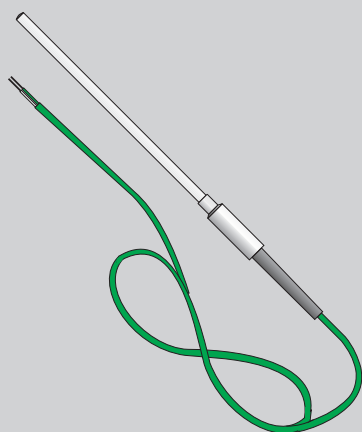




# Mineral-insulated Thermocouple



Type L, J and K

Single or duplex assembly

Bendible, compact

Vibration resistant

Fast response

Fixed cable or plug

## PROFILE

Mineral-insulated thermocouples correspond in form and design to the current DIN / IEC rules respectively are quite close. The thermocouple conductors are embedded in a closely compacted, inert mineral powder and surrounded by a metal sheath to form a hermetically sealed assembly. The sheath functions as a useful protective cover in many situations. They are applied in locations where fast response, reduced space and or vibration resistance is a need. They can be furnished with a fixed cable or with a special plug which allows rapid fitting or exchange.

## TECHNICAL DATA

Meets DIN IEC 65 B (CO) 76

### Sheath

- Stainless steel SS 321 (1.4541)
- Inconel 600, 2.4816

## THERMOCOUPLE

Type K to IEC 584

Type L to IEC 584

Type J to DIN 43710

- Single and duplex sensor
- Measuring junction isolated and grounded

### Isolation resistance

1000 MΩ at room temperature  
At higher temperatures as also with smaller diameter the resistance is reduced.

## Temperature limits

Element	Sheath 1.4541	Sheath 2.4816
Type K	max. 800 °C	max. 1100 °C
Type L	max 800 °C	
Type J	max 800 °C	

## Temperature at the cable junction

With standard extension lead +70 °C  
In general 200 °C

## APPLICATION HINTS

The above mentioned max. temperatures are valid for clean air only. At higher temperatures especially with cyclic charges the thickness of the sheath decreases due to tinding. Agressive parts of the measuring medium attack the sheath material. Especially with sensors with small diameter life time decreases tremendously at higher operating temperatures.

Measuring medium	Max. temperature [°C]	
	1.4541	2.4816
Air	approx. 800	approx. 1100
Carbon dioxide	approx. 650	approx. 500
Petrol	approx. 100	Not recommended
Benzene	approx. 100	
Boric acid	approx. 100	
Buthyl alcohol	approx. 100	
Phosphoric acid 50%	approx. 100	
Nitric acid	approx. 100	
Sodium, liquid	Not recommended	approx. 750
Air, with sulfur		approx. 550
Water, not chlorinated		approx. 590

(Not subject for completeness)

## Application examples

1.4541	2.4816
Chemical engineering	Reaction vessels
Petro chemistry	Plast and fibre
Food and Beverage	Pulp and paper
Thermprocess	Boiler

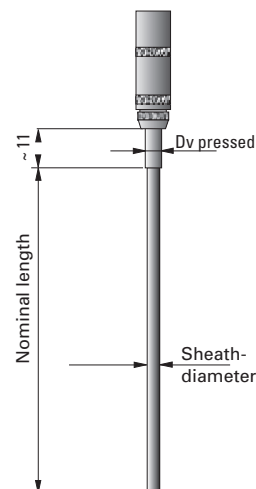
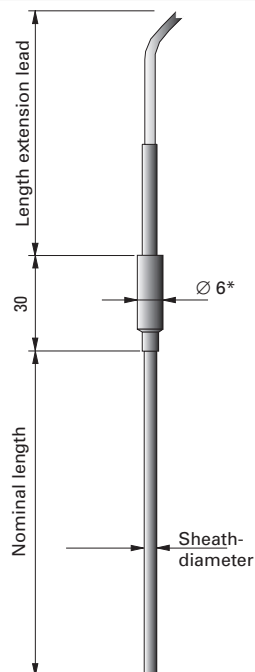
## REACTION TIME

Measuring junction isolated	Reaction time in [s]			
	water at 0,2 m/s		Air at 2,0 m/s	
Ø [mm]	t 0,5	t 0,9	t 0,5	t 0,9
0,5	0,06	0,13	1,8	5,5
1,0	0,15	0,5	3	10
1,5	0,21	0,6	8	25
3,0	1,2	2,9	23	80
4,5	2,5	5,9	37	120
6,0	4	9,6	60	200
Measuring junction grounded				
0,5	0,03	0,1	1,8	6
1,0	0,06	0,18	3	10
1,5	0,13	0,4	8	25
3,0	0,22	0,75	23	80
4,5	0,45	1,6	33	110
6,0	0,55	2,6	55	185

## Special remarks

M.I. thermocouples can be bent at a radius 5 times of sheath diameter.

Because of the inflexible attachment between sheath and thermoconductors at higher operating temperatures intense mechanical strength is applied to the thermoconductors. This leads to increased drift at extended operating time.



## ORDERING INFORMATION

The assemblies are being tailor made according to the given specification. Please use list on this page and fill-in details prior to mail / fax to our address given below.

\* 8 mm at 6 mm sheath diameter  
<sup>1)</sup> not for cable junction (seal pot)

## Optional Accessories

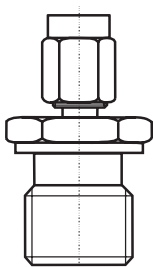
Adjustable compression fitting

Sheath Ø	Thread	Length
1 mm	M8 x 1	26 mm
1,5 mm	M8 x 1	26 mm
2 mm	M8 x 1	26 mm
3 mm	M8 x 1	26 mm
4,5 mm	G ¼ A	35 mm
6 mm	G ¼ A	37 mm

Material: C Steel 1.0718 or  
 Stainless steel 1.4571

Compression ring: PTFE or

Taper bush ring: Stainless steel 1.4571



Thermocouple

1\*L 1\*J 1\*K  
 2\*L 2\*J 2\*K

Tolerance

Class 2 Class 1

Hot junction

isolated grounded

Temperature range °C

Sheath-Ø mm

1 1,5 2 3 4,5 6

Sheath material

SS321(1.4541) 2.4816 (Inconel)

Nominal length [mm]

150 300 600

Extension lead Tmax  
 with anti chafe support

70°C 250 °C<sup>1)</sup> 285°C<sup>1)</sup>

Length m

1 1,5 2 2,5 3 4 5

End of leads

free sleeve

Plug type

with extension lead



## Deutschland

PMA Prozess- und Maschinen- Automation GmbH  
 Miramstrasse 87, D-34123 Kassel

Tel./Fax: (0561) 505 - 1307/-1710  
 E-mail: [mailbox@pma-online.de](mailto:mailbox@pma-online.de)  
 Internet: <http://www.pma-online.de>

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