TC-15 MGO-PAC Replacement Thermocouple Probe for Industrial Assembly

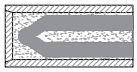
TEMPERATURE SENSOR

TC15 is MGO packed Thermocouple used as replacement element in industrial assemblies like TC70, TC80 etc. These elements can be ordered with or with out the spring loaded fittings. It is cost effective option when thermowell and other components are still in good condition.

Key Feature:

- Available in type J, K, E, N, T .
- A wide selection of sheath material to suit application requirement, 304ss, 316ss, 321ss, Inconel® 600, Incolloy 800, Monel, Pyrosil D etc.
- Sheath diameter is available from 0.125″ to 0.375".
- Grounded, Ungrounded and Exposed junction to suite application requirement.
- Available with low temp and high temp connectors.
- Available in IEC 60584 & ANSI MC 96.1 standard tolerances

Thermocouple Junction options for TC15



Ungrounded Junction: Junction is similar to grounded junction except wire are fuse welded, which is then insulated with Mgo powder and formed cap by welding without incorporating thermocouple wires. Thus, the junction is called the ungrounded junction.

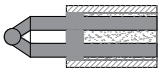
Key Benefits :

· Wires are protected from any mechanical damage
· Offers rugged construction, the same as the grounded junction.
· Strain due to differential expansion between wire and sheath is minimized with insulated wires.

Grounded Junction: In grounded junction thermocouple wires and sheath of the mineral insulated cable is welded together to form a junction. Thermocouple wires and sheath becomes an integral part of the junction. Thus, the wire is grounded to the sheath.

Key Benefits:

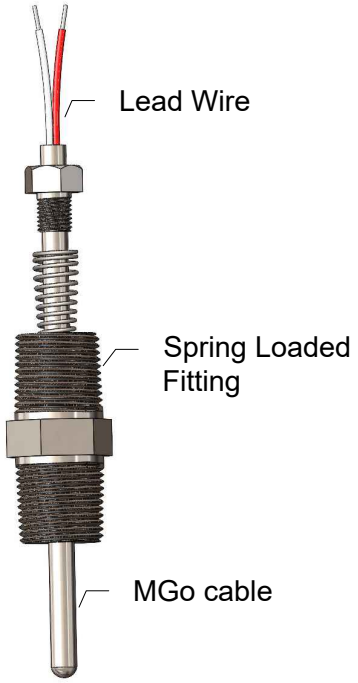
- Slower response than Exposed junction, but offers rugged construction.
- Can hold higher pressure than exposed junction and Ungrounded junction.



Exposed Junction: In expose junction, the sheath is removed, and thermocouple wires fuse-welded to form a junction.Tip of the MI cable is sealed with high temperature cement to protect MGO from contamination.

Key Benefits:

- Fast response time due to the less mass.



Suggested Maximum Temperature Limit As per ASTM E608/608M

Thermocouple Type	°C (F)	°C (F)	°C (F)	°C (F)	°C (F)	°C (F)
OD	1/25"	1/16"	1/8"	3/16"	1/4"	3/8"
T	260(500)	260(500)	315(600)	370 (700)	370 (700)	370 (700)
J	260 (500)	440(825)	520 (970)	620(1150)	720 (1330)	720 (1330)
K	700(1290)	920 (1690)	1070 (1960)	1150 (2100)	1150 (2100)	1150 (2100)
E	300(570)	510(950)	650 (1200)	730 (1350)	820(1510)	820(1510)

The suggested maximum temperature limit is based on information available in the ASTM standard and test performed in our facility. The maximum temperature limit may change based on the type of process and material/ liquid it is going to be used in. These limits apply to protected thermocouples.

Response Time

Thermocouple OD	Junction		
	Exposed	Grounded	Ungrounded
1/25"	0.005	0.1	0.3
1/16"	0.02	0.2	0.5
1/8"	0.03	0.7	1.3
3/16"	0.07	1.1	2.2
1/4"	0.1	2.2	4.5
3/8"	0.9	2.7	7.5

Response time is measured in liquid by inserting thermocouple into the temperature-controlled circulating bath. Time taken to reach 63.2% of a step temperature change is noted as the response time of thermocouple. For a fast response, the exposed tip is recommended, but the exposed junction is not as rugged as ungrounded and grounded junctions for industrial use.

Temperature Accuracy As per ASTM E608/608M/ IEC 60584 & ANSI MC 96.1 standard tolerances

Type	Temperature	Standard Limit	Special Limit
T	-200 °C to 0 °C	± 1 °C or 1.5% Whichever is greater	N/A
	0 °C to 350 °C	± 1 °C or .75% Whichever is greater	± 0.5 °C or 0.4% Whichever is greater
J	0 °C to 750 °C	± 2.2 °C or .75% Whichever is greater	± 1.1 °C or 0.4% Whichever is greater
E	-200 °C to 0 °C	± 1.7 °C or 1.0% Whichever is greater	N/A
	0 °C to 900 °C	± 1.7 °C or .5% Whichever is greater	± 1 °C or 0.4% Whichever is greater
KORN	-200 °C to 0 °C	± 2.2 °C or 2.0 % Whichever is greater	N/A
	0 °C to 1250 °C	± 2.2 °C or .75% Whichever is greater	± 1.0 °C or 0.4% Whichever is greater

Notes:

-All the thermocouples are manufactured as ASTM E608/608M
-Calibration is available as per ASTM E220 on request

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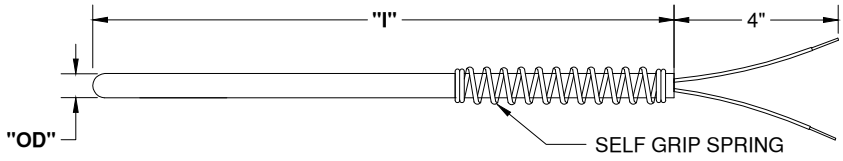
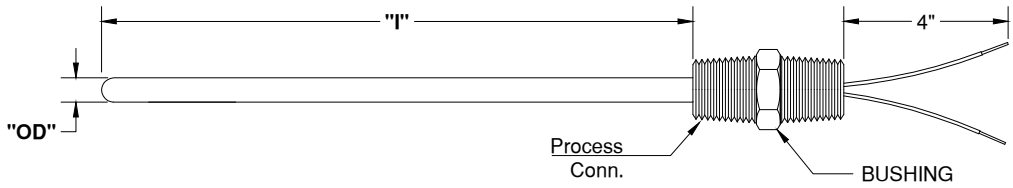


Element Without Bushing



Element Without Bushing

	1	2	3	4	5	6	7	8
TC15								

For Example- TC15-K-G-4-8-12i-2-02-55

1. THERMOCOUPLE TYPE	
CODE	
J	Iron(+) vs Constantan(-)
K	Chromel(+) vs Alumel(-)
T	Copper(+) vs Constantan(-)
E	Chromel(+) vs Constantan(-)
N	Nicrosil(+) vs Nisil(-)
Use "S" for Special limit of Error	

2. MEASURING JUNCTION	
CODE	
G	Simplex / Grounded Junction
UG	Simplex / Un- Grounded Junction
E	Simplex / Exposed
DG	Duplex / Grounded
DUG	Duplex / Un-Grounded
DE	Duplex/ Exposed

3.SHEATH OD		
CODE	IMPERIAL SIZE	METRIC SIZE
1	1/16"	1.5 mm
2	1/8"	3.2 mm
3	3/16"	4.76 mm
4	1/4"	6.35 mm
5	5/16"	7.9mm
6	3/8"	9.5 mm
7	0.215"	5.46 mm
2M	0.079	3.0mm
3M	0.197"	5.0mm
4M	0.236"	6.0 mm
5M	0.315"	8.0mm
6M	0.354"	9.0 mm
7M	0.394"	10.0 mm

4. SHEATH MAT.	
CODE	
8	SS 316
4	SS 310
9	SS 304
6	SS 321
3	INCONEL 600
5	SS 446
10	INCONEL 800

5. IMMERSION LENGTH ("I")
Immersion length - use "I" for inches and "M" for millimetre

6. WIRE TYPE	
CODE	
1	PVC (105° C)
2	TEFLON (205° C)
6	TEFLON (260° C)
3	FIBRE GLASS (510° C)
4	High Temp Fiberglass (704° C)

7. ELEMENT BUSHING STYLE	
CODE	
0	Not required
02	Spring Loading bushing
03	Oil seal spring load bushing

8. BUSHING SIZE	
CODE	HEAD CONN. X PROCESS CONN.
55	1/2" NPT X 1/2" NPT
57	1/2" NPT X 3/4" NPT
5M	1/2" NPT x M20 X1.5