

Applications

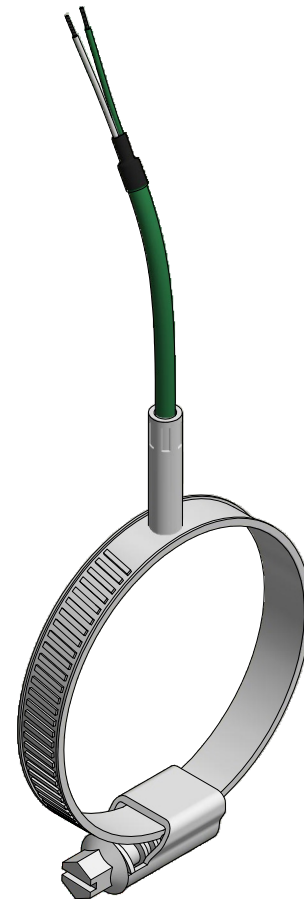
- Temperature measurement of pipelines and other cylindrical elements
- General industrial services

Features

- Single or double thermocouple
- Sensing element according to (PN-EN 60584-1):

Type K (NiCr-NiAl),
Type J (Fe-CuNi),
Type N (NiCrSi-NiSi),
Type E (NiCr-CuNi),
Type T (Cu-CuNi)

- Non-standard sensor versions available upon customer's request:
 - cable type according to client's specification
 - thermowell spring protection against excessive cable bending



TTE50244P

TSL cable insulation
(teflon®FEP/silicone)

Thermocouples TTE50244P are designed for assembling directly onto pipelines or other cylindrical elements.

Hose-clip allows to mount sensor on pipeline. Sensors designed for pipeline diameter greater than $\varnothing 100$ mm are equipped with two or more hose-clips.

The sensor consists of thermocouple cable, protection tube made out of stainless steel and hose-clip.

Thermocouple type, 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.

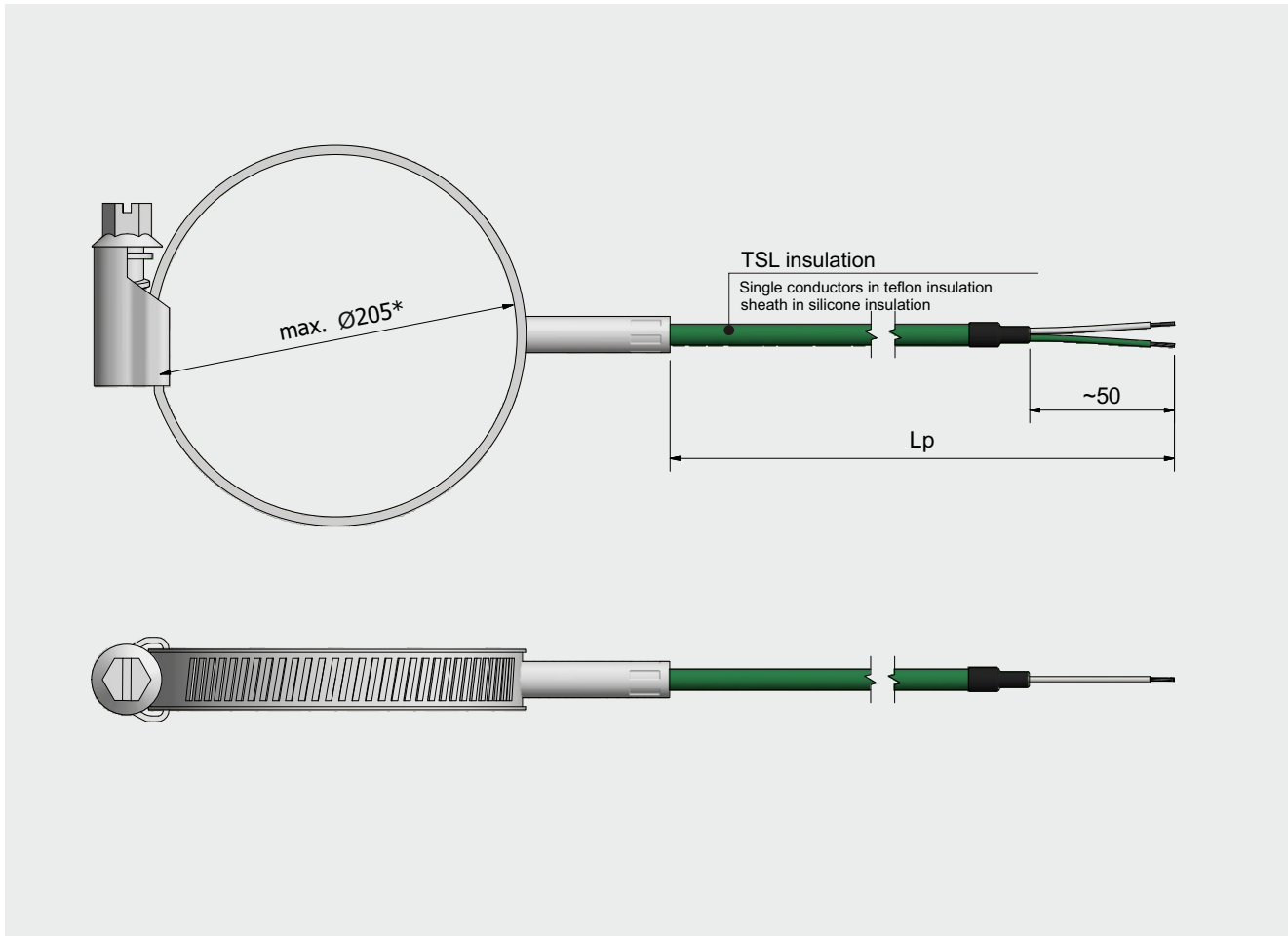
ATEX, IECEx, EAC Ex versions

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-TTE50244P

Designs



* Diameter > Ø205 are available for special client's request

Basic values of Thermocouples type J, K, N according to PN-EN 60584 / IEC 584

Temperature		°C	100	200	300	400
Basic value	Type J	mV	5.27	10.78	16.33	21.85
	Type K	mV	4.10	8.14	12.21	16.40
	Type N	mV	2.77	5.91	9.34	12.97
Tolerance	Class 1	°C	±1.5	±1.5	±1.5	±1.6
	Class 2	°C	±2.5	±2.5	±2.5	±3.0

Tolerance

The PN-EN 60584 Standard defines the formulas for calculating acceptable measure tolerance. More information available in the general thermoelectric thermometer sheet.

Electrical parameters

Isolation resistance > 10 GΩ (test 500 VDC)

Housing material

Stainless steel 1H18N9T (1.4541 / AISI321)

Type J (Fe-CuNi)

Class	Temperature range	Tolerance
1	-40 °C .. +375 °C	± 1.5 °C
	+375 °C .. +750 °C	± 0.0040 x t
2	-40 °C .. +333 °C	± 2.5 °C
	+333 °C .. +750 °C	± 0.0075 x t

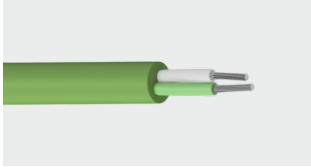
Type K (NiCr-Ni), Type N (NiCrSi-NiSi)

Class	Temperature range	Tolerance
1	-40 °C .. +375 °C	± 1.5 °C
	+375 °C .. +1000 °C	± 0.0040 x t
2	-40 °C .. +333 °C	± 2.5 °C
	+333 °C .. +1200 °C	± 0.0075 x t

Insulation types of connection cable

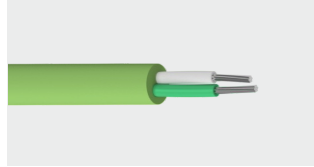
JJ insulation

Conductor: PVC
Sheath: PVC



TSL insulation

Conductor: Teflon® FEP
Sheath: Silicone



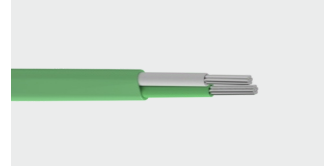
TCuT insulation

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



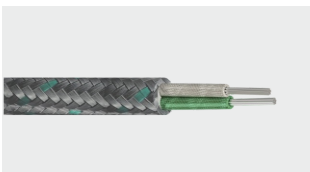
TT insulation

Conductor: Teflon® PFA
Sheath: Teflon® PFA



GLP insulation

Conductor: Fiberglass
Sheath: Stainless steel braid



GLGLP insulation

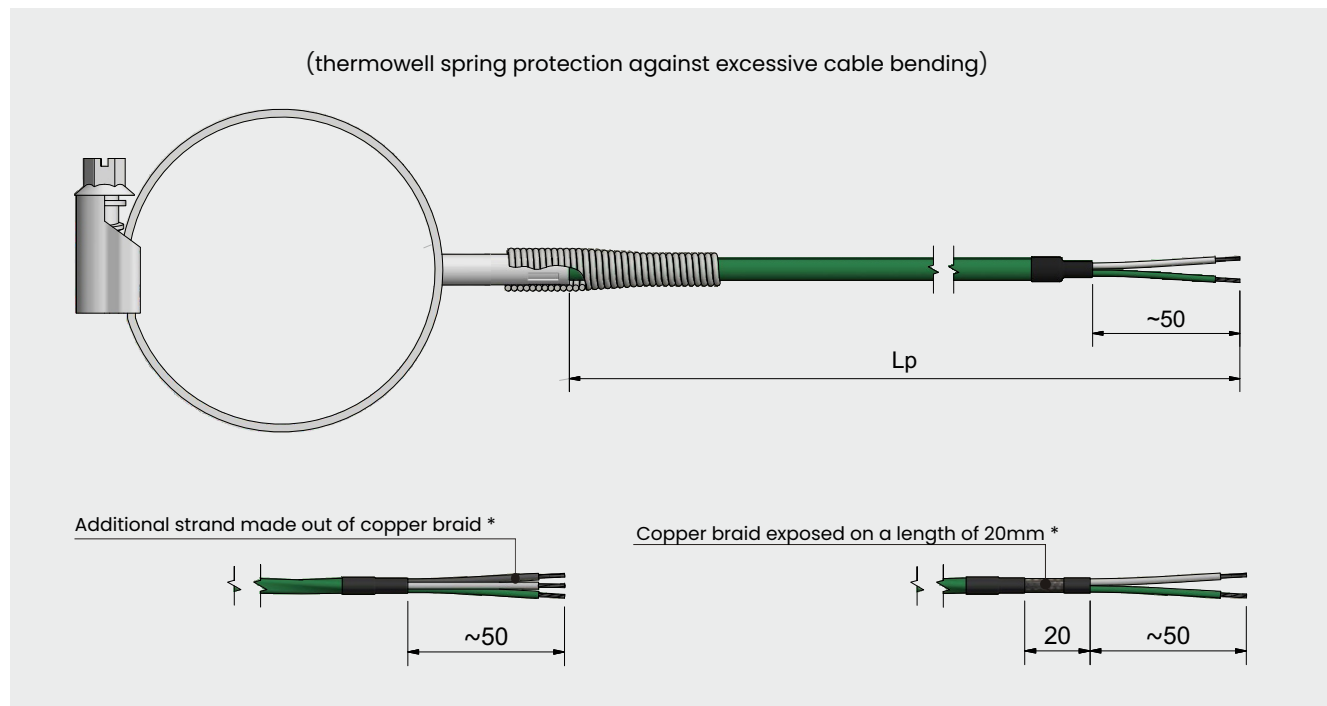
Conductor: Fiberglass
Sheath: Fiberglass
Braid: Stainless steel braid



Available measuring range

Measuring range	Insulation type	
-10 .. +105°C	JJ	PVC
-50 .. +180°C	TSL	silicone
-50 .. +205°C	TCuT	teflon® FEP
-50 .. +260°C	TT	teflon® PFA
-50 .. +400°C	GLP, GLGLP	fiberglass

Non-standard sensor versions



* Available only for TCuT cable insulation

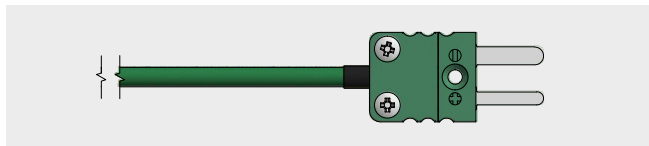
Connectors (optional)

Sensors with connection cable can be equipped with connector.

Available options:

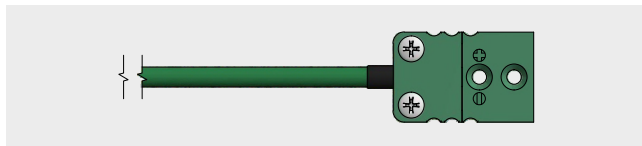
Connector S-010-(thermocouple type)-W

Miniature plug, 2-pin.



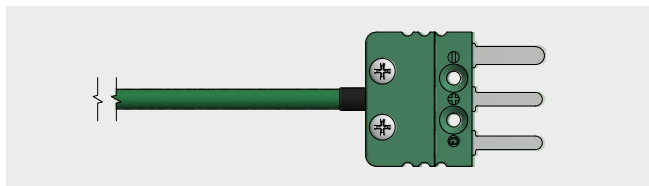
Connector S-010-(thermocouple type)-G

Miniature socket, 2-pin.



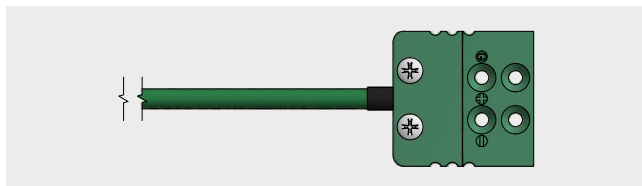
Connector S-013-(thermocouple type)-W

Miniature plug, 3-pin.



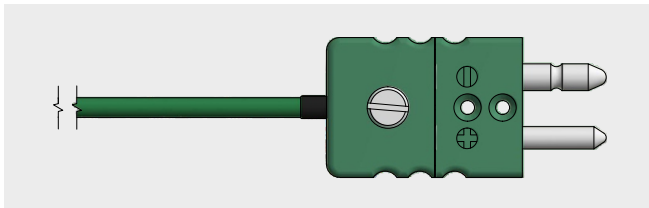
Connector S-013-(thermocouple type)-G

Miniature socket, 3-pin.



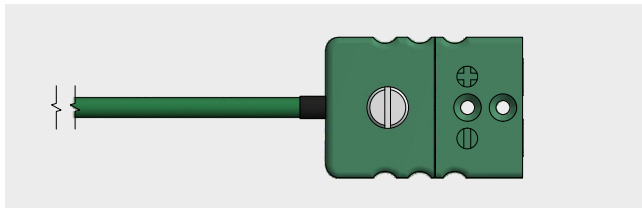
Connector S-020-(thermocouple type)-W

Standard plug, 2-pin.



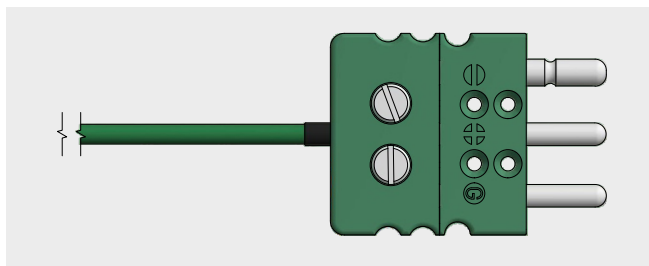
Connector S-020-(thermocouple type)-G

Standard socket, 2-pin.



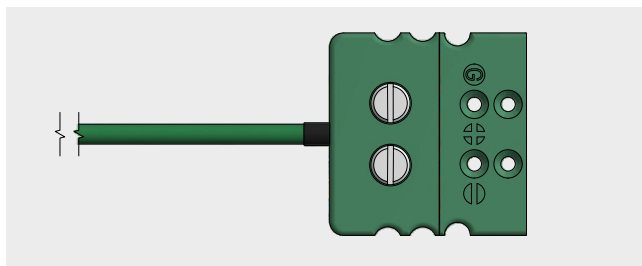
Connector S-023-(thermocouple type)-W

Standard plug, 3-pin.



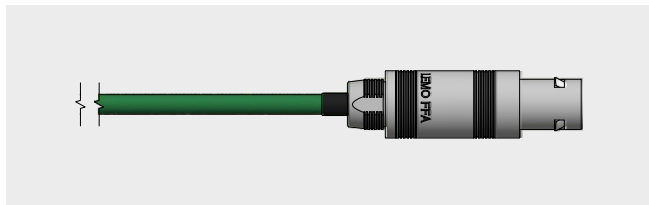
Connector S-023-(thermocouple type)-G

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.



Ordering code

TTE50244P - - - - - -

	Thermocouple type																			
1	<input type="text"/>	<table border="1"> <tr> <td>J</td> <td>Type J (Fe-CuNi)</td> </tr> <tr> <td>K</td> <td>Type K (NiCr-Ni)</td> </tr> <tr> <td>xxx</td> <td>other, please specify</td> </tr> </table>	J	Type J (Fe-CuNi)	K	Type K (NiCr-Ni)	xxx	other, please specify												
J	Type J (Fe-CuNi)																			
K	Type K (NiCr-Ni)																			
xxx	other, please specify																			
	Pipeline diameter ØD																			
2	<input type="text"/>	<table border="1"> <tr> <td>100</td> <td>Ø100 mm</td> </tr> <tr> <td>150</td> <td>Ø150 mm</td> </tr> <tr> <td>200</td> <td>Ø200 mm</td> </tr> <tr> <td>xxx</td> <td>other, please specify</td> </tr> </table>	100	Ø100 mm	150	Ø150 mm	200	Ø200 mm	xxx	other, please specify										
100	Ø100 mm																			
150	Ø150 mm																			
200	Ø200 mm																			
xxx	other, please specify																			
	Connecting cable length Lp																			
3	<input type="text"/>	<table border="1"> <tr> <td>1000</td> <td>1000 mm</td> </tr> <tr> <td>2500</td> <td>2500 mm</td> </tr> <tr> <td>xxx</td> <td>other, please specify</td> </tr> </table>	1000	1000 mm	2500	2500 mm	xxx	other, please specify												
1000	1000 mm																			
2500	2500 mm																			
xxx	other, please specify																			
	Tolerance class																			
4	<input type="text"/>	<table border="1"> <tr> <td>1</td> <td>Class 1 according to PN-EN 60584-2</td> </tr> <tr> <td>2</td> <td>Class 2 according to PN-EN 60584-2</td> </tr> </table>	1	Class 1 according to PN-EN 60584-2	2	Class 2 according to PN-EN 60584-2														
1	Class 1 according to PN-EN 60584-2																			
2	Class 2 according to PN-EN 60584-2																			
	Connecting cable type	Temperature range of sensor																		
5	<input type="text"/>	<table border="1"> <tr> <td>JJ</td> <td>PVC / PVC</td> <td>-10 .. +105°C</td> </tr> <tr> <td>TSL</td> <td>Teflon® FEP / Silicone</td> <td>-50 .. +180°C</td> </tr> <tr> <td>TCuT</td> <td>Teflon® FEP / Cu braid / Teflon® FEP</td> <td>-50 .. +205°C</td> </tr> <tr> <td>TT</td> <td>Teflon® PFA / Teflon® PFA</td> <td>-50 .. +260°C</td> </tr> <tr> <td>GLP</td> <td>Fiberglass / Stainless steel</td> <td>-50 .. +400°C</td> </tr> <tr> <td>GLGLP</td> <td>Fiberglass / Fiberglass / Stainless steel</td> <td>-50 .. +400°C</td> </tr> </table>	JJ	PVC / PVC	-10 .. +105°C	TSL	Teflon® FEP / Silicone	-50 .. +180°C	TCuT	Teflon® FEP / Cu braid / Teflon® FEP	-50 .. +205°C	TT	Teflon® PFA / Teflon® PFA	-50 .. +260°C	GLP	Fiberglass / Stainless steel	-50 .. +400°C	GLGLP	Fiberglass / Fiberglass / Stainless steel	-50 .. +400°C
JJ	PVC / PVC	-10 .. +105°C																		
TSL	Teflon® FEP / Silicone	-50 .. +180°C																		
TCuT	Teflon® FEP / Cu braid / Teflon® FEP	-50 .. +205°C																		
TT	Teflon® PFA / Teflon® PFA	-50 .. +260°C																		
GLP	Fiberglass / Stainless steel	-50 .. +400°C																		
GLGLP	Fiberglass / Fiberglass / Stainless steel	-50 .. +400°C																		
	Connector (optional)																			
6	<input type="text"/>	<table border="1"> <tr> <td></td> <td>without connector, free end conductors of connection cable</td> </tr> <tr> <td>S-010-K-W</td> <td>Miniature plug, 2-pin, type K</td> </tr> <tr> <td>FFA.IS</td> <td>Connector LEMO® FFA size IS</td> </tr> <tr> <td>xxx</td> <td>other, please specify</td> </tr> </table>		without connector, free end conductors of connection cable	S-010-K-W	Miniature plug, 2-pin, type K	FFA.IS	Connector LEMO® FFA size IS	xxx	other, please specify										
	without connector, free end conductors of connection cable																			
S-010-K-W	Miniature plug, 2-pin, type K																			
FFA.IS	Connector LEMO® FFA size IS																			
xxx	other, please specify																			

Example

TTE50244P-K-150-2000-1-TSL

TC sensor type K, hose-clip match to Ø150 mm, connection cable length Lp=2000 mm, tolerance class 1, single conductors in teflon insulation, sheath in silicone insulation.

TTE50244P-J-100-2500-2-TT-FFA.IS

TC sensor type J, hose-clip match to Ø100 mm, connection cable length Lp=2500 mm, tolerance class 2, single conductors in teflon insulation, sheath in teflon insulation, connection cable equipped with LEMO® FFA plug size IS.