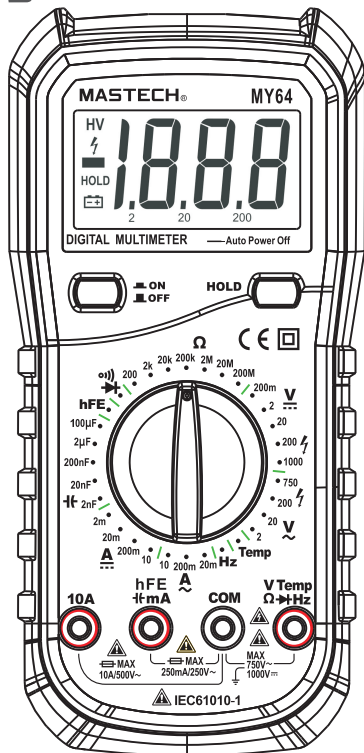


MASTECH® MY60-64

Digital Multimeters



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Limited Warranty And Limitation Of Liability

This instrument from MASTECH Inc. will be free from defects in workmanship and material for three years from the date of original purchase. This warranty does not cover defects resulting from damage caused by the user such as drops, neglect, misuse, unauthorized alteration, usage outside of specified conditions, contamination, or improper repair/maintenance. To receive service on the instrument if it becomes necessary during the warranty period, contact your nearest MASTECH authorized service center or visit www.p-mastech.com. A return authorization is necessary before returning any instrument to MASTECH; No service will be provided without a return authorization. The user is responsible for properly packing the unit and charges such as shipping, freight and insurance charges. The extent of MASTECH's liability is limited solely to the repair/replacement of the instrument. The above warranty in its entirety is inclusive and no other warranties, written or oral, are expressed or implied.

Out of the Box

Check the Meter and accessories thoroughly before using the Meter. Contact your local distributor if the Meter or any components are damaged or malfunction.

Accessories

| | |
|-------------------------|--------------------|
| • Test Leads | 1set |
| • Multi-function Socket | 1pc |
| • Thermocouple | 1pc(only for MY64) |
| • Type-K Thermocouple | 1pc(only for MY62) |
| • 9V Battery | 1pc |
| • User's Manual | 1pc |

Safety Information

WARNING

TO REDUCE THE RISK OF FIRE, ELECTRICAL SHOCK, PRODUCT DAMAGE OR PERSONAL INJURY, PLEASE FOLLOW THE SAFETY INSTRUCTIONS DESCRIBED IN THE USER MANUAL. READ THE USER MANUALS BEFORE USING THE METER.







WARNING

TO ENSURE SAFE OPERATION AND LIFE OF THE METER, DO NOT PLACE THE METER IN ANY ENVIRONMENT WITH HIGH PRESSURE, HIGH TEMPERATURE, DUST, EXPLOSIVE GAS OR VAPOR.

- Avoid shaking, dropping or any kind of impacts when using or transporting the Meter.
- To avoid electric shock or personal injury, repairs or servicing not covered in this manual should be performed only by qualified personnel.
- Avoid direct exposure to sunlight to ensure extended life of the Meter.

- Do not place Meter in a strong magnetic field; this may cause false readings.
- Use only the batteries indicated in the Technical Spec.
- Avoid exposing batteries to humidity. Replace batteries as soon as the low battery indicator appears.
- Please keep the original packing for future shipping purposes (ex. Calibration)
- After opening the box, check for any damage during delivery.

Safety Symbols on the Meter

| | |
|---|--|
|  | Important safety information, please refers to the user manual |
|  | High voltage |
|  | Earth ground |
|  | Indicates compliance with requirements for double insulation |
|  | Possibility of high voltage |
|  | Fuse must be replaced with ratings specified in the manual. |

⚠ Important Safety Information

- Never use the Meter to measure voltages that might exceed 1000V DC/750V AC above earth ground.
- Always be careful when working with voltages above 60V DC or 30VACRMS. Keep fingers behind the probe barriers while measuring.
- Never connect the Meter leads across a voltage source while the rotary switch is in the resistance, diode or continuity mode. Doing so can damage the Meter.
- Do not perform resistance, diode and continuity measurements on powered circuits.
- Never connect the Meter leads across a current source above 200mA while the test leads are in the mA-COM terminals. Doing so can damage the Meter
- Avoid direct exposure to sunlight to ensure extended life of the Meter.
- Inspect test leads and probes for cracks, breaks or crazes on the insulation before using the Meter.
- Before measuring current, check the Meter's fuses and turn off power to the circuit before connecting the meter to the circuit.
- Repair or maintenance should be implemented by trained personnel.

Certification

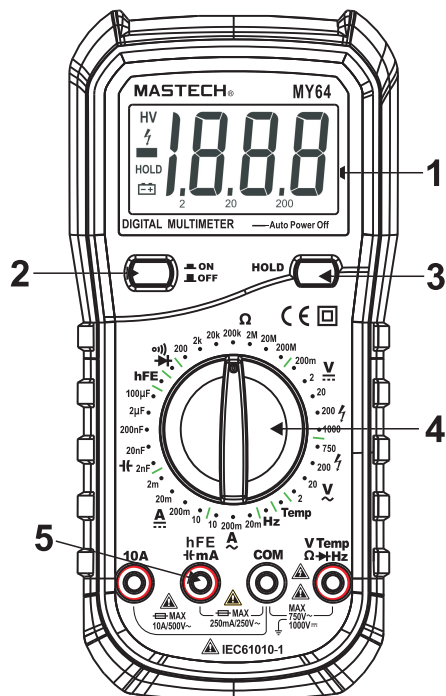
- **CAT II:** This meter has meet En61010-1 standard with an over voltage category (1000V CAT II) and pollution degree 2.
 - **CAT III:** This meter has meet En61010-1 standard with an overvoltage category (600V CAT III) and pollution degree 2.
- ⚡ The Meter is compiled to EMC requirements.

Introduction Overview

This manual is used for the MY60-MY64 Digital Multimeter (DMM). This Meter is designed to meet En61010-1 & CAT II 1000V, CAT III 600V over voltage category and double insulation. The meter's holster is designed to give a high resistance against the shock of a drop. These operating instructions cover information on safety and cautions; please read relevant information carefully and observe all warnings. The DMM as general purpose measurement tool and is ideal for both professionals and hobbyists.

Figures and Components

Front Panel



Buttons and Components

1. **Display:** 3 1/2 digit, (2000 count) LCD.
2. **Power Button**
3. **Hold Button:** to hold the last reading.
4. **Rotary switch:** to select functions and desired ranges.
5. **Input Sockets**

Display Description



Table 1 Display Symbols



| Symbols | Indication |
|---------|---|
| | Low battery. ⚠ To avoid wrong readings causing electric shock or personal injury, when the low battery symbol appears, the battery should be replaced immediately. |
| | Negative input polarity indication |
| HV | High voltage symbol, in AC750V or DC1000V. |
| HOLD | Keep the current measurement value |

Table 2 Input Socket

| Input Socket | Description |
|----------------------|--|
| COM | All common input ends to be measured are connected with common output socket of black test probe or dedicated multifunction test socket. |
| V, Ω, Hz TEMP | Positive input end of voltage, resistance, frequency, diode, buzzer measurement and temperature test (connected with the red test probe). |
| mA, μ A hFE | Positive input end of current mA, temperature, capacitance and triode hFE (connected with output socket of black test probe or dedicated multifunction test socket). |
| 10A | Positive input end of 10A (connected with the red test probe). |

Using the Meter

Preparation

- Switch on the power by turning the rotary switch. If the battery voltage is lower than 7V, the “ ” symbol will appear and the batteries should be replaced.
- The “ ” symbol next to the input lead shows that the input voltage or current should not exceed the specified value in order to protect the internal circuit from damage.
- Turn the rotary switch to the required function and range to be measured.
- Choose the highest range when the value to be measured is unknown.
- When making connection, connect the common test lead first and then the powered test lead.
- Removed the charged test lead first when disconnecting.

Readings Hold

- Press “**HOLD**” button to hold the readings of current measurement.
- Press “**HOLD**” button again to release the hold.

DC/AC Voltage Measurement



WARNING

USE CAUTION WHEN MEASUREING HIGH VOLTAGE CIRCUITS TO AVOID ELECTRICAL SHOCK AND INJURY. DO NOT TEST VOLTAGES HIGHER THAN 1000V DC/750V AC.

- Plug the black test lead into the “**COM**” jack and the red test lead into the “**VTempΩHz**” jack.
- Set the rotary switch to the “**V**” position for DC measurement and “**V~**” for AC measurement and at the proper range.
- Connect the test leads to the voltage source or load for measurement.
- Read the value on the main indicator of the LCD. The polarity symbol denotes the polarity of the end connected by the red test lead.

NOTE:

- At small voltage ranges, unsteady readings will appear before the test leads make contact with the circuit. This is normal since the Meter is highly sensitive. When the test leads are connected to the circuit, the true reading will be shown.
- When “1” is shown on the LCD, it means the measurement has exceeded the allowable range. A higher range should be selected.
- When the scale of the value to be measured is unknown, select the highest range first and lower the range accordingly.

DC/AC Current Measurement

WARNING


USE CAUTION WHEN MEASURING HIGH VOLTAGE CIRCUITS TO AVOID ELECTRICAL SHOCK AND INJURY. DO NOT TEST VOLTAGES HIGHER THAN 250V DC/AC.

WARNING

TO AVOID ELECTRICAL SHOCK AND INJURY POWER OFF THE CIRCUIT AND DISCHARGE THE CAPACITANCE BEFORE MEASURING CURRENT.

- Plug the black test lead into the “**COM**” jack.
- When the current to be measured is under 200mA, plug the red test lead into the “**mA**” jack; when the current to be measured is over 200mA but under 10A, plug the red test lead into the “**10A**” jack.
- Set the rotary switch to the “**A**” position for DC measurement and “**A~**” for AC measurement and at the proper range.
- Connect the test leads to the circuit.
- Read the value on the display.
- The polarity symbol denotes the polarity of the red test lead.

NOTE:

- When '1' is shown on the LCD, it means the measurement has exceeded the allowable range; a higher range should be selected.
- When the scale of the value to be measured is unknown, select the highest range first and then lower the range accordingly.
- “” indicates the maximum current of the mA jack is 200mA and the maximum current of the 10A jack is 10A. At either jack, current exceeding the limit will blow the fuse.

Resistance Measurement

WARNING

TO AVOID ELECTRICAL SHOCK AND INJURY POWER OFF THE CIRCUIT AND DISCHARGE THE CAPACITANCE BEFORE MEASURING RESISTANCE.

- Plug the black test lead into the “**COM**” jack and the red test lead into the “**VTempΩHz**” jack.
- Set the rotary switch to the “**Ω**” position and at the proper range.
- Connect the test leads to the ends of the resistor or circuit.
- Read the value on the LCD.

NOTE:

When the input is open, "1" is displayed on the LCD to indicate overload. For measuring resistance above $1\text{M}\Omega$, it may take a few seconds to get a steady reading. This is normal for high resistance measurement.

Diode

- Plug the black test lead into the "COM" jack and the red test lead into the "VTemp Ω \rightarrow Hz" jack.
- Set the rotary switch to the " \rightarrow " position
- Connect the red test lead to the anode and the black test lead to the cathode of the diode for testing.
- Read the value on the LCD.

NOTE:

- The Meter will show approximate forward voltage drop of the diode.
- When the test leads are reversed or opened, '1' will appear on the LCD.

Continuity



WARNING

**TO AVOID ELECTRICAL SHOCK AND INJURY
POWER OFF THE CIRCUIT AND DISCHARGE
THE CAPACITANCE BEFORE TESTING
CONTINUITY.**

- Plug the black test lead into the "COM" jack and the red test lead into the "V Ω \rightarrow Hz" jack.
- Set the rotary switch to the " \rightarrow " position.
- Connect the test leads to two ends of the circuit. If resistance of the circuit is less than 50Ω the built-in buzzer will sound.

Capacitance(only for MY61 MY62 MY63 MY64)



WARNING

**TO AVOID ELECTRICAL SHOCK AND INJURY
POWER OFF THE CIRCUIT AND DISCHARGE
THE CAPACITANCE BEFORE TESTING
CAPACITANCE.**

- Plug the black test lead into the "COM" jack and the red test lead into the "hFE \rightarrow mA" jack.
- Set the rotary switch to the " \rightarrow " position and at the proper range.
- Connect the test leads to two ends of the circuit/ capacitor and read the value on the LCD.

Frequency Measurement(only for MY63 MY64)

- Plug the black test lead into the "COM" jack and the red test lead into the "VTemp Ω \rightarrow Hz" jack.
- Set the rotary switch to the "Hz" position.
- Connect test leads to the two ends of the circuit for measurement.
- Read the value on the LCD.

Temperature(only for MY62 MY64)

WARNING

**TO AVOID ELECTRICAL SHOCK AND INJURY
DO NOT MEASURE THE SURFACE OF AND
OBJECT WITH AN ELECTRICAL POTENTIAL
HIGHER THAN 60V DC/ 24V AC.**

- Plug the multi-function socket with the “IN” end in the “VtempΩ→” jack and the “COM” end in the “COM” jack.
- Insert the K-type thermocouple into the multi-function socket with the correct polarity.
- Set the rotary switch to the “Temp” position.
- Use the thermocouple to measure the temperature of the surface of the test object.
- Read value on LCD.

Transistor Gain

WARNING

**TO AVOID ELECTRICAL SHOCK AND INJURY
DO NOT TEST WITH VOLTAGES HIGHER THAN
250V DC/AC.**

- Plug the multi-function socket with the “IN” end in the “hFE ← mA” jack and the “COM” end in the “COM” jack.
- Set the rotary switch to the “hFE” position and at the proper range.
- Determine if the transistor to be tested is either NPN or PNP type, then insert the three pins of the transistor into the corresponding holes of the multi-function socket.
- Read the approximate transistor gain on the LCD.

Specifications

General Specification

- Overload protection is provided for all modes (CAT II 1000V, CAT III 600V, pollution grade 2).
- Maximum voltage between terminals and earth ground: 1000V DC/750V AC
- Display: LCD
- Maximum value display: 1999
- Polarity indication: automatic; “-” for negative polarity.
- Overload indication: “1”
- Auto power off time: 20min
- Resettable fuse: F1 250mA/250V
- Fuse protection: F2 10A/500V (quick acting)
- Power Supply : 9V batteries
- Battery low indication: “E3” on LCD
- Operating Temperature: 0°C to 40°C (32°F to 104°F)
- Storage Temperature: 0°C to 60°C (32°F to 140°F)
- Dimension: 188×93×50mm (7.4×3.7×1.9in.)
- Weight: approximate 380g (13oz) including batteries

Technical Specifications

DC Voltage

| Range | Resolution | Accuracy |
|-------|------------|--|
| 200mV | 0.1mV | $\pm(0.5\% \text{ of reading} + 2\text{digits})$ |
| 2V | 1mV | |
| 20V | 10mV | |
| 200V | 100mV | |
| 1000V | 1V | $\pm(0.8\% \text{ of reading} + 2\text{digits})$ |

- Max input voltage: 250V DC at 200mV range, 1000V DC elsewhere.
- Input impedance: 10M Ω

NOTE:

- At small voltage ranges, unsteady readings will appear before the test leads make contact with the circuit. This is normal since the meter is highly sensitive. When the test leads connect to the circuit, the true reading will be shown.

AC Voltage

| Range | Resolution | Accuracy |
|--------------------------------|-------------|--|
| 200mV(only for MY60 My61 MY62) | 100 μ V | $\pm(1.2\% \text{ of reading} + 3\text{digits})$ |
| 2V | 1mV | $\pm(0.8\% \text{ of reading} + 3\text{digits})$ |
| 20V | 10mV | |
| 200V | 100mV | |
| 750V | 1V | $\pm(1.2\% \text{ of reading} + 3 \text{ digits})$ |

- Max input voltage: 250V AC at 200mV range, 750V AC elsewhere.
- Input impedance: 10M Ω
- Frequency response: 200Hz at 750V range, 40-400Hzelsewhere
- Response: Average (RMS of sine wave)

NOTE:

- At small voltage ranges, unsteady readings will appear before the test leads make contact with the circuit. This is normal since the meter is highly sensitive. When the test leads connect to the circuit, the true reading will be shown.

DC Current

| Range | Resolution | Accuracy |
|-----------------------------|--------------|--|
| 20 μ A (only for MY60) | 0.01 μ A | $\pm(2.0\% \text{ of reading} + 5\text{digits})$ |
| 200 μ A (only for MY60) | 0.1 μ A | $\pm(0.8\% \text{ of reading} + 1\text{digits})$ |
| 2mA | 1 μ A | |
| 20mA | 10 μ A | |
| 200mA | 0.1mA | $\pm(1.5\% \text{ of reading} + 1\text{digits})$ |
| 10A | 10mA | $\pm(2.0\% \text{ of reading} + 5 \text{ digits})$ |

- Overload protection:
mA ranges: resettable fuse F1, 250mA/250V
10A range: F2, 10A/500V fuse (quick acting).
- Max input current:
mAjack (mA range): 200 mA
10A jack: 10A

AC Current

| Range | Resolution | Accuracy |
|-------------------------|------------|------------------------------|
| 20μA(only for MY60) | 0.01μA | ±(2.0% of reading + 5digits) |
| 200μA(only for MY60) | 0.1μA | ±(1.0% of reading + 5digits) |
| 2mA(only for MY60 MY61) | 1μA | |
| 20mA | 10μA | |
| 200mA | 0.1mA | ±(1.8% of reading + 5digits) |
| 10A | 10mA | ±(3.0% of reading + 7digits) |


- Overload protection:
mA ranges: resettable fuse F1, 250mA/250V
10A range: F2, 10A/500V fuse (quick acting).
- Max input current:
mA jack (mA range): 200 mA
10A jack: 10A
- Frequency response: 200Hz at 750V range,
40-400Hz elsewhere
- Response: Average (RMS of sine wave)

Resistance


| Range | Resolution | Accuracy |
|-------|------------|-------------------------------|
| 200Ω | 0.1Ω | ±(0.8% of reading + 3digits) |
| 2kΩ | 1Ω | ±(0.8% of reading + 2digits) |
| 20kΩ | 10Ω | |
| 200kΩ | 100Ω | |
| 2MΩ | 1kΩ | |
| 20MΩ | 10kΩ | ±(1.0% of reading + 2digits) |
| 200MΩ | 100kΩ | ±(6.0% of reading + 10digits) |

- Overload protection: 250V DC/AC
- Open circuit voltage: DC>700mV

Diode Test

| | Resolution | Function |
|---|------------|---|
|  | 1mA | Displaying approximate forward voltage of diode |

Continuity Test

| | Function |
|---|---|
|  | Built-in buzzer will sound if resistance is lower than 50Ω. |

- Test current: approx. 1mA
- Open circuit voltage: approx. DC 2.8V

Frequency(only for MY63 MY64)

| Range | Resolution | Accuracy |
|---------------------|------------|-------------------------------|
| 20kHz | 10Hz | ±(2.0% of reading + 5 digits) |
| 2kHz(only for MY63) | 1Hz | ±(1.5% of reading + 5 digits) |

Capacitance(only for MY61 MY62 MY63 MY64)

| Range | Resolution | Accuracy |
|-------|------------|-------------------------------|
| 2nF | 1pF | ±(4.0% of reading + 3digits) |
| 20nF | 10pF | |
| 200nF | 0.1nF | |
| 2μF | 1nF | |
| 100μF | 100nF | ±(6.0% of reading + 10digits) |

Temperature(only for MY62 MY64)

| Range | Resolution | Accuracy |
|--------------|------------|------------------------------|
| -20°C~0°C | 1°C | ±(5.0% of reading + 4digits) |
| 1°C~400°C | | ±(2.0% of reading + 3digits) |
| 401°C~1000°C | | ±(2.0% of reading + 5digits) |

Transistor

| Range | Description | Test Condition |
|-------|---------------------------|--|
| hFE | hFEapproximation (0-1000) | Base current 10μA Vce is about DC 2.8V |

Maintenance

Replacing Batteries

Follow these steps to replace batteries:

- Turn off the Meter.
- Unscrew battery cover and open
- Remove the batteries and replace the batteries with new batteries.
- Reattach the battery compartment door to the case bottom and tighten the screws.

Replacing Fuse

Fuses rarely need replacement. Almost all blows are the result of operation error.

- Remove protective cover from meter
- Unscrew the screws located in the back of the Meter.
- Remove back cover of meter
- Replace the blown fuse with one at the specified rating.
- Put the back cover and protective cover back on and tighten the screws.

Test Leads Replacement



WARNING

REPLACE THE TEST LEADS WITH IDENTICAL OR COMPATIBLE LEADS. LEAD SPEC: 1000V 10A.

Replace new leads if the current leads are worn.

Cleaning and Decontamination

- The meter can be cleaned with a soft cloth to remove any oil, grease or grime.
- Do not use liquid solvent or detergent

