BSIDE ZT-M1 with Alligator Clip

BSIDE ZT-M1 True RMS Digital Multimeter User Manual

Model: ZT-M1 with Alligator Clip | Brand: BSIDE

1. Introduction

The BSIDE ZT-M1 is a versatile True RMS digital multimeter designed for accurate measurements in various electrical and electronic applications. It features a 3-line display, 8000 counts, and both auto-ranging and manual ranging capabilities. This manual provides detailed instructions for the safe and effective use of your ZT-M1 multimeter.

Key features include:

- Large 3-line display showing multiple test results simultaneously.
- VFC function for measuring inverter output voltage.
- Integrated auto and manual modes for user convenience.
- Battery test function for accurate battery performance measurement.
- Square wave output generator (up to 5 MHz).
- Dual rear probe holder design for single-handed operation and safe storage.
- Flashlight for improved visibility in dark environments.
- Measures AC/DC Voltage, AC/DC Current, Resistance, Capacitance, Frequency, Temperature, Diode, and Continuity.
- True RMS measurement for accurate readings on non-sinusoidal waveforms.
- Data hold, Max/Min reading, and low battery indication.

2. Product Overview

Familiarize yourself with the components of your BSIDE ZT-M1 multimeter.

Figure 2.1: BSIDE ZT-M1 Multimeter and Accessories

This image displays the BSIDE ZT-M1 digital multimeter along with its standard accessories, including red and black test leads, an alligator clip, a K-type thermocouple for temperature measurements, and a protective carrying case.

2.1 Display Features

The ZT-M1 features a large 3-line display capable of showing multiple readings simultaneously.

Figure 2.2: 3-Line Display for Temperature

This image illustrates the multimeter's display showing temperature readings in both Celsius and Fahrenheit, along with an analog bar graph, providing three test results on the screen simultaneously.

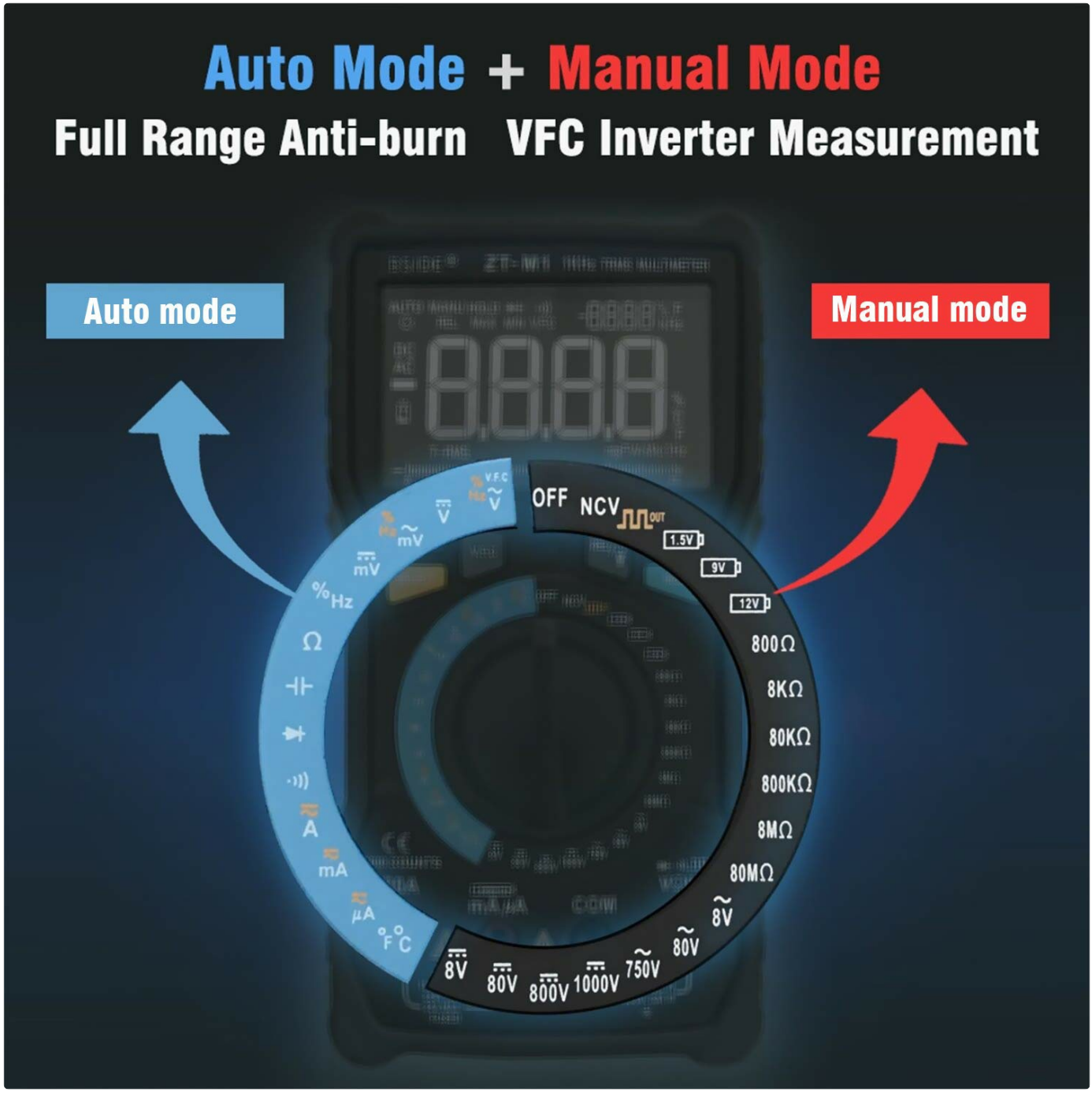

Figure 2.3: 3-Line Display for Voltage

This image demonstrates the multimeter's display showing voltage and frequency readings, accompanied by an analog bar graph, allowing for three simultaneous test results on the screen.

2.2 Convenient Design Features

The ZT-M1 is designed with user convenience and safety in mind.

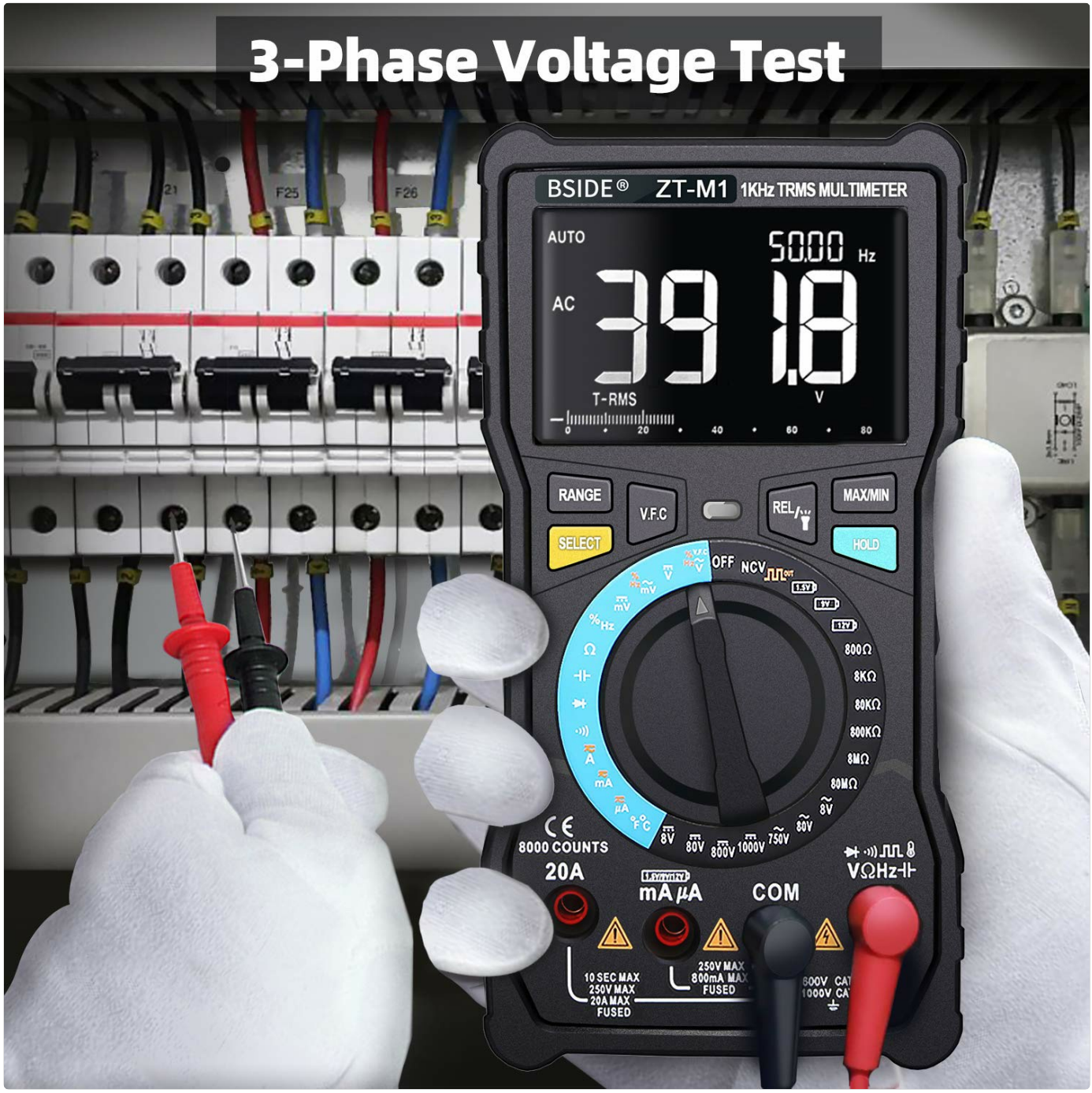

Figure 2.4: Convenient Design Features

This image highlights the convenient design features on the back of the multimeter, including a wall hang hole for easy storage, a built-in flashlight for illuminating dark work areas, integrated probe holders for secure storage and single-handed operation, and an anti-breaking stand for stable positioning during use.

3. Setup

3.1 Battery Installation

The multimeter requires 3 x 1.5V AA batteries (not included due to air safety control). To install or replace batteries:

1. Ensure the multimeter is turned OFF and disconnect all test leads from the input terminals.
2. Locate the battery compartment cover on the back of the unit.

3. Use a screwdriver to loosen the screw(s) on the battery cover.
4. Remove the battery cover.
5. Insert three 1.5V AA batteries, observing the correct polarity (+ and -) as indicated inside the compartment.
6. Replace the battery cover and tighten the screw(s) securely.

Warning:

Always turn off the multimeter and disconnect test leads before opening the battery compartment.

Do not mix old and new batteries, or different types of batteries.

Remove batteries if the multimeter is not used for an extended period to prevent leakage.

4. Operating Instructions

The BSIDE ZT-M1 offers both auto-ranging and manual ranging modes. The auto mode automatically selects the best range for the measurement, while manual mode allows you to select a specific range.

Figure 4.1: Auto Mode + Manual Mode Selection

This diagram illustrates the multimeter's rotary dial, highlighting the distinct sections for Auto mode (blue arrow) and Manual mode (red arrow), indicating the flexibility of the device for both automatic and user-selected measurement ranges.

4.1 General Measurement Steps

1. Connect the black test lead to the "COM" input jack.
2. Connect the red test lead to the appropriate input jack for your measurement (e.g., "VΩHz" for voltage/resistance/frequency, "mAμA" for small current, "20A" for large current).
3. Rotate the function switch to the desired measurement function.
4. Touch the test probes to the circuit or component under test.
5. Read the measurement value on the display.

4.2 Specific Measurement Functions

4.2.1 AC/DC Voltage Measurement

To measure AC or DC voltage:

- Set the rotary switch to the "V" position (AC or DC as indicated).
- Connect the red lead to "VΩHz" and the black lead to "COM".
- Apply the probes across the circuit points where voltage is to be measured.

Figure 4.2: 3-Phase Voltage Test

This image shows the BSIDE ZT-M1 multimeter being used to measure voltage in a 3-phase electrical panel, demonstrating its application in industrial or commercial settings.

4.2.2 AC/DC Current Measurement

To measure AC or DC current:

- Set the rotary switch to the "A" or "mA/μA" position (AC or DC as indicated).
- For currents up to 800mA, connect the red lead to "mAμA". For currents up to 20A, connect the red lead to "20A". Connect the black lead to "COM".
- Open the circuit and connect the multimeter in series with the load.

Figure 4.3: Automobile Circuit Test

This image depicts the multimeter performing a current measurement in an automobile circuit, with the test leads connected to a car battery, illustrating its utility for automotive diagnostics.

4.2.3 Resistance Measurement

Set the rotary switch to the "Ω" position. Connect the red lead to "VΩHz" and the black lead to "COM". Apply probes across the resistor or circuit to measure resistance.

4.2.4 Capacitance Measurement

Set the rotary switch to the "F" (Capacitance) position. Connect the red lead to "VΩHz" and the black lead to "COM". Connect the probes across the capacitor. Ensure the capacitor is discharged before testing.

4.2.5 Frequency Measurement

Set the rotary switch to the "Hz" position. Connect the red lead to "VΩHz" and the black lead to "COM". Apply probes to the signal source to measure frequency.

4.2.6 Temperature Measurement

Set the rotary switch to the "°C/°F" position. Connect the thermocouple to the input jacks, observing polarity. Place the thermocouple tip on the object whose temperature is to be measured.

4.2.7 VFC (Variable Frequency Control) Measurement

The VFC function allows for accurate measurement of the output voltage of variable frequency drives (VFDs) or inverters.

- Set the rotary switch to the "VFC" position.
- Connect the red lead to "VΩHz" and the black lead to "COM".
- Apply the probes across the output terminals of the inverter.

Figure 4.4: VFC Test in Progress

This image shows the BSIDE ZT-M1 multimeter connected to an industrial inverter, demonstrating the use of its VFC function to accurately measure the output voltage of the variable frequency drive.

4.2.8 Battery Test Function

The battery test function allows for more accurate measurement of battery performance.

- Set the rotary switch to the "BATTERY TEST" position (e.g., 1.5V, 9V, 12V as indicated).
- Connect the red lead to "VΩHz" and the black lead to "COM".
- Connect the probes to the battery terminals, observing polarity.

Figure 4.5: Battery Test

This image illustrates the multimeter being used to test a 9V battery, showcasing its dedicated battery test function for assessing battery performance.

4.2.9 Square Wave Output

The multimeter can generate a square wave signal for testing purposes.

- Set the rotary switch to the "Square Wave Output" position.
- The output signal will be available at the "VΩHz" and "COM" terminals.

4.2.10 NCV (Non-Contact Voltage) Detection

The NCV function detects the presence of AC voltage without direct contact.

- Set the rotary switch to the "NCV" position.
- Move the top part of the multimeter close to the conductor.
- An audible alarm and flashing LED indicate the detection of AC voltage.

4.2.11 Diode Test

Set the rotary switch to the "Diode" position. Connect the red lead to "VΩHz" and the black lead to "COM". Apply probes across the diode to measure its forward voltage drop.

4.2.12 Continuity Test

Set the rotary switch to the "Continuity" position. Connect the red lead to "VΩHz" and the black lead to "COM". Apply probes across the circuit or component. An audible alarm sounds if the resistance is less than 50 Ω, indicating continuity.

4.3 Additional Functions

- **HOLD:** Press the "HOLD" button to freeze the current reading on the display. Press again to release.
- **MAX/MIN:** Press the "MAX/MIN" button to display the maximum or minimum measured value.
- **SELECT:** Use the "SELECT" button to switch between different sub-functions within a rotary switch position (e.g., AC/DC voltage, diode/continuity).
- **Flashlight:** Press the flashlight button (usually integrated with another button or a dedicated one) to turn on/off the built-in flashlight.

5. Maintenance

5.1 Cleaning

To clean the multimeter, wipe the case with a damp cloth and a mild detergent. Do not use abrasives or solvents. Ensure the device is completely dry before use.

5.2 Storage

When not in use for extended periods, remove the batteries to prevent leakage. Store the multimeter in a cool, dry place, away from direct sunlight and extreme temperatures. Use the provided carrying case for protection.

5.3 Battery Replacement

Refer to Section 3.1 for detailed battery replacement instructions. Replace batteries when the low battery indicator appears on the display.

6. Troubleshooting

If you encounter issues with your multimeter, refer to the following common problems and solutions:

Problem	Possible Cause	Solution

Problem	Possible Cause	Solution
No display or dim display	Dead or low batteries; Incorrect battery installation.	Replace batteries (refer to Section 3.1); Check battery polarity.
"OL" (Overload) displayed	Input value exceeds the selected range; Incorrect function selected.	Switch to a higher range (if in manual mode); Ensure correct function is selected for the measurement.
Inaccurate readings	Poor test lead connection; Damaged test leads; External interference.	Ensure leads are firmly connected; Inspect leads for damage and replace if necessary; Move away from strong electromagnetic fields.
Continuity buzzer not working	Resistance is too high; Multimeter not in continuity mode.	Ensure resistance is below 50 Ω; Select the continuity function.

7. Specifications

Detailed technical specifications for the BSIDE ZT-M1 Digital Multimeter:

- **Display:** 8000 Counts, 3-line display
- **DC Voltage:** 800mV/8.000V/80.00V/800.0V/1000V ±(0.5% + 3)
- **AC Voltage:** 800mV/8.000V/80.00V/750V ±(1.0% + 3)
- **DC Current:** 800.0µA/8.000mA/80.00mA/800.0mA/8.000A/20.00A ±(1.2% + 3)
- **AC Current:** 800.0µA/8.000mA/80.00mA/800.0mA/8.000A/20.00A ±(1.5% + 3)
- **Resistance:** 800.0Ω/8.000kΩ/80.00kΩ/800.0kΩ/8.000MΩ ±(0.5% + 3); 80.00MΩ ±(1.5% + 3)
- **Capacitance:** 9.999nF/99.99nF/999.9nF/9.999µF/99.99µF/999.9µF ±(5.0% + 20); 9.999mF/99.99mF ±(5.0% + 5)
- **Frequency:** 9.999Hz/99.99Hz/999.9Hz/9.999kHz/99.99kHz/999.9kHz/9.999MHz ±(0.1% + 2)
- **Duty Cycle:** 1%~99% ±(0.1% + 2)
- **Temperature:** (-20~1000)°C/(-4~1832)°F ±(2.5% + 5)
- **Square Wave Output:** 50 Hz ~ 5000 Hz
- **Diode Test:** Displays forward voltage
- **NCV:** Audible alarm and LED flash if AC voltage is detected.
- **Continuity:** Audible alarm if resistance is less than 50 Ω.
- **Power Supply:** 3 x 1.5V AA batteries (not included)
- **Dimensions:** 176 x 91 x 47 mm (6.93 x 3.58 x 1.85 inches)
- **Weight:** 360 g (0.79 lbs)

8. Package Contents

The BSIDE ZT-M1 package includes the following items:

- 1 x Digital Multimeter (BSIDE ZT-M1)
- 1 x Pair of Test Leads
- 1 x Alligator Clip
- 1 x Thermocouple (K-type)
- 1 x Carrying Case
- 1 x User Manual

Figure 8.1: Complete Package Contents

This image displays all items included in the BSIDE ZT-M1 product package: the digital multimeter, a pair of test leads, an alligator clip, a thermocouple, a protective carrying case, and the user manual.

9. Safety Information

Please read and understand all safety information before operating the multimeter. Failure to follow safety warnings can result in injury or damage to the device.

- Do not exceed the maximum input values for any function.
- Use caution when working with voltages above 30V AC RMS, 42V peak, or 60V DC. These voltages pose a shock hazard.
- Always disconnect power to the circuit under test before connecting or disconnecting test leads, especially when measuring current.
- Ensure the function switch is in the correct position for the measurement being performed.
- Do not use the multimeter if it appears damaged or if the test leads are damaged.
- Do not operate the multimeter in explosive gas, vapor, or dust environments.
- Always use proper personal protective equipment (PPE) when working with electrical circuits.

10. Warranty and Support

For warranty information and technical support, please refer to the documentation provided with your purchase or contact BSIDE customer service through their official website. Keep your purchase receipt as proof of purchase.

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