

DIGITAL THERMOMETER

Type K/J/R/E/T

Instruction Manual

TC-950

Thank you for purchasing our Digital Thermometer. Please read this instruction manual carefully before using to ensure the correct usage of this device. Please keep this instruction manual for future reference.



Please note that misuse of this device may lead to injury to the user or damage to the device. Please observe all safety precautions and warnings in this instruction manual.

Customer Service



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Safety Precautions

For safe usage of this device, please observe all statements regarding precautions and warnings in this instruction manual.

ATTENTION

1. Operation

- Do not use this device near machines that emit strong electromagnetic fields or objects that store static electricity.
- Do not drop or subject this device to strong impact.
- Do not use or store this device where it will be exposed to water or in places with wet conditions.
- Do not use or store this device where it can be exposed to direct sunlight, dust, high temperature and high humidity.
- See the battery case markings to ensure that the battery is properly installed.
- For accurate measurements, do not subject this device in measuring sudden change of temperatures.
- Remove the battery when the device will not be used for a long period of time.
- Do not attempt to disassemble or modify this device.

2. Thermocouple Probe

- Do not measure beyond the temperature limits of the thermocouple probe being used.
- Do not use thermocouple probe in places where presence of electric shock is suspected.
- Avoid using the thermocouple probe to measure materials that may cause rust or corrosion. If used, wipe the thermocouple probe with a dry clean cloth after every use.
- Do not attempt to disassemble or bend the miniature connector of the thermocouple probe.
- Avoid bending, dropping or hitting the thermocouple probe, even when not in use.
- When measuring surfaces, make sure that the thermocouple probe is in contact with the surface perpendicularly to record accurate measurements.
- In measuring surfaces of non-metallic materials, transfer of heat takes longer than normal, therefore, make measurement time longer to get

2. Measuring Procedure

- 1.) Press the [POWER] button to switch-on the unit.
- 2.) Select the sensor type (Type K/J/T/E/R) by pressing the [SENSOR] button.
- 3.) Insert the thermocouple probe into the "Thermocouple Input Socket".
- 4.) The temperature reading will then be shown on the display.

3. Functions Operation

a. Data Hold

- 1.) While measuring, press the [HOLD] button to hold the last measured value on the display. The display will also show the "HOLD" symbol.
- 2.) Press the [HOLD] button again to exit from the data hold function.

b. Data Record (Max / Min Reading)

- 1.) To start recording the measurement data, press the [REC] button once. The display will show the "REC" symbol.
- 2.) While the "REC" symbol is on display, press the [REC] button once to display the Maximum measured data recorded. The "Max" symbol will also appear on the display. Press the [REC] button once again to display the Minimum measured data recorded. The "Min" symbol will appear on the display. To view back "Max"/("Min") measured data, press [REC] button, alternately.
- 3.) To exit from Data Record function, press the [REC] button for at least 2 seconds.

c. Relative Measurement

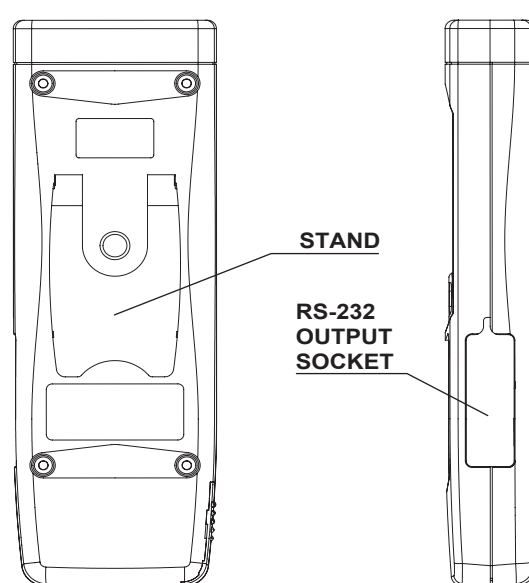
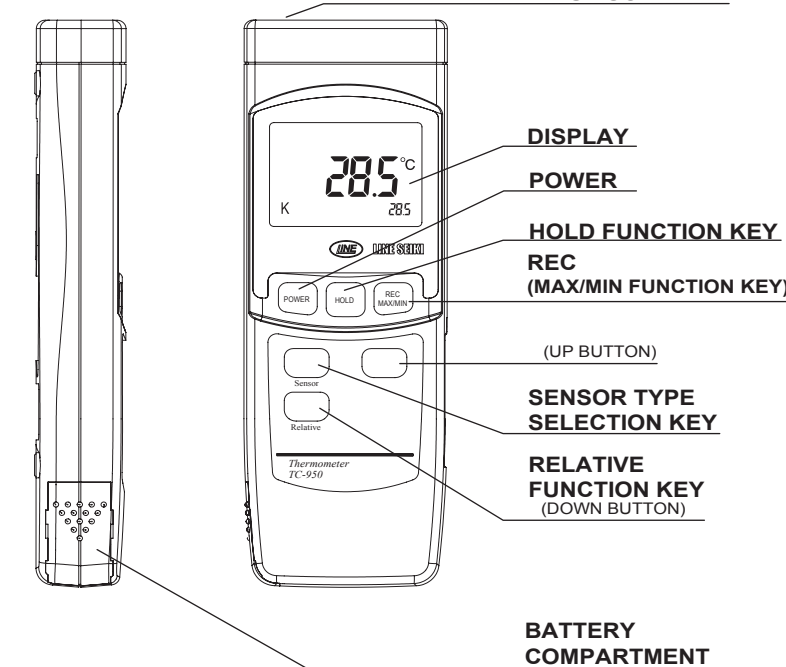
- 1.) By pressing the [RELATIVE] button, the unit will immediately remember the last measured value and the display will show "REL" symbol. The reading will show the difference between the new measured value and the last measured value.
- 2.) To exit from Relative Measurement function, press the [RELATIVE] button.
 Note: When the unit is in Data Hold or Data Record function, the Relative Measurement function cannot be activated.

d. Auto Power Off

- 1.) This unit will automatically switch off if none of the buttons are pressed for approximately 10 minutes.
 Note: The Auto Power Off feature is disabled while in Data Record function.

1. Functions

THERMOCOUPLE INPUT SOCKET

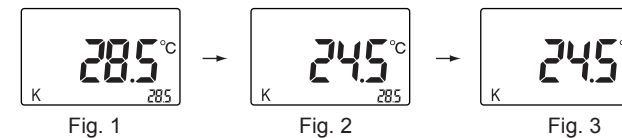


e. Offset Value Adjustment

ATTENTION (Read this before adjusting!!!)

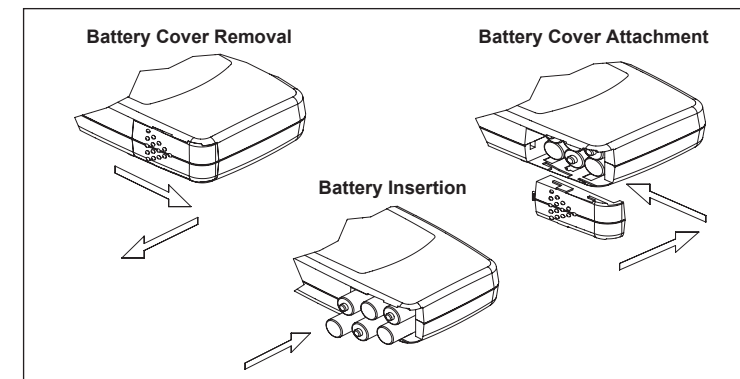
This unit is calibrated properly before shipping it out to customers. Due to some reasons, the measured value may drift a few degrees from the correct value. Therefore, the Offset Adjustment can be used to correct this error in measurement. Take note that doing the procedures below will change the factory setting calibration temperature of the unit. Turning Off the unit will not make it return to the original setting. Therefore, please be careful in adjusting!!! You should note down the values ??before and after offset adjustment in order to restore to the factory settings. If accidentally changed, please have the unit calibrated.

- 1.) While on measuring mode, press and hold the [HOLD] and [REC] buttons simultaneously. The same measured value (smaller size) will show on the lower right corner of the display. (See Fig. 1)
- 2.) While pressing the [HOLD] and [REC] button simultaneously, press either the [Blank Button] or [RELATIVE] button to adjust the temperature up or down respectively. (See Fig. 2)
- 3.) After the desired offset value is set, release all the buttons. The small digits in the lower right corner of the display will disappear and the offset value setting is completed. (See Fig. 3)



4. Battery Replacement

- 1.) When the Low Battery indicator appears on the display, it is necessary to replace the battery to maintain accurate readings.
 - 2.) Remove the battery cover as shown below.
 - 3.) Insert six LR03 (1.5V) batteries.
 - 4.) Attach the battery cover.
- * The instrument cannot measure accurately after low battery indicator is displayed. Please replace the battery immediately.



5. General Specifications

Main Unit	
MODEL	TC-950
NO. OF INPUT	1
SENSOR TYPE	Thermocouple Probe Type K,J,T,E,R
MEASURING RANGE	K: -100.0 ~ +1300.0 °C J: -100.0 ~ +1150.0 °C T: -100.0 ~ + 400.0 °C E: -100.0 ~ + 900.0 °C R: - 0.0 ~ +1700.0 °C
RESOLUTION	0.1°C
SAMPLING TIME	Approx. 1 sec.
FUNCTIONS	Data Hold, Data Record (Max/Min) Relative Measurement
DISPLAY	LCD : 51mm x 32mm Digit Size : 15mm
SENSOR CONNECTOR	Miniature Thermocouple Connector
DATA OUTPUT	RS-232 Serial Interface
POWER SUPPLY	LR03 (1.5V) battery x 6 pcs.
BATTERY LIFE	Approx. 90 Hours (Alkaline battery use)
POWER CONSUMPTION	Approx. 11mA.
OPERATING TEMP./HUMIDITY	0 to 50°C, 80%RH max.
DIMENSIONS/WEIGHT	202 (W) X 68 (H) X 30 (D) mm approx. 290g (including batteries)
CONTENTS	Instruction Manual, LR03 (1.5V) battery x 6 pcs.

Accuracy

Sensor Type	Resolution	Measuring Range	Accuracy
Type K	0.1°C	-100.0 ~ -50.1°C	±(0.2% + 1.0°C)
Type J	0.1°C	-50.0 ~ +1300.0°C	±(0.2% + 0.5°C)
		-100.0 ~ -50.1°C	±(0.2% + 1.0°C)
Type T	0.1°C	-50.0 ~ +1150.0°C	±(0.2% + 0.5°C)
		-100.0 ~ -50.1°C	±(0.2% + 1.0°C)
Type E	0.1°C	-50.0 ~ +400.0°C	±(0.2% + 0.5°C)
		-100.0 ~ -50.1°C	±(0.2% + 1.0°C)
Type R	1.0°C	-50.0 ~ +900.0°C	±(0.2% + 0.8°C)
		+0.0 ~ +600.0°C	±(1.0% + 5.0°C)
		+601.0 ~ +1700.0°C	±(1.5% + 5.0°C)

6. RS-232 PC Serial Interface

The temperature measurements and measured data graph can be checked and viewed through the computer through the RS-232 output option in the unit.

Communication Setting

Baud Rate	9600	Data bit	8 bit
Parity	None	Stop bit	1 bit

Communication Format

D15	STX (ASCII Code)
D14	4 (Fixed)
D13	1 (Fixed)
D12 - D11	Annunciator for Display °C = 01 °F = 02
D10	Polarity 0 = Positive, 1 = Negative
D9	Decimal Point (DP), position from right to left 0 = No DP, 1 = 1 DP, 2 = 2 DP, 3 = 3 DP
D8 ~ D1	Display Reading, D8 = MSB, D1 = LSB (Ex. if the Display is 1234, D8-D1 = 00001234)
D0	CR (ASCII Code)

For Example:

HEX

02	34	31	30	31	30	31	30	30	30	30	30	32	34	32	0d
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D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0	
			°C/°F	+	DP	Display (value)										
STX	4	1	0	1	0	1	0	0	0	0	0	2	4	2	CR	

※ The Output and Display change timing are in real-time.

7. Storage

For proper storage, avoid places where the device can be exposed to direct sunlight, high humidity, high temperature, vibration and shock, dust, rust, corrosion, etc. Remove batteries if the device will not be used for a long period of time.

8. Accessories (Sold Separately)

- Thermocouple Probes- Thermograph Software (UPCB-01 VER.2)
- USB Data Cable (USB-01)