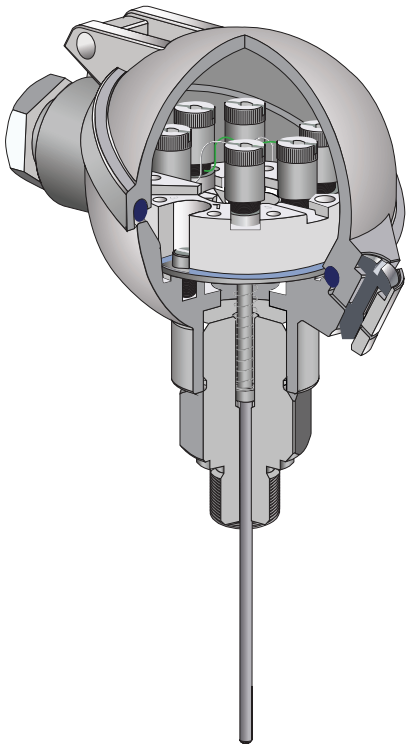
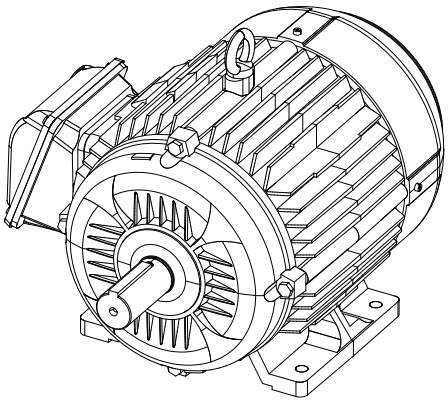
Application

- Measuring range: -40 .. +150 °C
- General mechanical engineering
- Temperature measurement of bearings
- General industrial services



Technical properties

- Made of sheathed cable, insulated inside with MgO
- Small dimensions (Ø 3.0 mm)
- Short response time for temperature change
- Metal sheath made of stainless steel AISI316
- Vibration resistant



Description

Mineral insulated thermocouples, also referred to as sheathed thermocouples, are made of metal sheathed cable with internal thermocouple wires are insulated from each other and from the outer sheath with magnesium oxide (MgO) powder. This provides the sensor with high vibration resistance, flexibility as well as resistance to temperature and with good electrical insulation.

These sensors are designed for direct temperature measuring in places with difficult access, as well as in all places, where it is required to use flexible sensors of small diameters, high resistance to vibrations and shock, and with short response time to temperature changes.

The complete sensor is equipped with a special spring, a threaded connector and an aluminum connection head.

All elements are made of non-magnetic stainless steel.

Other versions

This data sheet contains only a small portion of our program of supplying sheathed thermocouple thermometers for measuring temperature of bearings.

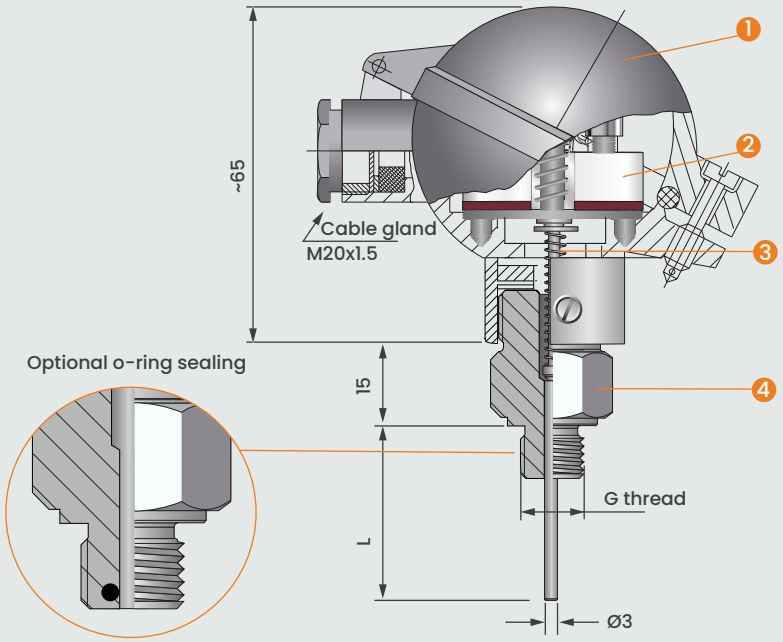
Other versions can be supplied upon customer's request.

MINERAL INSULATED THERMOCOUPLE

TYPE **TTP-323**

TERMO APARATURA WROCŁAW

Design



1. Connection head, Type NA (aluminum)
2. Ceramic terminal block, Type B10S-G4L
3. Spring
4. Process connection

Maximum 10mm of spring compensation for L length

Basic values of Thermocouples type J, K, N according to PN-EN 60584 / IEC 584

Temperature		°C	0	25	50	75	100	125	150
Basic value	Type J	mV	0.00	1.28	2.58	3.92	5.27	6.63	8.01
	Type K	mV	0.00	1.00	2.02	3.06	4.10	5.12	6.14
	Type N	mV	0.00	0.66	1.34	2.05	2.77	3.53	4.30
Tolerance	Class 1	°C	±1.5	±1.5	±1.5	±1.5	±1.5	±1.5	±1.5
	Class 2	°C	±2.5	±2.5	±2.5	±2.5	±2.5	±2.5	±2.5

Tolerances

PN-EN 60584 Standard defines the formulas for calculating acceptable measure tolerance. More information in the general thermocouple sheet.

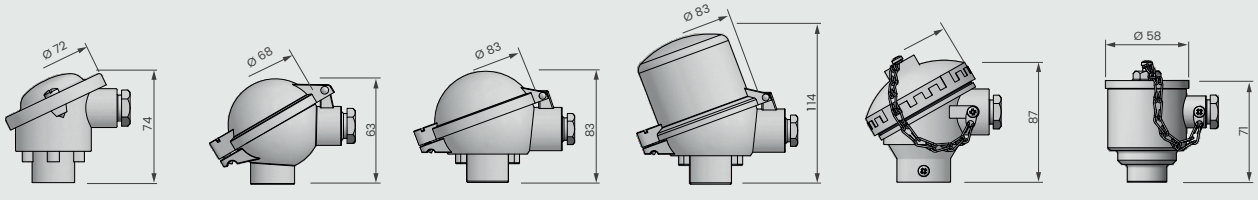
Type J (Fe-CuNi)

Class	Temperature range	Tolerance
1	-40 °C .. +375°C	± 1.5
	+375 °C .. +750°C	± 0.0040 x | t |
2	-40 °C .. +333°C	± 2.5
	+333 °C .. +750°C	± 0.0075 x | t |

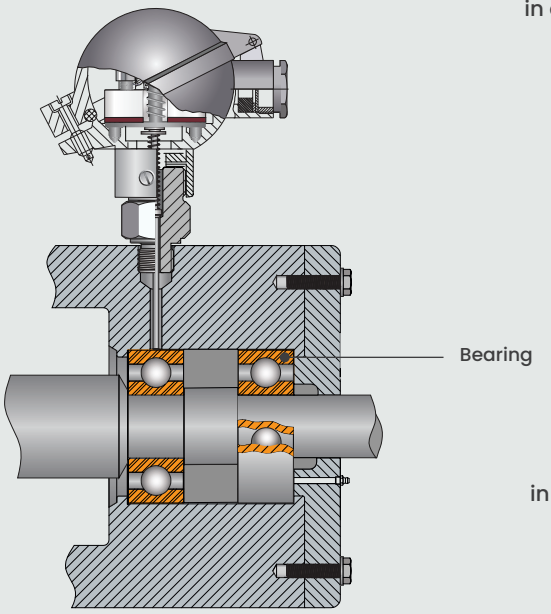
Type K (NiCr-Ni), Type N (NiCrSi-NiSi)

Class	Temperature range	Tolerance
1	-40 °C .. +375°C	± 1.5
	+375 °C .. +1000°C	± 0.0040 x | t |
2	-40 °C .. +333°C	± 2.5
	+333 °C .. +1200°C	± 0.0075 x | t |

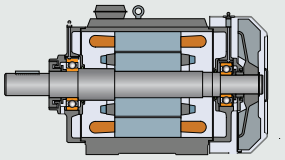
Connection heads



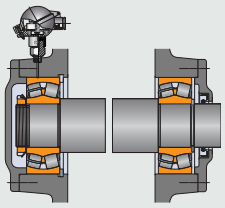
Example of installation



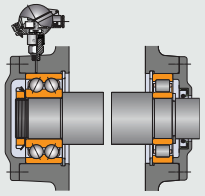
Rolling bearings and seals
in electric motors and generators



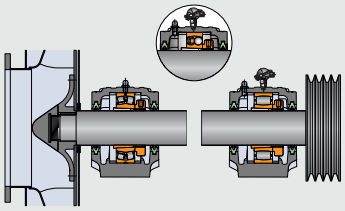
Spherical roller bearings
for wind turbine main shafts.



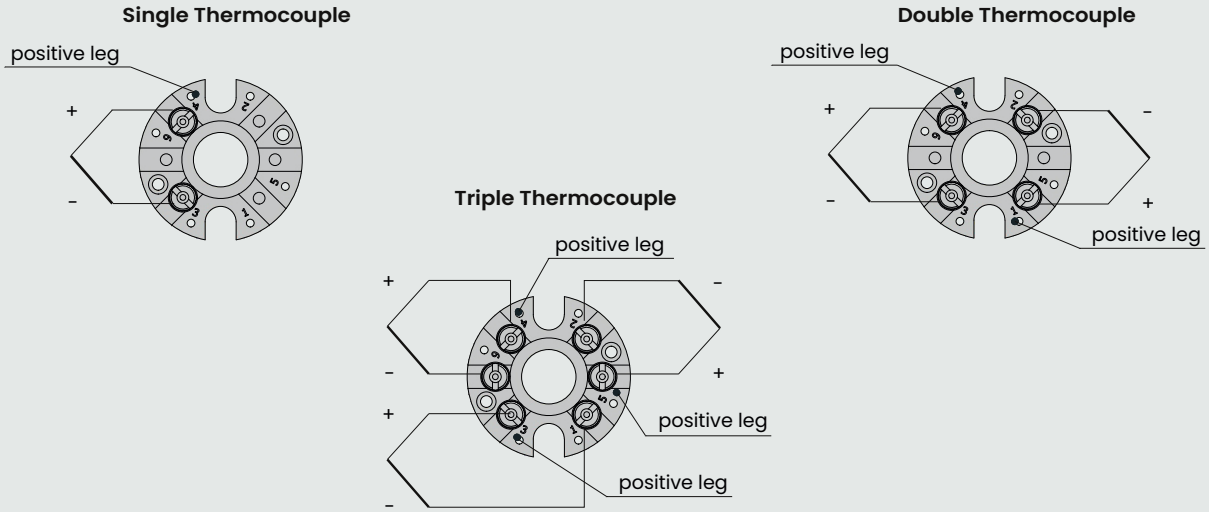
Rolling bearings and seals
in electric motors and generators



Process and hot gas fans



Electrical connection on Ceramic Block



Ordering code

1 2 3 4 5 6 7 8 9

☐ - **TTP-323** - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐ - ☐

Order	Parameter	Code	✓	Description			
1	Version		☐	Without transmitter			
		AP	☐	With installed transmitter 4..20 mA			
		APW	☐	With installed transmitter 4..20 mA and local LED display*			
		2AP	☐	With two installed transmitters 4..20 mA, Double thermocouple			
		3	☐	Triple thermocouple			
2	Thermocouple type	J	☐	Type J (Fe-CuNi)			
		K	☐	Type K (NiCr-Ni)			
		xxx	☐	Other, please specify			
3	Heads	NA	☐	Type NA	Aluminum	IP65	Cable gland: M20x1.5
		DAN	☐	Type DAN	Aluminum	IP65	Cable gland: M20x1.5
		DANW	☐	Type DANW	Aluminum	IP65	Cable gland: M20x1.5
		B	☐	Type B	Aluminum	IP65	Cable gland: M20x1.5
		BEG	☐	Type BEG	Stainless steel	IP65	Cable gland: M20x1.5
		xxx	☐	Other, please specify			
4	Length L	55	☐	55 mm			
		105	☐	105 mm			
		xxx	☐	Other, please specify			
5	Process connection G	M10x1	☐	M10x1			
		M12x1.5	☐	M12x1.5			
		M14x1.5	☐	M14x1.5			
		xxx	☐	Other, please specify			
6	Tolerance class	1	☐	Class 1 according to PN-EN 60584-1			
		2	☐	Class 2 according to PN-EN 60584-1			
7	Measuring range of temperature transmitter	0..100	☐	Input signal for 4..20mA: 0..100°C			
		xxx	☐	Other, please specify			
8	Type of temperature transmitter	PR5334A3B	☐	Output signal 4..20 mA			
		PR5335A	☐	Output signal 4..20 mA, with HART® protocol			
		PR5350A	☐	Output signal Profibus® PA / Foundation Fieldbus			
		xxx	☐	Other, please specify			
9	Sealing	-	☐	No extra sealing			
		o-ring	☐	O-ring FPM (viton)			

Example

2TTP-323-K-55-M14x1.5-1
Sensor 2xK type, sheath diameter Ø3.0 mm, length L=55 mm, process connection M14x1.5, class 1 according to PN-EN 60584-2.