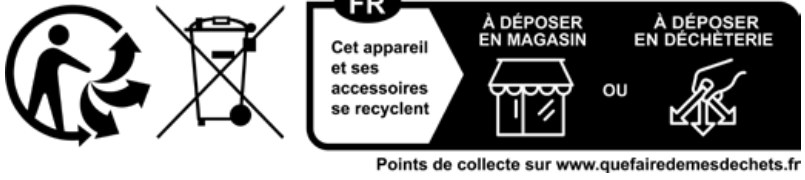
KAiWEETS

Users Manual

Multimeter True-RMS KM402



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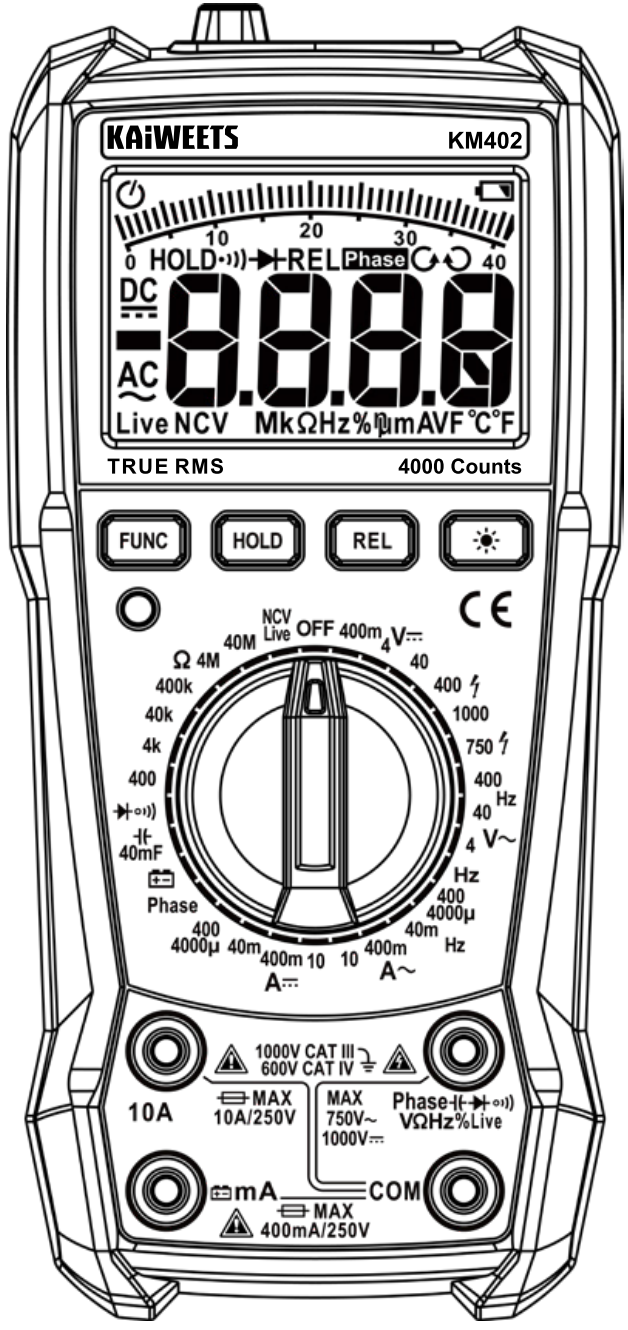


Contact us:support@kaiweets.com

Catalog

EN

Safety Instructions

The design and manufacture of instruments strictly comply with the requirements of IEC61010–1 CAT.IV 600V 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:

- Read this manual before using the instrument, and pay special attention to safety warning information.
- Check whether the instrument case is damaged.
- Comply with local and national safety code.

Safety Operating Procedures

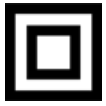
- Remove probe before opening the outer cabinet or battery cover.
- Put your fingers behind the finger protector of the probe.
- Connect the neutral line or the ground line first, then connect the live wire.
- Disconnect the live wire first, then disconnect the neutral line and ground line.
- Replace the battery when it shows low battery indicator.

Cautions

- Don’t use the instrument around explosive gas, steam or in wet environment.
- The instrument is used with specified category, voltage or current rating.
- Be careful if the measurement exceeds 60V DC、30V AC true RMS or 42V peak.
- 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.

Product Description

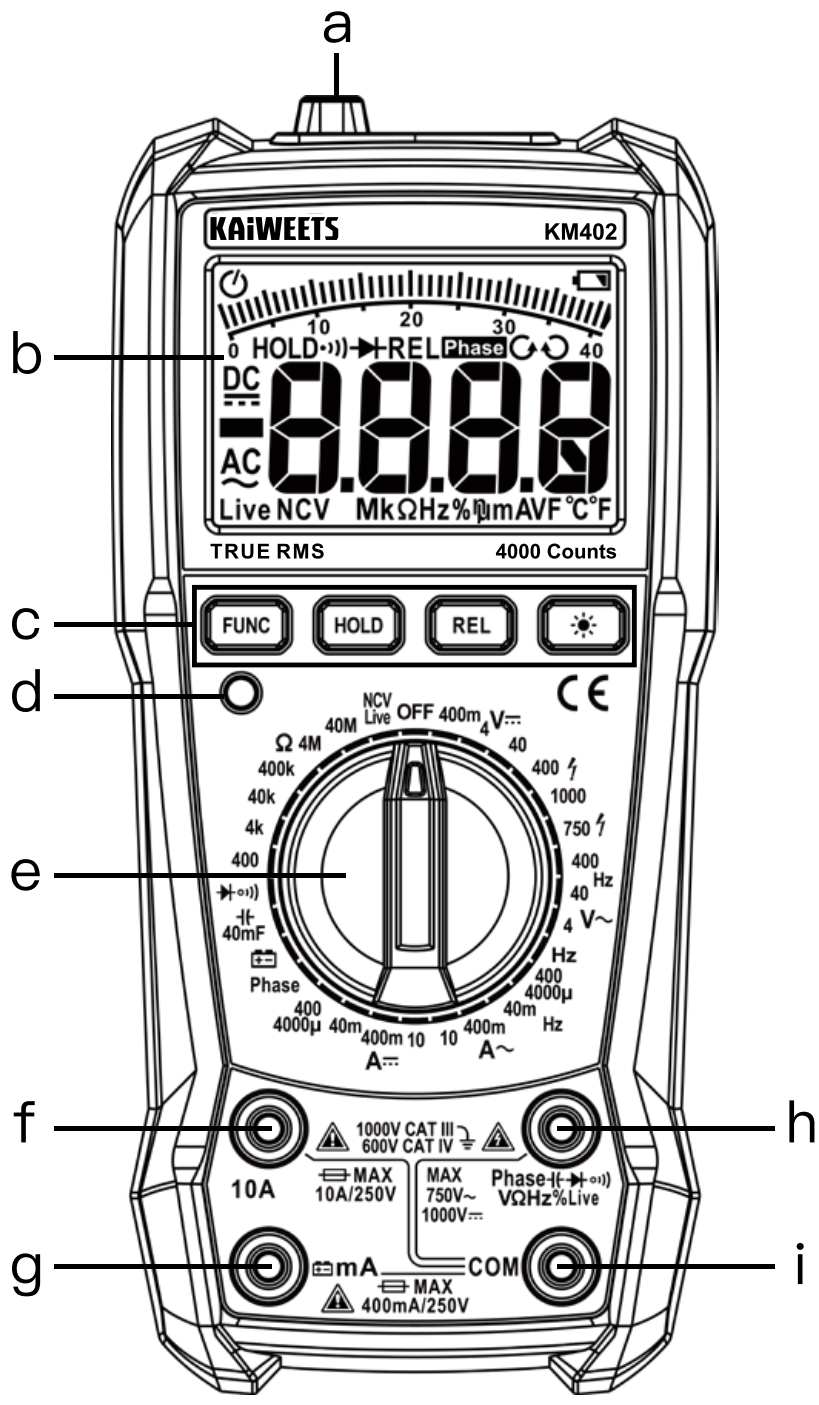
Safety Symbol Meaning

	Unsafe Voltage		Warning
	AC (Alternating Current)		DC (Direct Current)
	AC or DC		Earth ground
	Fuse		Low Battery
	Double insulated		Complies with EU directives
	Do not dispose of this product as unsorted municipal waste.		

CAT II	Suitable for testing circuits directly connected to power points (sockets and similarities) of low voltage power installations.
CAT III	Suitable for measuring circuits connected to the distribution part of low voltage power supply devices in buildings.
CAT IV	Suitable for measuring circuits connected to the power supply of low voltage power installations in buildings.

Multimeter Features

a. NCV probe
b. Display screen
c. Function buttons
d. Red/Green indicator
e. Rotary switch
f. 10A current terminal
g. uA/mA current terminal
h. V–Terminal Phase VΩHz%Live
i. COM input



Function buttons

FUNC	Press the FUNC button to select the appropriate measurement function.
HOLD	Press the “HOLD” key to hold the data for easier recording. Press the button again to cancel the hold function.
REL	Short press the key to enter or exit the relative value measurement mode.
☀	Backlight: Press once to turn on the display backlight. Press once more to turn off backlight.

Sleep Mode

The Meter automatically enters sleep mode if there is no operation in 15 minutes to save battery energy. Pressing any button or turning the rotary switch awakes the Meter.

If you press the “FUNC” button then turn on the meter, the sleep mode will be deactivated. After restarting, the meter will restore Sleep Mode automatically.

Measurement Operation

DC/AC voltage measurement

⚠ Don’t use it to test voltage over DC1000V or AC750V, the meter may be damaged. Always test known voltage with the meter before using to confirm the instrument function is intact.

1) Turn the rotary switch to“V⎓” or “V~”.
2) Insert the red lead in “Phase VΩHz%Live” terminal, insert the black lead into “COM” terminal.
3) Connect the test leads to the source or load to be measured.

4) Read the measurement readings from LCD display. When measuring DC voltage, the polarity of the voltage connected to the red test lead is displayed. (When the red test lead touches the negative polarity, the screen will display "–" in front of the reading.)

Frequency measurement

⚠ Don't use it to test voltage over AC 250V or DC voltage, the meter may be damaged. Always test known voltage with the meter before use to confirm the instrument function is intact.

1) Turn the rotary switch to "Hz". Or turn the rotary switch to " V~"/" A~"to select frequency function by "FUNC"
2) Insert red lead in " Phase VΩHz%Live" terminal, insert the black lead in "COM" terminal.
3) Connect the test leads to the source or circuit to be measured, measure the frequency.
4) Read the measurement result on the screen.

DC/AC current measurement

⚠ 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.

1) Turn the rotary switch to "A~" or "A⎓", select the appropriate range according to the magnitude of the measured current.
2) Insert the red lead into "μA/mA" terminal or "10A" terminal, insert the black lead into "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.

Resistance measurement

1) Turn the rotary switch to “Ω” to test resistance.
2) Insert the red lead into “ Phase VΩHz%Live ” terminal, insert the black probe into “COM” terminal.
3) Connect the test leads to the circuit or resistance to be measured.
4) Read the measurement result on the screen until the readings are stable.

Note：

- Disconnect power and discharge all high–voltage capacitors when measuring resistance on the line, otherwise, the meter may be damaged and you may receive an electric shock.
- When measuring resistance/capacitance on the line, the reading is affected by the other paths between the meter pens.

Continuity measurement

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

1) Turn the rotary switch to “ ” and select Continuity measurement function by “FUNC”
2) Insert the red lead into “ Phase VΩHz%Live ” terminal, insert the black probe into “COM” terminal.
3) Connect the test leads to the circuit or resistance to be measured.
4) Read the measurement result on the screen.

Note： If the resistance value of the measured resistor or circuit is less than about 50 Ω, the buzzer will sound and the green indicator will be lit.

Diode measurement

1) Turn the rotary switch to “ ” and select diode measurement function by

"FUNC".

2) Insert the red lead into "Phase VΩHz%Live" terminal, insert the black probe into "COM" terminal.
3) Connect the red test lead to the anode of the diode to be measured, and the black test lead to the cathode of the diode.
4) Read the measurement result on the screen.

Note: If the polarity of test leads is opposite to the diode polarity, the meter displays "OL", which can be used to distinguish the anode and cathode of the diode.

Capacitance measurement

1) Turn the rotary switch to " ⊣⊢ ".
2) Insert the red lead into " Phase VΩHz%Live" terminal, insert the black probe into "COM" terminal.
3) Connect the test leads to the capacitor to be measured.
4) Read the measurement result on the screen until the readings are stable.

Note:

- Disconnect power and discharge all high-voltage capacitors when measuring resistance on the line, otherwise, the meter may be damaged and you may receive an electric shock.
- When measuring resistance/capacitance on the line, the reading is affected by the other paths between the meter pens.

NCV measurement

1) Turn the rotary switch to the " NCV Live " and switch to NCV test function by "FUNC" key, the 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 and meter beeps slowly.The display shows "----L".

4) When the meter senses strong AC signals, the red indicator lights up and meter beeps fast. The display shows “----H”.

LIVE measurement

1) Turn the rotary switch to the “ NCV Live ” and switch to live test function by ”FUNC” key, the meter will display “Live”.
2) Insert the red lead into “ Phase VΩHz%Live ” terminal, then the probe contact to the test point.
3) When the meter senses weak AC signals, the green indicator lights up and meter beeps slowly. The display shows “----L”.
4) When the meter senses strong AC signals, the red indicator lights up and meter beeps fast. The display shows “----H”.

Phase Measurement

1) Turn the rotary switch to the “Phase”.
2) Insert the red lead into “ Phase VΩHz%Live ” terminal and leave the “COM” terminal empty.

- The display flashes to show the “PA” symbol (“A” flashes), then insert the red meter pen into the first phase line socket.
- The display flashes to show the “PAB” symbol (“A” is fixed, “B” is flashing), and then insert the red meter pen into the second phase line socket.
- The display flashes the “PABC” symbol (“A”and “B” fixed, “C” flashing), then insert the red meter pen into the third phase line socket.

1) The test is finished and the measurement result is shown on the display:
   “P --- L” symbol is on the display indicates phase sequence left rotation;
   “P --- R” symbol is on the display indicates phase sequence right rotation.

Note:

- Please complete the test on the three lines within 1 minute, otherwise, a detection timeout error will occur, prompted by the PABC symbol and the P letter flashing.

When the timeout error occurs, please return to phase sequence detection to re-test.

- When the three-phase lines are very close, as far as possible separate the lines to detect, otherwise it is easy to misjudge.

Battery Measurement

1) Turn the rotary switch to the " ⊣+− " to test the voltage of the battery specifically.
2) Insert the red lead into "⊣mA" terminal, insert the black probe into "COM" terminal.
3) Connect the test leads to the battery to be measured.
4) Read the measurement result on the screen.

General Specifications

Display Measurements	4000 counts, True – RMS
Safety / Compliances	CAT III 1000V ; CAT IV 600V
Maximum Voltage	DC1000V/AC750V
Fuse protection	μA/mA: F400mA/250V Fuse
	10A: F10A/250V Fuse
Measurement Speed	3 times per second
Range	Manual
Battery	3x1.5V AAA Batteries
Temperature & Humidity	Operating: 0℃~40℃, <80% RH, ＜10℃ non condensing
	Storage: –10~60℃, <70% RH, batteries removed

Accuracy Specifications

Reference condition: environment temperature 18˚C to 28˚C, relative humidity not above 80%. Accuracy: ± (% reading + word).

AC/DC Voltage

	Range	Resolution	Accuracy
DC Voltage	400.0mV	0.1mV	±(0.5%+3)
	4.000V	0.001V	
	40.00V	0.01V	
	400.0V	0.1V	
	1000V	1V	
	Input impedance: 10MΩ Overload protection: 1000V DC/750V AC Maximum measurement voltage: 1000V DC		
AC Voltage	4.000V	0.001V	±(0.8%+5)
	40.00V	0.01V	
	400.0V	0.1V	
	750V	1V	
	Input impedance: 10MΩ Overload protection: 1000V DC/750V AC Maximum measurement voltage: 750V AC Frequency range: 40Hz ~ 1kHz; Response: True RMS		

AC/DC Current

	Range	Resolution	Accuracy
DC Current	400.0μA	0.1μA	±(1.2%+3)
	4000μA	1μA	
	40.00mA	0.01mA	
	400.0mA	0.1mA	
	10A	0.01A	
AC Current	400.0μA	0.1μA	±(1.5%+3)
	4000μA	1μA	
	40.00mA	0.01mA	
	400.0mA	0.1mA	
	10A	0.01A	
	Frequency range: 40Hz ~ 1kHz; Response: True RMS		
Overload protection: μA/mA: F400mA/250V fuse; 10A: F10A/250V fuse Maximum measurement current: μA/mA: 400mA; A: 10A Note: When measuring high current, the continuous measurement time does not exceed 15 seconds.			

Resistance/Capacitance

	Range	Resolution	Accuracy
Resistance	400.0Ω	0.1Ω	±(1.0%+3)
	4.000kΩ	0.001kΩ	
	40.00kΩ	0.01kΩ	
	400.0kΩ	0.1kΩ	
	4.000MΩ	0.001MΩ	±(1.5%+3)
	40.00MΩ	0.01MΩ	
Capacitance	4.000nF	0.001nF	±(4.0%+5)
	40.00nF	0.01nF	
	400.0nF	0.1nF	
	4.000μF	0.001μF	
	40.00μF	0.01μF	
	400.0μF	0.1μF	
	4.000mF	0.001mF	±(5.0%+5)
	40.00mF	0.01mF	
Overload protection: 250V			

Frequency

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

Hz gear:

1) Measurement range: 0~10MHz
2) Voltage range: 0.2~220V AC (the greater the measured frequency, the greater the voltage should increase accordingly)
3) Overload protection：250V

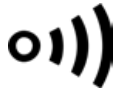
V~ gear:

1) Measurement range：0~1kHz
2) Voltage range: 0.5~600V AC (the greater the measured frequency, the greater the voltage should increase accordingly)
3) Overload protection: 250V.

μA/mA/A gear:

1) Measurement range: 0~1kHz
2) Signal range: ⩾1/4 range (the greater the measured frequency, the greater the current, current should increase accordingly)
3) Input protection: μA/mA: F400mA/250V fuse; A: F10A/250V fuse

Diode/Continuity

	Function	Overload protection
	It displays the approximate forward voltage value of the diode.	250V
	Resistance＜50Ω, the buzzer sounds and the indicator lights up green.	

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:

- Switch off the power supply and remove the test probe.
- Shake out the dust accumulated in the input terminal. Wipe the outer cabinet with a damp cloth and mild detergent. Wipe contacts in each input terminal with a clean cotton swab soaked in alcohol.

⚠ WARNING

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

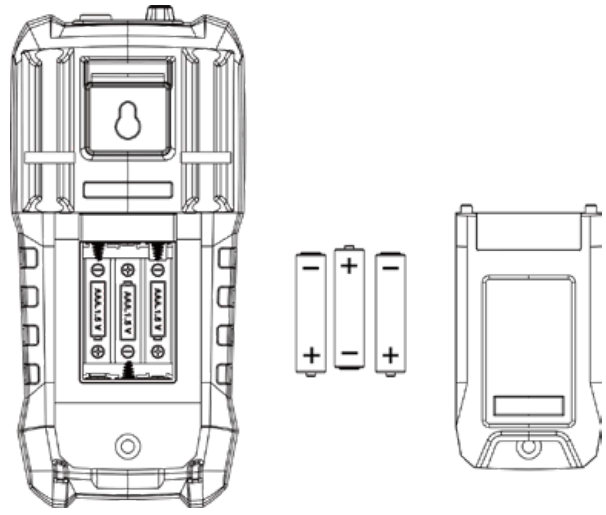
Remove and Replace the Battery

1) Turn off the power to the meter and remove the meter pen plugged into the meter.
2) Remove the battery cover by unscrewing the screw that holds the battery cover with a screwdriver.
3) Remove the old battery and replace it with a new one of the same size, please pay attention to the battery polarity, there are positive and negative polarity marks for each battery in the battery box.

4) Put the battery cover back to its original position and use the screws to fix the battery cover and lock it tightly.

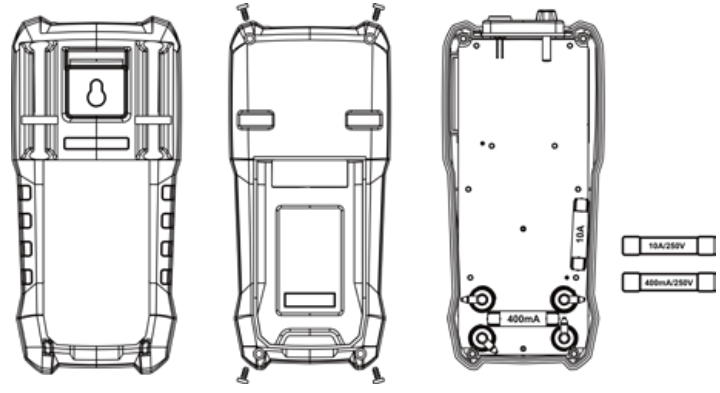
⚠ WARNING

- In order to avoid wrong reading which may lead to electric shock or personal injury, please replace the battery immediately when the battery power is low.
- Do not discharge the battery by short–circuiting it or reversing its polarity.
- To ensure the safe operation and maintenance of this meter, remove the batteries when not in use for a long period of time to prevent damage to the product from battery leakage.



Replace the Fuse

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



3 Years Warranty

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