

# DURATOOL






**DIGITAL MULTIMETER**  
**Model: D03046 and D03047**

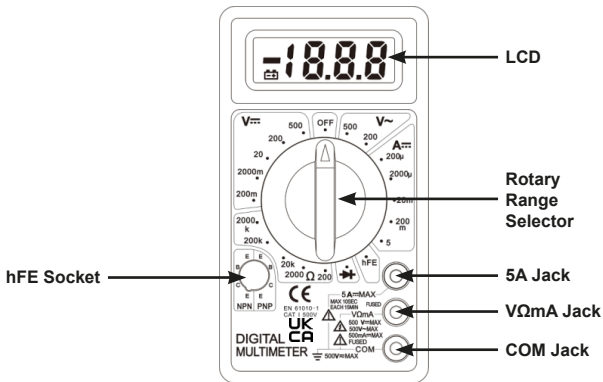
## IMPORTANT SAFETY INFORMATION

Please read these instructions carefully before use and retain for future reference.

- Check the test leads, probes and case insulation before using. If you find any breakage or abnormality, or you consider the device is broken, stop using the device immediately.
- When using the test probes, keep your fingers behind the finger protection ring.
- Do not use the meter with the back cover open.
- Select appropriate test range for measurements.
- Ensure all inputs are less than the range selected otherwise it may cause electrical shock or meter damage.
- Do not change the range selector position during voltage or current measurements.
- Do not apply a voltage exceeding the marked voltage between COM terminal and ground.
- Take caution when working voltages are above 60V DC or 30V AC rms.
- Do not connect the meter to voltage signals when the range selector is on current, resistance, diode or continuity range.
- When measuring current, each single measurement should be shorter than 10 seconds.
- When a measurement has been completed, disconnect the testing probes from the circuit under test.
- Replace the batteries as soon as the low battery indicator appears on the display.
- Remove dead batteries from the meter or if it is not going to be used for a long time.
- Never mix old and new batteries together, or different types of batteries.
- Never dispose of batteries in a fire, or attempt to recharge ordinary batteries.
- Before replacing the battery, turn off the meter and disconnect all the test probes.
- To prolong battery life turn off the meter after use.

## FUNCTIONS

Model	DCV	ACV	DCA	$\Omega$			hFE	
D03046	✓	✓	✓	✓	✓		✓	
D03047	✓	✓	✓	✓	✓	✓	✓	✓



## DC VOLTAGE

Range	Resolution	Accuracy
200mV	100μV	±(0.5% of rdg +3D)
2000mV	1mV	±(0.8% of rdg +5D)
20V	10mV	
200V	100mV	
500V	1V	±(1.0% of rdg +5D)


- OVERLOAD PROTECTION: 220V rms AC for 200mV range and 500V DC or 500V rms for all ranges.

## AC VOLTAGE

Range	Resolution	Accuracy
200V	100mV	$\pm(2.0\% \text{ of rdg} + 10D)$
500V	1V	

- RESPONSE: Average responding, calibrated in rms of a sine wave.
- FREQUENCY RANGE: 45Hz ~ 450Hz.
- OVERLOAD PROTECTION: 500V DC or 500V rms for all ranges.

## CONTINUITY

Range	Description
	Built in buzzer sounds if resistance is less than $30 \pm 20\Omega$

- OVERLOAD PROTECTION: 15 seconds maximum 220V RMS.

## DC CURRENT

Range	Resolution	Accuracy
200 $\mu$ A	100nA	$\pm(1.8\% \text{ of rdg} + 2D)$
2000 $\mu$ A	1 $\mu$ A	
20mA	10 $\mu$ A	
200mA	100 $\mu$ A	$\pm(2.0\% \text{ of rdg} + 2D)$
5A	10mA	$\pm(2.0\% \text{ of rdg} + 10D)$

- OVERLOAD PROTECTION: F0.5A/500V and F5A/250V fuse.
- MEASURING VOLTAGE DROP: 200mV.

## RESISTANCE

Range	Resolution	Accuracy
200 $\Omega$	0.1 $\Omega$	$\pm(1.0\%$ of rdg +10D)
2000 $\Omega$	1 $\Omega$	$\pm(1.0\%$ of rdg +4D)
20k $\Omega$	10k $\Omega$	
200k $\Omega$	100k $\Omega$	
2000k $\Omega$	1k $\Omega$	

- MAXIMUM OPEN CIRCUIT VOLTAGE: 3V.
- OVERLOAD PROTECTION: 15 seconds maximum 220Vrms.

## OPERATION

### DC & AC VOLTAGE MEASUREMENT

- Connect red test lead to “V $\Omega$ mA” jack, Black lead to “COM” jack.
- Set RANGE switch to desired VOLTAGE position, if the voltage to be measured is not known beforehand, set switch to the highest range and reduce it until satisfactory reading is obtained.
- Connect test leads to device or circuit being measured.
- Turn on power of the device or circuit being measured voltage value will appear on Digital Display along with the voltage polarity.


### DC CURRENT MEASUREMENT

- Red lead to “V $\Omega$ mA”. Black lead to “COM” (for measurements between 200mA and 5A connect red lead to “5A” jack with fully depressed).
- Set RANGE switches to desired DCA position.
- Open the circuit to be measured, and connect test leads IN SERIES with the load in with current is to measure.
- Read current value on Digital Display.
- Additionally, “5A” function is designed for intermittent use only. Maximum contact time of the test leads with the circuit is 10 seconds, with a minimum intermission time of 15 minutes between tests.

## RESISTANCE MEASUREMENT

- Red lead to “VΩmA”. Black lead to “COM”.
- Set RANGE switch to desired Ω position.
- If the resistance being measured is connected to a circuit, turn off power and discharge all capacitors before measurement.
- Connect test leads to circuit being measured.
- Read resistance value on the display.


## DIODE MEASUREMENT

- Red lead to “VΩmA”, Black lead to “COM”.
- Set RANGE switch to “ ” position.
- Connect the red test lead to the anode of the diode to be measured and black test lead to cathode.
- The forward voltage drop in mV will be displayed. If the diode is reversed, figure “1” will be shown.


## TRANSISTOR hFE MEASUREMENT

- Set RANGE switch to the hFE position.
- Determine whether the transistor is PNP or NPN type and locate the Emitter, Base and Collector leads. Insert the leads into the correct pins of the hFE socket.
- The meter will display the approximate hFE value at the condition of base current 10μA and VCE2.8V.

## AUDIBLE CONTINUITY TEST


- Red lead to “VΩmA”, Black lead to “COM”.
- RANGE switch to “ ” position.
- Connect test leads to two points of circuit to be tested. If the resistance is lower than  $30\Omega \pm 20\Omega$ , the buzzer will sound.

## TEST SIGNAL

- Set RANGE switch to “ ” position.
- A test signal (50Hz) is produced between “VΩmA” and “COM” jack.
- The output voltage is approx 5V p-p with 50KΩ impedance.

**NOTE:** OVERLOAD PROTECTION: 15 seconds maximum 220Vrms.


## BATTERY REPLACEMENT

- If “” appears in display, it indicates that the battery should be replaced.
- To replace battery remove the meter from the protective surround, then remove the 2 screws in the rear of the case
- Remove the rear case half and simply remove the old battery, and replace with a new one. (9-volt battery, NEDA 1604 6F22 type)
- Be careful to observe correct polarity.
- Fuses rarely need replacement and blow almost always as a result of operator error. (F500mA/500V for mA terminal and F5A/500V for 5A terminal).

## CLEANING

- Clean the meter with a clean, soft cloth.
- Do not use any chemicals, abrasives or solvents that could damage the meter.

## SPECIFICATIONS

<b>Max display:</b>	LCD 3½ digits (1999 count) 0.5" high
<b>Polarity:</b>	Automatic, indicated minus, assumed plus.
<b>Measure method:</b>	Double integral A/D switch implement
<b>Sampling speed:</b>	2 times per second
<b>Over-load indication:</b>	“1” is displayed
<b>Operating Environment:</b>	0°~40°, at <80%RH
<b>Storage Environment:</b>	-10°~50°, at <85%RH
<b>Power:</b>	9V NEDA 1604 or 6F22
<b>Low battery indication:</b>	“  ”
<b>Static electricity:</b>	Approx 4mA
<b>Dimension:</b>	126 x 70 x 26mm
<b>Weight:</b>	108g (including battery)



## **INFORMATION ON WASTE DISPOSAL FOR CONSUMERS OF ELECTRICAL & ELECTRONIC EQUIPMENT.**

When this product has reached the end of its life it must be treated as Waste Electrical & Electronics Equipment (WEEE). Any WEEE marked products must not be mixed with general household waste, but kept separate for the treatment, recovery and recycling of the materials used. Waste batteries can be returned to any waste battery recycling point which are provided by most battery retailers. Contact your local authority for details of recycling schemes in your area.

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