

Temperature

The degree of hotness or coldness of a body or environment; A measure of the average energy possessed by the molecules of a body.



About Temperature Measurement

Introduction to Thermometry

Thermometry is the measurement of temperature or temperature changes. Temperature measurements are necessary in various industries ranging from agriculture, HVAC, chemical and manufacturing, food and beverage, boiler and cooling towers, schools and laboratories to water and wastewater treatment. There are various types of thermometers that rely on different principles of measurement.

Eutech offers the user-friendly and feature-packed EcoScan temperature meters Temp 5, Temp 6 and Temp JKT for routine indoor and outdoor temperature measurements. The EcoScan Temp 5 and Temp 6 are paired with the 100K thermistor temperature probe and 3-wire RTD Pt 100 temperature probe respectively.

What is a Thermocouple?

Thermocouple probes are composed of two dissimilar metals, joined to produce a voltage at a given temperature. Thermocouple thermometers measure, amplify, linearise and display the proportional voltage signal generated by the thermocouple probe. Thermocouples are used in most general purpose applications where precision is not a top priority. They offer a wide temperature range and come in a variety of metal combinations or calibrations.

The J, K and T are three of the most common calibrations available. Although the maximum temperature differs with the diameter of the wire used in the thermocouple, each calibration consists of a different temperature range and environment.

Type J and K Probes:

± 1 to $4\text{ }^{\circ}\text{C}$ or $\pm 0.4\%$ probes of reading above $0\text{ }^{\circ}\text{C}$, whichever is greater

Type T Probes:

± 0.5 to $2\text{ }^{\circ}\text{C}$ or 0.4% of reading above $0\text{ }^{\circ}\text{C}$, whichever is greater

Thermocouple Selection

Some of the following criteria determine the selection of a suitable thermocouple:

- Temperature range
- Chemical resistance of the thermocouple or sheath material
- Abrasion and vibration resistance
- Installation requirements (may need to be compatible with existing equipment; existing holes may determine probe diameter)

The EcoScan Temp JKT is designed for measurement with the Type J, Type K and Type T thermocouples. The meter is capable of measuring a wide range of temperatures and is rugged, dust-proof and splash-proof to IP54 standards, making it suitable for most industrial applications.

Thermocouple Probe Junction Types

Sheaths with small diameters have faster response times. Sheaths with larger diameters have longer life and are better for measuring higher temperatures.

Probe Sheath Materials

INCONEL® 600 Sheath is ideal for severely corrosive environments and at elevated temperatures. It resists progressive oxidation.

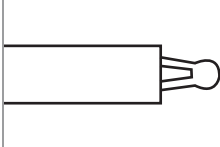
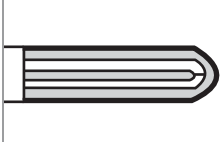

Maximum operating temperatures are: continuous – $1149\text{ }^{\circ}\text{C}$, intermittent – $1371\text{ }^{\circ}\text{C}$.

304 SS Sheath is for general purpose use. It is corrosion-resistant, and is good for food service and biological applications. Maximum operating temperatures: continuous – $899\text{ }^{\circ}\text{C}$, intermittent – $1399\text{ }^{\circ}\text{C}$.

316 SS Sheath has higher corrosion resistance than 304 SS. It withstands some strong acids. Maximum operating temperatures: continuous – $899\text{ }^{\circ}\text{C}$, intermittent – $1371\text{ }^{\circ}\text{C}$.

SS Sheath with Coating of HDPE with grounded junction is ideal with corrosive liquids and atmospheres. It has a longer response time and can measure temperatures to $260\text{ }^{\circ}\text{C}$.

Eutech offers various probes with ungrounded junction and 304 SS sheath. Models include the Type J and Type K probes available for general purpose immersions in liquids or penetration in meats, plastic and other semi-soft materials.

	Exposed Junction has the fastest response time making it ideal for measuring rapid temperature changes. Clear coating on most models provides a humidity barrier for the thermocouple. However, it is not recommended for use with corrosive fluids or atmospheres.
	Ungrounded Junction has a welded junction insulated from the protective sheath and is electrically isolated. Longer response time is expected. Recommended use for conductive solutions or where isolation of the measuring circuitry is required.
	Grounded Junction has a junction welded to tip of sheath. Wires are completely sealed from contaminants. Good response time.

What is a Thermistor?

Thermistors are thermally sensitive resistors which change electrical resistance due to temperature changes. They have predictable characteristics and offer long term stability. Although response times are generally faster than other types of probes, thermistors have a limited temperature range that usually cannot exceed $150\text{ }^{\circ}\text{C}$.

The Eutech EcoScan Temp 5 has a measurement range of 40.0 to $125.0\text{ }^{\circ}\text{C}$ using the 100K thermistor temperature probe.

What is RTD?

RTD or Resistance Temperature Detector refers to the measurement of temperature by measuring the change in electrical resistance across metal wires. This resistance value is interpreted by an RTD thermometer. Although the RTD wire can be made of any metal, platinum is preferred for its excellent repeatability, stability and resistance to corrosion and chemicals. RTDs are more accurate and stable compared to other probes such as thermocouples. However they are not recommended for extreme temperatures. An RTD probe is chosen where accuracy and repeatability are important.

The Eutech EcoScan Temp 6 is a RTD temperature meter which can be used with the 3-wire RTD Pt 100 temperature probe for accurate and reliable measurements.

Ideal for routine indoor and outdoor temperature testing, the EcoScan Temp 5, Temp 6 and Temp JKT are durable, value-for-money tools with user-friendly features.



Large custom screen with min/max display

Protective rubber boot doubles up as stand

Rugged splashproof design

EcoScan Temp 5 ; EcoScan Temp 6 ;
EcoScan Temp JKT

- Selectable °C/°F readout
- Non-volatile memory backup
- Factory calibrated
- Offset adjustment
- Self-diagnostic messages
- Easy push-button calibration
- HOLD and selectable auto power-off function
- EcoScan Temp 5 uses 100K thermistor probes
- EcoScan Temp 6 uses 3-wire RTD PT100 probes
- EcoScan Temp JKT features versatility with interchangeable J, K, T probes



Applications

General: Ideal for applications that require the measurement and monitor of temperature of liquid, solid, semi-solid or gel.




Industrial: Can be used in photo developing, chemical and plating industries and all applications that require temperature measurement. Can be used as a practical substitute for glass thermometers in food processing or agriculture applications. The min/max feature is useful for HVAC applications where the measurement and monitor of heating and cooling efficiency is required. Other applications include flue gas temperatures, boiler water, heater jacket temperatures, inlet and outlet water heater temperatures, etc.

Educational: Ideal for students with its user-friendly, easy push-button features. No worries about broken glass or mercury spillage.

Temperature

EcoScan Handhelds
Specifications &
Ordering Information



		EcoScan Single-Display					
		Temp JKT		Temp 6		Temp 5	
Temperature Handheld Meters Specifications							
	Measuring Parameter	°C / °F					
Highlights		Type J Thermocouple	Type K Thermocouple	Type T Thermocouple	3 wire RTD pt100 temperature probe		100K thermistor temperature probe
Range		-200 to 1000 °C / -328 to 1832 °F	-250 to 1372 °C / -418 to 2502 °F	-250 to 400 °C / -4.8 to 752 °F	-200.0 to 850.0 °C / 328.0 to 1562 °F		-40.0 to 125.0 °C / -40.0 to 257 °F
Resolution		1 °C / 1 °F (t < -99.0 °C) 0.1 °C / 0.1 °F (-99.9 °C < t < 299.9 °C) 1 °C / 1 °F (t > 299.9 °C)		0.1 °C / 0.1 °F (-99.9 to 199.9 °C); 1 °C / 1 °F (range < -99.9 °C and range > 199.9 °C)		0.1 °C / 0.1 °F	
Accuracy		±0.25 % of reading + 1 °C (t < -99.9 °C) ±0.2 % of reading + 0.5 °C (t > -99.9 °C)		±0.2 °C / ±0.4 °F (-99.9 to 199.9 °C) ±2 °C (range < -99.9 °C and range > 199.9 °C)		±0.2 °C / 0.4 °F	
Offset Adjustment		±10 °C / ±18 °F		±5 °C / ±0.9 °F			
Hold Function		Yes					
Auto-Off (Selectable)		Yes					
Low Battery Indicator		Yes					
LCD Display		Single custom LCD					
Operating Temperature		-10 to 50 °C / 14 to 122 °F			0 to 50 °C / 32 to 122 °F		
Input		2-pin ANSI mini connector		3-pin panel mount connector		¼ inch phono plug	
Power		4 x 1.5 V 'AAA' alkaline batteries					
Battery Life		> 200 hrs					
Dimensions (LxWxH); Weight	Meter	14 x 7 x 3.5 cm ; 200 g					
	Boxed	24 x 16.5 x 8.5 cm ; 510 g					

Temperature Handheld Meters

Item	Order Code	Part No.	Type			Temperature Probes		
			J, K, T	RTD	Thermistor	Thermocouple Type J, K, T	Temperature Probe (ECTEM6TEM01R)	Temperature Probe (ECTEM5TEM01P)
Temp JKT	ECTEMPJKT	01X270401	•	•	•	•		
Temp 6	ECTEMP601	01X256503	•	•			•	
Temp 5	ECTEMP501	01X256502	•					•

Accessories

Used With	Description	Order Code	Part No.
Type J	General purpose probe (for immersion into liquids), 1 m cable, ungrounded, -50 to 700 °C	ECTPGLPJ01M	01X220001
Type J	Penetration probe (for penetrating meat, plastic and semi-soft materials), 1 m cable, ungrounded, -50 to 700 °C	ECTPPENJ01M	01X220002
Type K	General purpose probe (for immersion into liquids), 1 m cable, ungrounded, -50 to 700 °C	ECTPGLPK01M	01X220101
Type K	Penetration probe (for penetrating meat, plastic and semi-soft materials), 1 m cable, ungrounded, -50 to 700 °C	ECTPPENK01M	01X220102
Type K	Surface probe (for direct contact on hot surfaces), 1 m cable, ungrounded, -50 to 700 °C	ECTPSURK01M	01X220103
RTD	3 wire RTD Pt100 Temperature probe, ungrounded, SS304 (max. Temperature 150 °C)	ECTEM6TEM01R	01X021814
RTD	RTD Pt100 Temperature probe, round-tip sensor, -50 to +400 °C	ECPT56L	93X375701
Thermistor	100K thermistor Temperature probe, ungrounded, SS304, 0 to 125 °C	ECTEM5TEM01P	01X021811

* Type T thermocouple probes available on request.



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