

**FRODE PEDERSEN**

### Application

- Thermocouple wires are used to manufacture thermocouples according to all standard combinations in IEC 584

### Types

- Bare thermocouple wire  
The maximum temperatures stated depends on many factors such as ambient atmosphere, type of installation and diameter etc. The limits are for mechanically unloaded thermocouple wires under continuous use in air not contaminated by noxious gasses
- Insulated thermocouple wire  
The temperature limits indicated apply to the insulation materials

### Features

- The thermocouple voltage and tolerance are in accordance with IEC 58
- Insulated non - precious metal thermocouple are delivered on spools with 100 or 500meter. For bare wires each leg on individually spools (paired)
- For precious metal thermocouple each leg are delivered on individually spools (paired)

### Ordering

The requested type is selected from the table below

### Ordering table for thermocouple wires

For thermocouple		Insulation		Conductors			Overall size	Weight	Designation	Item no.
Designation	Type	Single wire/ Outer sheath	Temperature °C	No. of cores	Core diameter mm	Resistance (f/a pair) ohm/m at 20°C	app. mm	g/m	PVC : P Silicone : S Fibreglass : GL	
Cu-CuNi	T	PVC/PVC	-10 +105	2	0.5	2.59	2.2x3.4 oval	12	PP	120763
Cu-CuNi		Silicone/ Silicone	-45 +200	2	0.5	2.59	4.0 round	15	SS	120764
Cu-CuNi		Fibreglass/ Fibreglass	-25 +400	2	0.2	16.14	0.6x1.0 oval	1,5	GLGL	120765
Cu-CuNi		Fibreglass/ Fibreglass	-25 +400	2	0.5	2.59	1.1x1.9 oval	6	GLGL	120766
Fe-CuNi	J	PVC/PVC	-10 +105	2	0.5	3.11	2.2x3.4 oval	12	PP	120767
Fe-CuNi		Fibreglass/ Fibreglass	-25 +400	2	0.2	19.42	0.6x1.0 oval	15	GLGL	120768
Fe-CuNi		Fibreglass/ Fibreglass	-25 +400	2	0.5	3.11	1.1x1.9 oval	6	GLGL	120769
NiCr-Ni	K	PVC/PVC	-10 +105	2	0.5	5.05	2.2x3.4 oval	12	PP	120770
NiCr-Ni		Silicone/ Silicone	-45 +200	2	0.5	5.05	4.0 round	15	SS	120771
NiCr-Ni		Fibreglass/ Fibreglass	-25 +400	2	0.2	31.49	0.6x1.0 oval	1.5	GLGL	120774
NiCr-Ni		Fibreglass/ Fibreglass	-25 +400	2	0.5	5.05	1.1x1.9 oval	6	GLGL	120775
NiCr-Ni	K	Bare	cont. 800 shortly 1000	2	1.0	1,26		13.5		120783
NiCr-Ni		Bare	cont. 900 shortly 1100	2	1.5	0.56		30		120781
NiCr-Ni		Bare	cont. 1000 shortly 1200	2	3.0	0.14		60		120787
NiCrosil-Nisil	N	Bare	cont. 1100 shortly 1200	2	1.5	0.56		30		120788
NiCrosil-Nisil		Bare	cont. 1150 shortly 1250	2	3.0	0.14		60		120789
Pt10Rh	S	Bare	cont. 1300 shortly 1600	2	0.3	4.22		2.92		120791
Pt10Rh		Bare	cont. 1400 shortly 1600	2	0.35	3.20		3.98		120790
Pt10Rh		Bare	cont. 1450 shortly 1600	2	0.50	1.56		8.12		120792
Pt13Rh	R	Bare	cont. 1300 shortly 1600	2	0.3	4.31		2.89		121674
Pt13Rh		Bare	cont. 1400 shortly 1600	2	0.35	3.16		3.94		120793
Pt13Rh		Bare	cont. 1450 shortly 1600	2	0.50	1.55		8.04		120794
Pt30Rh-Pt6Rh	B	Bare	cont. 1500 shortly 1800	2	0.50	2.01		7.51		120795

## TECHNICAL DATA

### Tolerances and temperature ranges

Type	Tolerance Class 1	Working temperature range °C <sup>1)</sup>	Tolerance Class 2	Working temperature range °C <sup>1)</sup>	Tolerance Class 3	Working temperature range °C <sup>1)</sup>
T	±0.5°C or 0.004 x t <sub>actual</sub> (°C)	-40 +350	±1.0°C or 0.0075 x t <sub>actual</sub> (°C)	-40 +350	±1.0°C or ±0.0015 x t <sub>actual</sub> (°C)	-40 +350
J	±1.5°C or 0.0040 x t <sub>actual</sub> (°C)	-40 +1000	±2.5°C or 0.0075 x t <sub>actual</sub> (°C)	-40 +750		
K	±1.5°C or 0.0040 x t <sub>actual</sub> (°C)	-40 +350	±2.5°C or 0.0075 x t <sub>actual</sub> (°C)	-40 +1200	±1.0°C or ±0.0015 x t <sub>actual</sub> (°C)	-200 +40
N	±1.5°C or 0.0040 x t <sub>actual</sub> (°C)	-40 +1000	±2.5°C or 0.0075 x t <sub>actual</sub> (°C)	-40 +1200	±2.5°C or ±0.0015 x t <sub>actual</sub> (°C)	-200 +40
S	±1.0°C	0 +1100	±1.5°C or 0.0025 x t <sub>actual</sub> (°C)	0 +1600		
S	±(1.0°C+0.003 (t <sub>actual</sub> -1100))°C	+1100 +1600				
R	±1.0°C	0 +1100	±1.5°C or 0.0025 x t <sub>actual</sub> (°C)	0 +1600		
R	±(1.0°C+0.003 (t <sub>actual</sub> -1100))°C	+1100 +1600				
B			±1.5°C or 0.0025 x t <sub>actual</sub> (°C)	+600 +1700	±4°C or ±0.005 x t <sub>actual</sub> (°C)	+600 +1700

Note 1: The values apply for the T/C only and are not related to diam., insulation etc.

### Colour code

	Type of thermocouple	Insulation sheath	Insulation positive	Insulation negative
IEC 584-4	Type T, Cu-CuNi	Brown	Brown	White
	Type J, Fe-CuNi	Black	Black	White
	Type K, NiCr-Ni	Green	Green	White
	Type R/S, PtRh-Pt	Orange	Orange	White
	Type B, PtRh-Pt	Grey	Grey	White
	Type N, NiCrosil-Nisil	Pink	Pink	White

### Features

Bare thermocouple wire. Non- precious	
Cu-conductor	Positive leg in T/C type Cu-CuNi (T). It consist of pure copper free of oxygen.
Fe-conductor	Positive leg in T/C type Fe-CuNi (J). It consist of pure iron with max few hundredts of common inclusions.
CuNi-conductor	Negative leg in T/C type Cu-CuNi (T) and Fe-CuNi (J). It consist of 45% Ni and 55% Cu and a small content of Mn and Si.
NiCr-conductor	Positive leg in T/C type NiCr-Ni (K). It consist of Ni with app. 10% Cr. and added app. with 2% aluminium and other materials.
Ni-conductor	Negative leg in T/C type NiCr-Ni (K) It consist of of Ni with app. 3% Mn and 2% Al. NiCr-Ni is also designated as Chromel-Alumel. The thermoelectrical properties are identical.
Nicrosil-conductor	Positive leg in T/C type Nicrosil-Nisil (N). It consist of Ni with 14% Cr and 1.5% Si.
Nisil-conductor	Negative leg in T/C type Nicrosil-Nisil (N). It consist of Ni with app. 4.5% Si and 0.1 Mg.
Bare thermocouple wire. Precious	
Pt10Rh-conductor	Positive leg in T/C type Pt10%Rh-Pt (S). It consist of an alloy of pure Pt and 10% Rh
Pt13Rh-conductor	Positive leg in T/C type Pt13%Rh-Pt (R). It consist of an alloy of pure Pt and 13% Rh.
Pt-conductor	Negative leg in T/C type Pt10%Rh-Pt (S) and Pt13%Rh-Pt (R). It consist of an alloy of pure Pt
Pt30Rh-conductor	Positive leg in T/C type Pt30%Rh-Pt6%Rh (B). It consist of an alloy of pure Pt and 30% Rh.
Pt6Rh-conductor	Negative leg in T/C type Pt30%Rh-Pt6%Rh (B). It consist of an alloy of pure Pt and 6% Rh.