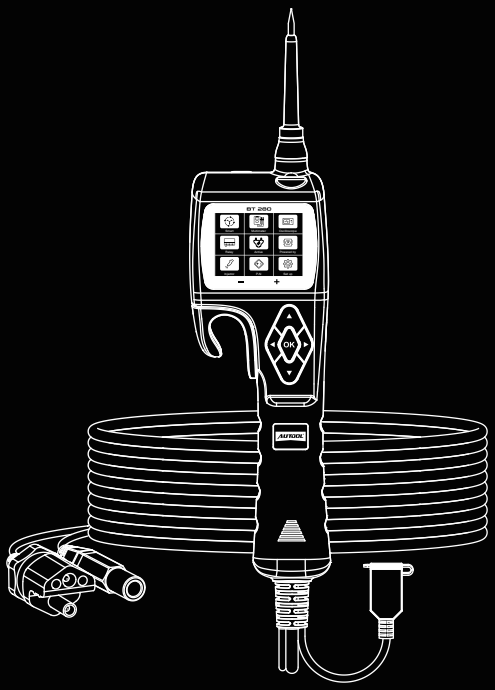
AUTOOL BT280

Electrical System Tester

User Manual
用户手册



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AUTOOL®

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CAUTIONS

Warning

⚠ Before using the instrument, please read this manual carefully for proper operation.

- Always perform automotive testing in a safe environment.
- Do not attempt to operate or observe the tool while driving a vehicle, operating or observing the tool will cause driver distraction and could cause a fatal accident.
- Wear safety eye protection that meets ANSI 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 P (for A/T) or N (M/T) 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 scan tool dry, clean free from oil / water or grease. Use a mild detergent on a clean cloth to clean the outside of the scan tool when necessary.
- Our company is not responsible for any damage caused by unintentional or deliberate misuse of our products or tools.

ABOUT BT280

Overview

The BT280 is the newest generation intelligent electrical system circuit tester with 2.4 inch large size LCD screen display. It is dedicated to test all 9V~30V vehicle electrical systems. BT280 is convenient, fast and intelligent!

Specifications

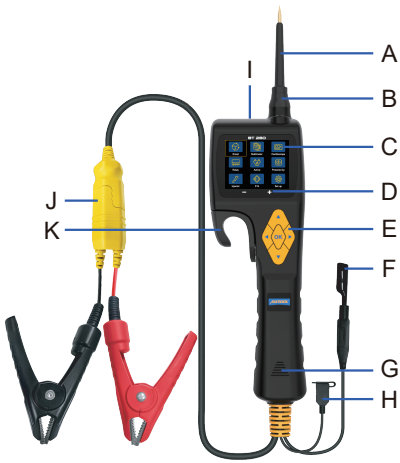
Display	**(320*240 DPI) TFT color display**
Working temperature	**0~60°C (32~140°F)**
Storage temperature	**-40~70°C (-40~185°F)**
External power supply	**12V or 24V Powered by battery**
Minimum working voltage	**9V**
Maximum working voltage	**30V**
Maximum measuring voltage	**100V**
Minimum measuring voltage	**0.1V**
Resistance measurement range	**1ohm~200K ohm**
Current measuring range	**0~18A**
Maximum continuous current	**18A**

Features

- Smart Test - Auto Detect Volts and Ohms
- Multimeter Mode (Voltage, Resistance, Diode, Open & Short, Current, Frequency)
- Circuit Breaker Protection (Current Adjustable)
- Screen Background Changeable
- Relay Test
- Diode Test
- Oscilloscope Test
- 0~5V Power Supply
- Component Activation
- Positive & Negative Test
- Multi-Languages
- Online update

PRODUCT STRUCTURE

Structure diagram



- **A - Probe Tip** – Contact the circuit or component for testing.
- **B - Front LED Light** – Used for lighting in dark working areas or when working at night.
- **C - LCD Screen** – Display test results.
- **D - Red / Green LED Indicator** – Positive and negative indicator light.
- **E - Key Button Operation** – 5 Keys Navigating for fast operation.
- **F - Auxiliary Ground Lead** – Auxiliary clip of ground lead (probe negative).
- **G - Speaker** – Buzzer for warning or remind.
- **H - USB Port** – Update by connect PC with USB cable to probe.
- **I - Relay Test Port** – Connect the relay test cable.
- **J - Power Connector** – Connect the battery clip to the car battery and extension cable.
- **K - HOOK** – Hook the probe in a suitable place to avoid broken and convenient in use.

PRODUCT USE

Power supply connection

The Probe is powered by the vehicle battery. Connect the RED clip to the positive pole of the battery, and the BLACK clip to the negative pole of the battery. The machine will automatically start to enter the working interface, The front LED light will illuminate the test area, which is convenient for operation in the dark area.

KEY Button operation

The Probe equipped with multi-function button adopts the latest scientific design. There are 5 physical buttons “Left”, “Right”, “Up”, “Down” and “OK”.

In different functional interfaces, the key functions performed are not exactly the same.

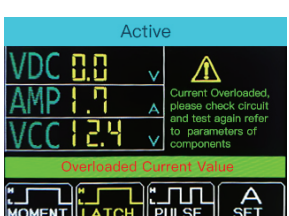
- **Left key** – Navigation key or exit key.
- **Right key –** Navigation key.
- **Up key –** Navigation key or voltage output, numerical adjustment.
- **Down button –** Navigation button or voltage output, numerical adjustmen.
- **OK –** Confirm key.

Circuit breaker protection

- **Short** – Circuit automatic protection - if current overloaded, its internal circuit breaker system will automatically tip for protection. The circuit breaker monitors this tool at all times. As an essential safety measure to prevent overload, it is a very practical function.
- **Fuse Protection –** Equipped with a 25amp fuse in the auxiliary grounding lead, which can be protected when the device is short-circuited or overloaded.

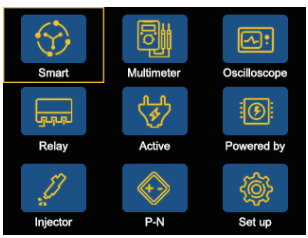
⚠ NOTE:

- Do not use the BT280 probe to test the voltage of the household AC Power (such as 110V, 220V plug), it may cause serious injury and property damage for improperly operation.



WORKING MODE

This probe adopts a 2.4-inch large color screen and 9-grid interface design, with clear display, simple operation and quick in use. You can select working mode through the navigation buttons and press OK to enter.

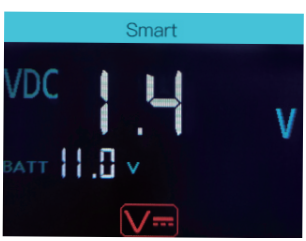


Smart test

The main test functions of this mode: voltage test, resistance test, Positive / negative test. (display as VDC, OHM). It is mainly used for quick test without switching between different test modes. Automatically recognize the measured signal and display values of voltage or OHMs.

Voltage Test Result

- How to use: When the probe clip (auxiliary ground lead) is connected to the ground wire, the probe will automatically enter the voltage display mode when a voltage signal detected on the probe Tip, it will display the test voltage.
- As shown in the figure, “BATT” means that the battery supply voltage is 9.9V, and “VDC” is the current test DC voltage value 10.0V.



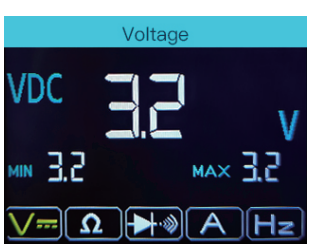
Resistance Test Result

- How to use: When the probe clip (auxiliary ground lead) is connected to an electrical circuit of resistance and the probe tip is connected to the other end of the resistance, the probe will automatically enter into the resistance display mode and display the resistance values.
- As shown in the figure: “BATT” means that the battery supply voltage is 9.9V, and “OHM” is the current test resistance value 0.0 Ω.

Postive / Negative Test

- When the probe detected voltage deviation of ±0.8v from the power supply, the RED LED lights ON, meanwhile it displays the voltage values, and the speaker sounds regularly. When Probe detected the negative signal of the power supply, the GREEN LED lights ON, and the speaker sounds regularly. (Speaker Enable / Disable in Setting)

Multimeter mode



Functions Display

- The bottom of the interface is the functional area from left to

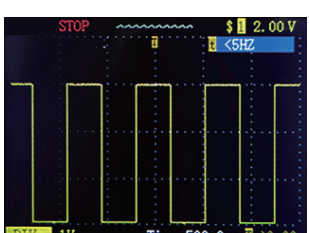
right are: DC voltage (VDC), resistance (OHM), diode/continuity test (DIO), current (AMP), frequency (HZ).

How to use

Press the “right” button to select the test mode. Press “Left” Button to exit.

- **DC voltage (VDC):**
  Connect the probe clip (auxiliary ground lead) to the negative pole, and connect the probe Tip to the measured voltage.
- **Resistance (OHM):**
  Connect the probe clip (auxiliary ground lead) to one side of the Resistance being measured, and the probe tip to the other side.
- **Diode / Continuity Test (DIO):**
  Connect the probe clip (auxiliary ground lead) to one side of the Diode being measured, and the probe tip to the other side. Meanwhile it will display the voltage and show positive and negative of diode.
- **Current (AMP):**
  The probe is connected in series in the circuit under test, it will display the current value.
- **Frequency (HZ):**
  Display the frequency of the measured signal and duty cycle value.

Oscilloscope mode



Instructions

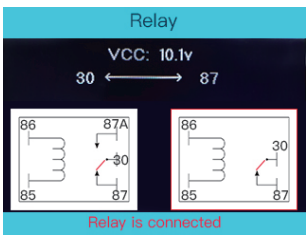
- “START / STOP” (press “OK” to Start or Stop waveform refresh).
- “DIV” voltage per grid (test range 1~49V) press up and down

keys to adjust the voltage value).

- “Time” time parameter.
- “HZ” Display test frequency.

*Press and hold left key to exit this working mode.

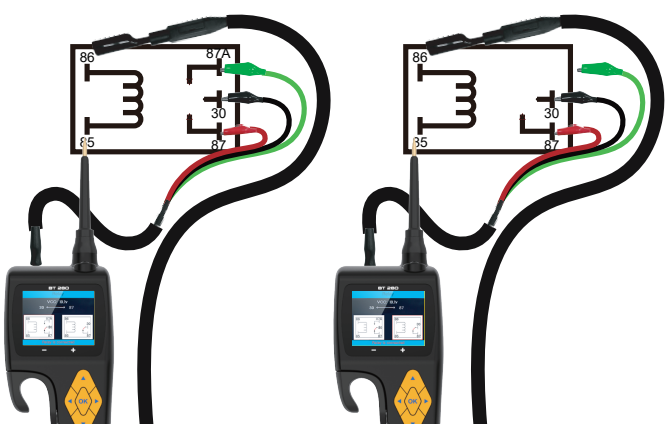
Relay test



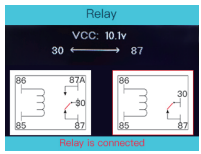
Instructions

- The “VCC” at the top of this interface displays the power supply voltage value. it shows 2 types of common automotive relay diagrams (5-terminal relay and 4-terminal relay). Press “Left” button to move selection, Press “OK” button to view the wiring connection diagram of these 2 different relays.

Relay wiring connection as figure below:



(5-terminal relay)



(Test Results)

(4-terminal relay)

For example, Test a 5-terminal relay

- Connect the relay test wire to probe.
- Connect the black wire to the relay terminal 30#.
- Connect the green wire to the relay terminal 87A#.
- Connect the red wire to the relay terminal 87#.
- Connect the auxiliary ground wire (negative clip) to terminal 86#.
- Connect the Probe Tip to the relay terminal 85#.
- Press the “UP” button to trigger the test.

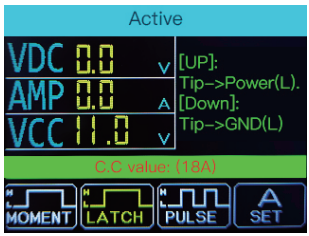
* The relay test result will be displayed at the bottom.

Component activation

⚠ NOTE:

- The activation mode is only designed for supply powers or ground, and cannot be used for any sensitive electronics equipment (such as ECU, sensor module), otherwise there is a risk of burning out components.
- Do not perform any tests on any ECU module, SRS (air bag) system before the system is completely disabled or unplugged.
- Supply power to electrical system will cause damage to the vehicle’s sensitive electronic components, so we strongly recommend that you refer to the vehicle manufacturer’s schematic diagram and diagnostic process.

The component activation function is designed to generate activation signals to the tested components, such as activating lights, motors and other on-board electric equipment.



Display Value

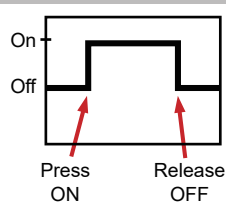
- **VDC:** Detected Voltage
- **AMP:** Detected Current
- **VCC:** Power Supply Voltage

Activation Type

- **"MOMENT" Mode:**

  Press "Right" button to select the activation mode to MOMENT mode.

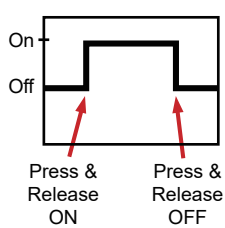
  Press and hold the "UP" / "Down" button to perform the power supply, Release "UP" / "Down" button to stop.



- **"LATCH" Mode:**

  Press "Right" button to select the activation mode to LATCH mode.

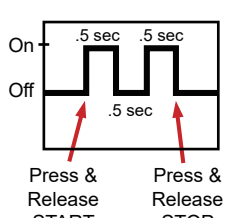
  Press the "UP" / "Down" button to perform the power supply, Press "UP" / "Down" button again to stop.



- **"PULSE" Mode:**

  Press "Right" button to select the activation mode to PULSE mode.

  Press the "UP" / "Down" button to perform the power supply, It will automatically supply power cycles in 1 second.



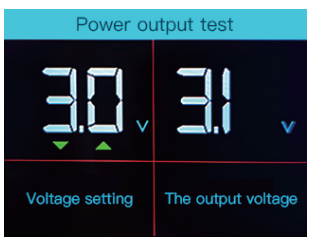
- **“SET” Circuit Breaker:**

  Press “Right” button to select the activation mode to SET mode.

  Press “UP” / “Down” button to adjust the overload current values from 1A~18A.

If the current flowing through the probe is greater than the set value, it will cut off the power and stop activation.

0~5V Power supply

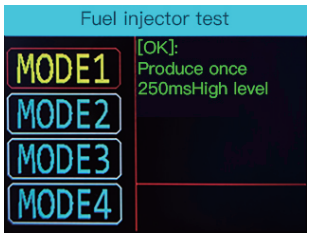


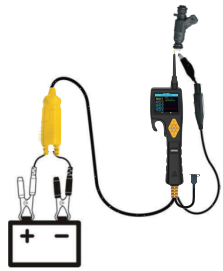
- The 0-5V power supply function is useful when checking the wiring to the ECU/ ECM. After you check the sensor with a multimeter, if there is still a problem, you can simulate the voltage output by the sensor to verify the wiring to the ECU.
- You can use the OBD scanner to diagnose the result in the ECU, you can set a power supply voltage from 0 to 5V (current <100mA) in 0.5 volt increments.
- There is a set point voltage alarm, in case the circuit connected to the probe tip will force the voltage to be higher or lower than the set point voltage to 0.1 volts, the device will sound an alarm to know that the output voltage is different from the set voltage. It can be disconnected and check for short circuit or other

⚠ NOTE:

▶ 0-5V power supply mode designed as an active mode, but its function is different from the component activation mode. It can adjust the voltage output under 5V and limit the current to 100mA. (This is safety to avoid burning out electric components).

Injector test





The probe outputs different pulse signals to the injector, and check the injector spraying status. This function can help diagnose injector conditions. It can work with any fuel pressure tester.

Signal Output Mode

- **MODE 1:**
  Press “OK” button to activate probe outputs 1 pulse. Pulse width is 250ms.
- **MODE 2:**
  Press “OK” button to activate probe outputs 50 pulses. Pulse width is 7ms.
- **MODE 3:**
  Press “OK” button to activate probe outputs 100 pulses. Pulse width is 4ms.
- **MODE 4:**
  Press “OK” button to activate probe outputs continuously at the rate of 50 pulses in 1450ms. every pulse width is 7ms, press “OK” button again to stop.

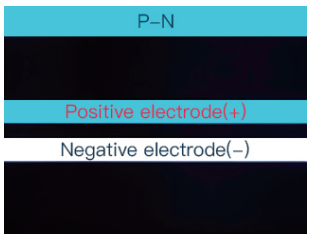
Test Fuel Injector

- Turn off the Vehicle’s engine
- Connect the BLACK clip to the negative terminal of the battery and the RED clip to the positive terminal of the battery.
- Unplug the connector from the fuel injector, connect the probe auxiliary ground lead to the negative side of the injector, and probe tip to the positive side of the injector.
- After enter into the injector test function, select the test mode.
- Press “OK” button to trigger the test.
- Check the injector spraying status to diagnose the condition.

Positive / Negative test

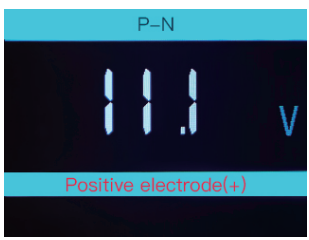
How to use

- Connect the probe negative clip to the vehicle ground wire, use the probe tip to find the positive / negative wire of the electric circuit system. The following interface is displayed default state:



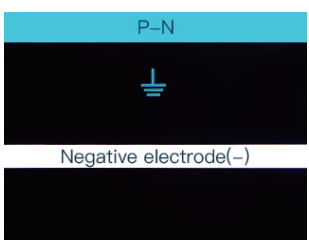
Positive Interface

- After detected positive signal, it will display voltage values and positive (+) symbol.

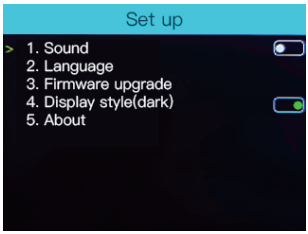


Negative Interface

- After detected negative signal, it will display ground icon and negative (+) symbol.



Setting



- From setting interface, you can set, sound, language, update, screen, use “UP” and “DOWN” button to select, press “OK” button to change parameters. Press “LEFT” button to save and exit.

Online Update

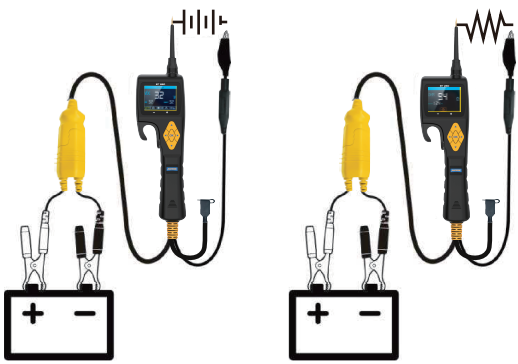
- After in setting interface, select update menu to enter into update mode. Connect PC with USB cable to probe, open update tool on computer to start update.
- Press “LEFT” and “OK” button on the same time to enter into update mode. Connect PC with USB cable to probe, open update tool on computer to start update.

TEST APPLICATIONS

Continuity testing

When the probe is in the “Multimeter mode” select resistance test function, Use the probe tip with chassis ground of the vehicle or auxiliary ground lead, continuity can be tested on wires and components attached or disconnected from the vehicles electrical system.

When the Probe is contacting a good ground, the LCD Screen will display “0.0Ω” and the green LED indicator will also light up. If the Sound enabled from setting, the buzzer will beep at the same time.



- In other cases, the LCD screen will only display the resistance value.
- If the resistance is greater than 200 KΩ, the LCD screen will display “0L” There is another way to verify the continuity of the connection to the ground or battery, while in component activation mode, you can supply power to the electrical system. if the circuit breaker trips, it means that this connections is a good connection with low resistance.

NOTE:

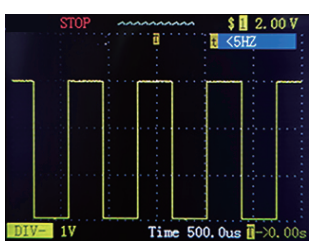
- Do not perform any tests on any ECU module, SRS (air bag) system before the system is completely disabled or unplugged.
- You can use the Probe Tip to pierce the plastic insulation on a wire to run test.

Signal circuit testing (Oscilloscope test)

Use an OBD2 Scanner to read out the FAULT CODE (DTC) from the vehicle and found the problem is with some kind of sensor circuit, there is a fast way to testing the sensors conditions with this probe.

For example, if you suspect that the problem is with the MAP sensor circuit of the vehicle, follow this procedure to testing the sensor.

- Enter into oscilloscope mode , use the probe tip with chassis ground or auxiliary ground lead.
- Connect the vacuum pump to M.A.P. sensor.
- Touch the probe tip to the positive terminal of the M.A.P. sensor and observe the LCD screen. Generally it should be with a Sine Waveform in good condition.
- Apply vacuum pump.
- Release the vacuum pump and observe the reading on the LCD screen.



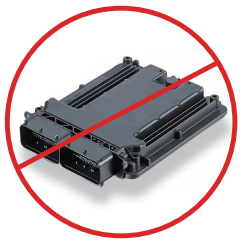
If the waveform reading is abnormal, there should be a problem with this sensor.

Activating components in your hand

For Example: Test a bulb working condition

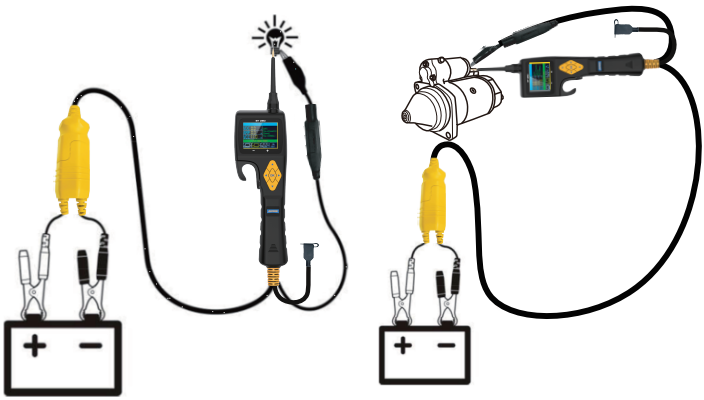
- Hook up the battery clip to power supply.
- Enter into component activation, select MOMENT modefunction.
- Connect the auxiliary ground lead to the negative terminal of the component being tested, Connect the probe tip to the positive terminal of the component, press “up” button to trigger activation test.

- The LCD screen will display the value of VDC, AMP, and VCC.



If the Probe restart for the circuit breaker tripped or the displayed message OVERLOADED on LCD screen, you can adjust the overload current value and repeat the above operation to further activation.

(To avoid burning out the component, please refer to the specification and parameter of component and then set the OVERLOAD CURRENT VALUE)



If the probe circuit breaker tripped, it means the probe is overloaded. This could happened by the following reasons:

- You have connected the probe tip to the direct ground or negative voltage.
- The component you are testing is short circuited.

- The component is a very high current component (such as STARTER MOTOR).

Activating components in vehicle

⚠ NOTE:

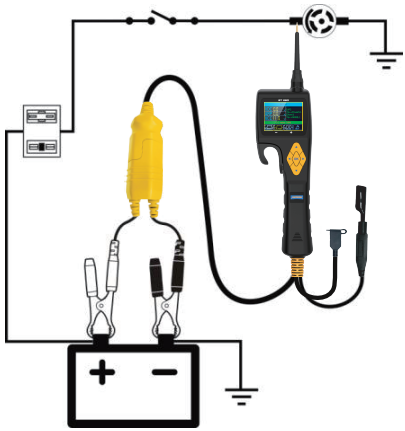
- The activation mode is only designed for supply powers or ground, and cannot be used for any sensitive electronics equipment (such as ECU, sensor module), otherwise there is a risk of burning out components.
- Do not perform any tests on any ECU module, SRS (air bag) system before the system is completely disabled or unplugged.
- Supply power to electrical system will cause damage to the vehicle's sensitive electronic components, so we strongly recommend that you refer to the vehicle manufacturer's schematic diagram and diagnostic process.

Test Procedure:

- Hook up the battery clip to power supply.
- Enter into component activation, select MOMENT mode function.
- Connect the auxiliary ground lead to the negative terminal of the component being tested.
- Connect the probe tip to the positive terminal of the component, press "UP" button to trigger activation test.
- The LCD screen will display the value of VDC, AMP, and VCC.

If the probe restart for the circuit breaker tripped or the displayed message OVERLOADED on LCD screen, you can adjust the overload current value and repeat the above operation to further activation.

(To avoid burning out the component, please refer to the specification and parameter of component and then set the OVERLOAD CURRENT VALUE)



If the probe circuit breaker tripped, it means the probe is overloaded. This could happened by the following reasons:

- You have connected the probe tip to the direct ground or negative voltage.
- The component you are testing is short circuited.
- The component is a very high current component. (such as STARTER MOTOR)

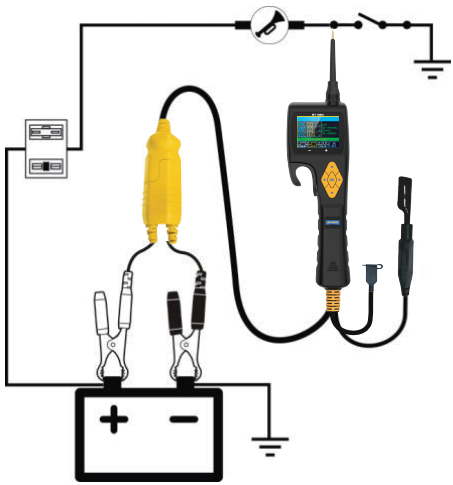
Activating components / Ground

Test Procedure

- Hook up the battery clip to power supply.
- Enter into component activation, select MOMENT mode function.
- Connect the auxiliary ground lead to the negative terminal of the component being tested.
- Connect the probe tip to the positive terminal of the component, press “DOWN” button to trigger activation test.
- The LCD screen will display the value of VDC, AMP, and VCC.

If the probe restart for the circuit breaker tripped or the displayed message OVERLOADED on LCD screen, you can adjust the overload current value and repeat the above operation to further activation.

(To avoid burning out the component, please refer to the specification and parameter of component and then set the OVERLOAD CURRENT VALUE)



If the probe circuit breaker tripped, it means the probe is overloaded. This could happened by the following reasons:

- You have connected the probe tip to the direct ground or negative voltage.
- The component you are testing is short circuited.
- The component is a very high current component. (such as STARTER MOTOR)

⚠ NOTE:

▶ If you are contacting a protected circuit, the vehicle fuse can be burn-out or probe tripped if you apply ground to it.

Checking for bad ground contacts

Use the probe tip to find the suspected ground wire.

- Enter into component activation interface. Select MOMENT mode function, set the overload current to 1A.
- Connect probe tip to a suspected wire.

- Press “OK” button to trigger power supply.

The RED led light will ON and LCD screen will display values of VDC, AMP and VCC, if the VDC value is almost the same as VCC and AMP value is minimum approach to 0A. it means this is not true ground. Otherwise, if probe circuit breaker tripped or display OVERLOADED, It probably the ground.

⚠ NOTE:

▶ Keep in mind that high current components such as starter motor will also trip the circuit breaker.

Following & Locating short circuits

In most cases, a short circuit will appear as a blown fuse or a tripping of an electrical protection device (such as a circuit breaker tripping).

This is the best place to start check the short circuit.

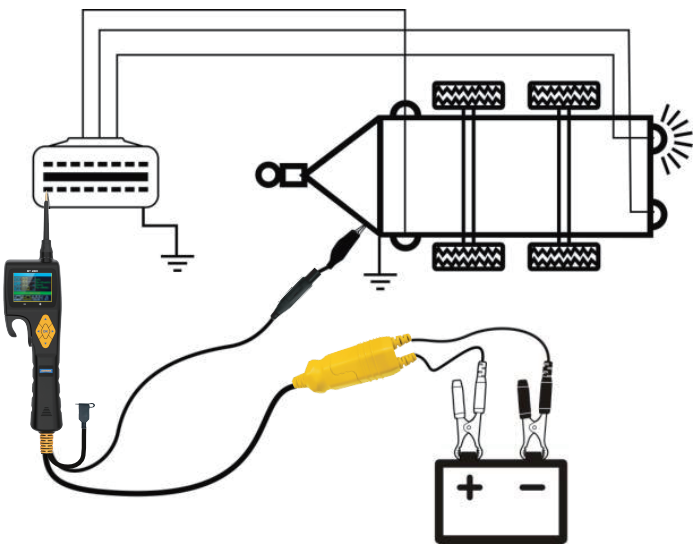
- Remove the blown fuse from the fuse box.
- Use the probe tip to activate each of the fuse contacts.
- While the circuit breaker trips is a short circuit. Record the number or color of the wire.
- Trace the wire as far as possible.

Here is an example for this application.

- If you are tracing a short circuit in the brake light circuit, you will know that the wiring harness must pass through the wire at the door sill, Locate the color-coded wire in the harness and expose it.
- While in component activation interface select MOMENT mode. Use the probe tip to contact the marked wire, press the “UP” button to trigger power supply.
- If the circuit breaker tripped, you have verified the shorted wire. Cut the wire and power supply each end with probe tip again.
- Follow the wire in the shorted direction and repeat this process until the short is located.

Trailer lights and connection test

- When the probe is in multimeter or SMART test, connect the probe auxiliary ground lead to the trailer light, and insert the probe tip into the OBD socket to display the current voltage. With this method you can check the function and direction of the connector and trailer lights. If you find the trailer light connection correctly, you can use the “Component Activation” function to test whether the trailer light is working or not working.



DESCRIPTION OF ACCESSORIES

Name	Name
BT280 Unit with 6 meters test line	Solid copper test probe tip
Extension connection line	Alligator battery clip
Relay test line	Probe adapter
25Amp fuse	User manual
ABS Toolbox	

MAINTENANCE SERVICE

Our products are made of long-lasting and durable materials, and we insist on perfect production process. Each product leaves the factory after 35 procedures and 12 times of testing and inspection work, which ensures that each product has excellent quality and performance.

Maintenance

To maintain the performance and appearance of the product, it is recommended that the following product care guidelines be read carefully:

- Be careful not to rub the product against rough surfaces or wear the product, especially the sheet metal housing.
- Please regularly check the product parts that need to be tightened and connected. If found loose, please tighten it in time to ensure the safe operation of the equipment. The external and internal parts of the equipment in contact with various chemical media should be frequently treated with anti-corrosion treatment such as rust removal and painting to improve the corrosion resistance of the equipment and extend its service life.
- Comply with the safe operating procedures and do not overload the equipment. The safety guards of the products are complete and reliable.
- Unsafe factors are to be eliminated in time. The circuit part should be checked thoroughly and the aging wires should be replaced in time.
- Adjust the clearance of various parts and replace worn (broken) parts. Avoid contact with corrosive liquids.
- When not in use, please store the product in a dry place. Do not store the product in hot, humid, or non-ventilated places.

WARRANTY

From the date of receipt, we provide a three-year warranty for the main unit and all the accessories included are covered by a one-year warranty.

Warranty access

- The repair or replacement of products is determined by the actual breakdown situation of product.
- It is guaranteed that AUTOOL will use brand new component, accessory or device in terms of repair or replacement.
- If the product fails within 90 days after the customer receives it, the buyer should provide both video and picture, and we will bear the shipping cost and provide the accessories for the customer to replace it free of charge. While the product is received for more than 90 days, the customer will bear the appropriate cost and we will provide the parts to the customer for replacement free of charge.

These conditions below shall not be in warranty range

- The product is not purchased through official or authorized channels.
- The product breakdown because the user does not follow product instructions to use or maintain the product.

We AUTOOL pride ourselves on superb design and excellent service. It would be our pleasure to provide you with any further support or services.

Disclaimer

All information, illustrations, and specifications contained in this manual, AUTOOL resumes the right of modify this manual and the machine itself with no prior notice. The physical appearance and color may differ from what is shown in the manual, please refer to the actual product. Every effort has been made to make all descriptions in the book accurate, but inevitably there are still inaccuracies, if in doubt, please contact your dealer or AUTOOL after-service centre, we are not responsible for any consequences arising from misunderstandings.

RETURN & EXCHANGE SERVICE

Return & Exchange

- If you are an AUTOOL user and are not satisfied with the AUTOOL products purchased from the online authorized shopping platform and offline authorized dealers, you can return the products within seven days from the date of receipt; or you may exchange it for another product of the same value within 30 days from the date of delivery.
- Returned and exchanged products must be in fully saleable condition with documentation of the relevant bill of sale, all relevant accessories and original packaging.
- AUTOOL will inspect the returned items to ensure that they are in good condition and eligible. Any item that does not pass inspection will be returned to you and you will not receive a refund for the item.
- You can exchange the product through the customer service center or AUTOOL authorized distributors; the policy of return and exchange is to return the product from where it was purchased. If there are difficulties or problems with your return or exchange, please contact AUTOOL Customer Service.

China	400-032-0988
Oversea Zone	+86 0755 23304822
E-mail	aftersale@autooltech.com
Facebook	https://www.facebook.com/autool.vip
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目 录

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注意事项

警告

⚠ 为了避免造成人身伤害或损坏车辆/检测设备，在使用仪器前请先阅读说明书并遵守以下安全保护措施

- 请确保在一个安全的环境中执行诊断测试或服务。
- 佩戴符合ANSL标准的安全保护眼镜。
- 将衣服、头发、手、工具、测试设备等远离所有正在运行或发热的设备。
- 由于测试时排出的废气有毒，请在通风良好的工作区测试车辆。
- 请在车轮底部放置阻块，勿在车辆处于无人看管的状态下测试。
- 在点火线圈周围工作时，要特别小心分器盖、点火导线和火花塞。这些组件在发动机运转时会产生危险高压。
- 在汽油/化学/电气装置附近放置灭火器以防发生火灾。
- 把变速箱档位挂停车挡（自动变速器）或空挡（手动变速器）并确保拉上手刹。
- 在点火开关打开或发动机运转时，请勿连接或断开任何测试设备。
- 当按压工具的电源开关，电池电流、电压会被直接传导到接触地面或某些电路，可能会产生火花。因此，请勿在易燃物，如汽油或其蒸气附近使用。通电工具的火花会引燃这些蒸气，所以请采取使用电焊机时同样的操作方式以确保安全。
- 保持设备干燥、清洁，无油、水或油脂。必要时请使用干净的布清洁设备。
- 本公司对于因无意或故意滥用我们的产品或工具而造成的任何损害，概不负责。

产品简介

概述

BT280是应用于快速测试所有9V-30V汽车电路系统的工具，具有高效先进的测试功能，能够大大提高用户的工作效率。

产品规格

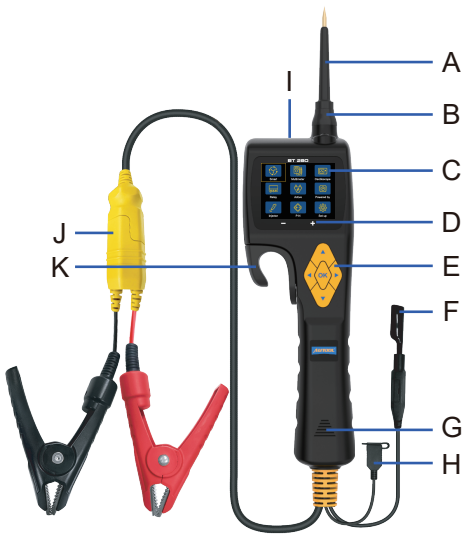
显示屏	(320*240 DPI) TFT 真彩显示屏
工作温度	0~60°C (32~140°F)
贮藏温度	-40~70°C (-40~185°F)
外接电源	12V或24V汽车蓄电池供电
最小工作电压	9V
最大工作电压	30V
最大测量电压	100V
最小测量电压	0.1V
电阻测量范围	1 欧姆~200K 欧姆
电流测量范围	0~18A
最大持续电流	18A

特征

- 电压/电阻智能识别
- 继电器测试
- 喷油器测试
- 万用表模式（测量电压，电阻，二极管，通断，电流和频率）
- 二极管测试
- 示波器功能
- 0-5V可调供电
- 车辆部件激活
- 正负极性测试
- 智能断路保护（过载可调）
- 屏幕风格背景可选
- 网络在线升级

产品结构

结构图



A	探针	接触线路或部件进行测试。
B	LED灯	黑暗的工作区或在夜间工作时照明用。
C	液晶显示屏	用于显示测试结果。
D	红/绿极性 检测指示灯	识别正极，负极或开路。当探针接触正级电路，红色指示灯亮起，当探针接触负级电路，绿灯亮起。
E	操作按钮	5键式快捷操作选择工作模式。
F	辅助接地引线	接地引线辅助测试功能（负极）。
G	扬声器	发出蜂鸣用于警告或提示。
H	USB端口	通过用USB线连接PC和探头进行更新。
I	端口	继电器测试线连接端口。
J	连接器	连接蓄电池夹到汽车蓄电池或延长线。
K	多功能挂钩	设备挂置合适的位置方便使用。

产品使用

电源连接方式

本产品通过汽车蓄电池供电，将红色蓄电池钳夹到汽车蓄电池的正极，黑色蓄电池钳夹到汽车蓄电池的负极。机器会自动启动进入工作界面，LED照明灯会照亮探针头的测试区域，方便在黑暗区域进行操作。

按键操作说明

电笔多功能按键采用最新科学设计，共有5个物理按键，包括：**“左键”、“右 键”、“上键”、“下键”、“OK键”**。

在不同的功能界面，五个按钮执行的功能也不完全相同。

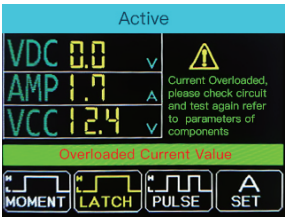
- **左键** - 导航键或退出键（进入功能菜单后按左键为退出功能）。
- **右键** - 导航键。
- **上键** - 导航键或电压输出，数值调节（激活功能菜单向上按键为正向电压输出功能）。
- **下键** - 导航键或电压输出，数值调节（激活功能菜单向下按键为反向电压导通功能）。
- **OK** - 确认键。

常见界面英文简写说明

- VDC: 直流电压
- VCC: 供电电压
- BATT: 电瓶电压
- AMP/A: 电流
- OHM: 电阻
- DIO: 二极管
- MOMENT: 瞬间模式
- LATCH: 锁定模式
- PULSE: 脉冲模式
- HZ: 频率
- MODE: 模式

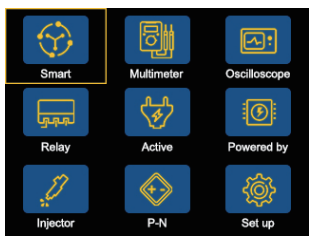
双重自动断路保护

- **短路自动保护功能**
  如果过载，其内部过载保护系统会自动断路保护，断路器会时刻监控设备本身，以防过载。
- **熔断保险管**
  辅助接地引线中置有20amp熔断保险管，当设备出现短路或过载时进行断电保护。



工作模式及测试应用

- 本产品采用2.4寸大彩屏9宫格界面设计，显示清晰，操作简单，使用快捷，您可以通过导航按键进行选择，按【OK】键进入。

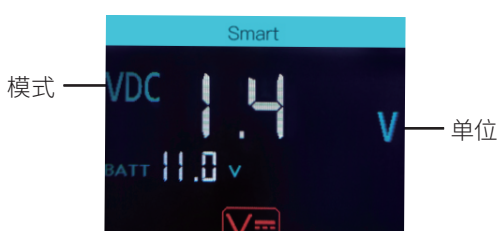


智能测试

该模式主要测试功能：电压测试，电阻测试，（对应显示模式，VDC，OHM，AMP）。主要用于快速测试，不用切换不同的测试模式。自动识别被测信号，智能判断是电压还是电阻，然后进行不同功能的显示。

电压显示

- 使用方法：当电笔夹子（辅助接地引线）接入地线，探头上感应到电压时会自动进入电压显示模式，并实时显示当前的电压。
- 如图显示“BATT”是电瓶供电电压为11.2V，“VDC”为当前测试直流电压的数值 1.4V。



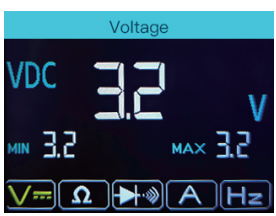
电阻显示

- 使用方法：当电笔夹子（辅助接地引线）接入线路电阻一端，探头接入电阻的另外一端，电笔会自动切入电阻显示模式，并实时显示当前线路的电阻值。

电源正负极功能

- 当系统检测到的电压与电源有±0.8V的偏差时，红色LED灯亮，VDC显示当前电源，喇叭规律性发声；当系统检测到电源负极时，绿色LED灯亮，同样地，喇叭会规律性发声。

万用表功能



功能区域

- 界面最下方是功能区域，从左到右依次是：直流电压（VDC），电阻（OHM），二极管/通断测试（DIO），电流（AMP），频率（HZ）。

使用方法

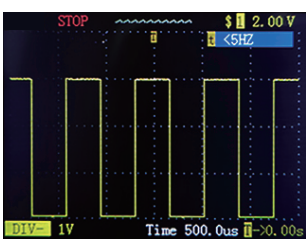
- **直流电压（VDC）：**将电笔的夹子（辅助接地引线）接入负极，探头接入被测电压。

- **电阻（OHM）：**将电笔的夹子（辅助接地引线）接入被测电阻一端，探头接被测电阻的另外一端。
- **二极管/通断测试（DIO）：**当电笔夹子（辅助接地引线）和探头接入的是普通二极管，界面显示该二极管的道通电压，并提示该二极管的正负极，当接入导线时会显示该导线的阻值，如果声音打开蜂鸣器会发声。
- **电流（AMP）：**显示外部电能流入电笔的电流值。
- **频率（HZ）：**显示被测信号的频率和对应的占空比值。

按键使用

- 使用“右键”按键进行功能的选择。
- 使用“左键”退出。

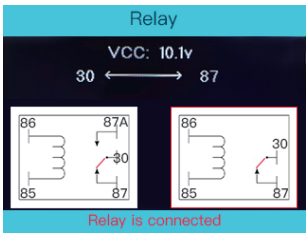
示波器



界面使用说明

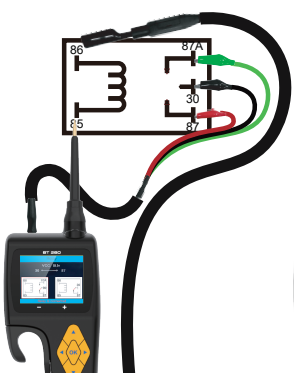
- “START”开始，“STOP”停止（按“OK”键运行或者停止波形的刷新）。
- “DIV”每格电压大小（测试范围1V-49V），按上下键调节电压值大小。
- “Time”时间参数。
- “HZ”显示测试频率。

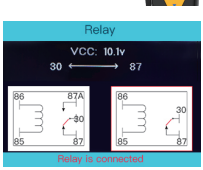
继电器



操作说明

- 此界面最上方“VCC”实时显示电源供电电压值，白色图示部分显示有2种常见的汽车用继电器框图（5端子继电器和4端子继电器），下面是30#引脚的连接状态，此状态是未连接状态，“左键”进行移动选择，“确认键”查看这2种不同继电器的接线效果图。





(5 端子继电器)　　(测试结果)　　(4 端子继电器)

例如 : 测试 5 端子继电器

- 1) 连接好继电器测试线

2) 将黑色导线连接到继电器端子 30
3) 将绿色导线连接到继电器端子 87A（绿色指示灯会亮）
4) 将红色导线连接到继电器端子 87
5) 将辅助接地导线（电笔负极）连接到端子 86
6) 将电笔探针连接到继电器端子 85
7) 按上键触发测试（红色指示灯应点亮，绿色指示灯应熄灭）
8) 松开按钮，红色指示灯熄灭，绿色指示灯点亮

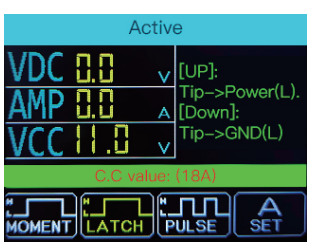
* 底部同时会显示继电器测试结果提示信息。

部件激活

⚠ 注意

- 激活模式仅仅设置于供电或者供地，不能随便用于敏感的电气设备（比如 ECU，传感器模块），否则有烧毁的风险。
- 在未完全禁用系统之前，切勿在任何 SRS(气囊) 系统上执行任何测试。

部件激活功能主要是产生激活信号传送至被测部件，比如激活电灯、电机等车载供电设备。



- 如图界面分3部分进行显示：电压电流显示区域，模式切换区域，文本提示区域。

电流电压显示

- VDC：电笔测试头电压值
- AMP：电笔测试头和大地之间的电流信号
- VCC：供电电压值

模式切换区域

- 界面最下方是功能选择区域，共有4个功能，有设置切换过载电流大小的功能，还有SET(过载电流设置）功能等。另外还有3种激活模式，分别为MOMENT(瞬间激活)，LATCH（锁定激活），PULSE(脉冲激活)。

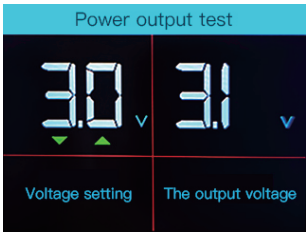
三种激活模式

- **“MOMENT”瞬间激活：(单次供电)**
  按住“上键”正向激活，此时电笔探头是电源电压，VDC会显示，AMP显示通过的电流。
  松开“上键”取消正向激活，电笔探头没有电压，VDC显示0V。
  如果“下键”被按下，电笔探头电源与负极相连，VDC显示0V，AMP显示通过的电流。
- **“LATCH”锁定试激活：(持续供电)**
  与“MOMENT”区别是不用持续的按“上键”或是“下键”，按一下即可。
- **“PULSE”脉冲式激活：(间隔式供电)**
  在此模式下，按“上键”按键，产生正向激活脉冲，脉冲的周期是1.0s，再次按“上键”电笔会取消正向激活脉冲信号。同理，“下键”按键会产生周期是1Hz 的接地脉冲信号。
- **“SET”过载电流设置：**
  用来设置切断电流，从1A~18A，使用“上键”和“下键”来进行增加或者减小。意思是在激活的过程种如果流过电笔的电流大于设置的值，电笔会切断电源，停止激活。

文本提示区域

- 提示性文件，当电笔切入不同的激活模式时，简略显示该模式下激活信号的特点。

0~5V供电模式

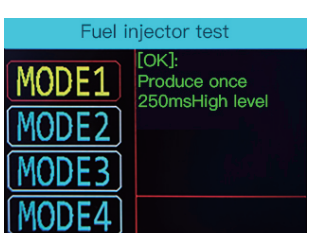


- 0-5V供电功能可以有效助力检查与ECU的接线。在您使用电压表或欧姆表检查传感器后，如果仍然存在问题，您可以模拟传感器输出的电压以验证去往ECU的接线，使用OBD扫描仪可以查看ECU的检测结果。设备可以选择从0~5V的供电电压（电流<100mA），以0.5V为增量。界面显示分为2个部分，左边的显示设置的电压（使用“上键”和“下键”按键来增加或者减小电压的设置值），右边显示实时采样电笔探头输出的电压值。具有一个设定点电压警报，以防连接到探头尖端的电路会迫使电压高于或低于设定点。电压为0.1V，设备将会响起警报声以便清楚输出电压与设置电压之间存在差异，可断开并检查电路是否出现短路或其他故障。

⚠ 注意

▶ 0~5V供电模式属于主动模式，但其功能与部件激活模式不同，它可对探头输出的电压进行调节，电流限制为100mA。

喷油嘴测试



喷油嘴测试原理

- 电笔通过输出不同的脉冲信号，然后把输出的信号接入到喷油嘴上，观察喷油嘴的好坏。

信号模式输出

共有4种脉冲信号模式，通过“上键”和“下键”进行模式选择，“OK”键产生对于模式的脉冲信号。

- **模式 1:**
  电笔产生250ms的高脉冲，按一下“OK”键，电笔输出一次。
- **模式 2:**
  电笔产生高7ms，低20ms的脉冲，总共持续1.4s，通过“OK”按键来启动。
- **模式 3:**
  电笔产生高4ms，低10ms的脉冲，总共持续1.4s，通过“OK”按键来启动。
- **模式 4:**
  电笔持续产生高7ms，低20ms的脉冲，通过“OK”按键来启动/停止。

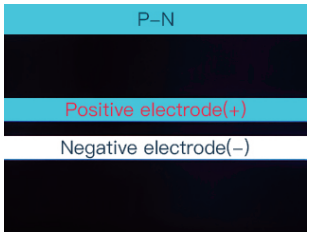
信号模式输出

- 1) 关闭汽车引擎。
- 2) 将黑色夹子连接至汽车电池的负极，将红色夹子连接至电池的正极。
- 3) 找到要测试的喷油器，然后从该喷油器上拔下电缆，并将测试仪的两个脉冲输出端子连接到该喷油器的电连接器上。拔掉被测试喷油嘴的连接器，将电笔的辅助接地引线连接喷油嘴的负极端，将探针接触到喷油嘴正极端。
- 4) 进入喷油嘴测试功能后选择相应该的测试模式。
- 5) 按OK键进行触发测试。
- 6) 观察喷油形态从而判断喷油嘴的好坏。

正负极测试

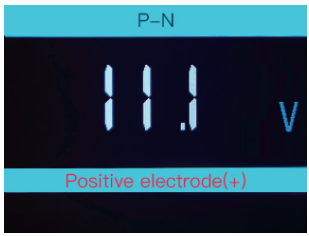
使用方法

- 电笔的负极夹子接入汽车地线上，电池的探头可以尝试寻找汽车电源的正极和负极。默认状态没有找到正负极的时候显示如下界面:



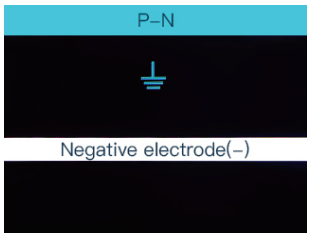
电笔找到正极界面

- 上部分实时显示正极性的电压值，下部分提示框显示“正极 (+)”。



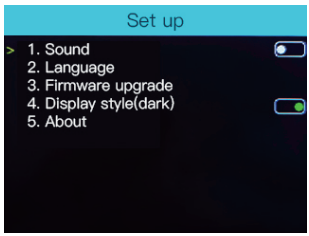
电笔找到负极界面

- 上部分显示接地图标，下部分提示框显示“负极 (-)”。



系统设置

系统设置分为五项。(声音，语言，升级，显示风格，关于)

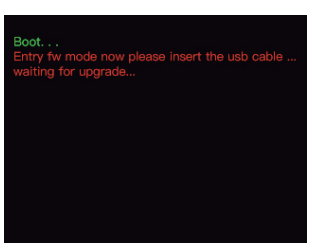


声音

- 使用上下键操作选择，当光标“>”选中“声音”选项时，使用“OK”键切换打开或关闭电笔的声音，按“左键”保存退出。发声是电笔内部蜂鸣器输出声音，应用于按键操作、报警声音以及其他提示声音（其它选项采用相同方式操作即可）。

在线升级

- 使用上下键操作选择[升级]菜单，按下“OK”进入升级模式后，界面显示如下图。此时，接入USB连线，打开电脑端升级软件，进行升级。



⚠ 注意

▶ 进入升级模式还有另一种方式即：电笔上电之前同时按住电笔的“左键”和“OK”按键，然后上电或是直接使用USB线进行供电、进行上电，电笔也会进入固件升级模式，同上图。此时可以松开“左键”和“OK”按键，使用电脑端软件进行升级。

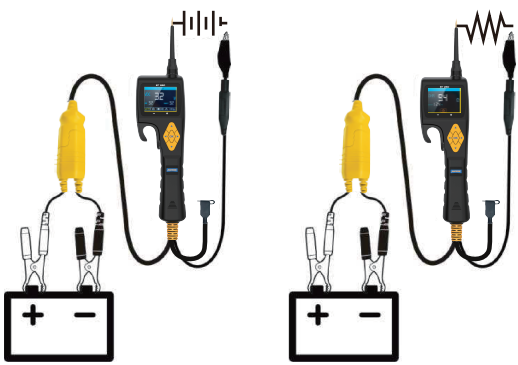
测试应用案例

连续性测试

当设备处于**万用表**电阻模式时，将探针接触汽车底盘或接地辅助线，可以连续性测试汽车电路系统的线路或部件，连接或者断开状态。当探针接地良好时，液晶显示屏会显示“0.0Ω”，同时绿色的LED 指示灯也会亮起。如果提示音功能已经开启，蜂鸣器会同时发出短提示音。

- 在其他情况下，液晶屏将只显示阻值。
- 如果阻值大于200千欧，液晶屏将显0L。

还有另外一种方法可以证明接地还是电瓶的连续性。用电源开关连接供电，如果断路器跳闸，说明此连接是一个良好的低电阻连接。



⚠ 注意

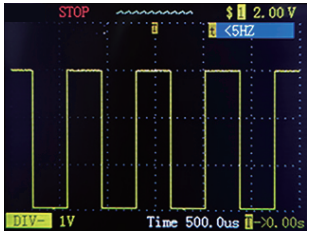
▶ 您可以使用锋利的探针刺破电线上的绝缘壁，如此您无需断开任何线路便可以测试该电路。

电路信号测试

一旦从汽车电脑中发现故障码，并且意识到该故障码是由于汽车电路传感器系统所导致，以下举例的方法可以快速地测试并验证该故障码。

例如，您怀疑车辆的M.A.P.传感器出现故障。那么，可通过下列方式逐步测试：

- 进入设备的示波器功能，用探针接触汽车底盘或接地辅助线。
- 连接真空泵与M.A.P.传感器。
- 将探针接触到M.A.P.传感器正极，并观察液晶显示屏，正常情况下显示内容应为正弦波形。
- 启用真空泵。
- 释放真空泵并观察液晶屏读数。



⚠ 注意

▶ 若液晶显示屏显示波形异常，即该传感器有故障。

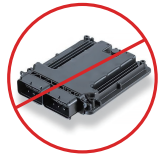
激活手中部件

⚠ 注意

▶ 激活模式仅仅设置于供电或者供地，不能随便用于敏感的电气设备（比如ECU，传感器模块），否则有烧毁的风险。

▶ 在未完全禁用系统之前，切勿在任何ECU，SRS（气囊），系统上执行任何测试。

▶ 随意施加电压到车辆电路会引起车辆电子部件的损坏，因此我们十分建议您在测试时请参考车辆制造商的原理图和诊断程序。



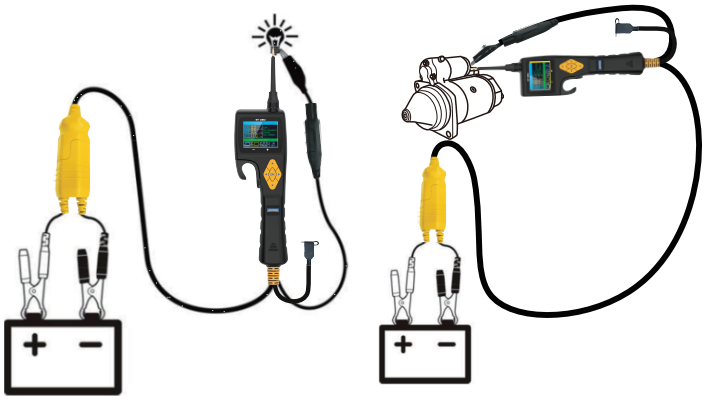
进入设备部件激活功能界面，将探针接触接地辅助线，您可以立即激活手中部件，从而测试它们的功能。

3种激活方式，假设过载电流设置到2A。

- **1)（MOMENT），瞬间激活，**此时激活界面下方黄色选中“MOMENT”模式，按压“UP”键不释放，红色LED灯亮起，表明此时电池正极接入电笔探头，电流将会从电瓶正极流入探针，通过探针流入部件的正极，流入部件后通过接地辅助引线流出部件，最后流回至汽车电瓶负极。激活界面中“VDC”实时显示探针的电压，AMP：显示通过电笔的电流，VCC：电源实时电压。如果发现电笔显示“设备过载”，但是供电部件并没有被激活，可使用“LEFT”选中“A”电流设置功能，使用“上键”增加电流，回到 “MOMENT”模式重复上述操作，进一步激活。
- **2）（LATCH），锁定激活功能，**与“MOMENT”的区别是，只需按一次“上键”，松开后电笔依然处于激活模式，如果再次按“上键”，电笔则会退出激活模式。
- **3) (PULSE），脉冲式激活，**按一次“上键”会有1s激活，然后自动断开1s，重复进行，部件会周期性激活或者关闭。如果再次按“上键”，则退出“PULSE”激活模式。

⚠ 注意

- ▶ 如果过载电流已经设置到最小值1A，激活时发现电笔断路或者跳闸，可能是设备短路到地，需要排查部件问题。
- ▶ 如果过载电流已经设置到最大值18A，激活时发现电笔断路或者跳闸，可能由于该部件是高电流部件（如启动马达等）。
- ▶ 不能随便用于敏感的电气设备（比如ECU，传感器模块），否则有烧毁的风险。



若设备熄灭，或者断路器跳闸，说明本产品过载，此种现象可能由如下原因导致:

- 您直接将探针接触到负极或地线。
- 您所测试的部件存在短路情况。
- 该部件是高电流部件（如启动马达等）。

激活车上部件

3种激活方式，假设过载电流设置到2A。

- **1)（MOMENT），瞬间激活，**此时激活界面下方黄色选中“MOMENT”模式，按压“UP”键不释放，红色LED灯亮起，表明此时电池正极接入电笔探头，电流将会从电瓶正极流入探针，通过探针流入部件的正极，流入部件后通过接地辅助引线流出部件，最后流回至汽车电瓶负极。激活界面中“VDC”实时显示探针的电压，AMP：显示通过电笔的电流，VCC：电源实时电压。如果发现电笔显示“设备过载”，但是供电部件并没有被激活，可使用“LEFT”选中“A”电流设置功能，使用“上键”增加电流，回到 “MOMENT”模式重复上述操作，进一步激活。
- **2)（LATCH），锁定激活功能，**与“MOMENT”的区别是，只需按一次“上键”，松开后电笔依然处于激活模式。如果再次按“上键”，电笔则会退出激活模式。

- **3) (PULSE)，脉冲式激活，**按一次“上键”会有1s激活，然后自动断开1s，重复进行，部件会周期性激活或者关闭。如果再次按“上键”，则退出“PULSE”激活模式。

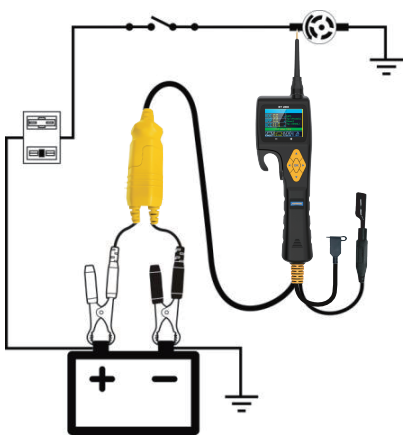
⚠ 注意

- ▶ 如果过载电流已经设置到最小值1A，激活时发现电笔断路或者跳闸，可能是设备短路到地，需要排查部件问题。
- ▶ 如果过载电流已经设置到最大值18A，激活时发现电笔断路或者跳闸，可能由于该部件是高电流部件（如启动马达等）。
- ▶ 不能随便用于敏感的电气设备（比如ECU，传感器模块），否则有烧毁的风险。

如果断路器跳闸，说明本产品过载，此种现象可能由如下原因导致：

- 您直接将探针接触到地线。
- 您所测试的部件存在短路情况。
- 该部件是高电流部件（如启动马达等）。

如果断路器跳闸，其冷却 15 秒后便会自动复位。



激活部件/接地

有3种激活方式，假设过载电流设置到2A。

当设备处于部件激活模式时，将探针接触至部件负极，此时激活界面VDC显示的电压接近VCC显示的电压值，表明电源已经加载到部件上，要激活该部件可以使用下面三种方式进行。

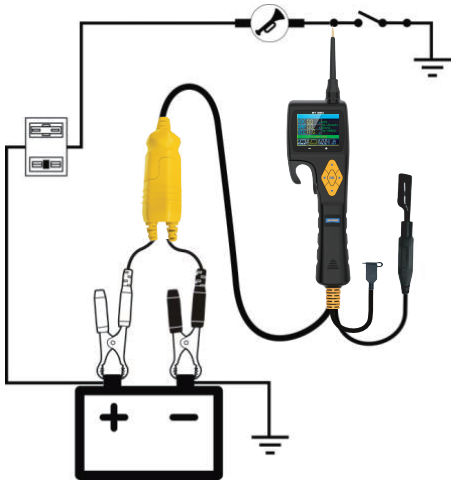
- **1)（MOMENT），瞬间激活，**此时激活界面下方黄色选中“MOMENT”模式，按压“DOWN”键不释放，绿色LED灯亮起，表明此时电源地线接入电笔探头，电流将会从电瓶正极流入部件正极，通过部件的负极流入探针，然后通过电笔流入电瓶负极。激活界面中“VDC”实时显示探针的电压，AMP：显示通过电笔的负电流，VCC：电源实时电压。如果激活时发现电笔显示“设备过载”，但是供电部件并没有被激活，可使用“LEFT”选中“A”电流设置功能，使用“上键”增加电流，回到“MOMENT”模式，重复上述操作，进一步激活。
- **2)（LATCH），锁定激活功能，**与“MOMENT”的区别是，只需按一次“上键”，松开后电笔依然处于激活模式。如果再次按“上键”，电笔则会退出激活模式。
- **3) (PULSE)，脉冲式激活，**按一次“上键”会有1s激活，然后自动断开1s，重复进行，部件会周期性激活或者关闭。如果再次按“上键”，则退出“PULSE”激活模式。

⚠ 注意

- ▶ 如果过载电流已经设置到最小值1A，激活时发现电笔断路或者跳闸，可能是设备短路到地，需要排查部件问题。
- ▶ 如果过载电流已经设置到最大值18A，激活时发现电笔断路或者跳闸，可能由于该部件是高电流部件（如启动马达等）。
- ▶ 不能随便用于敏感的电气设备（比如ECU，传感器模块），否则有烧毁的风险。

如果断路器跳闸，说明本产品过载，此种现象可能由如下原因导致：

- 您直接将探针接触到正极。
- 您所测试的部件存在短路情况。
- 该部件是高电流部件（如启动马达等）。



⚠ 注意

▶ 使用此功能时，如果您探触一个被保护的电路并搭上地线，车辆的保险丝可能熔断或跳闸。

检查地线不良接触

使用探针探测可疑的地线。

当设备处于部件激活模式时，假设过载电流设置到最小值 1A。

- **（MOMENT），**此时激活界面下方黄色选中“MOMENT”模式，按压“UP”键不释放，红色LED灯亮起，表明此时电池正极接入电笔探头，电流将会从电瓶正极流入探针，通过探针接触被测线路，如果激活界面中“VDC”实时显示探针的电压接近VCC电压，AMP显示的流过电笔的电路接近0，说明不是真正的地线，如果发现电笔显示“设备过载”，说明有可能是地线。

⚠ 注意

▶ 请牢记，高电流部件例如启动马达等也会使断路器跳闸。

追踪和定位短路电路

大多数情况下，短路会表现为一个保险丝熔断或电气保护装置跳闸（例如断路器跳闸）。这是检查短路开始的最佳位置。

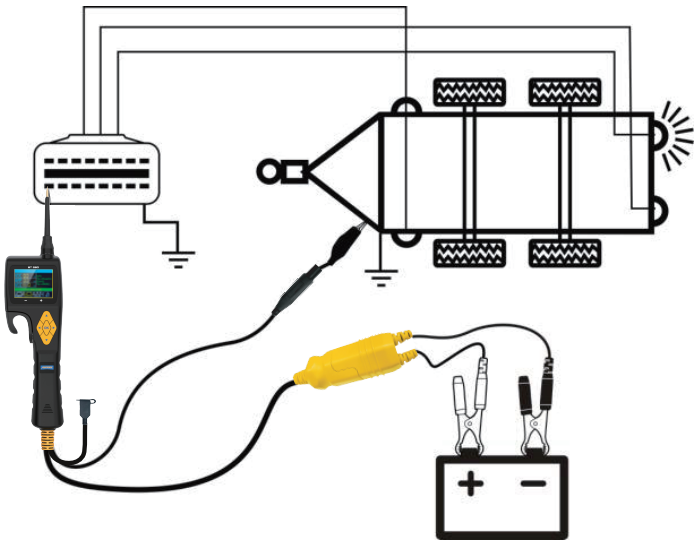
- 将熔断的保险丝从保险盒中取出。
- 用探针去激活并供给每个保险丝触点电流。
- 断路器跳闸的线路即为短路线路。
- 记录下线路的编号或颜色。
- 尽可能远地跟随导线来追踪线束。

示例：

- 如果您正在追踪刹车灯的短路线路，首先线束必须穿过导线的门槛，找到该线的颜色或编号并标记它。
- 用探针与绝缘处接触，使用“MOMENT”或者“LATCH”模式，按“上键”给线路通电激活。
- 如果电笔过载，表示已经验证了该线路短路。剪断该条线路并用探针分别给导线的两端加电。再次使电笔过载保护的一端即为短路端，它将引导您找到短路区域。
- 沿着导线短路的方向不断重复此操作过程，直到您找到短路的准确位置为止。

测试拖车灯和连接状态

- 当设备处于直流电压模式或者自动模式时，将接地辅助线连接至拖车灯的地线，将探针插入OBD脚位显示及时电压。通过此方法您可以检查连接器和拖车灯的功能和方向。如果正确找到拖车灯连线，可以使用《激活车上部件》方式测试拖车灯是否正常。



产品配件

名称	名称
主机 6 米长测试线	全铜测试探针
双通测试连接线	鳄鱼夹电瓶连接线
继电器测试线	探头适配器
20Amp 熔断保险管	操作说明书

维修保养服务

您所拥有的AUTOOL产品选用持久耐用的材料，AUTOOL坚持精益求精的生产工艺，每一件产品出厂都经过35道工序及12次质检工作，从而确保每一件产品都拥有卓越的品质及性能。所以您的AUTOOL产品值得您定期维护保养，使其将能够长期稳定地工作。

维修保养

维护保养是为了保持产品性能和外观，我们建议您仔细阅读以下产品保养指南：

- 注意不要将产品与粗糙表面摩擦或揉搓产品，特别是钣金外壳。
- 对产品中需要紧固和连接的部位经常进行检查，如发现松动应及时紧固，以保证产品的安全运行。对与各种化学介质接触的产品外部和内部零件要经常进行除锈、喷漆等防腐处理，以提高产品的抗腐蚀能力，延长产品的使用寿命。
- 遵守安全操作规程，不超负荷使用产品。产品的安全防护装置齐全可靠，及时消除不安全因素。电路部分彻底检查，老化电线要及时更换。
- 定期清洗和更换油泵、滤油器等易耗部件；调整各部位配合间隙和更换磨损（已坏）部件清洁时，避免产品接触带腐蚀性的液态物品。
- 不使用时，请将产品存放于干燥的位置。不要将产品存放在高温、潮湿或不通风的地方。

保修服务

AUTOOL主机自客户签收日起享有3年保修期。其所含附件自客户签收日起享有1年保修期。

保修方式

- 根据具体的故障情况对产品进行免费修理或更换；
- 我方保证所有更换的部件、附件或产品都是全新；
- 在客户收到产品90天内出现故障同时提供视频和图片，我方承担运费并免费提供相应配件给客户更换。收到产品超过90天，客户承担相应的费用，我方免费提供配件给客户更换；

以下情况不在免费保修范围：

- 非正规渠道购买AUTOOL的产品；
- 未按产品说明书要求使用和维护造成的损坏；

在AUTOOL，我们为精湛的设计和卓越的服务感到自豪。我们很乐意为您提供更多的支持或服务。

声明

偶然公司保留更改产品设计与规格的权利，届时恕不另行通知。实物外观与颜色可能与说明书中显示的有差别，请以实物为准。我们已尽最大努力力求使书中所有描述准确，但仍难免有不妥之处。如有疑问，请联系经销商或偶然售后服务中心。本公司对产品拥有最终解释权，不承担任何因误解而产生的后果。

退换货服务

退换货

- 如果您对从线上授权购物平台和线下授权经销商所购买的AUTOOL产品不满意，根据《AUTOOL全球销售条款》，您可以自收到产品之日起七日内退货；或者在产品交付之日起的30日内调换等值的其他产品。
- 退回及调换的产品必须处于完全可销售状态，并附上相关销售单单据，所有相关配件、纸质发票（如有）。
- AUTOOL将会对寄回退货的商品进行检查，以确保其处于完好无损的状态并且符合条件，相关条件详情请参阅《AUTOOL全球销售条款》。任何未通过检查的商品将退还给您，您将不会获得商品退款。
- 您可以通过客户服务中心或AUTOOL授权经销商调换产品；退换货原则为从哪里购买，就从哪里退换货。如果您退换货遇见困难或者阻碍，请联系AUTOOL客户服务中心。通过客户服务中心退换货时，我们建议您通过下面的方式进行：

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海外区域致电	+86 0755 23304822
E-mail	aftersale@autooltech.com
Facebook	https://www.facebook.com/autool.vip
YouTube	https://www.youtube.com/c/autooltech

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