



GÜNTHER^{GmbH}

Temperaturmesstechnik



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Product category 35-WGG
Angular Thermocouple Assemblies
with Bent or Welded Protection Tube

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Angular Thermocouple Assemblies with Bent or Welded Protection Tube

Angular thermocouple assemblies with bent or welded protection tube (35-WGG) are primarily used for temperature measurement in metal smelting and salt baths.

The angular shape allows for placement of the connector head away from the actual bath/melt in order to avoid direct exposure to high temperatures and aggressive vapours.

As an alternative to the installed thermocouple, numerous angular thermocouple assemblies may be fitted with a mineral-insulated gauge slide, which can have several crucial advantages:

- Optimal protection of the inner conductors from corrosion, oxidation, physical damage, and chemical contamination due to the enclosed structure of the outer insulation.
- Increased stability of the electrical insulation compared to ceramic insulated thermocouples.

In order to ensure functionality of the thermocouple assembly during a suitable timeframe, careful consideration should be used when selecting the materials for thermocouple and protective tube depending on the operating conditions.

Thermoelectric voltages and tolerances of our thermocouples and mineral-insulated gauge slides are pursuant to DIN EN 60584, class 1, for thermocouples and mineral-insulated gauge slides of type L pursuant to DIN 43710.

Recommended Protection Tube Materials in Salt Baths

Smelter	Maximum Temperature	Materials
Tenifer®	600°C	Titanium NT
Saltpetre-, Chloride- & Cyanogen containing	1000°C	Pure Iron
Annealing, Tempering and Hardening Baths	1300°C	1.4821

Recommended Protection Tube Materials in Metal Smelting:

Aluminium	700°C	SiN SiC
Magnesium Al/Mg-Alloys	700°C	Pure Iron SiN
Lead	600°C	SiN
Zinc	600°C	Pure Iron / Steel / SiN
Copper	1200°C	1.4762 Graphite
Brass	900°C	1.4762 / Graphite / SiN





① Connection Head

A	B
AUS	BUS
AUZ	BUZ
AUZH	BUZH
AUSH	BBK

② Protection Tube/Supporting Tube (Materials)

High-Grade Steel	1.4571
	1.4541
	1.4404
Heat-Resistant Steels	1.4762
	1.4841
	1.4893
	1.4749
Pure Iron	

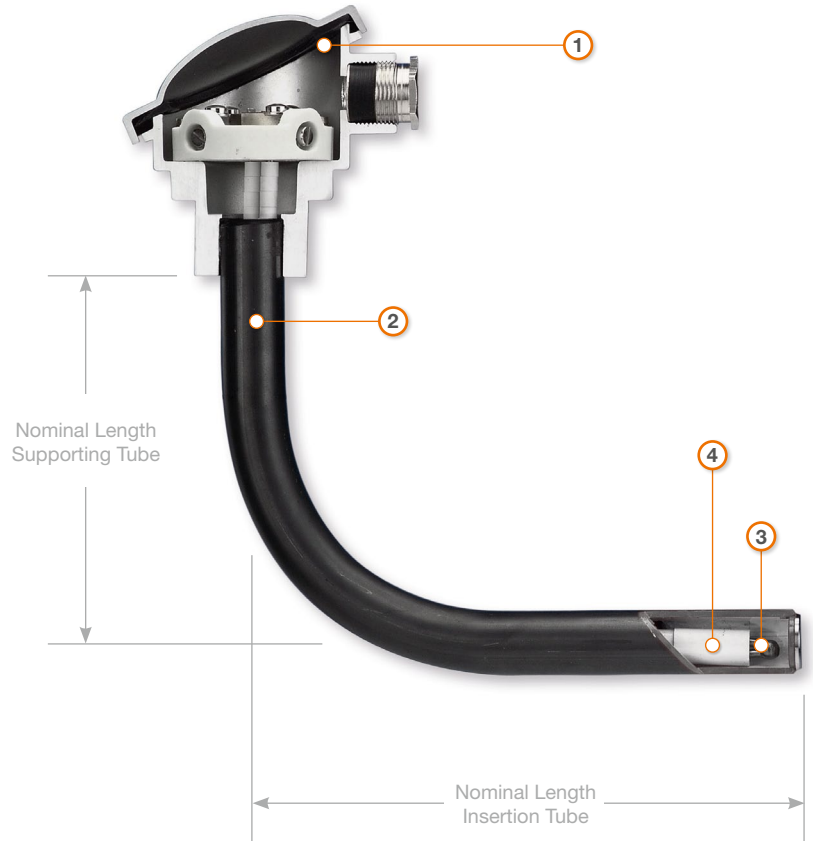
③ Ceramic Insulated Thermocouple

NiCr-Ni/K
Fe-CuNi/L
Fe-CuNi/J
Nicrosil-Nisil/N
Single or Double

④ Mineral insulated Gauge Slide

NiCr-Ni	
Fe-CuNi	
Fe-CuNi	
Nicrosil-Nisil	
Mantle Diameter:	3,0 - 8,0 mm
Single or Double	

Example of a common implementation in this product line



Individual Solutions such as, for example materials, process connectors, accessories, etc. not listed here, are often viable.

Please contact us for further information!

**35 - WGG // Angle thermocouples curved out of one segment
Angle thermocouples with welded together dip and carrier tube**

Article number

- x

Protection tube curved at a right angle, with a connection head

Protection tube 15 x 2 mm / mat. no.1.4571 / with connection head Type B	811	100
Protection tube 15 x 2 mm / mat. no.1.0305 / with connection head Type B	811	200
Protection tube 22 x 2 mm / mat. no.1.4571 / with connection head Type A	812	100
Protection tube 22 x 2 mm / mat. no.1.0305 / with connection head Type A	812	200
Protection tube 22 x 5 mm / pure iron / with connection head Type A	813	300

Protection tube welded at a right angle, with a connection head

Protection tube 15 x 2 mm / mat. no.1.4571 / with connection head Type B	821	100
Protection tube 15 x 2 mm / mat. no.1.0305 / with connection head Type B	821	200
Protection tube 22 x 2 mm / mat. no.1.4571 / with connection head Type A	822	100
Protection tube 22 x 2 mm / mat. no.1.0305 / with connection head Type A	822	200
Protection tube 22 x 5 mm / pure iron / with connection head Type A	823	300

The last two digits are replaced with "xx" for models without a connection head

Welded thermowell

Dimensions in [mm]	Material				
	1.0305	1.4571	1.4762	1.4841	2.4816
12 x 1	11 xxxx	12 xxxx	13 xxxx	14 xxxx	15 xxxx
12 x 1.5	21 xxxx	22 xxxx	23 xxxx	24 xxxx	25 xxxx
15 x 2	31 xxxx	32 xxxx	33 xxxx	34 xxxx	35 xxxx
15 x 3	41 xxxx	42 xxxx	43 xxxx	44 xxxx	45 xxxx
16 x 2	51 xxxx	52 xxxx	53 xxxx	54 xxxx	55 xxxx
22 x 2	61 xxxx	62 xxxx	63 xxxx	64 xxxx	65 xxxx

(xxxx = length of the compensation cable in mm)

Carrier tube nominal length (mm)

Dip tube nominal length (mm)



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Thermocouple (type / number)

Ceramic insulation

	Standard	Double
NiCr-Ni/K	11	21
Fe-CuNi/J	12	22
Fe-CuNi/L	13	23
Nicrosil-Nisil/N	14	24

Sheath measurement insert

ø / mm	NiCr-Ni		Fe-CuNi		Fe-CuNi		Nicrosil-Nisil	
	Type KI		Type LV		Type JV		Type NI	
	Standard	Double	Standard	Double	Standard	Double	Standard	Double
3.0	31	41	51	61	71	81	91	94
4.5	32	42	52	62	72	82	92	95
6.0	33	43	53	63	73	83	93	96
8.0	34	44	-	-	-	-	-	-

Custom designs:

- - x

Consecutive no.

Carrier tube nominal length (mm)

Dip tube nominal length (mm)