

ZOYI ZT-109

ZOYI ZT-109 Digital Multimeter User Manual

Model: ZT-109

1. INTRODUCTION

Thank you for choosing the ZOYI ZT-109 Digital Multimeter. This device is a high-precision, automatic range digital multimeter designed for measuring DC/AC voltage, DC/AC current, resistance, capacitance, frequency, duty cycle, diode, and continuity. It also features non-contact voltage (NCV) detection and temperature measurement. Its compact design and intuitive interface make it suitable for both professional and hobbyist use.

2. SAFETY INFORMATION

Please read and understand all safety warnings and operating instructions before using this multimeter. Failure to do so may result in injury or damage to the meter or equipment under test.

- Always ensure the test leads are properly connected and the function dial is set to the correct range before making measurements.
- Do not exceed the maximum input values specified for each function. The meter features high voltage protection of 550V (except current gear).
- Exercise extreme caution when working with voltages above 30V AC RMS, 42V peak, or 60V DC. These voltages pose a shock hazard.
- Do not use the meter if it appears damaged or if the test leads are damaged.
- Replace the battery immediately when the low battery indicator appears to ensure accurate readings.
- Never connect the test leads across a voltage source when the function dial is set to current, resistance, or diode mode.
- Disconnect power to the circuit and discharge all high-voltage capacitors before measuring resistance, continuity, diodes, or capacitance.
- Use caution when making measurements on live circuits.

3. PACKAGE CONTENTS

Verify that all items are present in your package:

- ZOYI ZT-109 Digital Multimeter
- Test Leads (Red and Black)
- User Manual
- Storage Pouch (may vary by package)

Features

DC voltage 1000V, AC voltage 750V,
DC current 10A, AC current 10A,
Resistance 10M Ω , capacitance 10000 μ F,
frequency 10MHz, duty cycle,
diode, on-off buzzer, Screen backlight,
low voltage display, automatic shutdown,
manual/auto range, square wave output,
Maximum display: 9999, data retention,
true effective value, temperature,

Accessories



Figure 1: ZOYI ZT-109 Digital Multimeter with included test leads, storage pouch, and user manual.

4. PRODUCT FEATURES

- **Automatic Range:** Simplifies operation by automatically selecting the appropriate measurement range.
- **True RMS Measurement:** Provides accurate readings for non-sinusoidal AC waveforms.
- **High Voltage Protection:** 550V protection on most ranges (excluding current).
- **High Precision Display:** 9999 counts display for detailed readings.
- **Backlit Screen:** Improves readability in low-light conditions.
- **Data Hold:** Freezes the displayed reading for easy recording.
- **Automatic Power Off:** Conserves battery life when not in use.

- **Temperature Measurement:** Allows for temperature readings (probe not explicitly listed in contents, assuming standard K-type thermocouple compatibility if included).
- **NCV (Non-Contact Voltage) Detection:** Safely detects AC voltage without direct contact.
- **Versatile Measurement:** Measures DC/AC Voltage, DC/AC Current, Resistance, Capacitance, Frequency, Diode, and Continuity.

5. COMPONENT IDENTIFICATION

Familiarize yourself with the main components of your ZOYI ZT-109 Digital Multimeter:

1. **LCD Display:** Shows measurement readings, units, and function indicators.
2. **Function Dial:** Rotary switch to select measurement functions (Voltage, Current, Resistance, etc.).
3. **RANGE/Hz Button:** Toggles between manual and auto range, or selects frequency/duty cycle.
4. **AUTO POWER OFF/SEL/HOLD Button:** Activates/deactivates auto power off, selects sub-functions (e.g., AC/DC), or holds data.
5. **Input Jacks:**
 - **COM Jack (Black):** Common input for all measurements.
 - **VΩHz Jack (Red):** Input for Voltage, Resistance, Frequency, Capacitance, Diode, Continuity, and Temperature measurements.
 - **mAμA Jack (Red):** Input for small current measurements (mA, μA).
 - **10A Jack (Red):** Input for large current measurements (up to 10A).

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Figure 2: Detailed view of the ZOYI ZT-109 Multimeter's front panel, highlighting the display, function dial, and input terminals.

6. SETUP

6.1 Battery Installation

The ZOYI ZT-109 is powered by batteries (typically 2x AA or 9V, check battery compartment for specifics). To install or replace batteries:

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

6.2 Connecting Test Leads

Always connect the black test lead to the **COM** jack. Connect the red test lead to the appropriate input jack based on the measurement you intend to make:

- For Voltage, Resistance, Frequency, Capacitance, Diode, Continuity, and Temperature: Connect the red lead to the **VΩHz** jack.
- For small current (mA, μA) measurements: Connect the red lead to the **mAμA** jack.
- For large current (up to 10A) measurements: Connect the red lead to the **10A** jack.

7. OPERATING INSTRUCTIONS

Before any measurement, ensure the test leads are correctly connected and the function dial is set to the desired measurement type.

7.1 Measuring DC/AC Voltage

1. Set the function dial to the **V** (Voltage) position. The meter will typically default to DC Voltage.
2. To switch between DC and AC Voltage, press the **SEL/HOLD** button.
3. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
4. Connect the test probes in parallel across the component or circuit to be measured.
5. Read the voltage value on the LCD display.

7.2 Measuring DC/AC Current

Caution: Never connect the multimeter in parallel with a voltage source when measuring current. This will blow the fuse and may damage the meter.

1. Set the function dial to the **A** (Current) position (for 10A) or **mAμA** (for milli/microamps).
2. To switch between DC and AC Current, press the **SEL/HOLD** button.
3. Connect the black test lead to the **COM** jack. Connect the red test lead to the **10A** jack for currents up to 10A, or to the **mAμA** jack for smaller currents.
4. Open the circuit where current is to be measured and connect the test probes in series with the circuit.
5. Read the current value on the LCD display.

7.3 Measuring Resistance

1. Ensure the circuit is de-energized and all capacitors are discharged.
2. Set the function dial to the **Ω** (Resistance) position.
3. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
4. Connect the test probes across the component to be measured.
5. Read the resistance value on the LCD display.

7.4 Measuring Capacitance

1. Ensure the capacitor is fully discharged before measurement.
2. Set the function dial to the **Capacitance** symbol (often shared with Resistance or Diode). Press **SEL/HOLD** if needed to select capacitance.
3. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
4. Connect the test probes across the capacitor terminals.
5. Read the capacitance value on the LCD display.

7.5 Diode Test and Continuity

1. Ensure the circuit is de-energized.
2. Set the function dial to the **Diode/Continuity** symbol. Press **SEL/HOLD** to switch between diode test

and continuity.

3. Connect the black test lead to the **COM** jack and the red test lead to the **VΩHz** jack.
4. **For Diode Test:** Connect the red probe to the anode and the black probe to the cathode. The display will show the forward voltage drop. Reverse the probes; the display should show OL (Open Loop) for a good diode.
5. **For Continuity Test:** Connect the probes across the circuit or component. A low resistance (typically below 50Ω) will trigger an audible beep, indicating continuity.

7.6 NCV (Non-Contact Voltage) Detection

1. Set the function dial to the **NCV** position (often shared with other functions, use **SEL/HOLD** if necessary).
2. Move the top part of the multimeter near the AC voltage source (e.g., a live wire or outlet).
3. The meter will beep and/or flash an indicator light when AC voltage is detected.

7.7 Temperature Measurement

If your multimeter includes a temperature probe:

1. Set the function dial to the **Temperature** symbol (often °C/°F).
2. Connect the temperature probe to the **COM** and **VΩHz** jacks, observing polarity if applicable.
3. Place the tip of the probe on or near the object whose temperature you wish to measure.
4. Read the temperature on the LCD display.

7.8 Data Hold Function

Press the **SEL/HOLD** button briefly to freeze the current reading on the display. Press it again to release the hold function.

7.9 Backlight

Press the **Backlight** button (often integrated with RANGE or another button) to turn the display backlight on or off. It may automatically turn off after a short period to conserve battery.

8. MAINTENANCE

8.1 Cleaning

Wipe the meter with a damp cloth and a mild detergent. Do not use abrasives or solvents. Ensure the meter is completely dry before use.

8.2 Battery Replacement

When the low battery indicator appears on the display, replace the batteries as described in the "Battery Installation" section (6.1). Always use the specified battery type.

8.3 Fuse Replacement

Caution: Blown fuses are almost always the result of improper operation. Always correct the cause of the blown fuse before replacing it.

If the current measurement function stops working, the fuse may be blown. To replace the fuse:

1. Ensure the multimeter is turned OFF and test leads are disconnected.
2. Open the battery compartment cover (and potentially the entire back casing, depending on the design).
3. Carefully remove the old fuse.

4. Replace it with a fuse of the exact same type and rating (e.g., F10A/250V for 10A range, F200mA/250V for mA/μA range). Refer to the meter's internal markings for specific fuse ratings.
5. Reassemble the meter, ensuring all screws are tightened.

9. TROUBLESHOOTING

Problem	Possible Cause	Solution
Meter does not power on.	Dead or incorrectly installed batteries.	Check battery polarity; replace batteries.
No reading or "OL" (Overload) displayed.	Incorrect function selected, open circuit, or measurement exceeds range.	Select correct function, check circuit connections, or switch to a higher range if available.
Inaccurate readings.	Low battery, dirty test leads, or external interference.	Replace batteries, clean test leads, move away from strong electromagnetic fields.
Current measurement not working.	Blown fuse.	Replace the appropriate fuse (refer to section 8.3).
NCV not detecting voltage.	Voltage too low, or meter not close enough to source.	Ensure voltage is present and position meter closer to the source.

10. SPECIFICATIONS

Feature	Specification
Display	9999 Counts, Backlit LCD
Ranging	Automatic/Manual
True RMS	Yes
DC Voltage	Up to 1000V
AC Voltage	Up to 750V
DC Current	Up to 10A
AC Current	Up to 10A
Resistance	Up to 10MΩ
Capacitance	Up to 10000uF
Frequency	Up to 10MHz
Diode Test	Yes
Continuity Test	Yes (with buzzer)
NCV Detection	Yes

Feature	Specification
Temperature Measurement	Yes (requires compatible probe)
Data Hold	Yes
Auto Power Off	Yes
Low Battery Indication	Yes
Power Source	Battery Powered (type not specified, typically AA or 9V)
Safety Rating	600V CAT III, 1000V CAT II

11. WARRANTY AND SUPPORT

ZOYI products are manufactured to high-quality standards. For warranty information, please refer to the warranty card included with your product or contact your point of purchase. Keep your purchase receipt as proof of purchase.

For technical support, troubleshooting assistance, or inquiries regarding your ZOYI ZT-109 Digital Multimeter, please contact ZOYI customer service through the retailer where you purchased the product or visit the official ZOYI website for contact details.