KING TONY

AUTORANGING DIGITAL MULTIMETER

Please read this operation manual before using the digital multimeter

NO.09DM1361

CE

Please wear proper safety gear while working.

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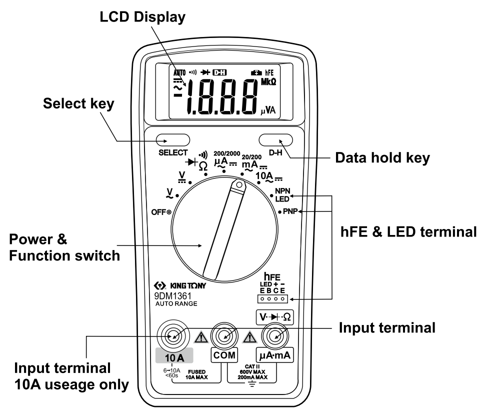
1. NAME OF COMPONENTS



- The Max. protective fuse for μA~ 、μA⎓ 、mA~ 、mA⎓ is 0.5A/660V
- The Max. protective fuse for 10A~、10A⎓ is 10A/600V

2. POWER & FUNCTION SWITCH

OFF	Turn of the power
V~	AC voltage measurement
V⎓	DC voltage measurement
Ω/▶|/•)))	Resistance measurement / Diode test / Continuity check
≅μA	AC/DC current measurement in micro-amperes
≅mA	AC/DC current measurement in milli-amperes
≅10A	AC/DC current measurement in 10 amperes
NPN	Transistor in NPN hFE measurement
LED	LED test
PNP	Transistor in PNP hFE measurement

3. SELECT SWITCH (SELECT KEY)

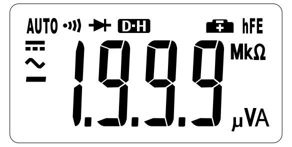
Press SELECT key to select the alternate functions as below:

Ω/▶|/•)))	Resistance measurement / Diode test / Continuity check
≅	AC or DC measurement

4. DATA HOLD FUNCTION (D-H KEY)

Press D-H during the measurement, the D-H symbol will display on LCD and lock the reading values as well. The cancel this function, please press D-H once again.

5. DISPLAY



Symbol & Unit	Instruction
⎓	Lit when in DC mode measurement
~	Lit when in AC mode measurement
—	Negative polarity indicator - lit when the polarity is negative
AUTO	Auto range indicator
•)))	Lit when in continuity check
▶|	Lit when in diode check
D-H	Date hold indication
🔋	Lit when the battery is low
M Ω,k Ω Ω	Unit for resistance measurement
mV,V	Unit for voltage measurement
1.8.8.8	Numeral date display
hFE	Lit when in transistor hFE check
μA,mA,A	Unit for current measurement

6. MEASUREMENT PROCEDURE

⚠ CAUTION

To make sure that the meter is used safely, the owner has to follow the instruction while using the instrument:

◎ Be sure to set to correct position or function before measurement.
◎ Be sure to disconnect the lead and measured object before switch to the different function.
◎ Never apply an input signal exceeding the maximum rating input value.
◎ Never use meter if the meter or test leads are damaged or broken
◎ Never use meter with wet hands or in a damp environment.

⚠ WARNING

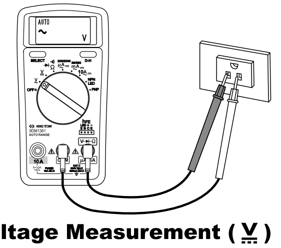
To avoid damage to instrument or electrical shock!
The maximum input voltage level depends on the over -voltage categories specified by the safety standards.

Over-voltage Category (CAT.)	Maximum Input Voltage
CAT II	600V
CAT III	300V

■ AC Voltage Measurement (V~)

Range 2V ~ 600V (4 ranges-auto ranging)
1. Set the function switch knob to V~ position.
2. Apply the test leads to the AC circuits under test and then read the value when it stabilizes
3. When finished, set the function switch knob to OFF position and turn off the multimeter.

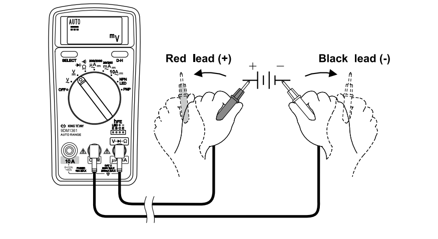
ATTENTION
* The polarity is irrelevant to this measurement.
* To prevent the injury of operator, please make sure the input signals will not exceed the maximum rating input value 600V before forwarding the measurement.



■ DC Voltage Measurement (V⎓)

Range 200mV ~ 600V (5 ranges-auto ranging)
1. Set the function switch knob to V⎓ position.
2. Apply the test leads to the DC circuits under test and then read the value when it stabilizes.
3. When finished, set the function switch knob to OFF position and turn off the multimeter.

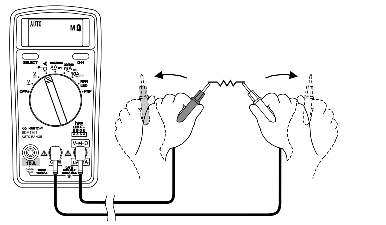
ATTENTION
* Be sure the connection with the circuit under measurement comes with the correct polarity.
* To prevent the injury of operator, please make sure the input signals will not exceed the maximum rating input value 600V before forwarding the measurement.



■ Resistance Measurement (Ω)

Range 200Ω ~ 20MΩ (6 ranges-auto ranging)
1. Set the function switch knob to Ω/▶|/•))) position and MΩ unit display on LCD.
2. Apply the test leads to the object under test and then read the value when it stabilizes.
3. When finished, set the function switch knob to OFF position and turn off the multimeter.

ATTENTION
* The polarity is irrelevant to this measurement.
* To prevent the reading error, please do not touch the probes of test lead during measurement.



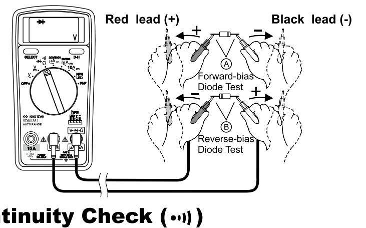
■ Diode Test (▶|)

1. Set the function switch knob to Ω/▶|/•))) position. The ▶| symbol display on LCD by press SELECT key.
2. Apply the test leads to the diode and then read the value when it stabilize.

(A) Forward-bias Diode Test (Fig.Ⓐ)
Connect the black testing lead to the cathode and red testing lead to the anode. Silicon diodes should give a reading approximately 0.5~0.7V and GE diodes give 0.2~0.3V. In case the reading value is near to "0" , it means short circuit. If LCD display "OL" , it means open circuit.

(B) Reverse-bias Diode Test (Fig.Ⓑ)
Connect the black testing lead to the anode and the red testing lead to the cathode. Normally the LCD display "OL" indicating that the diode is good. The diode is defective if the display gives a certain voltage level.

3. When finished, set the function switch knob to OFF position and turn off the multimeter.

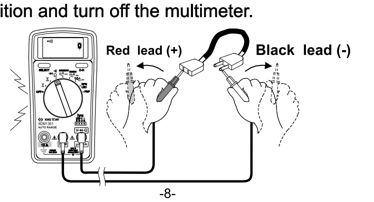


■ Continuity Check (•)))

⚠ CAUTION

To avoid damaging the multimeter :
◎Please shut down the power source applying the circuit under test before forwarding measurement. Otherwise, the high voltage or big current may damage the multimeter.

1. Set the function switch knob to Ω/▶|/•))) position.
2. Press SELECT key and •))) symbol display on LCD.
3. Apply the test leads to the circuit under test and the beeper will sound while the circuit is continuous and below 100Ω .
4. When finished, set the function switch knob to OFF position and turn off the multimeter.



■ Current Measurement≅(uA / mA / A)

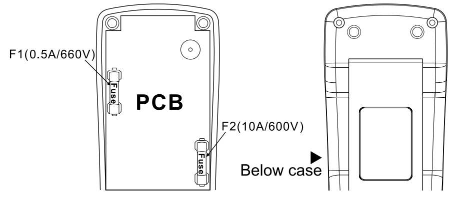
⚠ CAUTION

To avoid damaging the multimeter
◎ Before starting measurement, make sure the appropriate mode/function dial is set up.
◎ Choose a proper range for exact measurement after get a rough value by setting the knob at the top level if current range is unknown, otherwise the meter may be damaged by this improper operation.
◎ The maximum of each range is –
For uA:2000uA DC / 2000uA AC max.
For mA:200mA DC / 200mA AC max.
For A: 10A DC / 10A AC max.
- ● To prevent possible damage of meter from overheat, please retain the measurement at 10A range with conditions
  - ■ ≤ 6A:can be continuous
  - ■ > 6A to 10A: limit <60 seconds (t≤35℃). A pause of 5 minutes between each measurement is necessary.

1. Set the function switch knob to≅uA/mA/10A position,each position need to work with the current from correct input terminal.
2. Press SELECT key to choose AC (≅) or DC (⎓) mode, then the symbol of ~ or ⎓ will be shown on the display.
3. Connect measured circuit and test lead in series.
4. The Max. measuring value is about ≅200mA at ≅(uA / mA)position, please do not over input and the Max. protective fuse at this position is 0.5A/660V ; Do not over input ≅10A at ≅10A position and the Max. Protective fuse for this position is 10A/600V.
5. Each different position ≅(uA 、mA 、10A) need to have value from different input terminal, please choose input terminal correctly or the meter may be damaged by this improperly operation.
6. When finished, set the function switch knob to OFF position and turn off the multimeter.

※Fuse Replacement

The protection fuse may blow if a current greater than the rated value flows the multimeter in the current measurement function. If happened, replace the fuse.
The multimeter contains the following two types:
F1 0.5A/660V 5⌀L:20mm for the position of uA、mA
F2 10A/600V 6.35⌀L:32mm for the position of 10A



■ hEF(DC Current Amplification) Test & LED Test

1. Set the function switch knob to NPN & LED position
2. Insert the resistor of type NPN to hFE & LED terminal, if pins are correctly inserted, the hFE value can be read directly.

3. If pins inserted incorrect, LCD will show 000 or over 1000.
4. LED can be checked at this position. Insert longer pin of the LED to + & shorter pin of LED to -, the LED is OK if LED lights. If LED does not light up, then pins were inserted incorrect or LED is defective.
5. Set the switch knob to PNP position and insert the pins of resistor of type PNP to hFE / LED terminal. If LCD giving hFE value means the pin insert correctly.
6. If pins are incorrectly inserted, LCD shows 000 or over 1000.
7. When finished, set the function switch knob to OFF position and turn off the multimeter.

7. AUTO POWER OFF DEVICE (POWER SAVING)

The multimeter will power off automatically in 15 minutes later after the last operation was stopped. One minute before the multimeter shut down, the buzzer sounds to warn the operator. Press any key or turn the function switch can regenerate the multimeter.

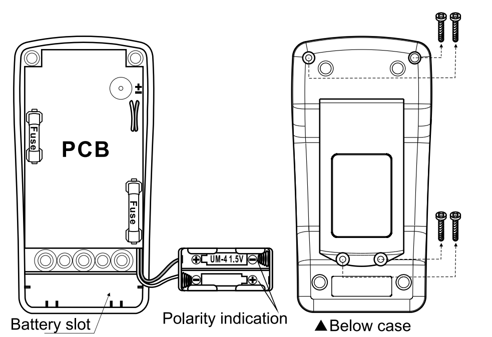
ATTENTION
If the multimeter is regenerated by pressing D-H key while the Auto Power Off function will cancel thereof. If by pressing other keys or turn the function switch knob, the Auto Power Off is still available and will turn off the power again after 15 minutes.

8. AUTO POWER OFF CANCELLATION

Hold down D-H key and then turn the function switch knob to power on the multimeter. The Auto Power Off function is canceled thereon. In case D-H symbol displays on the LCD. Please press D-H key again to cancel D-H symbol and enter the normal measuring mode. The Auto Power Off function is still disabled.

9. BATTERY REPLACEMENT

If 🔋 symbol appears, the battery falls below the normal operating voltage. Please replace the battery with 2 new AAA batteries.



1. Remove the screws on the back of case and open the case.
2. Move out the battery holder from battery slot on the top cover.
3. Replace the new batteries (2 new pcs at the same time)
4. Put the battery holder back to the battery slot on the top cover.
5. Assembly the cover and case and fasten the screws.

10. SPECIFICATIONS:

1. General Specifications:

- **Measurement Functions :** ACV,DCV,Ω,Diode,Continuity ,ACA, DCA, resistor, hFE & LED check .
- **Additional Function :** Date Hold,Auto Power Off Selection, Auto Power Off Cancelation.
- **LCD Display :** Unit & function indication, Maximum reading value 1999 digits. Negative polarity indicator (no indication is given for positive polarity) & indicating low battery.
- **Range:** Auto range
- **Sampling Rate:** approx. 3 times / sec.
- **Operation Temperature / Humidity:** 0℃ ~ 50℃ (32℉ ~ 122℉) / below 80% R.H. (No condensation).
- **Storage Temperature / Humidity:** -10℃ ~ 60℃ (14℉ ~ 140℉) / below 70% R.H. (No condensation).
- **Power Supply:** battery AAA (1.5V) x 2
- **Battery Life time:** approx. 400 hours at DCV
- **Safety Standard:** IEC61010-1(2010) CATII 600V,CAT III 300V
- **Dimension:** 138mm (L) x 70mm (W) x 32mm (H)
- **Weight:** approx. 140 g

- **Accessories:** 1. Instruction Manual........................1
  2. Battery (AAA)...............................2
  3. Test lead (red + black)..................1

2. Electrical Specifications:

Environment temperature/humidity:23±5℃ below 80% R.H.
rdg: reading digits；dgt: decimal digits

Function	Range	Resolution	Accuracy	Input Impedance	Remarks
V⎓ (DCV)	200mV	0.1mV	±(0.7%rdg+3dgt)	≥100MΩ	————
	2V	0.001V	±(1.3%rdg+3dgt)	Approx.11MΩ	
	20V	0.01V		Approx.10MΩ	
	200V	0.1V			
	600V	1V			

Function	Range	Resolution	Accuracy	Input Impedance	Remarks
V~ (ACV)	2V	0.001V	±(2.3%rdg+5dgt)	Approx.11MΩ	■Accuracy in the case of sine wave ■Frequency range 40~500Hz
	20V	0.01V		Approx.10MΩ	
	200V	0.1V			
	600V	1V			

Function	Range	Resolution	Accuracy	Remarks
Ω	200Ω	0.1Ω	±(2%rdg+5dgt)	■ Open voltage：Approx. 0.4V ■ The measuring current changes in accordance with the resistance measured.
	2kΩ	0.001kΩ		
	20kΩ	0.01kΩ		
	200kΩ	0.1kΩ		
	2MΩ	0.001MΩ	±(5%rdg+5dgt)	
	20MΩ	0.01MΩ	±(10%rdg+5dgt)	

Function	Range	Resolution	Accuracy	Remarks
▶| (DIODE)	1V	0.001V	±(10%rdg+5dgt)	■ Open voltage：Approx. 1.5V

Function	Range	Resolution	Remarks
•))) (BUZZER)	200Ω	0.1Ω	■ Buzzer sounds at less than 100Ω and the open voltage is about 0.4V

Function	Range	Resolution	Accuracy	voltage drop	Max. Protection
ACμA	200uA	0.1uA	±(2.3%rdg+10dgt)	AC20mV	0.5A/660V Fuse
	2000uA	1uA		AC200mV	
ACmA	20mA	0.01mA	±(2.3%rdg+10dgt)	AC20mV	
	200mA	0.1mA		AC200mV	
AC10A	2A	0.001A	±(2.3%rdg+10dgt)	AC20mV	10A/600V Fuse
	10A	0.01A	±(2.5%rdg+20dgt)	AC100mV	

Function	Range	Resolution	Accuracy	voltage drop	Max. Protection
DCμA	200uA	0.1uA	±(2.3%rdg+10dgt)	DC20mV	0.5A/660V Fuse
	2000uA	1uA		DC200mV	
DCmA	20mA	0.01mA	±(2.3%rdg+10dgt)	DC20mV	
	200mA	0.1mA		DC200mV	
DC10A	2A	0.001A	±(2.3%rdg+10dgt)	DC20mV	10A/600V Fuse
	10A	0.01A	±(2.5%rdg+20dgt)	DC100mV	

- ● To prevent possible damage of meter from overheat, please retain the measurement at 10A range with conditions
  - ■ ≤ 6A:can be continuous
  - ■ > 6A to 10A: limit <60 seconds (t<=35℃). A pause of 5 minutes between each "measurement is necessary.

Function	Range	Resolution	Measuring range	Remarks
NPN	2000	1	The testing value of resistor hFE of NPN type is under 1000	
PNP	2000	1	The testing value of resistor hFE of PNP type is under 1000	

11. STORAGE AND CLEARING

⚠ CAUTION

◎Don't wipe the instrument with any organic solvent to avoid damage or discolor happened in front panel. If necessary, clean the instrument with dry cloth.
◎Don't leave the instrument exposed to direct sunlight or in a hot and humidity place.

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8909DM1361KT 420x297mm