

Operation Instruction For Temperature Simulator

WARRANTY

Our company warrants to the original purchaser that each product it manufactures will be free from defects in material and workmanship under normal use and service for a period of one year from date of purchase. Our company's warranty does not apply to fuses, test leads or any product which, in our company's opinion, has been misused, altered, or damaged by accident or abnormal conditions of operation or handling.

To obtain warranty service, contact your nearest Service Center (or send the product, with a description of the difficulty, and postage prepaid, to the nearest Service Center). Our company assumes no risk for the damage in transit. Our company will, at its option, repair or replace the defective product free of charge or refund your purchase price. However, if our company determines that the failure was caused by misuse, alterations, accident or abnormal condition of operation or handling, you will be billed for the repair and the repaired product will be returned to you transportation prepaid.

SHIPPING TO MANUFACTURER FOR REPAIR OR ADJUSTMENT

All shipment of our company's instruments should be made via United Parcel Service or "Best Way" prepaid. The instrument should be shipped in the original carton; or if it is not available, use any suitable container that is rigid and of adequate size. If a substitute container is used, the instrument should be wrapped in paper and surrounded with at least

four inches of excelsior or similar shock-absorbing material.

CLAIM FOR DAMAGE IN SHIPMENT TO ORIGINAL PURCHASER

The instrument should be thoroughly inspected immediately upon original delivery to purchaser. All material in the container should be checked against the enclosed packing list. The manufacturer will not be responsible for shortages against the packing sheet unless notified immediately.




If the instrument is damaged in any way, a claim should be filed with the carrier immediately. (To obtain a quotation to repair shipment damage, contact the nearest Service Center.) Final claim and negotiations with the carrier must be completed by the customer.

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Section One Safe Use

To ensure safe use, the meter and manual employ the following symbols:

-  **Warning** identifies conditions and actions that may pose hazard(s) to the user and avoid methods.
-  **Caution** identifies conditions and actions that may damage the meter or the equipment under test and avoid methods.
-  **Note** reminds Users of knowledge of symbols for the operation and explanations of the features.


To avoid possible electric shock or any other dangers, please do follow the under-mentioned rules:

-  **Warning**
 - Do not operate the meter around explosive gas, vapor, or dust, which is extreme dangerous.
 - Never apply voltage exceeding 30V between any two terminals and earth ground terminals.
-  **Caution**
 - Do not open the meter's case except for the professional technicians.
 - Use a damp cloth with neutral detergent for cleaning the meter periodically. Do not use abrasives or solvents.

Note

- To ensure accuracy, preheat for 5 minutes after power-on.
- Please contact the manufacture or dealers if the Users have higher accuracy requirement.

Section Two Components and functions of Meter's Panel

- h)  :indicates connection of output signals.
- i) Pt10、Pt100、pt200、pt500、Cu50、Cu10 : indicates graduated no. of thermal resistance(RTD).
- j) R、S、K、E、J、T、B、N: indicates graduated no. of thermocouple(TC).

Section Three Maintenance

This section provides some basic maintenance procedures. Repair, calibration, and servicing not covered in this manual must be performed by qualified personnel. For maintenance procedures not described in this manual, contact a Service Center.

(1) General maintenance

- Periodically wipe the case with a damp cloth and detergent; do not use abrasives or solvents.
- Take out the batteries if the meter won't be used for a long time.
- Dirt or moisture in the terminals can affect readings.

Clean the terminals as follows:

- (1) Turn the meter off and remove all test leads.
- (2) Shake out any dirt that may be in terminals.
- (3) Soak a new swab with alcohol. Clean each terminal with the swab.

(2) Replacing the batteries

The meter is powered by two LR6 alkaline batteries

(AA).

Warning

To avoid electrical shock or personal injury:

- Remove test leads from the meter before opening the battery door.
- Close and latch the battery door before using the meter.

Note

- The new and old batteries can not be mixed.
- Make sure the battery's odes are in accordance with the marks illustrated in battery pool when replacing them.
- Take out the batteries if the meter won't be used for a long time.
- Dispose the old batteries in accordance with the local law.

Replace the batteries as follows (See Figure 3-1):

1. Turn the rotary switch to OFF and remove the test leads from the terminals;
2. Take off the support of the meter, remove the battery door by a standard-blade screwdriver, and then take off the battery case;
3. Replace with two new batteries;
4. Reinstall the battery case, spin the screws and tighten screws.

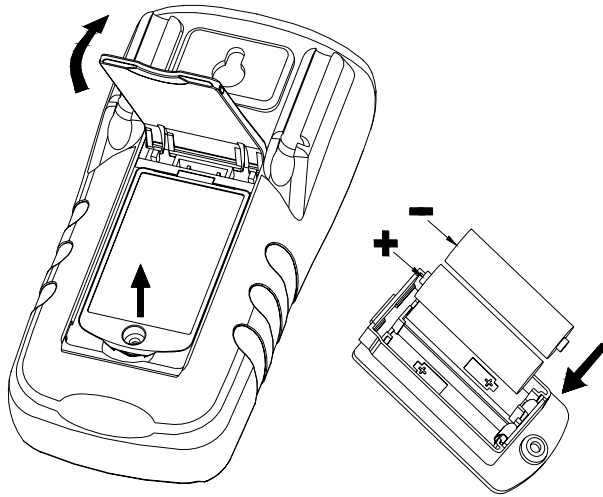


Figure 3-1 replacing batteries

Section Four Power on/Power off the Meter

(1) Turn on/off the meter

Press [power] key to electrify the meter, and repress [power] key for more than 1 second to cut off the power.

When turning on the power, the meter starts to make inner diagnose and display in full screen, and then undertakes corresponding operation.

⚠ Note

To ensure correct electrifying operation, please wait for 5 seconds to turn on the meter again after cutting off the power.

(2) Automatically turn off the power

The default factory value is set as: the meter will automatically turn off if no operation has been made within 15 minutes.

The Users can set by themselves to choose whether using this function or not (See Section Six).

Section Five Output of the Meter

The meter generates DC current or simulate resistance set by the Users from the corresponding output terminals (OUTPUT) .

⚠ Caution

Do not apply any voltage to output terminal; otherwise damage to interior circuit may occur if the voltage is not proper.

(1) DC voltage output

1. Insert the testing probe into the jack of the meter's output terminal (TC/mV), and connect the other end with input terminal of the Users' meter, see Figure 5-1:
2. Press [FUN] key , select V function, and display 'mV' unit;
3. Press [RANG] key, select range 100.00mV or 1000.0mV;
4. Press [τ] / [υ] key, select output set bit;

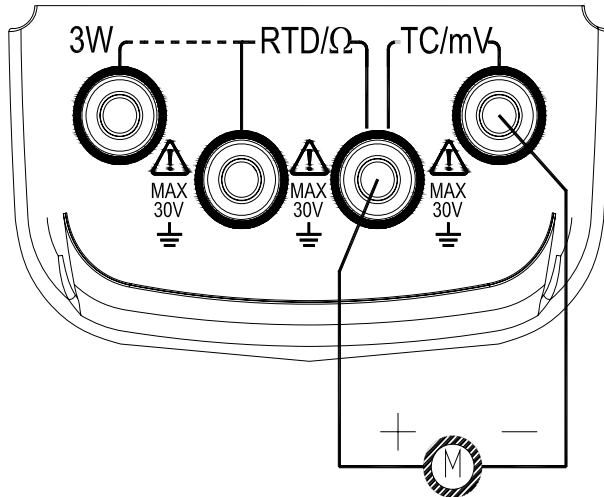


Figure 5-1

5. Press $\{\pi\}/\{\theta\}$ key, change the value of set bit, and the value can carry or abdicate automatically, and hold the key, the value will alter constantly after one second.
6. Press the $\{\text{ZERO}\}$ key, the output will be set as 000.00mV or 0000.0mV.

(2) Thermocouple (TC) simulate output

1. Insert the testing probe into the jack of the meter's output terminal (TC/mV), and connect the other end with input terminal of the Users' meter, see Figure 5-1;
2. Press $\{\text{FUN}\}$ key, select thermocouple(TC) function, and display '°C' unit and 'R' graduation no.;
3. Press $\{\text{RANG}\}$ key, select corresponding graduation no.;

4. Press $\{\tau\}/\{\upsilon\}$ key, select output set bit;
5. Press $\{\pi\}/\{\theta\}$ key, change the value of set bit, and the value can carry or abdicate automatically, and hold the key, the value will change constantly after one second.

6. Automatic compensation of cold junctions

When calibrating meter with temperature cold junction compensation directly, press $\{\text{RJ-ON}\}$ key to start the automatic compensation function of cold junctions of this meter, and it will output the necessary temperature thermoelectric force, and display 'RJ-ON'. (See Section Seven for the accuracy of cold junction compensation), and :

Output thermoelectric force = the corresponding thermoelectric force of set temperature – the corresponding thermoelectric force of room temperature

- * The Users need to wait for 2 seconds when starting the interior cold junction compensation of the meter and the meter will make automatic compensation every 10 seconds
 - * When the operation ambient temperature change, the Users need to wait until the interior compensation sensor stabilizes (about 10 minutes) and then use
 - * If the Users do not use the automatic compensation function of this meter, press the $\{\text{RJ-ON}\}$ key and the symbol 'RJ-ON' will not display any more
7. Press $\{\text{ZERO}\}$ key, the output will be set as 0000°C (R、S graduation)、400°C (B graduation)、

0000.0°C (other graduation) .

8. Press (°C/°F) key , select Centigrade or Fahrenheit unit.

(3) Resistance or thermal resistance(RTD)simulate output

⚠ Note

- **Resistance simulate:** The meter generates a simulate resistance value ranging from 400Ω to 4000Ω from the output terminal (RTD/ Ω). The output method for simulate resistance is that the meter outputs corresponding voltage “Vx” according to incentive current “Ix” generated by the calibrated meter, and for the R(set resistance) equals to $Vx(\text{output voltage})/Ix(\text{incentive current})$, thus the calibrated body should supply a simulate current to this meter. For realizing the correct simulate output of 400Ω , the incentive current should be within $\pm 0.5 \sim \pm 3\text{mA}$ range; for simulate output of 4000Ω , the incentive current should be within $\pm 0.05 \sim \pm 0.3\text{mA}$ range;

⚠ Note

- **Resistance simulate:** when the output resistance is 4-wired for calibration, the error generated by the resistance (approximately 0.1Ω) of test lead should be considered if the Users employ

two wires connection method; The meter may generate incorrect resistance value if the capacity between the output terminals and the measured meter is higher than 0.1uf .

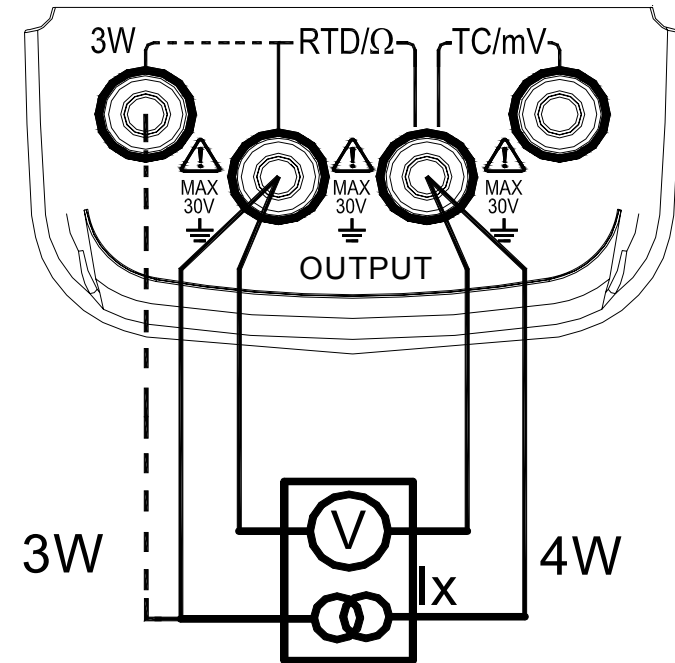


Figure 5-2

1. Insert the testing probe into the jack of the meter's output terminal (RTD/ Ω), and connect the other end with input terminal of the Users' meter, see Figure 5-2: (the dedicated testing probe supplied by the meter can be connected as three-wired or four-wired output as required by the Users)
2. The LCD shows 'OUTPUT', indicating the meter is

- in output state
3. Press (FUN) key , select resistance or thermal resistance (RTD) function, and display 'Ω' or '°C' and thermal resistance 'Pt100' graduation no.;
 4. In thermal resistance (RTD) function ,press (RANG) key, select corresponding graduation no.;
 5. Press (τ) / (υ) key, select output set bit;
 6. Press (π)/(θ) key , change the value of set bit, and the value can carry or abdicate automatically, and hold the key, the value will change constantly after one second.
 7. Press (ZERO) key, the output will be set as 000.0°C
 8. Press (°C/°F) key , select Centigrade or Fahrenheit unit.

Section Seven Performance Index

Accuracy is specified for a period of one year after calibration, at 23±5°C, with relative humidity to 75%.

Accuracy specifications are given as: ± ([% of reading] + [number of least significant digits]) ("Counts" refers to the number of increments or decrements of the least significant digit).

Output	Range	Output range	Resolution	Accuracy	Illustration
DCV	100mV	-10.00~110.00mV	0.01mV	0.05%+ 30uV	Max. output current ±2mA
	1000mV	-100.0~1100.0mV	0.1mV	0.05%+0.3mV	
OMH	400Ω	0.0~400.0Ω	0. 1Ω	0.05%+0.2Ω	±0.5 ~ ±3mA Note 1, Note 2

Section Six Function Setting

The following operation can change the automatic power off function of the meter:

1. When the meter is in power-off state, press (power) key and the LCD displays in full , loose (power) key and press (RANG) key, the meter enters into maintenance state and the LCD displays 'AP –XX'
2. Press (θ) key and the LCD displays symbol 'AP-OF', the meter stops automatically power-off function ; The LCD displays symbol 'AP-ON', the meter restores automatically power-off function, and the meter exit from maintenance state if cutting off the power again.

	4000Ω	0~4000Ω	1Ω	0.05%+2Ω	±0.05~±0.3 mA Note one, Note 2
TC	R	-40~1760℃	1℃	0.05%+3℃（less than or equals to 100℃）	Employs ITS-90 temperature standard Note 3
	S	-20~1760℃	1℃	0.05%+2℃（more than 100℃）	
	B	400~1800℃	1℃	0.05%+3℃（400~600℃） 0.05%+2℃（more than 600℃）	
	E	-200.0~1000.0℃	0.1℃	0.05%+2℃（less than or equals to -100℃） 0.05%+1℃（more than -100℃）	
	K	-200.0~1370℃	0.1℃		
	J	-200.0~1200.0℃	0.1℃		
	T	-200.0~400.0℃	0.1℃		
	N	-200.0~1300.0℃	0.1℃		
RTD	Cu10	-10.0℃ ~ 250.0℃	0.1℃	0.05%+0.6℃	incentive current is ±0.5~ ±3 mA when the incentive current is ±0.1 ~ 0.5 mA , add 0.5℃ additional error
	Cu50	-50.0℃ ~ 150.0℃	0.1℃	0.05%+0.6℃	
	Pt10 385	-200.0℃ ~ 850.0℃	0.1℃	0.05%+0.6℃	
	Pt100 385	-200.0℃ ~ 850.0℃	0.1℃	0.05%+0.6℃	
	Pt200 385	-200℃~630℃	0.1℃	0.05%+0.6℃	Incentive current is ±0.05~±0.3 mA
	Pt500 385	-200℃~630℃	0.1℃	0.05%+0.6℃	

	Pt1000 385	-200.0°C 630.0°C	~	0.1°C	0.05%+0.6°C	
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Note 1: Affiliated resistance of test lead is excluded

Note 2: The range of incentive current is from 0.05mA to 3mA, and the maximum output is less than or equals to 2V

Note 3: The accuracy does not include the error of interior temperature compensation sensor

the range of interior temperature compensation sensor is from -10 to 50°C, and the error compensation is less than or equals to 0.5°C

General Feature

- power : two 1.5V alkaline batteries(LR6)
- power consumption : about 60m/3V
- maximum allowed voltage : 30V (within terminals or between terminal and earth ground)
- operation temperature range : 0°C~50°C
- operation humidity range : ≤ 80%RH
- storage temperature range : ≤ -10°C~55°C
- storage humidity range : ≤ 90%RH
- temperature coefficient : $0.1 \times (\text{dedicated accuracy}) \text{ } ^\circ\text{C} \text{ } ^\circ\text{C}^{-1}$ (5°C~18°C、28°C~40°C)
- measurement : 180 (L) × 90 (W) × 47 (D) mm (with protector)
- weight : about 500g
- accessory : User's Manual, industrial testing lead CF-36 (clips for probe)
- safety : complies with IEC1010 (safety standard issued by International Electrician Committee)

Section Eight Note for the Manual

- The present operation instruction is subject to change without notice;
- The content of the operation instruction is regarded as correct. Whenever any user finds its mistakes, omission, etc., he or she is requested to contact the manufacturer;
- The present manufacturer is not liable for any accident and hazard arising from the customer misuse or inadvertent operation;
- The functions described in this operation instruction should not be used as grounds to apply this product to a particular purpose.