

## SINGLE CORE HEATER WITH REAL COLD ENDS (customized design)

The cold ends of this heater type are without any change in diameter between heated part and cold ends. Due to this they can be fixed easily on surfaces, in grooves with small bending radius and optimal heat transfer at the hot cold area. The maximum working temperature is up to 1000°C. For contacting the heaters in vacuum or high temperature environment metal ceramic connectors are available. In atmosphere and environment up to 200°C a cable connection using a tightly encapsulated transition can be used.

Variants in line resistance		Standard Line resistance		High Line resistance	
Sheath Ø (mm)	Minimum hot part length (mm)	Hot part	Cold end	Hot part	Cold end
		1,0	250	12,5	<0,6
1,5	300	5,5	<0,3	12,5	<0,5
2,0	250	3,1	<0,15	7,0	<0,2
2,5	500	2,0	<0,1	4,5	<0,15
3,0	500	1,4	<0,07	3,1	<0,1
3,5	500	1,0	<0,05	2,3	<0,07
4,0	500	0,8	<0,04	1,8	<0,06

### ELECTRICAL CONNECTION

Mineral insulated (MI) cables require due to their special construction a special type of end contact sealing the cable. Due to the hygroscopic insulation material (MgO, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>) between current-carrying inner conductor and metallic sheath make it necessary to perform an excellent sealing of cable ends from the surround. For the contacting of the MI cable especially at high temperatures and in vacuum, **metal-ceramic** composite components have a big importance. For operating up to 200°C ambient temperature (in air or at a slight negative / positive pressure) can be made a **cable connection** using a tightly encapsulated.

Further information and designs of different electrical connectors on request.



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### TECHNICAL DATA'S / HANDLING:

- Resistance tolerance: +/-10% (standard)
- Sheath-Ø-tolerance: +/-0,05mm
- Core material: NiCr80/20 (standard)
- Sheath material: VA4 or I (standard)
- Bending radius: 2 - 3 x sheath-Ø
- Do not bend heater too often - depending from bending ratio and accumulated plastic deformations of the heater materials !
- Hot part length tolerance: hot part <
- 1m: +/-10%, above +/-5% (but min +/- 100mm)
- Cold part length: customized
- Max. voltage / power over sheath depending on sheath diameter, temperature gradient heater to heated parts / thermodynamic max. possible flow energy from heater to heated part and heating up cycles. Please refer to our technical sheet "Handling and operation of ThermSys mineral insulated heaters and applications" we send on request or you can download on our website.
- Mineral insulation: Magnesium Oxide (MgO), other insulation on request
- Recommended use: Stainless steel sheath up to 600°C,
- Alloy 600 sheath up to 1000°C



<b>Mater. nucleo</b>	K=Constantan	Ni=Nickel	NC=NiCr80/20	BA=NiFe70/30				
<b>Mater. guaina</b>	VA=AISI 304L	VA2=AISI 304	VA3=AISI 316L	VA4=AISI 321	VA5=AISI 316TI	VA6=AISI 314	VA7=AISI 309	VA8=AISI 310S
	I= Alloy 600	I2= Alloy 601	I3= Alloy 625	I4= Alloy 800	I5= Alloy 825			

