



OPERATOR'S
MANUAL

DIGITAL
MULTIMETER

⊙ MY-60

⊙ MY-61

⊙ MY-63

○

⊙ MY-60T

⊙ MY-62

⊙ MY-64

○

1. INTRODUCTION

This MY-60 Series Digital Multimeter is a compact precision, battery operated, LCD display 3-½ digits Digital Instrument.

Superiority:

- ✓ High accuracy
- ✓ Large LCD display
- ✓ Digital height 25mm
- ✓ Single 32 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 power indication & Auto-Power Off

2. GENERAL SPECIFICATION

- 1) Display: 3-½ digits LCD with a maximum reading of 1999.
- 2) Measurement rate: updates 2-3/sec.
- 3) Over range indication: "1" figure only in the display
- 4) Automatic negative polarity indication.
- 5) The "⚡" 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: 189L*90W*34Hmm.
- 12) Weight: approx 230g (including battery)
- 13) Accessories: test leads (pair), K-type thermocouple wire (model MY-60T/MY-62/MY-64 only), operator's manual.

3. ELECTRICAL SPECIFICATIONS

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

- 1) DCV

Range	Accuracy					
	MY-60	MY-60T	MY-61	MY-62	MY-63	MY-64
200mV	0.5%±1					
2V	0.5%±2					
20V						
200V						
1000V	0.8%±2					

Input impedance: 10MΩ on all range

2) ACV

Range	Accuracy					
	MY-60	MY-60T	MY-61	MY-62	MY-63	MY-64
200mV	1.2%±3					
2V						
20V	0.8%±3					
200V	0.8%±3					
700V						

Input impedance: 10MΩ

Frequency range: 40 ~ 400Hz

3) DCA

Range	Accuracy					
	MY-60	MY-60T	MY-61	MY-62	MY-63	MY-64
20uA	2.0%±5					
200uA	1.0%±2					
2mA	1.0%±2					
20mA	1.2%±2					
200mA						
2A	1.5%±3					
10A	2.0%±3					

Measuring voltage drop: 200mV

4) ACA

Range	Accuracy					
	MY-60	MY-60T	MY-61	MY-62	MY-63	MY-64
200uA	1.2%±3					
2mA	1.5%±3					
20mA	1.5%±3					
200mA	3.0%±3					
2A						
10A						

Measuring voltage drop: 200mV

Frequency range: 40 ~ 400Hz

5) CAPACITANCE

Range	Accuracy					
	MY-60	MY-60T	MY-61	MY-62	MY-63	MY-64
2nF			4.0%±3			
20nF						
200nF						
2uF						
20uF						

6) OHM

Range	Accuracy					
	MY-60	MY-60T	MY-61	MY-62	MY-63	MY-64
200Ω	1.0%±10					
2KΩ	1.0%±3					
20KΩ						
200KΩ						
2MΩ						
20MΩ	1.0%±5					
200MΩ	5.0%±20					

7) TEMPERATURE (MY-60T/MY-62/MY-64 only)

Range	Accuracy		
	MY-60T	MY-62	MY-64
-20°C ~ 400°C	0.75%±3		
400°C ~ 1000°C	1.5%±15		

With K-type thermocouple wire

8) FREQUENCY TEST(MY-63 & MY-64 only)

Range	Accuracy	
	MY-63	MY-64
2KHz	1.5%±10	
20KHz		

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 2~700V		700VAC
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		2A DC/AC
DCA 2A		
ACA 2A		
DCA10A	10A COM	10A DC/AC
ACA10A		

- 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 MY-60 & MY-60T 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.

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 to be set to a higher range.
- c) Excessive current will blow the fuse that must be replaced when the input is from "A" terminal. Fuse type is 0.5A (model MY-60 & MY-60T maximum 2A).
- d) A fuse does not protect the 10A range. Maximum 8A continuous, maximum 10A 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 Ω range has a 10 digits (1M Ω) constant, the figure will appear in short circuit status it should be subtracted from measurement result, for instance: when measuring 100M Ω resistor, figure 101.0 will be 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.

Note: The tested capacitor should be discharged before the testing procedure. Never apply voltage to the “Cx” input socket, or serious damage may result.

5.5 FREQUENCY MEASUREMENT

- 1) Set the function range switch at the required “Hz” position.
- 2) Connect test leads to measuring points and read the display value.

Note: Do not apply more than 250V rms to the input. Indication is possible a voltage higher than 100V rms, but reading maybe out of specification.


5.6 TEMPERATURE MEASUREMENT

- 1) Set the function range switch at the “TEMP” position.
- 2) Be sure the polarity of the thermocouple, put the cold end (free end) of the thermocouple sensor into the temperature testing holes.
- 3) The working end (testing end) on or inside the object being tested.
- 4) The value of the temperature is shown on the display in degrees centigrade (°C).

Note:

- a) The testing temperature is displayed automatically when the thermocouple is put into the testing holes.
- b) The surrounding temperature is shown when the circuit of the sensor is cut off.
- c) The limit temperature measured by the thermocouple given together with the instrument is 250°C, 300°C is acceptable within short period.

5.7 DIODE & CONTINUITY TEST

- 1) Set the function range switch at the “” position.
- 2) Connect the black test lead to “COM” terminal and red test lead to “V/OHM” input terminal (Note: the polarity of the red test lead is “+”).
- 3) This range with “AUDIBLE CONTINUITY TEST” function. Built-in buzzer sounds if the resistance between two probes is less than $30 \pm 10 \Omega$.
- 4) Connect the test leads across the diode and read the display value.

Note:

- a) When the input is not connected, i.e. at open circuit, the figure “1” will be displayed.
- b) Test condition: Forward DC current approx.1mA. Reversed DC

voltage approx. 2.8V.

- c) The meter displays the forward voltage drop and displays figure "1" for overload when the diode is reversed.

5.8 TRANSISTOR hFE TEST

- 1) Set the function range switch to the "hFE" position.
- 2) Make sure the transistor is "NPN" or "PNP" type.
- 3) Transistor correct insert to E.B.C connector.
- 4) Display reading is approx. transistor hFE value.

Note:

Test condition: Base current approx. 10 μ A. V_{CE} approx.2.8V

6. BATTERY AND FUSE REPLACEMENT

- 1) Battery and fuse replacement should only done after the test leads have been disconnected and power is off.
- 2) Loosen screws with suitable screwdriver and remove case bottom.
- 3) The meter is power by a single 9V battery (IEC 6F22, NEDA 1604, JIS 006P). Snap the battery connector leads to the terminals of a new battery and reinsert the battery into the case top. Dress the battery leads so that they will not be pinched between the case bottom can case top.
- 4) The meter is protected fast fuse 0.5A/250V (model MY-60 & MY-60T protected fuse 2A/250V), dimensions is $\Phi 5 \times 20$ mm.
- 5) Replace the case bottom and reinstall the three screws. Never operate the meter unless the case bottom is fully closed.

OPERATOR'S MANUAL

CAUTION:

* Before attempting to insert transistors capacitor thermocouple for testing, always be sure that test test leads have been disconnected from any measurement circuits.

* Components should not be connected to the hFE and capacitor and the thermocouple socket when making voltage measure with test leads.

*Using this appliance in an environment with a strong radiated radio – frequency electromagnetic field (approximately 3V/m), may influence its measuring accuracy. The measuring result can be strongly deviating from the actual value.

CONTENTS	PACE
1. SAFETY INFORMATION.....	1
1.1 PRELIMINARY.....	1
1.2 DURING USE.....	2
1.3 SYMBOLS.....	3
1.4 MAINTENANCE.....	4
2. DESCRIPTION.....	5
3. OPERATING INSTRUCTION.....	9
3.1 MEASURING VOLTAGE.....	9
3.2 MEASURING CURRENT.....	9
3.3 MEASURING FREQUENCY.....	10
3.4 MEASURING RESISTANCE.....	11
3.5 MEASURING CAPACITANCE.....	12
3.6 TESTING DIODE.....	13
3.7 TESTING TRANSISTOR.....	13
3.8 CONTINUITY TEST.....	14
3.9 MEASURING TEMPERATURE.....	14
4. SPECIFICATIONS.....	15
5. ACCESSORIES.....	23
5.1 SUPPLIED WITH THE MULTIMETER.....	23
5.2 OPTIONAL ACCESSORY.....	23
5.3 HOW TO USE THE HOLSTER.....	24
6. BATTERY & FUSE REPLACEMENT.....	26

1. SAFETY INFORMATIONS

This multimeter 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 that meter is used safely and is kept in good operating condition.

1.1 PRELIMINARY

* When using this meter, the user must observe all normal safety rules concerning:

- Protection against dangers of electronic current.
- Protection of the meter against misuse.

* Full compliance with safety standards can be guaranteed only if used with test leads supplied. If necessary, they must be replaced with the same model or same electronic ratings. Measuring leads must be in good condition.

-1-

1.2 DURING USE

* Never exceed the protection limit values indicated in specifications for each range of measurement.

* When the meter is linked to measurement circuit, do not touch unused terminals.

* When the value scale to be measured is unknown beforehand, set the range selector at the highest position.

* Before rotating the range selector to change functions, disconnect test leads from the circuit under test.

* When carrying out measurements on TV or switching power circuits, always remember that there may be high amplitude voltage pulses at test points which can damage the meter.

* Never perform resistance measurements on live circuits.

-2-

* Never perform capacitance measurements unless the capacitor to be measured been discharged fully.

* Always be careful when working with voltage above 60V dc or 30V ac rms. Keep fingers behind the probe barriers while measuring.

* Before attempting to insert transistors capacitor thermocouple for testing, always be sure that test leads have been disconnected from any measurement circuits.

* Components should not be connected to the hFE and capacitor socket and the thermocouple has been removed when making voltage measurements with test leads.

1.3 SYMBOLS

△ Important safety information, refer to the operating manual.

⚠ Dangerous voltage may be present.

⊥ Earth ground

□ Double insulation (protection class II)

-3-

1.4 MAINTENANCE

* Before opening the meter, always disconnect test leads from all sources of electric current.

* For continue protection against fire, replace fuse only with the specified and current rating: F200mA / 250V (quick acting)

*If any faults or abnormalities are observed, the meter can not be used any more and it has to be checked out.

*Never use the meter unless the back cover is in place and fastened fully.

*Do not use abrasives or solvents on the meter use a damp cloth and mild detergent only.

-4-

1. DESCRIPTION

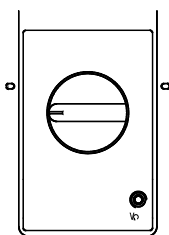
This meter is one of a series portable professional measuring instrument, capable of performing functions:

- DC and AC voltage measurement
- DC and AC current measurement
- Resistance measurement
- Capacitance measurement
- Diode and Transistor test
- Audible continuity test

Some models of this series also provide functions:

- Temperature measurement
- Frequency measurement

-5-



2.1 FUNCTION AND RANGE SELECTOR

There are different functions and 32 ranges provided. A rotary switch is used to select functions as well as ranges.

2.2 POWER SWITCH

A push-push switch is used to turn the meter on or off.

To extend the battery life, Auto Power- Off function is provided (Optional). The meter will be turned off automatically within around 40 minutes. To turn on the meter again, push the power switch to release it and then push it once more.

2.3 INPUT JACKS

This meter has four input jacks that are protected against overload to the limits shown. During use connect the black test lead to COM jack connect red test lead depending on the function selected.

-7-

FUNCTION	RED LEAD CONNECTION	INPUT LIMITS
200mV $\overline{=}$	V Ω Hz	250V dc or rms ac
V $\overline{=}$ & V \sim	V Ω Hz	1000V dc, 700V ac (sine)
Hz	V Ω Hz	250V dc or rms ac
Ω	V Ω Hz	250V dc or rms ac
μ \rightarrow	V Ω Hz	250V dc or rms ac
mA $\overline{=}$ & mA \sim	mA	200mA dc or rms ac
20A $\overline{=}$ & 20A \sim	A	10Adc or rms ac continuous 20A for15seconds maximum

-8-

3. OPERATING INSTRUCTION

3.1 MEASURING VOL TAGE

1.Connect the black lead to the COM jack and the red test lest lead to the V Ω Hz jack.

2. Set the rotary switch at the desired V $\overline{=}$ or V \sim range position and connect test leads across the source or load under measurement.

The polarity of the red lead connection will be indicated along voltage value when making DC voltage measurement.

3. When only the figure"1" is displayed, it indicates overrange situation and the higher range have to be selected.

3.2 MEASURING CURRENT

1. Connect the black lead to the COM jack and the test lead to the mA jack for a maximum of 200mA current. For a maximum of 20A, move the red lead to the A jack.

2. Set the rotary switch at desired A $\overline{=}$ or A \sim range position and connect test leads in series with the load under measurement.

-9-

The polarity of the red lead connection will be indicated along with the current value when making DC current measurement.

3. When only the figure "1" displayed, it indicates overrange situation and the higher range has to be selected.

3.3 MEASURING FREQUENCY

1. Connect the black test lead to the COM jack and the red test lead to the V Ω Hz jack.

2. Set the rotary switch at kHz position and connect test leads across the source or load under measurement.

NOTE:

1. Reading is possible at input voltages above 10Vrms, but the accuracy is guaranteed.

2. In noisy environment, it is preferable to use shield cable for measuring small signal.

-10-

3.4 MEASURING RESISTANCE

1. Connect the black test lead to the COM jack and the red to the V Ω Hz jack. (The polarity of red lead is "+")

2. Set the rotary switch at desired Ω position and connect test leads across the resistor under measurement.

NOTE:

1. If the resistance being measured exceeds the maximum value of the range selected or the input is not connected, an overrange indication "1" will be displayed.

2. When checking in – circuit resistance, be sure the circuit under test has all power removed and that all capacitors have been discharged fully.

3. For measuring resistance above 1M Ω , the meter may take a few seconds to get stable reading. This is normal for high resistance measurements.

4. At 200M Ω range display reading is around 10 counts when test leads are shorted.

-11-

These counts have to be subtracted from measuring results. For example, when measuring 100M Ω resistance the display reading will be 101.0 and the correct measuring result should be $101.0 - 1.0 = 100.0 \text{M } \Omega$.

3.5 MEASURING CAPACITANCE

1. Set the rotary switch at desired F position.

2. Before inserting capacitor under measurement into capacitance testing socket, be sure that the capacitor has been discharged fully.

3. When measuring capacitors with shorter leads, a testing adapter is provided with the meter. Insert the adapter into the capacitance testing socket on the front panel to continue measurements.

⚠ WARNING

To avoid electric shock, be sure the capacitor measuring adapter has been removed before changing to another function measurement.

-12-

3.6 TESTING DIODE

1. Connect the black test lead to COM jack and the red test lead to the V Ω Hz jack (The polarity of red lead is "+")
2. Set the rotary switch at \blacktriangleright position and connect red lead to the anode, black lead to the cathode of the diode under testing .The meter will show the approx. forward voltage of the diode. If the lead connection is reversed. only figure "1" displayed.

3.7 TESTING TRANSISTOR

1. Set the rotary switch at hFE position.
2. Determine whether the transistor to be tested is NPN or PNP type and locate the Emitter. Base and Collectors. Insert leads of the transistor into proper holes of the transistor testing socket.
3. The meter will show the approx. hFE value at test condition of base current 10 μ A and Vce 3.2V.

-13-

3.8 CONTINUITY TEST

1. Connect the black test lead to the COM jack and the red test lead to the V Ω Hz jack. (The polarity of the red lead is positive "+")
2. Set the rotary switch at \mathbb{A} position and connect test leads across two points of the circuit under testing. If continuity exists (i.e., resistance less than about 50 Ω), built - in buzzer will sound.

3.9 MEASURING TEMPERATURE

1. Set the rotary switch at TEMP position and the LCD display will show the current environment temperature.
2. Insert "K" type thermocouple into the temperature measuring socket on the front panel and contact the object to be measured with the thermocouple probe. Read LCD display.

\triangle WARNING: To avoid electric shock, be sure the thermocouple has been removed before changing to another function measurement.

-14-

4. SPECIFICATIONS

Accuracy is specified for a period of one year after calibration and at 18°C to 28°C (64°F to 82°F) with relative humidity to 80%.

4.1 GENERAL


MAXIMUM VOLTAGE BETWEEN TERMINALS AND EARTH GROUND	1000V dc or 700V rms ac (sine)
FUSE PROTECTION	mA: F 200mA/250V (A: unfused)
POWER SUPPLY	9V battery, Neda 1604 or 6F22
DISPLAY	LCD, 1999 counts, updates 2-3/sec
MEASURING METHOD	Dual-slope integration A/D converter
OVERRANGE INDICATION	"1" figure only on the display
POLARITY INDICATION	"-" displayed for negative polarity
OPERATING TEMPERATURE	0°C to 40°C(32°F to 104°F)
STORAGE TEMPERATURE	-10°C to 50°C(10°F to 122°F)

-15-

LOW BATTERY INDICATION

SIZE (HxWxL)

WEIGHT

"" appears on the display

31.5mm×91mm×189mm

310g(including battery)

4.2 DC VOLTAGE

Range	Resolution	Accuracy
200mV	0.1mv	±0.5% of rdg ± 1 digit
2V	1mV	±0.5% of rdg ± 1 digit
20V	10mV	±0.5% of rdg ± 1 digit
200V	0.1V	±0.5% of rdg ± 1 digit
1000V	1V	±0.8% of rdg ± 2 digits

Input impedance:10MΩ

-16-

4.3 AC VOLTAGE

Range	Resolution	Accuracy
200mV	0.1mv	±1.2% of rdg ± 3 digits
2V	1mV	±0.8% of rdg ± 3 digits
20V	10mV	±0.8% of rdg ± 3 digits
200V	0.1V	±0.8% of rdg ± 3 digits
700V	1V	±1.2% of rdg ± 3 digits

Input impedance: 10MΩ

Frequency Range: 40Hz to 400Hz

Response: Average, calibrated in rms of sine wave

-17-

4.4 DC CURRENT

Range	Resolution	Accuracy	Burden Voltage
2mA	1 μ A	±0.8% of rdg ± 1 digit	110mV/mA
20mA	10 μ A	±0.8% of rdg ± 1 digit	15mV/mA
200mA	0.1mA	±1.5% of rdg ± 1 digit	5.0mV/mA
10A	10mA	±2.0% of rdg ± 5 digit	0.03V/A

-18-

4.5 AC CURRENT

Range	Resolution	Accuracy	Burden Voltage
2mA	1 μ A	±1.0% of rdg ± 3 digits	110mV/mA
20mA	10 μ A	±1.0% of rdg ± 3 digits	15mV/mA
200mA	0.1mA	±1.8% of rdg ± 3 digits	5.0mV/mA
10A	10mA	±3.0% of rdg ± 7 digits	0.03V/A

Frequency Range: 40Hz to 400Hz

Response:Average, Calibrated in rms of sine wave

-19-

5.3 How to use the holster


The holster is used to protect the meter and to make the measurement more comfortable.

It comes with two stands installed together. The figure shows how to use the holster to:

- a. Support the meter with a standard angle.
- b. Support the meter with a small angle using the little stand
- c. Hang the meter on the wall using the little stand. Take the little stand off from the back side of the large stand and insert it into holes located upper on the holster.
- d. Hold test leads.

-24-

6. BATTERY & FUSE REPLACEMENT

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

Fuse rarely need replacement and blow almost always as a result of the operator's error. Open the case as mentioned above, and then take the PCB out from the front cover. Replace the blown fuse with same ratings.

WARNING

Before attempting to open the case, be sure that test leads have been disconnected from measurement circuits to avoid electric shock hazard.

For protection against fire, replace fuse only with specified ratings: F 200mA/250V (quick acting).

-26-

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