SKF

Condition Monitoring Custom Products

"Vibration Monitoring and Machine Protection Systems"

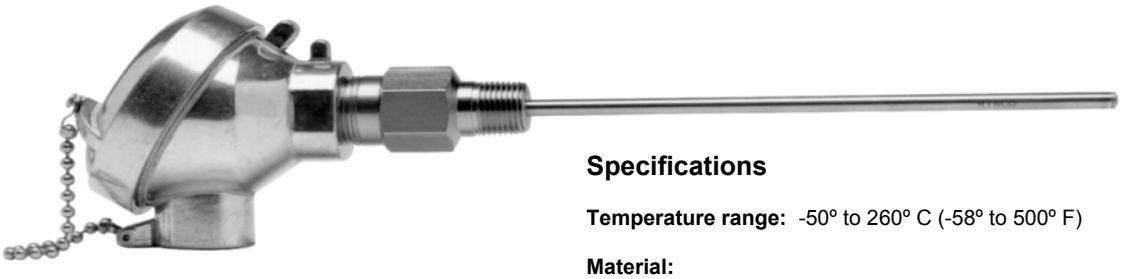
2911 S. Shore Blvd., Ste. 170, League City, TX 77573 Phone: 281.334.0766 Fax: 281.334.4255

Condition Monitoring Custom Products

www.cmcpweb.com

CMCP1210

RTD & Thermocouple Tip Sensitive, Spring Loaded Sensors for Rolling Element Bearings



Features:

- ***Tip Sensitive RTD or Thermocouple***
- ***For use to 260º C (500º F)***
- ***Adjustable Spring-Loaded Holder with Fluid Seal***
- ***Aluminum Connection Head***

Description

The CMCP-1210 series temperature sensor provides, fast and accurate readings from bearings, blocks, and other solids. CMCP's spring-loaded holder ensures solid contact in drilled holes with a built-in oil seal. The sensing probe features a copper alloy tip for quick response to temperature changes. Probes may be cut to length in the field using a tube cutter. Explosion proof version is available upon request.

Specifications

Temperature range: -50º to 260º C (-58º to 500º F)

Material:
Probe: SS with Copper Alloy Tip
Holder: Nikel Plated Steel with Viton O-ring
Head: Aluminum or Stainless Steel

Pressure rating: 50 psi (3.4 bar)

Insulation resistance: 10 megohms min. at 100 Vdc, leads to case. Ungrounded junctions only on thermocouples.

Connection: Terminal block for wires to 14 AWG

Conduit thread: 1/2" NPT

Bearing entry:
1/2" NPT
3/4" Adapter Is Available

Time constant: Typical value in moving water:
2.0 seconds

Explosion Proof Version Rating:
Class I Div I FM/CSA to 50 psi

Ordering Information:

Part #	-XX	-X.X	-XX	Description
CMCP-1210				Tip Sensitive, Spring Loaded Temperature Sensor for Rolling
	- PA			Platinum 392, 100 Ohm (US)
	- PD			Platinum 385, 100 Ohm (Meets DIN, EIC, Cl B)
	- J			Type J Iron-Constant Thermocouple
	- K			Type K Chromel-Alumel Thermocouple
		- 8.4		8.4" Standard Insertion Depth (Field Cut)
		- X.X		Insertion Depth - Specify 0.1" Increments Example: 6.7 = 6.7 Inches (Max 8.4")
			-01	Standard Version
			-02	XP Version, Aluminum Head
			-03	XP Version, Stainless Steel Head
CMCP-1211				1/2" NPT to 3/4" NPT Adapter for the Standard CMCP1210

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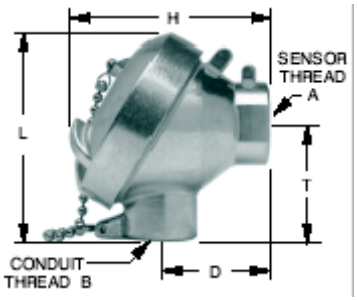
Standard Version



Cast Aluminum Head
Silicone Gasket
IP 55 Type 3 and 4
3.5 (89) H
3.5 (89) L
2.0 (51) D
1.75 (44) T
A = 3/4" NPT
B = 1/2" NPT

Spring Loaded Holder
300 Series Stainless Steel
3/4" NPT / 1/2" NPT

The sensing tip of these probes is constructed of copper alloy, twenty times more conductive than stainless steel. Sensors react more quickly to changes and indicate tip temperature instead of stem temperature.

PA - Platinum 392 (US Standard), 3-Wire, 100 Ω ±0.5% at 0°C
PD - Platinum 385 (European Standard), 3-Wire, 100 Ω ±0.1% at 0°C (meets EN60751, Class B)
J - Type J Thermocouple, Iron-Constantan
K - Type K Thermocouple, Chromel-Alumel

Diameter: 0.250"
Temperature range: -50 to 260°C (-58 to 500°F).
Case: Stainless steel with copper alloy tip.
Leads: Stranded copper with PTFE insulation. AWG 22
Time constant: 2.0 seconds typical in moving water
Pressure rating: 100 psi (6.9 bar).
Insulation resistance: 1000 megohms min. at 500 VDC, leads to case.
Vibration: Withstands 10 to 2000 Hz at 20 G's min. per MIL-STD-202, Method 204, Test Condition D.
Shock: Withstands 100 G's min. sine wave shock of 8 milliseconds duration.

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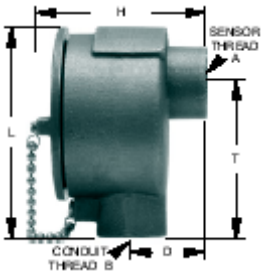
Explosion Proof Version



Cast Aluminum or Stainless Steel Head
Buna-N O-Ring
IP 55 Type 3 and 4
4.60 (116.8) L
3.50 (88.9) H
1.63 (41.4) D
3.35 (85.1) T
A = 1/2" NPT
B = 1/2" NPT

FM/CSA
Division 1;
Class I, Groups B, C, D;
Class II, Groups E, F, G;
Class I, Zone 1, AEx d IIC;
Zone 1, Ex d IIC;
T6 (Ta = 40°C),
T2 (Ta = 260°C)

Spring Loaded Holder
300 Series Stainless Steel
Additional O-ring and bleeding hole
1/2" NPT / 1/2" NPT

FM/CSA
Division 1;
Class I, Groups B, C, D;
Class II, Groups E, F, G;
Class I, Zone 1, AEx d IIC;
Zone 1, Ex d IIC;
T6 (Ta = 40°C),
T2 (Ta = 260°C)

The sensing tip of these probes is constructed of copper alloy, twenty times more conductive than stainless steel. Sensors react more quickly to changes and indicate tip temperature instead of stem temperature.

PA - Platinum 392 (US Standard), 3-Wire, 100 Ω ±0.5% at 0°C
PD - Platinum 385 (European Standard), 3-Wire, 100 Ω ±0.1% at 0°C (meets EN60751, Class B)
J - Type J Thermocouple, Iron-Constantan
K - Type K Thermocouple, Chromel-Alumel

Diameter: 0.236"
Temperature range: -50 to 260°C (-58 to 500°F).
Case: Stainless steel with copper alloy tip.
Leads: Stranded copper with PTFE insulation. AWG 22
Time constant: 2.0 seconds typical in moving water
Pressure rating: 100 psi (6.9 bar).
Insulation resistance: 1000 megohms min. at 500 VDC, leads to case.
Vibration: Withstands 10 to 2000 Hz at 20 G's min. per MIL-STD-202, Method 204, Test Condition D.
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Selecting an RTD or Thermocouple

Resistance Temperature Detectors (RTDs)

An RTD sensing element consists of either a wire coil or a deposited film of pure metal. The element's resistance increases with temperature in a known and extremely repeatable manner. RTDs have excellent accuracy over a wide temperature range and are the most popular industrial temperature sensors.

RTD Advantages:

Temperature range: -260 to 850°C (-436 to 1582°F).
Repeatability and stability: The platinum resistance thermometer is the primary interpolation instrument used by the National Institute of Standards and Technology from -260 to 962°C. Ordinary industrial RTDs typically drift less than 0.1°C/year.
Sensitivity: The voltage drop across an RTD provides a much larger output than a thermocouple.
Linearity: Platinum RTDs produce a more linear response than thermocouples or thermistors.
Low system cost: RTDs use ordinary copper extension leads and require no cold junction compensation.
Standardization: Manufacturers offer RTDs to industry standard curves, most commonly 100 Ohm platinum to EN60751—PD or PE

IEC Publication EN60751 (IEC 751)

Issued by: International Electrotechnical Commission
Date: 1983

IEC 751 has the widest international scope of any RTD standard. It calls for platinum RTDs, 100 Ω at 0°C, TCR 0.00385 Ω/Ω/°C, in one of two tolerance classes:
Class A: ±0.06% at 0°C.
Class B: ±0.12% at 0°C.
CMCP RTDs with PD element code meet Class B

Thermocouples

A thermocouple consists of two wires of dissimilar metals welded together into a junction. At the other end of the signal wires, usually as part of the input instrument, is another junction called the reference junction. Heating the sensing junction generates a thermoelectric potential (emf) proportional to the temperature difference between the two junctions. This millivolt-level emf, when compensated for the known temperature of the reference junction, indicates the temperature at the sensing tip. Published millivolt tables assume the reference junction is at 0°C.

Thermocouples are simple and familiar. Designing them into systems, however, is complicated by the need for special extension wires and reference junction compensation.

Thermocouple Advantages Include:

Extremely high temperature capability: Thermocouples with precious metal junctions may be rated as high as 1800°C (3272°F).
Ruggedness: The inherent simplicity of thermocouples makes them resistant to shock and vibration.
Small size/fast response: A fine-wire thermocouple junction takes up little space and has low mass, making it suitable for point sensing and fast response. Note, however, that many RTDs have time constants faster than equivalent thermocouples.