KING TONY

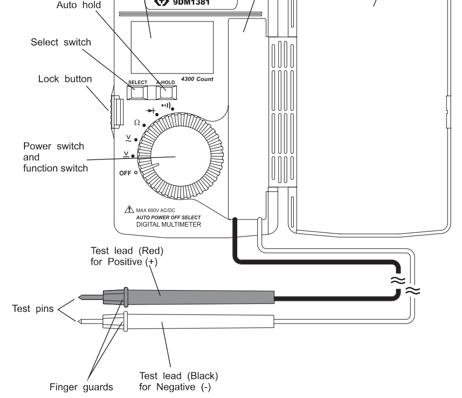
POCKET TYPE DIGITAL MULTIMETER

NO.9DM1381

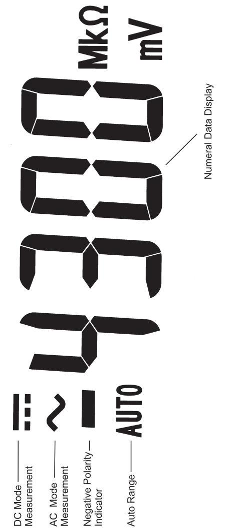
Please wear proper safety gear while working.

(1) NAME OF COMPONENTS

1-1 Multimeter, Test leads



1-2 Display



(2) SAFETY PRECAUTIONS : Before use, read the following safety precautions

Please read this instruction manual thoroughly in order to use this new pocket size D. M. M. safely. And for reference, please keep this manual together with the meter.

Instructions followed the sign " ⚠ WARNING" must be obeyed to avoid accidental burn or electric shock.

⚠ : Very important instruction for safe use.

- The warning messages are intended to prevent accidents to operating personnel such as burn and electric shock.
- The caution messages are intended to prevent damage to the instrument.

⚠ **WARNING**

■**To avoid damage to instrument or electrical shock!**

The maximum input voltage level depend on the over-voltage categories specified by the safety standards.

These categories are described as below to protect operators against transient impulse voltages in power lines.

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

Over-voltage category I (CAT. I):

Covers the path from a main outlet, through a power transformer, to a circuit in the transformer's secondary stage.

Over-voltage category II (CAT. II):

Covers a primary-stage circuit of equipment connected to a main outlet.

2-2 Warning Instruction for Safe Use

⚠ **WARNING**

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

1. Pay special attention when measuring the voltage of AC 30Vrms or DC 60V or more to avoid injury.
2. Never apply an input signals exceeding the maximum rating input value.
3. Never use meter for measuring the line connected with equipment (i.e. motors) that generates induced or surge voltage since it may exceed the maximum allowable voltage.
4. Never use meter if the meter or test leads are damaged or broken.
5. Never use uncased meter.
6. When connecting the test leads, first connect the ground lead (black). When disconnecting them, the ground lead must be disconnected last.
7. Always keep your fingers behind the finger guards on the probe when making measurement.
8. Be sure to disconnect the test pins from the circuit when changing the function.

⚠ **WARNING**

9. Before starting measurement, make sure that the function is properly set in accordance with the measurement.
10. Never use meter with wet hands or in a damp environment.
11. Never open tester case except when replacing batteries. Do not attempt any alteration of original specifications.

2-3 Maximum Overload Protection Input

Function	Input terminal	Maximum rating input value	Maximum overload Protection input
V⎓ (DCV)	+ (Red)	DC 600V	DC 600V AC 600V rms
V~ (ACV)		AC 600V	
Ω · •)) · ▶|	− (Black)	⚠Voltage and current input prohibited	

Note : AC voltage is regulated by rms value of sinusoidal wave.

(3) DESCRIPTION OF FUNCTIONS

- **Power Switch and Function Switch**
  Turn the switch for power on and off and to select the functions of DCV, ACV, Ω , •)) , ▶|
- **Battery Voltage Drop Indication Display**
  If the internal battery has been consumed and the voltage drops, the display shows 🔋.
  In this case, replace with 2 new batteries. (LR-44 or SR-44).
- **Select Function**
  Press SELECT when the following functions are selected:
  Ω/•)) :Select for Measuring Capacitance or Checking Continuity.
- **Auto Hold Function**
  ① Press A-HOLD key. (The display shows the A-H symbol.)
  ② Connect the test leads to the object under test.
  ③ When the reading stabilizes, the buzzer sounds.
  ④ Remove the testing leads from the object under test.

⑤ The D. M. M. now shows the measured value that it retains.
⑥ You can repeat steps ② to ⑤ as many times as you like as long as the display shows the A-H symbol.
⑦ To cancel this function, press the A-HOLD key once again.

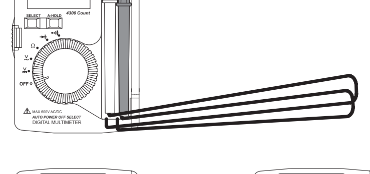
Note:

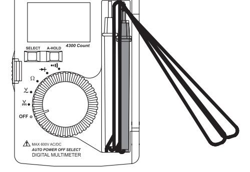
Do not mistake the following for a malfunction!

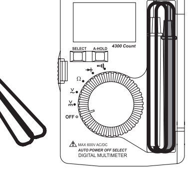
- In DC voltage measurement, the Auto Hold function is only available for range over 4V.
- In a capacitor check, the Auto Hold function requires few seconds before it takes effect.
- The Auto Hold function cannot be applied to unstable signals.

◎ How to store test leads.

① Test rod of red-black test leads is let in to store space first of all.
② Red-black lead wire of the test leads is pulled toward a display and it folds in two and a folded place is put inside the upper part of store space.
③ An end of lead wire is accepted inside the lower part of store space.







(4) MEASUREMENT PROCEDURE

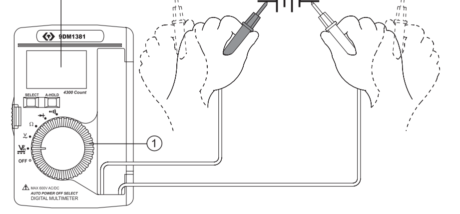
4-1 Voltage Measurement

⚠ **WARNING**

1. Never apply an input signals exceeding the maximum rating input value.
2. Be sure to disconnect the test pins from the circuit when changing the function.
3. Always keep your fingers behind the finger guards on the probe when making measurement.

4-1-1 V⎓ (DCV) Measurement Maximum Rating Input Value 600V DC (CAT. I)

1) Applications.
   Measure D.C. circuits.
2) Measuring Ranges
   5 ranges from 400mV to 600V.



3) Measurement Procedure
   ① Set the function switch at V⎓ (DCV) range.
   ② Apply the black test pin to the negative potential side of the circuit to measure and the red test pin to the positive potential side.
   ③ Read the value on the display.
   ④ After measurement, remove the red and black test pins from the circuit measured.

- The display fluctuates when the test leads are removed. This is not malfunction.

4-1-2 V~ (ACV) Measurement Maximum Rating Input Value 600V AC (CAT. I)

1) Applications.
   Measure sine-wave A.C. voltages such as lighting voltages.
2) Measuring Ranges
   4 ranges from 4V to 600V.

3) Measurement Procedure
   ① Set the function switch at V~ (ACV) range.
   ② Apply the red and black test pins to the circuit to measure.
   ③ Read the value on the display.
   ④ After measurement, remove the red and black test pins from the circuit measured.

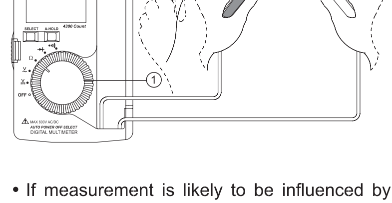
- This instrument employs the average measurement system and some error is made to the display of waveforms other than sine waves.
- The accuracy guaranteed frequency range is 45 Hz to 400Hz.

4-2 Resistance Measurement

⚠ **WARNING**

Never apply voltage to the input terminals.

1) Applications
   Resistance of resistors and circuits is measured.
2) Measuring Ranges
   6 ranges from 400 Ω to 40MΩ.
3) Measurement Procedure
   ① Set the function switch at Ω (Press SELECT key until Ω is shown on display).
   ② Apply the red and black test pins to an object to measure.
   ③ Read the value on the display.
   ④ After measurement, release the red and black test pins from the object measured.



- If measurement is likely to be influenced by noise, shield the object to measure with negative potential (⊖ test lead black).
- If a test pin is touched by a finger during measurement, measurement will be influenced by the resistance in the human body to result in measurement error.

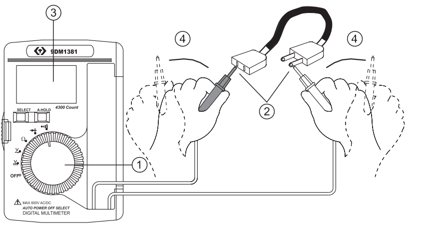
4-3 •)) Checking Continuity

⚠ **WARNING**

Never apply voltage to the input terminals.

1) Applications
   Checking the continuity of wiring and selecting wires.
2) How to Use
   ① Set the function switch at •)) (Press SELECT key until •)) is shown on display).
   ② Apply the red and black test pins to a circuit or conductor to measure.
   ③ The continuity can be judged by whether the buzzer sounds or not.
   ④ After measurement, release the red and black test pins from the object measured.

- The buzzer sounds when the resistance in a circuit to measure is less than about 70Ω.

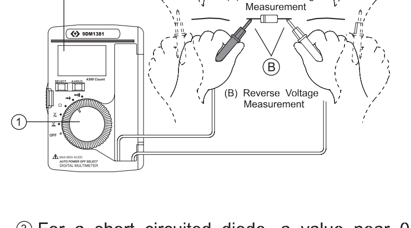


4-4 Testing Diode

⚠ **WARNING**

Never apply voltage to the input terminals.

1) Applications
   The quality of diodes tested.
2) How to Use
   ① Set the function switch at ▶| range.
   ② Connect the test leads to the diode to be tested. As shown in Fig. (A), when measuring the forward voltage across diode, a normal diode will indicate 0.5 to 0.7V (GE Doide 0.2V~0.3V) , and as shown in Fig. (B) the reverse voltage will indicate "OL" (same as an open condition).



③ For a short-circuited diode, a value near 0mV will be displayed.

(5) AUTO POWER OFF SELECTION

① The D. M. M. will power off automatically in 20 minutes later after the last operation was stopped.
② The alarm buzzer sounds 7 times before around 1 minute of power off.
③ Press any key or turn the switch can postpone the power-off time or restart the D. M. M. is turned off.
④ To cancel the Auto Power Off Function, hold down the SELECT key and then set the function switch from OFF to the position of any desired measurement mode. (The AUTO POWER OFF indication turns off when the function is cancelled.)

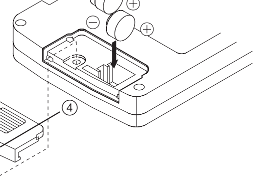
(6) MAINTENANCE

6-1 Battery Replacement

⚠ **WARNING**

1. If the rear case or the battery lid is removed with input applied to the input terminals, you may get electric shock. Before starting the work, always make sure that no input is applied.
2. Before starting the work, be sure to turn OFF the main unit power and release the test leads from the circuit.

(How to Replace)
① Remove the battery lid screw with a screwdriver.
② Remove the battery cover.
③ Take out the batteries and replace with 2 new batteries.
④ Attach the battery lid and screw it on.



The button cell is made of oxidized silver, etc. Please keep it away from little children lest they should swallow it in.

⚠ **Caution**

Set a battery with its polarities facing in the correct directions.

6-2 Storage

⚠ **Caution**

1. For cleaning, use dry soft cloth and wipe it lightly.
2. The panel and the case are not resistant to heat. Do not place the instrument near heat-generating devices (such as a soldering iron).
3. Do not store the instrument in a place which it may be subjected to vibration or which it may fall.
4. For storing the instrument, avoid hot, cold or humid places or places under direct sunlight or where condensation is anticipated.

Following the above instructions, store the instrument in good environment. (See 7-1)

(7) SPECIFICATIONS

7-1 General Specifications

Measuring method	: Dual integration mode
Display	: Counter approx. 4300 counts max.
Range selection	: Auto range
Over indication	: "OL" mark. (Voltage only) "---" mark. (Others)
Polarity	: Automatic selection ("-" is displayed only.)
Low battery indication	: If the internal battery has been consumed and the voltage drops, the display shows 🔋.
Sampling rate	: Approx. 2 times/sec.
Operating temperature/humidity	: 0~50°C <80% RH. No condensation
Storage temperature/ Humidity	:-10~60°C <70%RH. No condensation
Power supply	: LR-44 x2 or SR-44x2
Dimension & weight	: 117(L)x76(W)x18(H)mm. Approx. 110g
Accessories	:Instruction Manual .... 1 LR-44 Button Cell (installed)........... 2

8-2 Measurement Range and Accuracy

Accuracy assurance range : 18~28°C <80% RH.
CAT I 600V. CAT II 300V.
No condensation

This range may produce readout error equivalent to several times their resolutions

FUNCTION	RANGE	RESOLUTION	ACCURACY	INPUT RESISTANCE	MAXIMUM INPUT VOLTAGE
DCV	400mV	0.1mV	1.2% + 2	>100MΩ	600V
	4V	0.001V	0.7% + 1	11MΩ	
	40V	0.01V	1.2% + 1	10MΩ	
	400V	0.1V			
	600V	1V			

Mean-value detection and rms-value calibration

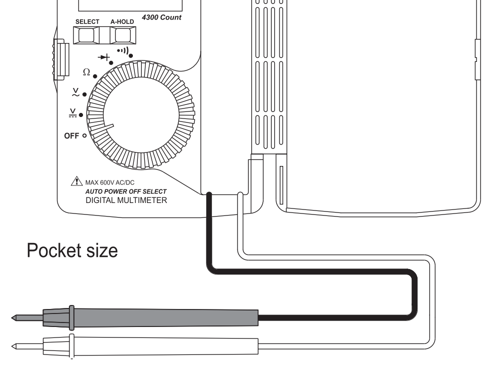
FUNCTION	RANGE	RESOLUTION	ACCURACY	INPUT RESISTANCE	MAXIMUM INPUT VOLTAGE
ACV	4V	0.001V	2% + 5	11MΩ,<50pF	600V rms
	40V	0.01V		10MΩ,<50pF	
	400V	0.1V			
	600V	1V			

FUNCTION	RANGE	RESOLUTION	ACCURACY	MEASURING CURRENT	OPEN-LOOP VOLTAGE	MAXIMUM INPUT VOLTAGE
Ω	400Ω	0.1Ω	1.2% + 2	<1mA	<3.4V	600V
	4KΩ	0.001KΩ		<0.5mA	<1.0V	
	40KΩ	0.01KΩ		<70uA	<0.7V	
	400KΩ	0.1KΩ		<7uA		
	4MΩ	0.001MΩ	2% + 3	<0.7uA		
	40MΩ	0.01MΩ	5% + 3	<70nA		

FUNCTION	RANGE	RESOLUTION	ACCURACY	OPEN-CIRCUIT VOLTAGE	MAXIMUM INPUT VOLTAGE
•))	400Ω	0.1Ω	The buzzer turns on for resistance lower than 50±20Ω.	<3.4V	600V

FUNCTION	RANGE	RESOLUTION	ACCURACY	OPEN-CIRCUIT VOLTAGE	MAXIMUM INPUT VOLTAGE
▶|	2V	0.01V	1.5% + 1 (for measuring currents smaller than 1.0mA)	<3.4V	600V

Specifications and external appearance of the product described above may be revised for modification without prior notice.



Pocket size

This product has been designed and manufactured using high quality, recyclable and reusable materials and components.
The crossed wheeled bin symbol applied to the product indicates that it complies with European Directive 2014/30/EU.
Please inquire about the collection of electrical and electionic products in your area. Please comply with the local regulations.
Do not dispose of this product with your normal household waste.

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