User Manual

Digital Multimeter+LCR

Model：DE-5003/5004

Thank you for purchasing our products. Please read this instruction manual before using the meter and keep it properly for contingent use.

DER EE

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V0.3

User Manual ……Table of Contents

For safety, read the users manual carefully and keep it with the meter together for further reference.

Precautions：

To avoid possible electrical shock or personal injury, please pay extra attention on those symbols indicated on the manual and corresponding illustration.

Warning：Improper or careless may result in personal injury or even death.

Caution：Improper or careless may result in damage to the meter or other equipment

Dual Insulation

AC- Alternating Current

DC- Direct Current

Grounding – Earth Terminal

Fuse

⚠ Warning

- Set the function switch and function key at the proper position and function before measuring.
- Remove test leads from the circuit being tested before switching functions.
- Do not apply more than the rated range of function specified.
- Check and make sure the meter or test leads are intact before use. Do not use the meter or test leads if they appear damaged.
- When using the test leads, always keep hands behind the guard ring.

- When measuring resistance, first switch off the power to the circuit under test, and verify that the voltage is zero.
- Keep the meter dry. Do not use it with wet hands or if there is moisture in or on the meter.

⚠ Warning

Maximum input voltage according to overvoltage installation category of safety standard.

Measuring Category	Maximum input voltage
CAT. II	1000V
CAT. III	600V

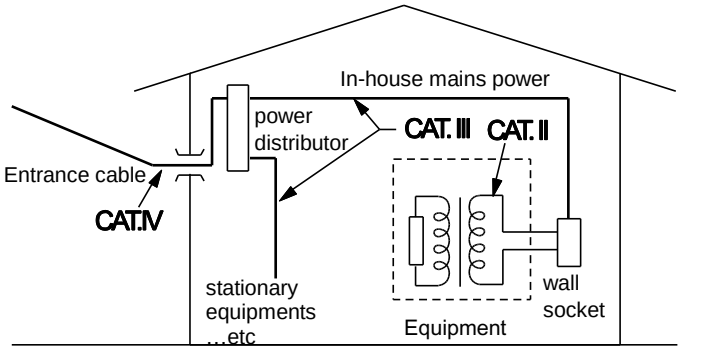
⚠ Caution

- Do not use the meter near equipment emitting noise or in environments with sudden temperature changes. Unstable or inaccurate reading may occur.
- When finished measurement, turn the function switch back to OFF position to turn off the meter completely. There is minor power exhaustion if the meter is power off by auto-power-off function.
- If it is necessary to clean the meter, use a soft cloth. Never use solvents.
- Do not expose the meter to direct sunlight, extreme temperatures or moisture.
- Do not attempt to open the case except the battery door for replacing battery or fuses.
- Any impact or drop of battery will result leakage afterwards and possibly damage the meter. Thus, don't use those batteries if occurred.
- Take the battery out of the meter if it will not be used for several weeks or storage.
- When  symbol displays, replace the battery immediately.

Overvoltage Installation Category：

Maximum input voltage of the meter is according to overvoltage installation category of safety standard. Do not apply more than the rating voltage.

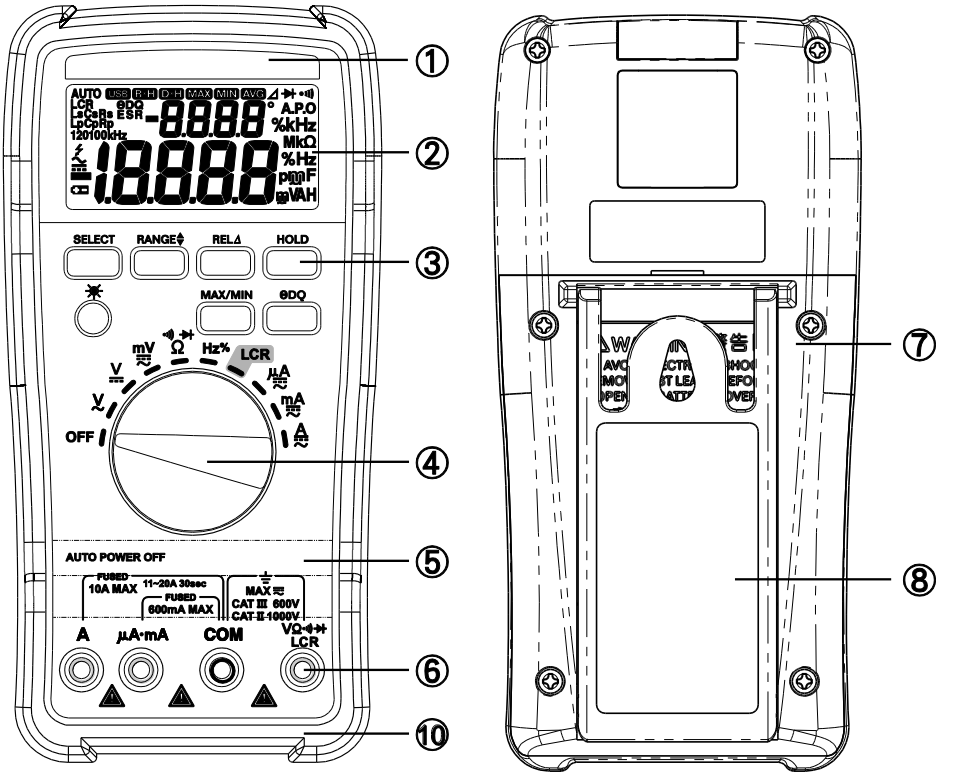
Measuring Category	Description	Example
CAT. II	Measurements in electrical circuits which are directly connected to the low-voltage mains via plug	in household, office and laboratory applications
CAT. III	Measurements in building installations	stationary consumers, distributor terminals, devices connected permanently to the distributor
CAT. IV	Measurements at power sources for low-voltage installations	Meters, mains terminals, primary over current protection device



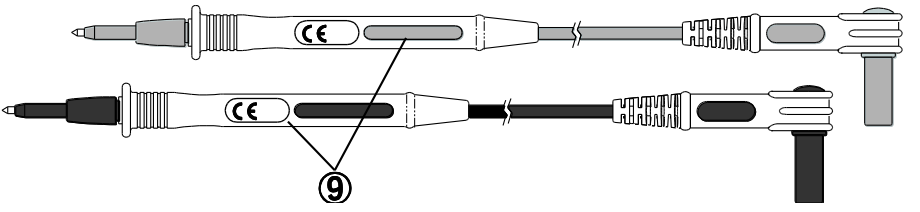
- **Warning**

Radiation immunity affects the accuracy of meter under the conditions specified in IEC61326-1 Also may result the meter malfunctions where has equipments emitted strong electromagnetic interference.

(1) Parts Identification



drawing:DE-5004



① **Trademark & model**

② **Liquid crystal display (LCD)**
Display measuring symbols, units and readings
Refer to functions at page 6~7

③ **Buttons**
Refer to functions at page 9~13

④ **Function switch**
Refer to functions at page 8

⑤ **Range label**
Indication of functions and terminals

⑥ **Input terminals**

Terminal	Description
A	(for red test lead) Positive input terminal for AC or DC current measurement to 10A. *11~20A overload for 30 seconds maximum. **Pause 10 minutes at least before next measurement.
μA mA	(for red test lead) Positive input terminal for AC microampere / milliampere or DC microampere / milliampere measurement.
COM	(for black test lead) Input terminal for all measurements.
V Ω LCR	(for red test lead) Positive input terminal for voltage, resistance, diode, continuity, frequency, duty & LCR (inductance / capacitance / Resitance) measurements.

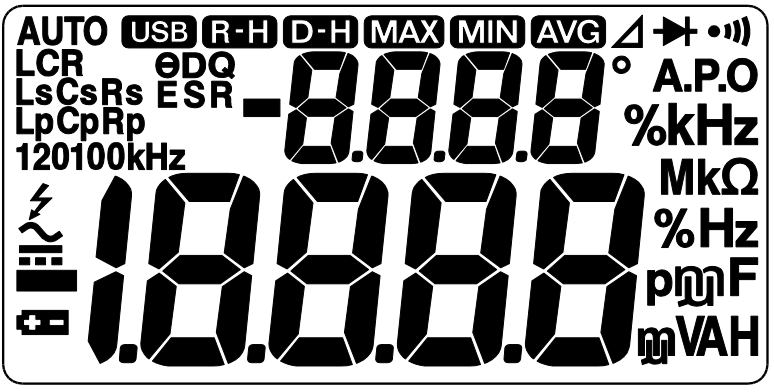
⑦ **Battery door**

⑧ **Stand rack**

⑨ **Test leads (red & black)**

⑩ **Sheath**

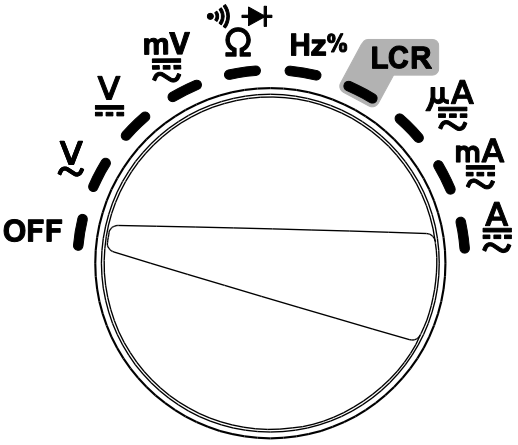
(2) Symbol on Display



Symbol	Description
18.8.8.8.8	Primary reading
8.8.8.8	Secondary reading
A.P.O	Auto power off

~	AC measurement mode
⎓	DC measurement mode
▬	Negative polarity
	Replace battery (low power indication)
△	Relative mode
AUTO	Auto range
R-H	Range hold
D-H	Data hold
MAX	Maximum value
MIN	Minimum value
	Continuity
	Diode
	Input high Voltage alert
Hz , kHz , MHz	Units of frequency – Megahertz, Kilohertz and Hertz
%	Unit of Duty
Ω, kΩ, MΩ	Units of resistance – Megaohms, Kiloohms and Ohms
mV, V	Units of voltage - millivoltage & voltage
μA, mA, A	Units of current - microampere, milliampere and ampere
LCR	L/C/R measurement mode
Ls Lp	Inductance in series or parallel mode is active
Cs Cp	Capacitance in series or parallel mode is active
Rs Rp	Resistance in series or parallel mode is active
100Hz, 1kHz, 10kHz	Test frequency indication
pF, μF, mF	Units of capacitance –picofarad, nanofarad, microfarad , millifarad and farad
μH, mH	Units of Inductance – microhenry, millihenry and henry
°	Unit of phase angle
θDQ	Dissipation, Quality factor or Phase angle is active for L & C measurement mode

(3) Rotary Switch Positions



Positions	Description
OFF	Power off
V~	AC voltage measurement
V⎓	DC voltage measurement
⎓~ mV	DC/AC millivoltage measurement
Ω •))) ⏚	Resistance/ Continuity/ Diode measurement --initial function is Resistance.
Hz %	Frequency / Duty measurement
LCR	Inductance/ Capacitance/ Resistance Measurement. -- initial function is Inductance
⎓~ µA	DC/AC microampere measurement --initial function is DC uA.
⎓~ mA	DC/AC milliampere measurement -- initial function is DC mA.
⎓~ A	DC/AC ampere measurement --initial function is DCA.

(4) Button Operations

■ SELECT

Press SELECT button to shift the functions as below:

Rotary sw. position	Function Shift
≂ mV	DC/ AC mode
Ω •)) ⊣▶	Resistance / Continuity / Diode
LCR	Inductance / Capacitance / Inductance
≂ μA	DC/ AC microampere
≂ mA	DC/ AC milliampere
≂ A	DC/ AC ampere

■ RANGE

- Press RANGE button to enter manual range, R-H symbol displays and AUTO range indicator turns off. In manual range mode, press RANGE button to choose the proper range for measurement as list.
- Shift ranges as below table:

Rotary SW. position	Press RANGE button to shift ranges	Initial range
V~	6.000V / 60.00V / 600.0V / 1000V	6.000V
V⎓	6.000V / 60.00V / 600.0V / 1000V	6.000V
Ω	600.0Ω / 6.000kΩ / 60.00kΩ / 600.0kΩ / 6.000MΩ / 60.00 MΩ	60.00 MΩ
Hz%	600.0Hz / 6.000kHz / 60.00kHz / 600.0kHz / 6.000MHz / 20.00MHz	600.0Hz
≂ μA	600.0μA / 6000μA	DC 600.0μA
≂ mA	60.00mA / 600.0mA	DC 60.00mA

- Hold RANGE button ≧2 sec. will retrieve auto range function, R-H indicator turns off and AUTO symbol displays.

■ REL (REL⊿)

- Press REL button during the measurement, ⊿ symbol displays and the Relative function turns on.
- In REL mode , the manual range R-H turns on automatically and cancel auto-range feature.

- The range is locked according to the first input value. To prevent over range during measurement, use RANGE key to choose proper range before entering Relative mode.
- The difference (relative value) between 2 input signals displays on LCD.
  [For example:]
  - The first input is X, press REL key will store X as the reference value and display 0 on LCD.
  - The 2nd input is Y will display **Y minus X** on LCD.
  - The 3rd input is Z, will display **Z minus X** on LCD.

  And follow the same rule of the above for the next inputs.
- To cancel the Relative function, press REL button again. The Δ indicator turns off and resumes the normal measuring mode.
- REL button also performs calibration process for LCR measurement.

HOLD

- Press HOLD button to retain data during measuring. D-H symbol displays and freeze the reading .
- Press HOLD again to resume normal measuring mode.
- In Hold mode, either REL or MAX/MIN button is disabled.

Backlit (☀)

- Press " ☀ " button to turn on the backlight of LCD.
- Press " ☀ " button again to turn off the backlight.
- Or the backlight will turn off automatically in around 60 seconds after activation.

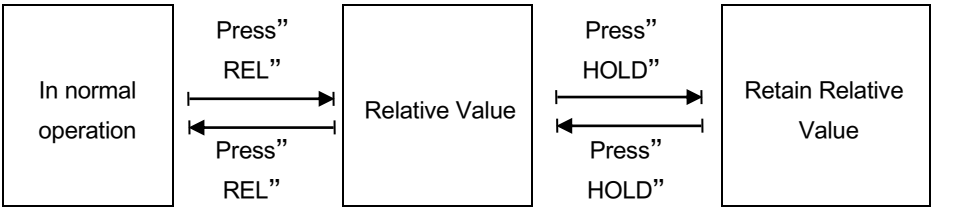
MAX/MIN

- Press MAX/MIN button, R-H and MAX symbols turn on and the maximum value displays on the sub display. And current value on the main display. In MAX/MIN mode the manual range (R-H) turns on automatically and cancel auto-range (AUTO) and A.P.O features.
- Press MAX/MIN button again will shift to the minimum value on the sub display. MIN symbol turns on and MAX symbol is off.
- In MAX/MIN mode, the maximum or minimum value on the sub display will update according to the changes of measuring value on the main display.

- Hold MAX/MIN button for ≧2 sec will cancel the function and back to normal measuring mode.
- In MAX/MIN mode, REL button is disabled.

■ Integrate REL + HOLD

- Press REL button during measurement to enter Relative mode. R-H & ⊿ display. The reference value is stored and display on sub-display and the relative value on main display and renews according to the inputs.
- Press HOLD button to enter REL+HOLD mode, D-H symbol is on to freeze the measuring value and mode on display. In Hold mode, either REL or MAX/MIN button is disabled.

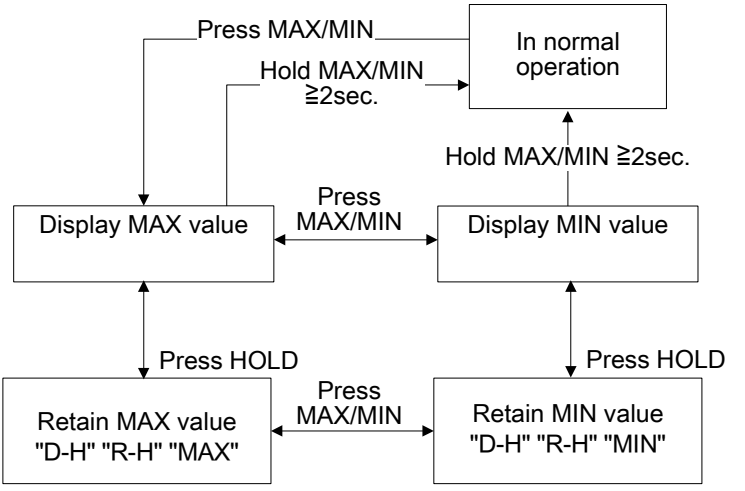


■ Integrate REL + MAX/MIN

- Press REL button during measurement to enter Relative mode. R-H & ⊿ display. The reference value is stored and display on sub-display and the relative value on main display and renews according to later inputs.
- Press MAX/MIN button to enter REL+Max/Min mode, A.P.O is off. Maximum-Relative (MAX & ⊿) and Minimum-Relative (MIN & ⊿) and the reference values (MAX, MIN & ⊿ blinking) display on sub-display and press MAX/MIN button to shift the reading. The update Relative value displays on main display always.
- REL button is disabled in REL+MAX/MIN mode.
- To cancel REL+MAX/MIN mode, hold MAX/MIN button ≧2 sec. first until MAX/MIN symbol is off and then press REL button to resume normal measuring mode.

■ Integrate MAX/MIN + HOLD

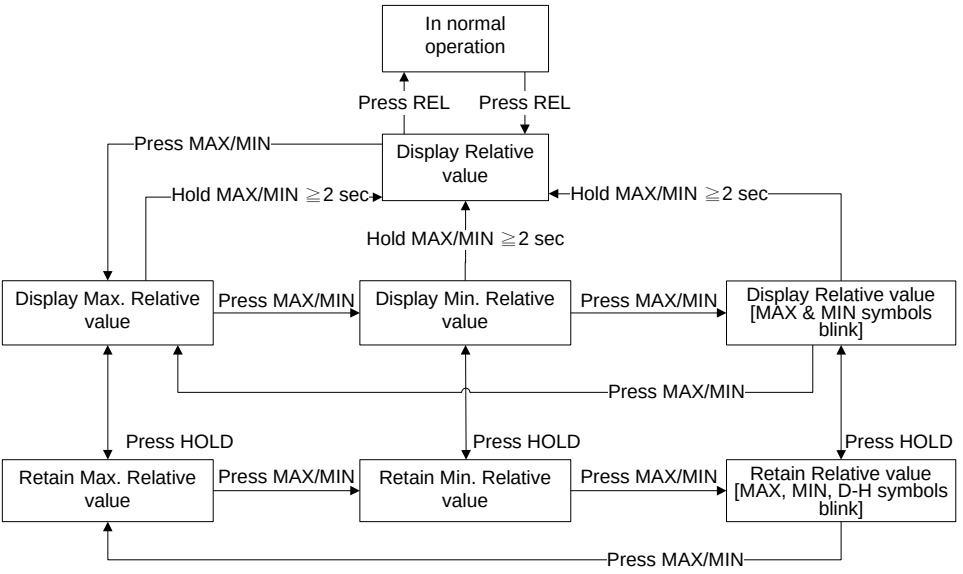
- Press MAX/MIN button to enter MAX/MIN value recording mode. (*refer to MAX/MIN operation for details)
- Press HOLD button to enter MAX/MIN+HOLD mode to freeze the measuring value and mode on display.
- Press MAX/MIN button to shift reading the maximum and minimum values be retained.



■ Integrate REL+ MAX/MIN + HOLD

- In REL+MAX/MIN mode, press HOLD button to enter REL+MAX/MIN+HOLD mode to freeze the values and mode.
- Press MAX/MIN button to shift reading Maximum-Relative (MAX &⊿) and Minimum-Relative (MIN &⊿) and the reference values (MAX, MIN & ⊿ blinking) display on sub-display. REL button is disabled in REL+MAX/MIN+HOLD mode.

- To cancel this mode, first press HOLD button to relief from HOLD mode (D-H is off) and then hold MAX/MIN button ≧2 sec. to out of MAX/MIN recording mode (MAX & MIN is off) and last to press REL button (⊿ is off) to resume normal measuring mode. ◦



■ θDQ

- **θDQ** button is only available in LCR measurement.
- Press **θDQ** button to select the parameter at the sub display.

  Shift function lists

	Parameter on sub-display
In C (Capacitance) test mode	D → **θ** (in cycle)
In L (Inductance) test mode	Q → **θ** (in cycle)

■ The following table lists the available button function versus every measurement mode.

Button / function	SELECT	RANGE	HOLD	MAX MIN	REL (CAL)	☼	θDQ
V~	—	●	●	●	●	●	—
V⎓	—	●	●	●	●	●	—
≂ mV	●	—	●	●	●	●	—
Ω	●	●	●	●	●	●	—
•))	●	—	●	●	●	●	—
⊣◁	●	—	●	●	●	●	—
Hz+ Duty	—	●	●	●	—	●	—
LCR	●	—	●	—	●	●	●
μA~	●	●	●	●	●	●	—
μA⎓	●	●	●	●	●	●	—
mA~	●	●	●	●	●	●	—
mA⎓	●	●	●	●	●	●	—
A~	●	—	●	●	●	●	—
A⎓	●	—	●	●	●	●	—

Note: ● : available — : unavailable

■ Measurement Functions

AC Voltage Measurement (V~)

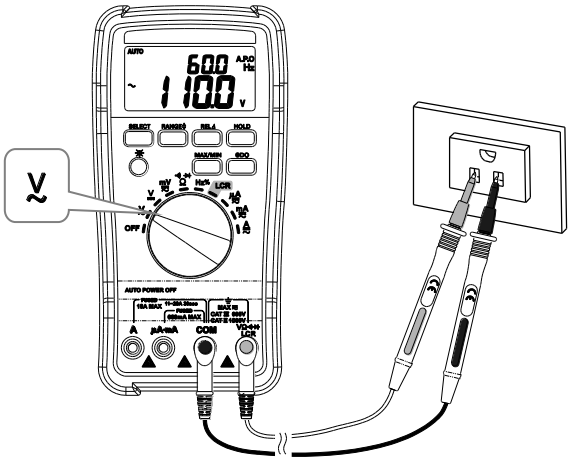
⚠ Caution

To prevent possible personal injury or damage the meter, do not apply the circuits exceed 1000V.

Range: 0.000V~1000V

(4 ranges : auto range and manual range mode for option)

1. Set rotary switch to V~ position.
2. Plug black test lead into the COM terminal and red test lead into the V terminal.
3. Connect test leads to the circuit to be tested. Allow time for the value to stabilize and then read the AC voltage measurement on the LCD.
4. When input exceeds 1010V, “OL” & high voltage alert ⚡ symbol display and buzzer is on to alarm a high voltage presents.
5. The corresponding frequency of the AC voltage value syncs displaying on sub-display. It may not display properly if the input AC voltage is too small to be detected.
6. When finished, turn rotary switch to OFF position to turn off the meter.



■ DC Voltage Measurement (V⎓)

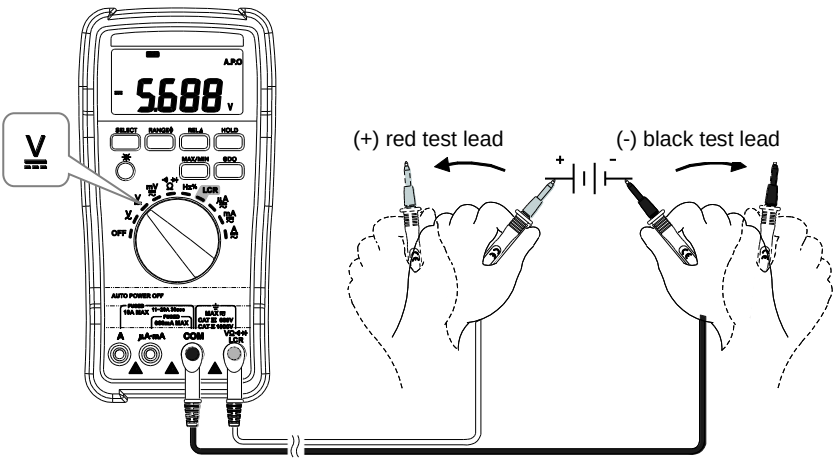
⚠ Caution

To prevent possible personal injury or damage the meter, do not apply the circuits exceed 1000V.

Range: 0.001V~1000V

(4 ranges: auto range & manual range mode for option)

1. Set rotary switch to V⎓ position.
2. Plug black test lead into the COM terminal and red test lead into the V terminal.
3. Connect test leads to the circuit to be tested. Allow time for the value to stabilize and then read the DC voltage measurement on the LCD.
4. When input exceeds 1010V, “OL” & high voltage alert ⚡ symbol display and buzzer is on to alarm a high voltage presents.
5. When finished, turn rotary switch to OFF position to turn off the meter.



■ DC/AC millivoltage Measurement (≂ mV)

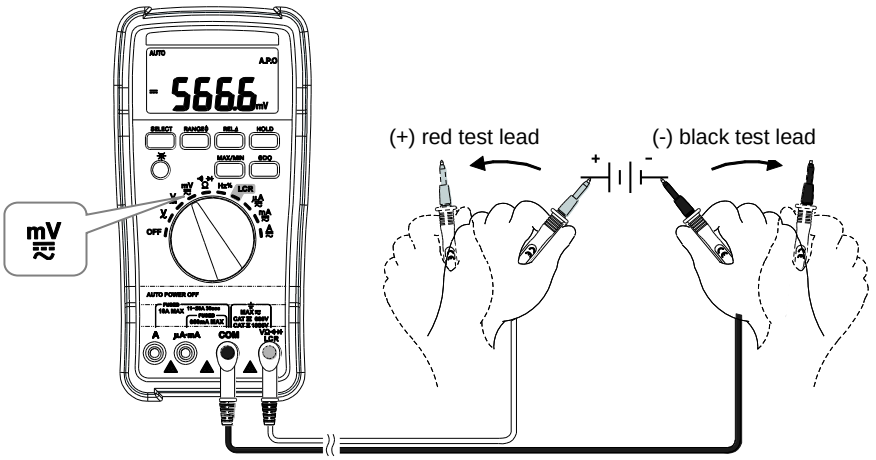
⚠ Caution

To prevent possible personal injury or damage the meter, do not apply the circuits exceed 1000V.

Range: 600.0mV

1. Set rotary switch to ≂ mV position.
2. Plug black test lead into the COM terminal and red test lead into the V terminal.
3. Press SELECT button to choose ACmV(~) or DCmV(⎓) for measurement.
4. Apply test leads to the circuit to be tested. Allow time for the value to stabilize and then read the voltage measurement on the LCD.
5. The corresponding frequency of the AC voltage value syncs displaying on sub-display. It may not display properly if the input AC voltage is too small to be detected.
6. When exceed 600mV, “OL” displays on LCD.
7. When finished, turn rotary switch to OFF position to turn off the meter.

* For DC measurement, connect to correct polarity is necessary.



■ Resistance Measurement (Ω)

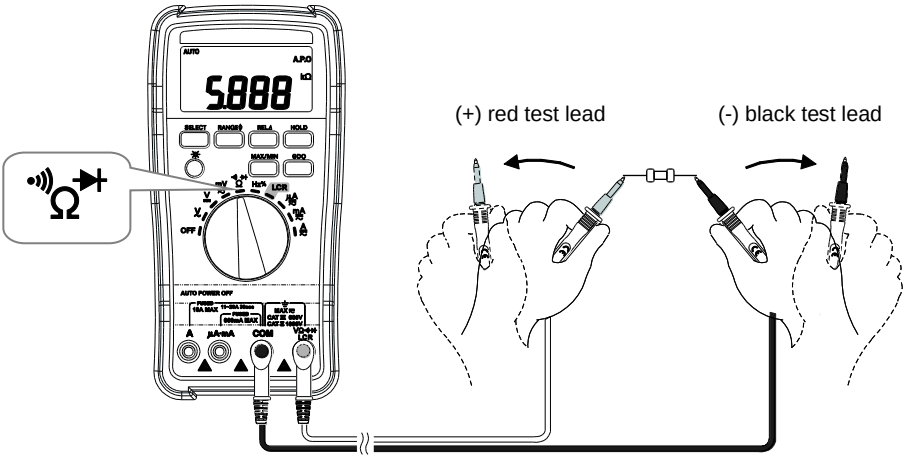
> **⚠ Warning**
>
> To prevent damaging the meter, must switch off the power of the circuit to be tested before conducting the measurement.

Range: 600.0Ω~60.00MΩ

(6 ranges: auto range & manual range mode for option)

1. Set rotary switch to "Ω •)) ⊣◀" position. and OL with MΩ unit display on LCD.
2. Plug black test lead into the COM terminal and red test lead into the Ω terminal.
3. Connect test leads to the object to be tested. Allow time for the value to stabilize and then read the resistance measurement on the LCD.
4. Polarity is not in consideration when measuring resistance.
5. When finished, turn rotary switch to OFF position to turn off the meter.

Note: During measuring, do not touch the probes of test leads with bare hands to prevent affecting the accuracy.

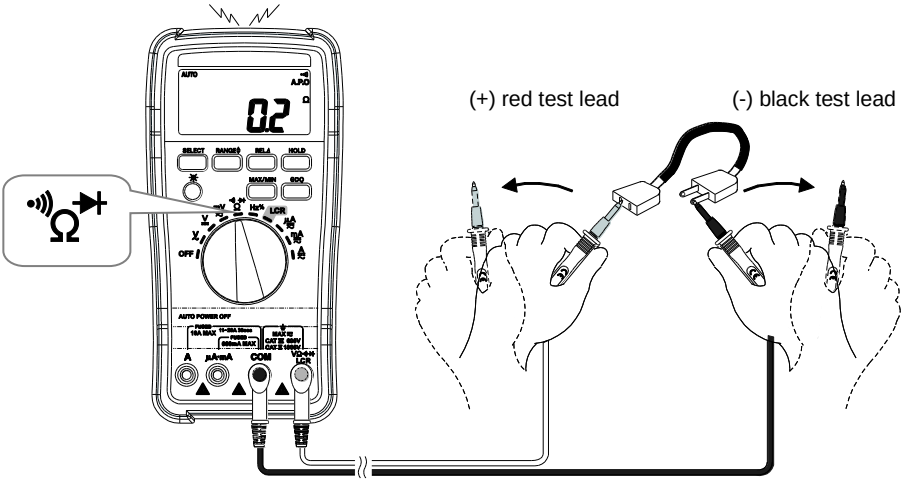


■ Continuity Tests (•))))

⚠ Warning

To prevent damaging the meter, must switch off the power of the circuit to be tested before conducting the measurement.

1. Set rotary switch to " Ω •))) ⊣◀ " position.
2. Press SELECT button to choose the Continuity Test mode, OL and •))) symbol display on the LCD.
3. Plug black test lead into the COM terminal and red test lead into the •))) terminal.
4. Connect test leads to the circuit to be tested. If the circuit is continuous or has a resistance of < 10Ω, the beeper will emit.
5. When finished, turn rotary switch to OFF position to turn off the meter.



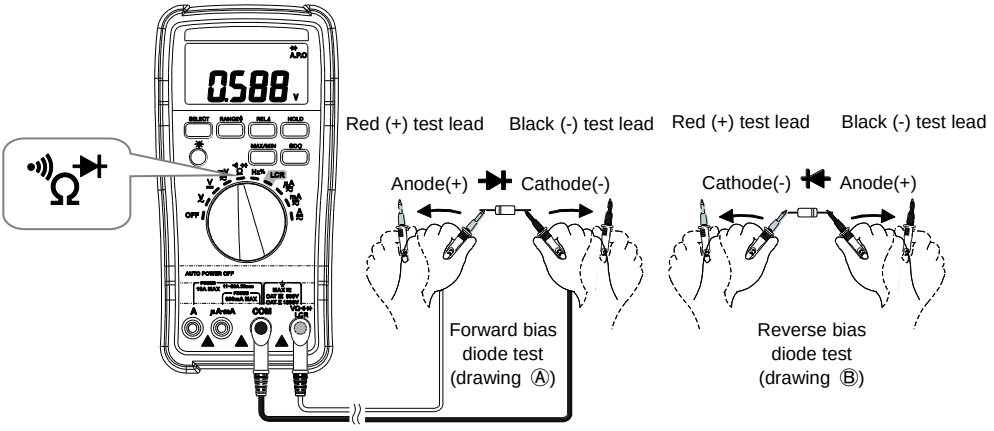
■ Diode Tests (⇥)

⚠ Warning

To prevent damaging the meter, must switch off the power of the circuit to be tested before conducting the measurement.

1. Set rotary switch to " Ω •)) ⇥ " position.
2. Press SELECT button to choose the Diode Test mode, OL and ⇥ symbol display on the LCD.
3. Plug black test lead into the COM terminal and red test lead into the ⇥ terminal.
4. Connect test leads to the diode and allow time for the value to stabilize and then read the diode measurement on the LCD.
   (A) Forward-bias Diode Test (drawing Ⓐ)
   - Connect black test lead to the cathode of diode and red test lead to the anode of diode.
   - Silicon diodes should give a reading approximately 0.5~0.7V ◦
   - GE diodes give a reading approximately 0.2~0.3V ◦
   - If the reading is near to "0" means short circuit. If LCD displays "OL" means open circuit.

   (B) Reverse-bias Diode Test (drawing Ⓑ)
   - Connect black test lead to the anode of diode and red test lead to the cathode of diode.
   - Normally the LCD displays "OL" indicating that the diode is in good condition.
   - The diode is defective if the display gives a certain voltage level.
5. When finished, turn rotary switch to OFF position to turn off the meter.



■ Frequency (Hz) + Duty (%) Measurements

⚠ Caution

To prevent possible personal injury or damage the meter, do not apply the circuits exceed 1000V.

Range: 0.0Hz~20.00MHz

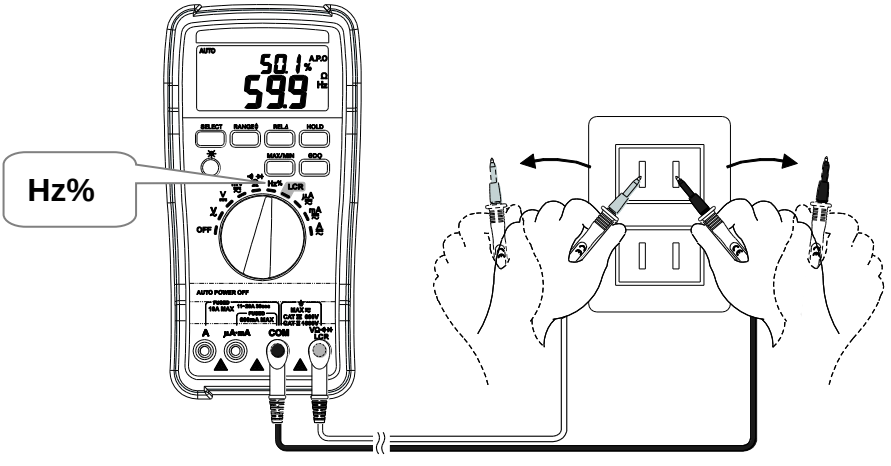
(6 ranges: auto range & manual range mode for option)

1. Set rotary to " **Hz %"** position.
2. Plug black test lead into the COM terminal and red test lead into the V terminal.
3. Connect test leads to the circuit to be tested. Allow time for values stabilize and then read the frequency of AC measurement on the LCD.
4. The corresponding duty of the frequency value syncs displaying on sub-display.
5. When finished, turn rotary switch to OFF position to turn off the meter.

Note:

1. The voltage detected is too small which will not allow frequency to be detected and displayed properly.
2. Duty cycle range is variable at different Frequency range, see below table for detail.

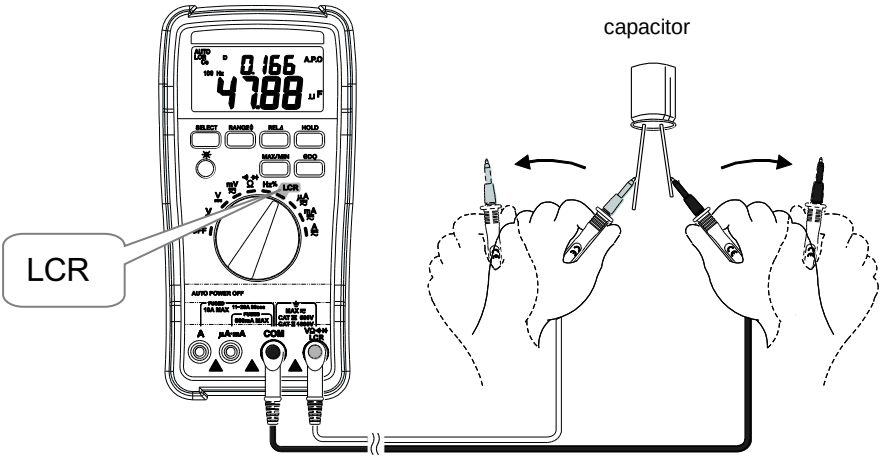
Duty / Hz range	Available Range
600.0Hz	5.0% ～95.0%
6.000KHz	10.0% ～90.0%
60.00KHz	20.0% ～80.0%
600.0KHz	unavailable
6.000MHz	unavailable
20.00MHz	unavailable



■ LCR Measurement

> **⚠ Caution**
>
> When a capacitor with big capacitance, fully discharge is recommended to prevent possible damaging the meter and expedite the measurement.

1. Set rotary switch to **LCR** position.
2. Plug black test lead into the COM terminal and red test lead into the **LCR** terminal.
3. To get the best accuracy, highly recommend to do calibration before measurement.
   - Press REL Button to enter calibration mode, “OPEn” displays. Open test lead and press REL button to process open calibration until PASS displays. Press REL button again, “Srt” displays. Short test leads press REL button to process short calibration until PASS displays the calibration is complete. Press REL button again to enter LCR measurement.
4. Press SELECT button to choose L or C or R for measurement. Parallel or series mode and test frequency (100Hz, 1kHz or 10kHz) is chosen automatically.
5. Connect the test leads to the component to be tested. Allow time for the value to stabilize and then read the value on the LCD.
6. The main display shows inductance, capacitance or resistance value of components be tested.
7. The parameter of (Q) quality factor, (D) dissipation factor and (**θ**) phase angle displays on sub-display.
8. Press **θDQ** button to shift reading the parameter.
   - Q &θ for inductance measurement.
   - D &θ for capacitance measurement.
   - θDQ button is disabled for resistance measurement.

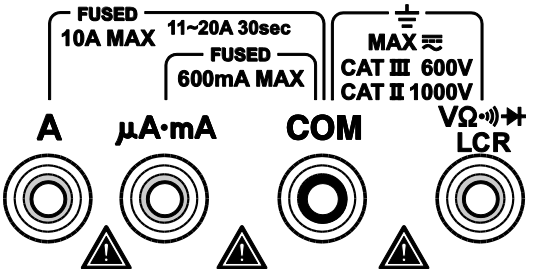


■ DC & AC Current Measurement ⎓≂ (µA/ mA/ A)

⚠ Caution

- To prevent the meter damage from the high voltage or the high current, set the function switch knob at the proper position before measurement.
- If the range of circuit to be tested is unknown, set the function switch and the test leads from the highest range, then adjust to the proper range for the best measurement afterwards.
- To avoid personal injury, damage to the meter or malfunction, use the proper terminals, switch position, and range for your current measurement.

1. Set rotary switch to ⎓≂ µA, ⎓≂ mA or ⎓≂ 10A position. (auto range / manual range for option is available for µA & mA)
2. Press SELECT button to choose AC (~) or DC(⎓) for measurement.
3. Plug black test lead into the COM terminal and red test lead into the A or µA or mA terminal according to the position of rotary switch stays.



Terminals for current

4. Connect test leads to the circuit to be tested. For DC(⎓) measurement, make sure to connect to the correct polarity.
5. The maximum input protection of DC / AC (⎓≂) µA/mA is 600mA with fuse 630mA/1000V. And the maximum input protection of DC / AC (⎓≂) A is 10A with fuse 10A/1000V.
6. At 10A range, when input exceeds 10A can stand with overload 11~20A with maximum 30 sec.
7. The corresponding frequency value syncs displaying on sub-display. It may not display properly if the signal is too small to be detected.
8. When finished, turn rotary switch to OFF position to turn off the meter.

(6) Auto Power OFF (A.P.O.) Function & Cancellation

- Once meter is powered on and idle for 15 minutes from the last operation was made, it will turn off automatically for saving the power.
  - Before the meter turns off, an alarm with short beep 6 times to alert the user. If without any operation, the meter will turn off after a long beep sound. Press any button will extend the A.P.O. activates while hearing the short beep alarm.
- If the meter has auto power off, press any button or turn rotary switch position will turn it on.
- There is still minor power consumption after the A.P.O. For power saving, please always turn the function switch to OFF position after finished the measurement.
- Hold SELECT button and to turn on the meter, The A.P.O. function will be cancelled, and the APO symbol disappears.

(7) Replacing Fuse

⚠ Caution

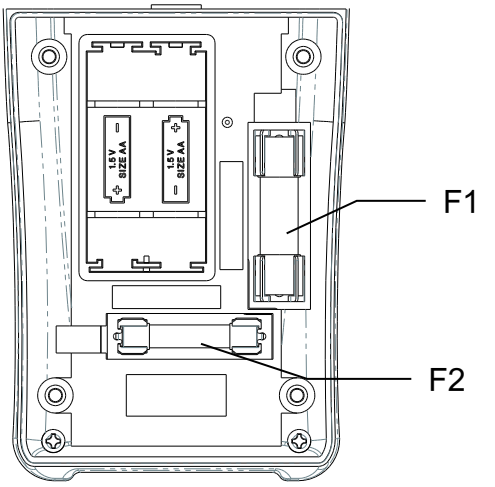
To avoid possible electrical shock or personal injury or damage the meter!

- Disconnect the meter with the circuit being tested before replacing fuses.
- Do not attempt to open the case (cover & case) while replacing fuses.
- Replace the fuses with the same specified specification.

The fuses may be broken, if conduct the measurement exceeding the rating current. Replace the fuses with the same specification listed below.

μA、mA range, fuse: F2 630mA/1000V 6.3Φ×32

10A range, fuse: F1 10A/1000V 10Φ×38



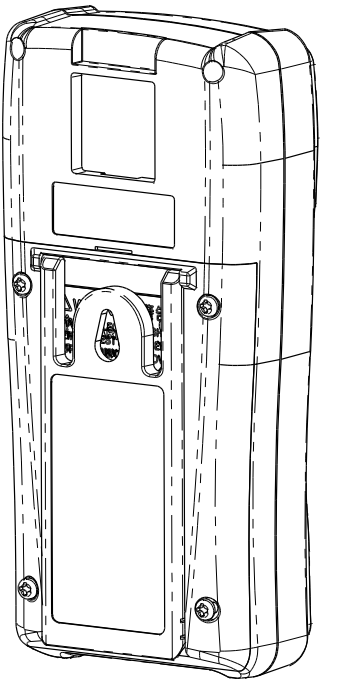
(8) Replacing the Battery

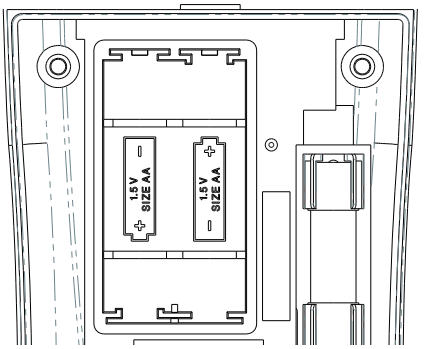
Replace the battery as soon as the low battery indicator appears. 1.5Vx2 (AA LR6) alkaline battery is recommended. Carbon-zinc-battery (AA R6P) is also acceptable, but battery life is shorter.

⚠ Caution

- Turn off the meter and disconnect to the circuit to be tested before replacing battery.
- Place the battery in position with the correct polarity.

1. Remove sheath.
2. Loosen 4 screws on battery door with suitable screwdriver.
3. Use stand rack as a handle to remove battery door.
4. Replace the specified batteries.
5. Reverse the procedure from step 3 to step 1.





(9) Specifications:

1. General:

- **Liquid Crystal Display (LCD):**
  6000 counts + 2000 counts dual display,

- **DMM Measurement functions:**
  ACV, DCV, AC/DCmV, Resistance, Audible Continuity, Diode check, Frequency & Duty, AC/DCuA, AC/DCmA, ACA & DCA

- **DMM mode Additional features:**
  Data Hold, Auto Power Off (Auto Power Off Cancellation), Range Hold, Relative, Maximum/Minimum Values Recording, Automatic polarity indication & Backlit.

- **LCR Measurement functions:**
  Rs, Rp, Cs, Cp, Ls , Lp, phase angle, Dissipation factor, Quality factor
  Auto set ” series or parallel “test mode.
  Auto set ”test frequency” (100/ 1K/ 10K Hz)
  Auto Range

- **LCR mode Additional features:**
  Calibration, Data Hold, Auto Power Off (Auto Power Off Cancellation) & Backlit

- **Sampling rate:**
  Approx. 3 times/sec. (DMM mode)
  Approx. 1 time/sec. (LCR mode)

- **Operation temperature/humidity:**
  0°C~50°C (32°F~122°F) / <80% R.H.(no condensation)

- **Storage temperature/humidity:**
  -10°C~60°C(14°F~140°F) / <70% R.H.(no condensation)

- **Power supply:** 1.5V battery x 2 (AA LR6/ AA R6P)

- **Battery life time:** Around 250 hours at DCV (Alkaline battery)

- **Safety standard:** IEC 61010-1 CAT. III 600V
  IEC 61010-1 CAT. II 1000V

- **Dimension:** 180(L)x91(W)x57(H)mm

- **Weight:** Approx. 400g(excluding battery)

- **Standard Accessories:**
  Instruction Manual x1
  1.5V Battery x2
  Test Leads (black + red) x1 set
  Sheath x 1

2.Electrical Specifications:

- 23°C ± 5°C max. 80%R.H. Accuracy: ±(%rdg +dgt)
- **Temperature coefficient:**
  0.1 x (specified accuracy) / ℃ (<0℃ or >28℃)

Measurement	Range	Resolution	Accuracy (Responding Hz) DE-5003 (sine wave)	Accuracy (Responding Hz) DE-5004** (True RMS)	Input Impedance	Max. Input Voltage
V~ ACV	6.000V	0.001V	0.7%+6 (40Hz~1kHz)	0.7%+6 (40Hz~1kHz)	Approx. 11MΩ	1000V rms
	60.00V	0.01V	0.7%+5 (40Hz~1kHz)	0.7%+6 (40Hz~1kHz) 2.0%+6 (1kHz~5kHz)	Approx. 10MΩ	
	600.0V	0.1V				
	1000V	1V	1.2%+5 (40Hz~1kHz)	1.2%+6 (40Hz~1kHz) 2.0%+6 (1kHz~2kHz)		

**True RMS: valid from 10%~100% of range

Measurement	Range	Resolution	Accuracy DE-5003	Accuracy DE-5004	Input Impedance	Max. Input Voltage
V⎓ DCV	6.000V	0.001V	0.1%+3		Approx. 11MΩ	1000V rms
	60.00V	0.01V	0.2%+3		Approx. 10MΩ	
	600.0V	0.1V	0.4%+3			
	1000V	1V	0.6%+5			

VA+Hz (at secondary display)		Accuracy		Max. Input Voltage
Range	Resolution	DE 5003	DE 5004	
600.0Hz	0.1Hz	0.1%+5		1000V rms
6.000KHz	0.001KHz			
60.00KHz	0.01KHz			

Measurement ADP	Range	Resolution	Accuracy (Responding Hz) DE-5003 (sine wave)	Accuracy (Responding Hz) DE-5004** (True RMS)	Input Impedance	Max. Input Voltage
ACmV	600.0mV	0.1mV	0.7%+5 (40Hz~2KHz)	0.7%+5* (40Hz~10KHz)	Approx. 1000MΩ	1000V rms
DCmV	600.0mV	0.1mV	0.2%+5	0.2%+5		

**True RMS: valid from 10%~100% of range

Measurement	Range	Resolution	Accuracy	Max. Input Voltage
Ω Resistance	600.0 Ω *	0.1Ω	0.5%+5	1000V rms
	6.000KΩ	0.001KΩ		
	60.00KΩ	0.01KΩ		
	600.0KΩ	0.1KΩ		
	6.000MΩ	0.001MΩ	1.0%+5	
	60.00MΩ	0.01MΩ	2.5%+5	

Measurement	Range	Resolution	Remarks	Open-loop Voltage	Max. Input Voltage
Continuity	600.0Ω	0.1Ω	Buzzer emits at around ≦10Ω±3Ω	Approx. -3.3V	1000V rms

Measurement	Range	Resolution	Accuracy	Open-loop Voltage	Max. Input Voltage
Diode	6.000V	0.001V	0.5%+5	Approx. 2.8V	1000V rms

Measurement	Range	Resolution	Accuracy	Remarks	Max. Input Voltage
Hz	600.0Hz	0.1Hz	0.1%+5	Available reading of Duty: 5.0%~94.9%(< 600Hz) 10.0%~90.0%(< 6kHz) 20.0%~80.0%(< 60kHz) Resolution 0.1% Duty smaller than 5%, The **UL** will be show on LCD. Duty larger than 94.9%, The **OL** will be show on LCD.	1000V rms
	6.000kHz	0.001kHz			
	60.00kHz	0.01kHz			
	600.0kHz	0.1kHz			
	6.000MHz	0.001 MHz			
	20.00MHz	0.01MHz			

Measurement	Range	Resolution	Accuracy	Overload Protection
DC μA	600.0μA	0.1μA	0.5%+5	630mA/1000 V fuse
	6000μA	1μA		
DC mA	60.00mA	0.01mA		
	600.0mA	0.1mA		
DC A	10.00A	0.01A	1.0%+10	10A/1000V fuse

*overload 11 ~ 20A stands with 30 sec. max.

Measurement	Range	Resolution	Accuracy (Responding Hz)		Overload Protection
			DE-5003 (sine wave)	DE-5004** (True RMS)	
AC μA	600.0μA	0.1μA	1.0%+10 (40Hz~1kHz) 1.5%+10 (1KHz~2KHz)	1.0%+10 (40Hz~1kHz) 1.5%+10 (1KHz~5KHz)	630mA/1000 V fuse
	6000μA	1μA			
AC mA	60.00mA	0.01mA			
	600.0mA	0.1mA			
AC A	10.00A	0.01A	1.5%+10 (40Hz~2kHz)	1.5%+10 (40Hz~5kHz)	10A/1000V fuse

*over load 11 ~ 20A stands with 30 sec. max.

**True RMS: valid from 10%~100% of range

☐ LCR Inductance

Ls/Lp	0.3~ 60.0μH	60.1~ 600.0μH	601~ 6000μH	6.01~ 60.00mH	60.1~ 600.0mH	601~ 6000mH	6.01~ 60.00H	60.1~ 100.0H
Resolution	0.1μH	0.1μH	1μH	0.01mH	0.1mH	1mH	0.01H	0.1H
Accuracy	±(3.0%+20)	±(1.5%+5)	±(1.0%+5)	±(1.0% +5)	±(1.0%+5)	±(1.0%+5)	±(1.5%+5)	±(3.0%+10)

☐ LCR Capacitance

Cs/Cp	3.0~ 600.0pF	601~ 6000pF	6.01~ 60.00nF	60.1~ 600.0nF	601~ 6000nF	6.01~ 60.00μF	60.1~ 600.0μF	0.60~ 6.00mF
Resolution	0.1pF	1pF	0.01nF	0.1nF	1nF	0.01μF	1μF	0.01mF
Accuracy	±(2.0%+20)	±(1.0%+5)	±(0.3%+5)	±(0.3%+5)	±(0.5%+5)	±(0.8%+5)	±(1.5%+10)	±(3.0%+20)

☐ LCR Resistance

Rs/Rp	0.01~ 60.0Ω	60.1~ 600.0Ω	601~ 6000Ω	6.01~ 60.00KΩ	60.1~ 600.0KΩ	601~ 6000KΩ	6.01~ 20.00MΩ
Resolution	0.1Ω	0.1Ω	1Ω	0.01KΩ	0.1KΩ	1KΩ	0.01MΩ
Accuracy	±(1.0%+20)	±(0.3%+5)	±(0.3%+5)	±(0.3%+5)	±(0.3%+5)	±(1.0%+5)	±(3.0%+5)

- Above accuracy is guaranteed after open/short calibration.
- Some types of inductor, the inductance value changes acutely according to the test voltage applied. The meter provides the output voltage around 2.2kΩ / 0.6Vrms at sine wave. However, the test voltage is altered in according to the resistance of the inductor be tested.

⚠ Caution

- It is necessary to clean the meter, use a soft dry cloth. Never use solvents.
- Do not expose the meter to direct sunlight, extreme temperatures or moisture.

DER EE is assessed and certificated as meeting the requirements of ISO 9001. We produce meters in various types and specification and all our products conforms to ISO standards. If any further inquiry needed, please visit our website at **www.deree.com.tw**

Specifications and external appearance of this product may be revised or modified without prior notice.

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