

KAIWEETS

True-RMS Multimeter

Model: HT118A

Made in China

CE RoHS




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Statement

In accordance with the international copyright law, without permission and written consent, do not copy the contents of this manual in any form (including storage and retrieval or translation into languages of other countries or regions). The manual is subject to change in future edition without prior notice.

 **Caution** mark refers to the condition and operation which may cause damage to the instrument or equipment.

It requires that you must be careful during the execution of the operation. If incorrectly perform the operation or do not follow the procedure, it may damage the instrument or equipment. In the circumstances that such conditions are not met or not fully understood, please do not continue to perform any operation indicated by the caution mark.

 **Warning** mark indicates the condition and operation which may cause danger to users.

It requires that you pay attention during the execution of this operation. If incorrectly perform the operation or do not follow the procedure, it may result in personal injury or casualties. In the circumstances that such conditions are not met or not fully understood, please do not continue to perform any operation indicated by the warning mark.

Safety Instructions

The instrument is designed according to the requirements of the international electrical safety standard IEC61010-1 for the safety requirements of the electronic testing instruments. The design and manufacture of instruments strictly comply with the requirements of IEC61010-1 CAT.III 1000V over voltage safety standards and pollution level 2.

Warning

In order to avoid possible electric shock or personal injury and other safety accidents, please abide by the following specifications:












- Please read this manual carefully before using the instrument, and pay special attention to safety warning information.
- Strictly observe the operation of this manual and use this instrument. Otherwise, the protection function of the instrument may be damaged or weakened.
- Please be careful if the measurement exceeds 30V AC true RMS, 42V AC peak or 60V DC. There may be danger of electric shock at this kind of voltage
- By measuring the known voltage to check whether the meter work is normal, if it is not normal or damaged, do not use it again.

- Before using the instrument, please check whether there is any crack or plastic damage in the instrument case. If you do, do not use it again.
- Before using the instrument, please check whether the probe is cracked or damaged. If so, please replace the same type and the same electrical specifications.
- The instrument shall be used in accordance with the specified measurement category, voltage or current rating.
- Please comply with local and national safety code. Wear personal protection equipment (such as approved rubber gloves, masks and flame retardant clothes, etc.) to prevent being damaged by electric shock and electric arc due to exposed hazardous live conductor
- When it shows low battery indicator, please replace the battery in time in case of any measurement error.
- Do not use the instrument around explosive gas, steam or in wet environment.
- When using the probe, please put your fingers behind the finger protector of the probe.
- When measuring, please connect the zero line or the ground line firstly, then connect the live wire; but when disconnecting, please disconnect the live wire firstly, then disconnect the zero line and ground line.
- Before opening the outer cabinet or battery cover, please

remove the probe on the instrument. Do not use the instrument in the circumstances that the instrument is taken apart or battery cover is opened.

- It only meets the safety standards when the instrument is used together with the supplied probe. If the probe is damaged and needs to replace, the probe with same model number and same electrical specifications must be used for replacement.

Symbols

	High voltage warning		AC (Alternating Current)
	AC and DC		DC (Direct current)
	Warning; Important information		Earth ground
	Fuse		Low Battery
	Double insulated		
	Product complies with all relevant European laws		
	Do not dispose of this product as unsorted municipal waste.		
CAT. II	Product is suitable for testing and measuring circuits directly connected to power points (sockets and similarities) of low voltage power installations.		
CAT. III	Product is suitable for testing and measuring circuits connected to the distribution part of low voltage power supply devices in buildings.		
CAT. IV	Product is suitable for testing and measuring circuits connected to the power supply of low voltage power installations in buildings.		

Multimeter Features

A new generation of high performance digital multimeter. The new display and function layout show clearer and better user experience. It is the best choice for professional electricians, enthusiasts or families.

- ① NCV probe
- ② Flashlight
- ③ Red / green light
- ④ LCD display (Dual color backlight)
- ⑤ Function keys
- ⑥ Rotary Switch
- ⑦ Other measurement input terminal
- ⑧ COM Input terminal
- ⑨ mA、uA Input terminal
- ⑩ 10A Input terminal



FUNC. keys

When there are multiple measuring functions on a gear, the FUNC. key switch function is adopted.

Data hold


Press "HOLD" key, enter/cancel data hold mode.

MIN MAX Measurement


Press the MAX/MIN key to enter the MIN MAX mode and then press the loop to display the maximum and minimum values.

Press and hold for more than 2 seconds to exit the MIN MAX mode.

Backlight

Press  key, turn on/off the backlight. After about 10 seconds of inactivity it will automatically shut down.

Flashlight

Press  key and keep more than 2 seconds to turn on/off the flashlight.

Sleep Mode

- The Meter automatically enters sleep mode if there is no operation for 15 minutes to save battery energy. Pressing any button or turning the rotary switch awakes the Meter.
- If you press the "FUNC." button and turn on the meter, the sleep mode will be deactivated. After turning off the meter, The Meter will restore Sleep Mode after power off.

LED-Terminal Indication

Turn on the Meter and switch the gear, the corresponding light on the terminal flashes to imply the correct input terminal.

High voltage prompt function

When the measuring voltage is greater than 80V or the measuring current greater than 1A, the orange backlight will light up, prompting the users to be careful.

Measurement Operation

DC/AC voltage measurement

- 1) Turn the knob to “Hz \tilde{V} ” and switch DC/AC voltage function by "FUNC." key
- 2) Insert the **red** probe in “ \tilde{V} Hz%Live” terminal, insert the **black** probe in “COM” terminal.
- 3) Connect the probe to the measured circuit (connect to the measured power supply or circuit in parallel), measure the voltage.
- 4) Read the measurement result on the screen, when measuring AC voltage the frequency is displayed simultaneously.

WARNING

The voltage above DC1000V or AC750V can't be measured; otherwise the instrument may be damaged.

Pay special attention to safety when measuring high voltage to avoid electric shock or personal injury.

Always test known voltage with the meter before use to confirm the instrument function is intact.

Note: When the voltage is greater than 80V, the orange backlight will light up.

DC/AC voltage mV measurement

- 1) Turn the knob to " $\overline{\text{mV}}$ " and switch AC/ DC voltage function by "FUNC." key
- 2) Insert the **red** probe in " $\overline{\text{V}\Omega\text{Hz}\% \text{Live}}$ " terminal, insert the **black** probe in "COM" terminal.
- 3) Contact the probe to the measured circuit (connect to the measured power supply or circuit in parallel), measure the voltage.
- 4) Read the measurement result on the screen, when measuring AC voltage the frequency is displayed on LCD simultaneously.

WARNING

The voltage above DC250V can't be measured; otherwise the instrument may be damaged.

Pay special attention to safety when measuring high voltage to avoid electric shock or personal injury.

Test the known voltage with the meter before use, confirm the instrument function is intact.

Frequency/Duty measurement

- 1) Turn the knob to "Hz%" and switch Frequency or Duty function by "FUNC." key
- 2) Insert the red probe in " $\overset{+}{\text{V}}\Omega\text{Hz}\% \text{Live}$ " terminal, insert the black probe in "COM" terminal.
- 3) Contact the probe to the measured circuit (connect to the measured power supply or circuit in parallel), measure the frequency and duty.
- 4) Read the measurement result on the screen.

WARNING

The voltage above 10V can't be measured; otherwise the instrument may be damaged.

Pay special attention to safety when measuring high voltage to avoid electric shock or personal injury.

Test the known voltage with the meter before use, confirm the instrument function is intact.



Caution: To avoid damaging instruments or equipment, do not enter frequency or duty cycle signal greater than 10V valid value.

DC/AC current measurement

- 1) Turn the knob to " $\overline{\mu\text{A}}^{\text{Hz}}$ " or " $\overline{\text{mA}}^{\text{Hz}}$ " or " $\overline{\text{A}}^{\text{Hz}}$ " and switch AC or DC current function by "FUNC." key
- 2) Insert the **red** probe in "mA" terminal or "10A" terminal, insert the **black** probe in "COM" terminal.
- 3) Disconnect the power of the tested circuit; connect the meter to the circuit under test, then turn on the circuit power supply.
- 4) Read the measurement result on the screen. When measuring AC current, the frequency is displayed on LCD simultaneously.



WARNING

The voltage above 250V can't be measured; otherwise the instrument may be damaged.

Pay special attention to safety when measuring high voltage to avoid electric shock or personal injury.

Test the known current with the meter before use; confirm the instrument function is intact.

When measuring large current, continuous measurement should be no longer than 15 seconds



Caution

To avoid damaging the instrument or equipment, check the fuse before measuring and ensure that the measured current does not exceed the rated maximum current; use the correct input.

Resistance measurement

- 1) Turn the knob to " Ω " and switch resistance function by "FUNC." key
- 2) Insert the red probe in " $V\Omega Hz$ " terminal, insert the black probe in "COM" terminal.
- 3) Contact the probe to the measured circuit or resistance, measure the resistance.
- 4) Read the measurement result.

WARNING

When measuring resistance on the line, disconnect the power supply and discharge all the high-voltage capacitors. Otherwise, the instrument may be damaged and may be struck by electric shocks.

Continuity measurement

- 1) Turn the knob to " Ω " and Switch to Continuity function by "FUNC." key.
- 2) Insert the red probe in " $V\Omega Hz$ " terminal, insert the black probe in "COM" terminal.
- 3) Contact the probe to the measured circuit or resistance,
- 4) If the resistance or circuit of the measured resistance is less than 30Ω , the buzzer will on and the green indicator lights up at the same time; when the resistance is about between 30Ω to 60Ω , the red indicator lights up; LCD displays the resistance.

WARNING

When measuring Continuity on the line, disconnect the power supply and discharge all the high-voltage capacitors. Otherwise, the instrument may be damaged and may be struck by electric shocks.


Diode measurement

- 1) Turn the knob to " Ω " and Switch to diode measurement function by "FUNC." key.
- 2) Insert the red probe in " $V\Omega Hz$ Live" terminal, insert the black probe in "COM" terminal.
- 3) Touch the diode anode with the red probe, the black probe contacts the diode cathode.
- 4) Read the measurement result on the screen.

WARNING

When measuring diode on the line, disconnect the power supply and discharge all the high-voltage capacitors. Otherwise, the instrument may be damaged.

Capacitance measurement

- 1) Turn the knob to “”.
- 2) Insert the red probe in “ $\overset{+}{\text{V}}\Omega\text{Hz}\% \text{Live}$ ” terminal, insert the black probe in “COM” terminal.
- 3) Contact the probe to the measured circuit or Capacitance, measure the resistance.
- 4) Read the measurement result on the screen.

 WARNING

When measuring Capacitance on the line, disconnect the power supply and discharge all the high-voltage capacitors. Otherwise, the instrument may be damaged and may be struck by electric shocks.

NCV test

- 1) Turn the knob to the "^{NCV}Live" and Switch to NCV test function by "FUNC." key. Meter will display "NCV".
- 2) Then NCV probe gradually approaches the detected point.
- 3) When the meter senses weak AC signals, the green indicator lights up, at the same time, the beeps send out slow dips.
- 4) When the meter senses strong AC signals, the red indicator lights up, at same time, the beeps send out fast dips.

WARNING

In order to avoid possible accidents such as electric shock or personal injury, please follow the safety regulations.

Live test

- 1) Turn the knob to the "Live"^{NCV}, and Switch to live test function by "FUNC." key. Meter will display "LIVE".
- 2) Insert the red probe in "vΩHz%Live"^(f→o) terminal, Then the probe contact to the test point
- 3) When the meter senses weak AC signals, the green indicator lights up, at same time, the beeps send out slow dips.
- 4) When the meter senses strong AC signals, the red indicator lights up, at same time, the beeps send out fast dips.

WARNING

In order to avoid possible accidents such as electric shock or personal injury, please follow the safety regulations.

Temperature Measurement

- 1) Turn the knob to the "°C/°F".
- 2) Insert the K-Type thermocouple into the meter. The thermocouple's positive (red) is inserted into the "VΩHz%Live" input, and the negative end (black) is inserted into the "COM" input.
- 3) Connect the measured object with the thermocouple probe and read the result from the display.

Note: The cold junction of thermocouple is placed inside the instrument, and it needs longer heat balance with the measuring environment.

WARNING

When measuring temperature with thermocouple, the probe of thermocouple can't touch the charged object, otherwise it may damage the instrument and may suffer electric shock or personal injury.

General Specifications

Display	6000 counts, true RMS
Measurements	
Safety Rating	CAT. IV 600V; CAT. III 1000V
MAX. Voltage between terminals and earth ground	DC1000V/AC750V
Fuse protection	mA: F600mA/250V fuse 10A: F10A/250V fuse
Sampling rate:	3 times/second
Terminal indication	Auto
Battery	2 x 1.5V AAA batteries Operating temperature and humidity:0~40°C (<80% RH,<10°C non condensing)
Operation Conditions	Storage temperature and humidity: -10~60°C(<70% RH, remove the battery) Operating altitude:0-6500 ft (0-2000 m) Pollution level: 2
Temperature coefficient	0.1' accuracy /°C (<18°C or >28°C) .

Accuracy Specifications

The accuracy applies within one year after the calibration.

Reference condition: the environment temperature 18°C to 28°C,
the relative humidity is no more than 80%.

Accuracy: \pm (% reading + word)

DC voltage

Range	Resolution	Accuracy
600mV	0.1mV	$\pm(0.5\% \text{ reading}+3)$
6V	0.001V	
60V	0.01V	
600V	0.1V	
1000V	1V	

- Input impedance: 10M Ω
- Maximum input voltage: 1000V DC
- Overload protection: 1000V DC or 750V AC

AC voltage

Range	Resolution	Accuracy
600mV	0.1mV	±(0.8% reading+5)
6V	0.001V	
60V	0.01V	
600V	0.1V	
750V	1V	

- Input impedance: 10MΩ;
- Maximum input voltage: 750V AC
- Overload protection: 1000V DC or 750V AC;
- Frequency Response: 10Hz ~ 1kHz: True-RMS

DC current

Range	Resolution	Accuracy
600μA	0.1μA	±(1.2% reading+3)
6000μA	1μA	
60mA	0.01mA	
600mA	0.1mA	
10A	0.01A	

- Overload protection: μA/mA: F600mA/250V fuse
10A: F10A/250V fuse
- Maximum input current: mA: 600mA; A: 10A
When measuring large current, continuous measurement should be no longer than 15 seconds

AC current

Range	Resolution	Accuracy
600 μ A	0.1 μ A	$\pm(1.5\% \text{ reading}+3)$
6000 μ A	1 μ A	
60mA	0.01mA	
600mA	0.1mA	
10A	0.01A	

- Overload protection: μ A/mA: F600mA/250V fuse
10A: F10A/250V fuse
- Maximum input current: mA: 600mA; A: 10A
- Frequency Response: 10Hz ~ 1kHz; True-RMS

When measuring large current, continuous measurement should be no longer than 15 seconds

Resistance

Range	Resolution	Accuracy
600 Ω	0.1 Ω	$\pm(1.0\% \text{ reading}+3)$
6k Ω	0.001k Ω	
60k Ω	0.01k Ω	
600k Ω	0.1k Ω	
6M Ω	0.001M Ω	$\pm(1.5\% \text{ reading}+3)$
60M Ω	0.01M Ω	

Overload protection: 250V

Capacitance

Range	Resolution	Accuracy
10nF	0.001nF	±(4.0% reading+5)
100nF	0.01nF	
1000nF	0.1nF	
10μF	0.001μF	
100μF	0.01μF	
1000μF	0.1μF	
10mF	0.001mF	±(5.0% reading+5)
100mF	0.01mF	

- Overload protection: 250V

Note: the parameters do not include errors caused by the capacitance of the pen capacitor and the substrate.

Frequency/Duty

Range	Resolution	Accuracy
10Hz	0.001Hz	±(1.0% reading+3)
100Hz	0.01Hz	
1000Hz	0.1Hz	
10kHz	0.001kHz	
100kHz	0.01kHz	
1000kHz	0.1kHz	
10MHz	0.001MHz	±(3.0% reading+3)
1~99%	0.1%	

Hz/duty:

- 1) Range: 0 ~ 10MHz
- 2) Voltage sensitivity: 0.2~10V AC
- 3) Overload protection: 250V;


V:

- 1) Range: 0 ~ 100 kHz
- 2) Voltage sensitivity: 0.5~600V AC3);


μ A、 mA、 A:

- 1) Range: 0 ~ 100 kHz
- 2) Voltage sensitivity: $\geq 1/4$ Full range
- 3) Overload protection: μ A/mA: F600mA/250V fuse;
A: F10A/250V fuse

Diode test

	Function	Forward DC current is about 2.5mA Reverse DC voltage is about 3V Overload protection:250V
	It displays the approximate forward voltage value of the diode.	

Continuity test

	Function	Reverse DC voltage is about 3V Overload protection:250V
	The resistance is <30, the buzzer will sound and the indicator light is green. When the resistance >30 and <60, the buzz does not ring, the indicator light is red.	

Temperature

Range	Resolution	Accuracy	
°C	1°C	-20°C ~ 0°C	± 5.0% reading or ± 3°C
		0°C ~ 400°C	± 1.0% reading or ± 2°C
		400°C ~ 1000°C	± 2.0% reading
°F	1°F	-4°F ~ 32°F	± 5.0% reading or ± 6°F
		32°F ~ 752°F	± 1.0% reading or ± 4°F
		752°F ~ 1832°F	± 2.0% reading

The accuracy does not include the error of the thermocouple probe.

Maintenance

Clean

If there's dust on the terminal or the terminal is wet, it may cause measurement error. Please clean the instrument according to the steps below:

- 1) Switch off the power supply of the instrument, and remove the test probe.
- 2) Turn over the instrument and shake out the dust accumulated in the input terminal. Wipe the outer cabinet with a damp cloth and mild detergent, do not use abrasive or solvent. Wipe contacts in each input terminal with a clean cotton swab soaked in alcohol.

WARNING

Please always keep the inside of the instrument clean and dry to avoid electric shock or instrument damage.

Replace Battery and Fuse

Replace Battery:

- 1) Turn off the power supply of the instrument, and remove the probe on the instrument.
- 2) Use screwdriver to unscrew screws fixing the battery cover, remove the battery cover.
- 3) Remove old batteries, replace with new batteries of the same specifications. Please note the polarity of the battery according to the positive and negative polarity marks inside of the battery cover.
- 4) Install the battery cover to its original position, fix and lock

the battery cover with screws.

 **WARNING**

- - o prevent electric shock or personal injury caused by error reading, please replace the battery promptly when the battery power is low. Please do not make battery short circuit or reverse battery polarity to discharge the batteries.
- - o ensure safety operation and product maintenance, when the instrument will not be used for an extended period of time, please remove the batteries to avoid any product damage caused by battery leakage.

Replace Fuse

- 1) Turn off the power supply of the instrument, and remove the probe on the instrument.
- 2) Use screwdriver to unscrew screws fixing the back cover, and remove the back cover.
- 3) Remove the burnt fuse, replace with new fuse of the same specifications, and ensure that the fuse is clamped in the safety clip.
- 4) Install the back cover, fix and lock it with screws.

 **WARNING**

To avoid possible electric shock, personal injury or instrument damage, please use the fuse with same specifications or specified specifications.