Sinometer M9704

Sinometer Mastech M9704 Dual Display Analog Digital Multimeter User Manual

1. Introduction

This manual provides detailed instructions for the safe and effective operation, maintenance, and troubleshooting of the Mastech M9704 Dual Display Analog Digital Multimeter. The M9704 is a versatile 2-in-1 instrument featuring both an analog pointer display and a digital readout, designed for various electrical measurements.

2. Safety Information

To ensure safe operation and prevent damage to the meter, please read and follow all safety instructions carefully before use. Failure to observe these warnings may result in injury or damage to the device.

- Always ensure the test leads are properly connected and the function switch is set to the correct range before making any measurements.
- Do not attempt to measure voltages or currents exceeding the maximum rated values for each range. The device is rated CAT X 600V.
- Exercise extreme caution when working with live circuits. Avoid contact with bare wires or terminals.
- Replace the fuse only with a specified type and rating (200mA/250V).
- Do not operate the meter if it appears damaged or if the test leads are compromised.
- Remove test leads from the circuit before changing the function switch position.
- Ensure batteries are correctly installed and replaced when the low battery indicator appears.

3. Product Overview

The Mastech M9704 combines the benefits of an analog meter for trend indication and a digital display for precise readings. It features a robust design suitable for various electrical testing environments.

Figure 1: Mastech M9704 Multimeter Front Panel

This image displays the front panel of the Mastech M9704 multimeter. Key components visible include the large dual display at the top, featuring both an analog pointer scale and a digital LCD readout. Below the display is the central rotary switch, used for selecting various measurement functions and ranges such as OHM, DC Voltage (V=), AC Voltage (V~), DC Current (A=), AC Current (A~), Diode Test, Continuity, Transistor hFE, Capacitance (F, Cx), Frequency (20kHz), and Temperature (TEMP). To the right of the rotary switch are the input jacks for test leads: a common (COM-) jack, a VΩmA jack, and a 20A MAX jack. A small '0 ADJ' knob for analog zero adjustment is located near the display. The device also features a wrist strap for portability and security.

Key Features:

- Dual Display: Simultaneous analog pointer and digital LCD readout.
- Wide Measurement Range: 29 ranges for various electrical parameters.
- Functions: Measures DC/AC Voltage, DC/AC Current, Resistance, Diode, Continuity, Transistor hFE, Capacitance, Frequency, and Temperature.
- Safety: CAT X 600V rating and fuse protection (200mA/250V).
- Portability: Compact design with a wrist strap.

4. Setup

4.1 Battery Installation

The M9704 multimeter requires batteries for operation. Batteries are not included with the product. To install or replace batteries:

1. Ensure the multimeter is turned OFF and disconnect all test leads.
2. Locate the battery compartment cover on the back of the unit.
3. Unscrew the retaining screw(s) and carefully remove the cover.
4. Insert new batteries, observing the correct polarity (+ and -) as indicated inside the compartment.
5. Replace the battery compartment cover and secure it with the screw(s).

4.2 Connecting Test Leads

Proper connection of test leads is crucial for accurate and safe measurements.

- Always insert the black test lead into the **COM-** (Common) jack.
- For most voltage, resistance, diode, continuity, capacitance, frequency, and temperature measurements, insert the red test lead into the **VΩmA** jack.
- For high current measurements (up to 20A), insert the red test lead into the **20A MAX** jack. Ensure the rotary switch is set to the appropriate current range.

5. Operating Instructions

Before taking any measurement, ensure the meter is set to the correct function and range, and test leads are connected properly.

5.1 General Operation

1. Turn the rotary switch from the 'OFF' position to the desired measurement function and range.
2. Connect the test leads to the circuit or component under test.
3. Read the measurement value from the digital display and observe the analog pointer for trend indication.
4. For analog readings, use the '0 ADJ' knob to zero the pointer before measurement if necessary.
5. When finished, turn the rotary switch back to the 'OFF' position and disconnect the test leads.

5.2 Specific Measurement Modes

- **DC Voltage (V=):**
  Set the rotary switch to the desired 'V=' range. Connect the red lead to the positive side and the black lead to the negative side of the DC voltage source.
- **AC Voltage (V~):**
  Set the rotary switch to the desired 'V~' range. Connect the test leads across the AC voltage source. Polarity is not critical for AC voltage.
- **DC Current (A=):**
  Set the rotary switch to the desired 'A=' range. For currents up to 200mA, use the VΩmA jack. For currents up to 20A, use the 20A MAX jack. Connect the meter in series with the circuit.
- **Resistance (OHM):**
  Set the rotary switch to the 'OHM' range. Ensure the circuit is de-energized. Connect the test leads across the component to measure its resistance.
- **Diode Test:**
  Set the rotary switch to the diode symbol. Connect the red lead to the anode and the black lead to the cathode of the diode. The display will show the forward voltage drop. Reverse the leads to check for open circuit.
- **Continuity Test:**
  Set the rotary switch to the continuity symbol. Connect the test leads across the circuit or component. An audible tone indicates continuity (low resistance).
- **Transistor hFE Test:**
  Set the rotary switch to the 'hFE' position. Insert the transistor leads (Emitter, Base, Collector) into the corresponding sockets (E, B, C) on the front panel, ensuring correct PNP or NPN type selection. The display will show the hFE value.

- **Capacitance (F, Cx):**
  Set the rotary switch to the 'F' or 'Cx' range. Ensure the capacitor is discharged before connecting the test leads across its terminals.
- **Frequency (20kHz):**
  Set the rotary switch to the '20kHz' range. Connect the test leads to the signal source to measure its frequency.
- **Temperature (TEMP):**
  Set the rotary switch to the 'TEMP' range. Connect a K-type thermocouple (not included) to the appropriate input jacks.

6. Maintenance

6.1 Battery Replacement

When the low battery indicator appears on the digital display, replace the batteries as described in Section 4.1.

6.2 Fuse Replacement

If the current measurement function fails, the fuse may need replacement. Always replace with a fuse of the specified type and rating (200mA/250V).

1. Ensure the multimeter is turned OFF and disconnect all test leads.
2. Locate and open the fuse compartment, typically near the battery compartment.
3. Carefully remove the old fuse and insert a new one of the correct rating.
4. Close the fuse compartment securely.

6.3 Cleaning and Storage

- Clean the meter casing with a soft, damp cloth. Do not use abrasive cleaners or solvents.
- Store the multimeter in a cool, dry place, away from direct sunlight and extreme temperatures.
- If storing for extended periods, remove the batteries to prevent leakage.

7. Troubleshooting

If the multimeter is not functioning as expected, refer to the following common issues and solutions:

- **No Display/Meter Does Not Turn On:**
  Check battery installation and ensure batteries are not depleted. Replace if necessary.
- **Incorrect Readings:**
  Verify that the function switch is set to the correct measurement type and range. Ensure test leads are properly connected and making good contact with the circuit. Check for damaged test leads.
- **Current Measurement Not Working:**
  Check the fuse. A blown fuse is a common cause for current measurement failure. Replace with a 200mA/250V fuse.
- **Analog Pointer Not Zeroed:**
  Use the '0 ADJ' knob to adjust the analog pointer to zero before taking measurements.

8. Specifications

The following are the general specifications for the Sinometer Mastech M9704 Multimeter:

Specification	Value
Brand	Sinometer
Model Number	M9704
Measurement Type	Multimeter (Analog & Digital)
Power Source	Battery Powered
Style	Digital
Item Weight	340 g
Product Dimensions (L x W x H)	19.7 x 10.8 x 3.8 Centimeters
Safety Compliance	CE
UPC	789957400728

9. Warranty and Support

For warranty information, technical support, or service inquiries regarding your Mastech M9704 Multimeter, please contact Sinometer customer support directly. Refer to the product packaging or Sinometer's official website for the most current contact details and warranty terms.