



- Sensitivity: sine wave 0.6V rms (9.999MHz: 1.5V rms)
- Overload protection: 500V DC or AC rms

### 6-8 Duty cycle

0.1%~99.9%:  $\pm$  (2.0% of rdg + 2 digits), Frequency lower than 10kHz

- Sensitivity: sine wave 0.6V rms
- Overload protection: 500V DC or AC rms

### 6-9 Temperature

Range	Accuracy	Resolution
°C	-20~150°C	$\pm$ (3°C+ 3digits)
	150~1000°C	$\pm$ (3% of rdg + 3digits)
°F	-4~302°F	$\pm$ (5°F+ 5digits)
	302~1832°F	$\pm$ (3% of rdg + 5digits)

- NiCr-NiSi K-type sensor
- Overload protection: 500mA/500V Fast Fuse

### 6-10 Diode and Audible continuity test

Range	Description	Test Condition
	Display read approximately forward voltage of diode	Forward DC current approx. 1.5mA Reversed DC voltage approx. 3.2V
	Built-in buzzer sounds if resistance is less than 50Ω	Open circuit voltage approx. 1V

Overload protection: 500V DC or AC rms

### 6-11 Transistor hFE test

Test range: 0-1000

I<sub>b</sub>=10μA, V<sub>ce</sub>=1.8V Approx.

### 6-12 Non Contact AC Voltage (NCV) detection

Test voltage range: 90V~1000V AC rms

The NCV red light and green light will light up alternately together with sound.

## 7. OPERATING INSTRUCTIONS

### 7-1 Attention before operation

7-1-1 Check battery. When the battery voltage drop below proper operation range, the symbol will appear on the LCD display and the battery need to be changed.

7-1-2 Pay attention to the besides the input jack which shows that the input voltage or current should be within the specified value.

7-1-3 The range switch should be positioned to desired range for measurement before operation.

### 7-2 Measuring DC & AC Voltage

7-2-1 Set the rotary switch at the desired "mV or "V range position, it shows symbol for testing DC voltage, if you want to test AC voltage, push "SELECT" button switch.

7-2-2 Connect the black test lead to COMT- jack and the red to VΩHz jack.

7-2-3 Connect test leads across the source or load under measurement.

7-2-4 You can get reading from LCD. The polarity of the red lead connection will be indicated along with the DC voltage value.

#### NOTE:

1. means you can't input the voltage more than 1000V DC or 750V AC, it's possible to show higher voltage, but it may destroy the inner circuit or pose a shock.
2. Be cautious against shock when measuring high voltage.

### 7-3 Measuring DC & AC Current

7-3-1 Set the rotary switch at the desired "uA & "mA & "A range position, it shows symbol for testing DC current, if you want to test AC current, push "SELECT" button switch.

7-3-2 Connect the black test lead to COMT- jack and the red to the μAmAT+ jack for a maximum 400mA current, for a maximum 4A or 20A current, move the red lead to the 20A jack.

7-3-3 Connect test leads in series with the load under measurement.

7-3-4 You can get reading from LCD. The polarity of the red lead connection will be indicated along with the DC current value.

#### NOTE:

1. When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
2. When only "OL" is displayed, it indicates over-range situation and the higher range has to be selected.
3. means the socket mA's maximum current is 500mA and 20A's maximum current is 20A, over 500mA or 20A current can be protected by the fast fuse.
4. On the 20A range, the measuring time should be less than 10 seconds to prevent precision from affecting by circuit heating.

### 7-4 Measuring Resistance

7-4-1 Set the rotary switch at the desired "Ω range position.

7-4-2 Connect the black test lead to COMT- jack and the red to VΩHz jack.

7-4-3 Connect test leads across the resistance under measurement.

7-4-4 You can get reading from LCD.

NOTE: Max. input overload: 500V rms < 10sec

1. For measuring resistance above 1MΩ, the meter may take a few seconds to get stable reading.
2. When the input is not connected, i.e. at open circuit, the figure 'OL' will be displayed for the over-range condition.
3. When checking in-circuit resistance, be sure the circuit under test has all power removed and that all capacitors have been discharged fully.

### 7-5 Measuring Capacitance

7-5-1 Set the rotary switch at the desired "F range position.

7-5-2 Connect the black test lead to COMT- jack and the red to VΩHz jack.

7-5-3 Connect test leads across the capacitance under measurement.

7-5-4 You can get reading from LCD.

NOTE: Max. input overload: 500V rms < 10sec

1. Capacitors should be discharged before being tested.
2. When testing large capacitance, it will take longer time before the final indication ( For 100uF~99.99mF range, it will take about 10 seconds ).
3. When testing small capacitance ( $\leq$ 1uF), to assure the measurement accuracy, first press "REL , then go on measuring.

### 7-6 Measuring Frequency & Duty cycle

7-6-1 Set the rotary switch at the desired "Hz" range position.

7-6-2 Connect the black test lead to COMT- jack and the red to VΩHz jack.

7-6-3 Push "Hz/Duty" key to choose Frequency or Duty cycle test.

7-6-4 Connect the probe across the source or load under measurement.

7-6-5 You can get reading from LCD.

### 7-7 Measuring Temperature

7-7-1 Set the rotary switch at the desired "°C/°F" range position, push "SELECT" to choose °C or °F measurement.

7-7-2 Connect the black banana plug of the sensor to COMT- jack and the red banana plug to the μAmAT+ jack.

7-7-3 Put the sensor probe into the temperature field under measurement.

7-7-4 You can get reading from LCD.

#### NOTE:

1. The accessory of the meter WRNM-010 type contact thermocouple limit temperature is 250 °C (300 °C shortly), please use special probe for test higher temperature.
2. Please don't change the thermocouple at will, otherwise we can't guarantee to measure accuracy.
3. Please don't importing the voltage in the temperature function.

### 7-8 Diode & Audible continuity Testing

7-8-1 Set the rotary switch at the "Ω range position, push "SELECT" to choose Diode or Audible continuity measurement.

7-8-2 Connect the black test lead to COMT- jack and the red to VΩHz jack.

7-8-3 On diode range, connect the test leads across the diode under measurement, display shows the approx. forward voltage of this diode.

7-8-4 On Audible continuity range, connect the test leads to two point of circuit, if the resistance is lower than approx. 50Ω, the buzzer sounds.

NOTE: Make sure the power is cut off and all capacitors need to be discharged under this measurement.

### 7-9 Transistor hFE Test

7-9-1 Set the rotary switch at the desired "hFE" range position.

7-9-2 Determine whether the transistor is NPN or PNP and locate the Emitter, Base and Collector leads. Insert the leads into the proper holes in the socket on the front panel.

7-9-3 You can get reading of the approximate hFE value from LCD.

NOTE: Don't connect an external voltage to measuring terminals.

### 7-10 Non Contact AC Voltage detection

7-10-1 Set the rotary switch at the desired "NCV" range position, the NCV green LED light will light up.

7-10-2 Hold the Meter so that the meter's top is vertically and horizontally centered and contacting the conductor, when the live voltage  $\geq$  90V AC rms, the NCV red LED light and green LED light will light up alternately together with sound.

#### NOTE:

1. Even without LED indication, the voltage may still exist. Do not rely on non-contact voltage detector to determine the presence of voltage wire. Detection operation may be subject to socket design, insulation thickness and different type and other factors.
2. When the meter input terminals presence voltage, due to the influence of presence voltage, voltage sensing indicator may also be bright.
3. Keep the meter away from electrical noise sources during the tests, i.e., florescent lights, dimmable lights, motors, etc.. These sources can trigger Non-Contact AC Voltage detection function and invalidate the test.

### 8. Battery replacement

8-1 When the battery voltage drop below proper operation range the symbol will appear on the LCD display and the battery need to be changed.

8-2 Before changing the battery, set the selector switch to "OFF" position and remove the test leads from the terminals. Open the cover of the battery cabinet by a screwdriver.

8-3 Replace the old battery with the same type battery (9V 6F22).

8-4 Close the cover of the battery cabinet and fasten the screw.

### 9. Fuse replacement

9-1 This meter is provided with a 500mA/500V fast fuse to protect the temperature test and the current measuring circuits which measure up to 400mA, with a 20A/500V fuse to protect the 20A range.

9-2 Ensure the meter is not connected to any external circuit, set the selector switch to "OFF" position and remove the test leads from the terminals. Open the cover of the battery cabinet by a screwdriver.

9-3 Replace the old fuse with the same type and rating: 6×30mm 500mA/500V fast fuse or 6×30mm 20A/500V fast fuse.

9-4 Close the cover of the battery cabinet and fasten the screw.

### 10. Maintenance

10-1 You must replace the test leads if the lead is exposed, and should adopt the leads with the same specifications as origin.

10-2 Use only moist fabric or small amount of detergent but not chemical solution for cleaning.

10-3 Do not use the meter before the back cover is properly closed and screw secured. Upon any abnormality, stop operation immediately and send the meter for maintenance.

10-4 Please take out the battery when not using for a long time.

### 11. Accessories

[1] Test Leads: electric rating 1000V 20A

[2] "K" type thermocouple sensor probe

[3] Operator's Manual



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