2. Description

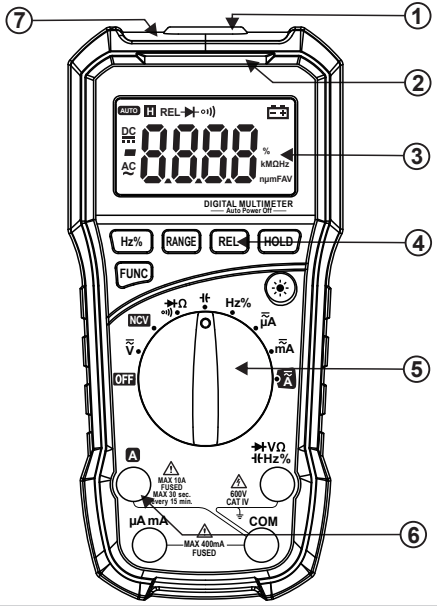
- The meter is a portable, professional measuring instrument with LCD display and back light for easy reading by users. Measuring range switch is operated by one hand for ease of operation. The meter has overload protection and low battery indicator. It is an ideal multifunction meter no matter for professionals, factories, schools, fans or family use.
- The meter is used to measure AC current, DC current, voltage, DC voltage, frequency, duty ratio, resistance, capacitance measurement and circuit connection, diode test.
- The meter has automatic measuring range and manual measuring range.
- The meter's AC current and AC voltage are measured with True RMS.

The meter has:

- Reading hold function.
- Relative measuring function.
- Auto power off function.
- When measuring AC voltage and AC current, the meter can measure frequency of AC voltage and AC current synchronously.

2.1 Part Name

(2) Non-contact voltage detection indicator
(3) LCD display
(4) Key
(5) Functional rotary switch
(6) Input socket
(7) Non-contact voltage induction area

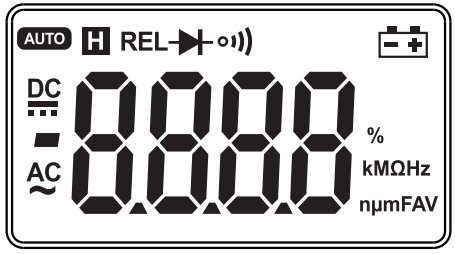


2.2 Switch, Button and Input Jack Description

HOLD key: used for reading hold.
FUNC key: used for measuring function switch.
RANGE key: used for switching automatic measuring range or manual measuring range.
REL key: used for switching relative to measuring function.
Hz% key: used for duty ratio and frequency measurement function switch.

☼ Backlight key: turn on backlight
OFF position: used for shutting off the power.
VΩ Hz% Jack: voltage, resistance, frequency, duty ratio, capacitance, diode, circuit connection input wire connecting terminal.
COM Jack: common wire connecting terminal
μAmA Jack: μA and mA current input terminal.
A Jack: A current input terminal.

2.3 LCD display



~	AC
⎓	DC
▶|	Diode
)))	Audible continuity
AUTO	Automatic measuring range mode
▭	Low battery
%	Percentage (duty ratio)
Hz, kHz	Hertz, Kilohertz (frequency)
mV, V	Millivolt, Volt (voltage)
μA, mA, A	Ampere (current)
nF, μF, mF	Microfarad, Millifarad (capacitance)
Ω, kΩ, MΩ	Ohm, Kilohm, Megohm (resistance)
REL	Relative measurement mode

3. Specifications

The meter should be recalibrated annually. When calibrating, temperature should be 18°C~28°C, and relative humidity should be less than 75%.

3.1 General

3.1.1 Automatic measuring range and manual measuring range
3.1.2 Full measuring range overload protection
3.1.3 The maximum allowable voltage between measurement end and ground: 600V DC or AC (RMS)
3.1.4 Operational height: maximum 2000 m
3.1.5 Display: LCD
3.1.6 Displayed maximum value: digit 3999
3.1.7 Polarity indication: automatical indication, "–" means negative polarity.
3.1.8 Exceeding measuring range display: "0L" or "-0L"
3.1.9 Sampling time: digital display is about 0.4 sec/time, analog display 0.04 sec/time (except current measurement). When measuring current, digital display is about 1 sec/cycle, analog display 0.1 sec/cycle.
3.1.10 Unit display: has function and power unit display.
3.1.11 Auto off time: 30 min.
3.1.12 Operating power supply: 9V, 6F22 battery.
3.1.13 Battery low voltage indication: LCD displays"" symbol.
3.1.14 Temperature coefficient: less than 0.1×accuracy/°C
3.1.15 Operating temperature: 0°C ~ 40°C
3.1.16 Storage temperature: -10°C ~ 50°C
3.1.17 Dimension: 175x86x52mm
3.1.18 Weight: about 372g

KPS®
ENGLISH

3.2 Technical Indicators

Environment temperature: 23±5°C, relative humidity (RH): <75%

3.2.1 DC voltage

Range	Resolution	Accuracy
400mV	0.1mV	±(0.8% reading + 3 digits)
4V	0.001V	±(0.5% reading + 5 digits)
40V	0.01V	
400V	0.1V	
600V	1V	

- Input impedance: 10MΩ
- Overload protection: 400mV measuring range: 250V DC or AC (RMS), 4.0V-600V measuring range: 600V DC or 600V AC (RMS)
- Maximum input voltage: 600V DC

3.2.2 AC voltage

Range	Resolution	Accuracy
400mV	0.1mV	±(1% reading + 5 digits)
4V	0.001V	±(0.8% reading + 5 digits)
40V	0.01V	
400V	0.1V	
600V	1V	±(1.2% reading + 3 digits)

- Input impedance: 10MΩ
- Overload protection: 400mV measuring range: 250V DC or AC (RMS), 4.0V-600V measuring range: 600V DC or 600V AC (RMS)
- Maximum input voltage: 600V AC (RMS)
- Frequency range: 50 ~ 60Hz

3.2.3 Resistance

Range	Resolution	Accuracy
400Ω	0.1Ω	±(1% reading + 5 digits)
4kΩ	0.001kΩ	
40kΩ	0.01kΩ	
400kΩ	0.1kΩ	
4MΩ	0.001MΩ	
40MΩ	0.01MΩ	±(1.2% reading + 15 digits)

- Open circuit voltage: about 0.4V
- Overload protection: 250V DC or AC (RMS)

3.2.4 Capacitance

Range	Resolution	Accuracy
50nF	0.01nF	±(3.0% reading + 5 digits)
500nF	0.1nF	
5μF	0.001μF	
50μF	0.01μF	
100μF	0.1μF	

- Overload protection: 250V DC or AC (RMS)

3.2.5 Diode Test

Range	Resolution	Function
	0.001V	Display approximate diode forward voltage value

- Forward DC current is about 1mA
- Backward DC voltage is about 1.5V
- Overload protection: 250V DC or AC (RMS)

3.2.6 Circuit Continuity Test

Range	Resolution	Function
	0.1Ω	If the resistance of circuit to be measured is less than 50Ω ±20Ω, the meter's built-in buzzer will sound.

- Open circuit voltage is about 0.4V
- Overload protection: 250V DC or AC (RMS)

3.2.7 Frequency

3.2.7.1 Pass Hz grade:

Range	Resolution	Accuracy
5Hz	0.001Hz	±(0.5% reading + 2 digits)
50Hz	0.01Hz	
500Hz	0.1Hz	
5kHz	0.001kHz	
50kHz	0.01kHz	
500kHz	0.1kHz	
5MHz	1kHz	

- Overload protection: 250V DC or AC (RMS)
- measurement signal: Vpp=3V AC signal

3.2.7.2 Duty Ratio

Range	Resolution	Accuracy
0.1%-99.9%	0.1%	±2.0%+5

3.2.8 DC Current

Range	Resolution	Accuracy
400μA	0.1μA	±(0.8% reading + 2 digits)
4000μA	1μA	
40mA	10μA	
400mA	100μA	
10A	10mA	±(2.0% reading + 5 digits)

Overload protection:
μA and mA grade: F1:FF 400mA H 1000V,
A grade: F2:FF 10A H 600V.
When measuring current is greater than 5A, the continuous measurement time should not be more than 10 seconds. After measuring, disconnect the current.

3.2.9 AC Current

Range	Resolution	Accuracy
400μA	0.1μA	±(1.5% reading + 2 digits)
4000μA	1μA	
40mA	10μA	
400mA	100μA	
10A	10mA	±(3.0% reading + 5 digits)

Overload protection:
μA and mA grade: F1:FF 400mA H 1000V,
A grade: F2:FF 10A H 600V.
- Frequency range: 50 ~ 60Hz
When measuring current is greater than 5A, the continuous measurement time should not be more than 10 seconds. After measuring, disconnect the current.

KPS®
ENGLISH

4. Operating Guidance

4.1 Reading Hold

4.1.1 In the process of measurement, if reading hold is required, press **"HOLD"** key, the value on the display will be locked.
4.1.2 Press **"HOLD"** key again to cancel reading hold.

4.2 Measuring Range Switch

4.2.1 When turning the conversion switch to current, voltage, resistance, capacitance, frequency grade, the meter is in automatic measuring range mode.
4.2.2 Press **"RANGE"** key, the meter will enter the manual range mode. Ppress once, the measuring range will go up with one grade. If it is pressed at the highest measuring range, it will go to the minimum measuring range.
4.2.3 If the user presses "RANGE" key more than 1 sec, the meter will restore automatic measuring range.

Note:
Frequency and capacitance measurement can't be set to manual measuring range mode.

4.3 Relative Measurement Mode Switch

4.3.1 Press **"REL"** key to enter the relative measurement mode. When making relative measurement, the measurement value at the moment of pressing REL key in the internal memory of the meter is called initial value. The display value after that is the current measurement value - initial value.

4.4 Duty Ratio And Frequency Measurement Choice

4.4.1 Press **"Hz%"** key at Hz grade. The meter will enter the duty ratio measurement state. Press **"Hz%"** key again. The meter will enter frequency measurement state.

4.5 Function Switch

4.5.1 When measuring voltage and current, press **"FUNC"** key to switch AC voltage and AC current.

4.5.2. When measuring resistance, diode or continuity. press **"FUNC"** to switch different measuring signals.

4.6 Backlight

4.6.1 Press " ☀ " key to open the backlight, the backlight will automatically trun off after 20 seconds.

4.7 Automatic Power-off

4.7.1 If there is no operation for 30 minutes after turning the machine on, the meter will automatically power off to save the battrery.

4.7.2 After automatic power-off, press any key to turn the meter on again.

4.7.3 Holding the **"FUNC"** key when powering on will cancel automatic power-off function.

4.9 NCV (non-contact Voltage Detection)

4.9.1 Turn the meter to NCV grade

4.9.2 Place the meter top close to the conductor. When test voltage is greater than 110 Vac (RMS), the meter induction voltage indicator will turn on and buzzer will give dripping alarm sound.

Note:

1: Even there is no indication, voltage may still exist. Don't use non-contact voltage detector to judge whether there is voltage in the wire. Detection operation could be affected by socket design, insulation thickness, type and other factors.

2: When inputting voltage on the meter input terminal, due to the existence of the induced voltage, voltage induction indicator also may light.

3: Interference sources in the external environment (such as flashlight, motor, etc.) may trigger erroneous non-contact voltage detection.

4.10 AC Voltage/DC Voltage Measurement

Voltage is the potential difference between two points. AC voltage polarity changes over time, while DC voltage polarity does not change over time.

DC voltage measuring range of this meter: 400.0mV, 4.000V, 40.00V, 400.0V, 600V; AC voltage measuring range of this meter: 400.0mV, 4.000V, 40.00V, 400.0V, 600V. The 400mV measuring range can be entered only in the manual measuring range mode.

To measure AC and DC voltage:

4.10.1 Rotate switch to voltage position.

4.10.2 Respectively connect black and red test probes to COM input socket and V input socket.

4.10.3 Measure the voltage of circuit to be tested with other two ends of test probes. (Connected with the circuit to be tested in parallel)

4.10.4 Read the measuring voltage value from LCD display. When measuring DC voltage, the display will simultaneously show the voltage polarity which is connected with red test probe.

4.10.5 Press FUNC key to switch AC voltage, DC voltage measurement.

4.11 Resistance Measurement (Ω)

Resistance range of this meter: 400.0Ω, 4.000kΩ, 40.00kΩ, 400kΩ, 4.000MΩ, 40.00MΩ .
To measure resistance:
4.11.1 Rotate rotary switch to Ω position.
4.11.2 Respectively connect black and red test probes to COM input socket and V input socket.
4.11.3 Measure the resistance value of circuit to be tested with other two ends of test probes.
4.11.4 Read the measuring resistance value from LCD display.

4.12 Continuity Measurement( ))

When measuring resistance, press FUNC key to switch continuity test.
4.12.1 Respectively connect black and red test probes to COM input socket and Ω input socket.
4.12.2. Measure the resistance value of circuit to be tested with other two ends of test probes
4.12.3. During continuity test, if the measured circuit resistance is not greater than about 50Ω±20Ω, the buzzer may issue continuous sound.

4.13 Diode Test( )

When measuring continuity, press FUNC key to switch to diode test.
4.13.1 Respectively connect black and red test probes to COM input socket and Ω input socket.
4.13.2. Measure two ends of diode to be measured with other two ends of test probes
4.13.3. The meter will display the forward voltage drop value of the diode.

4.14 Capacitance Measurement

Capacitance range of this meter: 50.00nF, 500.0nF, 5.000μF, 50.00μF, 100.0μF.
To measure capacitance:
4.14.1 Rotate rotary switch to position.
4.14.2 Respectively connect black and red test probe to COM input socket and input socket.
4.14.3 Measure the capacitance value of circuit to be tested with other two ends of test probes and read the measuring value from LCD display.

4.15 Frequency And Duty Ratio Measurement

Capacitance range of this meter: 5Hz, 50Hz, 500Hz, 5kHz, 50kHz, 5MHz
To measure capacitance:
4.15.1 Rotate the switch to Hz position.
4.15.2 Respectively connect black and red test probe to COM input socket and Hz input socket.
4.15.3 Measure the frequency to be measured with other two ends of test probes and read the measuring value from LCD display.

4.16 Current Measurement

Current range of this meter: 400.0μA, 4000μA, 40.00mA, 400.0mA, 10.00A;
4.16.1 Cut off the power supply of circuit to be tested. Discharge all high voltage capacitors on the circuit to be tested.
4.16.2 Rotate switch to the appropriate position (μA, mA or A grade).

4.16.3 Connect the black test probe to the COM input socket. If the current to be tested is lower than 400mA, connect the red test probe to the mA input socket; if the measured current is between the range of 400mA~10A, the red test probe should be connected to A input socket.

4.16.4 Cut off the circuit to be tested. Connect the black test probe to one end of disconnected circuit (low voltage relatively), and connect the red test probe to the other end of disconnected circuit (high voltage relatively).

4.16.5. Connect the power supply of circuit to be tested, then read the display reading. If the display shows only “OL”, the input is out of the selected input range, so please rotate the switch to a higher measuring range.

5. Maintenance

⚠ WARNING

Protection impairment if used in a manner not specified by the manufacturer.

5.1 Replace Battery

⚠ WARNING

Before opening the meter battery cover, remove probe from the circuit to be measured to avoid electric shock.

5.1.1 When the battery indicator “” appears, the battery should be replaced immediately.

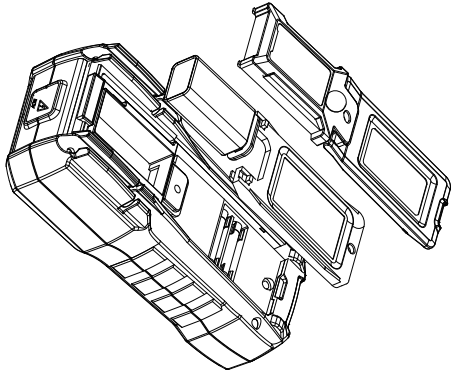
5.1.2 Unscrew the fastening screw of the meter battery cover and remove it .

5.1.3 Replace 1x9V 6F22 battery.

5.1.4 Install the battery cover.

Note:

The battery polarity can't be reversed.



5.2 Replace Probe

Replace probe if leads become damaged or worn.

> ⚠ **WARNING**
> Use meet EN 61010-031 standard, rated CAT III 600V, or better probes.

5.3 Replace Fuse

5.3.1 Fuse specifications:F1:FF 400mA H 1000V,
F2:FF 10A H 600V.

5.3.2 Replacing the defective fuse should the done according to the following procedure.

- To avoid electrical shock,remove the test lead and any input signal before opening the bottom case.
- Remove the battery cover and remove the three screws from the bottom case.
- Lift the button case until it gently unsnaps from the top case.
- Remove the defective fuse and insert a new fuse of the same size and rating.
- Replace the bottom case and reinstall all the screw.

KPS®
ENGLISH

6. Accessories

1)	Probe		1Pair
2)	Precautions for use		1pcs
3)	Battery	9V 6F22	1pcs

Introduzione

Si tratta di un multimetro digitale portatile, stabile, sicuro, affidabile e compatto, con capacità di conteggio di 4000 e gamma automatica. Questo multimetro può misurare la tensione CA/CC, la corrente CA/CC, la resistenza, la capacità, la frequenza, il ciclo di lavoro, eseguire test di diodi e di continuità, rilevare la tensione senza contatto (NCV) ed eseguire controlli di connessione del circuito. Questo multimetro è ideale in numerose situazioni, sia per i professionisti che per gli utenti occasionali.

1. Informazioni sulla sicurezza

⚠ AVVERTIMENTO

Si prega di notare che un uso improprio può causare scosse elettriche o danni al multimetro. Durante l'uso, attenersi alle normali procedure di sicurezza e seguire tutte le misure di sicurezza indicate nel manuale operativo. Per sfruttare appieno le funzioni del multimetro e garantire la sicurezza durante il lavoro, leggere attentamente e seguire le istruzioni per l'uso.

Il multimetro soddisfa i requisiti di sicurezza per gli strumenti di prova elettrici e i multimetri digitali portatili di EN61010-1, EN61010-2-032. È progettato per soddisfare la classificazione di sicurezza CAT IV 600 V e il grado di inquinamento 2. Seguire le istruzioni per un utilizzo sicuro del multimetro. Il multimetro vi fornirà un servizio soddisfacente se lo usate e lo proteggete correttamente.

1.1 Preparazione

1.1.1 Durante l'utilizzo del multimetro, l'utente deve rispettare i requisiti di sicurezza:
- Protezione generale contro gli urti.
- Prevenire l'uso improprio del multimetro.

ITALIANO

1.1.2 Al momento del ricevimento, controllare il multimetro per verificare che non vi siano danni verificatisi durante il trasporto.

1.1.3 Se il multimetro è stato conservato o trasportato in cattive condizioni, verificare che non sia danneggiato.

1.1.4 I cavi di prova devono essere in buone condizioni. Prima dell'uso, controllare che l'isolamento del filo non sia danneggiato e che il cavo metallico non sia scoperto (non adeguatamente isolato).

1.1.5 Per garantire la protezione, utilizzare i cavi forniti con il multimetro. Se necessario, vanno sostituiti con altri identici o della stessa capacità.

1.2 Utilizzo

1.2.1 Durante l'uso, selezionare la funzione e la scala corrette.

1.2.2 Non superare il massimo indicato per ogni scala.

1.2.3 Quando si misurano i circuiti con il multimetro collegato, non toccare la punta dei cavi (parte metallica)

1.2.4 Durante la misurazione, se la tensione da misurare è superiore a 60 V CC o 30 V CA (RMS), tenere sempre le dita dietro la barriera protettiva.

1.2.5 Non misurare tensioni superiori a 600 V

1.2.6 Quando si utilizza la scala di misurazione manuale e il valore misurato è sconosciuto, selezionare la scala più grande.

1.2.7 Prima di modificare le funzioni tramite la rotella, rimuovere i fili dal circuito da misurare.

1.2.8 Non misurare la resistenza, la capacità, i diodi e la continuità nei circuiti alimentati.
1.2.9 Durante le misurazioni di corrente, resistenza, capacità, diodi e continuità, evitare di collegare il multimetro a fonti di tensione.
1.2.10 Non misurare la capacità prima che il condensatore sia completamente scarico.
1.2.11 Non utilizzare il multimetro in ambienti con presenza di gas, vapori o polvere esplosivi.
1.2.12 Se si rileva un funzionamento anomalo o un guasto nel multimetro, interromperne immediatamente l'uso
1.2.13 Non utilizzare il multimetro se il coperchio inferiore e il coperchio della batteria non sono completamente fissati in posizione.
1.2.14 Non conservare o utilizzare il multimetro alla luce diretta del sole o in condizioni di temperatura e umidità elevate.

1.3 Simboli

⚠	Nota: per informazioni importanti sulla sicurezza, vedere il manuale di istruzioni.
⚡	È consentito l'uso in prossimità di conduttori sotto tensione pericolosi e privi di isolamento, ma separatamente da essi.
⚠	Attenzione, rischio di scossa elettrica.
⧈	Apparecchiatura protetta con doppio isolamento o isolamento rinforzato.
CE	Conforme ai requisiti di sicurezza europei (UE).
⏚	Messa a terra
⎓	Corrente continua
~	Corrente alternata

CATEGORIA IV: La misurazione di categoria IV è adatta per controllare e misurare i circuiti collegati alla rete di alimentazione a bassa tensione dell'edificio.

1.4 Manutenzione

1.4.1 Non tentare di aprire il coperchio posteriore del multimetro per regolarlo o ripararlo. Questo tipo di operazione dovrebbe essere eseguita solo da tecnici che hanno piena familiarità con il multimetro e con il pericolo di scosse elettriche.
1.4.2 Prima di aprire il coperchio inferiore del multimetro o il coperchio della batteria, è necessario rimuovere i cavi dal circuito da misurare.
1.4.3 Per evitare letture errate e possibili cause di scosse elettriche, quando sul display del multimetro appare 🪫, sostituire immediatamente la batteria.
1.4.4 Pulire il multimetro con un panno umido e un detergente delicato. Non utilizzare solventi o abrasivi.
1.4.5 Quando il multimetro non è in uso, portare la rotella in posizione OFF.
1.4.6 Se si prevede di non utilizzare il multimetro per un lungo periodo di tempo, rimuovere la batteria per evitare di danneggiarlo.