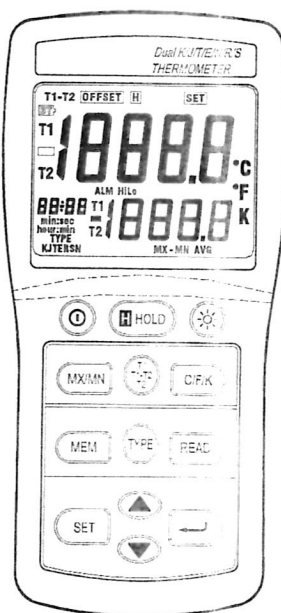


TES Dual K/J/T/E/N/R/S THERMOMETER

TES-1314

INSTRUCTION MANUAL



TES ELECTRICAL ELECTRONIC CORP.

1. INTRODUCTION

This instrument is a digital thermometer for working with any J, K, T, E, N, R and S-type thermocouple as temperature sensor.

Temperature indication follows the international temperature scale of 1990. (ITS-90)

- Read the following safety information carefully before attempting to operate or service the meter.
- Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired

Environment conditions

- ① Altitude up to 2000 meters
- ② Relatively humidity 80% max.
- ③ Operation Ambient 0~50°C (32°F~122°F)

U.S. Pat. No. Des. 446,135

Safety symbols

When servicing, use only specified replacement parts.

CE Comply with EMC

2. SPECIFICATIONS

2-1 Electronical Specifications

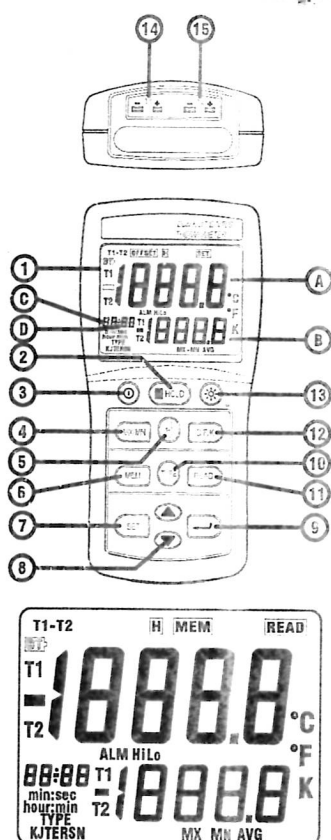
Measurement Range :

J - type : -150.0°C to +1090.0°C (-200.0°F to +1994.0°F)

K - type : -150.0°C to +1370.0°C (-200.0°F to +1999.9°F)

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3. FRONT PANEL DESCRIPTION



(1). LCD Display :

- A. Main display : T1, T2 or T1-T2 reading.
- B. Secondary display : T1 or T2 reading and MAX, MIN, AVG reading.
- C. Time display : Time display (100-hour clock), shows elapsed time when MAX, MIN or AVG is on.
- D. Auto power off mark (:).

(2). **[H] HOLD key** : Press "**[H] HOLD**" key to freeze or unfreeze the display reading.

(3). **[1] Power key** : Press **[1]** key to turn the meter on or off.

(4). MX/MN key :

- ① Press "MX/MN" key to step through the maximum, minimum, and average readings.
- ② Press "MX/MN" key for 2 seconds to exit MX/MN mode.

(5). **T1/T2/T1-T2 key** : Press "T1/T2/T1-T2" key to toggle showing the T1, T2 and T1-T2 in the main or secondary display.

(6). MEM key :

Press "MEM" key each time, stores a single set of logged reading in memory.

T - type : -150.0°C to +400.0°C (-200.0°F to +752.0°F)
 E - type : -150.0°C to +870.0°C (-200.0°F to +1598.0°F)
 N - type : -150.0°C to +1300.0°C (-200.0°F to +1999.9°F)
 R - type : 2.0°C to +1767.0°C (+35°F to +1999.9°F)
 S - type : 2.0°C to +1767.0°C (+35°F to +1999.9°F)

Display Effect Resolution :

J-, K-, T-, E-, and N-type : 0.1°C/°F/K
 R- and S-type : 1.0°C/°F/K (0.1°C/°F/K only for reference)

Measurement Accuracy :

J-, K-, T-, E-, and N-type : $\pm[0.05\%$ of reading +0.5°C (0.9°F)]
 [Below -100°C (-148°F) : add 0.15% of reading for J, K, E, and N ; and 0.45% of reading for T]
 R-and S-type : $\pm[0.05\%$ of reading +2°C (4°F)]

NOTE

This basic accuracy specification does not include the error of the temperature probe. Please refer to the temperature probe accuracy specification for additional details.

Temperature Coefficient :

0.01% of reading +0.03°C per °C (0.06°F per °F)
 outside the specified +18°C to 28°C (+64°F to 82°F) range.
 [Below -100°C (-148°F) : add 0.04% of reading for J-, K-, E- and N-type ; and 0.08% of reading for T-type]

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Maximum Differential Common Mode Voltage : 1V
 (Maximum voltage difference between T1 and T2).
 Input Protection : 20V maximum input voltage on any combination of input connector.
 Manual Data Memory capacity : 44 sets.

2-2 General Specifications

Power Supply : 6 pcs size AAA battery.
 Battery life : approx. 200 hours (carbon zinc battery).
 Auto Power off : 30 minutes. (If no key is pressed).
 Low Battery Indication : The **(BT)** is displayed when the battery voltage drops below the operating voltage.
 Measurement Rate : One time per 1.5 seconds.
 Weight : 235 gm (8.29 oz)
 Dimension : 5.91"Lx 2.83"Wx 1.38"H (150x72x35mm)
 Operating Temperature : 0 to 50°C (32 to 122°F) and Humidity below 80% RH
 Storage Temperature : -10 to 60°C , 14 to 140°F and Humidity below 70% RH
 Accessories: 6 pcs Battery, Instruction Manual.

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(7). SET key :

- ① Press "SET" key enter to alarm setting mode.
- ② Press "SET" key for 2 seconds to enter or exit alarm mode.

(8). ▲▼ Key :

- ① Press ▲ or ▼ key to increase or decrease the alarm high or low limit value setting.
- ② Press ▲ or ▼ key to increase or decrease the READ mode memory location.

(9). ⏏ key :

- ① Press ⏏ key to store alarm limit value setting.
- ② Press ⏏ key to toggle showing the "hour:min" and "min:sec" elapsed time in the MX/MN mode.

(10). TYPE key: Press "TYPE" key to select the thermocouple type (K, J, E, T, R, S, N).

(11). READ key : Press "READ" key to show manual memory logged reading, press again to exit this mode.

(12). C/F/K key : Press "C/F/K" key to select Celsius (°C), Fahrenheit (°F) or Kelvin (K) temperature scale.

(13). ☼ key : Press backlight key to turn the backlight on and off. The backlight turns off after 13 seconds.

(14). T1 input : Thermocouple T1 input.

(15). T2 input : Thermocouple T2 input.

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4. OPERATION INSTRUCTIONS

WARNING

- To avoid electrical shock or personal injury, do not apply more than 20Vrms, between the thermocouples (s), or between any thermocouple and earth ground.
- If voltage on the measurement surfaces result in potentials more than 1V between the two thermocouples, then measurement errors may occur. If the potential differences are anticipated between the thermocouples, use electrically insulated thermocouples.

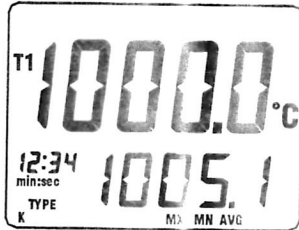
4-1 Temperature Measurement

- ① Press ① key to turn on the thermometer.
- ② Plug the thermocouple (s) into the thermocouple input. If no thermocouple is plugged into the selected input or the thermocouple is "open", the display will show "- - - -".
- ③ Press "C/F/K" key to desired temperature scale.
- ④ Press "TYPE" key to select the thermocouple you want.
- ⑤ Press "T1/T2/T1-T2" key to toggle between showing the T1, T2, and T1-T2 reading in the main display or secondary display.
- ⑥ Perform measurements by contacting the object being measured with the probe sensor.
- ⑦ Read the temperature on the display. The display shows "OL" (overload) when the temperature being measured is outside the meter valid range.

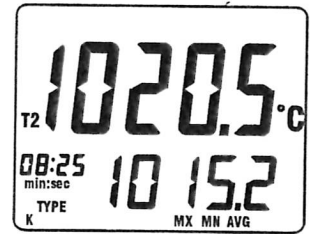
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4-2 MAX, MIN and AVG Function Operations

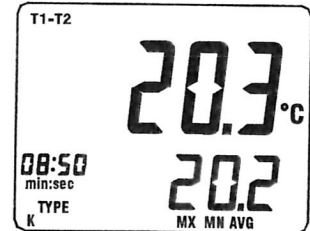
- ① Press "MX/MN" key to enter to MX/MN mode, to step through the maximum (MAX), minimum (MIN) or the true average (AVG-true 9.7 hours recording average) readings, and disable auto power off function.
- ② Press "T1/T2/T1-T2" key to toggle showing present reading of the T1, T2 and T1-T2 on the main display. Press "MX/MN" key, the MAX, MIN and AVG reading of T1/T2/T1-T2 will appear on the secondary display.



T1 present reading + T1 Maximum reading plus elapsed time + T1 Minimum reading plus elapsed time + T1 Averaging reading plus averaging time.



T2 present reading + T2 Maximum reading plus elapsed time + T2 Minimum reading plus elapsed time + T2 Averaging reading plus averaging time.



T1-T2 present reading + T1-T2 Maximum reading plus elapsed time + T1-T2 Minimum reading plus elapsed time + T1-T2 Averaging reading plus averaging time.

- ④ Press "MX/MN" key for 2 seconds to exit MX/MN mode. In MX/MN mode, the "C/F/K" and "TYPE" key are not active.

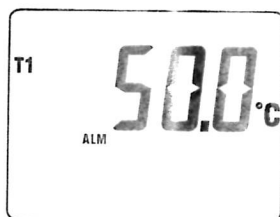
4-3 To Erase the Memory of Datalogger

Press and hold down "MEN" key until the beeper sound twice, all memory will be cleared.

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- ④ Press "SET" key for 2 seconds then release it, enter to ALARM function LCD will show "ALM" mark, when main display measured temperature value is above the setting high temperature value or below the setting Low temperature value, the beeper will continuous sound.



- ⑤ Press "SET" key for 2 seconds then release it, exit the ALARM function.

4-6 How to Disable Auto Power off Function

The meter enters sleep mode if no key pressed occurs for 30 minutes.

- ① Press ① key to turn off the meter.
- ② Press and hold down ④ key then press ① key to turn on the meter, the auto power off function will be disabled.

The time display auto power off mark ":" will disappeared.

Auto power off mode is enabled each time you turn on the meter and is automatically disabled in "MX/MN" and continuity data logging modes.

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5. MAINTENANCE

5-1 Cleaning :

Periodically wipe the case with a damp cloth and mild detergent.

Do not use abrasives or solvents. Clean and dry as required.

5-2 Battery Replacement :

When LCD display shows "BT", the battery has insufficient power to support an accurate test. At this moment, replace it with new battery from the battery compartment.

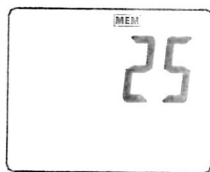
5-3 Prevention of Battery Fluid Leakage :

- ① When the battery power is low, replace the new battery in order to avoid the further battery fluid leakage possibility.
- ② When the meter will not be in use for the long period of time, please remove the batteries out of meter to prevent the possibility of battery fluid leakage damage.

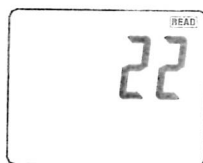
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4-4 To Trigger "One by One Datalogging"

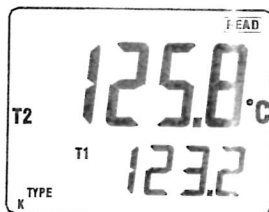
- ① Press "MEM" key each time, stores one set logged reading in memory, LCD shows "MEM" and memory location numbers (01 to 44).



- ② Press "READ" key to enter the manual memory data mode. LCD will show "READ" and memory location numbers.



- ③ Press ▲ or ▼ key to scroll through the logged readings.
- ④ Press "READ" key again to exit READ mode.

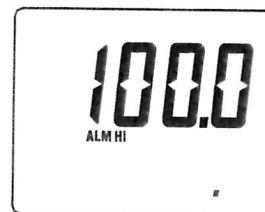


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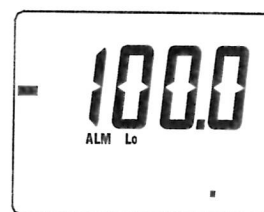
4-5 Alarm Function Operations

The ALARM function only perform on the main display temperature value, the resolution of setting value is one degree and regardless the temperature units.

- ① Press "SET" key one time, enter to Alarm High limit value setting mode, LCD will show "ALM Hi" mark.



- ② Press ▲ or ▼ key, until the display shows the alarm High limit values you want, and then press ↵ key to store the high limit value and enter to Alarm Low limit value setting LCD will show "ALM Lo" mark.



- ③ Press ▲ or ▼ key, until the display shows the alarm Low limit values you want, then press ↵ key to store the Low limit value and finished the setting mode.

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6. OPTIONAL ACCESSORY

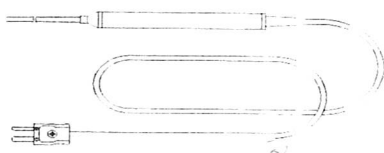
K (CA) type thermocouple.

Model	Range	Tolerances	Description
TP-K01 Bead probe	-50°C to 200°C -58°F to 392°F	±2.2°C or ±0.75% (±3.6°F or ±0.75%)	with Teflon tape insulation. Maximum insulating temperature: 200°C
TP-K02 Immersion probe	-50°C to 600°C -58°F to 1112°F	±2.2°C or ±0.75% (±3.6°F or ±0.75%)	130mm handle with 100cm Compensating wire
TP-K03 Surface probe	-50°C to 400°C -58°F to 752°F	±2.2°C or ±0.75% (±3.6°F or ±0.75%)	100mm handle with 100cm Compensating wire

TP-K01: Available for general condition, especially for complex and any place hard to reach.

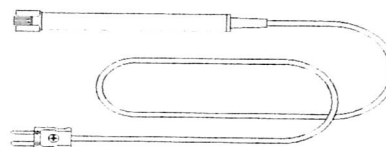


TP-K02: Available for temperature measurement of liquid, gels or air.



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TP-K03: Available for flat or curved surface measurement.



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TES ELECTRICAL ELECTRONIC CORP.



7F, No. 31, Lane 513, Rui Guang Road, Neihu Dist. Taipei, Taiwan, R. O. C.

Tel : (02) 2799-3660

Fax : 886-2-2799-5099

E-Mail : tes@ms9.hinet.net

http://www.tes.com.tw

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