

IR Thermometer + Pt 100 ohm + Type K/J/R/E/T
3 in 1 THERMOMETER

Model : TM-2000

ISO-9001, CE, IEC1010



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LUTRON ELECTRONIC

The Art of Measurement

3 in 1 THERMOMETER

Model : TM-2000

1. FEATURES

* 3 in 1, Infrared thermometer + Pt 100 ohm thermometer + Thermocouple (Type K/J/R/E/T) thermometer.
* The best professional thermometer in the world.
* Microcomputer circuit with high performance.
* Wide temperature measuring range.
* Build in °C & °F select button on the front panel.
* 0.1 degree resolution for Pt 100 ohm & type K/J/T/E.
* Data hold function for storing the desired value on display.
* Memory function to record the maximum & minimum reading.
* Build in a REL button, useful for relative measurement.
* LCD display with back light.
* Sensor select button on the front panel, easy to change different type probe.
* Infrared thermometer, non-contact temperature measurement, -20 °C to 400 °C (-4 °F to 752 °F), precise non contact temperature measurement.
* Emissivity adjustment for IR thermometer.
* Laser guide for IR temperature measurement.
* 4 wires PT 100 probe input, cooperate with an 0.00385 alpha coefficient, meet DIN IEC 751, high precision.
* Thermocouple probe accept 5 different types : type K, type J, type R, type T, type E.
* RS 232 data output, easily cooperate with computer.
* Optional data acquisition software for data record.
* Auto power off saves battery life.
* Built-in low battery indicator.
* Heavy duty & compact housing case with stand.
* Operate from 006P DC 9V battery.
* Patent pending in TAIWAN, CHINA, USA, GERMANY.....

2. SPECIFICATIONS

2-1 General Specifications

Display	51 mm x 32 mm supper large LCD display, 15 mm (0.6") digit size.
Sensor Type	1. Infrared thermometer (Non contact temperature measurement) 2. Platinum Pt 100 ohm (0.00385 alpha coefficient, meet DIN IEC 751) 3. Thermocouple probe @ Thermocouple type K @ Thermocouple type J @ Thermocouple type T @ Thermocouple type E @ Thermocouple type R
Functions	°C, °F, Data hold, Memory (Max., Min.), Relative measurement, LCD back light, Emissivity adjustment (IR thermometer).
Resolution	0.1 degree or 1 degree.
Circuit	Exclusive microcomputer circuit, the software build in linearity correction function instead of the traditional hardware circuit.
Emissivity Adjustment	Range : 0.20 to 1.00. Adjustment by pushing button on front panel.
Laser Guide	Red laser light, less than 1 mW, Meet EN60825
Probe Input Socket	Pt 100 ohm probe : DIN 4 pin socket. Thermocouple couple probe : Standard 2 pin thermocouple socket.
Sampling Time	Approx. 1 second.
Hold Function	To freeze the display reading value.
Memory Recall	Memorize the Maximum, Minimum reading.
Offset Adjustment	Available for IR thermometer, Pt 100 ohm & Thermocouple thermometer Adjustment by pushing button on front panel.
Over Indication	Show " - - - "
Data Output	RS232 PC serial interface.
Power Supply	Alkaline or heavy duty type, DC 9V battery, 006P, MN1604 (PP3) or equivalent.
Power Consumption	Approx. DC 11 mA (w/o laser light on). Approx. DC 16 mA (with laser light on). * Above consumption value is calculated under the function of IR thermometer & without LCD back light.
Operating Temperature	0 to 50 °C (32 to 122 °F).
Operating Humidity	Less than 80% RH.
Size	HWD 200 x 68 x 30 mm (7.9 x 2.7 x 1.2 inch).
Weight	220 g/0.48 LB.
Standard Accessory	Operational manual..... 1 PC. * Type K Temp. probe : TP-01,TP-02A,TP-03,TP-04 * PT 100 ohm Temp. probe : TP-100 * RS232 cable, UPCB-02. * USB cable, USB-01 * Data Acquisition software, SW-U801-WIN.

Optional & accessories	Thermocouple couple (Type K) probe : Model : TP-01, TP-02A, TP-03, TP-04.
Temp. Probe	Pt 100 ohm probe : Model : TP-100
(Refer page 18, page 19)	RS232 cable Model : UPCB-02 Application software, windows version. Model : SW-U801-WIN

2-2 Electrical Specifications

A. Infrared Thermometer

Resolution/ ranges	1°C -20 °C to 400 °C 1°F -4 °F to 752 °F
Accuracy	3 % of reading or 3°C (5 °F), which ever is greater. * Accuracy test under the measurement range less than 300 °C (572 °F). * Meter operating temp. within 23 5 °C & the emissivity value of measurement target set to 0.95. * Spec. tested under the 20 cm dia. black body, the measuring distance from the probe sensing Head is 30 cm. * Spec. tested under the environment RF Field Strength less than 3 V/M & frequency less than the 30 MHz only.
Temp. Sensor	Thermocouple pie.
Emissivity Setting	* By push button. Setting range : 0.20 to 1.00. * Factory preset emissivity value to 0.95, which will cover 90% of a typical application.
Measurement Wave length Region	6 to 12 micro meter.
Distance Factor	D/S : Approx. 7:1. D - Distance, S - Spot.

B. Thermocouple (type K/J/R/E/T) Thermometer

Sensor Type	Resolution	Range	Accuracy
Type K	0.1 °C	-50.0 to 1300.0 °C	± (0.2 % + 0.5 °C)
	0.1 °F	-50.1 to -100.0 °C -58.0 to 2372.0 °F	± (0.2 % + 1 °C) ± (0.2 % + 1 °F)
Type J	0.1 °C	-100.0 to 1150.0 °C	± (0.2 % + 0.5 °C)
	0.1 °F	-50.1 to -100.0 °C -58.0 to 2102.0 °F	± (0.2 % + 1 °C) ± (0.2 % + 1.8 °F)
Type T	0.1 °C	-50.0 to 400.0 °C	± (0.2 % + 0.5 °C)
	0.1 °F	-50.1 to -100.0 °C -58.0 to 752.0 °F	± (0.2 % + 1 °C) ± (0.2 % + 1.8 °F)
Type E	0.1 °C	-50.0 to 900.0 °C	± (0.2 % + 0.8 °C)
	0.1 °F	-50.1 to -100.0 °C -58.0 to 1652.0 °F	± (0.2 % + 1 °C) ± (0.2 % + 1.5 °F)
Type R	1 °C	0 to 600 °C	± (1 % + 5 °C)
	1 °F	601 to 1700 °C 32 to 1112 °F	± (1.5 % + 5 °C) ± (1 % + 10 °F)

Remark :

- Accuracy value is specified for the meter only.
- Accuracy is tested under the meter's environment temperature within 23 ± 5°C.
- Linearity Correction : Memorize the thermocouple's curve into the intelligent CPU circuit.

C. Platinum PT 100 ohm Thermometer

Resolution	Range	Accuracy
0.1 °C	-200.0 to 850.0 °C	± (0.2 % + 0.5 °C)
0.1 °F	-328.0 to 1562.0 °F	± (0.2 % + 1.0 °F)

Remark :

- Accuracy value is specified for the meter only.
- Accuracy is tested under the meter's ambient temperature within 23 ± 5°C.
- Linearity Correction : Memorize the Pt 100 ohm's curve into the intelligent CPU circuit.
- Pt 100 probe input, cooperate with an 0.00385 alpha coefficient, meet DIN IEC 751. Input socket : DIN 4 pin socket.
- 4 wires Pt 100 ohm probe (model : PT-100) is optional.