

**Note:**

- a) If the current range is unknown beforehand, set the function range switch to the highest range and work down.
- b) When only the figure "1" is displayed, over range is being indicated and the function range switch has be set to a higher range.
- c) Excessive current will below the fuse that must be replaced when the input is from "A" terminal. Fuse type is 0.5A (model M840D use 2A).
- d) A fuse does not protect the 20A range; maximum 10A continuous or maximum 20A measuring time must be less than 15 seconds.

**5.3 RESISTANCE MEASUREMENT**

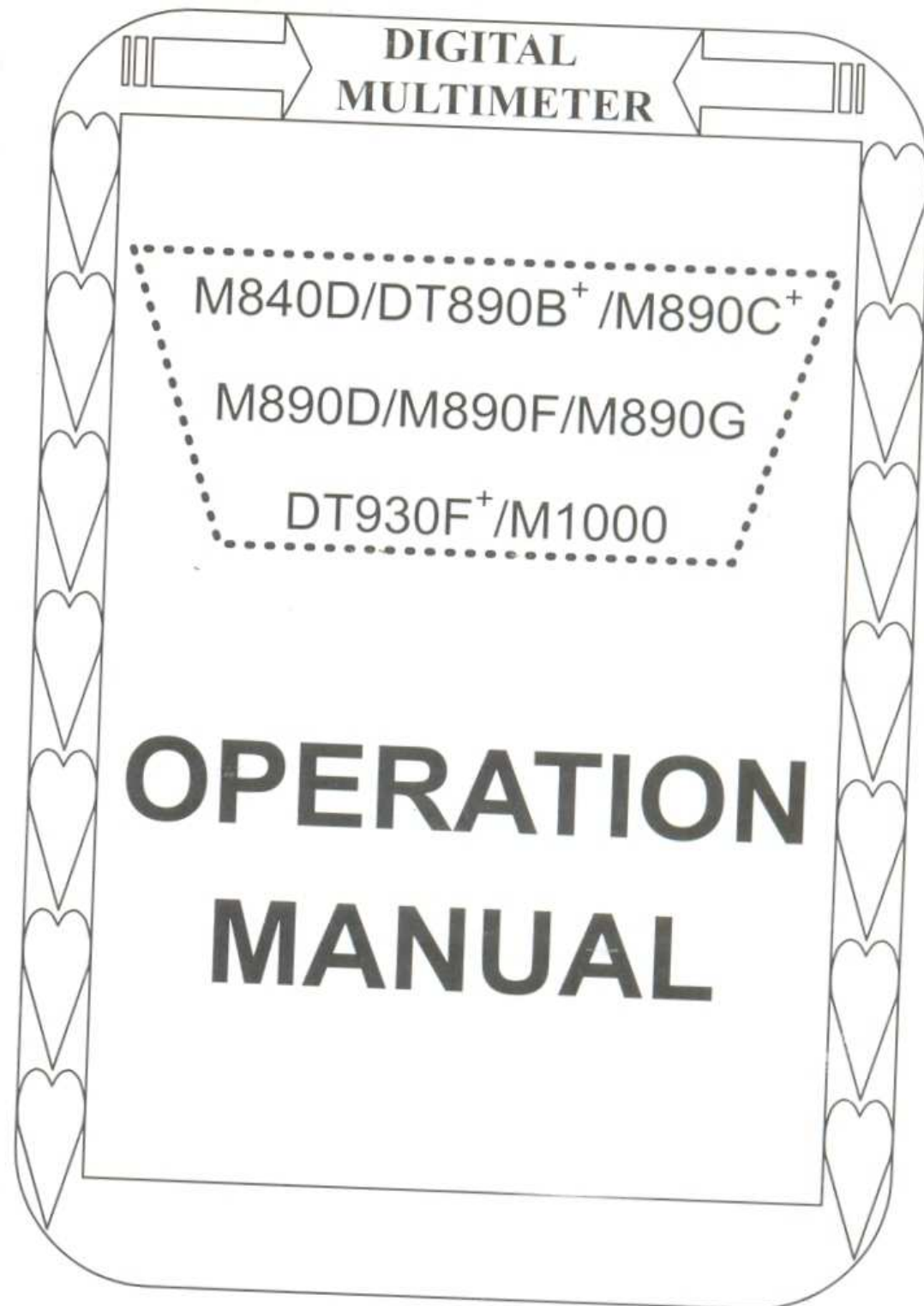
- 1) Connect black test lead to "COM" terminal and red test lead to the "V/OHM" input terminal.
- 2) Set the function range switch to the OHM range.
- 3) Connect the test leads across the resistance under measurement and read the display value.

**Note:**

- a) The polarity of the red test lead is "+".
- b) When the input is not connected, i.e. at open circuit the figure "1" will be displayed for the over range condition.
- c) If the resistance value being measured exceeds the maximum value of the range selected an over range indication "1" will be displayed and function range switch must be set to a higher range.
- d) 200M $\Omega$  range has a 10 digits (1M $\Omega$ ) constant, the figure will appear in short circuit status it should be subtracted from measurement result, for instance: when measuring 100M $\Omega$  resistor, figure 101.0 will shown in display and the last 10 digits should be subtracted.

**5.4 CAPACITANCE MEASUREMENT**

- 1) Set the function range switch at the "Cx" position. Before connecting the capacitor, the display that could be zeroed automatically slows.
- 2) Connect the test capacitor to the "Cx" input socket (not test leads) and read the display value.



## 1. INTRODUCTION

This Digital Multimeter is a compact precision, battery operated, LCD display 3-1/2 or 4-1/2 digits Digital Instrument.

Superiority:

- ✓ High accuracy
- ✓ Icon display (3-1/2 only)
- ✓ Digital height 22mm
- ✓ Single 30 position rotary switch for FUNCTION and RANGE selection, allows fast and convenient operation.
- ✓ Curvilinear mode soft case.
- ✓ Colored indication jack with fully protection test leads.
- ✓ Lower overage power Auto-Power Off

## 2. GENERAL SPECIFICATION

- 1) Display: 3-1/2 digits LCD with a maximum reading of 1999, DT930F+ & M1000 is 4-1/2 digits LCD with a maximum reading of 19999.
- 2) Measurement rate: updates 2-3/sec.
- 3) Over range indication: "1" figure only in the display
- 4) Automatic negative polarity indication.
- 5) The "BAT" is displayed when the battery voltage drops below the operating voltage.
- 6) Full range over load protection.
- 7) Capacitance measurement Auto-Zeroing.
- 8) Auto Power Off: It will be automatically cut off in about 15 minutes after the power is turned on. It needs to be turned off and turned on again to continue the power.
- 9) Operating temperature: 0°C~40°C, 0~75% R.H.  
Storage temperature: -10°C~50°C, 0~75% R.H.
- 10) Power: Single standard 9V battery IEC 6F22, NEDA 1604, JIS 006P.
- 11) Dimensions: 176L\*88W\*38Hmm.
- 12) Weight: approx 310g (including battery)
- 13) Accessories: test leads (pair), spare fuse 0.5A piece in case (model M840D fuse 2A), K-type thermocouple wire (model M890C+/M890G only), operation manual.

## 3. ELECTRICAL SPECIFICATIONS

Accuracy is given as ± (% of reading + number of least significant digits) for one year, at 23°C±5°C RH<75%

- 1) DCV

Range	Accuracy							
	M840D	DT890B+	M890C+	M890D	M890F	M890G	DT930F+	M1000
200mV	0.5%±1							
2V	0.1%±2							
20V								
200V								
1000V	0.8%±3							
	0.2%±5							

Input impedance: 10MΩ on all range

### 2) ACV

Range	Accuracy							
	M840D	DT890B+	M890C+	M890D	M890F	M890G	DT930F+	M1000
200mV	1.2%±5	—						
2V	1.0%±5							
20V								
200V								
750V	1.2%±5							
	0.8%±15							
	1.2%±15							

Input impedance: 10MΩ

Frequency range: 40 ~ 400Hz

### 3) DCA

Range	Accuracy							
	M840D	DT890B+	M890C+	M890D	M890F	M890G	DT930F+	M1000
200uA	—							
2mA	1.0%±3	—						
20mA	1.0%±3							
200mA	0.8%±2							
2A	1.2%±1	1.5%±5						
10A	—							
	2%±10							

Measuring voltage drop: 200mV

### 4) ACA

Range	Accuracy							
	M840D	DT890B+	M890C+	M890D	M890F	M890G	DT930F+	M1000
200uA	—							
2mA	1.2%±3	—						
20mA	1.2%±3	—						
200mA	1.2%±3							
2A	1.8%±3	2.0%±5						
10A	—							
	3.0%±10							
	0.8%±5							
	1.2%±10							
	2%±12							

Measuring voltage drop: 200mV

Frequency range: 40 ~ 400Hz

### 5) CAPACITANCE

Range	Accuracy							
	M840D	DT890B+	M890C+	M890D	M890F	M890G	DT930F+	M1000
2nF	—							
20nF	4.0%±3							
200nF								
2uF								
20uF								



## 6) OHM

Range	Accuracy							
	M840D	DT890B+	M890C+	M890D	M890F	M890G	DT930F+	M1000
200Ω	1.0%±10							
2KΩ	1.0%±1							
20KΩ								
200KΩ								
2MΩ	1.0%±5							
20MΩ								
200MΩ	—	±(5.0%(RDG-10)+20D)				—	5%±10	5%±10

## 7) TEMPERATURE MEASUREMENT (M890C+ & M890G only)

Range	Accuracy	
	M890C+	M890G
-40°C ~ 400°C	0.8%±3	0.8%±3
400°C ~ 1000°C	1.5%±15	1.5%±15

With K-type thermocouple wire

## 8) FREQUENCY MEASUREMENT

Range	Accuracy							
	M840D	DT890B+	M890C+	M890D	M890F	M890G	DT930F+	M1000
20KHz	—				1.5%±5			

Sensitivity: 100mV rms

## 4. PRECAUTIONS AND PREPARATIONS FOR MEASUREMENT

- 1) Be sure that battery is correctly placed in the battery case and connected to the battery snap.
- 2) Don't exceed the input limit shown below:

Function Range	Input terminals	Maximum input
DCV 200mV	V/OHM COM	250VDC
ACV 200mV		250VAC
DCV 2~1000V		1000VDC
ACV 2~750V		750VAC
OHM	V/OHM COM	250V DC/AC
Freq.	V/OHM/Hz COM	
Diode	V/OHM COM	
DCA 200mA	A COM	200mA DC/AC
ACA 200mA		
DCA 2A		2A DC/AC
ACA 2A		
DCA 20A	20A COM	20A DC/AC

- 3) Inspect the test leads for damaged insulation or exposed metal. Check test lead continuity. Damaged leads should be replaced.
- 4) Select the proper function and range for your measurement.
- 5) Check the input terminal position for red test lead depends on measurement ranges.

- 6) Either one of the test leads should be taken off from the circuit under test when changing the test ranges.
- 7) To avoid electrical shock or damage to the meter; Do not apply more than 500V between any terminal and earth ground.
- 8) To avoid electronic shock, use caution when working above 60VDC or 25VAC rms, such voltage pose a shock hazard.
- 9) When finished the measurement, switch off the power. Be sure to remove the battery when it is not used for a long time to avoid leakage problem.
- 10) Do not tamper with the circuitry to avoid damage.
- 11) Do not use or store the instrument in a place of direct sunlight, high temperature and high humidity.

## 5. METHOD OF MEASUREMENT

### 5.1 DCV & ACV MASUREMENT

- 1) Set the Function range switch at the required position.
- 2) Connect black test lead to "COM" terminal and red test lead to the "V/OHM" input terminal.
- 3) Connect test leads to measuring point and read the display value the polarity of the red lead connection will be indicated at the same time as the voltage.

#### Note:

- a) If the voltage to be tested is unknown beforehand, set the Function range switch to the highest range and work down.
- b) When only the figure "1" is displayed over range is being indicated and the function range switch has be set to a higher range.
- c) Never try to measure the voltage above 1000V! Although the indication is possible to show, there is danger of damaging the internal circuitry.

### 5.2 DCA & ACA MEASUREMENT

- 1) Connect the black test lead to the "COM" terminal and the red test lead to "A" terminal for a maximum of 0.5A (model M840D maximum 2A)
- 2) Set the function range switch at the required position.
- 3) Connect test leads to measuring points and read the display value. The polarity at the red test lead connection will be indicated at the same time as the current.