

**Rebel**

**TOOLS**

# DIGITAL MULTIMETER



## USER'S MANUAL

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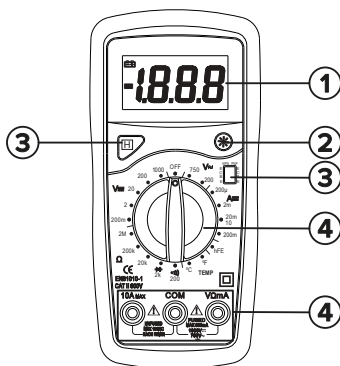
model: MIE-RB-33B, C, D

## SAFETY INSTRUCTIONS

In order to avoid electric shock or other injuries, follow the safety instructions below:

1. Before using the device, inspect the case for any mechanical damage. If the case has cracks or is missing any part, do not use the device.
2. Before using the device, check the test leads for any insulation damage. If the test leads have insulation damage or cuts, do not use the device.
3. Do not input voltages higher than those in the specification.
4. During measurements do not change the position of the rotary switch.
5. Take extra precaution while measuring voltages above 60 V DC and 30 V AC.
6. Before measurement position the rotary switch to correct position and connect the test leads to the proper terminals.
7. Do not use the device in temperatures exceeding the range in specification, in high humidity, and near explosives and flammables.
8. During measurement, hold the test leads by the finger guards.
9. Before measuring resistance, continuity, diodes and hFE, disconnect the measured circuit from power and discharge all capacitors.
10. If the display shows low battery icon, change the batteries. Otherwise the accuracy of measurements may be decreased.
11. Before opening the battery case disconnect the test leads from measured circuit and from the device.
12. Spare parts (battery and fuse) must be replaced for a new ones and with the same specification.
13. Do not tamper with devices internal circuits. This may lead to accuracy decrease or damaging the device.
14. The device is intended for indoors use only.
15. Take out the batteries, if the device is not going to be used for a long time.

# PRODUCT DESCRIPTION



1. Display
2. Display backlight button
3. Measurement hold button
4. hFE socket
5. Rotary switch
6. Connection terminals

## OPERATION

### AC and DC measurement

1. Connect the red test lead to the VΩmA terminal.
2. Connect the black test lead to the COM terminal.
3. Set the rotary switch to proper voltage range.
4. Connect the test leads to a measured circuit.
5. Turn on the circuits power. The voltage and polarization will show on the display.

\*If the range is not known, set the range to highest and gradually lower it, until getting the accurate measurement.

## **DC current measurement**


1. Connect the red test lead to the V $\Omega$ mA terminal. If the measurement will be in 200 mA - 10 A range, connect the red test lead to the 10 A terminal.
2. Connect the black test lead to the COM terminal.
3. Set the rotary switch to proper current range.
4. Open the measured circuit and connect the test leads in series.
5. The result will appear on the display.

**Caution:** while connected to the 10 A terminal, measurements can last only 15 seconds in a few seconds intervals.

## **Resistance measurement**

1. Connect the red test lead to the V $\Omega$ mA terminal.
2. Connect the black test lead to the COM terminal.
3. Set the rotary switch to proper  $\Omega$  range.
4. If the resistance measurement will be conducted on the circuit, disconnect the circuit from power and discharge all capacitors.
5. Connect the test leads to the measured circuit.
6. The result will appear on the display.

## **Diode measurement**


1. Connect the red test lead to the V $\Omega$ mA terminal.
2. Connect the black test lead to the COM terminal.
3. Set the rotary switch to  position.
4. Connect the red lead to anode of the diode, and black to the cathode.
5. Voltage drop will be displayed. If the display shows the "1", it means that the polarization is reversed.

## **Temperature measurement (model RB-33C model)**

1. Connect the red lead of the K-type thermocouple to the V $\Omega$ mA terminal.
2. Connect the black lead of the K-type thermocouple to the COM terminal.
3. Set the rotary switch to  $^{\circ}\text{C}$  position.

4. The temperature will be displayed.
5. Maximum measurement of the temperature is 250°C / 482°F.

### **Continuity test**

1. Connect the red test lead to the VΩmA terminal.
2. Connect the black test lead to the COM terminal.
3. Set the rotary switch to the  position.
4. Connect the test leads to a measured circuit. If the resistance is lower than 30 Ω, the buzzer will buzz.

### **hFE transistor test**

1. Set the rotary switch to the hFE position.
2. Determine the type of transistor (PNP or NPN) and connect the emitter, base and collector to proper sockets.
3. Approximate value of hFE will be displayed.

### **Battery test (models RB-33B and RB-33D only)**

1. Connect the red test lead to the VΩmA terminal.
2. Connect the black test lead to the COM terminal.
3. Set the rotary switch to the proper range, according to the measured battery.
4. Connect the test leads to the battery.
5. Result will be displayed.

## **CLEANING AND MAINTENANCE**

- Clean the device with soft, slightly damp cloth, without abrasive agents.
- To change the battery and fuse, lift the stand and unscrew two screws. After opening the battery cover, replace the battery (note the polarity) and the fuse. Close the battery cover and screw in two screws.

# SPECIFICATION

## DC voltage

Range	Resolution	Accuracy
200 mV	100 $\mu$ V	$\pm(0,5\% + 3)$
2 V	1 mV	$\pm(0,8\% + 5)$
20 V	10 mV	
200 V	100 mV	
1000 V	1 V	$\pm(1\% + 5)$


- Overload protection: 200 V AC for 200 mV range; 1000 V DC or 750 V for all ranges.
- Input impedance: 1M $\Omega$

## AC voltage

Range	Resolution	Accuracy
200 V	100 mV	$\pm(2\% + 10)$
750 V	1 V	

- Average responding calibrated in rms of a sine wave.
- Frequency range: 45 Hz ~ 450 Hz
- Overload protection: 1000 V DC or 750 V for all ranges.

## Continuity

Range	Description
	If the resistance is lower than 30 $\Omega$ +20 $\Omega$ , the buzzer will buzz.

Overload protection: for 15 seconds in max. 220 V.

## **DC current**

Range	Resolution	Accuracy
200 $\mu$ A	100 nA	$\pm(1,8\% + 2)$
2 mA	1 $\mu$ A	
20 mA	10 $\mu$ A	
200 mA	100 $\mu$ A	$\pm(2\% + 2)$
10 A	1 mA	$\pm(2\% + 10)$

Overload protection: 500 mA / 250 V fuse (10 A range is not protected with fuse)

## **Resistance**

Range	Resolution	Accuracy
200 $\Omega$	0,1 $\Omega$	$\pm(1\% + 10)$
2 K $\Omega$	1 $\Omega$	$\pm(1\% + 4)$
20 K $\Omega$	10 $\Omega$	
200 K $\Omega$	100 $\Omega$	
2 M $\Omega$	1 K $\Omega$	

- Max. voltage of open circuit: 3 V
- Overload protection: for 15 seconds in max. 220 V.

## **Temperature (model RB-33C only)**

Range	Resolution	Accuracy
-40°C ~ 150°C	1°C	$\pm(1\% + 4)$
150°C ~ 1370°C		$\pm(1,5\% + 15)$
-40°F ~ 302°C	1°F	$\pm(1\% + 4)$
302°F ~ 1999°C		$\pm(1,5\% + 15)$

### **Battery test (models RB-33B and RB-33D only)**

Range	Resolution	Internal resistance
12 V	10 mV	1,2 K $\Omega$
9 V	10 mV	900 $\Omega$
1,5 V	1 mV	3 K $\Omega$



**English**  
**Correct Disposal of This Product**  
**(Waste Electrical & Electronic Equipment)**



(Applicable in the European Union and other European countries with separate collection systems) This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources. Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

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