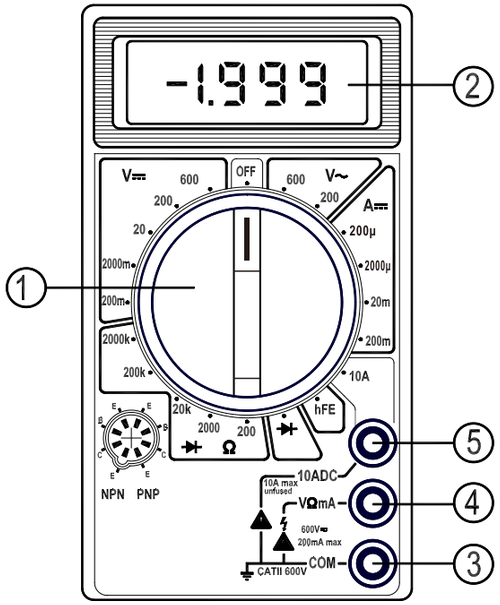
M83 SERIES
POCKET-SIZED DIGITAL MULTIMETER

OPERATOR'S INSTRUCTION MANUAL



SAFETY INFORMATION

This meter has been designed according to IEC-1010 concerning electronic measuring instruments with an overvoltage category (CAT II) and Pollution 2.

Follow all safety and operating instructions to ensure the meter is used safely and is kept in good condition.

Full compliance with safety standards can be guaranteed only with test leads supplied. If necessary, they must be replaced with the type specified in this manual.

DURING USE

- Never exceed the protection limit indicated in the specifications for each range of measurement.
- When the meter is linked to measurement circuit, be careful not to touch unused terminals.
- Never use the meter to measure voltages that might exceed 600V above earth ground in category II installations.
- Always be careful when working with voltages above 60V dc or 30v ac rms.keep fingers behind the probe barriers while measuring.
- Before attempting to insert transistors for testing, always be sure that test leads have been disconnected from any measurement circuits.
- Components should not be connected to the hFE socket when making voltage measurements with test leads.
- Do not perform resistance measurements on live circuits.

SAFETY SYMBOLS

⚠	Important safety information, refer to the instruction manual.
ϟ	Dangerous voltage may be present.
⏚	Earth ground
⧈	Indicates compliance with requirements for double insulation.
	Fuse must be replaced with ratings specified in the manual.

MAINTENANCE

- Before opening case, always disconnect test leads from all energized circuits.
- For continuous protection against fire, replace fuse only with ratings: F 250mA/250V (Quick Acting).
- Never use the meter unless the back cover is in place and fastened completely.
- Do not use abrasives or solvents on the meter. To clean it use only a damp cloth and mild detergent.

GENERAL DESCRIPTION

This instrument is one of a series of pocket-sized 3 1/2 digit multimeters for measuring dc and ac voltage, dc current, resistance and testing diode. Some models also provide transistor test function, signal output or performing continuity test. Overload protection and low battery indication are provided. Following table shows functions of the series multimeters.

	M830B	M831	M832	M833	M838
DCV	△	△	△	△	△
ACV	△	△	△	△	△
DCA	△	△	△	△	△
Ω	△	△	△	△	△
⊣⊢	△	△	△	△	△
◦))		△	△	△	△
hFE	△		△		△
⊓r **			50Hz	1000Hz	
TEMP					△

** This function allows the meter to output a signal like a signal generator.

FRONT PANEL DESCRIPTION

1. Rotary switch
   This switch is used to select functions and desired ranges as well as to turn on/off the meter.
2. Display
   3 1/2 digit,7 segment,0.5" high LCD.
3. " COM " jack
   Plug in connector for black (negative) test lead.
4. " V Ω mA " jack
   Plug in connector for red (positive) test lead for voltage, resistance and current (except 10A) measurements
5. " 10A " jack
   Plug in connector for red test lead for 10A measurement.

SPECIFICATION

Accuracy is guaranteed for 1 year, 23℃±5℃, less than 75% RH.

AC VOLTAGE

Range	Resolution	Accuracy
200V	100mV	±1.2% of rdg±10dgts
600V	1V	±1.2% of rdg±10dgts

Overload protection: 600V dc or rms ac for all ranges.
Frequency range: 45Hz to 450Hz.
Response: Average responding, calibrated in rms of a sine wave.

DC VOLTAGE

Range	Resolution	Accuracy
200mV	0.1mV	±0.5% of rdg±2dgts
2V	1mV	±0.5% of rdg±2dgts
20V	10mV	±0.5% of rdg±2dgts
200V	100mV	±0.5% of rdg±2dgts
600V	1V	±0.8% of rdg±2dgts

Overload Protection: 250V rms for 200mV range and 600V dc or rms ac for other ranges.

DC CURRENT

Range	Resolution	Accuracy
200μA	0.1μA	±1.0% of rdg±2dgts
2000μA	1μA	±1.0% of rdg±2dgts
20mA	0.01mA	±1.0% of rdg±2dgts
200mA	0.1mA	±1.5% of rdg±2dgts
10A	10mA	±3.0% of rdg±2dgts

Overload Protection: F 250mA/250V fuse (10A range unfused).

RESISTANCE

Range	Resolution	Accuracy
200Ω	0.1Ω	±0.8% of rdg±3dgts
2000Ω	1Ω	±0.8% of rdg±2dgts
20KΩ	10Ω	±0.8% of rdg±2dgts
200KΩ	100Ω	±0.8% of rdg±2dgts
2000KΩ	1KΩ	±1.0% of rdg±2dgts

Maximum Open Circuit Voltage: 3.2V
Overload Protection: 250V rms ac on all ranges.

DIODE & CONTINUITY

Range	Description
•))	If continuity exists (i.e. less than 1kΩ), built-in buzzer will sound.
⊣◂	Show the approx. forward voltage drop of the diode.

Overload Protection: 250V rms ac.

TEMPERATURE

Range	Resolution	Accuracy
Temp** 1℃	-20℃ to -10℃	±10% of rdg± 2dgts
	-10℃ to 300℃	±1.0% of rdg±3dgts
	300℃ to 1370℃	±2.0% of rdg

Overload Protection: 250V rms ac.
** This series meter is designed to measure temperature with 〝k〞 type thermocouple, each model of thermocouple has it's measuring range, For example, HYTP083010 is suitable for temperature of -20℃ to 250℃ and the measurement range of HYTPO83104 is -20℃ to 750℃.

GENERAL CHARACTERISTICS

Maximum voltage between Terminals and earth ground	CAT II 600V
Fuse protection	F 250mA/250V
Power supply	9V battery,NEDA1604 or 6F22
Display	LCD 1999 counts, updates 2-3/sec.
Measuring method	Dual-slope integration A/D converter
Overrange indication	Only figure 〝1〞 on the display
Polarity indication	〝-〞 displayed for negative polarity
Operating temperature	0℃ to 40℃ (32℉ to 104℉)
Storage temperature	-10℃ to 50℃ (10℉ to 122℉)
Low battery indication	〝BAT〞 appears on the display
Size	126×70×25mm
Weight	Approx.170g

OPERATING INSTRUCTION

AC VOLTAGE MEASUREMENT

1 Connect the red test lead to the 〝VΩmA〞 jack and the black lead to the 〝COM〞 jack.
2 Set the rotary switch at desired ACV position.
3 Connect test leads across the source or load being measured and read voltage value on the LCD display

DC VOLTAGE MEASUREMENT

1 Connect the red test lead to the 〝VΩmA〞 jack and the black lead to the 〝COM〞 jack.
2 Set rotary switch at desired DCV position. If the voltage to be measured is not known beforehand, Set range switch at the highest range position and then reduce it until satisfactory resolution is obtained.
3 Connect test leads across the source or load being measured. Read voltage value on the LCD display along with the polarity of the red lead connection.

DC CURRENT MEASUREMENT

1 Connect the red test lead to the 〝VΩmA〞 jack and the black lead to the "COM" jack. (For measuring current between 200mA and 10A, remove red lead to "10A" jack.)
2 Set the rotary switch at desired DCA position.
3 Open the circuit in which the current is to be measured, and connect test leads in series with the circuit.
4 Read current value on the LCD display along with the polarity of red lead connection.

RESISTANCE MEASUREMENT

1 Connect the red test lead to the 〝VΩmA〞 jack and the black lead to the "COM" jack. (The polarity of red lead is positive 〝+〞)
2 Set the rotary switch at desired resistance range position.
3 Connect test leads across the resistor to be measured and read LCD display.
4 If the resistor being measured is connected to a circuit, turn off power and discharge all capacitors before applying test leads.

TRANSISTOR TEST

1 Set the rotary switch at 〝hFE〞 position
2 Determine whether the transistor under testing is PNP or NPN type and locate the emitter, base, collector leads. Insert the leads into proper holes of the hFE socket on front panel.
3 The meter will show the approx. hFE value at the condition of base current 10μA and Vce 3V.

DIODE TEST

1 Connect the red test lead to the 〝VΩmA〞 jack and the black lead to the "COM" jack. (The polarity of red lead is positive 〝+〞)
2 Set the rotary switch at ⊣◂ position.
3 Connect the red test lead to the anode of the diode to be tested and the black lead to the cathode of the diode.
4 The approx. forward voltage drop of the diode will be displayed in mV. If the connection is reversed, only figure 〝1〞 will be shown.

AUDIBLE CONTINUITY TEST

1 Connect the red test lead to the 〝VΩmA〞 jack and the black lead to the "COM" jack.
2 Set the rotary switch at •)) position.
3 Connect test leads to two points of the circuit to be tested. If continuity exists, built-in buzzer will sound.

TEMPRATURE MEASUREMENT

1 Set the rotary switch at "Temp" position, the meter will show the current room temperature without any external thermocouple connections.
2 Connect the red plug of a thermocouple to the 〝VΩmA〞 jack and the black plug to the "COM" jack.
3 Read temperature value on the LCD display.

TEST SIGNAL USE

Set the rotary switch at ⊓⊔ position.
A test signal appears between 〝VΩmA〞 and "COM" jacks. The output voltage is approx.5Vp-p. A coupling capacitor should be used when connecting the meter to circuits.

BATTERY & FUSE REPLACEMENT

If the sign "BAT" appears on the LCD display, it indicates that the battery should be replaced. Loosen screws on the back cover and open the case. Replace the exhausted battery with a new one of the same type.

Fuse rarely need replacement and blow almost always as a result of operator's error. Open the case and replace the blown fuse with the ratings specified: F 250mA/250V.

WARNING

Before attempting to open the case. always be sure that test leads have been disconnected from measurement circuits. Close case and tighten screws completely before using the meter to avoid electrical shock hazard.