

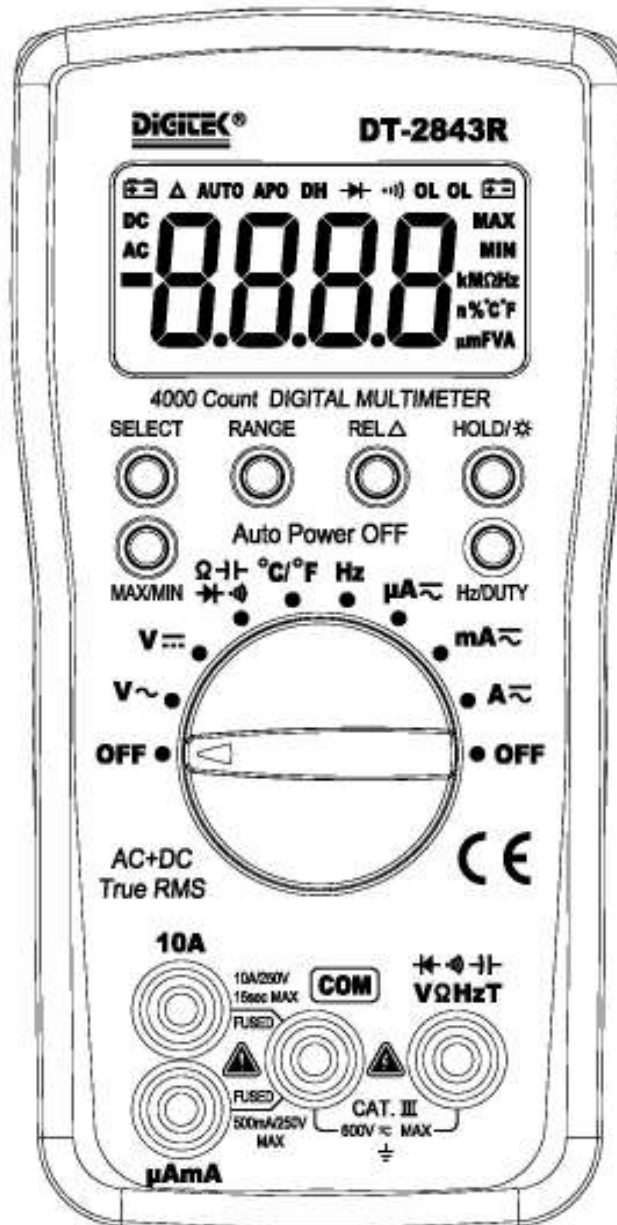
DT-2844R

4000 COUNTS AUTO-RANGE

AC+DC TRUE-RMS











DIGITAL MULTIMETER




OPERATION MANUAL




1. ATIONS SAFETY INFORM

SAFETY SYMBOLS

-  **Warning!** Dangerous Voltage (Risk of electric shock).
-  **Caution!** Refer to the user's manual before using this Meter.
-  **Double Insulation.**
-  Alternating Current (**AC**).
-  Direct Current (**DC**).
-  Either **DC** or **AC**.
-  **Ground** (maximum permitted voltage between terminal and ground).
-  US Safety Standard.
-  European Safety Standard
-  The symbol indicating separate collection for electrical and electronic equipment.

-  **The RESPONSIBLE BODY shall be made aware that, if the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.**
-  **The finger or any part of your body shall not be beyond the barrier of the test probe when measuring.**
-  **Individual protective equipment must be used if HAZARDOUS LIVE parts in the installation where measurement is to be carried out could be ACCESSIBLE.**

The following safety information must be observed to insure maximum personal safety during the operation at this meter.

- 1.1 Do not operate the meter if the body of meter or the test lead look broken.
- 1.2 Check the main function dial and make sure it is at the correct position before each measurement.
- 1.3 When making current measurements ensure that the circuit not "live" before opening it in order to connect the test leads.
- 1.4 Do not perform resistance, capacitance, temperature, diode and continuity test on a live power system.
- 1.5 Do not apply voltage between the test terminals and test terminal to ground that exceed the maximum limit record in this manual.
- 1.6 Exercise extreme caution when measuring live system with voltage greater than 60V DC or 30V AC.
- 1.7 Change the battery when the "" symbol appears to avoid incorrect data.
- 1.8 Use the DMM indoor, altitude up to 2000m and temperature 5°C to 40°C.
Maximum relative humidity 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C.
- 1.9 In locations subject to radio frequency interference, the product may malfunction and it resets automatically when leaving this environment.

2. SPECIFICATIONS

2.1 GENERAL SPECIFICATIONS

Display: LCD with a max. reading of 4000.

Range control: Auto range & Manual range control

Polarity: Automatic negative polarity indication.

Zero adjustment: Automatic.

Overrange indication: The "OL" or "-OL" display.

Low battery indication: Display "⊖" sign.

Data hold: Display "DH" sign.

Relative measurement: Display "△" sign.

Auto Power Off: Display "APO" sign. When measurement exceeds 10 minutes without switching mode and pressing key, the meter will switch to standby mode. Press any key to exit standby mode. When restart the system, press and hold **SELECT** key to disable auto power off.

Safety standards: **ETL, CE EMC/LVD. CAT III 600V.**

The meter is up to the standards of IEC1010 Double Insulation, Pollution Degree 2, Overvoltage Category III.

Operating environment: Temperature 32 to 104°F (0°C to 40°C), Humidity ≤ 80% RH.

Storage environment: Temperature -4 to 140°F (-20°C to 60°C), Humidity ≤ 90% RH.

Power supply: One standard 9 volt battery (NEDA 1604, IEC 6F22 or equivalent).

Dimension: 165(H) x 83(W) x 36(D) mm

Weight: Approx. 360g (including battery).

2.2 ELECTRICAL SPECIFICATIONS

Accuracies are ± (% of reading + number in last digit), at 23 ± 5°C , ≤75% RH.

2.2.1 DC Voltage

Range	Accuracy ± ([% of Reading] + [Counts])
0.4V, 4V, 40V, 400V	0.5%+2
600V	0.8%+3

Overload protection: 600V DC or AC rms

Impedance: 10MΩ, More than 100MΩ on 400mV range.

2.2.2 AC Voltage (AC+DC True RMS) ^[1]

Range	Accuracy ± ([% of Reading] + [Counts])		
	DC, 45Hz to 500Hz	500Hz to 1kHz	1kHz to 2kHz
0.4V, 4V	1.0%+3	2.0%+3	
40V, 400V, 600V	1.0%+3	2.0%+3	

Impedance : 10MΩ. More than 100MΩ on 400mV range.

Overload protect: 600V DC or AC RMS.

[1] All ac ranges are specified from 1 % to 100 % of range. Below 5 % of range, add 10 counts. (In the range 400mV, an additional 2mV.) .

Because inputs below 1 % of range are not specified, it is normal for this and other true-rms meters to display nonzero readings when the test leads are disconnected from a circuit or are shorted together. For volts and amps, crest factor of ≤3 at 3000 counts, decreasing linearly to 2 at full scale. AC volts and AC amps are dc-coupled.

If the measurement of AC voltage contains more than DCV 250V, please choose manual range 600V.

2.2.3 DC Current

Range	Accuracy ± ([% of Reading] + [Counts])
400μA, 4000μA	1.5%+2
40mA, 400mA	1.5%+2
4A, 10A ^[1]	2.0%+3

Overload protection: 0.5A/250V, 10A/250V fuse.

[1] 10A for 15sec each 15min maximum.

2.2.4 AC Current (AC+DC True RMS) ^[1]

Range	Accuracy \pm ([% of Reading] + [Counts])
	DC, 45Hz to 2kHz
400 μ A, 4000 μ A	2.0%+3
40mA, 400mA	2.0%+3
4A, 10A ^[2]	2.5%+3

Overload protection: 0.5A/250V, 10A/250V fuse.

[1] All ac ranges are specified from 1 % to 100 % of range. Below 5 % of range, add 10 counts. Because inputs below 1 % of range are not specified, it is normal for this and other true-rms meters to display nonzero readings when the test leads are disconnected from a circuit or are shorted together. For volts and amps, crest factor of ≤ 3 at 3000 counts, decreasing linearly to 2 at full scale. AC volts and AC amps are dc-coupled.

[2] 10A for 15sec each 15min maximum.

2.2.5 Resistance

Range	Accuracy \pm ([% of Reading] + [Counts])
400 Ω , 4k Ω , 40k Ω , 400K Ω , 4M Ω	1.0%+2
40M Ω	2.0%+3


Overload protection: 250V DC or AC rms.

2.2.6 Capacitance

Range	Accuracy \pm ([% of Reading] + [Counts])
40nF	\pm (3.0%+10)
400nF, 4 μ F	\pm (2.5%+5)
40 μ F	\pm (5.0%+10)
400 μ F, 4000 μ F	\pm (20.0%+20)

Overload protection: 250V DC or AC rms

2.2.7 Diode and Audible continuity test

Range	Description	Test condition
	Display read approximately forward voltage of diode	Forward DC current approx. 0.4mA. Reversed DC voltage approx. 2.8V
	Built-in buzzer sounds if resistance is less than 100 Ω	Open circuit voltage approx. 0.5V

Overload protection: 250V DC or AC rms

2.2.8 Frequency

Range	Accuracy \pm ([% of Reading] + [Counts])
10Hz~10MHz	\pm (0.1%+5)

Sensitivity: sine wave 0.6V rms (10MHz: 1.5V rms)

Overload protection: 250V DC or AC rms

2.2.9 Duty cycle

0.1%~99.9%: \pm (2.0%+2) Frequency lower than 10kHz

Sensitivity: sine wave 0.6V rms

Overload protection: 250V DC or AC rms

3. OPERATION

3.1 DC Voltage Measurement

- 1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
- 2) Set the selector switch to desired "**V $\overline{\text{---}}$** " position.
- 3) Measure the voltage by touch the test lead tips to the test circuit where the value of voltage is needed.
- 4) Read the result from the LCD panel.

3.2 AC Voltage Measurement

- 1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
- 2) Set the selector switch to desired "**V \sim** " position.
- 3) Measure the voltage by touch the test lead tips to the test circuit where the value of voltage is needed.
- 4) Read the result from the LCD panel.
- 5) Press "**Hz/DUTY**" key to measurement **frequency** or **duty cycle**.

3.3 DC and AC Current Measurement

- 1) Connect the black test lead to "**COM**" socket. For measurement up to 400mA, connect the red test lead to the " **μ AmA**" socket; for measurement from 400mA to 10A, connect the red test lead to the "**10A**" socket
- 2) Set the selector switch to desired " **μ A \sim** ", "**mA \sim** " or "**A \sim** " position.
- 3) Press "**SELECT**" key to choose "**DC**" or "**AC**" measurement.
- 4) Remove power from the circuit under test and open the normal circuit path where the measurement is to be taken. Connect the meter in series with the circuit.
- 5) Read the result from the LCD panel.
- 6) On **AC** range, press "**Hz/DUTY**" key to measurement **frequency** or **duty cycle**.

3.4 Resistance Measurement

- 1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
- 2) Set the selector switch to desired " **$\Omega \rightarrow \text{diode symbol} \rightarrow \text{diode symbol}$** " position.
- 3) Press "**SELECT**" key to choose **Resistance** measurement.
- 4) Connect tip of the test leads to the points where the value of the resistance is needed.
- 5) Read the result from the LCD panel.

Note:

When take resistance value from a circuit system, make sure the power is cut off and all capacitors need to be discharged.

3.5 Capacitance Measurement

- 1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
- 2) Set the selector switch to desired " **$\Omega \rightarrow \text{diode symbol} \rightarrow \text{diode symbol}$** " position.
- 3) Press "**SELECT**" key to choose **Capacitance** measurement.
- 4) Connect tip of the test leads to the points where the value of the capacitance is needed.
- 5) Read the result from the LCD panel.

Note:

- a) Before testing, discharge the capacitor by shorting its leads together. Use caution in handling capacitors because they may have a charge on them of considerable power before discharging.
- b) Before testing, press "**REL Δ** " key to eliminate the zero error.
- c) When testing 4000 μ F capacitor, note that there will be approx. 30 seconds time lag.

3.6 Diode and Audible continuity Test

- 1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
- 2) Set the selector switch to desired " **$\Omega \rightarrow \text{diode symbol} \rightarrow \text{diode symbol}$** " position.
- 3) Press "**SELECT**" key to choose **Diode** or **Audible continuity** measurement.
- 4) Connect the test leads across the diode under measurement, display shows the approx.

forward voltage of this diode.

- 5) Connect the test leads to two point of circuit, if the resistance is lower than approx. 100Ω, the buzzer sounds.

Note:

Make sure the power is cut off and all capacitors need to be discharged under this measurement.

3.7 Frequency and Duty cycle measurement

- 1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
- 2) Set the selector switch to desired "**Hz**" position.
- 3) Press "**Hz/DUTY**" key to choose **Frequency** or **Duty cycle** measurement.
- 4) Connect the probe across the source or load under measurement.
- 5) Read the result from the LCD panel.

3.8 Data Hold

On any range, press the "**HOLD**" key to lock display value, and the "**DH**" sign will appear on the display, press it again to exit.

3.9 MAX/MIN Hold

Press the "**MIN/MAX**" key to lock **MAX** or **MIN** value, and the "**MAX**" or "**MIN**" sign will appear on the display, press it over 2 seconds to exit. It can not display bar graph on **MAX/MIN HOLD** mode.

3.10 Relative measurement

Press the "**REL△**" key, you can measure the relative value and "**△**" sign will appears on the display, the auto range mode be changed to manual range mode. Press it again to exit relative measurement and "**△**" sign disappears, but you can not go back to auto range mode. This function is non effective on **Hz /DUTY** measurement. It can not display bar graph on **Relative measurement** mode.

3.11 Auto/Manual range

The auto range mode is a convenient function, but it might be faster to manually set the range when you measure values that you know to be within a certain range.


To select manual range, repeatedly press "**RANGE**" key until the display shows the desired range. The range steps upward as you press "**RANGE**" key. The meter will go back to auto range mode when you press "**RANGE**" key for more than 2 seconds. It can not select manual range mode on **Hz/DUTY**, **capacitance** and **temperature** range.

Caution: while using the manual range mode, if "**OL**" sign appears on the display, immediately set range to a higher.

3.12 Back Light

On any range, press the "**HOLD**" key over 2 seconds to light the back light, press it again for more than 2 seconds to wink the light. The light can wink automatically after 10 seconds too.

4. Battery replacement

- 1) When the battery voltage drop below proper operation range, the  symbol will appear on the LCD display and the battery need to changed.
- 2) Before changing the battery, set the selector switch to "**OFF**" position.
Open the cover of the battery cabinet by a screwdriver.
- 3) Replace the old battery with the same type battery.
- 4) Close the battery cabinet cover and fasten the screw.

Caution: Dispose the used batteries according to the rules, which are defined by each community.

5. Fuse replacement

- 1) This meter is provided with a 0.5A/250V fuse to protect the current measuring circuits which measure up to 500mA, with a 10A/250V fuse to protect the 10A range.
- 2) Ensure the instrument is not connected to any external circuit, set the selector switch to “**OFF**” position and remove the test leads from the terminals.
- 3) Remove the screw on the battery cabinet cover to open the battery cabinet cover, then remove the three screws on the bottom case and lift the bottom case. Replace the old fuse with the same type and rating:
5×20mm 0.5A/250V or 6.3×25.4mm 10A/250V fuse.
- 4) Close the bottom case and fasten the screws, then close the battery cabinet cover and fasten the screw.

6. MAINTENANCE

- 1) Before open the battery cover, disconnect both test lead and never uses the meter before the battery cover is closed.
- 2) To avoid contamination or static damage, do not touch the circuit board without proper static protection.
- 3) If the meter is not going to be used for a long time, take out the battery and do not store the meter in high temperature or high humidity environment.
- 4) Repairs or servicing not covered in this manual should only by qualified personal.
- 5) Periodically wipe the case with a dry cloth and detergent. Do not use abrasives or solvents on the meter.

For any questions, please contact Kaito Electronics, Inc or visit www.multimeterwarehouse.com