Owner's Manual & Safety Instructions

Save This Manual Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

KZYEE

KM50

Vehicle Super Probe



Visit our website at: www.kzyee.com / www.kzyeetech.com
Email our technical support at: sales@kzyee.com / support@kzyeetech.com

V1.0

When unpacking, make sure that the product is intact and undamaged. If any parts are missing or broken, please call +86-774-5818335 as soon as possible.

Due to continuing improvements, actual product may differ slightly from the product described herein. Tools required for assembly and service may not be included.

⚠ WARNING

Read this material before using this product. Failure to do so can result in serious injury.
SAVE THIS MANUAL.

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1. Important Safety Information

To prevent personal injury or damage to vehicles and/or the test tool, read this instruction manual first and observe the following safety precautions at a minimum whenever working on a vehicle:

- Always perform automotive testing in a safe environment.
- Wear safety eye protection that meets safety standards.
- Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
- Operate the vehicle in a well-ventilated work area: Exhaust gases are poisonous.
  Put blocks in front of the drive wheels and never leave the vehicle unattended while running tests.
- Use extreme caution when working around the ignition coil, distributor cap, ignition wires and spark plugs. These components create hazardous voltages when the engine is running.
- Put the transmission in PARK (for automatic transmission) or NEUTRAL (for manual transmission) and make sure the parking brake is engaged.
- Keep a fire extinguisher suitable for gasoline/chemical/ electrical fires nearby.
- Don't connect or disconnect any test equipment while the ignition is on or the engine is running.
- Keep the tool dry and clean. Use a mild detergent on a clean cloth to clean the outside of the test tool, when necessary.
- When the rocker switch in the tool is depressed battery current/voltage is conducted directly to the tip which may cause sparks when contacting ground or certain circuits. Therefore the tool should NOT be used around flammables such as gasoline or its vapors. The spark of an energized tool could ignite these vapors. Use the same caution as you would when using an arc welder.

Warning!

KM50 is ONLY for 12-24V vehicle battery electrical systems, and should NOT be used to test 110/220V household electric appliances; otherwise, it will be damaged.

The LED and LCD pull no more than 100 milliamp of current, therefore when using this device as a test light or multimeter, it is safe for computer and airbag.

While performing component activation, please pay special attention: when the instrument is powered on, if the rocker switch is pressed forward or rearward, it means that all the battery current is being introduced from the positive or negative pole through the probe. Please strictly follow the instructions to avoid damage to the vehicle's electrical component.

2. Product Introduction

KM50 Can:

1. Diagnose 12 ~24V automotive electrical systems swiftly and accurately.

2. Show battery voltage reading and help user determine circuit polarity immediately after connecting the KM50 clips to the vehicle battery.

3. Test DC Voltage, AC Voltage, Frequency, Duty Cycle, Fuel Injection Circuit, Resistance, and Diode. Especially, in AC Voltage, Frequency, Duty Cycle and Fuel Inject Modes, user can long press the mode button for 3 seconds to switch between Waveform Display Mode and Digital Display Mode.

4. Activate electrical components and test their functions without jumper leads – by depressing the rocker switch to conduct a positive or negative battery current to the tip so as to power up electrical components.

5. Test bad ground contacts instantly without performing voltage drop tests.

6. Help user to follow and locate short circuits without using external fuses.

7. Test continuity with the assistance of its auxiliary ground lead.

8. The tool is short-circuit protected. If it becomes overloaded, Its internal circuit breaker will trip to protect the instrument from overload.

9. When the circuit breaker is tripped, the tool will NOT be able to conduct battery current to the tip even when the rocker switch is pressed; however, all other functions of the tool are still active, which means you can still probe a circuit and observe the voltage reading.

3. Product Specifications

(1) Tool Specifications

Display	TFT color display (160x128 dpi)
Operating Temperature	0 to 60℃ (32 to 140℉)
Storage Temperature	-5 to 70℃ (-40 to 185℉)
Dimensions (L*W*H)	200mm*52mm*39mm
Net Weight	0.48Kg

(2) Electrical Specifications

Supply Voltage	8V DC ~ 30V DC
DC/ AC Voltage Test	-110V ~ 110V
Frequency	0Hz ~ 1Mhz
Duty Cycle	0.0~100.0%
Fuel Injection	Voltage: 0~180V, Time: 0~25ms
Resistance	0~1MΩ
Diode	Germanium diode, silicon diode
Rating Current	1A~8 A

- Instrument Trip Time:
  8 Amps: Hold > 1 hour.
  12 Amps: current: trip in one hour.
  16 Amps: current: trip in 3-30 seconds.
  24 Amps: current: trip in 0.5-4.0 seconds.

4. Product Appearance

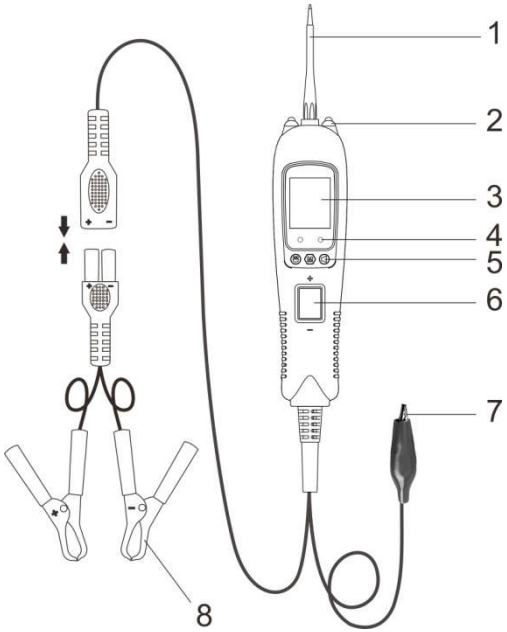


Figure 1

1) **Probe Tip** - Contacts the circuit or component to be tested.
2) **LED Lights** - Illuminates dark work areas or work areas at night.
3) **LCD Display** - Indicates test results, test data and waveforms.
4) **Red/ Green Polarity Indicator** - Identifies positive, negative or open circuits. The RED Indicator lights when the Probe Tip is contacting a positive circuit. The GREEN Indicator lights when the probe tip is contacting a negative or negative voltage circuit. When the resistance is being measured, the green indicator light is on when the resistance is less than 30Ω.
5) **Function Button:**
   Switching Light ON &OFF/Up Button - short press is the up button, long press is to turn the light on/off;
   Mode Button - for selecting test mode;
   Silent/Down Button - short press is the down button, long press is to turn on/off the buzzer.
6) **Rocker Switch** - Allows you to conduct a positive or negative battery current to the tip for activating and testing the function of electrical components.
7) **Auxiliary Ground Lead** - Assists test as a ground lead.
8) **Red/Black Alligator Clips** - Clip the red alligator clip to the battery positive pole; Clip the black alligator clip to the battery negative pole.

5. Function Introduction

KM50 has 7 test modes: DC Voltage, AC Voltage, Frequency, Duty Cycle, Fuel Injection Circuit Detection, Resistance, and Diode. Especially, in AC Voltage, Frequency, Duty Cycle and Fuel Inject Modes, user can long press the mode button to switch between Waveform Display Mode and Digital Display Mode. After the power is turned on, short press the mode button to enter the menu, select the test mode by pressing the up and down keys, and then press the mode button to enter the desired test mode.

Before testing a circuit or component, make sure your tool is in good order by doing a quick self-test. Connect the vehicle battery properly to turn the instrument on, the instrument enters DC Voltage Mode by default, and the fast self-test is performed in DC Voltage Mode. The rocker switch is an on-off switch located on the tool's front side. The positive and negative poles are marked above and below the switch. Press the Rocker Switch forward to activate the tip with a positive voltage. The Red LED should light and LCD display will read the battery voltage and tip voltage. A beep tone will sound. Let go of the rocker switch and the LED will turn off and the tone will cease. Press the Rocker Switch rearward to activate the tip with a negative voltage. The Green LED should light and the LCD display will read the battery voltage and 0.0V (ground). A beep tone will sound. Let go of the rocker switch and the LED will turn off and the tone will cease. Your tool is working correctly and is now ready for use. (Figure 2)

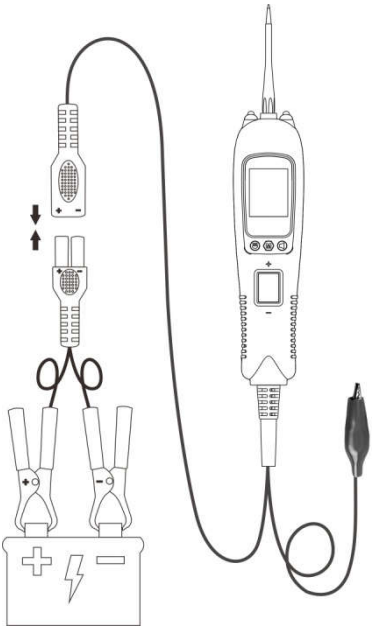
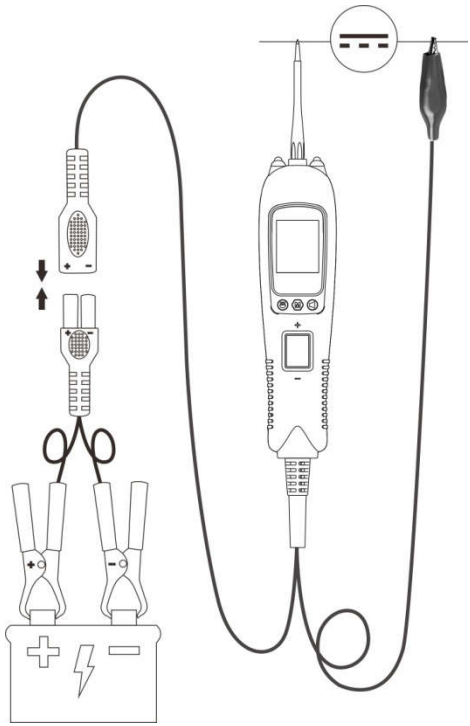


Figure 2

IMPORTANT: When powering-up components, you can increase the life of rocker switch in the tool if you first press the switch, and then contact the tip to the component. The arcing will take place at the tip instead of the metal contacts of the rocker switch.

5.1 DC Voltage



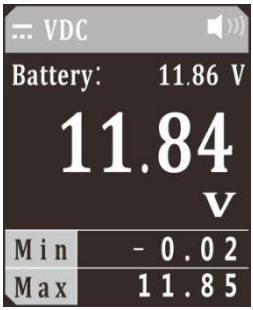
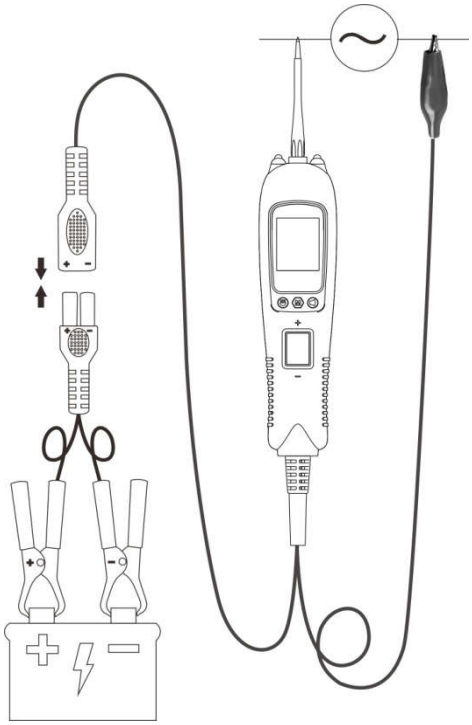


Figure 3

1) Clip the red alligator clip to battery positive pole; clip the black alligator clip to battery negative pole.
2) Contact the probe tip to the circuit.
3) The LCD display will show the battery voltage and the real-time voltage, maximum and minimum values at the probe (Figure 3). The battery voltage reading will not be affected and its accuracy can be assured by the application of Kelvin test method, which avoids voltage drop usually caused by excessive length of instrument power cable.

5.2 AC Voltage



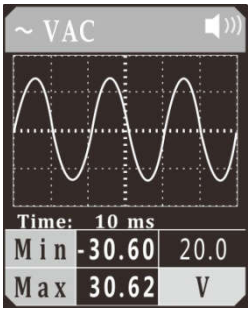


Figure 4

1) Clip the red alligator clip to the battery positive pole; clip the black alligator clip to the battery negative pole.
2) Once the device is powered on, it will enter DC voltage test mode as default. Short press the mode button to enter the menu, short press the down button to place the cursor in the AC voltage mode, and short press the mode button to enter the AC voltage waveform display mode.
3) The auxiliary ground wire is connected to one end of the circuit under test, and the probe contacts the other end of the test circuit. The LCD display will read the maximum and minimum voltage value (Figure 4), and display the signal waveform in real time. You can adjust the sampling frequency by pressing the Up/Down Button.
4) In Figure 4, “time: 10 ms” is the time interval indicated by each large grid. This time reading will change with the sampling frequency.
5) Long press and hold the mode button until the device switches to digital display mode. The device will display the true RMS value, the minimum voltage value, and the maximum voltage value.

5.3 Frequency

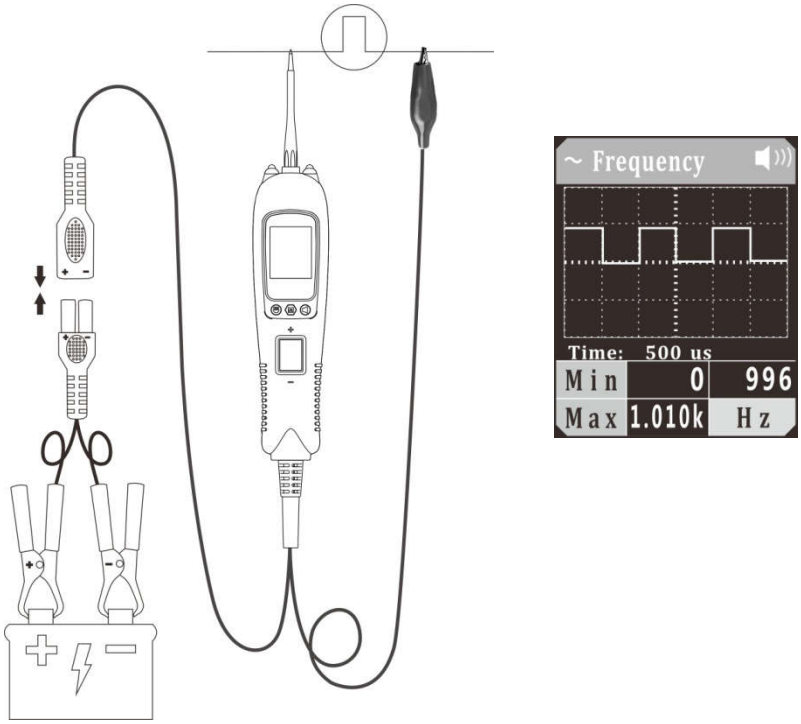


Figure 5

1) Clip the red alligator clip to the battery positive pole; Clip the black alligator clip to the battery negative pole.
2) Once the device is powered on, it will enter DC voltage test mode as default. Short press the mode button to enter the menu, short press the down button to place the cursor in the frequency mode, and short press the mode button to enter the frequency waveform display mode.
3) The auxiliary ground wire is connected to one end of the circuit under test, and the probe contacts the other end of the test circuit. The LCD display will show the minimum frequency, maximum frequency and waveform frequency (Figure 5), and display the signal waveform in real time. You can adjust the sampling frequency by pressing the Up/Down Button. In Figure 5, “time: 500us” is the time interval indicated by each large grid. This time reading will change with the sampling frequency.
4) Long press and hold the mode button until the device switches to digital display mode. The LCD display will display the current frequency, minimum frequency, and maximum frequency.

5.4 Duty Cycle

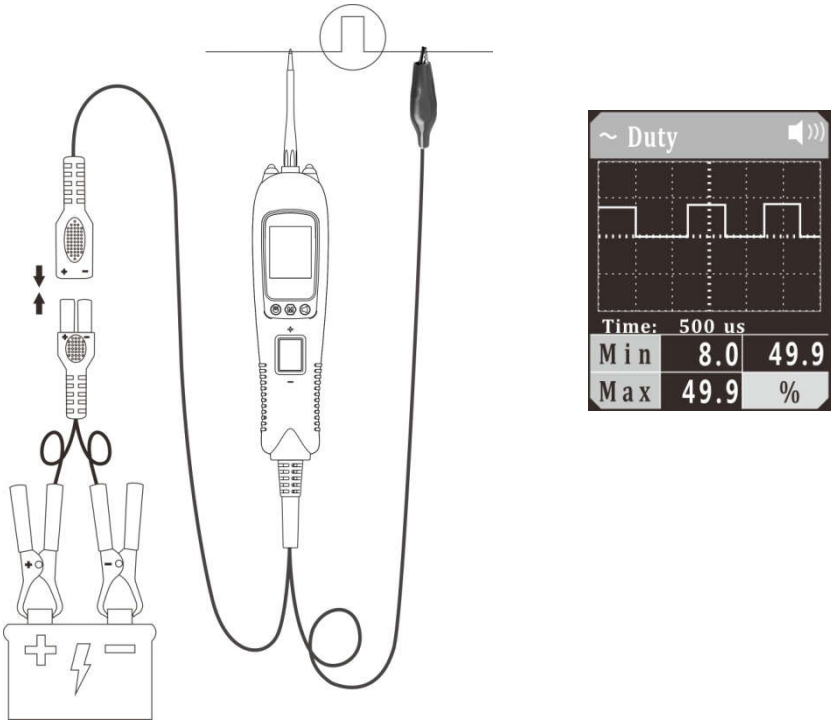


Figure 6

1) Clip the red alligator clip to the battery positive pole; Clip the black alligator clip to the battery negative pole.
2) Once the device is powered on, it will enter DC voltage test mode as default. Short press the mode button to enter the menu, short press the down button to place the cursor in the Duty Cycle mode, and short press the mode button to enter the Duty Cycle waveform display mode.
3) The auxiliary ground wire is connected to the common end of the circuit under test, and the probe contacts the test circuit. The LCD display will show the minimum duty cycle, maximum duty cycle and waveform duty cycle (Figure 6), and display the signal waveform in real time. You can adjust the sampling frequency by pressing the Up/Down Button. In Figure 6, “time: 500us” is the time interval indicated by each large grid. This time reading will change with the sampling frequency.
4) Long press and hold the mode button until the device switches to digital display mode. The LCD display will display the current duty cycle, minimum duty cycle, and maximum duty cycle.

5.5 Fuel Inject

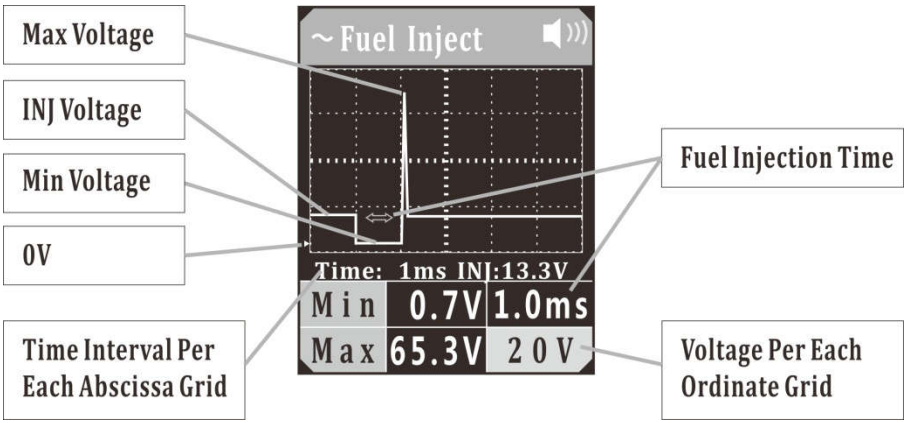


Figure 7

1) Clip the red alligator clip to the battery positive pole; Clip the black alligator clip to the battery negative pole.
2) Once the device is powered on, it will enter DC voltage test mode as default. Short press the mode button to enter the menu, short press the down button to place the cursor in the Fuel Inject mode, and short press the mode button to enter the Fuel Inject waveform display mode.
3) Let the auxiliary ground wire be grounded, have the probe tip contact the negative electrode of the injector control circuit, and the LCD display will read:
   a) Maximum Reverse Induced Voltage Value of Fuel Injector Control Coil, shown as Max (If it exceeds 35V, the red LED light will flash);
   b) Minimum Ground Voltage Value When Fuel Injection Is ON, shown as Min;
   c) Fuel Injection Time;
   d) Fuel Injector Power Supply Voltage (INJ voltage), as shown in (Figure 7);
   e) Display Signal Real-Time Waveform.

- You can adjust the voltage per each ordinate grid in the waveform by pressing the up button, and press the down button to adjust the time interval per each abscissa grid.
- (Figure 7) “time: 1ms” is the time interval indicated by each grid in the waveform, which will vary with the sampling frequency.
- The voltage value shown on the lower right corner is the voltage value per each ordinate grid.
- The green triangle mark indicates the position of 0V in the ordinate, as shown in (Figure 7).

4) Long press and hold the mode button until the device switches to digital display mode. It reads:

a) Fuel Injection Time, displayed in the main area;
b) Fuel Injector Power Supply Voltage (INJ Voltage), displayed at the top;
c) Maximum Reverse Induced Voltage Value of Fuel Injector Control Coil, shown as Max (If it exceeds 35V, the red LED light will flash); and
d) Minimum Ground Voltage Value When Fuel Injection Is ON, shown as Min.

- To reset the maximum and minimum values, press the mode button twice.
- In this mode, if it fails to detect a valid injection pulse, a bar symbol will display instead, as shown in (Figure 7).

5.6 Resistance

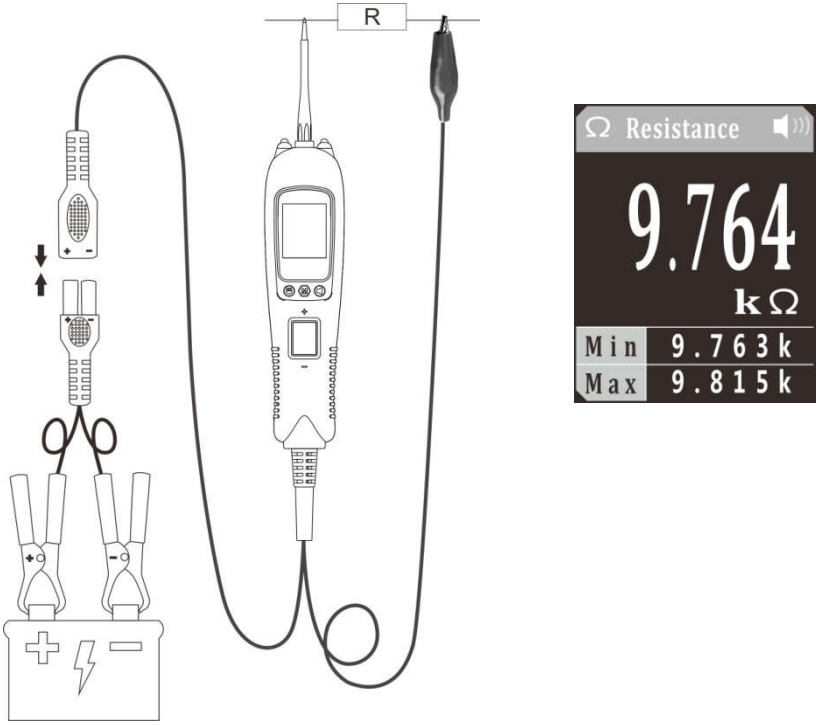


Figure 8

1) Clip the red alligator clip to the battery positive pole; Clip the black alligator clip to the battery negative pole.
2) Once the device is powered on, it will enter DC voltage test mode as default. Short press the mode button to enter the menu, short press the down button to

place the cursor in the Resistance mode, and short press the mode button to enter the Resistance mode.

3) The probe contacts one end of the measured resistance, and the auxiliary ground lead is connected to the other end of the measured resistance. The LCD display will read the resistance between the tip and auxiliary ground lead. (Figure 8)
4) When resistance value is less than 30Ω, the instrument buzzer will alarm and the green LED will light. This function can be used as continuity test.

5.7 Diode

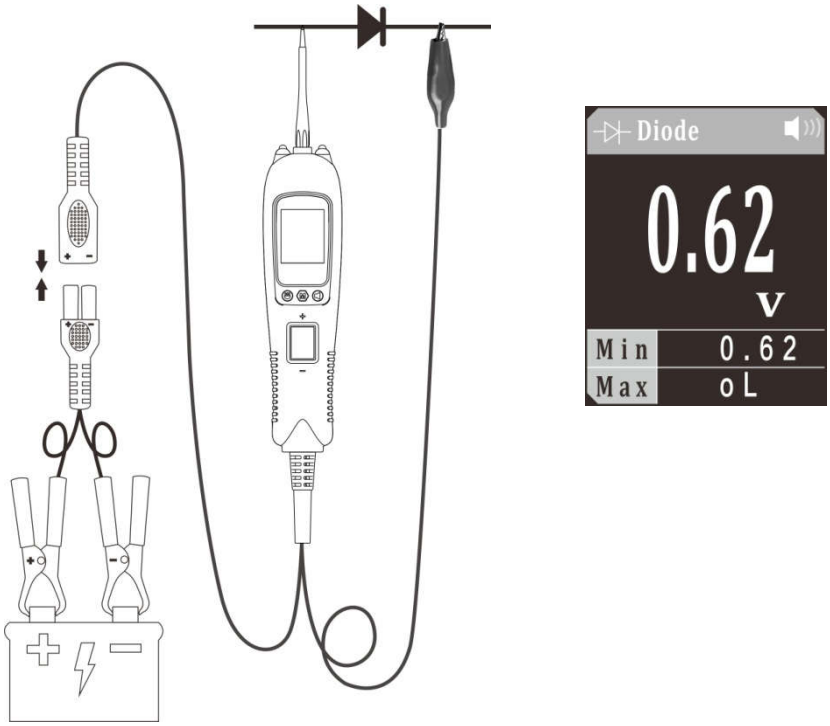


Figure 9

1) Clip the red alligator clip to the battery positive pole; Clip the black alligator clip to the battery negative pole.
2) Once the device is powered on, it will enter DC voltage test mode as default. Short press the mode button to enter the menu, short press the down button to place the cursor in the Diode mode, and short press the mode button to enter the Diode mode.

3) Contact the probe tip to diode positive terminal, connect the auxiliary ground lead to diode negative terminal, the screen will display the forward voltage drop, which indicates forward bias. If swapping the probe tip with auxiliary ground lead, the screen will not display voltage, which indicates reverse bias. It also displays the maximum and minimum values during measurement, as shown in (Figure 9).

5.8 Voltage & Polarity Testing

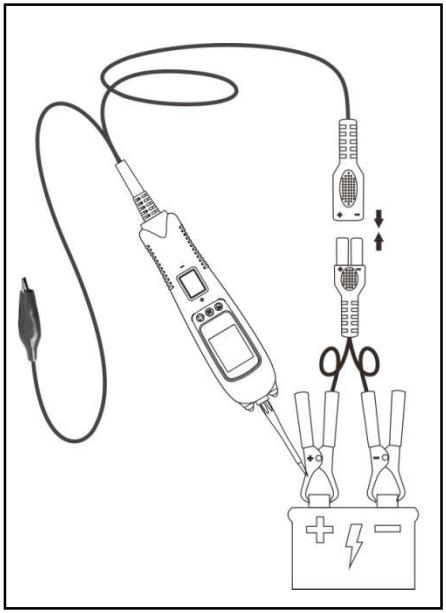


Figure 10

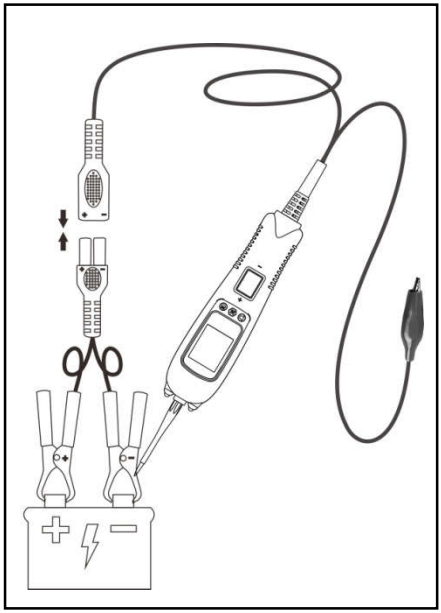


Figure 11

1) Clip the red alligator clip to the battery positive pole; Clip the black alligator clip to the battery negative pole.
2) Contact the probe tip to the circuit under test.
3) If contact the probe tip to a POSITIVE circuit (Figure 10), the red LED will light and the LCD displays the voltage with a highest resolution of 0.01V. A beep tone will sound. If contact the probe tip to a NEGATIVE circuit (Figure 11), the green LED will light and the LCD displays the voltage with a highest resolution of 0.01V. A beep tone will sound. If contact the probe tip to an OPEN circuit, neither of the LED will light.

5.9 Continuity Testing

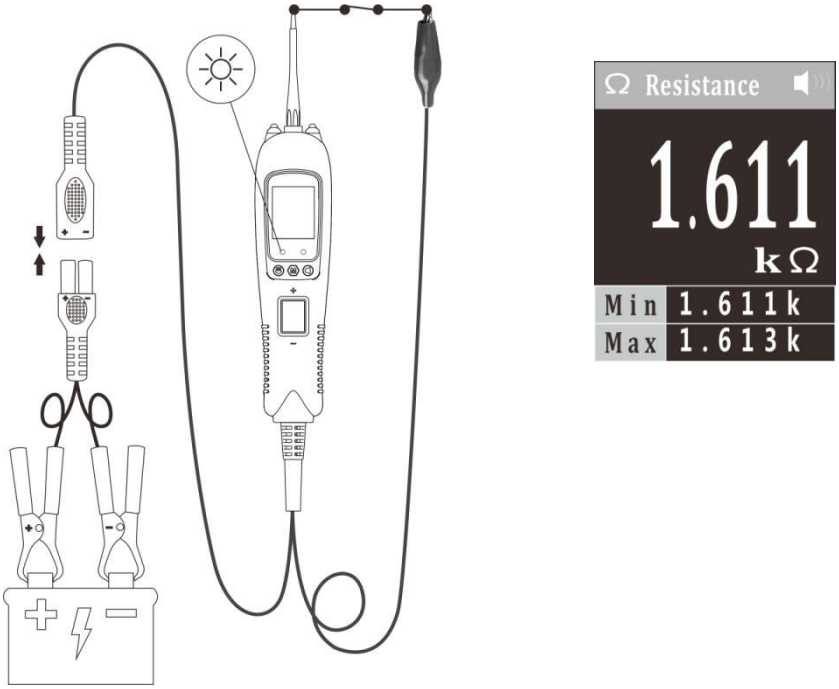


Figure 12

1) Clip the red alligator clip to the battery positive pole; Clip the black alligator clip to the battery negative pole.
2) Once the device is powered on, it will enter DC voltage test mode as default. Short press the mode button to enter the menu, short press the down button to place the cursor in the Resistance mode, and short press the mode button to enter the Resistance mode.
3) Using the probe tip and the auxiliary ground lead, it can test continuity of wires and components connected or disconnected with the vehicle's electrical system. When the probe tip is contacting a good ground, the LCD will show 0Ω and green LED will be on. A beep tone will sound .
4) In other cases, the LCD shows the resistance of the component under test, along with the maximum and minimum values during the measurement, as shown in Figure 12.
5) If the resistance value is greater than 1000KΩ, the LCD will show "0L".
6) Note: You can use the probe tip to pierce the plastic insulation on a wire. This means that you can test the circuit without disconnecting anything.

5.10 Signal Circuit Testing

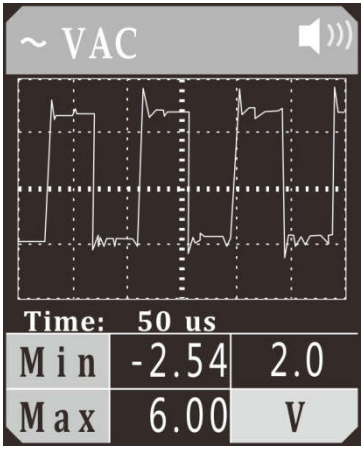


Figure 13

Once you extract a DTC from the vehicle and realize that troubleshooting begins with some kind of sensor circuit, there is a quick test you can perform to verify the code. Testing your sensor is easy while using the tool.
For example, if you suspect there is a problem with your M.A.P. sensor circuit, then you may follow the procedure involved to test this sensor:

1) Set the tool in AC Voltage mode, using the probe tip (with chassis ground) or the auxiliary ground lead.
2) Connect vacuum pump to MAP sensor.
3) Contact the probe tip to the MAP sensor positive terminal and observe the LCD readings which should be a sine wave in normal condition.
4) Apply vacuum.
5) Release vacuum and observe the LCD readings. (Figure 13)
6) If the LCD readings are abnormal, there is a problem with this sensor.

5.11 Activating Components in Your Hand

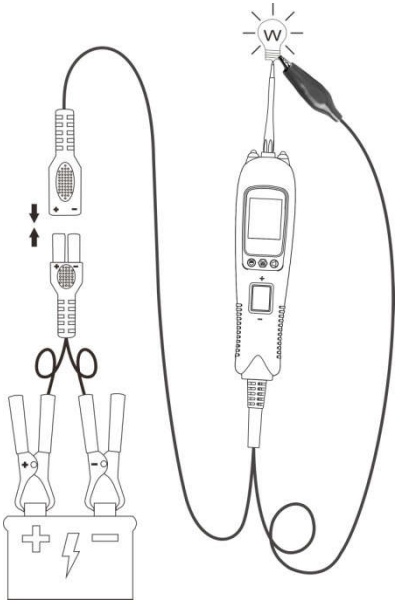


Figure 14

1) While the tool is in DC voltage mode, by using the probe tip in connection with the auxiliary ground lead, components can be activated right in your hand, thereby testing their functions.
2) Connect the auxiliary ground lead to the negative terminal or ground side of the component being tested. Then contact the probe tip to the positive terminal of the component, the green LED should light, indicating continuity through the component. While keeping an eye on the green LED, quickly press and release the rocker switch forward. If the green LED went out and the red LED came on, you may proceed with further activation. Rock the rocker switch forward and hold it down to provide power to your component. With the rocker switch rocked forward, power will flow from the positive lead on the battery into the probe tip, through the tip into the component's positive terminal, into the component and out of the component, through the auxiliary ground lead and back into the tool, and back to the vehicle's battery's ground.
3) Press the rocker switch forward to activate the bulb.(Figure 14). Contact the tip to the positive terminal of the bulb.Connect the negative auxiliary clip. If the green LED went off at that instant or if the circuit breaker tripped, the tool has been overloaded. This could happen for the following reasons:
   - The contact you are probing is direct ground or negative voltage.
   - The component you are testing is short-circuit.
   - The component is a very high current component (i.e., starter motor).

If the circuit breaker is tripped, reset it by waiting for it to cool down (about 1 minute).

5.12 Activating Components in the Vehicle

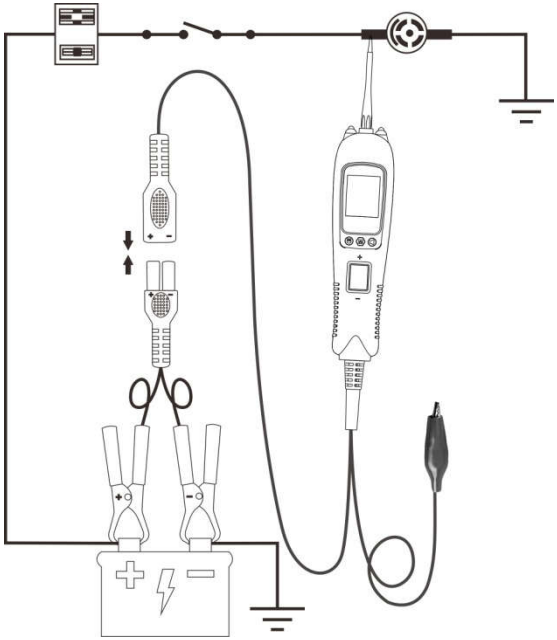


Figure 15

1) While the tool in DC Voltage mode, contact the probe tip to the positive terminal of the component, the green LED should light, indicating continuity to ground.
2) Observe the green LED, quickly depress and release the rocker switch forward. If the green LED went out and the red LED came on, you may proceed with further activation. (Figure 15) If the green LED went off at that instant or if the circuit breaker tripped, the tool has been overloaded. This could happen for the following reasons:
   - The contact you are probing is a direct ground.
   - The component you are testing is short-circuited.
   - The component is a very high current component (i.e., starter motor).

If the circuit breaker is tripped, reset it by waiting for it to cool down (about 1 minute.)

WARNING: Haphazardly applying voltage to certain circuits can cause damage to a vehicle's electronic components. Therefore, it is strongly advised to use the vehicle manufacturer's schematic and diagnosing procedure while testing.

NOTE: When powering up components, you can increase the life of rocker switch if you first press the switch, then contact the tip to the component. The arcing will take place at the tip instead of the contacts of the switch.

5.13 Testing Trailer Lights and Connections

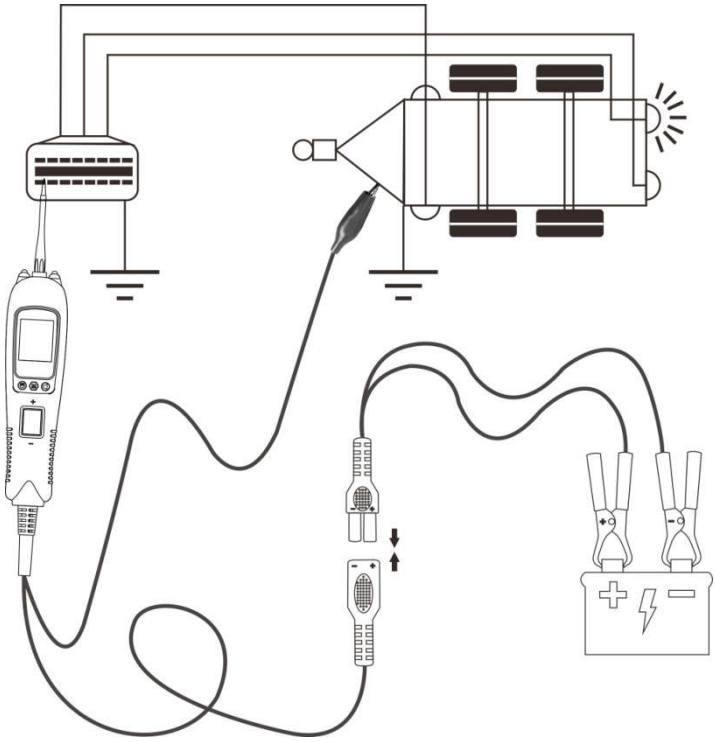


Figure 16

1) While the tool in DC Voltage mode, clip the auxiliary ground lead to the trailer ground, probe the contacts at the jack and then apply voltage to the probe tip. This may check the function and orientation of the connector and trailer lights. (Figure 16)
2) If the circuit breaker tripped, that contact is likely a ground. Reset the circuit breaker by letting it cool down for 1 minute.

5.14 Activating Components W/Ground

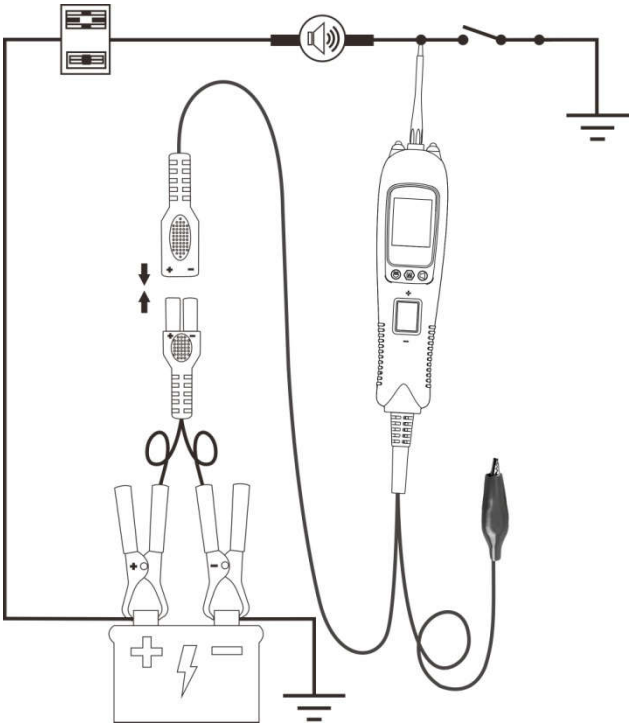


Figure 17

1) While the tool in DC Voltage mode, contact the probe tip to the negative terminal of the component, the red LED should light. While observing the red LED, quickly depress and release the rocker switch rearward. If the red LED went out and the green LED came on, you may proceed with further activation. (Figure 17)
2) If the green LED went off at that instant or if the circuit breaker tripped, the tool has been overloaded. This could happen for the following reasons:
   - The contact you are probing is a direct positive voltage.
   - The component you are testing is short-circuited.
   - The component is a very high current component (i.e., starter motor).

If the circuit breaker is tripped, reset it by waiting for it to cool down (about 1 minute.).

WARNING: With this function, if you are contacting a protected circuit, a vehicle's fuse can be blown or tripped if you apply ground to it.

5.15 Following & Locating Short Circuits

In most cases a short circuit will appear by a fuse or a fusible link blowing or an electrical protection device tripping (i.e., a circuit breaker). This is the best place to begin the search.
Remove the blow fuse from the fuse box.
Use the probe tip to activate and energize each of the fuse contacts. The contact which trips the circuit breaker is the shorted circuit. Take note of this wire's identification code or color.
Follow the wire as far as you can along the wiring harness.
Here is an example for this application.
If you are following a short in the brake light circuit, you may know that the wire must pass through the wiring harness at the door sill. Locate the color-coded wire in the harness and expose it.
Probe through the insulation with the probe tip, and depress the rocker switch forward to activate and energize the wire.
If the circuit breaker tripped, you have verified the shorted wire. Cut the wire and energize each end with the probe tip. The wire end which trips the circuit breaker again is the shorted circuit and it will lead you to the shorted area.
Follow the wire in the shorted direction and repeat this process until the short is located.

5.16 Checking for Bad Ground Contacts

Probe the suspected ground wire or contact with the probe tip.
Observe the green LED. Depress the rocker switch forward then release. If the green LED went out and the red LED came on, a beep will sound, this is not a true ground. If the circuit breaker tripped, this circuit is more than likely a good ground. Keep in mind that high current components such as starter motors will also trip the circuit breaker.

6. Parts List

Part	Description	Qty
1	Vehicle Super Probe	1
2	Probe Tip	1
3	Crochet Hook	1
4	Crochet Hook Extension Cable	1
5	Battery Clamp Cable	1
6	User's Manual	1
7	Rugged Blow Molded Case	1

Limited 90 Day Warranty

KZYEE makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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