GÜNTHER GmbH
Temperaturmesstechnik

Product category 30-WTE
Angled Thermocouple Assemblies
with Threaded Elbow Tubing

30-WTE
Angled Thermocouple Assemblies with Threaded Elbow Tubing

Recommended Protection Tube Materials in Salt Baths

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

30-WTE
Angular Thermocouple Assemblies with Threaded Elbow Tubing

Angular thermocouple assemblies with threaded elbow tubing (30-WTE) 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/smelt in order to avoid direct exposure to high temperatures and aggressive vapours.

Angular thermocouple assemblies with threaded elbow tubing offer the advantages of an exchangeable immersion tube and the possibility of using more economic material for the supporting tube due to reduced ambient stress factors.

GÜNTHER GmbH has all prevalent angular thermocouples used in smelting and foundry technology. Standard assemblies with immersion tubes made of steel, pure iron, heat-resistant steels and special alloys are applied, as well as silicon nitride, graphite, SIC or special metal ceramics.
Optionally, these thermocouple assemblies may be fitted with in an internal ceramic tube, which significantly increases the long-term stability and electrical insulation in many application scenarios.
As an alternative to the installed thermocouple, numerous angular thermocouple assemblies may be fitted with a mineral-insulated gauge slide, which yields several crucial advantages, such as optimal protection of the inner conductors from corrosion, oxidation, physical damage, and chemical contamination due to the enclosed structure of the outer insulation.
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.

1 Connection Head

A	B
AUS	BUS
AUZ	BUZ
AUZH	BUZH
AUSH	BBK

2 Supporting Tube (Materials)

ST 35.8
1.4571

3 Insertion Tube

Pure Iron (Techn. Pure)	with Prot. Sleeve
Steel SL 25	Tapered Tip
Cast Iron GG-22	
Graphite	
Titanium	
Enamelled Steel	

Materials:

High-Grade Steel	1.4541
X10CrAl24	1.4762
X15CrNiSi 25 20	1.4841
Inconel	2.4816
SiN (Silicon Nitride)	
SiC (Silicon Carbide)	
Metal-Ceramic	
Quartz Glass	

4 Inner Tube

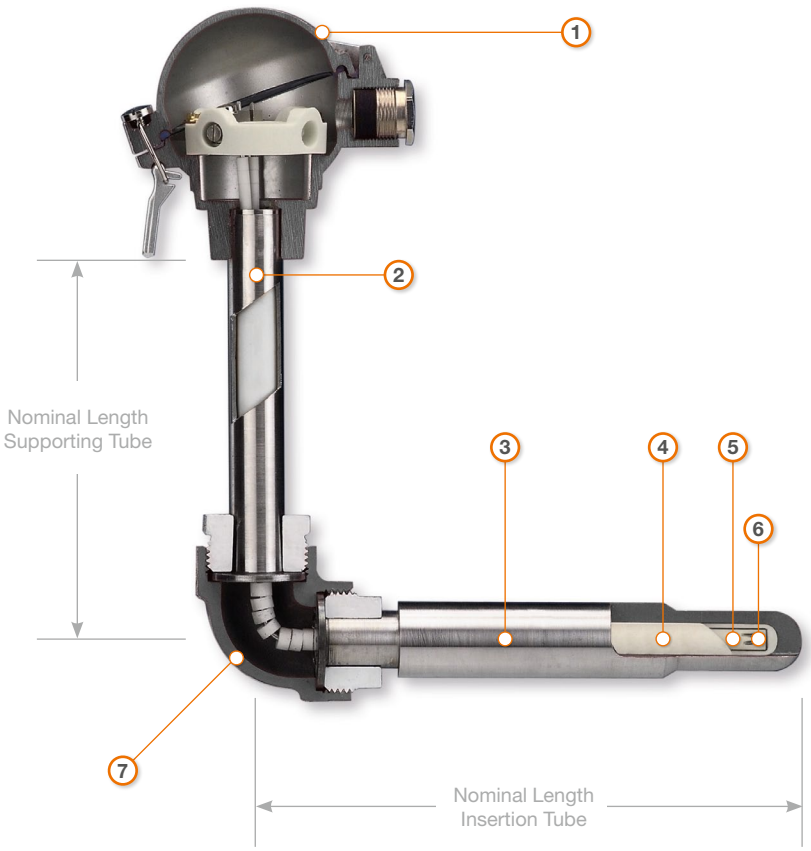
C610
C799

5 Mineral-Insulated Gauge Slide

NiCr-Ni	Typ KI
Fe-CuNi	Typ LV
Fe-CuNi	Typ JV
Nicrosil-Nisil	Typ NI
Mantle Diameter:	3,0 - 8,0 mm
Single or Double	

Further technical information for this product line is available on our website: http://www.guenther.eu/en/products/thermocouples/30-wte/angle-thermocouples-with-bolted-central-angle

Example of a common implementation in this product line



6 Ceramic Insulated Thermocouple

NiCr-Ni/K
Fe-CuNi/L
Fe-CuNi/J
Nicrosil-Nisil/N
PtRh10-Pt/S
PtRh13-Pt/R
PtRh30-PtRh6/B
Single or Double

7 Angular Section

Elbow Pipe	3/4”
	3/8”
	1 1/4”
	1/2”

30 - WTE // Angle thermocouples with a bolted central angle

Metal protection tube + thermocouple: 3 0 - [ ][ ][ ][ ][ ][ ][ ][ ] - [ ][ ][ ][ ] x [ ][ ][ ][ ]

Nominal length Carrier tube (mm) | Nominal length Dip tube (mm)

Carrier tube (material / dimensions)	St 35.8	15 x 2	mm	**1**
	St 35.8	17 x 2.5	mm	**2**
	1.4571	15 x 2	mm	**3**
	1.4571	17 x 3	mm	**4**
	St 35.8	22 x 2	mm	**5**
	1.4571	22 x 2	mm	**6**

Head	A	**1**	B	**6**
	AUS	**2**	BUS	**7**
	AUZ	**3**	BUZ	**8**
	AUZH	**4**	BUZH	**9**
	AUSH	**5**	BBK	**0**

Thermocouple with ceramic insulation

	Standard	Double
NiCr-Ni/K	11	21
Fe-CuNi/J	12	22
Fe-CuNi/L	13	23
Nicrosil-Nisil/N	14	24
PtRh10-Pt/S	15	25
PtRh13-Pt/R	16	26
PtRh30-PtRh6/B	17	27

Sheath measurement insert

	NiCr-Ni Type KI		Fe-CuNi Type LV		Fe-CuNi Type JV		Nicrosil-Nisil Type NI	
ø / mm	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**	-	-	-	-	-	-

Dip tube (material / dimensions)

None, thermocouples freely protruding	**0 0**
Pure iron (techn. pure), ø = 22 x 5 mm, seamless	**1 1**
Pure iron (techn. pure), ø = 22 x 5 mm, with a protection sleeve	**1 2**
Steel SL 25 ø = 30 x 9 mm; point tapered (ø = 24) to 50 mm length	**1 3**
Grey cast iron GG-22, ø = 30 x 6 mm	**1 4**
Graphite ø = 40 x 11 mm	**1 5**
Graphite ø = 50 x 25 mm	**1 6**
Titanium ø = 18 x 1.5 mm pressed and welded	**1 7**
Titanium ø = 18 x 1.0 mm, with a welded round base	**1 8**
Glassed steel ø = 22 x 2 mm	**1 9**

Material	Number	Dimensions in mm				
		15 x 2	17 x 2	22 x 2	22 x 2.5	22 x 4
Stainless steel	1.4541	-	**3 1**	**4 1**	-	-
Stainless steel	1.4571	**2 2**	**3 2**	**4 2**	**5 2**	**6 2**
X10CrAl 24	1.4762	**2 3**	**3 3**	**4 3**	-	-
X15CrNiSi 25 20	1.4841	**2 4**	**3 4**	**4 4**	-	-
Alloy 600	2.4816	**2 5**	**3 5**	**4 5**	-	-

Inner tube

None		**0**
C610	gastight ceramic	**1**
C799	Aluminium oxide	**2**

Elbow:

Curved angle	3/4"	**1**
Curved angle	3/8"	**2**
Curved angle	1 1/4"	**3**
Curved angle	1/2"	**4**

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Consecutive no. | Nominal length Carrier tube (mm) | Nominal length Dip tube (mm)