
DIGITAL THERMOMETER

Your purchase of this Digital Thermometer marks a step forward for you in the field of precision measurements. Although this Thermometer is a complex and delicate instrument, its ruggedness will allow many years of use if the proper operating techniques are used. Please read the following instructions carefully and always keep this manual within easy reach.

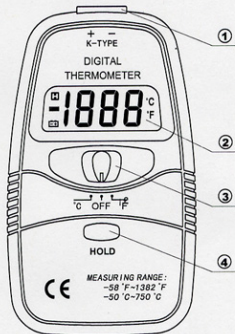
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1. FEATURES

- * Can use any standard K type sensor.
- * Fitted with standard K probe socket.
- * LCD display allows clear read out even in bright light.
- * LCD display draws very little power from battery.
- * LSI-circuit use provides high reliability and durability.
- * High accuracy and wide measurement range.
- * Compact, lightweight, and excellent operation.
- * Circuit uses a high quality multi-turn VR for maintaining high accuracy and reliability.

2. FRONT PANEL DESCRIPTION



- Thermocouple input socket
- LCD display
- Function switch
- HOLD key

3. SPECIFICATIONS

3-1 General Specification

∞ Environment Conditions:

Operating Temperature:

0° to 40°C ≤80% RH, non-condensing

Storage Temperature:

-10° to 60°C ≤70% RH, battery removed

∞ Operating principle: dual slope integration

∞ Sample Rate: 2 times/sec for digital data

∞ Display:

3 1/2 digit LCD Display with max. Reading 1999,

Automatic indication of functions.

∞ Polarity indication: "-" displayed automatically.

∞ Open-circuit Sensor indicator:

LCD will display "1" when sensor is open-circuit.

∞ Power Supply:

DC 9V battery (NEDA 1604 6F22 006P).

∞ Low Battery Indicator:

The "⊕" is displayed when the battery falls below the proper operating range

∞ Impedance: 10MΩ

∞ Dimension: 125.5(L)×72(W)×27(H)mm

∞ Weight: 145g approx. (battery included)

∞ TP-01 Thermocouple Probe:

The sensor supplied with the instrument is an ultra-fast response naked-bead thermocouple TP-01 suitable for many applications, but with a maximum operating temperature of 250°C/482° F (300°C/572°F short-term).

∞ Accessories: TP-01 Thermocouple Probe with plug, Instruction manual, Carrying case

3-2 Technical Specification

Measurement Range:

-50° to 750°C; -50° to 1382°F

Sensor Type: K type thermocouple

Resolution: 1°C or 1°F

Accuracy:

±(% of reading + number of digits) at 18°C to 28°C
(64°F to 82°F) with relative humidity to 80%.

3-2-1 Celsius scale

Range	accuracy
0° to 500°	±(0.75%+2°)
500° to 750°	±(1%+3°)
0° to -20°	typ. ±3°
-20° to -40°	typ. ±5°
-40° to -50°	typ. ±6°

3-2-2 Fahrenheit scale

Range	accuracy
32° to 932°	±(0.75%+4°)
932° to 1382°	±(1%+5°)
32° to -4°	typ. ±4°
-4° to -58°	typ. ±7°

*typ.(typically): means most units are within such accuracy.

4. MEASURING PROCEDURE

4-1 Temperature Measurement

For measurement of high temperatures, surfaces, semi-solids, liquids etc., any suitable K type probe can be used.

- ∞ Insert the sensor plug into the socket at the top edge of the instrument, taking care to observe the correct polarity.
- ∞ Select the °C/°F range desired.
- ∞ Use the sensing point of the thermocouple to measure the surface.
- ∞ Observe the stable reading.
- ∞ Hold the value, if necessary, by pressing the hold key. A second short press returns the instrument to normal mode.

4-2 Consideration

When the sensor is first plugged into the thermometer, or if the sensor is changed, the plug must be allowed to stabilize to the temperature of the socket, which is in thermal contact with the cold junction compensation device, so the greatest accuracy can be achieved. This will only take a couple of minutes and only applies if the sensor plug has previously been exposed to an ambient temperature different to that of the thermometer.

Note that in common with other thermocouple thermometers, the accuracy specification applies only to the instrument itself and allowance must be made for limits of error permitted in the thermocouple. The relevant specifications and respective limits for the K type thermocouples

are:

DIN 43710

Measurement Temp.	Allowable Error
0° TO 400°	±3%
400 °TO 1100°	±0.75%

JIS C1602-1981

Measurement Temp.	Class	Allowable Error
>0°<1000°	0.4	±1.5° or ±0.4% of Measured Temp.
>0°<1200°	0.75	±2.5° or ±0.75% of Measured Temp.
>-200°< 0°	1.5	±2.5° or ±1.5% of Measured Temp.

5. MAINTENANCE


5-1 General maintenance

- ∞ To keep the instrument clean, wipe the case with a dry cloth and mild detergent, do not use abrasives or solvents.
- ∞ Any adjustments, maintenance or repairs should be performed by a skilled professional with temperature technology.

To keep a thermocouple in good condition, observe the following items.

- Avoid excess bending.
- Don't overheat the thermocouple.
- Avoid chemical reactions that can damage the thermocouple.

5-2 Battery Replacement

- ∞ When the battery voltage drop below proper operation range the  symbol will appear on the LCD display and the battery needs to be replaced..
- ∞ Slide the battery cover away from the instrument and remove the battery.
- ∞ Replace with a 9V battery and reinstall the cover.