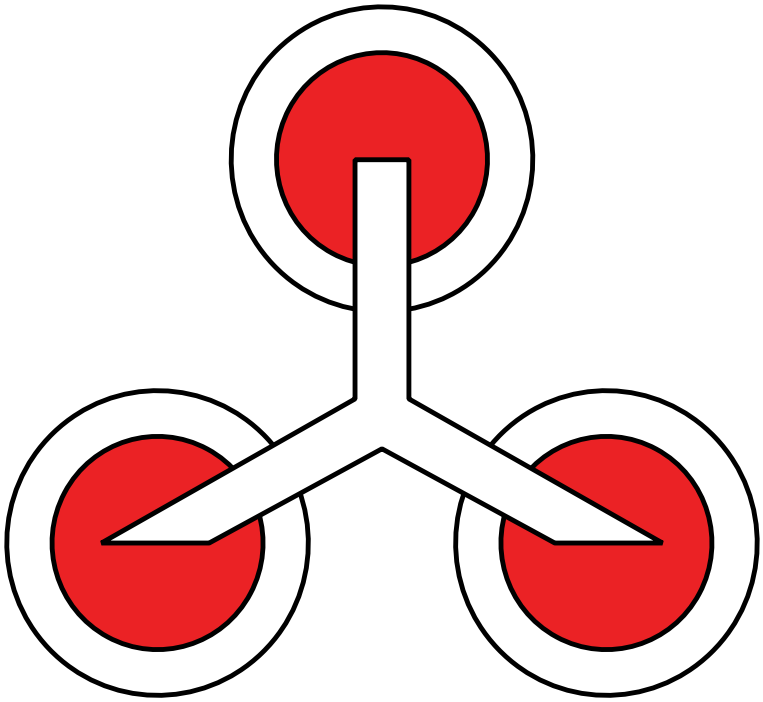

Product overview

Thermocouples

thermo-control Körtvélyessy GmbH • Grünspechtweg 19 • D-13469 Berlin

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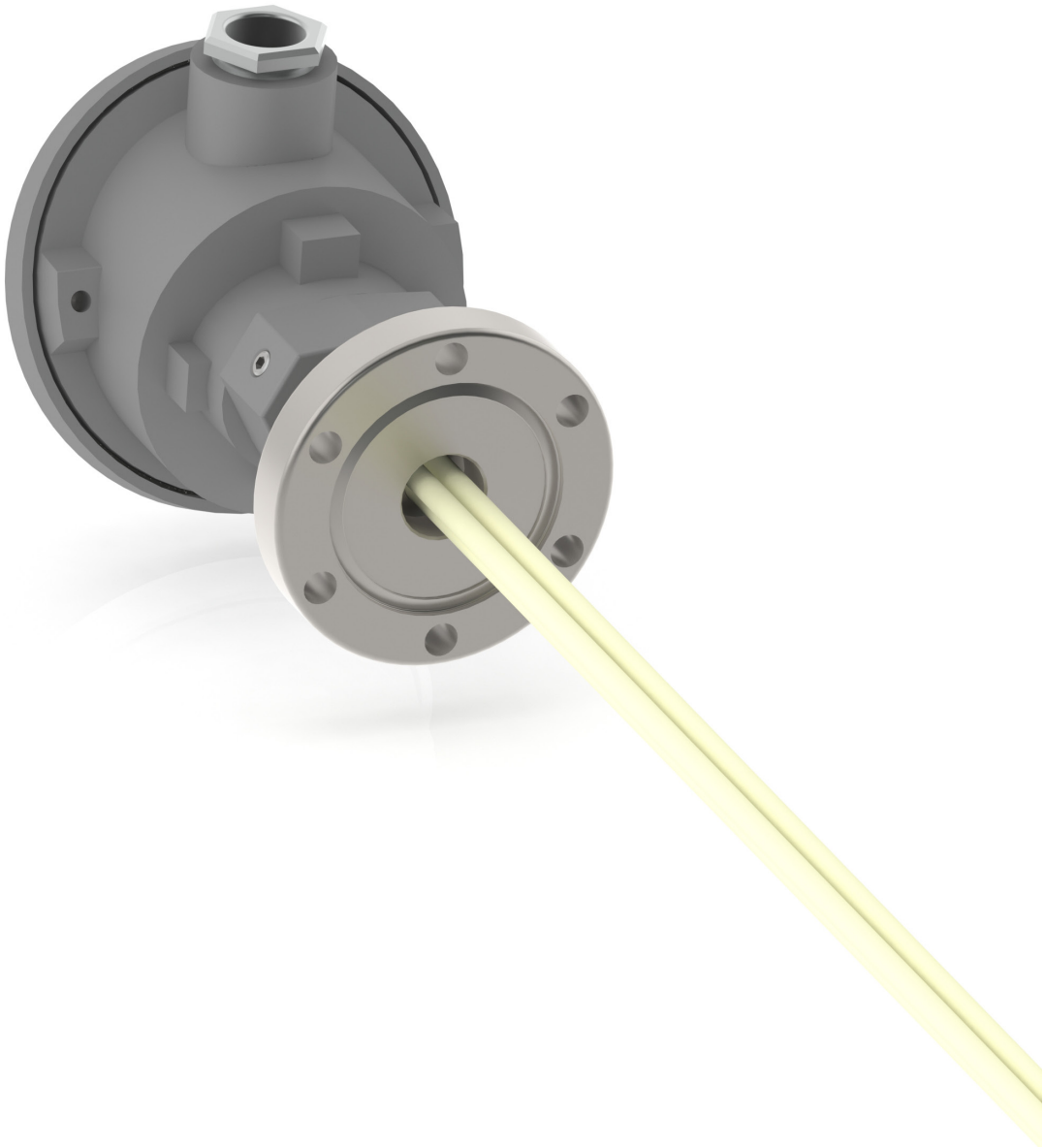


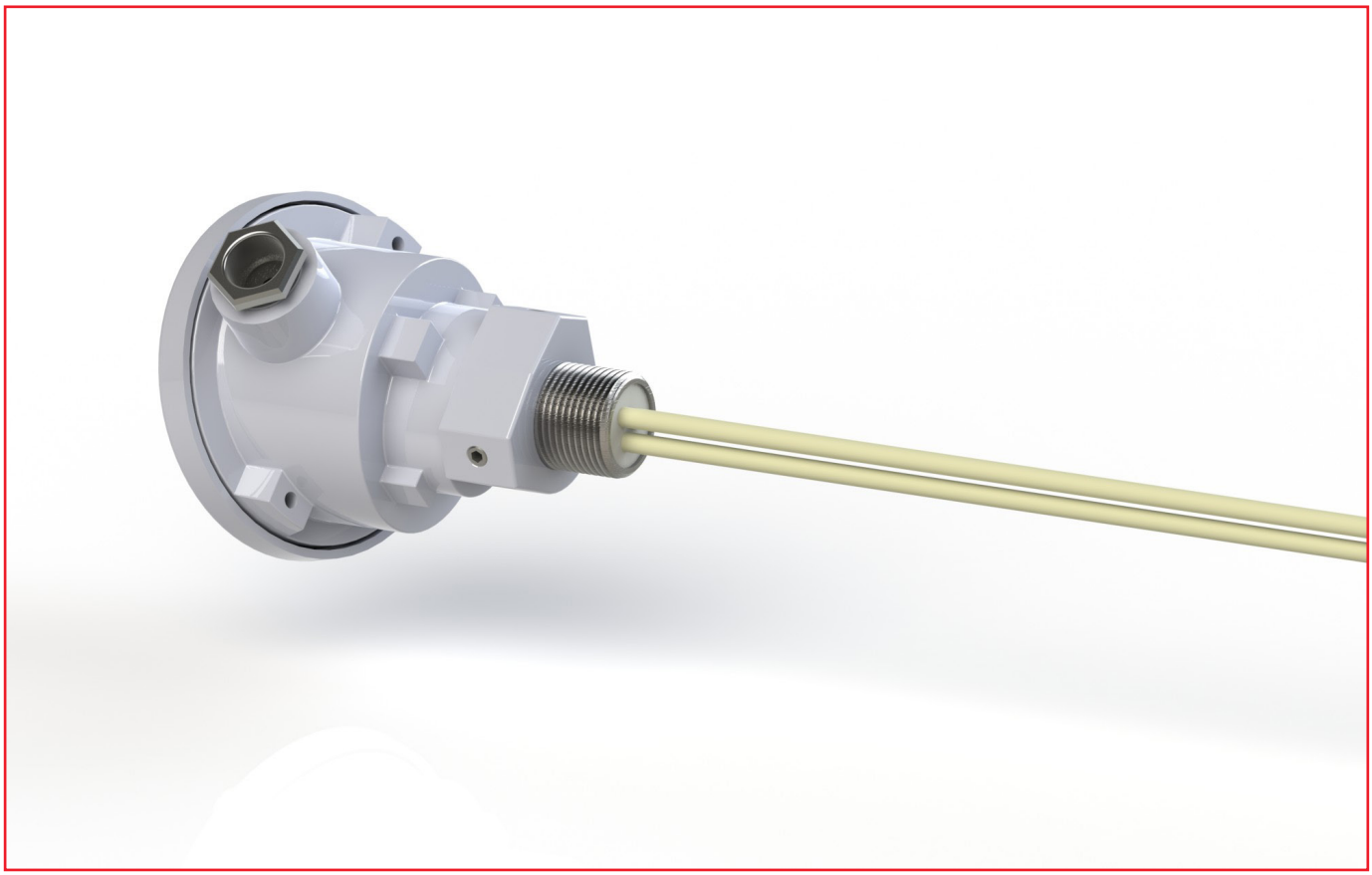
Thermocouples for inert gas applications

General view of standard types

Pressure range	Gas-tight and pressure proof up to 2 bar
Number of thermocouples [n]	1-3
Number of protective tubes	n + 1 additional empty tube for controlling measurements
Material of protective tubes	High-density Al_2O_3 99,7%
Diameter protective tubes	5 mm (type K up to 8 mm)
Electric connections	Ceramic insulating screws max 1,0 mm^2
Connecting head	Shape A with M20x1,5 cable screw connection
Certificates	Calibration certificate based on Ag and Pd fix-point measurements for PtRh – Pt types Optional calibration certificate in accordance to AMS 2750

Connection by screw socket

Connection by screw socket



Standard connection is a G3/4 inch DIN 228 with a thread length of 20 mm types with a G1 inch thread are also available.

Order chart:

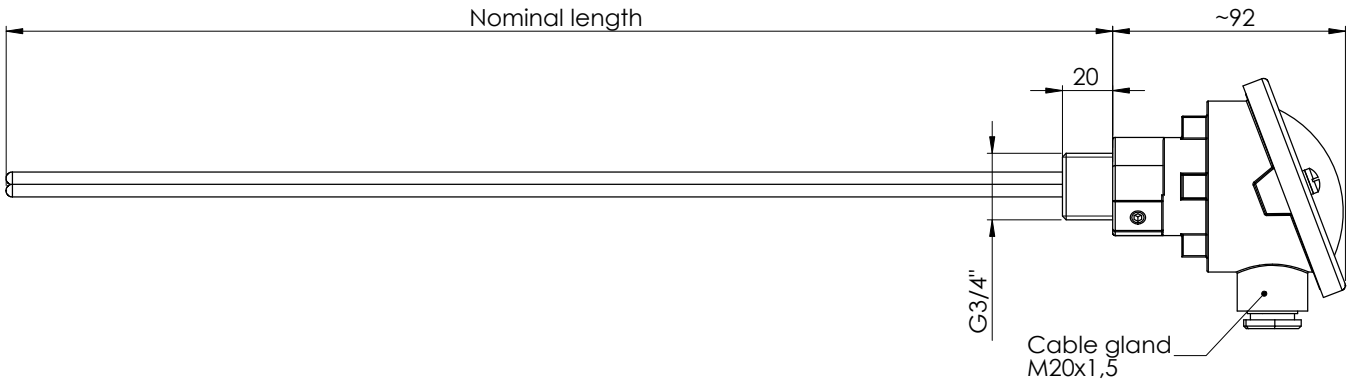
8	-	*01XXZZ*	-	*LLLLA*
		01 – Inert gas type XX – Number of thermocouples (TP) 02 – 1 TP + empty tube 03 – 2 TP + empty tube 04 – 3 TP + empty tube ZZ – Alloy of thermocouple 01 – PtRh10% - Pt (type S) 02 – PtRh13% - Pt (type R) 03 – PtRh30% - PtRh16 (type B) 04 – NiCr – Ni (type K) 05 – NiCrSi – NiSi (type N)		LLLL – Nominal length [mm] 0400 – 400 mm up to 1600 – 1600 mm In 100 mm steps A – Connection G34 – G3/4 thread G1 – G1 thread G1SW28 – G1 thread with SW28 connection

Example: 8-010301-0600G34

Thermocouple for inert gas with 2 x type S thermocouples + 1 additional empty tube for controlling measurements, with a nominal length of 600 mm and a G3/4“ threaded connection.

Connection by screw socket

Inert gas thermocouples with G3/4 screw thread



Equipped with 1 thermocouple type S (PtRh10% - Pt)

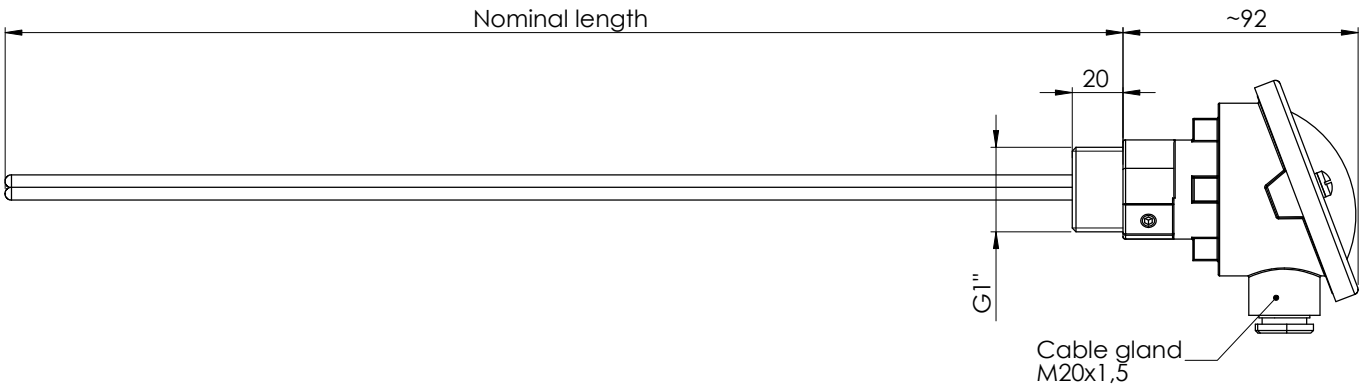
Material number	Description	Specification
501212	Inert gas thermocouple 600 mm, 1 x type S + empty tube, G3/4 threaded connection	8-010201-0600G34
501213	Inert gas thermocouple 700 mm, 1 x type S + empty tube, G3/4 threaded connection	8-010201-0700G34
501214	Inert gas thermocouple 800 mm, 1 x type S + empty tube, G3/4 threaded connection	8-010201-0800G34
501215	Inert gas thermocouple 900 mm, 1 x type S + empty tube, G3/4 threaded connection	8-010201-0900G34
501216	Inert gas thermocouple 1000 mm, 1 x type S + empty tube, G3/4 threaded connection	8-010201-1000G34
501218	Inert gas thermocouple 1200 mm, 1 x type S + empty tube, G3/4 threaded connection	8-010201-1200G34

Equipped with 2 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
501312	Inert gas thermocouple 600 mm, 2 x type S + empty tube, G3/4 threaded connection	8-010301-0600G34
501313	Inert gas thermocouple 700 mm, 2 x type S + empty tube, G3/4 threaded connection	8-010301-0700G34
501314	Inert gas thermocouple 800 mm, 2 x type S + empty tube, G3/4 threaded connection	8-010301-0800G34
501315	Inert gas thermocouple 900 mm, 2 x type S + empty tube, G3/4 threaded connection	8-010301-0900G34
501316	Inert gas thermocouple 1000 mm, 2 x type S + empty tube, G3/4 threaded connection	8-010301-1000G34
501318	Inert gas thermocouple 1200 mm, 2 x type S + empty tube, G3/4 threaded connection	8-010301-1200G34

Connection by screw socket

Inert gas thermocouple with G1 threaded connection



Equipped with 1 thermocouple type S (PtRh10% - Pt)

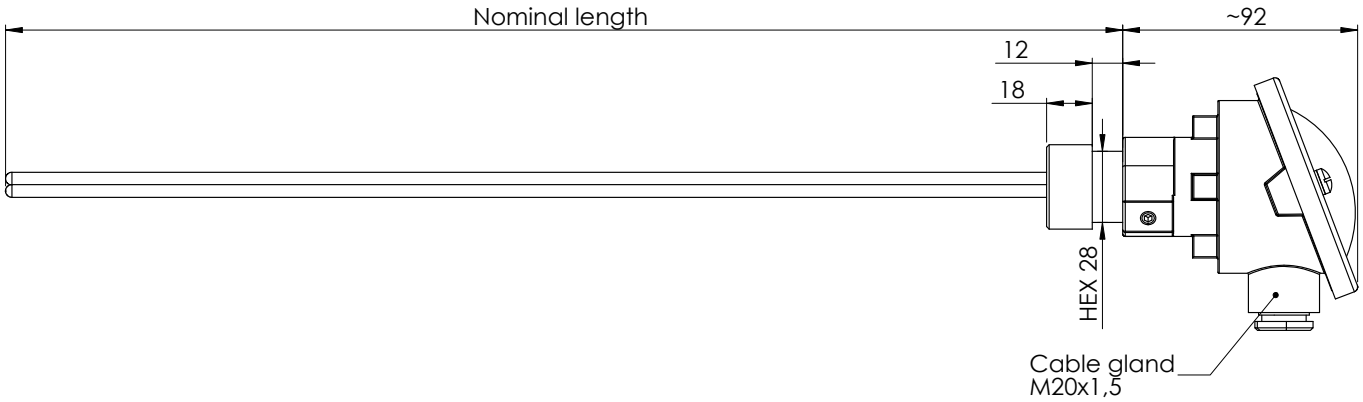
Material number	Description	Specification
92000840	Inert gas thermocouple 600 mm, 1 x type S + empty tube, G1 threaded connection	8-010201-0600G1
92000841	Inert gas thermocouple 700 mm, 1 x type S + empty tube, G1 threaded connection	8-010201-0700G1
92000842	Inert gas thermocouple 800 mm, 1 x type S + empty tube, G1 threaded connection	8-010201-0800G1
92000843	Inert gas thermocouple 900 mm, 1 x type S + empty tube, G1 threaded connection	8-010201-0900G1
92000844	Inert gas thermocouple 1000 mm, 1 x type S + empty tube, G1 threaded connection	8-010201-1000G1
92000845	Inert gas thermocouple 1200 mm, 1 x type S + empty tube, G1 threaded connection	8-010201-1200G1

Equipped with 2 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
92000836	Inert gas thermocouple 600 mm, 2 x type S + empty tube, G1 threaded connection	8-010301-0600G1
521039	Inert gas thermocouple 700 mm, 2 x type S + empty tube, G1 threaded connection	8-010301-0700G1
92000837	Inert gas thermocouple 800 mm, 2 x type S + empty tube, G1 threaded connection	8-010301-0800G1
92000838	Inert gas thermocouple 900 mm, 2 x type S + empty tube, G1 threaded connection	8-010301-0900G1
521040	Inert gas thermocouple 1000 mm, 2 x type S + empty tube, G1 threaded connection	8-010301-1000G1
92000839	Inert gas thermocouple 1200 mm, 2 x type S + empty tube, G1 threaded connection	8-010301-1200G1

Connection by screw socket

Inert gas thermocouple with G1 threaded connection with SW28 connection



Equipped with 1 thermocouple type S (PtRh10% - Pt)

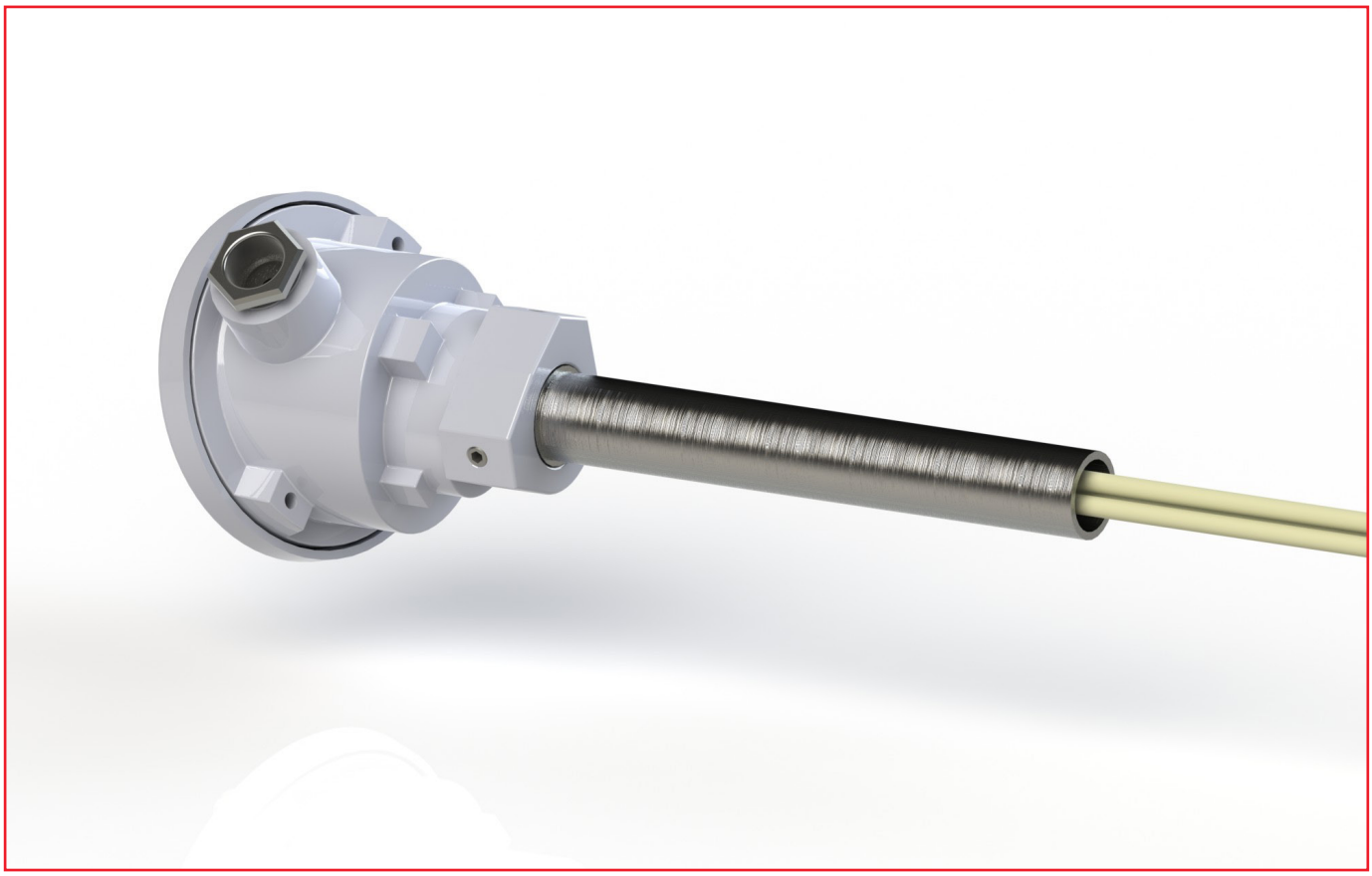
Material number	Description	Specification
92000846	Inert gas thermocouple 600 mm, 1 x type S + empty tube, G1 threaded connection with SW28	8-010201-0600G1SW28
92000847	Inert gas thermocouple 700 mm, 1 x type S + empty tube, G1 threaded connection with SW28	8-010201-0700G1SW28
92000848	Inert gas thermocouple 800 mm, 1 x type S + empty tube, G1 threaded connection with SW28	8-010201-0800G1SW28
92000849	Inert gas thermocouple 900 mm, 1 x type S + empty tube, G1 threaded connection with SW28	8-010201-0900G1SW28
92000850	Inert gas thermocouple 1000 mm, 1 x type S + empty tube, G1 threaded connection with SW28	8-010201-1000G1SW28
92000851	Inert gas thermocouple 1200 mm, 1 x type S + empty tube, G1 threaded connection with SW28	8-010201-1200G1SW28

Equipped with 2 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
92000852	Inert gas thermocouple 600 mm, 2 x type S + empty tube, G1 threaded connection with SW28	8-010301-0600G1SW28
92000853	Inert gas thermocouple 700 mm, 2 x type S + empty tube, G1 threaded connection with SW28	8-010301-0700G1SW28
92000854	Inert gas thermocouple 800 mm, 2 x type S + empty tube, G1 threaded connection with SW28	8-010301-0800G1SW28
92000855	Inert gas thermocouple 900 mm, 2 x type S + empty tube, G1 threaded connection with SW28	8-010301-0900G1SW28
92000856	Inert gas thermocouple 1000 mm, 2 x type S + empty tube, G1 threaded connection with SW28	8-010301-1000G1SW28
92000857	Inert gas thermocouple 1200 mm, 2 x type S + empty tube, G1 threaded connection with SW28	8-010301-1200G1SW28

Stainless steel tube connection

Stainless steel tube connection



As a standard a tube (W1.4305) of Ø22 mm x 150 mm length is used. Variations with Ø 1“ inch x 150 mm or Ø27 mm x 150 mm are also available.

Order chart:

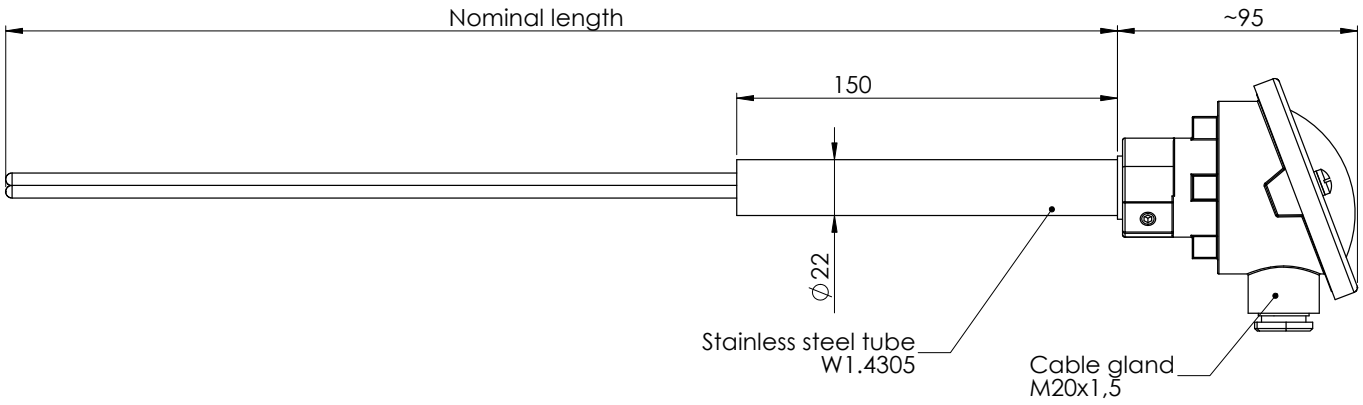
8	-	*01XXZZ*	-	*LLLLA*
		01 – Inert gas type XX – Number of thermocouples (TP) 02 – 1 TP + empty tube 03 – 2 TP + empty tube 04 – 3 TP + empty tube ZZ – Alloy of thermocouple 01 – PtRh10% - Pt (type S) 02 – PtRh13% - Pt (type R) 03 – PtRh30% - PtRh16 (type B) 04 – NiCr – Ni (type K) 05 – NiCrSi – NiSi (type N)		LLLL – Nominal length [mm] 0400 – 400 mm up to 1600 – 1600 mm In 100 mm steps A – Connection SR22 – Ø22 mm x 150 mm SG1Z – Ø 1“ inch x 150 mm SR27 – Ø27 mm x 150 mm

Example: 8-010301-0600SR22

Thermocouple for inert gas with 2 x type S thermocouples + 1 additional empty tube for controlling measurements, with a nominal length of 600 mm and a Ø22 mm x 150 mm tube.

Stainless steel tube connection

Inert gas thermocouple with Ø22 x 150 stainless steel tube



Equipped with 1 thermocouple type S (PtRh10% - Pt)

Material number	Description	Specification
92000858	Inert gas thermocouple 600 mm, 1 x type S + empty tube, 22 x 150 tube	8-010201-0600SR22
92000860	Inert gas thermocouple 700 mm, 1 x type S + empty tube, 22 x 150 tube	8-010201-0700SR22
92000861	Inert gas thermocouple 800 mm, 1 x type S + empty tube, 22 x 150 tube	8-010201-0800SR22
92000862	Inert gas thermocouple 900 mm, 1 x type S + empty tube, 22 x 150 tube	8-010201-0900SR22
92000863	Inert gas thermocouple 1000 mm, 1 x type S + empty tube, 22 x 150 tube	8-010201-1000SR22
92000864	Inert gas thermocouple 1200 mm, 1 x type S + empty tube, 22 x 150 tube	8-010201-1200SR22

Equipped with 2 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
92000865	Inert gas thermocouple 600 mm, 2 x type S + empty tube, 22 x 150 tube	8-010301-0600SR22
520993	Inert gas thermocouple 700 mm, 2 x type S + empty tube, 22 x 150 tube	8-010301-0700SR22
92000866	Inert gas thermocouple 800 mm, 2 x type S + empty tube, 22 x 150 tube	8-010301-0800SR22
92000867	Inert gas thermocouple 900 mm, 2 x type S + empty tube, 22 x 150 tube	8-010301-0900SR22
92000868	Inert gas thermocouple 1000 mm, 2 x type S + empty tube, 22 x 150 tube	8-010301-1000SR22
92000869	Inert gas thermocouple 1200 mm, 2 x type S + empty tube, 22 x 150 tube	8-010301-1200SR22

Equipped with 3 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
92000870	Inert gas thermocouple 600 mm, 3 x type S + empty tube, 22 x 150 tube	8-010401-0600SR22
92000871	Inert gas thermocouple 700 mm, 3 x type S + empty tube, 22 x 150 tube	8-010401-0700SR22
92000872	Inert gas thermocouple 800 mm, 3 x type S + empty tube, 22 x 150 tube	8-010401-0800SR22
92000873	Inert gas thermocouple 900 mm, 3 x type S + empty tube, 22 x 150 tube	8-010401-0900SR22
92000874	Inert gas thermocouple 1000 mm, 3 x type S + empty tube, 22 x 150 tube	8-010401-1000SR22
92000875	Inert gas thermocouple 1200 mm, 3 x type S + empty tube, 22 x 150 tube	8-010401-1200SR22

Stainless steel tube connection

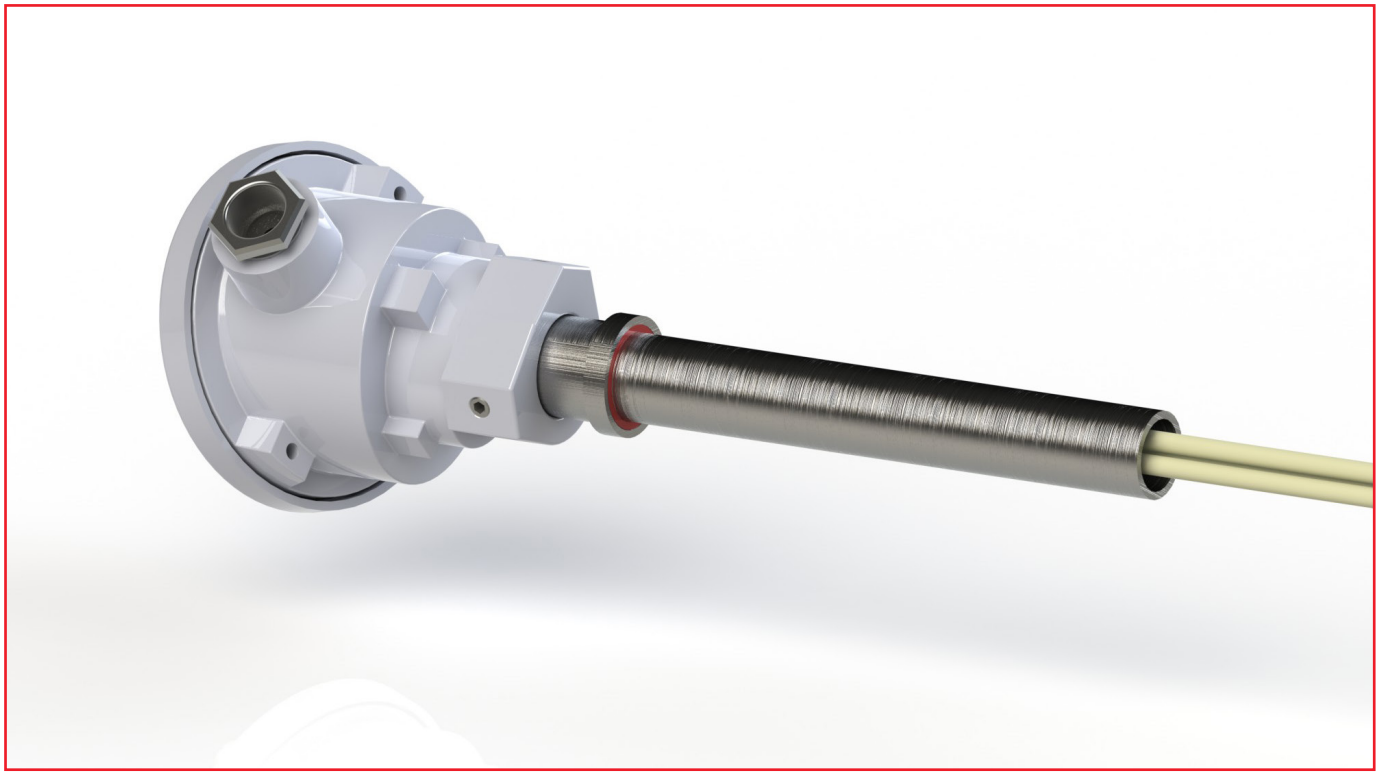
Thermocouple for vacuum application

Standard type chart:

Pressure range	Gas-tight and pressure proof up to 20 bar
Maximum tolerated leak rate	1.0 x 10^{-6} mbar·l/s
Number of thermocouples [n]	1-3
Number of protective tubes	n + 1 additional empty tube for controlling measurements
Material of protective tube	High density Al_2O_3 99,7%
Diameter protective tube	5 mm
Electric connections	Ceramic insulating screws max 1,0 mm^2
Connecting head	Shape A with M20x1,5 screw connection
Certificate	Calibration certificate based on Ag and Pd benchmark measurements for PtRh – Pt types Optional calibration certificate in accordance to AMS 2750

Connection with stainless steel tube

Connection with stainless steel tube



Standard connection is a tube (W1.4305) of Ø22 mm x 150 mm length. Types with Ø 1“ Zoll x 150 mm or Ø32 mm x 150 mm are also available.

Order chart:

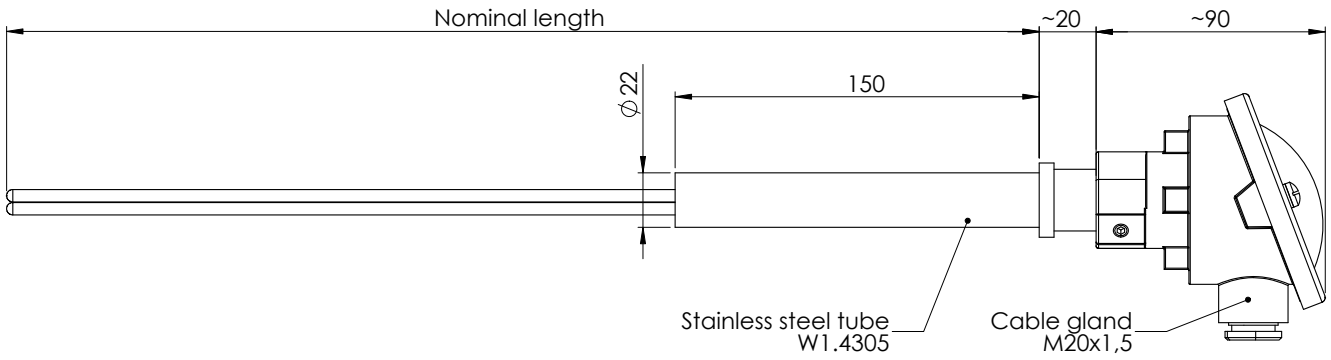
8	-	*PPXXZZ*	-	*LLLLA*
		PP – Vacuum tight pressure proof up to 05 – 5 bar 10 – 10 bar 15 – 15 bar XX – Number of thermocouples (TP) 02 – 1 TP + empty tube 03 – 2 TP + empty tube 04 – 3 TP + empty tube ZZ – Alloy of thermocouple 01 – PtRh10% - Pt (type S) 02 – PtRh13% - Pt (type R) 03 – PtRh30% - PtRh16 (type B) 04 – NiCr – Ni (type K) 05 – NiCrSi – NiSi (type N)		LLLL – Nominal length [mm] 0400 – 400 mm up to 1600 – 1600 mm In 100 mm steps A – Connection SR22 – Ø22 mm x 150 mm

Example: 8-050301-0600SR22

Thermocouple for vacuum atmosphere, gas tight and pressure proof up to 5 bar, with 2 x type S thermocouples + 1 additional empty tube for controlling measurements, a nominal length of 600 mm and a Ø22 mm x 150 mm tube.

Connection with stainless steel tube

Vacuum thermocouple with Ø22 x 150 tube



Equipped with 1 thermocouple type S (PtRh10% - Pt)

Material number	Description	Specification
510225	Vacuum thermocouple 600 mm, 1 x type S + empty tube, 22 x 150 tube	8-050201-0600SR22
510226	Vacuum thermocouple 700 mm, 1 x type S + empty tube, 22 x 150 tube	8-050201-0700SR22
510227	Vacuum thermocouple 800 mm, 1 x type S + empty tube, 22 x 150 tube	8-050201-0800SR22
510228	Vacuum thermocouple 900 mm, 1 x type S + empty tube, 22 x 150 tube	8-050201-0900SR22
510229	Vacuum thermocouple 1000 mm, 1 x type S + empty tube, 22 x 150 tube	8-050201-1000SR22
510231	Vacuum thermocouple 1200 mm, 1 x type S + empty tube, 22 x 150 tube	8-050201-1200SR22

Equipped with 2 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
510325	Vacuum thermocouple 600 mm, 2 x type S + empty tube, 22 x 150 tube	8-050301-0600SR22
510326	Vacuum thermocouple 700 mm, 2 x type S + empty tube, 22 x 150 tube	8-050301-0700SR22
510327	Vacuum thermocouple 800 mm, 2 x type S + empty tube, 22 x 150 tube	8-050301-0800SR22
510328	Vacuum thermocouple 900 mm, 2 x type S + empty tube, 22 x 150 tube	8-050301-0900SR22
510329	Vacuum thermocouple 1000 mm, 2 x type S + empty tube, 22 x 150 tube	8-050301-1000SR22
510331	Vacuum thermocouple 1200 mm, 2 x type S + empty tube, 22 x 150 tube	8-050301-1200SR22

Equipped with 3 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
510425	Vacuum thermocouple 600 mm, 3 x type S + empty tube, 22 x 150 tube	8-050401-0600SR22
510426	Vacuum thermocouple 700 mm, 3 x type S + empty tube, 22 x 150 tube	8-050401-0700SR22
510427	Vacuum thermocouple 800 mm, 3 x type S + empty tube, 22 x 150 tube	8-050401-0800SR22
510428	Vacuum thermocouple 900 mm, 3 x type S + empty tube, 22 x 150 tube	8-050401-0900SR22
510429	Vacuum thermocouple 1000 mm, 3 x type S + empty tube, 22 x 150 tube	8-050401-1000SR22
510431	Vacuum thermocouple 1200 mm, 3 x type S + empty tube, 22 x 150 tube	8-050401-1200SR22

Connection with stainless steel tube

Equipped with 1 thermocouple type S (PtRh10% - Pt)

Material number	Description	Specification
510225	Vacuum thermocouple 600 mm, 1 x type S + empty tube, 22 x 150 tube	8-100201-0600SR22
510226	Vacuum thermocouple 700 mm, 1 x type S + empty tube, 22 x 150 tube	8-100201-0700SR22
510227	Vacuum thermocouple 800 mm, 1 x type S + empty tube, 22 x 150 tube	8-100201-0800SR22
510228	Vacuum thermocouple 900 mm, 1 x type S + empty tube, 22 x 150 tube	8-100201-0900SR22
510229	Vacuum thermocouple 1000 mm, 1 x type S + empty tube, 22 x 150 tube	8-100201-1000SR22
510231	Vacuum thermocouple 1200 mm, 1 x type S + empty tube, 22 x 150 tube	8-100201-1200SR22

Equipped with 2 thermocouples type S (PtRh10% - Pt)

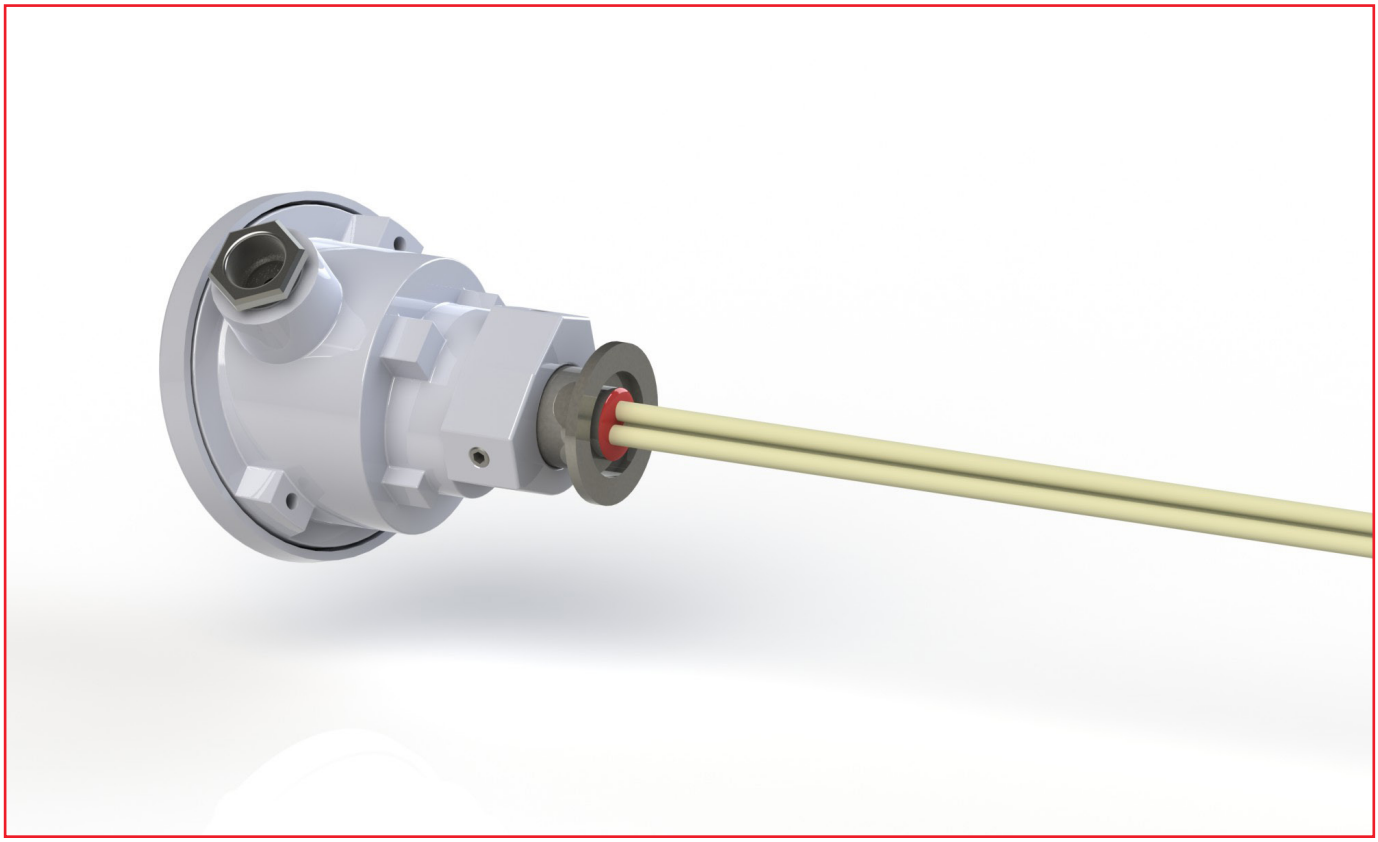
Material number	Description	Specification
510325	Vacuum thermocouple 600 mm, 2 x type S + empty tube, 22 x 150 tube	8-100301-0600SR22
510326	Vacuum thermocouple 700 mm, 2 x type S + empty tube, 22 x 150 tube	8-100301-0700SR22
510327	Vacuum thermocouple 800 mm, 2 x type S + empty tube, 22 x 150 tube	8-100301-0800SR22
510328	Vacuum thermocouple 900 mm, 2 x type S + empty tube, 22 x 150 tube	8-100301-0900SR22
510329	Vacuum thermocouple 1000 mm, 2 x type S + empty tube, 22 x 150 tube	8-100301-1000SR22
510331	Vacuum thermocouple 1200 mm, 2 x type S + empty tube, 22 x 150 tube	8-100301-1200SR22

Equipped with 3 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
92000093	Vacuum thermocouple 600 mm, 3 x type S + empty tube, 22 x 150 tube	8-100401-0600SR22
92001411	Vacuum thermocouple 700 mm, 3 x type S + empty tube, 22 x 150 tube	8-100401-0700SR22
92001412	Vacuum thermocouple 800 mm, 3 x type S + empty tube, 22 x 150 tube	8-100401-0800SR22
92000101	Vacuum thermocouple 900 mm, 3 x type S + empty tube, 22 x 150 tube	8-100401-0900SR22
92001413	Vacuum thermocouple 1000 mm, 3 x type S + empty tube, 22 x 150 tube	8-100401-1000SR22
92000102	Vacuum thermocouple 1200 mm, 3 x type S + empty tube, 22 x 150 tube	8-100401-1200SR22

Connection with small flange

Connection with small flange



Standard connection is a small flange ISO 2861 DN 25. Types with DN 16 and DN40 are also available.

Order chart:

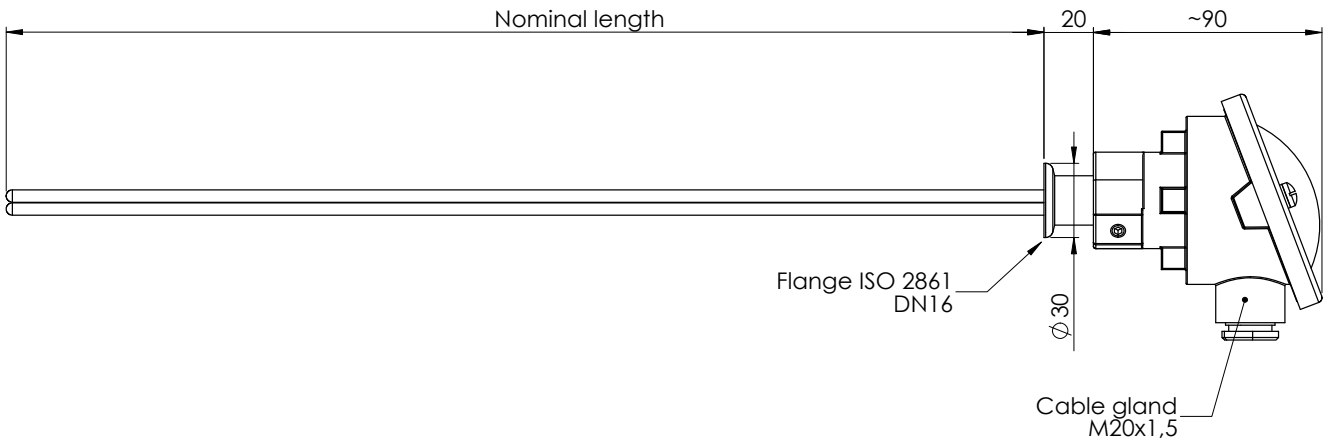
8	-	*PPXXZZ*	-	*LLLLA*
		PP – Vacuum tight pressure proof up to 05 – 5 bar 10 – 10 bar XX – Number of thermocouples (TP) 02 – 1 TP + empty tube 03 – 2 TP + empty tube 04 – 3 TP + empty tube ZZ – Alloy of thermocouple 01 – PtRh10% - Pt (type S) 02 – PtRh13% - Pt (type R) 03 – PtRh30% - PtRh16 (type B) 04 – NiCr – Ni (type K) 05 – NiCrSi – NiSi (type N)		LLLL – Nominal length [mm] 0400 – 400 mm up to 1600 – 1600 mm in 100 mm steps A – Connection KF16 – small flange DN16 KF25 – small flange DN25 KF40 – small flange DN40

Example: 8-050301-0700KF25

Thermocouple for vacuum atmosphere, gas tight and pressure proof up to 5 bar, with 2 x type S thermocouples + 1 additional empty tube for controlling measurements, a nominal length of 700 mm and a small flange connection ISO 2861 DN 25.

Connection with small flange

Vacuum thermocouple with small flange DN 16



Equipped with 1 thermocouple type S (PtRh10% - Pt)

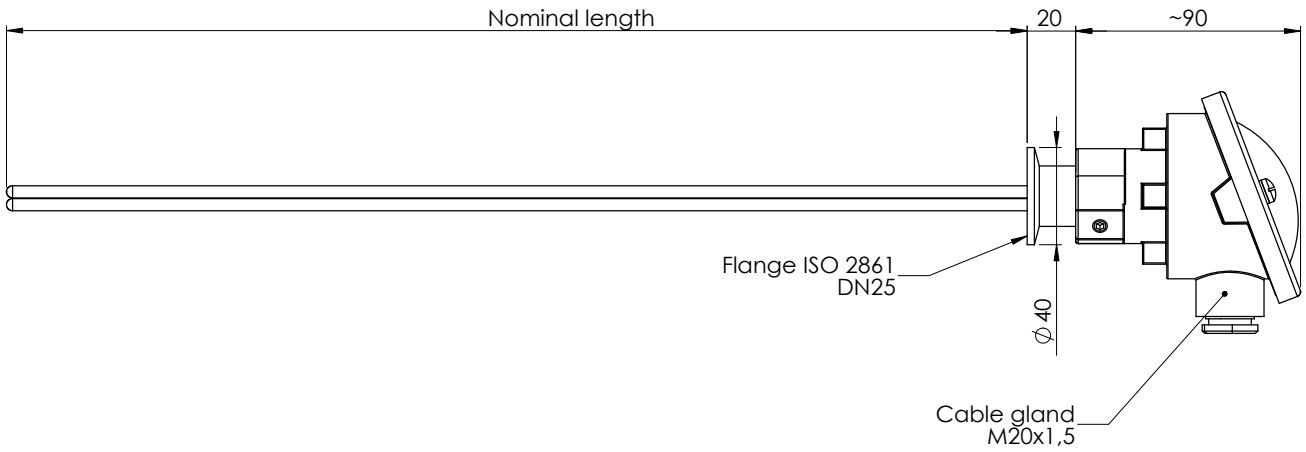
Material number	Description	Specification
92000876	Vacuum thermocouple 600 mm, 1 x type S + empty tube, small flange DN 16	8-050201-0600KF16
92000877	Vacuum thermocouple 700 mm, 1 x type S + empty tube, small flange DN 16	8-050201-0700KF16
92000881	Vacuum thermocouple 800 mm, 1 x type S + empty tube, small flange DN 16	8-050201-0800KF16
92000882	Vacuum thermocouple 900 mm, 1 x type S + empty tube, small flange DN 16	8-050201-0900KF16
92000883	Vacuum thermocouple 1000 mm, 1 x type S + empty tube, small flange DN 16	8-050201-1000KF16
92000884	Vacuum thermocouple 1200 mm, 1 x type S + empty tube, small flange DN 16	8-050201-1200KF16

Equipped with 2 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
92000892	Vacuum thermocouple 600 mm, 2 x type S + empty tube, small flange DN 16	8-050301-0600KF16
92000893	Vacuum thermocouple 700 mm, 2 x type S + empty tube, small flange DN 16	8-050301-0700KF16
92000894	Vacuum thermocouple 800 mm, 2 x type S + empty tube, small flange DN 16	8-050301-0800KF16
92000895	Vacuum thermocouple 900 mm, 2 x type S + empty tube, small flange DN 16	8-050301-0900KF16
92000896	Vacuum thermocouple 1000 mm, 2 x type S + empty tube, small flange DN 16	8-050301-1000KF16
92000897	Vacuum thermocouple 1200 mm, 2 x type S + empty tube, small flange DN 16	8-050301-1200KF16

Connection with small flange

Vacuum thermocouple with small flange DN 25



Equipped with 1 thermocouple type S (PtRh10% - Pt)

Material number	Description	Specification
510213	Vacuum thermocouple 600 mm, 1 x type S + empty tube, small flange DN 25	8-050201-0600KF25
510214	Vacuum thermocouple 700 mm, 1 x type S + empty tube, small flange DN 25	8-050201-0700KF25
510215	Vacuum thermocouple 800 mm, 1 x type S + empty tube, small flange DN 25	8-050201-0800KF25
510216	Vacuum thermocouple 900 mm, 1 x type S + empty tube, small flange DN 25	8-050201-0900KF25
510217	Vacuum thermocouple 1000 mm, 1 x type S + empty tube, small flange DN 25	8-050201-1000KF25
510219	Vacuum thermocouple 1200 mm, 1 x type S + empty tube, small flange DN 25	8-050201-1200KF25

Equipped with 2 thermocouples type S (PtRh10% - Pt)

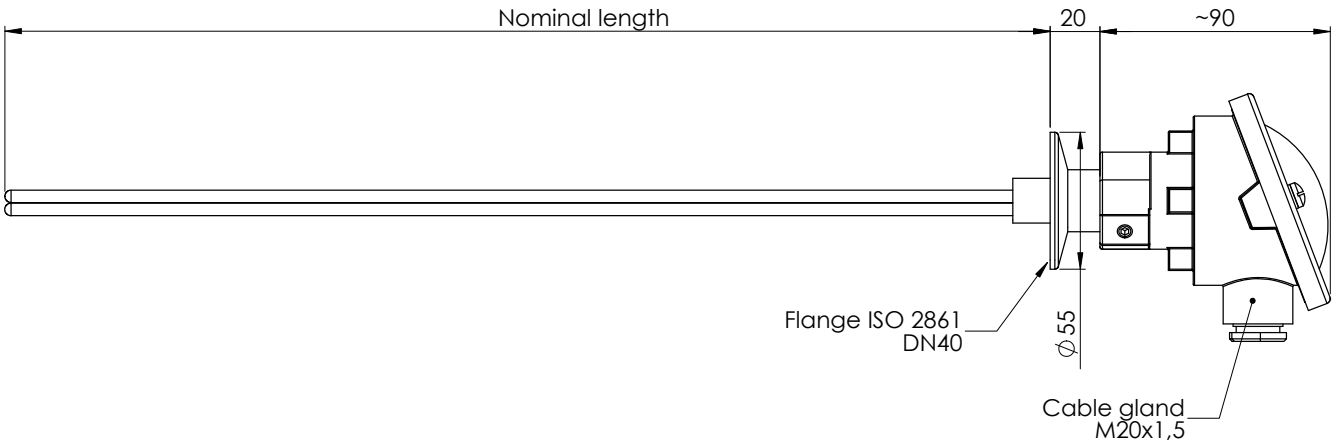
Material number	Description	Specification
510313	Vacuum thermocouple 600 mm, 2 x type S + empty tube, small flange DN 25	8-050301-0600KF25
510314	Vacuum thermocouple 700 mm, 2 x type S + empty tube, small flange DN 25	8-050301-0700KF25
510315	Vacuum thermocouple 800 mm, 2 x type S + empty tube, small flange DN 25	8-050301-0800KF25
510316	Vacuum thermocouple 900 mm, 2 x type S + empty tube, small flange DN 25	8-050301-0900KF25
510317	Vacuum thermocouple 1000 mm, 2 x type S + empty tube, small flange DN 25	8-050301-1000KF25
510319	Vacuum thermocouple 1200 mm, 2 x type S + empty tube, small flange DN 25	8-050301-1200KF25

Equipped with 3 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
510413	Vacuum thermocouple 600 mm, 3 x type S + empty tube, small flange DN 25	8-050401-0600KF25
510414	Vacuum thermocouple 700 mm, 3 x type S + empty tube, small flange DN 25	8-050401-0700KF25
510415	Vacuum thermocouple 800 mm, 3 x type S + empty tube, small flange DN 25	8-050401-0800KF25
510416	Vacuum thermocouple 900 mm, 3 x type S + empty tube, small flange DN 25	8-050401-0900KF25
510417	Vacuum thermocouple 1000 mm, 3 x type S + empty tube, small flange DN 25	8-050401-1000KF25
510419	Vacuum thermocouple 1200 mm, 3 x type S + empty tube, small flange DN 25	8-050401-1200KF25

Connection with small flange

Vacuum thermocouple with small flange DN 40



Equipped with 1 thermocouple type S (PtRh10% - Pt)

Material number	Description	Specification
92000885	Vacuum thermocouple 600 mm, 1 x type S + empty tube, small flange DN 40	8-050201-0600KF40
92000886	Vacuum thermocouple 700 mm, 1 x type S + empty tube, small flange DN 40	8-050201-0700KF40
92000887	Vacuum thermocouple 800 mm, 1 x type S + empty tube, small flange DN 40	8-050201-0800KF40
92000888	Vacuum thermocouple 900 mm, 1 x type S + empty tube, small flange DN 40	8-050201-0900KF40
92000890	Vacuum thermocouple 1000 mm, 1 x type S + empty tube, small flange DN 40	8-050201-1000KF40
92000891	Vacuum thermocouple 1200 mm, 1 x type S + empty tube, small flange DN 40	8-050201-1200KF40

Equipped with 2 thermocouples type S (PtRh10% - Pt)

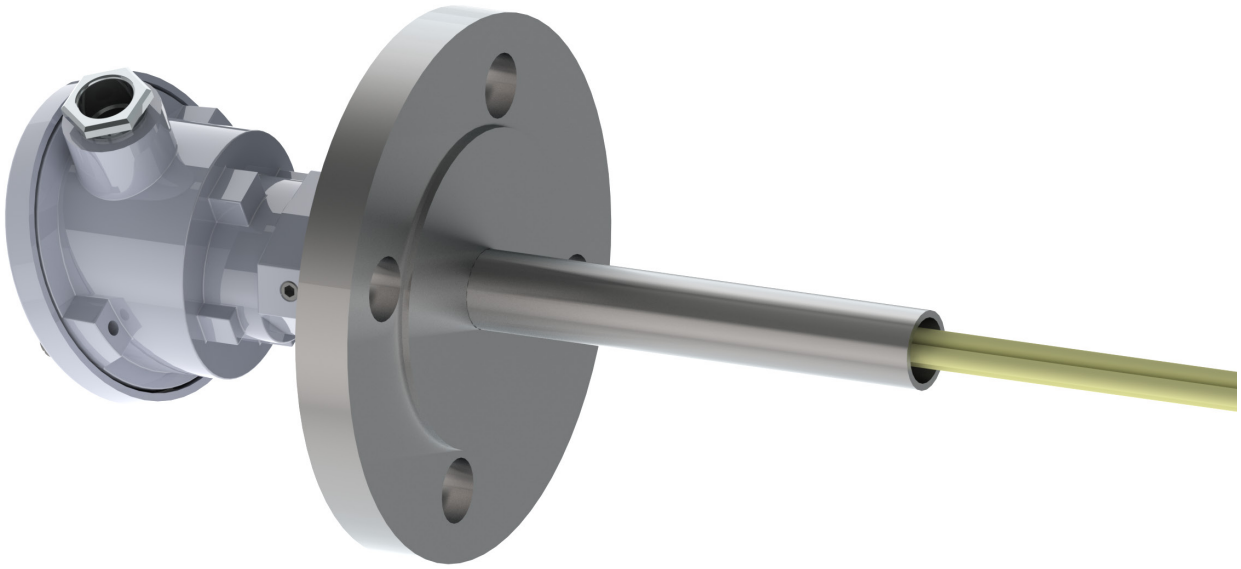
Material number	Description	Specification
92000898	Vacuum thermocouple 600 mm, 2 x type S + empty tube, small flange DN 40	8-050301-0600KF40
92000899	Vacuum thermocouple 700 mm, 2 x type S + empty tube, small flange DN 40	8-050301-0700KF40
92000900	Vacuum thermocouple 800 mm, 2 x type S + empty tube, small flange DN 40	8-050301-0800KF40
92000901	Vacuum thermocouple 900 mm, 2 x type S + empty tube, small flange DN 40	8-050301-0900KF40
92000902	Vacuum thermocouple 1000 mm, 2 x type S + empty tube, small flange DN 40	8-050301-1000KF40
92000903	Vacuum thermocouple 1200 mm, 2 x type S + empty tube, small flange DN 40	8-050301-1200KF40

Equipped with 3 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
92000910	Vacuum thermocouple 600 mm, 3 x type S + empty tube, small flange DN 40	8-050401-0600KF40
92000911	Vacuum thermocouple 700 mm, 3 x type S + empty tube, small flange DN 40	8-050401-0700KF40
92000912	Vacuum thermocouple 800 mm, 3 x type S + empty tube, small flange DN 40	8-050401-0800KF40
92000913	Vacuum thermocouple 900 mm, 3 x type S + empty tube, small flange DN 40	8-050401-0900KF40
92000914	Vacuum thermocouple 1000 mm, 3 x type S + empty tube, small flange DN 40	8-050401-1000KF40
92000915	Vacuum thermocouple 1200 mm, 3 x type S + empty tube, small flange DN 40	8-050401-1200KF40

Connection with standard flange DIN EN 1092-1

Connection with standard flange DIN EN 1092-1



The type is also used for applications up to 21 bar high pressure or in hydrogen atmospheres. Standard connection is a flange DIN EN 1092-1 with a nominal width DN25 PN25. Further nominal widths and types, for example with notch, are available on request.

Order chart:

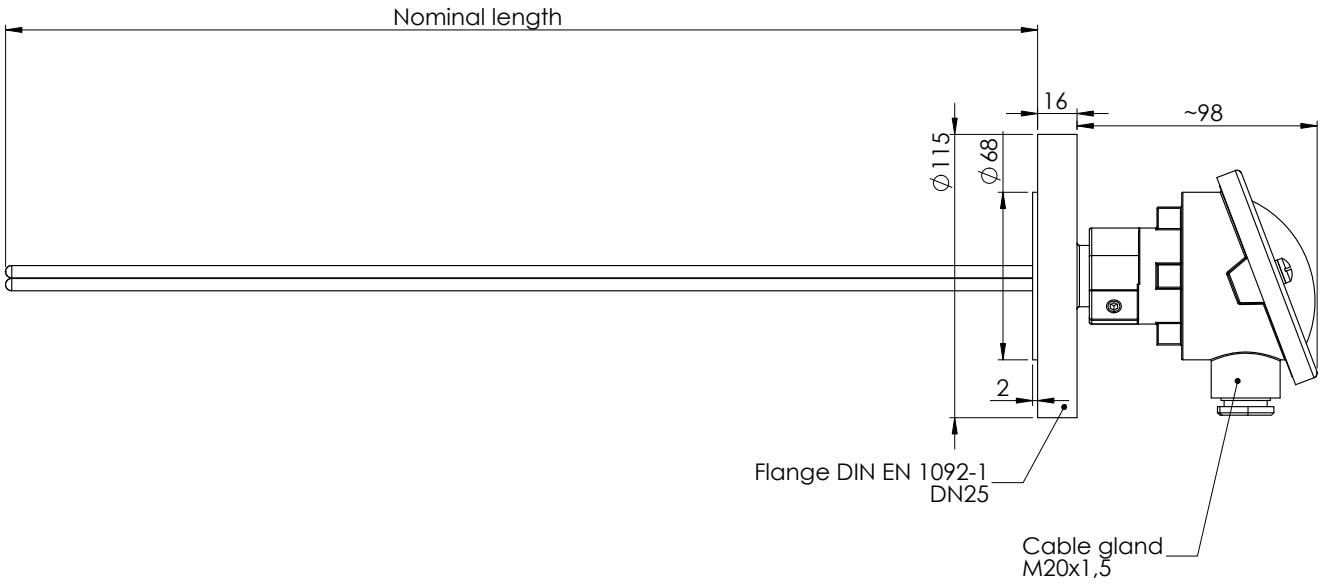
8	-	*PPXXZZ*	-	*LLLLA*
		PP – Vacuum tight pressure proof up to 20 – 20 bar XX – Number of thermocouples (TP) 02 – 1 TP + empty tube 03 – 2 TP + empty tube ZZ – Alloy of thermocouple 01 – PtRh10% - Pt (type S) 02 – PtRh13% - Pt (type R) 03 – PtRh30% - PtRh16 (type B) 05 – NiCrSi – NiSi (type N)		LLLL – Nominal length [mm] 0400 – 400 mm up to 1600 – 1600 mm in 100 mm steps A – Connection FLDN25 – Nominal width 25 FLDN40 – Nominal width 40

Example: 8-200301-0700FLDN25

Thermocouple for vacuum atmosphere, gas tight and pressure proof up to 21 bar absolute, with 2 x type S thermocouples + 1 additional empty tube for controlling measurements, a nominal length of 700 mm and a DIN EN 1092-1 flange for PN25 with a nominal width DN 25.

Connection with standard flange DIN EN 1092-1

Vacuum thermocouple with standard flange FLDN25



Equipped with 1 thermocouple type S (PtRh10% - Pt)

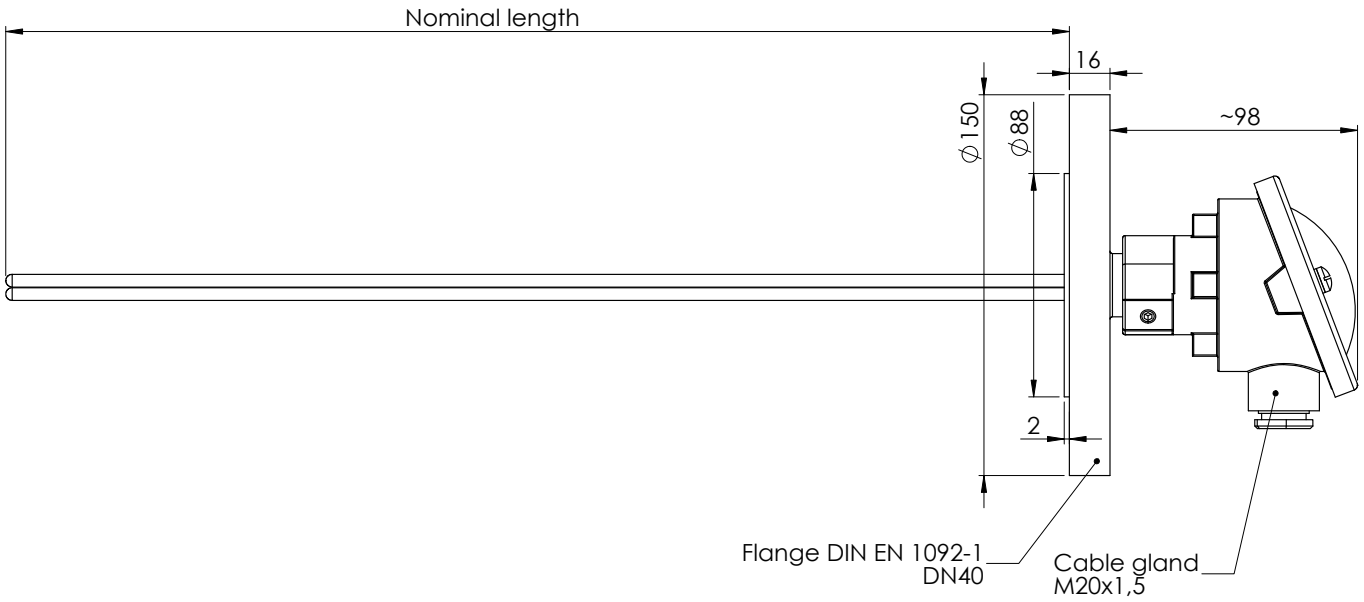
Material number	Description	Specification
92002018	Vacuum thermocouple 600 mm, 1 x type S + empty tube, flange DN 40	8-200201-0600FLDN25
92002032	Vacuum thermocouple 700 mm, 1 x type S + empty tube, flange DN 40	8-200201-0700FLDN25
92002033	Vacuum thermocouple 800 mm, 1 x type S + empty tube, flange DN 40	8-200201-0800FLDN25
92002034	Vacuum thermocouple 900 mm, 1 x type S + empty tube, flange DN 40	8-200201-0900FLDN25
92002035	Vacuum thermocouple 1000 mm, 1 x type S + empty tube, flange DN 40	8-200201-1000FLDN25
92002036	Vacuum thermocouple 1200 mm, 1 x type S + empty tube, flange DN 40	8-200201-1200FLDN25

Equipped with 2 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
92000922	Vacuum thermocouple 600 mm, 2 x type S + empty tube, flange DN25	8-200301-0600FLDN25
92000923	Vacuum thermocouple 700 mm, 2 x type S + empty tube, flange DN25	8-200301-0700FLDN25
92000924	Vacuum thermocouple 800 mm, 2 x type S + empty tube, flange DN25	8-200301-0800FLDN25
92000925	Vacuum thermocouple 900 mm, 2 x type S + empty tube, flange DN25	8-200301-0900FLDN25
92000926	Vacuum thermocouple 1000 mm, 2 x type S + empty tube, flange DN25	8-200301-1000FLDN25
92000927	Vacuum thermocouple 1200 mm, 2 x type S + empty tube, flange DN25	8-200301-1200FLDN25

Connection with standard flange DIN EN 1092-1

Vacuum thermocouple with standard flange FLDN40



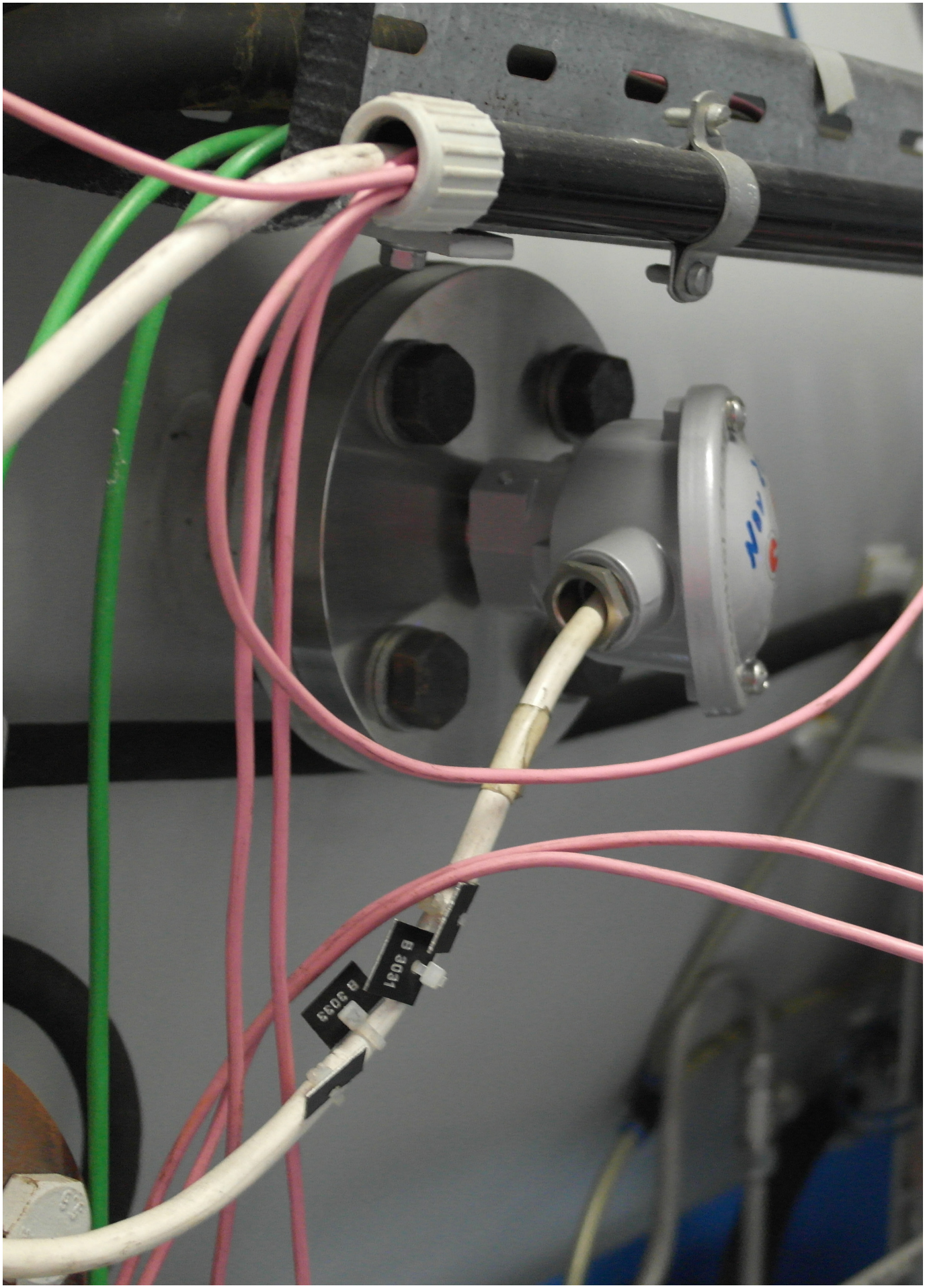
Equipped with 1 thermocouple type S (PtRh10% - Pt)

Material number	Description	Specification
92000916	Vacuum thermocouple 600 mm, 1 x type S + empty tube, flange DN 40	8-200201-0600FLDN40
92000917	Vacuum thermocouple 700 mm, 1 x type S + empty tube, flange DN 40	8-200201-0700FLDN40
92000918	Vacuum thermocouple 800 mm, 1 x type S + empty tube, flange DN 40	8-200201-0800FLDN40
92000919	Vacuum thermocouple 900 mm, 1 x type S + empty tube, flange DN 40	8-200201-0900FLDN40
92000920	Vacuum thermocouple 1000 mm, 1 x type S + empty tube, flange DN 40	8-200201-1000FLDN40
92000921	Vacuum thermocouple 1200 mm, 1 x type S + empty tube, flange DN 40	8-200201-1200FLDN40

Equipped with 2 thermocouples type S (PtRh10% - Pt)

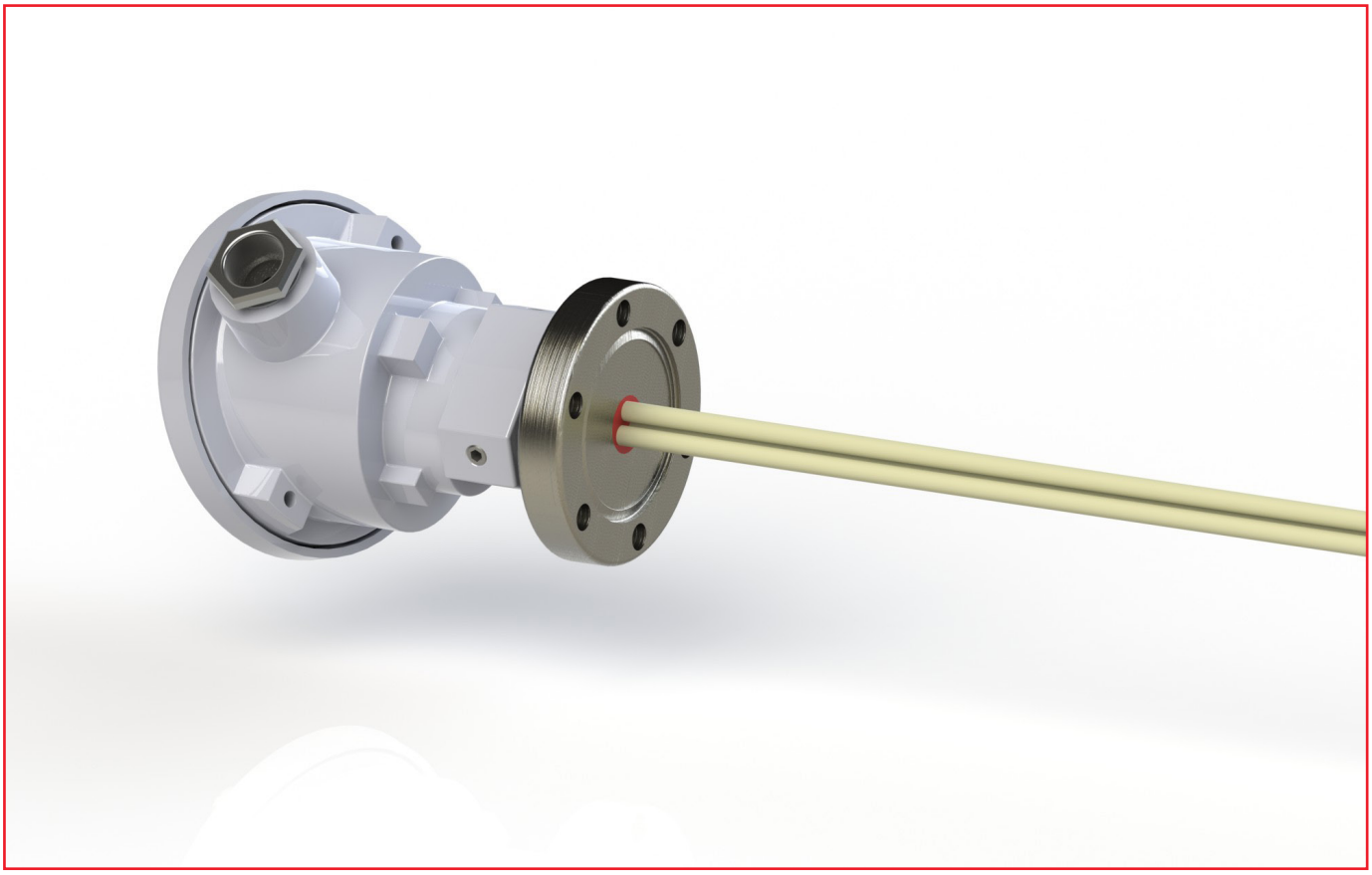
Material number	Description	Specification
92000922	Vacuum thermocouple 600 mm, 2 x type S + empty tube, flange DN 40	8-200301-0600FLDN40
92000923	Vacuum thermocouple 700 mm, 2 x type S + empty tube, flange DN 40	8-200301-0700FLDN40
92000924	Vacuum thermocouple 800 mm, 2 x type S + empty tube, flange DN 40	8-200301-0800FLDN40
92000925	Vacuum thermocouple 900 mm, 2 x type S + empty tube, flange DN 40	8-200301-0900FLDN40
92000926	Vacuum thermocouple 1000 mm, 2 x type S + empty tube, flange DN 40	8-200301-1000FLDN40
92000927	Vacuum thermocouple 1200 mm, 2 x type S + empty tube, flange DN 40	8-200301-1200FLDN40

Connection with standard flange DIN EN 1092-1



Connection with CF–flange

Connection with CF–flange



The high vacuum type has a maximum admissible leak rate of 1.0 10^{-8} mbar · l/s. Standard width is the nominal width DN 40. Further nominal widths are available on request.

Order chart:

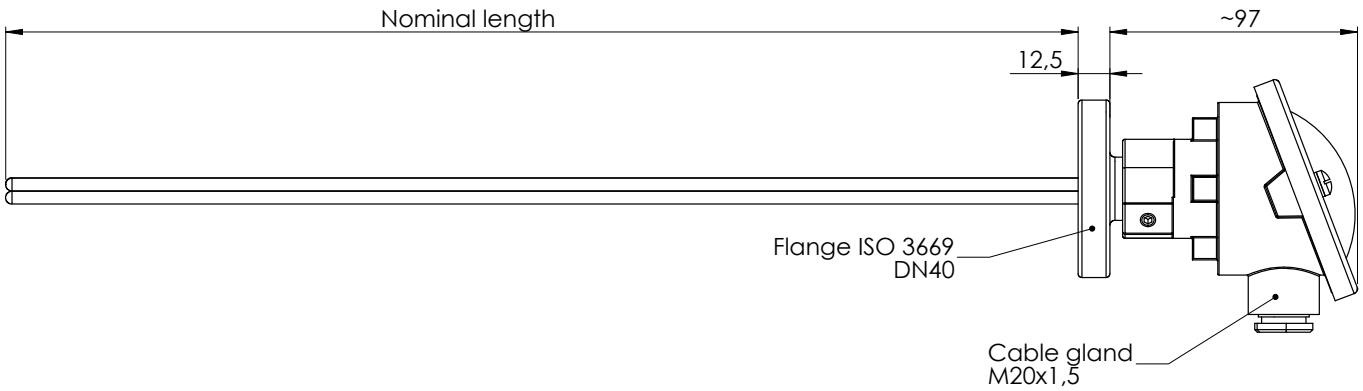
8	-	*PPXXZZ*	-	*LLLLA*
		PP – Pressure range vacuum tight up to 05 – 5 bar high pressure XX – Number of thermocouples (TP) 02 – 1 TP + empty tube 03 – 2 TP + empty tube 04 – 3 TP + empty tube ZZ – Alloy of thermocouple 01 – PtRh10% - Pt (type S) 02 – PtRh13% - Pt (type R) 03 – PtRh30% - PtRh16 (type B) 04 – NiCr – Ni (type K) 05 – NiCrSi – NiSi (type N)		LLLL – Nominal length [mm] 0400 – 400 mm up to 1600 – 1600 mm in 100 mm steps A – Connection CF40 – nominal width DN40

Example: 8-050301-0700CF40

Thermocouple for vacuum atmosphere, gas tight and pressure proof up to 5 bar, with 2 x type S thermocouples + 1 additional empty tube for controlling measurements, a nominal length of 700 mm and a CF-flange with the nominal width DN 40.

Connection with CF–flange

Vacuum thermocouple with CF-flange



Equipped with 1 thermocouple type S (PtRh10% - Pt)

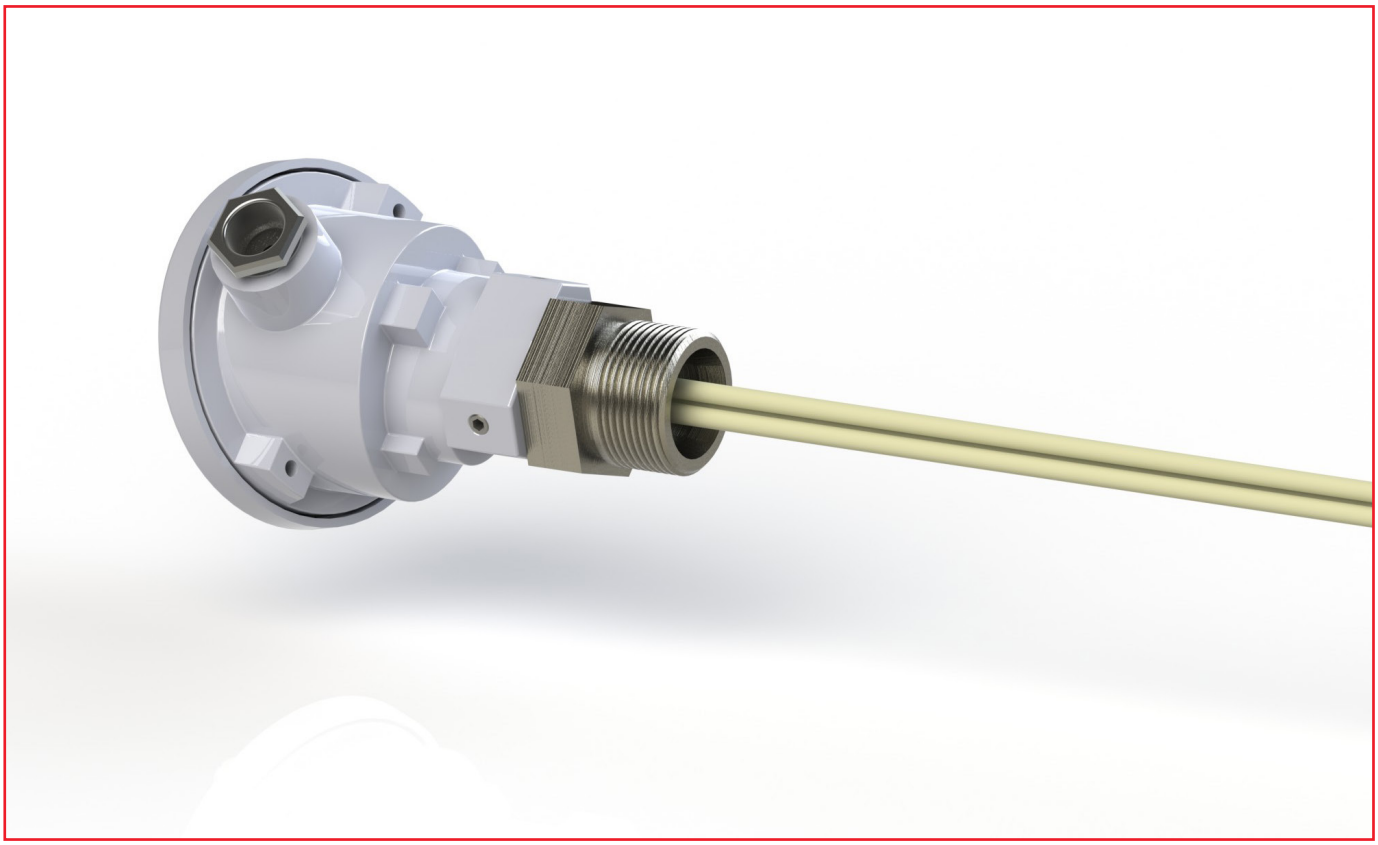
Material number	Description	Specification
92000916	Vacuum thermocouple 600 mm, 1 x type S + empty tube, CF-flange DN 40	8-050201-0600CF40
92000917	Vacuum thermocouple 700 mm, 1 x type S + empty tube, CF-flange DN 40	8-050201-0700CF40
92000918	Vacuum thermocouple 800 mm, 1 x type S + empty tube, CF-flange DN 40	8-050201-0800CF40
92000919	Vacuum thermocouple 900 mm, 1 x type S + empty tube, CF-flange DN 40	8-050201-0900CF40
92000920	Vacuum thermocouple 1000 mm, 1 x type S + empty tube, CF-flange DN 40	8-050201-1000CF40
92000921	Vacuum thermocouple 1200 mm, 1 x type S + empty tube, CF-flange DN 40	8-050201-1200CF40

Equipped with 2 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
92000922	Vacuum thermocouple 600 mm, 2 x type S + empty tube, CF-flange DN 40	8-050301-0600CF40
92000923	Vacuum thermocouple 700 mm, 2 x type S + empty tube, CF-flange DN 40	8-050301-0700CF40
92000924	Vacuum thermocouple 800 mm, 2 x type S + empty tube, CF-flange DN 40	8-050301-0800CF40
92000925	Vacuum thermocouple 900 mm, 2 x type S + empty tube, CF-flange DN 40	8-050301-0900CF40
92000926	Vacuum thermocouple 1000 mm, 2 x type S + empty tube, CF-flange DN 40	8-050301-1000CF40
92000927	Vacuum thermocouple 1200 mm, 2 x type S + empty tube, CF-flange DN 40	8-050301-1200CF40

Connection with M36x2 fitting DIN 2353

Connection with M36x2 fitting DIN 2353



The type is especially developed for sites with high pressure quenching up to 20 bar.

Order chart:

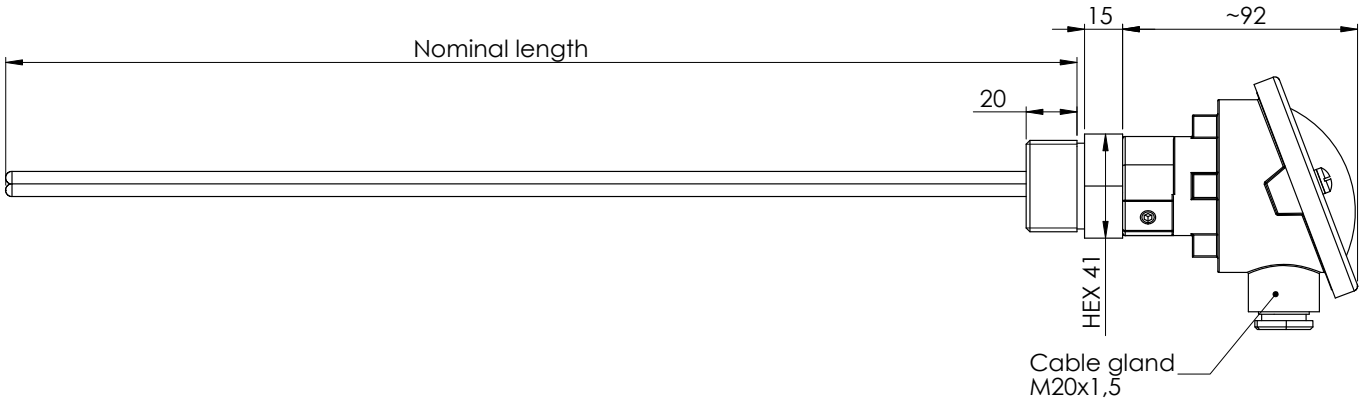
8	-	*PPXXZZ*	-	*LLLLA*
		PP – Pressure range vacuum tight up to 20 – 20 bar high pressure XX – Number of thermocouples (TP) 02 – 1 TP + empty tube 03 – 2 TP + empty tube 04 – 3 TP + empty tube ZZ – Alloy of thermocouple 01 – PtRh10% - Pt (type S) 02 – PtRh13% - Pt (type R) 03 – PtRh30% - PtRh16 (type B) 04 – NiCr – Ni (type K) 05 – NiCrSi – NiSi (type N)		LLLL – Nominal length [mm] 0400 – 400 mm up to 1600 – 1600 mm in 100 mm steps A – Connection SW41 – conical welding stud 24° with sleeve nut, DIN 2353

Example: 8-200301-0700SW41

Thermocouple for vacuum atmosphere, gas tight and pressure proof up to 20 bar, with 2 x type S thermocouples + 1 additional empty tube for controlling measurements, a nominal length of 700 mm, fitted on a conical welding stud 24° with M36x2 sleeve nut DIN 2353.

Connection with M36x2 fitting DIN 2353

Vacuum thermocouple with M36x2 fitting DIN2353



Equipped with 1 thermocouple type S (PtRh10% - Pt)

Material number	Description	Specification
92000928	Vacuum thermocouple 600 mm, 1 x type S + empty tube, fitting DIN2353	8-200201-0600SW41
92000929	Vacuum thermocouple 700 mm, 1 x type S + empty tube, fitting DIN2353	8-200201-0700SW41
521009	Vacuum thermocouple 800 mm, 1 x type S + empty tube, fitting DIN2353	8-200201-0800SW41
92000930	Vacuum thermocouple 900 mm, 1 x type S + empty tube, fitting DIN2353	8-200201-0900SW41
92000931	Vacuum thermocouple 1000 mm, 1 x type S + empty tube, fitting DIN2353	8-200201-1000SW41
520932	Vacuum thermocouple 1200 mm, 1 x type S + empty tube, fitting DIN2353	8-200201-1200SW41

Equipped with 2 thermocouples type S (PtRh10% - Pt)

Material number	Description	Specification
520313	Vacuum thermocouple 600 mm, 2 x type S + empty tube, fitting DIN2353	8-200301-0600SW41
520314	Vacuum thermocouple 700 mm, 2 x type S + empty tube, fitting DIN2353	8-200301-0700SW41
520315	Vacuum thermocouple 800 mm, 2 x type S + empty tube, fitting DIN2353	8-200301-0800SW41
520316	Vacuum thermocouple 900 mm, 2 x type S + empty tube, fitting DIN2353	8-200301-0900SW41
520317	Vacuum thermocouple 1000 mm, 2 x type S + empty tube, fitting DIN2353	8-200301-1000SW41
520319	Vacuum thermocouple 1200 mm, 2 x type S + empty tube, fitting DIN2353	8-200301-1200SW41

Equipped with 3 thermocouples type S (PtRh10% - Pt)

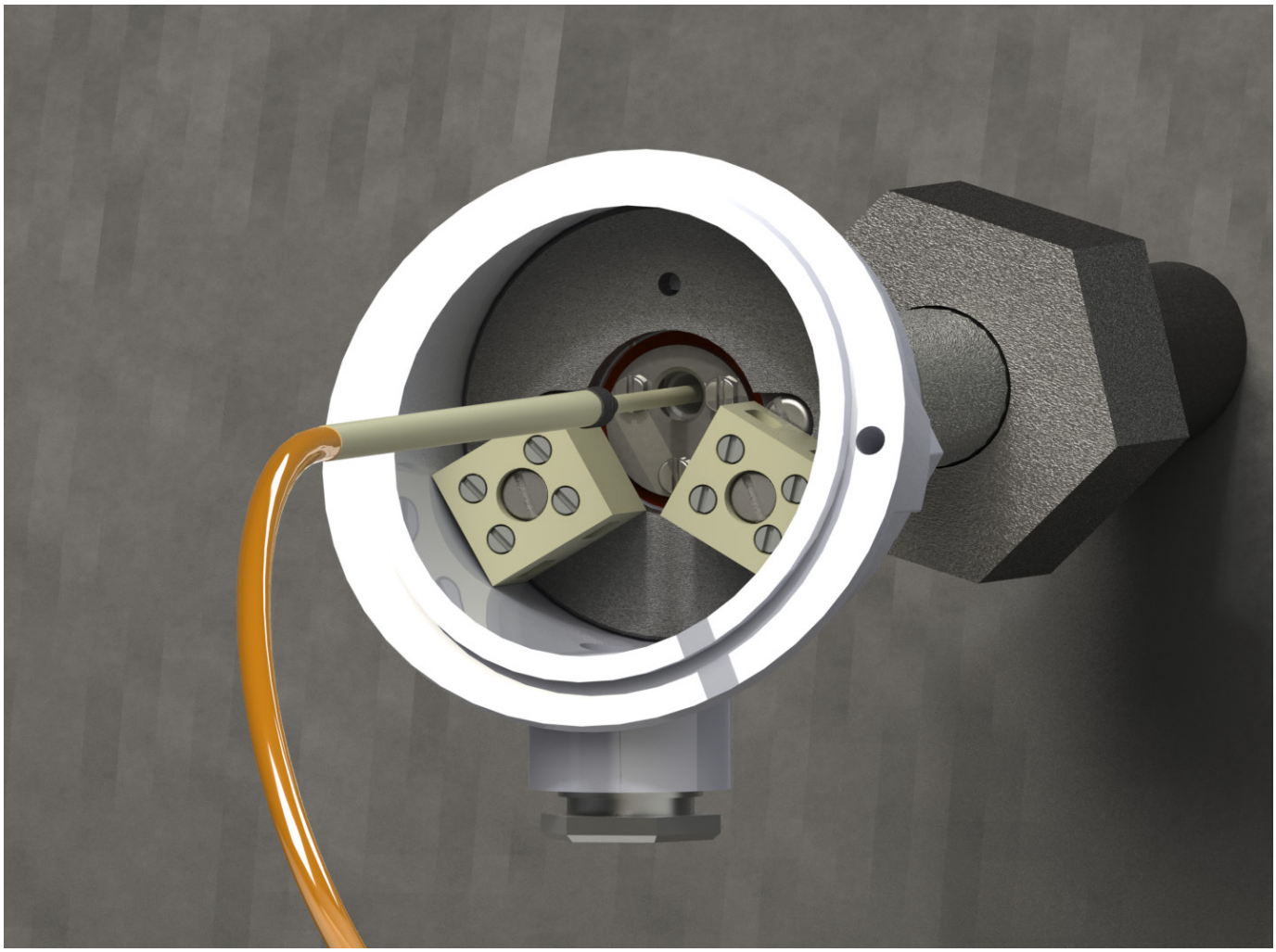
Material number	Description	Specification
92000933	Vacuum thermocouple 600 mm, 3 x type S + empty tube, fitting DIN2353	8-200401-0600SW41
92000934	Vacuum thermocouple 700 mm, 3 x type S + empty tube, fitting DIN2353	8-200401-0700SW41
92000935	Vacuum thermocouple 800 mm, 3 x type S + empty tube, fitting DIN2353	8-200401-0800SW41
92000936	Vacuum thermocouple 900 mm, 3 x type S + empty tube, fitting DIN2353	8-200401-0900SW41
92000937	Vacuum thermocouple 1000 mm, 3 x type S + empty tube, fitting DIN2353	8-200401-1000SW41
92000938	Vacuum thermocouple 1200 mm, 3 x type S + empty tube, fitting DIN2353	8-200401-1200SW41

Testing thermocouple

Overview

Application	Suitable for all thermocouples of the thermo-control Körtvélyessy GmbH up to the given nominal length
Number of thermocouples [n]	1
Material capillary	High density Al_2O_3 99,7%
Diameter capillary	2,5 mm
Configuration	With 2,5 m compensating line
Certifikates	Calibration certificate based on Ag and Pd fix-point measurements PtRh – Pt types Optional calibration certificate in accordance to AMS 2750
Recommended recalibration interval	10 years

Overview



Order chart:

10	-	*CCXXZZ*	-	*LLLLA*
		CC – Certificate of calibration 00 – DIN EN 60584-2 01 – AMS 2750 XX – Number of thermocouples (TP) 01 – 1 TP ZZ – Alloy of thermocouple 01 – PtRh10% - Pt (type S) 02 – PtRh13% - Pt (type R) 03 – PtRh30% - PtRh16 (type B) 04 – NiCr – Ni (type K) 05 – NiCrSi – NiSi (type N)		LLLL – Nominal length [mm] 0400 – 400 mm up to 1600 – 1600 mm in 100 mm steps A – Connection BL – End dismantled MC – Miniature connector SC – Standard connector

Example: 10-000101-0800BL

Test thermocouple type S, suitable for thermocouple up to 800 mm nominal length, with 2,5 m compensating line and bared ends.

Testing thermocouple

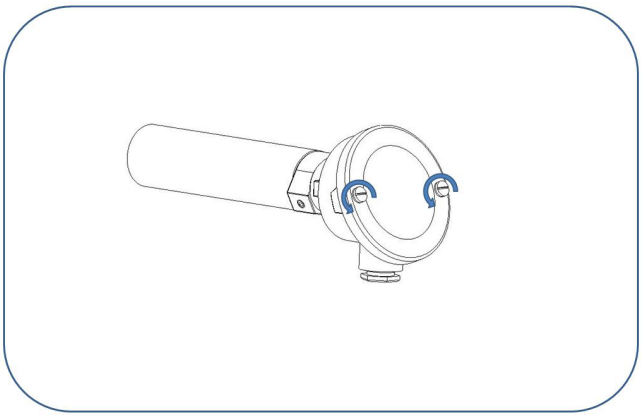
Testing thermocouple type S DIN EN 60584-2, with 2,5 m compensating line and bared ends

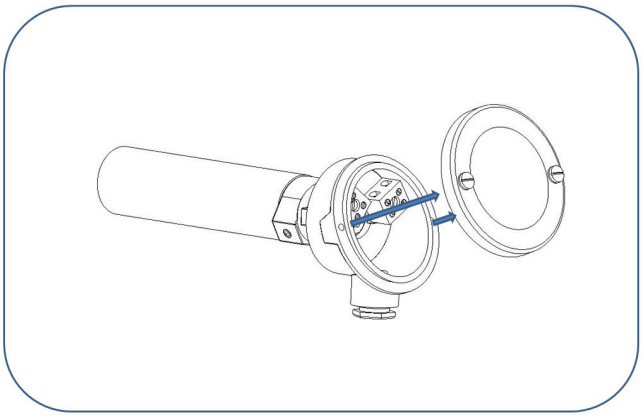
Material number	Description	Specification
509932	Test thermocouple 500 mm, type S DIN 60584-2, ends bared	10-000101-0500BL
509933	Test thermocouple 600 mm, type S DIN 60584-2, ends bared	10-000101-0600BL
509934	Test thermocouple 700 mm, type S DIN 60584-2, ends bared	10-000101-0700BL
509935	Test thermocouple 800 mm, type S DIN 60584-2, ends bared	10-000101-0800BL
520412	Test thermocouple 900 mm, type S DIN 60584-2, ends bared	10-000101-0900BL
509936	Test thermocouple 1000 mm, type S DIN 60584-2, ends bared	10-000101-1000BL
92000939	Test thermocouple 1100 mm, type S DIN 60584-2, ends bared	10-000101-1100BL
509937	Test thermocouple 1200 mm, type S DIN 60584-2, ends bared	10-000101-1200BL

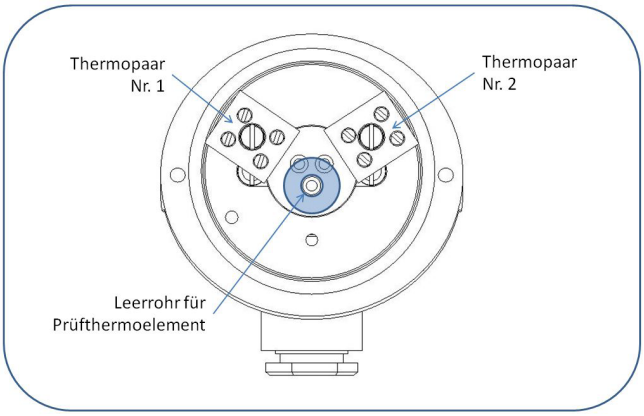
Testing thermocouple type S AMS 2750, with 2,5 m compensating line and bared ends

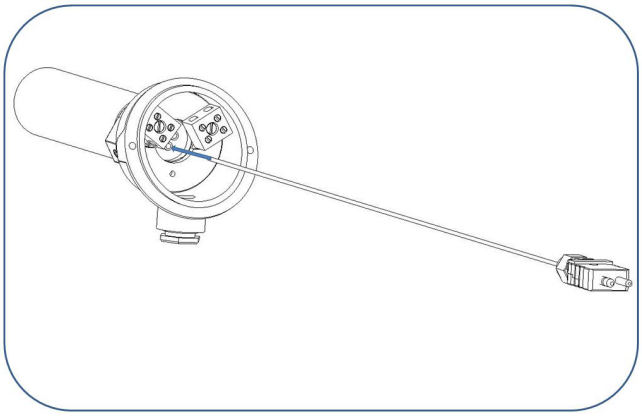
Material number	Description	Specification
92000940	Test thermocouple 500 mm, type S AMS 2750, ends bared	10-010101-0500BL
92000941	Test thermocouple 600 mm, type S AMS 2750, ends bared	10-010101-0600BL
510501	Test thermocouple 700 mm, type S AMS 2750, ends bared	10-010101-0700BL
520400	Test thermocouple 800 mm, type S AMS 2750 ends bared	10-010101-0800BL
520465	Test thermocouple 900 mm, type S AMS 2750, ends bared	10-010101-0900BL
92000943	Test thermocouple 1000 mm, type S AMS 2750, ends bared	10-010101-1000BL
92000942	Test thermocouple 1100 mm, type S AMS 2750, ends bared	10-010101-1100BL
92000944	Test thermocouple 1200 mm, type S AMS 2750, ends bared	10-010101-1200BL

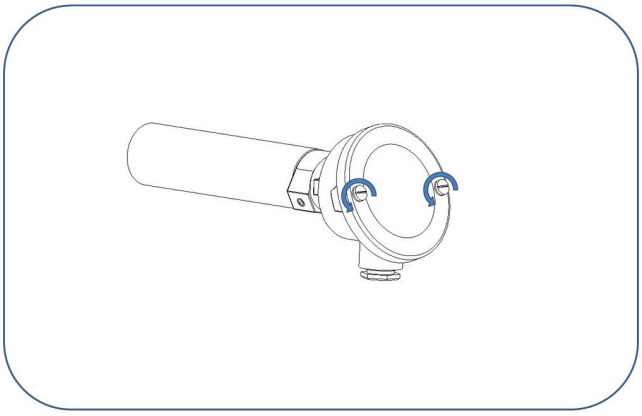
Overview

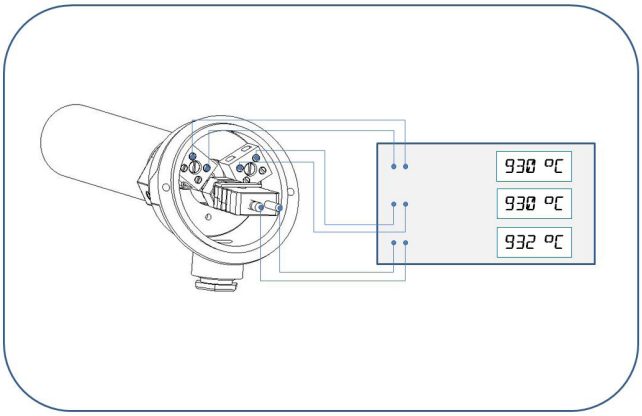





Thermopaar
Nr. 1
Thermopaar
Nr. 2
Leerrohr für
Prüfthermoelement






930 °C
930 °C
932 °C

Mineral insulated - Thermocouples

Order chart

16 –	MMXXZZ –	DD –	F –	LLLLL–AAAA
	MM – Sheath material 01 – W1.4845 (ASTM 310 S) 02 – W2.4816 (Inconel© 600) 03 – Parent Material* 04 – PtRh13% *XX – No of thermocouples pair (TP)* 01 – 1 TP 02 – 2 TP 03 – 3 TP *ZZ – TP alloy* 01 – PtRh10% - Pt (Type S) 02 – PtRh13% - Pt (Type R) 03 – PtRh30% - PtRh16 (Type B) 04 – NiCr – Ni (Type K) 05 – NiCrSi – NiSi (Type N) 06 – Fe – CuNi (Type J)	*DD – Diameter* 10 – 1,0 mm 15 – 1,5 mm ... 80 – 8,0 mm	*F – Form* C – Coil S – Straight	*LLLL – Nominal length [mm]* 0100 – 100 mm ... 5000 – 5 m *AAAA – Connection cold end* BL30 – End dismantled 30 mm MC – Miniature - connector MCH – Miniature - connector High Temperature MCU – Miniature - connector Ultra-High Temperature MCC – Miniature - connector ceramic SC – Standard - connector SCH – Standard - connector High Temperature SCU – Standard - connector Ultra-High Temperature SCC – Standard - connector ceramic DSC – Duplex Standard - connector S1 – LEMO connector type S1 S2 – LEMO connector type S2 S3 – LEMO connector type S3

** Parent Material: Basic material is similar to one of the thermocouple's alloys known by the trade name Pyrosil or Super-Omega-Clad-XL.*

Notice for the use of MI - thermocouples

Notice for the use of MI - thermocouples

Due to the vast amount of different designs you will find just a small list of examples here. By using the order charts you may to set up your individual type. We will be pleased to submit our respecting quotation.

Furthermore we would like to draw your attention to the table below. Here you will find our recommendations in terms of diameter and sheath alloy. If you need more details or support in this regard, please send us your inquiry.

Type K (NiCr – Ni)

Diameter wires [mm]	*Diameter sheath [mm]*	*Sheath alloy*	*Virtual measure-ment-point[1] [mm]*	*Recommended max. temperature[2] [°C]*
0,20	1,0	W2.4816	1-2	750
0,35	2,0	W2.4816	2-3	950
0,35	3,0	W2.4816	4-6	990
0,50	4,5	W2.4816	6 – 8	1000
0,50	6,0	W2.4816	8 - 10	1050

Type N (NiCrSi - NiSi)

Diameter wires [mm]	*Diameter sheath [mm]*	*Sheath alloy*	*Virtual measure-ment-point[1] [mm]*	*Recommended max. temperature[2] [°C]*
0,20	1,0	W2.4816	1-2	900
0,35	2,0	W2.4816	2-3	1000
0,35	3,0	W2.4816	4-6	1100
0,5	4,5	W2.4816	6 – 8	1200
0,5	6,0	W2.4816	8 - 10	1200

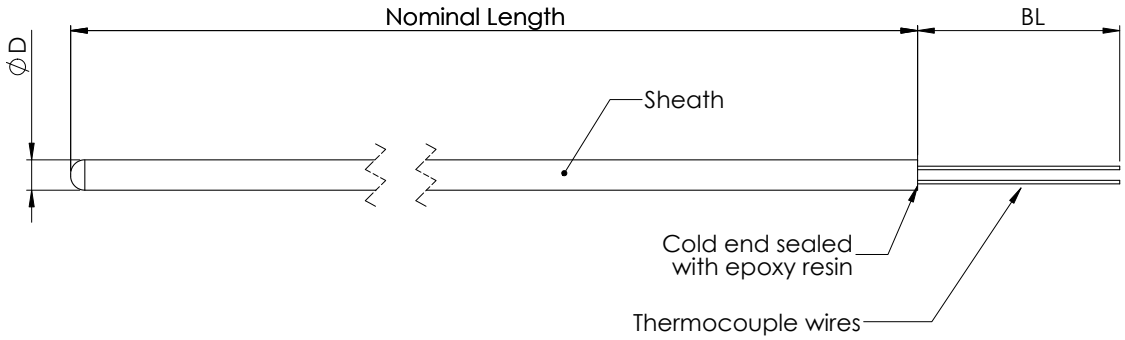
[1] Due to the constant loss of heat through the sheath, the measurement point is not located at the top end of the thermocouple, but is shifted towards the cold end. The distance of the virtual measurement point is shown in the chart. In order to measure the correct temperature, the thermocouple needs to be inserted deeper into the measuring area by the given millimeters.

Especially when measuring surfaces, it is very important to consider the virtual measurement point, because only the tip of the thermocouple is in contact with the material. The recommended minimum contact area is 10 times the diameter of the thermocouple.

[2] The DIN EN 60584-1 specifies 1200°C as the maximum temperature for the classes 1 and 2. Experiments have proven that beginning with 900°C, the drift is considerably. For the use of thermocouples in higher temperatures, the number of furnace measurements and times of operation should be limited to avoid measuring errors. The recommended temperature is a result of the balance between acceptable measuring errors and operating times.

Dismantled with blank wires

Cold end 30 mm (BL) dismantled



-

Sheath alloy W2.4816 (Inconel© 600), Diameter 1,0 mm

Product-No	Description	Specification
92000545	MI - thermocouple 1 x Type K 1,0 x 500 End dismantled W2.4816	16-020104-10-C-0500-BL30
92000546	MI - thermocouple 1 x Type K 1,0x1000 End dismantled W2.4816	16-020104-10-C-1000-BL30
92000547	MI - thermocouple 1 x Type K 1,0x1500 End dismantled W2.4816	16-020104-10-C-1500-BL30
92000548	MI - thermocouple 1 x Type K 1,0x2000 End dismantled W2.4816	16-020104-10-C-2000-BL30

Sheath alloy W2.4816 (Inconel© 600), Diameter 1,5 mm

Product-No	Description	Specification
92000561	MI - thermocouple 1 x Type K 1,5x500 End dismantled W2.4816	16-020104-15-C-0500-BL30
92000562	MI - thermocouple 1 x Type K 1,5x1000 End dismantled W2.4816	16-020104-15-C-1000-BL30
92000563	MI - thermocouple 1 x Type K 1,5x1500 End dismantled W2.4816	16-020104-15-C-1500-BL30
92000564	MI - thermocouple 1 x Type K 1,5x2000 End dismantled W2.4816	16-020104-15-C-2000-BL30

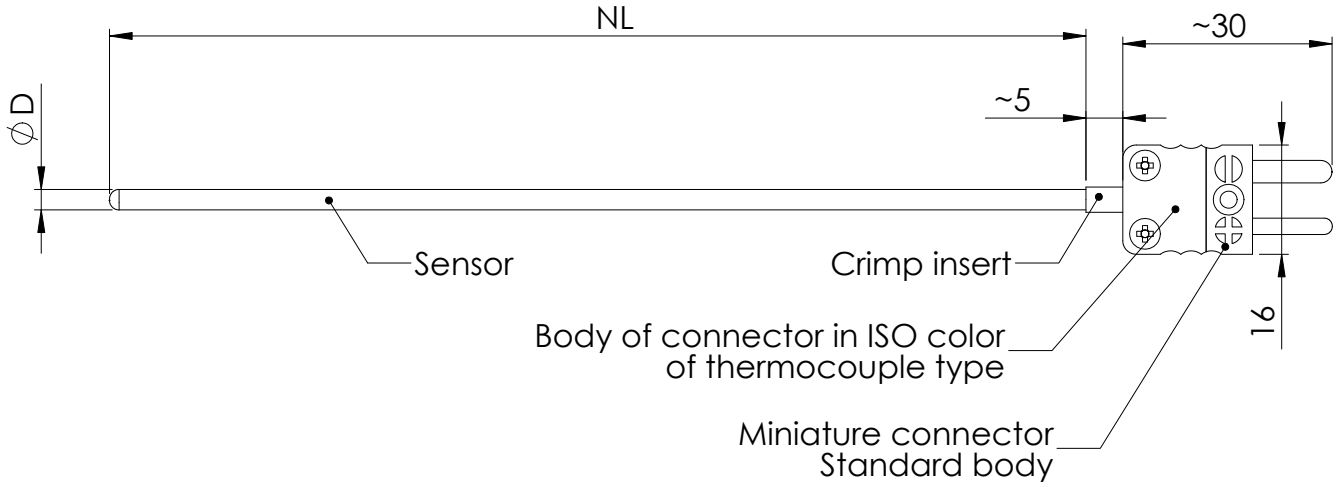
Sheath alloy W2.4816 (Inconel© 600), Diameter 2,0 mm

Product-No	Description	Specification
92000577	MI - thermocouple 1 x Type K 2,0x500 End dismantled W2.4816	16-020104-20-C-0500-BL30
92000578	MI - thermocouple 1 x Type K 2,0x1000 End dismantled W2.4816	16-020104-20-C-1000-BL30
92000579	MI - thermocouple 1 x Type K 2,0x1500 End dismantled W2.4816	16-020104-20-C-1500-BL30
92000580	MI - thermocouple 1 x Type K 2,0x2000 End dismantled W2.4816	16-020104-20-C-2000-BL30

Assembled with miniature - connectors

Assembled with miniature - connectors

Miniature - connector and crimped strain relief



Sheath alloy W2.4816 (Inconel© 600), Diameter 1,0 mm

Product-No	Description	Specification
92000541	MI - thermocouple 1 x Type K 1,0x500 MC W2.4816	16-020104-10-C-0500-MC
92000542	MI - thermocouple 1 x Type K 1,0x1000 MC W2.4816	16-020104-10-C-1000-MC
92000543	MI - thermocouple 1 x Type K 1,0x1500 MC W2.4816	16-020104-10-C-1500-MC
92000544	MI - thermocouple 1 x Type K 1,0x2000 MC W2.4816	16-020104-10-C-2000-MC

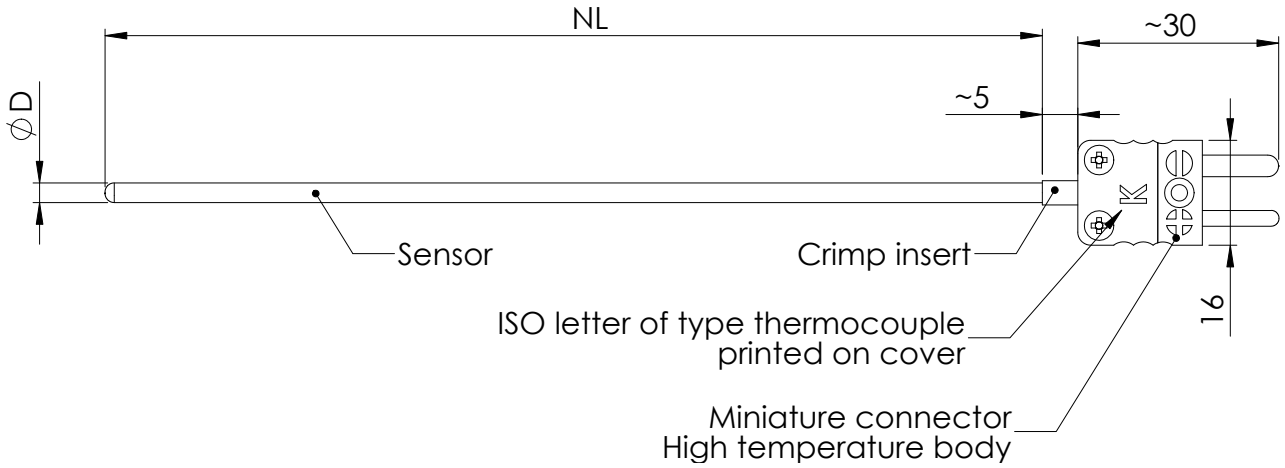
Sheath alloy W2.4816 (Inconel© 600), Diameter 2,0 mm

Product-No	Description	Specification
92000573	MI - thermocouple 1 x Type K 2,0x500 MC W2.4816	16-020104-20-C-0500-MC
92000574	MI - thermocouple 1 x Type K 2,0x1000 MC W2.4816	16-020104-20-C-1000-MC
92000575	MI - thermocouple 1 x Type K 2,0x1500 MC W2.4816	16-020104-20-C-1500-MC
92000576	MI - thermocouple 1 x Type K 2,0x2000 MC W2.4816	16-020104-20-C-2000-MC

Sheath alloy W2.4816 (Inconel© 600), Diameter 3,0 mm

Product-No	Description	Specification
92000597	MI - thermocouple 1 x Type K 3,0x500 MC W2.4816	16-020104-30-C-0500-MC
92000598	MI - thermocouple 1 x Type K 3,0x1000 MC W2.4816	16-020104-30-C-1000-MC
92000599	MI - thermocouple 1 x Type K 3,0x1500 MC W2.4816	16-020104-30-C-1500-MC
92000600	MI - thermocouple 1 x Type K 3,0x2000 MC W2.4816	16-020104-30-C-2000-MC

High temperature miniature - connector and crimped strain relief



Sheath alloy W2.4816 (Inconel© 600), Diameter 1,0 mm

Product-No	Description	Specification
92001093	MI - thermocouple 1 x Type K 1,0x500 MCH W2.4816	16-020104-10-C-0500-MCH
92001094	MI - thermocouple 1 x Type K 1,0x1000 MCH W2.4816	16-020104-10-C-1000-MCH
92001095	MI - thermocouple 1 x Type K 1,0x1500 MCH W2.4816	16-020104-10-C-1500-MCH
92001096	MI - thermocouple 1 x Type K 1,0x2000 MCH W2.4816	16-020104-10-C-2000-MCH

Sheath alloy W2.4816 (Inconel© 600), Diameter 1,5 mm

Product-No	Description	Specification
92001117	MI - thermocouple 1 x Type K 1,5x500 MCH W2.4816	16-020104-15-C-0500-MCH
92001118	MI - thermocouple 1 x Type K 1,5x1000 MCH W2.4816	16-020104-15-C-1000-MCH
92001119	MI - thermocouple 1 x Type K 1,5x1500 MCH W2.4816	16-020104-15-C-1500-MCH
92001120	MI - thermocouple 1 x Type K 1,5x2000 MCH W2.4816	16-020104-15-C-2000-MCH

Sheath alloy W2.4816 (Inconel© 600), Diameter 2,0 mm

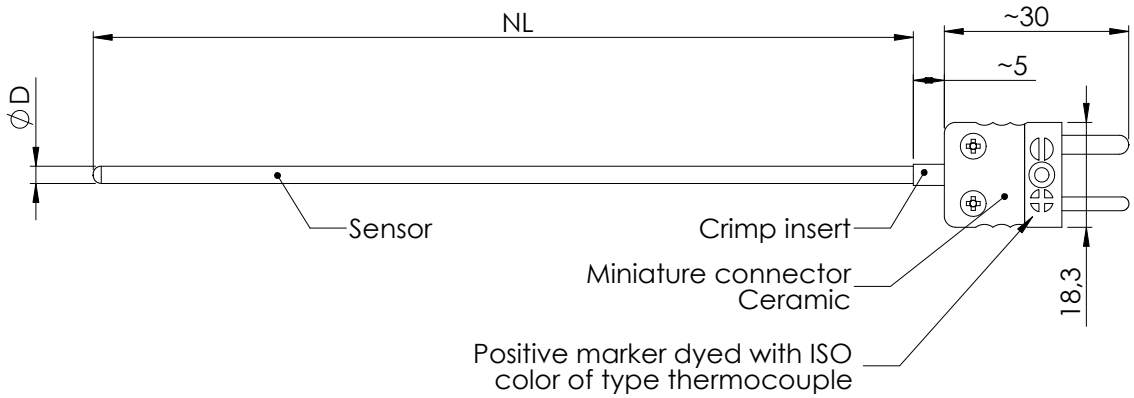
Product-No	Description	Specification
92001152	MI - thermocouple 1 x Type K 2,0x500 MCH W2.4816	16-020104-20-C-0500-MCH
92001153	MI - thermocouple 1 x Type K 2,0x1000 MCH W2.4816	16-020104-20-C-1000-MCH
92001154	MI - thermocouple 1 x Type K 2,0x1500 MCH W2.4816	16-020104-20-C-1500-MCH
92001155	MI - thermocouple 1 x Type K 2,0x2000 MCH W2.4816	16-020104-20-C-2000-MCH

Sheath alloy W2.4816 (Inconel© 600), Diameter 3,0 mm

Product-No	Description	Specification
92001184	MI - thermocouple 1 x Type K 3,0x500 MCH W2.4816	16-020104-30-C-0500-MCH
92001185	MI - thermocouple 1 x Type K 3,0x1000 MCH W2.4816	16-020104-30-C-1000-MCH
92001186	MI - thermocouple 1 x Type K 3,0x1500 MCH W2.4816	16-020104-30-C-1500-MCH
92001187	MI - thermocouple 1 x Type K 3,0x2000 MCH W2.4816	16-020104-30-C-2000-MCH

Assembled with miniature - connectors

Ceramic miniature - connector and crimped strain relief



Sheath alloy W2.4816 (Inconel© 600), Diameter 1,0 mm

Product-No	Description	Specification
92001101	MI - thermocouple 1 x Type K 1,0x500 MCC W2.4816	16-020104-10-C-0500-MCC
92001102	MI - thermocouple 1 x Type K 1,0x1000 MCC W2.4816	16-020104-10-C-1000-MCC
92001103	MI - thermocouple 1 x Type K 1,0x1500 MCC W2.4816	16-020104-10-C-1500-MCC
92001104	MI - thermocouple 1 x Type K 1,0x2000 MCC W2.4816	16-020104-10-C-2000-MCC

Sheath alloy W2.4816 (Inconel© 600), Diameter 1,5 mm

Product-No	Description	Specification
92001133	MI - thermocouple 1 x Type K 1,5x500 MCC W2.4816	16-020104-15-C-500-MCC
92001134	MI - thermocouple 1 x Type K 1,5x1000 MCC W2.4816	16-020104-15-C-1000-MCC
92001135	MI - thermocouple 1 x Type K 1,5x1500 MCC W2.4816	16-020104-15-C-1500-MCC
92001136	MI - thermocouple 1 x Type K 1,5x2000 MCC W2.4816	16-020104-15-C-2000-MCC

Sheath alloy W2.4816 (Inconel© 600), Diameter 2,0 mm

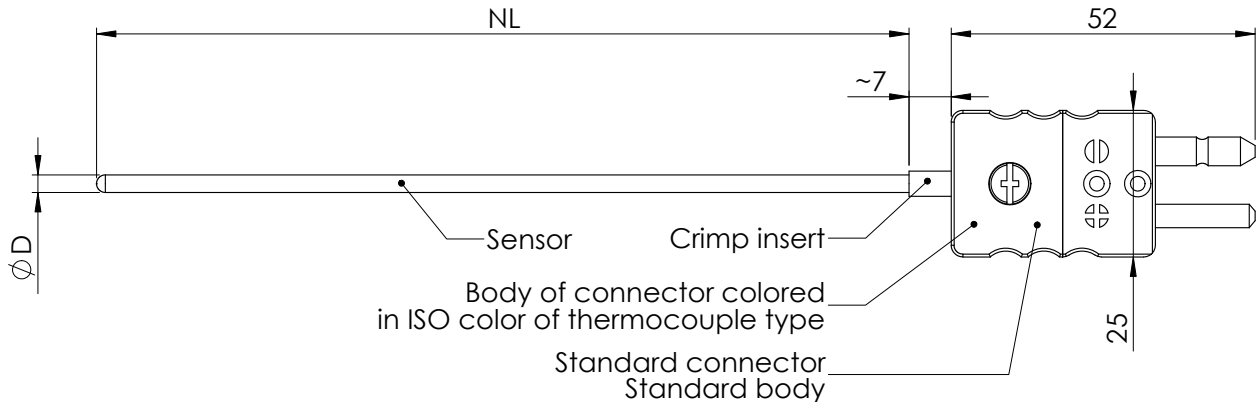
Product-No	Description	Specification
92001168	MI - thermocouple 1 x Type K 2,0x500 MCC W2.4816	16-020104-20-C-500-MCC
92001169	MI - thermocouple 1 x Type K 2,0x1000 MCC W2.4816	16-020104-20-C-1000-MCC
92001170	MI - thermocouple 1 x Type K 2,0x1500 MCC W2.4816	16-020104-20-C-1500-MCC
92001171	MI - thermocouple 1 x Type K 2,0x2000 MCC W2.4816	16-020104-20-C-2000-MCC

Sheath alloy W2.4816 (Inconel© 600), Diameter 3,0 mm

Product-No	Description	Specification
92001200	MI - thermocouple 1 x Type K 3,0x500 MCC W2.4816	16-020104-30-C-0500-MCC
92001201	MI - thermocouple 1 x Type K 3,0x1000 MCC W2.4816	16-020104-30-C-1000-MCC
92001202	MI - thermocouple 1 x Type K 3,0x1500 MCC W2.4816	16-020104-30-C-1500-MCC
92001203	MI - thermocouple 1 x Type K 3,0x2000 MCC W2.4816	16-020104-30-C-2000-MCC

Assembled with standard - connectors

Standard - connector and crimped strain relief



Sheath alloy W2.4816 (Inconel© 600), Diameter 1,0 mm

Product-No	Description	Specification
92000537	MI - thermocouple 1 x Type K 1,0x500 SC W2.4816	16-020104-10-C-0500-SC
92000538	MI - thermocouple 1 x Type K 1,0x1000 SC W2.4816	16-020104-10-C-1000-SC
92000539	MI - thermocouple 1 x Type K 1,0x1500 SC W2.4816	16-020104-10-C-1500-SC
92000540	MI - thermocouple 1 x Type K 1,0x2000 SC W2.4816	16-020104-10-C-2000-SC

Sheath alloy W2.4816 (Inconel© 600), Diameter 2,0 mm

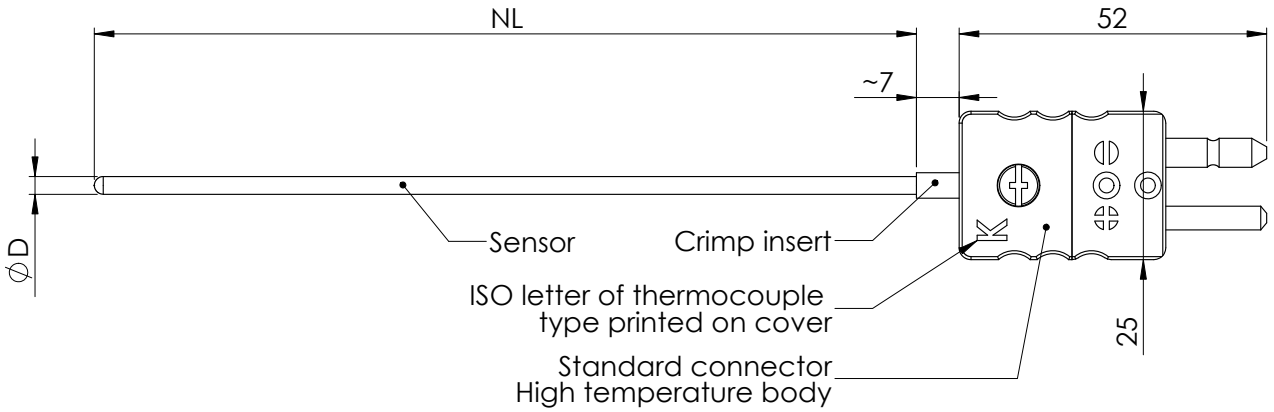
Product-No	Description	Specification
92000569	MI - thermocouple 1 x Type K 2,0x500 SC W2.4816	16-020104-20-C-0500-SC
92000570	MI - thermocouple 1 x Type K 2,0x1000 SC W2.4816	16-020104-20-C-1000-SC
92000571	MI - thermocouple 1 x Type K 2,0x1500 SC W2.4816	16-020104-20-C-1500-SC
92000572	MI - thermocouple 1 x Type K 2,0x2000 SC W2.4816	16-020104-20-C-2000-SC

Sheath alloy W2.4816 (Inconel© 600), Diameter 3,0 mm

Product-No	Description	Specification
92000593	MI - thermocouple 1 x Type K 3,0x500 SC W2.4816	16-020104-30-C-0500-SC
92000594	MI - thermocouple 1 x Type K 3,0x1000 SC W2.4816	16-020104-30-C-1000-SC
92000595	MI - thermocouple 1 x Type K 3,0x1500 SC W2.4816	16-020104-30-C-1500-SC
92000596	MI - thermocouple 1 x Type K 3,0x2000 SC W2.4816	16-020104-30-C-2000-SC

Assembled with standard - connectors

High temperature standard - connector and crimped strain relief



Sheath alloy W2.4816 (Inconel© 600), Diameter 1,0 mm

Product-No	Description	Specification
92001085	MI - thermocouple 1 x Type K 1,0x500 SCH W2.4816	16-020104-10-C-0500-SCH
92001086	MI - thermocouple 1 x Type K 1,0x1000 SCH W2.4816	16-020104-10-C-1000-SCH
92001087	MI - thermocouple 1 x Type K 1,0x1500 SCH W2.4816	16-020104-10-C-1500-SCH
92001088	MI - thermocouple 1 x Type K 1,0x2000 SCH W2.4816	16-020104-10-C-2000-SCH

Sheath alloy W2.4816 (Inconel© 600), Diameter 1,5 mm

Product-No	Description	Specification
92001125	MI - thermocouple 1 x Type K 1,5x500 SCH W2.4816	16-020104-15-C-0500-SCH
92001126	MI - thermocouple 1 x Type K 1,5x1000 SCH W2.4816	16-020104-15-C-1000-SCH
92001127	MI - thermocouple 1 x Type K 1,5x1500 SCH W2.4816	16-020104-15-C-1500-SCH
92001128	MI - thermocouple 1 x Type K 1,5x2000 SCH W2.4816	16-020104-15-C-2000-SCH

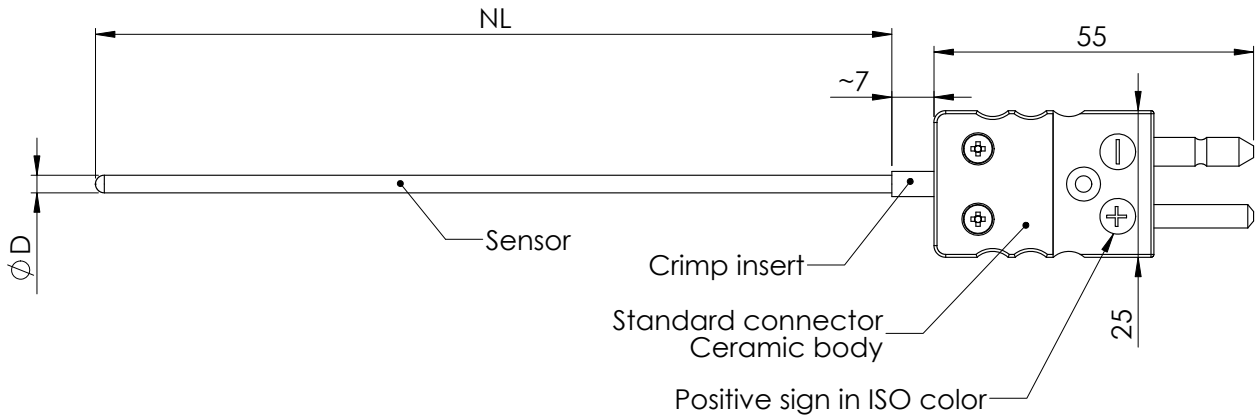
Sheath alloy W2.4816 (Inconel© 600), Diameter 2,0 mm

Product-No	Description	Specification
92001160	MI - thermocouple 1 x Type K 2,0x500 SCH W2.4816	16-020104-20-C-0500-SCH
92001161	MI - thermocouple 1 x Type K 2,0x1000 SCH W2.4816	16-020104-20-C-1000-SCH
92001162	MI - thermocouple 1 x Type K 2,0x1500 SCH W2.4816	16-020104-20-C-1500-SCH
92001163	MI - thermocouple 1 x Type K 2,0x2000 SCH W2.4816	16-020104-20-C-2000-SCH

Sheath alloy W2.4816 (Inconel© 600), Diameter 3,0 mm

Product-No	Description	Specification
92001192	MI - thermocouple 1 x Type K 3,0x500 SCH W2.4816	16-020104-30-C-0500-SCH
92001193	MI - thermocouple 1 x Type K 3,0x1000 SCH W2.4816	16-020104-30-C-1000-SCH
92001194	MI - thermocouple 1 x Type K 3,0x1500 SCH W2.4816	16-020104-30-C-1500-SCH
92001195	MI - thermocouple 1 x Type K 3,0x2000 SCH W2.4816	16-020104-30-C-2000-SCH

With ceramic standard-connector and crimped strain relief



Sheath alloy W2.4816 (Inconel© 600), Diameter 1,0 mm

Product-No	Description	Specification
92001109	MI - thermocouple 1 x Type K 1,0x500 SCC W2.4816	16-020104-10-C-0500-SCC
92001110	MI - thermocouple 1 x Type K 1,0x1000 SCC W2.4816	16-020104-10-C-1000-SCC
92001111	MI - thermocouple 1 x Type K 1,0x1500 SCC W2.4816	16-020104-10-C-1500-SCC
92001112	MI - thermocouple 1 x Type K 1,0x2000 SCC W2.4816	16-020104-10-C-2000-SCC

Sheath alloy W2.4816 (Inconel© 600), Diameter 1,5 mm

Product-No	Description	Specification
92001141	MI - thermocouple 1 x Type K 1,5x500 SCC W2.4816	16-020104-15-C-0500-SCC
92001142	MI - thermocouple 1 x Type K 1,5x1000 SCC W2.4816	16-020104-15-C-1000-SCC
92001143	MI - thermocouple 1 x Type K 1,5x1500 SCC W2.4816	16-020104-15-C-1500-SCC
92001144	MI - thermocouple 1 x Type K 1,5x2000 SCC W2.4816	16-020104-15-C-2000-SCC

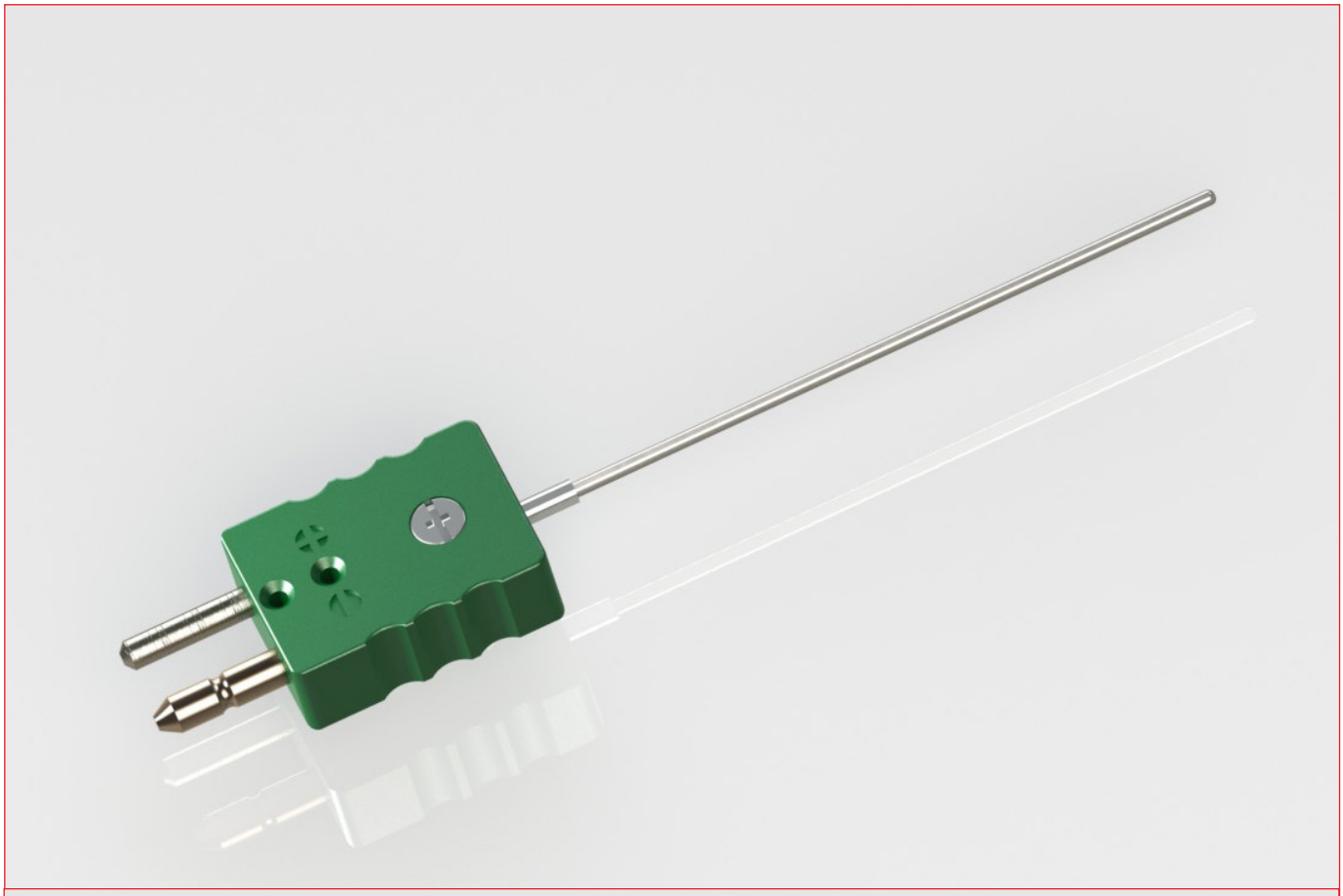
Sheath alloy W2.4816 (Inconel© 600), Diameter 2,0 mm

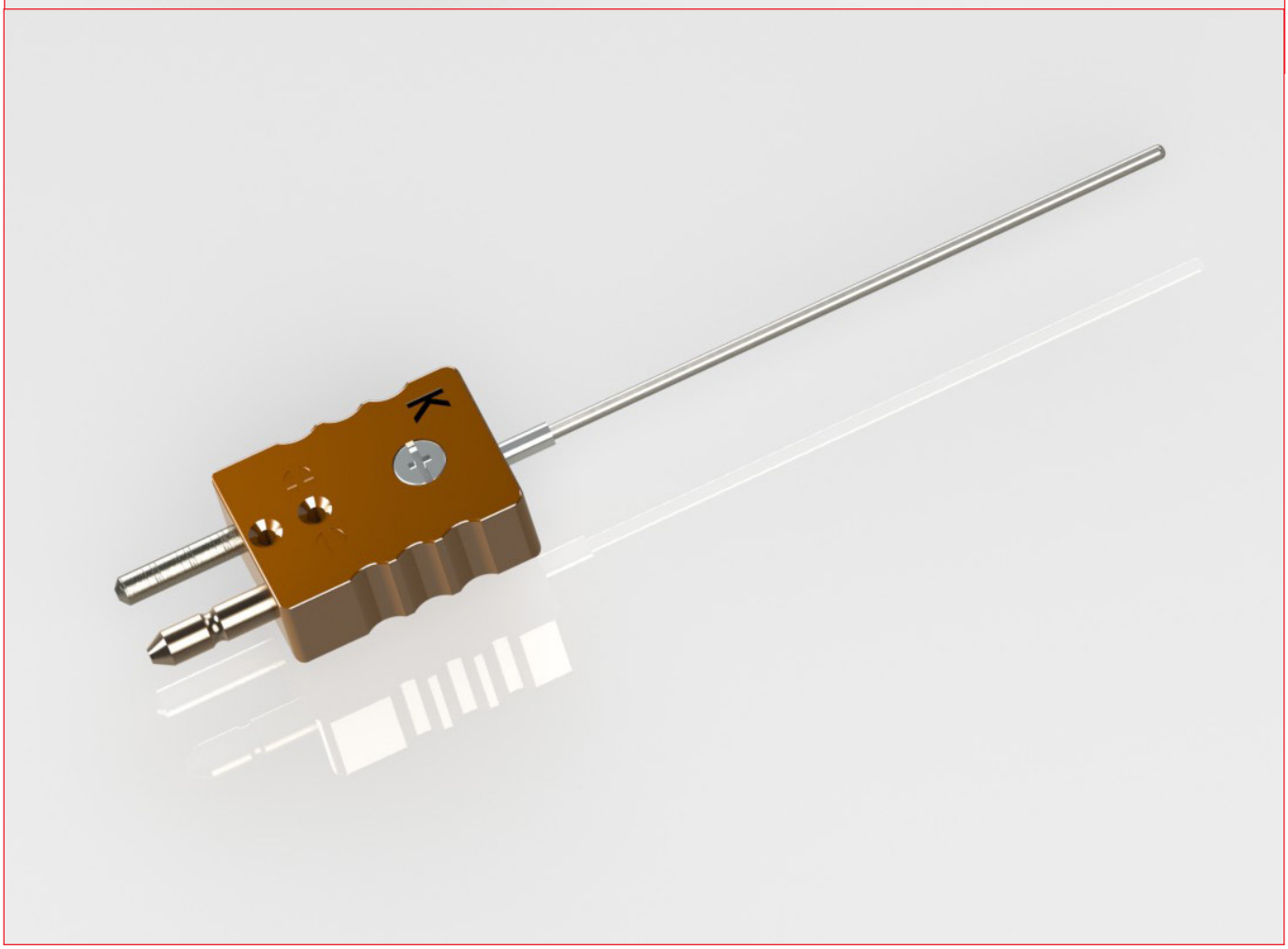
Product-No	Description	Specification
92001176	MI - thermocouple 1 x Type K 2,0x500 SCC W2.4816	16-020104-20-C-0500-SCC
92001177	MI - thermocouple 1 x Type K 2,0x1000 SCC W2.4816	16-020104-20-C-1000-SCC
92001178	MI - thermocouple 1 x Type K 2,0x1500 SCC W2.4816	16-020104-20-C-1500-SCC
92001179	MI - thermocouple 1 x Type K 2,0x2000 SCC W2.4816	16-020104-20-C-2000-SCC

Sheath alloy W2.4816 (Inconel© 600), Diameter 3,0 mm

Product-No	Description	Specification
92001208	MI - thermocouple 1 x Type K 3,0x500 SCC W2.4816	16-020104-30-C-0500-SCC
92001209	MI - thermocouple 1 x Type K 3,0x1000 SCC W2.4816	16-020104-30-C-1000-SCC
92001210	MI - thermocouple 1 x Type K 3,0x1500 SCC W2.4816	16-020104-30-C-1500-SCC
92001211	MI - thermocouple 1 x Type K 3,0x2000 SCC W2.4816	16-020104-30-C-2000-SCC

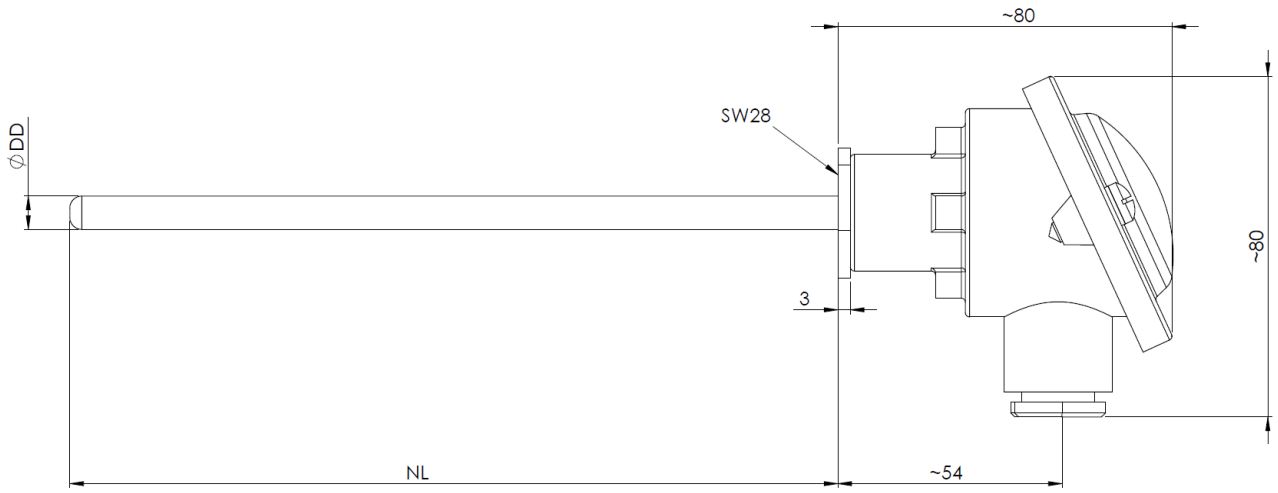
Assembled with standard - connectors





Assembled with connection head

With connection head form B without extension wire



Sheath alloy W2.4816 (Inconel© 600), Diameter 3,0 mm

Product-No	Description	Specification
92002108	MI - thermocouple 3,0 x NL500, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-30-S-0500-BA
92002109	MI - thermocouple 3,0 x NL600, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-30-S-0600-BA
92002110	MI - thermocouple 3,0 x NL700, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-30-S-0700-BA
92002111	MI - thermocouple 3,0 x NL800, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-30-S-0800-BA

Sheath alloy W2.4816 (Inconel© 600), Diameter 4,5 mm

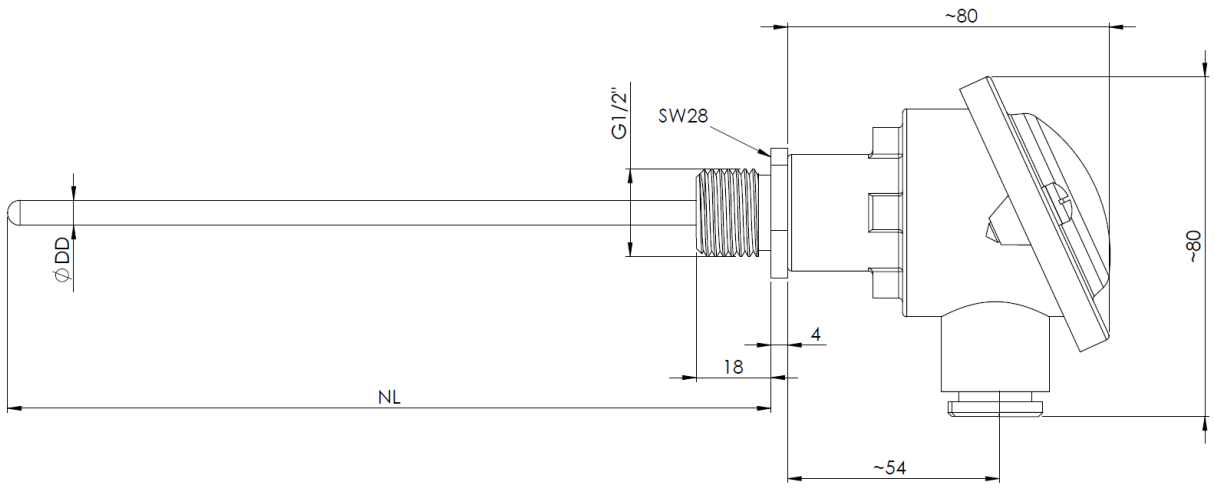
Product-No	Description	Specification
92002112	MI - thermocouple 4,5 x NL500, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-45-S-0500-BA
92002113	MI - thermocouple 4,5 x NL600, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-45-S-0600-BA
92002114	MI - thermocouple 4,5 x NL700, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-45-S-0700-BA
92002115	MI - thermocouple 4,5 x NL800, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-45-S-0800-BA

Sheath alloy W2.4816 (Inconel© 600), Diameter 6,0 mm

Product-No	Description	Specification
92002116	MI - thermocouple 6,0 x NL500, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-60-S-0500-BA
92002117	MI - thermocouple 6,0 x NL600, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-60-S-0600-BA
92002118	MI - thermocouple 6,0 x NL700, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-60-S-0700-BA
92002119	MI - thermocouple 6,0 x NL800, mit 1 x Type K (NiCr-NiAl) and connection head B	16-020104-60-S-0800-BA

Assembled with connection head

Built with connection head form B and G1/2inch process thread



Sheath alloy W2.4816 (Inconel© 600), Diameter 3,0 mm

Product-No	Description	Specification
92002120	MI - thermocouple 3,0 x NL500, mit 1 x Type K (NiCr-NiAl) , head BA and G1/2“ process thread	16-020104-30-S-0500-BG12
92002121	MI - thermocouple 3,0 x NL600, mit 1 x Type K (NiCr-NiAl) , head BA and G1/2“ process thread	16-020104-30-S-0600-BG12
92002122	MI - thermocouple 3,0 x NL700, mit 1 x Type K (NiCr-NiAl) , head BA and G1/2“ process thread	16-020104-30-S-0700-BG12

Sheath alloy W2.4816 (Inconel© 600), Diameter 4,5 mm

Product-No	Description	Specification
92002123	MI - thermocouple 4,5 x NL500, mit 1 x Type K (NiCr-NiAl) , head BA and G1/2“ process thread	16-020104-45-S-0500-BG12
92002124	MI - thermocouple 4,5 x NL600, mit 1 x Type K (NiCr-NiAl) , head BA and G1/2“ process thread	16-020104-45-S-0600-BG12
92002125	MI - thermocouple 4,5 x NL700, mit 1 x Type K (NiCr-NiAl) , head BA and G1/2“ process thread	16-020104-45-S-0700-BG12

Sheath alloy W2.4816 (Inconel© 600), Diameter 6,0 mm

Product-No	Description	Specification
92002126	MI - thermocouple 6,0 x NL500, mit 1 x Type K (NiCr-NiAl) , head BA and G1/2“ process thread	16-020104-60-S-0500-BG12
92002127	MI - thermocouple 6,0 x NL600, mit 1 x Type K (NiCr-NiAl) , head BA and G1/2“ process thread	16-020104-60-S-0600-BG12
92002128	MI - thermocouple 6,0 x NL700, mit 1 x Type K (NiCr-NiAl) , head BA and G1/2“ process thread	16-020104-60-S-0700-BG12

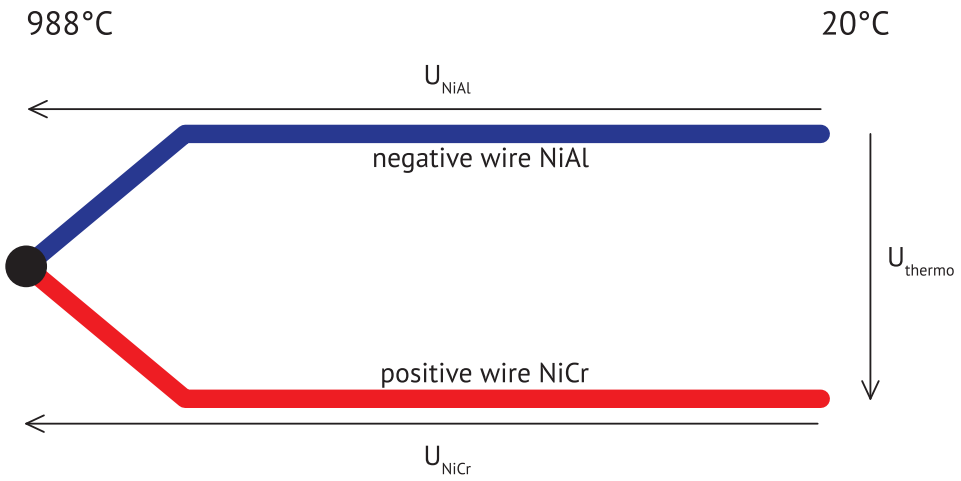
General information about thermocouples

Thermocouple thermometers (also referred to as thermocouples) are used in many areas of temperature measurement. They are characterized by a high flexibility of construction and a fast response.

Especially in areas above 500 ° C thermocouples are the most common.

The thermocouple voltage

Generation of thermoelectric voltage using the example of the type K thermocouple



$U_{thermo} = U_{NiAl} - U_{NiCr} = {}_{14}0\ mV - 80\ mV = {}_{4}\underline{0\ mV}$

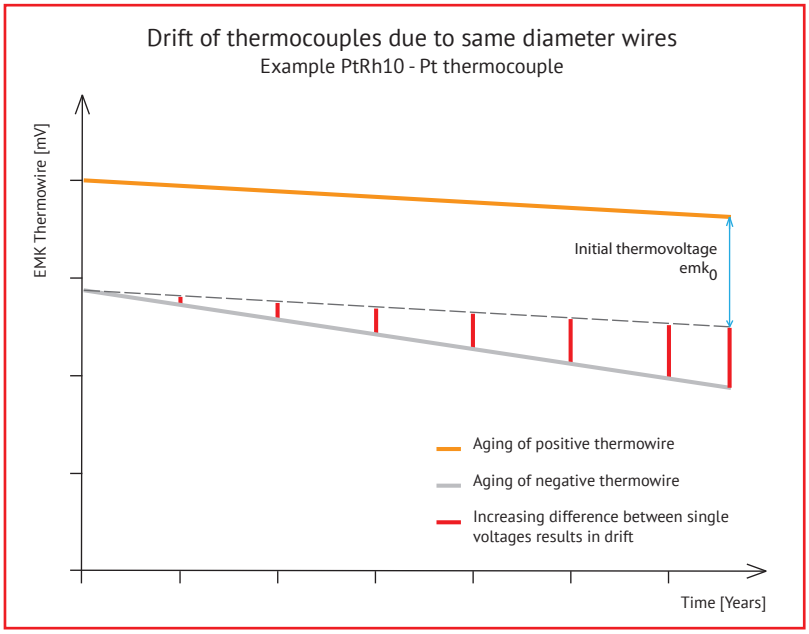
The thermocouple consists of two wires, which consist of different alloys. Each of these wires develops a certain oltage as soon as one end is warmer than the other. If you now connect both wires, then the difference of the respective voltage in the wire can be measured. This difference is referred to as thermoelectric voltage.

Different alloy pairings have proven to be advantageous because they have an almost linear voltage profile to the temperature. It is important to know that the actual thermoelectric voltage arises in the respective wire and that it can not be measured.

Type	Positive ire [plus]	Negative wire [minus]	Color DIN [plus / minus]	Temperature range [°C]
J	CuNi	Fe	black / white	-200 +750
K	NiCr	NiAl	green / white	-200 +1100
N	NiCrSi	NiSi	pink / white	-200 +1200
S	PtRh10%	Pt	orange / white	0 +1600
R	PtRh13%	Pt	orange / white	0 +1600
B	PtRh30%	PtRh6%	grey / white	+600 +1700
C	WRe25%	WRe5%	red / white	0 +2200

Deviation / Drift

In DIN EN 60584-1, the thermovoltages are given for the respective alloy pairs and temperatures. However, as these are the result of a difference in the true thermoelectric voltage (namely, that which arises in the wire), the values can only be considered approximate.



In addition, manufacturing factors such as the homogeneity and composition of the alloy of the thermo-wire play a decisive role in the development of the thermoelectric voltage. Accordingly, deviations of the thermo-electric voltage are an unavoidable fact. This is taken into account in DIN EN 60584-2, in which the permissible deviations are divided into classes.

Type	Class 1	Class 2	Class 3
Type J			
Temperature range	-40°C to 375°C	-40°C to 333°C	-
Max. error.	± 1,5 °C	± 2,5 °C	-
Temperature range	375°C to 750°C	333°C to 750°C	-
Max. error.	± 0,4% · | *t* |	± 0,75% · | *t* |	-
Type K, Type N			
Temperature range	-40°C to 375°C	-40°C to 333°C	-167°C to +40°C
Max. error.	± 1,5 °C	± 2,5 °C	± 1,5 °C
Temperature range	375°C to 1200°C	333°C to 1200°C	-200°C to -167°C
Max. error.	± 0,4% · | *t* |	± 0,75% · | *t* |	± 1,5% · | *t* |
Type S, Type R			
Temperature range	0°C to 1100°C	0°C to 600°C	-
Max. error.	± 1,0 °C	± 1,5 °C	-
Temperature range	1100°C to 1600°C	600°C to 1600°C	-
Max. error.	± [1 + 0,3% · (*t* - 1100)]°C	± 0,25% · | *t* |	-
Type B			
Temperature range	-	-	600°C to 800°C
Max. error.	-	-	± 4,0 °C
Temperature range	-	600°C - 1700°C	800°C to 1700°C
Max. error.	-	± 0,25% · | *t* |	± 0,5% · | *t* |

Deviation / Drift

The chemical change of the alloys, for example due to thermal aging or chemical contamination, also changes the thermoelectric property. This causes thermal stresses to arise which no longer correspond to the original state assumed in the standard. This is called drift, which, depending on the type of damage, can develop at different rates.Ausführungen

Basically, the thermocouples are divided into three different versions:

- unprotected
- protected by metallic sheath
- protected in ceramic / metallic thermowells

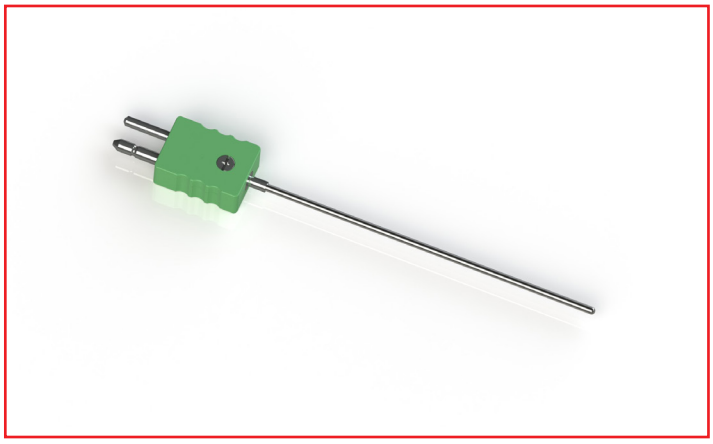
The remarks will briefly be described below.

Unprotected

Here, the bare thermo wire is used, which is only protected by insulators from a short circuit. These insulators are often ceramic sleeves which are threaded onto the wire. This is true in areas where the thermowire is not chemically affected and requires a very fast response time. For example, tungsten / rhenium thermocouples are used in hydrogen stoves in this embodiment.

Protected by metallic coat

Often referred to as coat or towed thermocouple execution is most commonly used. Here, the thermocouple wires are electrically insulated by an oxide powder (usually magnesium oxide) and fixed in a continuous tube made of stainless steel. This is rolled on coils and is available from very small diameters of 0.1 mm for medical applications to several millimeters Ø.



As sheath different types of stainless steel can be found according to the chemical requirements. In the area of heat treatment, versions in W.14841 or W2.4816 (Inconel 600) can often be found. But exotic designs, such as platinum / rhodium alloys, are sometimes found.

In addition to the very inexpensive production of the endless tube, the flexibility of the jacket thermocouples is another advantage.

Protected in metallic / ceramic thermowells

Particularly in areas with high thermal / mechanical requirements, additional protection mechanisms had to be developed to allow correct measurement.

thermo-control thermocouples

For example, in the field of heat treatment systems, high thermal loads often lead to mechanical deformations of the sheath thermocouples described above. To prevent this, the jacket thermocouples were placed in an additional metallic protective tube, so that the measurement always takes place in the same place.

thermo-control Körtvélyessy GmbH was one of the first manufacturers to produce thermocouples with thin-walled ceramic thermowells at the end of the 1980s.

These have the great advantage that virtually no deformation takes place at 1800°C. Due to the thin-walled design also very good properties against thermal shock are given, as well as an improved reaction time to temperature fluctuations.

The figure above shows a thermo-control Körtvélyessy GmbH shielding gas thermocouple, in which two single crystal Al_2O_3 thermowells have been used.

thermo-control thermocouples

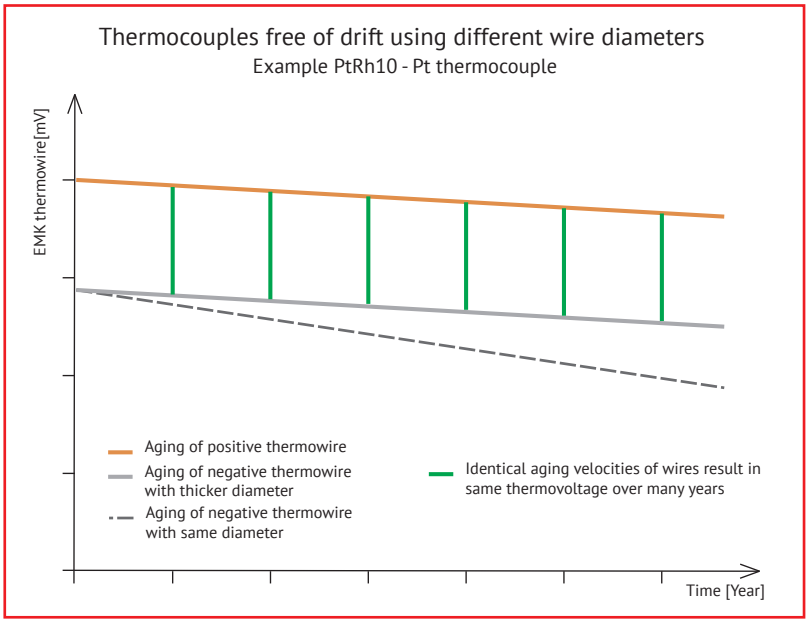
thermo-control Körtvélyessy GmbH specializes in the construction of high-precision and durable platinum / rhodium thermocouples.

These are characterized by the following properties:

- Drift-free measurement over many years (4 years under warranty)
- Separate guidance of the installed thermocouples in ceramic thermowells
- Arrangement of an additional empty tube for the in-situ inspection of the built-in thermocouples by a calibrated test thermocouple
- Contacting the measuring tip to the inside of the ceramic protective tube to increase the reaction time to temperature changes

Non drifting PtRh-Pt Thermocouples

Due to the aging of the thermo wires, the thermoelectric property is changed. Since the two alloys must be different so that a thermoelectric voltage can be measured, the rate at which aging occurs is also different in speed. This changes the difference in the voltage; The result is the so-called drift.



After much research, thermo-control Körtvélyessy GmbH has succeeded in adjusting the diameters of the individual thermo wires so that the speed of aging is equally fast. The patented result is that the difference between the two thermo-wire voltages always remains the same. The thermocouple is therefore free from drift, even after 5 years of continuous load at 1200 ° C.

However, this mechanism is lost when the thermowells are mechanically or chemically damaged and the thermocouple wires are exposed to the atmosphere / vacuum contaminants. Therefore, damaged thermocouples should not continue to be operated if possible, but should be sent in immediately for repair.Verwendung separater Schutzrohre

The use of separate thermowells offers many advantages that greatly increase the process reliability of the thermocouple.

Damage to the thermowells is usually not all broken. The unprotected thermocouple develops a drift, as the thermo-wire is chemically altered by diffusion of foreign substances. This usually leaves a thermocouple protected from the atmosphere and retains its freedom from drift. A constant comparison of the displays can be realized by any control and so early a drift development can be detected.

At the latest during the routine inspection of the thermocouple by a test thermocouple, the difference in the display of the installed thermocouples is determined and the replacement of the thermocouple can be initiated.

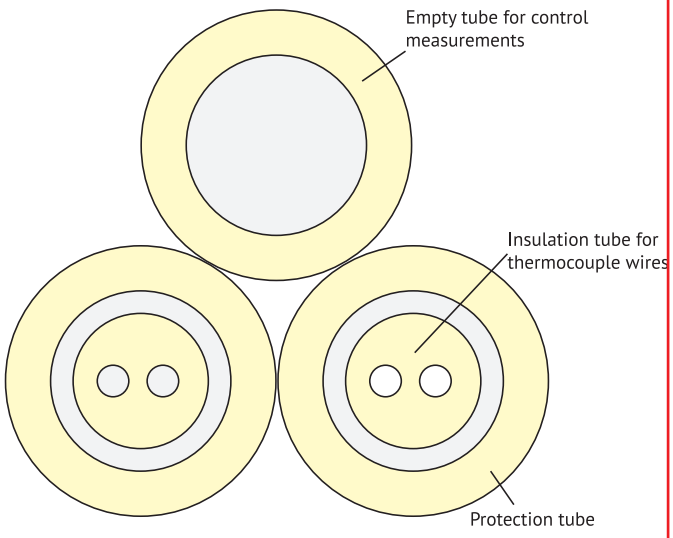
If all thermocouples are installed in a thermowell, they will all be chemically altered if damaged. A drift may be detected too late.

Additional empty tube for test measurements

For a long time, the review of the thermocouples was very cumbersome. Either they had to be removed and recalibrated in an external laboratory or compared by installing a second calibrated thermocouple in a neighboring bushing. Both procedures are very costly and unnecessarily tie up capital and working hours.

Separate protection tubes

Cross secton of a thermo-control thermocouple with 2 thermocouples and one empty tube



Due to the patented arrangement of an additional empty pipe, the thermo-control Körtvélyessy GmbH can make the inspection in the installed state, without affecting the current production.

The additional empty pipe is located directly next to the equipped protective pipes. Now, if a corresponding test thermocouple is inserted into the empty tube, you get a very accurate comparison measurement.

It is recommended that when purchasing new thermocouples you also purchase a test thermocouple from the same wire batch. Thus, the conversion of the measured values is avoided, since all thermocouples have the same original deviation and in this case corresponds to the relative deviation of the actual.

Memos

Sales agents

Oxygen probes can be purchased in below mentioned region through these companies:

Southeast Europe

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H-S-K Heat Treatment Service Doni Kurti

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E-Mal: info@h-s-k-net

http://www.h-s-k.net

P.R. China

Ms. Wang Fang

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Zertificates / Other ID's

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NATO-Supplier-ID	: 837462912

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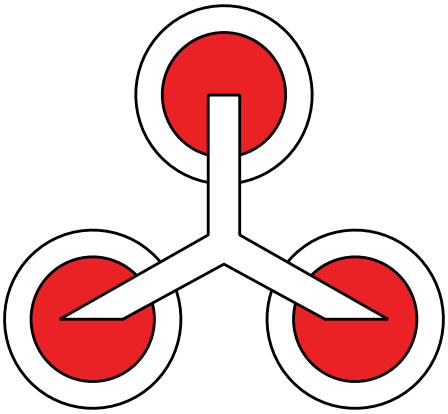

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