

do not measure voltages that might exceed 500V above earth ground.

2. Before the use of instrument, inspect test leads, connectors and probes for cracks, breaks, or crazes in the insulation.

#### DC VOLTAGE MEASUREMENT

1. connect red test lead to "V  $\Omega$  mA" jack. Black lead to "COM" jack.

2. Set RANGE switch to desired DCV 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.

3. Connect test leads to device or circuit being measured.

4. Turn on power of the device or circuit being measured, voltage value will appear on Digital Display along with the voltage polarity.

#### AC VOLTAGE MEASUREMENT

1. Red lead to "V  $\Omega$  mA". Black lead to "COM".

2. RANGE switch to desired ACV position.

3. Connect test leads to device or circuit being tested.

4. Read voltage value on Digital Display.

#### DC CURRENT MEASUREMENT

1. Red lead to "V  $\Omega$  mA". Black lead to "COM". (For measurements between 200mA and 10A connect red lead to "10A" jack with fully depressed.)

2. RANGE switch to desired DCA position.

3. Open the circuit to be measured, and connect test leads IN SERIES with the load in which current is to be measured.

4. Read current value on Digital Display.

#### RESISTANCE MEASUREMENT

1. Red lead to "V  $\Omega$  mA". black lead to "COM".

2. RANGE switch to desired  $\Omega$  Position.

3. If the resistance being measured is connected to a circuit, turn off power and discharge all capacitors before measurement.

4. Connect test leads to circuit being measured.

5. Read resistance value on Digital Display.

#### DIODE MEASUREMENT

1. Red lead to "V  $\Omega$  mA". Black lead to "COM"

2. RANGE switch to  $\rightarrow$  position.

3. Connect the red test lead to the anode of the diode to be measured and black test lead to cathode.

4. The forward voltage drop in mV will be displayed. If the diode is reversed, figure "1" will be shown.

#### TRANSISTOR hFE MEASUREMENT

1. RANGE switch to the hFE position.

2. Determine whether the transistor is NPN or PNP type and locate the Emitter, Base and Collector leads. Insert the leads into the proper holes of the hFE Socket on the front panel.

3. The meter will display the approximate hFE value at the condition of base current 10 $\mu$ A and VCE 2.8V.

#### TEMPERATURE MEASUREMENT

1. Connect the k type thermoelectric couple to "V  $\Omega$  mA" and "COM" jacks.

2. RANGE switch to TEMP position.

3. The display will read the Temperature value  $^{\circ}$ C.

#### ROOM TEMPERATURE MEASUREMENT

M835 can be used to measure room temperature ( $0^{\circ}$ C to  $35^{\circ}$ C) without a thermoelectric couple. Simply set the RANGE switch to RT position and the current room temperature will be displayed.

#### AUDIBLE CONTINUITY TEST

1. Red lead to "V  $\Omega$  mA". Black lead to "COM".

2. RANGE switch to  $\rightarrow$  position.

3. Connect test leads to two points of circuit to be tested. If the resistance is lower than 100 ohm, buzzer will sound.

#### TEST SIGNAL USE

1. RANGE switch to  $\rightarrow$  position.

2. A test signal (50Hz for M832 M835, M837 and 1000Hz for M833) appears between "V  $\Omega$  mA" and "COM" jacks. The output voltage is approx 5V p-p with 50 k ohm impedance.

#### BATTERY AND FUSE REPLACEMENT

Fuse rarely need replacement and blow almost always as a result of operator error.

If "BAT" appears on display, it indicates that the battery should be replaced.

To replace battery & Fuse (200mA/250V) remove the 2 screws in the bottom of the case. Simply remove the old, and replace with a new one. Be careful to observe polarity.

#### CAUTION

Before attempting to open the case of the instrument, be sure to disconnect test leads from any energized circuits to avoid shock hazard.

#### ACCESSORIES

- Operator's instruction manual
- Set of test leads
- Gift box
- K type thermoelectric couple (M837, M838, M890c only)
- 9 volt battery, NEDA 1604 6F22 TYPE (Optional).

# OPERATOR'S INSTRUCTION MANUAL

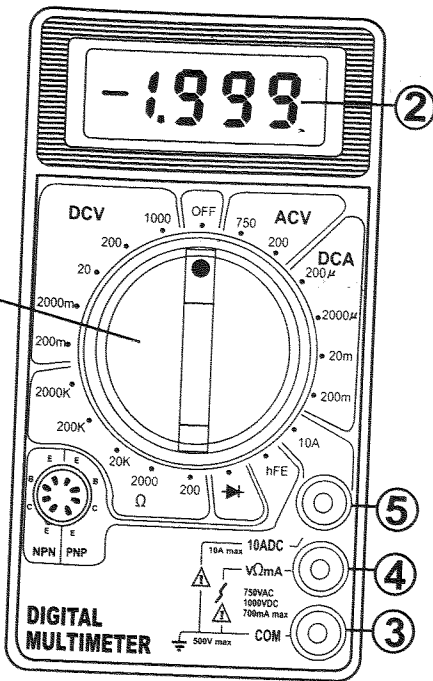
## MINI DIGITAL MULTIMETER



**WARNING**

**READ AND UNDERSTAND THIS MANUAL BEFORE  
USING THE INSTRUMENT**

Failure to understand and comply with the WARNINGS and operating instructions can result in serious or fatal injuries and/or property damage.



**GENERAL**

M83 instruments are a series of compact pocket - sized  $3 \frac{1}{2}$  digit multimeters for measuring DC and ac voltage, DC current, resistance and diode. Some of those also provide temperature, transistor measurement and audible continuity test function or can be used as a signal generator (see table). Full range overload protection and low battery voltage indication are provided. they are ideal instruments for use in fields, such as laboratory, workshop, hobby and home applications.

M83 series multimeters

Model	DCV	ACV	DCA	$\Omega$	hFE	BAT	TEMP	RT*
M 830B	.	.	.	.	.	.	.	.
M 831	.	.	.	.	.	.	.	.
M 832	.	.	.	.	.	.	.	.
M 833	.	.	.	.	.	.	.	.
M 835	.	.	.	.	.	.	.	.
M 837	.	.	.	.	.	.	.	.
M 838	.	.	.	.	.	.	.	.
M 890C	.	.	.	.	.	.	.	.

\* RT : ROOM TEMPERATURE.

**FRONT PANEL DESCRIPTION**

**1. FUNCTION AND RANGE SWITCH**

This switch is used to select the function and desired range as well as to turn on the instrument.

To extend the life of this battery, the switch should be in the "OFF" position when the instrument is not use.

**2. DISPLAY**

$3 \frac{1}{2}$  digit, 7 segment, 0.5" high LCD.

**3. "Common" JACK**

- 4. "V  $\Omega$  mA" JACK  
Plug in connector for red (Positive) test lead for all voltage and resistance and current(except 10A) measurements.
- 5. "10A" JACK  
Plug in connector for red (positive) test lead for 10A measurement.

**SPECIFICATIONS**

Accuracies are guaranteed for 1 year, 23°C  $\pm$  5°C, less than 75%

**RH.**

**DC VOLTAGE**

RANGE	RESOLUTION	ACCURACY
200mV	100 $\mu$ V	$\pm$ 0.25 % of rdg $\pm$ 2D
2000mV	1mV	$\pm$ 0.5 % of rdg $\pm$ 2D
20V	10mV	$\pm$ 0.5 % of rdg $\pm$ 2D
200V	100mV	$\pm$ 0.5 % of rdg $\pm$ 2D
1000V	1V	$\pm$ 0.5 % of rdg $\pm$ 2D

OVERLOAD PROTECTION: 220Vrms AC for 200mV range and 1000V DC or 750Vrms AC for other ranges.

**AC VOLTAGE**

RANGE	RESOLUTION	ACCURACY
200V	100mV	$\pm$ 1.2 % of rdg $\pm$ 10D
750V	1V	$\pm$ 1.2 % of rdg $\pm$ 10D

OVERLOAD PROTECTION: 1000V DC or 750Vrms for all ranges.

RESPONSE: Average responding, calibrated in rms of a sine wave.

FREQUENCY RANGE: 45Hz - 450Hz

**DC CURRENT**

RANGE	RESOLUTION	ACCURACY
200 $\mu$ A	10nA	$\pm$ 1% of rdg $\pm$ 2D

2000 $\mu$ A	1 $\mu$ A	$\pm$ 1% of rdg $\pm$ 2D
20mA	10 $\mu$ A	$\pm$ 1% of rdg $\pm$ 2D
200mA	100 $\mu$ A	$\pm$ 1.2% of rdg $\pm$ 2D
10A	10mA	$\pm$ 2% of rdg $\pm$ 2D

OVERLOAD PROTECTION: 200mA 250V fuse (10A range unfused).

MEASURING VOLTAGE DROP : 200mV.

**RESISTANCE**

RANGE	RESOLUTION	ACCURACY
200 ohm	100m ohm	$\pm$ 0.8 % of rdg $\pm$ 2D
2000 ohm	1 ohm	$\pm$ 0.8 % of rdg $\pm$ 2D
20k ohm	10 ohm	$\pm$ 0.8 % of rdg $\pm$ 2D
200k ohm	100 ohm	$\pm$ 0.8 % of rdg $\pm$ 2D
2000k ohm	1k ohm	$\pm$ 1% of rdg $\pm$ 2D

MAXIMUM OPEN CIRCUIT VOLTAGE : 2.8V.

OVERLOAD PROTECTION : 15 seconds maximum 220Vrms on all ranges.

**AUDIBLE CONTINUITY**

RANGE	DESCRIPTION
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\*) Built - in buzzer sounds if resistance is less then 100 ohm

OVERLOAD PROTECTION: 15. seconds maximum 220 Vrms. Sounds alarm.

**TEMPERATURE(K TYPE PROBE)**

RANGE	RESOLUTION	ACCURACY
-20°C to 1370°C	1°C	$\pm$ 3 $\pm$ 2D(up to 150°C) $\pm$ 3% of rdg(over 150°C)

OVERLOAD PROTECTION: 220V rms AC.

**OPERATING INSTRUCTIONS**

**WARNING**

1. To avoid electrical shock hazard and/or damage of the instrument,