1/2"	20
1/8"NPT	11
1/4"NPT	14
1/2"NPT	18

Measuring range

from -50°C to +400°C (depends on cable insulation type)

Sensing element

Single or double

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

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

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

Tolerance class

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 temp. 0°C)

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

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

Class of tolerance	Tolerance $^\circ\text{C}$
A	$\pm 0.15 + (0.002 \times t)$
B	$\pm 0.30 + (0.005 \times t)$

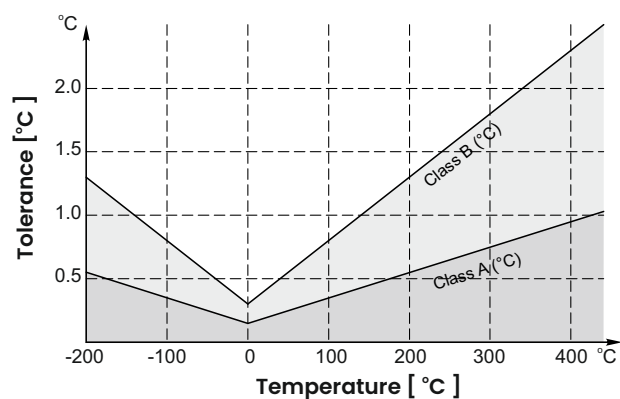
Electrical parameters

Measuring current nom. 0,1 mA to 1 mA

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

Housing material

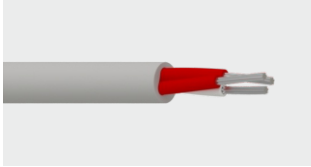
Stainless steel 1H18N9T (1.4541 / AISI321)



Insulation types of connection cable

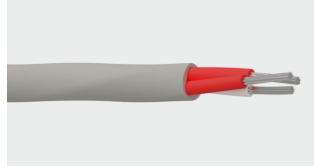
JJ insulation

Conductor: PVC
Sheath: PVC



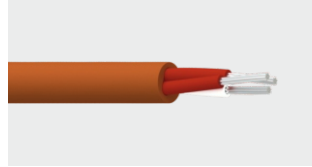
SLSL insulation

Conductor: Silikon
Sheath: Silikon



TSL insulation

Conductor: Teflon® FEP
Sheath: Silicone



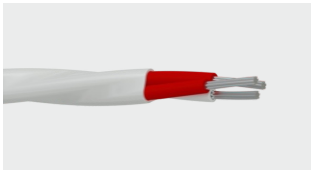
TPSL insulation

Conductor: Teflon® FEP
Screen: Copper braid
Sheath: Silicone



TT insulation

Conductor: Teflon® PFA
Sheath: Teflon® PFA



TP insulation

Conductor: Teflon® PFA
Sheath: Stainless steel braid



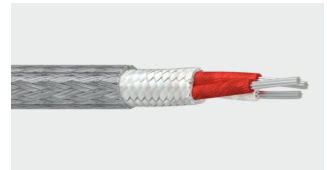
TCuT insulation

Conductor: Teflon® PFA
Screen: Copper braid
Sheath: Teflon® PFA



GLGLP insulation

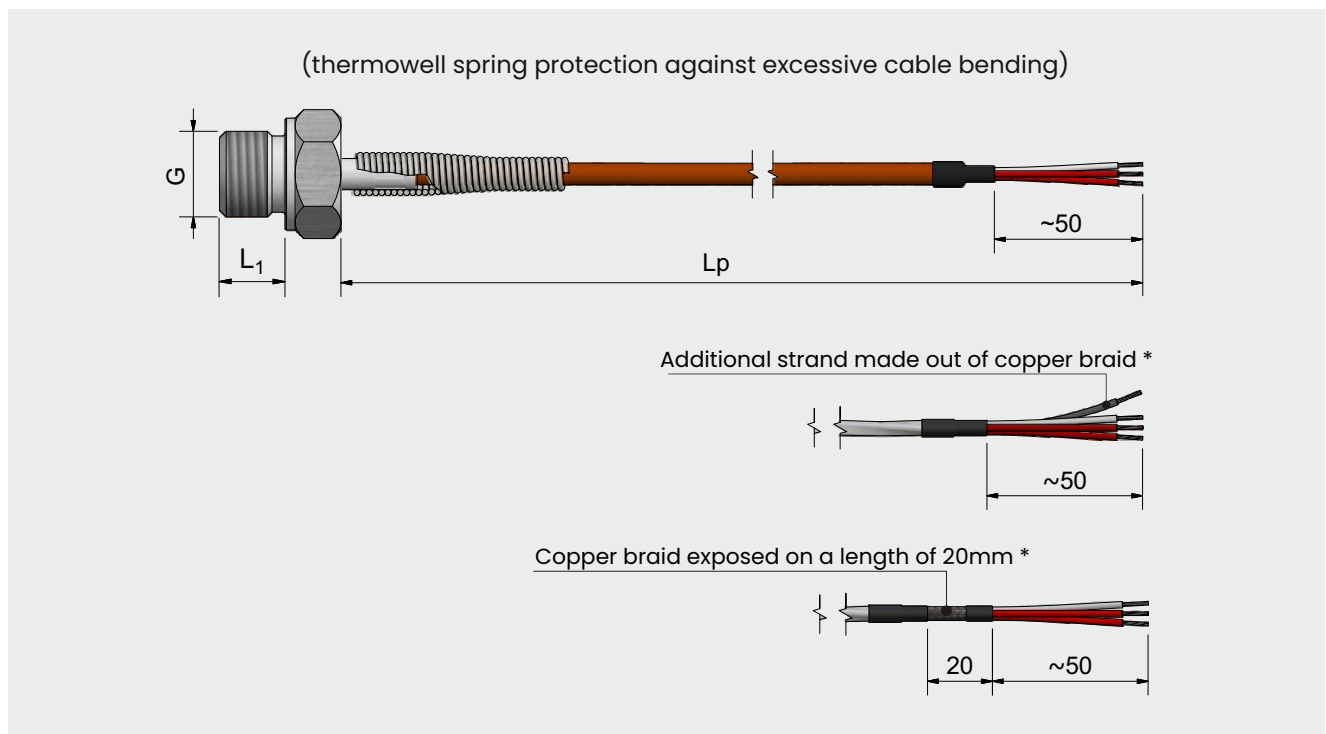
Conductor: Fiberglass
Screen: Fiberglass
Sheath: Stainless steel braid



Available measuring range

Measuring range	Insulation type	
-10 .. +105°C	JJ	PVC
-50 .. +180°C	SLSL, TSL, TPSL	silicone
-50 .. +260°C	TT, TP, TCuT	teflon® PFA
-50 .. +400°C	GLGLP	fiberglass

Non-standard sensor versions



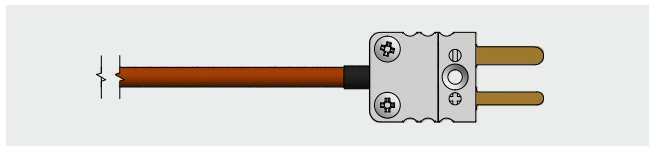
* Available only for TCuT and TPSL cable insulation

Connectors (optional)

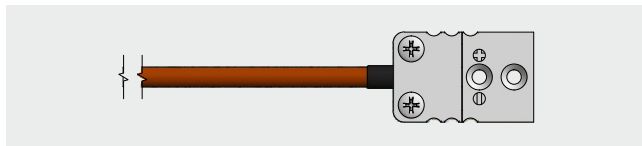
Sensors with connection cable can be equipped with connector.

Available options:

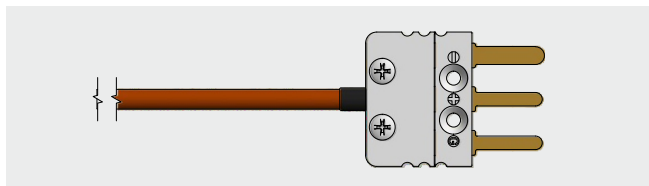
Connector S-010-Cu-W
Miniature plug, 2-pin.



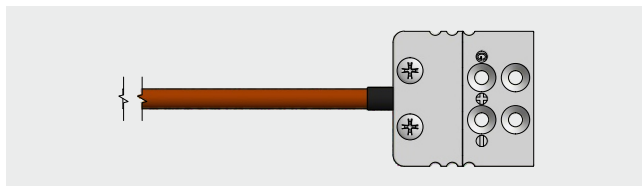
Connector S-010-Cu-G
Miniature socket, 2-pin.



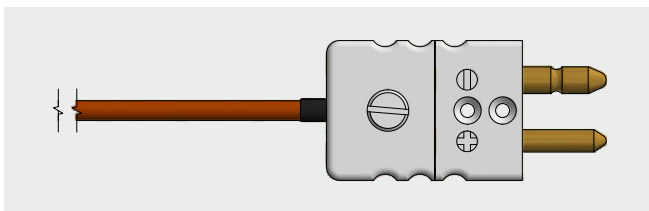
Connector S-013-Cu-W
Miniature plug, 3-pin.



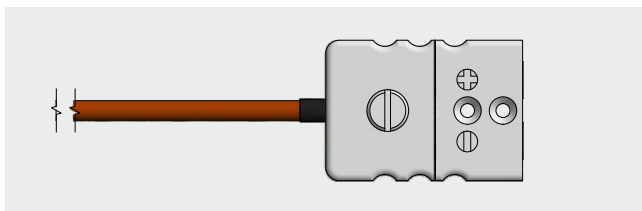
Connector S-013-Cu-G
Miniature socket, 3-pin.



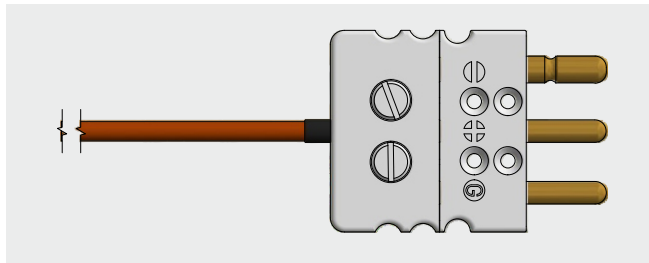
Connector S-020-Cu-W
Standard plug, 2-pin.



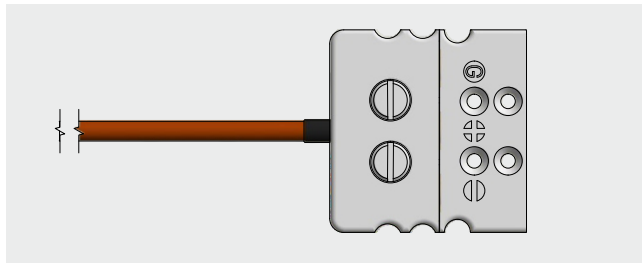
Connector S-020-Cu-G
Standard socket, 2-pin.



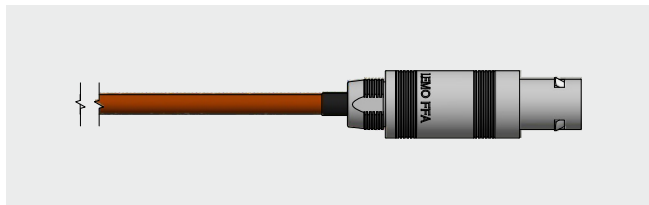
Connector S-023-Cu-W
Standard plug, 3-pin.



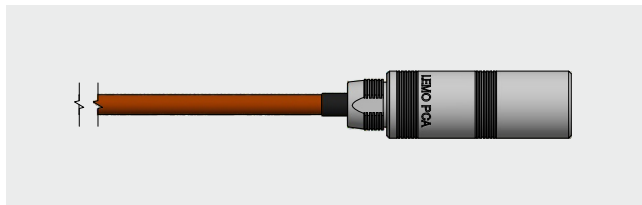
Connector S-023-Cu-G
Standard socket, 3-pin.



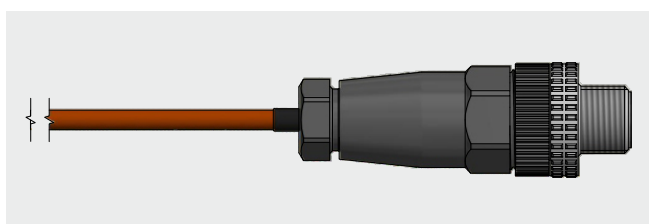
Connector LEMO® FFA
Plug size from 0S to 3S. 2-, 3-, 4-, 6-pin.



Connector LEMO® PCA
Plug size from 0S to 3S. 2-, 3-, 4-, 6-pin.



Hirschmann M12 series
4-pin.



Ordering code

TOPE414 - - - - - - -

1	<input type="text"/>	Type of sensing element			
		1xPt100	Single Pt100 IEC 751, $\alpha=0.00385$		
		2xPt100	Double Pt100 IEC 751, $\alpha=0.00385$		
		1xNi100	Single Ni100 DIN43760, $\alpha=0.00618$		
		2xNi100	Double Ni100 DIN43760, $\alpha=0.00618$		
	xxx	other, please specify			
2	<input type="text"/>	Connecting cable length Lp			
		1000	1000 mm		
		2500	2500 mm		
	xxx	other, please specify			
3	<input type="text"/>	Tolerance class			
		A	Class A wg PN-EN 60751 / IEC 751 (available only for platinum sensing elements)		
		B	Class B wg PN-EN 60751 / IEC 751 / DIN43760 / GOST 6651-94		
4	<input type="text"/>	Measuring circuit			
		2	2-wire		
		3	3-wire		
		4	4-wire		
5	<input type="text"/>	Process connection thread			
		M10x1	M10x1		
		M12x1	M12x1		
		G1/4"	G1/4"		
		G1/2"	G1/2"		
		1/2"NPT	1/2"NPT		
	xxx	other, please specify			
6	<input type="text"/>	Connecting cable type		Temperature range of sensor	
		JJ	PVC / PVC	-10 .. +105°C	
		SLSL	Silicone / Silicone	-50 .. +180°C	
		TSL	Teflon® FEP / Silicone	-50 .. +180°C	
		TPSL	Teflon® FEP / Cu braid / Silicone	-50 .. +180°C	
		TT	Teflon® PFA / Teflon® PFA	-50 .. +260°C	
		TP	Teflon® PFA / Stainless steel	-50 .. +260°C	
		TCuT	Teflon® PFA / Cu braid / Teflon® PFA	-50 .. +260°C	
GLGLP	Fiberglass / Fiber glass / Stainless steel	-50 .. +400°C			
7	<input type="text"/>	Connector (optional)			
			without connector, free end conductors of connection cable		
		S-013-Cu-W	Miniature plug, 3-pin		
		FFA.IS	Connector LEMO® FFA size IS		
	xxx	other, please specify			

Example

TOPE414-1xPt100-2000-A-3-G1/4"-TSL

RTD sensor 1xPt100, connection cable length Lp=2000 mm, A tolerance class, 3-wire measuring circuit, threaded thermowell connection G1/4", single conductors in teflon insulation, sheath in silicone insulation.

TOPE414-1xPt100-2500-B-2-M10x1-TT-FFA.IS

RTD sensor 1xPt100, connection cable length Lp=2500 mm, B tolerance class, 2-wire measuring circuit, threaded thermowell connection M10x1, single conductors in teflon insulation, sheath in teflon insulation, connection cable equipped with LEMO® FFA plug size IS.