



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Thermocouple assembly TH52

Compact Instructions



Measuring System

General purpose MgO insulated thermocouple for process and laboratory applications.

The thermocouple sensor complies with the ASTM E-230 and IEC60584 specifications. The sensor is designed to ensure highest accuracy and long term stability.

Important Notice



Electrical shock could cause death or serious injury. If the sensor is installed in a high voltage environment and a fault or installation error occurs, high voltage may be present on the connection terminals or the probe itself.

Safe and secure operation of the temperature sensor can only be guaranteed if the operating instructions of the used transmitters and all included safety notes are read, understood and followed. For Endress+Hauser temperature transmitters see enclosed CD-ROM.

Correct use

The manufacturer cannot be held responsible for damage caused by misuse of the unit. The installation conditions and connection values indicated in the operating instructions must be followed!

Installation Guidelines and Safety instructions

1. Install the unit according to the relevant NEC Code and local regulations.
2. Avoid any spark due to impact, friction and installation. Anti-sparking wrenches should be utilized.
3. For ambient temperature higher than 158 °F, suitable cables and conductors must be used.



Do not disconnect equipment unless power has been switched off or the area is not hazardous.

The accessories for pipe connections and the appropriate gaskets and sealing rings are not supplied with the sensors. These are the customer's responsibility. Depending on temperature and pressure operating conditions, the gaskets, the sealing and clamping rings and the applicable torques must be selected by the user. For further information regarding connections, please refer to the corresponding Standards.

Installation and operation

The unit is constructed using the most up to date production equipment and complies with the safety requirements of the local guidelines. However, if it is installed incorrectly or misused, certain application dangers can occur. Installation, wiring and maintenance of the unit must only be completed by trained, skilled personnel who are authorized to do so by the plant operator. The plant operator must make sure that the measurement system has been correctly wired to the connection schematics. Procedures indicated in these instructions must be followed.

Returns

Please follow the Return Authorization Policy which is attached with this manual.

Safety pictograms and symbols

 Note!

Notes draw attention to activities or procedures that can have a direct influence on operation or trigger an unforeseen device reaction if they are not carried out properly.

 Caution!

Cautions draw attention to activities or procedures that can lead to persons being injured or to incorrect device operation if they are not carried out properly.

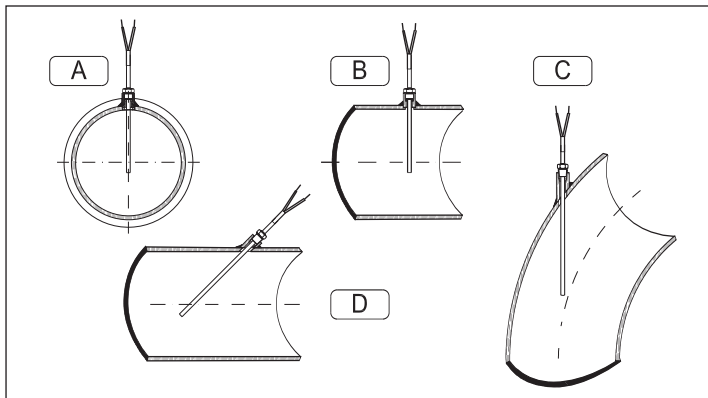
 Warning!

Warnings draw attention to activities or procedures that can lead to persons being seriously injured, to safety risks or to the destruction of the device if they are not carried out properly.

Though the information provided herein is believed to be accurate, be advised that the information contained herein is NOT a guarantee of satisfactory results. Specifically, this information is neither a warranty nor guarantee, expressed or implied, regarding performance; merchantability, fitness, or other matter with respect to the products; and recommendation for the use of the product/process information in conflict with any patent. Please note that Endress+Hauser reserves the right to change and/or improve the product design and specifications without notice.

Installation

Installation locations



- A, B: In pipes of a small section the axis line of the duct must be reached and if possible slightly exceeded by the tip of the probe.
- C, D: Tilted installation.

For installation proceed as follows:

1. Seal the $\frac{1}{2}$ " NPT process connection or the pipe thread of the compression fitting with pipe thread sealant, e.g. "TFE" tape before screwing in the device.
2. Make sure that the process fitting matches the maximum specified process pressure.
3. Install and tighten the thermocouple before applying process pressure.

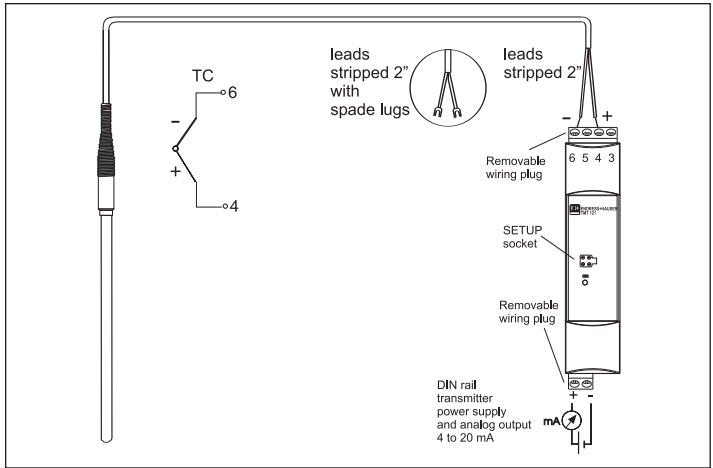


Note!

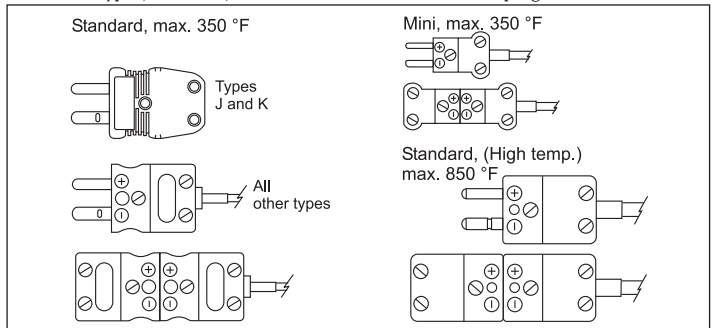
Minimum immersion length should be 10 times the OD of the sheath, nominal.

Electrical connection-wiring diagrams

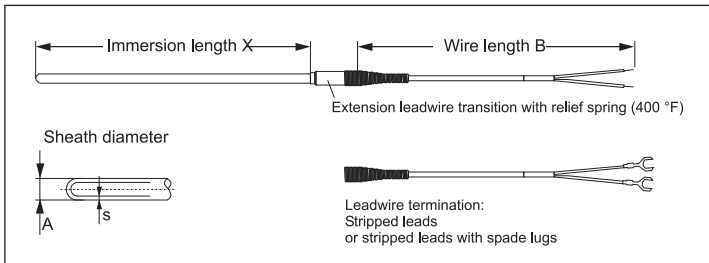
Wiring example - leads stripped wiring with DIN rail transmitter TMT121



Connector types, standard, standard+female and miniature plugs



Dimensions



Immersion length X	Wire length B	Sheath diameter A	Wall thickness s
6", 12", 18", 24" specified length 2" to 96" in 1/2" increments	48", 72", 120" specified length 12" to 3600" in 12" increments	1/16"	0.007"
		1/8"	0.014"
		3/16"	0.022"
		1/4"	0.029"
		3/8"	0.045"

All dimensions in inches.

Wire specifications

Fiberglass or FEP insulated solid and stranded,
with or without flex armor
Connectors, standard, standard+female and miniature
plugs, see figure in 'Electrical connection'.

Technical data

Weight

From 1 to 5.5 lbs

Material

Wetted parts 316 SS

sheath material: 316 SS¹ or Inconel 600²

1) Duplex version of Type N general purpose MgO insulated TC are not available with 316 SS sheath.

2) Type T & J general purpose MgO insulated TC are not available with Inconel 600 sheath.



Note: Inconel 600 should not be used in sulfurous atmospheres.

Shock and vibration
resistance

4g/2 to 150 Hz as per IEC 60 068-2-6

Technical data (continued)

Ambient temperature
limits

-40 to 185 °F (-40 to 85 °C)

Measurement range

Upper Temperature Limit for Various Sheath Diameter °F (°C)					
	Thermocouple Type				
Sheath OD	T	J	E	K	N
Ø 1/16"	500 °F (260 °C)	825 °F (440 °C)	950 °F (510 °C)	1690 °F (920 °C)	
Ø 1/8"	600 °F (315 °C)	970 °F (520 °C)	1200 °F (650 °C)	1960 °F (1070 °C)	
Ø 3/16"	700 °F (370 °C)	1150 °F (620 °C)	1350 °F (730 °C)	2100 °F (1150 °C)	
Ø ¼"		1330 °F (720 °C)	1510 °F (820 °C)		
Ø 3/8"					

 Note: Thermocouples with 316SS Sheath are rated for a max. temperature of 1700 °F (927 °C)

Performance Characteristics

Response time 63% response time per ASTM E839

Junction style	Ø 1/16"	Ø 1/8"	Ø 3/16"	Ø ¼"	Ø 3/8"
Grounded	0.3 s	0.6 s	0.9 s	1.3 s	3.5
Unrounded	0.4 s	1.6 s	2.4 s	2.9 s	7.2 s

Maximum measured error

Type	Temperature range		Standard Tolerance in % and °C* (whichever is greater)	
	°C	°F	IEC class 1	IEC class 2
E	0 to 870	32 to 1600	± 1 or ± 0.4%	± 1.7 or ± 0.5%
J	0 to 760	32 to 1400	± 1.1 or ± 0.4%	± 2.2 or ± 0.75%
K	0 to 1260	32 to 2300	± 1.1 or ± 0.4%	± 2.2 or ± 0.75%
T	0 to 370	32 to 700	± 0.5 or ± 0.4%	± 1 or ± 0.75%
N	0 to 1260	32 to 2300	± 1.1 or ± 0.4%	± 2.2 or ± 0.4%

* For measurement errors in °F, calculate using equation above in °C, then multiply the outcome by 1.8.

Performance characteristics (continued)

Insulation resistance 1,000 M Ω at 77 °F (25 °C)
Insulation resistance for MgO insulated TC with ungrounded hot junction between terminals and probe sheath, test voltage 500 V DC. Value applies also between each TC wire at single and duplex construction with ungrounded hot junction.

Supplementary documentation

TMT 121 PCP DIN rail temperature transmitter	BA156r24ae find on CD-ROM
TMT 122 HART DIN rail temperature transmitter	BA155r24ae find on CD-ROM
TMT 162 HART temperature field transmitter	BA132r24ae find on CD-ROM

All Temperature Operating Instructions are available on CD-ROM, find enclosed or order by order number: **SONDTT-AG**.

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