



Instruction Manual

RS-1314

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

EN FR IT DE ES

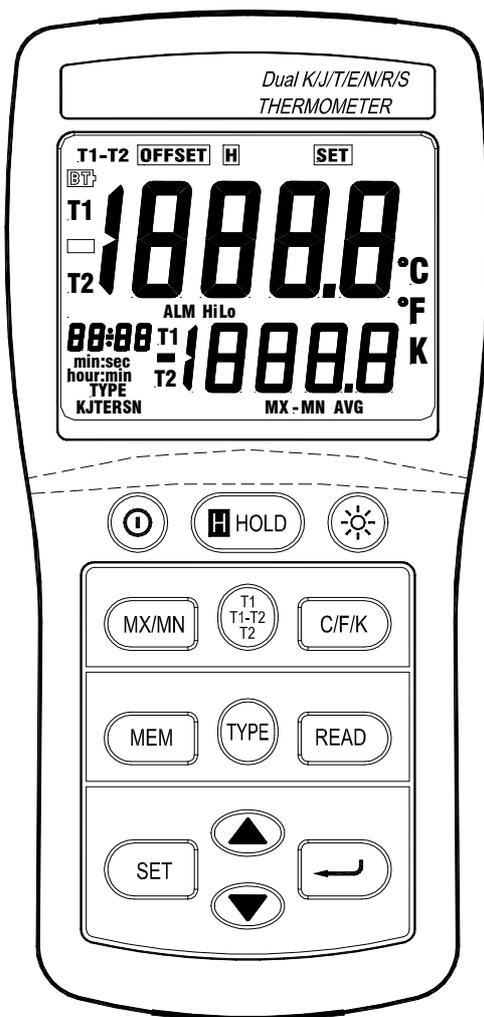


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1. INTRODUCTION

This instrument is a digital thermometer for use with J, K, T, E, N, R and S-type thermocouples as the temperature sensor.

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

- ❑ Read the following information carefully before attempting to operate or service the meter. When servicing the meter, use only specified replacement parts.
- ❑ Environment conditions
 - ① Altitude up to 2000 meters
 - ② Relatively humidity 80% max.
 - ③ Operating ambient temperature: 0 to 50°C (32 to 122°F)

U.S. Pat. No. 446,135

Safety symbols



Complies with EMC directive 89/336/EEC

2. SPECIFICATIONS

2-1 Electrical Specifications

Measurement Range:

J - type: -150.0°C to $+1090.0^{\circ}\text{C}$ (-200.0°F to $+1994.0^{\circ}\text{F}$)

K - type: -150.0°C to $+1370.0^{\circ}\text{C}$ (-200.0°F to $+1999.9^{\circ}\text{F}$)

T - type: -150.0°C to $+400.0^{\circ}\text{C}$ (-200.0°F to $+752.0^{\circ}\text{F}$)

E - type: -150.0°C to $+870.0^{\circ}\text{C}$ (-200.0°F to $+1598.0^{\circ}\text{F}$)

N - type: -150.0°C to $+1300.0^{\circ}\text{C}$ (-200.0°F to $+1999.9^{\circ}\text{F}$)

R - type: 2.0°C to $+1767.0^{\circ}\text{C}$ ($+35^{\circ}\text{F}$ to $+1999.9^{\circ}\text{F}$)

S - type: 2.0°C to $+1767.0^{\circ}\text{C}$ ($+35^{\circ}\text{F}$ to $+1999.9^{\circ}\text{F}$)

Resolution:

J-, K-, T-, E-, and N-type: $0.1^{\circ}\text{C}/^{\circ}\text{F}/\text{K}$

R- and S-type: $1.0^{\circ}\text{C}/^{\circ}\text{F}/\text{K}$ ($0.1^{\circ}\text{C}/^{\circ}\text{F}/\text{K}$ only for reference)

Measurement Accuracy:

J-, K-, T-, E-, and N-type: $\pm[0.05\%$ of reading $+0.5^{\circ}\text{C}$ (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 $+2^{\circ}\text{C}$ (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 $+0.03^{\circ}\text{C}$ per $^{\circ}\text{C}$ (0.06°F per $^{\circ}\text{F}$)

Outside the specified $+18^{\circ}\text{C}$ to 28°C ($+64^{\circ}\text{F}$ 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]

Maximum Differential Common Mode Voltage: 1V
(Maximum voltage difference between T1 and T2).

Input Protection: 20V maximum input voltage on any
combination of input connectors.

Manual Data Memory capacity: 44 sets.

2-2 General Specifications

Power Supply: Qty. 6 size AAA batteries.

Battery life: approx. 200 hours (carbon zinc battery).

Auto power-off: 30 minutes. (If no key is pressed).

Low Battery Indication: The (**BT**) symbol is displayed
when the battery voltage drops
below the operating voltage.

Measurement Rate: Once per 1.5 seconds.

Weight: 235 gms. (8.29 oz)

Dimension: 5.91"Lx 2.83"Wx 1.38"H (150x72x35mm)

Operating Temperature: 0 to 50°C (32 to 122°F)

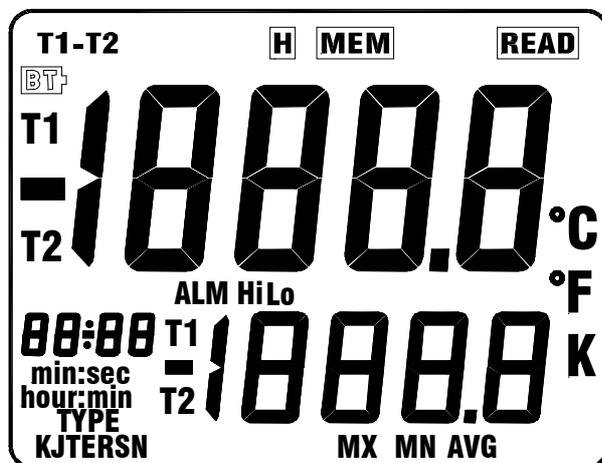
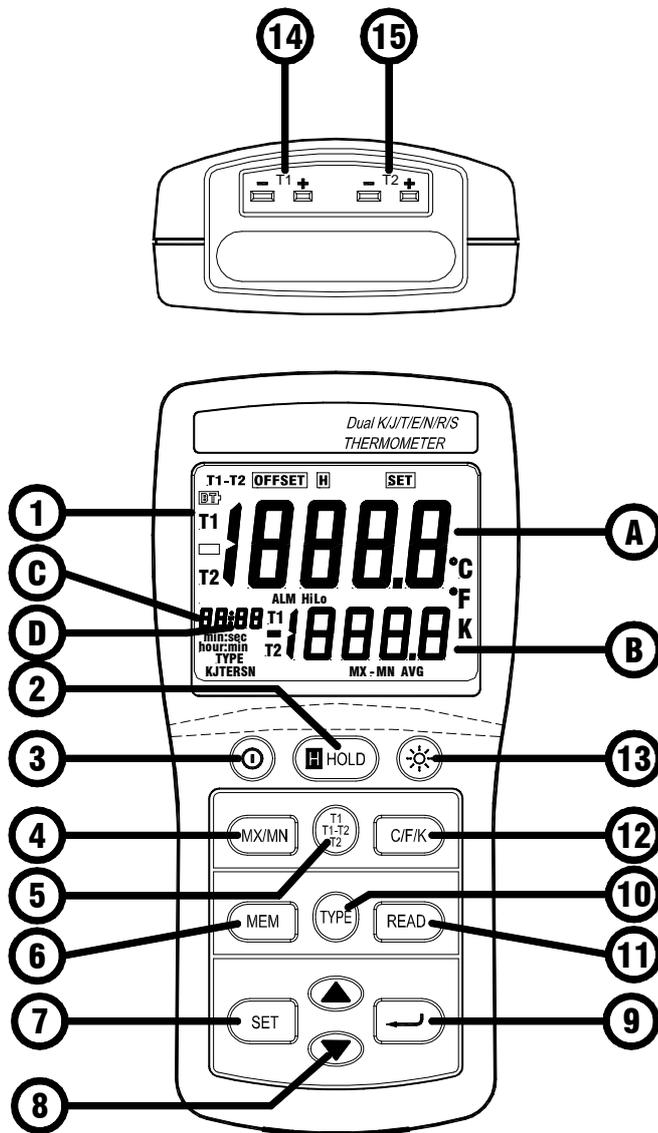
Operating humidity: Below 80% RH

Storage Temperature: -10 to 60°C, 14 to 140°F

Storage humidity: Below 70% RH

Supplied accessories: Qty. 6 AAA Batteries and instruction
manual.

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 or 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). I **Power key:** Press I key to turn the meter on or off.

(4). **MX/MN key:** Press "MX/MN" key to read the maximum, minimum, and average readings alternately. Press and hold "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 between T1, T2 and T1-T2 in the main or secondary display.

(6). **MEM key:** Each press of the "MEM" key stores a single set of logged data in memory.

(7). **SET key:**

① Press "SET" key to enter alarm setting mode.

② Press "SET" key for 2 seconds to exit alarm mode.

(8). **▲ ▼ Key:**

① Press ▲ or ▼ key to increase or decrease the value for high/low alarm value settings.

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 between the "hour:min" and "min:sec" elapsed time in MX/MN mode.

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

(11). READ key: Press "READ" key to show memory logged readings. Press "READ" key 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.

4. OPERATION INSTRUCTIONS

WARNING

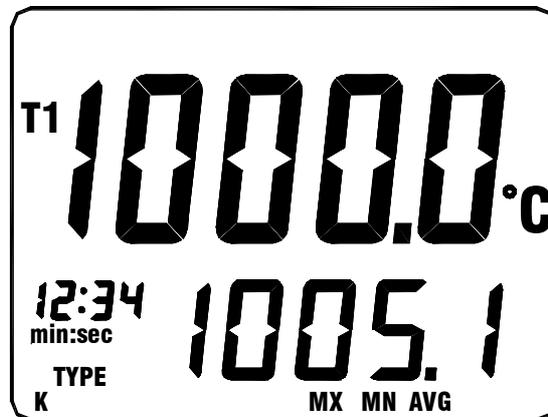
- To avoid electrical shock or personal injury, do not apply more than 20Vrms, between the thermocouples (s), or between any thermocouple and earth ground.
- If voltage on the measurement surfaces result in potentials more than 1V between the two thermocouples, then measurement errors may occur.
If the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

4-1 Temperature Measurement

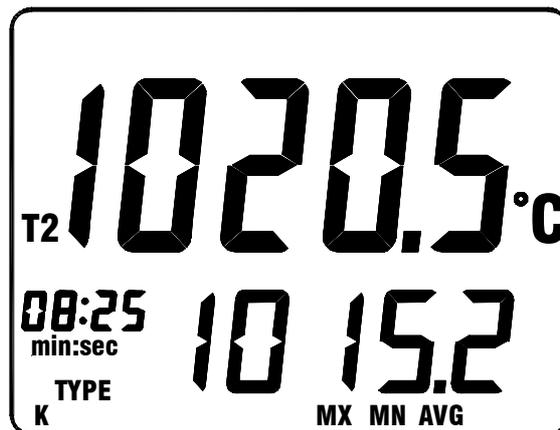
- ① Press "ⓘ" key to turn on the thermometer.
- ② Plug the thermocouple(s) into the thermocouple input(s) as required. If no thermocouple is plugged into the selected input or the thermocouple is "open circuit", the appropriate display will show "- - - .-".
- ③ Press "C/F/K" key to select the desired temperature scale.
- ④ Press "TYPE" key to select the thermocouple type required.
- ⑤ Press "T1/T2/T1-T2" key to determine which of the T1, T2, and T1-T2 readings appears in the main display or secondary display.
- ⑥ To measure the temperature, touch the probe sensor on the object whose temperature is to be measured.
- ⑦ Read the temperature on the display. The display shows "OL" (overload) when the temperature being measured is outside the valid measurement range of the meter.

4-2 MAX, MIN and AVG Function Operations

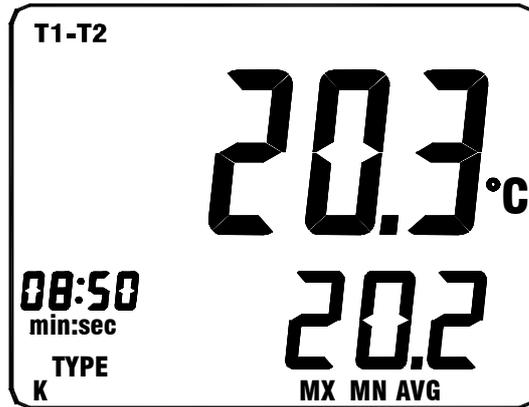
- ① Press "MX/MN" key to enter to MX/MN mode and to step through the maximum (MAX), minimum (MIN) or the true average (AVG is a true 9.7 hours recording average) mode. Auto power-off function will be automatically disabled.
- ② Press "T1/T2/T1-T2" key to toggle between present reading of the T1, T2 and T1-T2 on the main display. Press "MX/MN" key and 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.

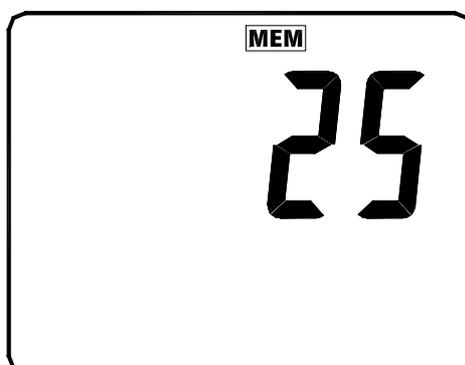
- ④ Press "MX/MN" key for 2 seconds to exit MX/MN mode. In MX/MN mode, the "C/F/K" and "TYPE" key are not active.

4-3 To Erase the Memory of Datalogger

Press and hold down the "MEM" key until the beeper sound twice and all readings in memory will be cleared.

4-4 To Trigger "One by One Datalogging"

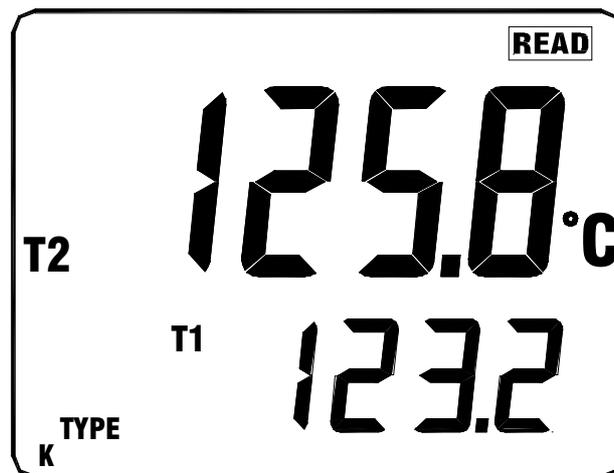
- ① Press the "MEM" key once and one set of readings will be stored in memory. The LCD display shows "MEM" and a memory location number (01 to 44).



- ② Press "READ" key to enter the manual memory data mode. The LCD display will show "READ" and a memory location number.



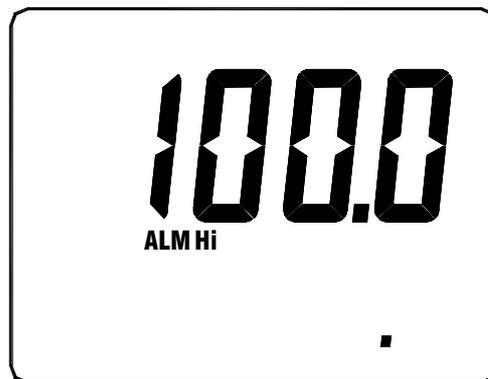
- ③ Press "▲" or "▼" key to scroll through the logged readings.
- ④ Press "READ" key again to exit READ mode.



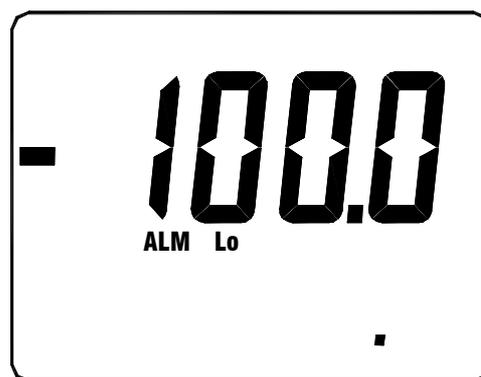
4-5 Alarm Function Operations

The ALARM function only operates on the main display temperature value. The resolution of the set value is one degree and independent of the temperature units.

- ① Press "SET" key once to enter to Alarm High limit value setting mode. The LCD display will show "ALM Hi" mark.

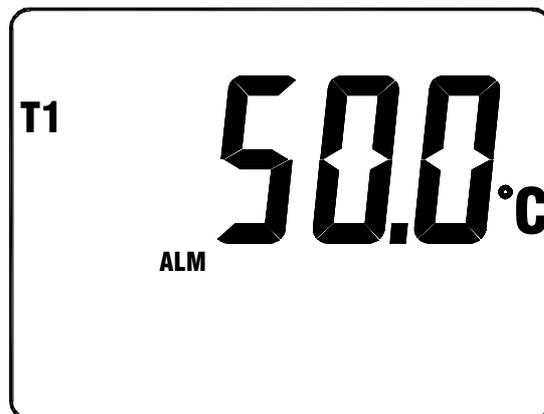


- ② Press "▲" or "▼" key, until the display shows the desired alarm high limit values and then press "↵" key to store the high limit value. Repeat ① to enter the alarm low limit value setting and the LCD display will show "ALM Lo" mark.



- ③ Press "▲" or "▼" key, until the display shows the desired alarm Low limit value. Press "↵" key to store the Low limit value and exit the setting mode.

- ④ To enter ALARM mode, press "SET" key for 2 seconds then release it. The LCD display will show "ALM" mark. When the main display measured temperature value is greater than the setting high temperature value or below the setting low temperature value, the beeper will sound continuously.



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

4-6 How to Disable Auto Power-off Function

The meter will automatically turn off if no key press occurs for 30 minutes.

- ① Press "ⓘ" key to turn off the meter.
- ② Press and hold down "↵" key then press "ⓘ" key to turn on the meter. The auto power-off function will be disabled.

The auto power off mark ":" on the time display will not be visible.

Auto power-off mode is automatically re-enabled each time the meter is turned on. Auto power off is automatically disabled in "MX/MN" and continuous data-logging modes.

5. MAINTENANCE

5-1 Cleaning:

Periodically clean 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 had insufficient power to support an accurate test. Replace the batteries with Qty. 6 type AAA cells.

6. RECALIBRATION PROCEDURE

The thermometer should be calibrated once a year to ensure its continued accuracy. Contact RS Components for further details of calibration service. The address is given at the end of these instructions.

