

AUTOOL[®]

User's Manual

Intelligent Electrical System Circuit Tester



BT280

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Safety Precautions and Warnings

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

- Always perform automotive testing in a safe Environment.
- Do not attempt to operate or observe the tool while driving a vehicle, Operating or observing te 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

1. About BT280

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 !



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

1.1 Overview











- ① Probe Tip – contact the circuit or component for testing.
- ② Front LED light– Used for lighting in dark working areas or when working at night.
- ③ Red/green LED indicator– Positive and Negative indicator light.
- ④ LCD screen– Display test results.
- ⑤ Key Button Operation– 5 Keys Navigating for fast operation.
- ⑥ Speaker– Buzzer for warning or remind.
- ⑦ Auxiliary ground lead– Auxiliary clip of ground lead (probe negative).
- ⑧ Power Connector – Connect the battery clip to the car battery and extension cable.
- ⑨ Relay Test Port– Connect the relay test cable
- ⑩ HOOK– Hook the probe in a suitable place to avoid broken and Convenient in use.
- ⑪ USB Port– Update by connect PC with USB cable to probe

1.2 Specifications and Parameters

- ① LCD: (320*240 DPI) TFT color display
- ② Working temperature: 0–60°C (32–140 F°)
- ③ Storage temperature: 40–70°C (–40–185 F°)
- ④ External power supply: 12V or 24V Powered by battery
- ⑤ Minimum working voltage: 9V
- ⑥ Maximum working voltage: 30V
- ⑦ Maximum measuring voltage: 150V
- ⑧ Minimum measuring voltage: 0.1V
- ⑨ Resistance measurement range: 1 ohm~200K ohm
- ⑩ Current measuring range: 0~18A
- ⑪ Maximum continuous current: 18A

1.3 Packing List

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	

1.4 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.



1.5 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

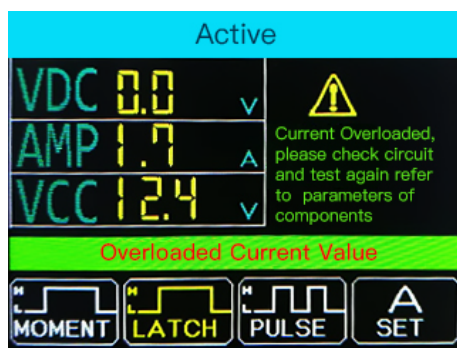
Down button–navigation button or voltage output, numerical adjustment

OK– Confirm key

1.6 Circuit Breaker Protection

1. **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.
2. **Fuse Protection**– Equipped with a 25amp fuse in the auxiliary grounding lead, which can be protected when the device is short–circuited or overloaded.

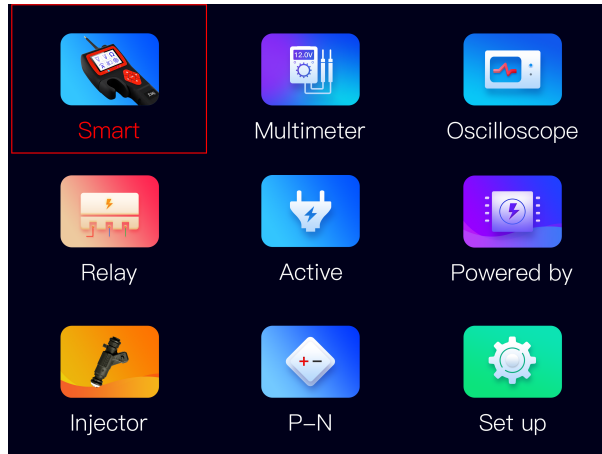
* Do not use the BT280 probe to test the voltage of the household AC Power (such as 110V, 220V plug), , it may cause serious injury and property damage for improperly operation.



Working Mode

2.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.



2.1 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.

2.1.1 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.

2.1.2 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.

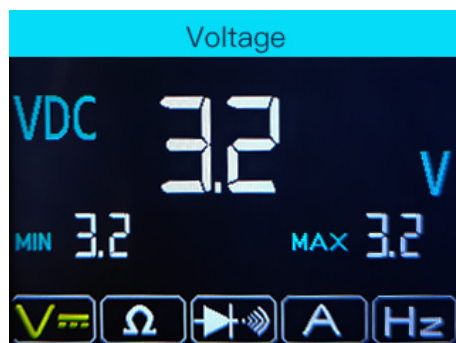


As shown in the figure: “BATT” means that the battery supply voltage is 9.9V, and “OHM” is the current test resistance value 0.0 Ω.

2.1.3 Postive/Negative Test

When the probe detected voltage deviation of $\pm 0.8v$ 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)

2.2 Multimeter Mode



2.2.1 Functions Display

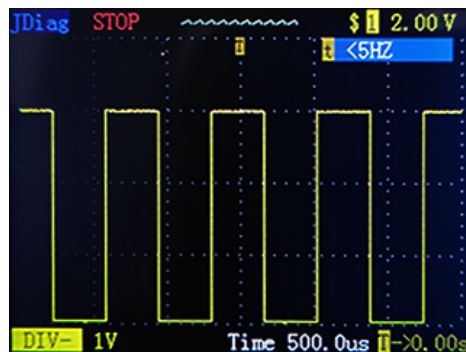
The bottom of the interface is the functional area from left to right are: DC voltage (VDC), resistance (OHM), diode/continuity test (DIO), current (AMP), frequency (HZ).

2.2.2 How to use:

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

- 1) **DC voltage (VDC):** Connect the probe clip (auxiliary ground lead) to the negative pole, and connect the probe Tip to the measured voltage.
- 2) **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.
- 3) **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.
- 4) **Current (AMP):** The probe is connected in series in the circuit under test ,it will display the current value .
- 5) **Frequency (HZ):** Display the frequency of the measured signal and duty cycle value.

2.3 Oscilloscope Mode



Instructions:

“START/STOP” (press “OK” to Start or Stop waveform refresh)

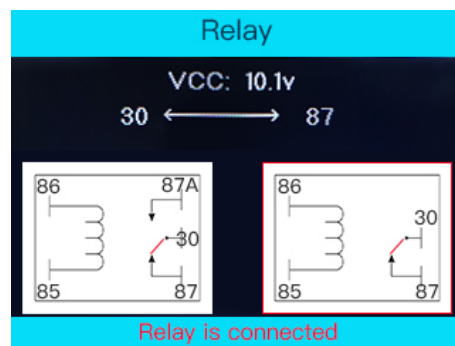
“DIV” voltage per grid (test range 1V–49V) Press up and down keys to adjust the voltage value)

“Time” time parameter

“HZ” Display test frequency

*Press and hold left key to Exit this working mode

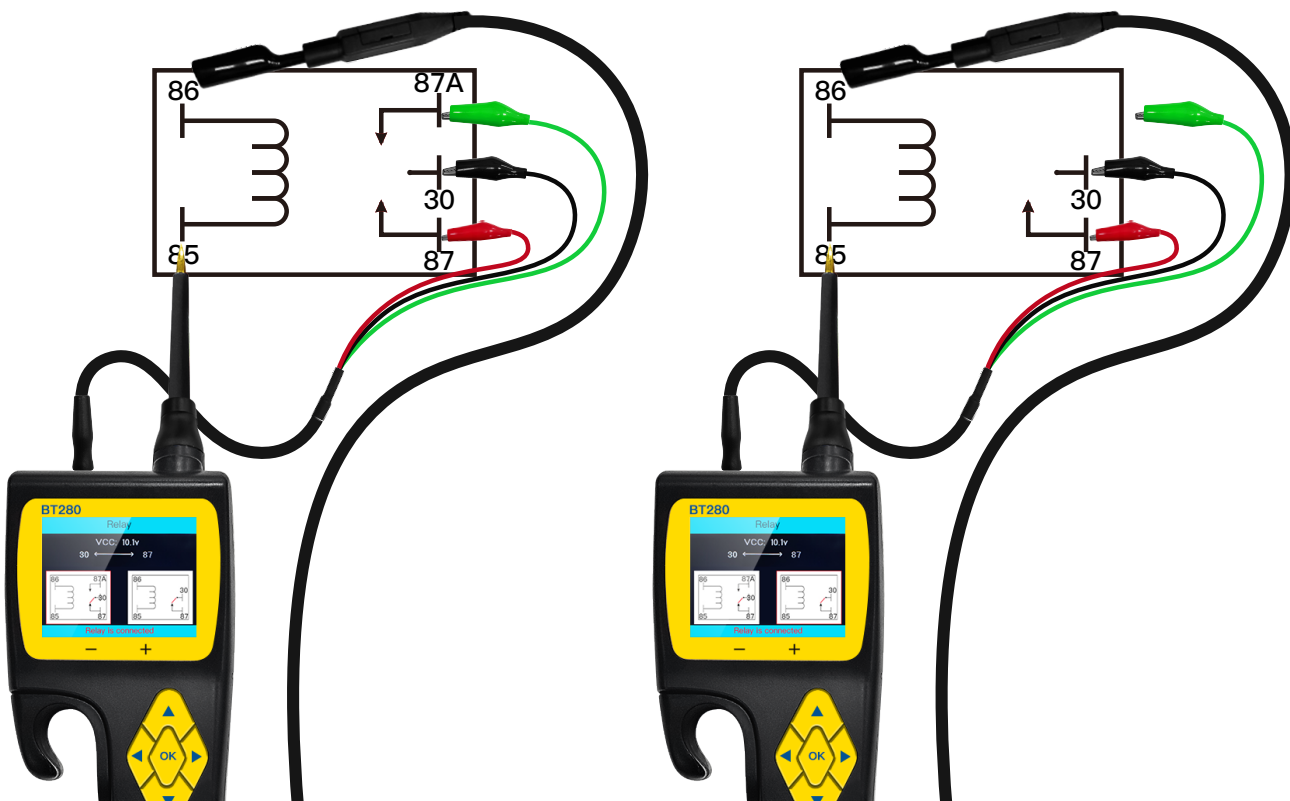
2.4 Relay Test



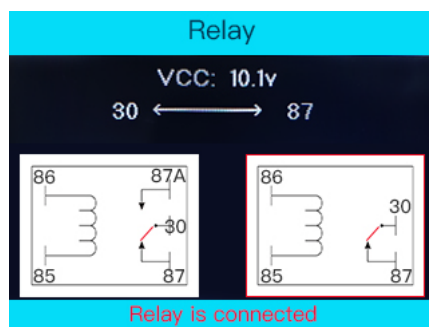
Instructions:

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.

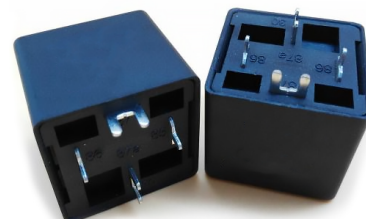
Relay wiring connection as figure below:



(5-terminal relay)



(Test Results)



(4-terminal relay)

For example, Test a 5-terminal relay

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

* The relay test result will be displayed at the bottom

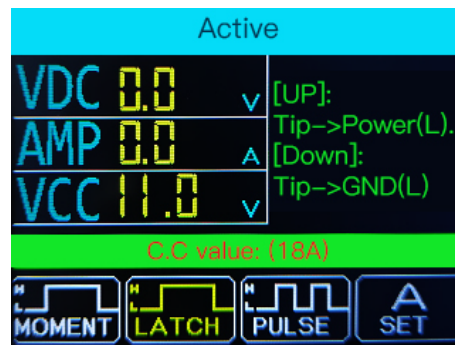
2.5 Component Activation

Warning: 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.

Warning: Do not perform any tests on any ECU module ,SRS (air bag) system before the system is completely disabled or unplugged.

Warning: 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.



2.5.1 Display Value

VDC : Detected Voltage

AMP : Detected Current

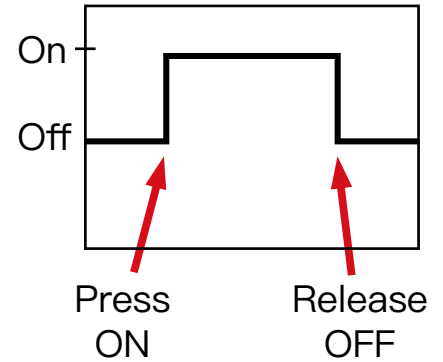
VCC : Power Supply Voltage

2.5.2 Activation Type:

“MOMENT” Mode:

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

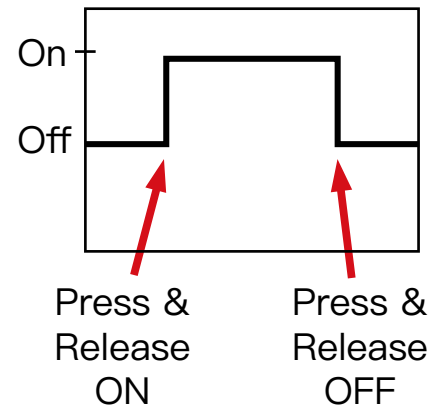
Press and hold the “UP” /” Down” button to perform the power supply , Release “UP” /” Down” button to stop.



“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.

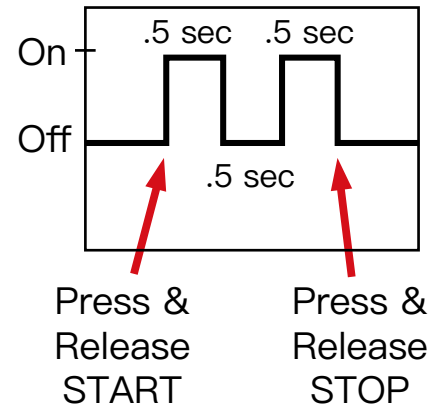


“PULSE” mode:

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.

Press “UP” /” Down” button again to stop.



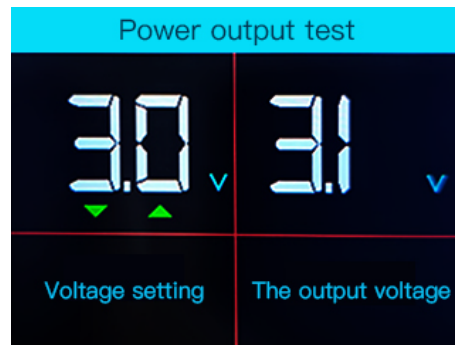
“SET” Circuit Breaker :

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.

2.6 0–5V Power Supply



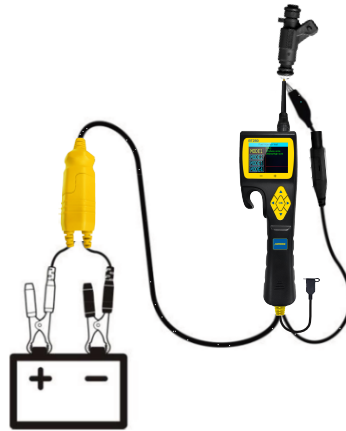
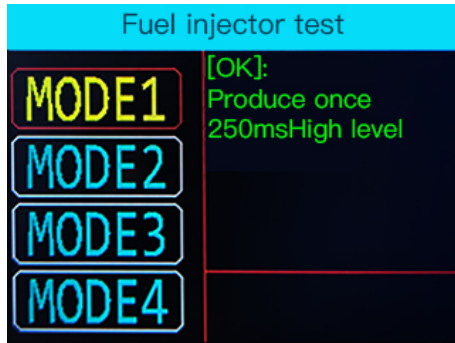
The 0–5V power supply function is useful when checking the wiring to the ECU/ECM. After you check the sensor with a Multimeter , if there is still a problem, you can simulate the voltage output by the sensor to verify the wiring to the ECU.

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 faults.

* 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).

2.7 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.

2.7.1 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 1450 ms . every pulse width is 7ms, Press "OK" button again to stop.

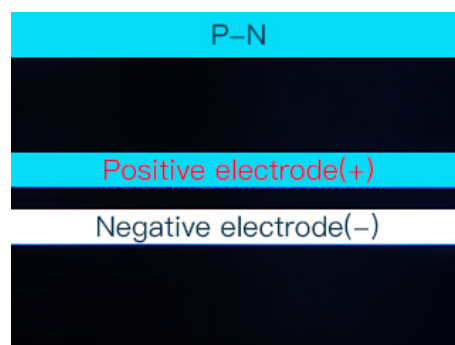
2.7.2 Test Fuel Injector:

- 1). Turn off the Vehicle' s engine
- 2). Connect the BLACK clip to the negative terminal of the battery and the RED clip to the positive terminal of the battery.
- 3). 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.
- 4). After enter into the injector test function, select the test mode.
- 5). Press "OK" button to trigger the test.
- 6). Check the injector spraying status to diagnose the condition.

2.8 Positive/Negative Test

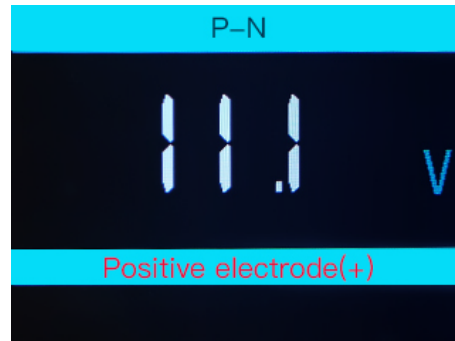
2.8.1 How to use:

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:



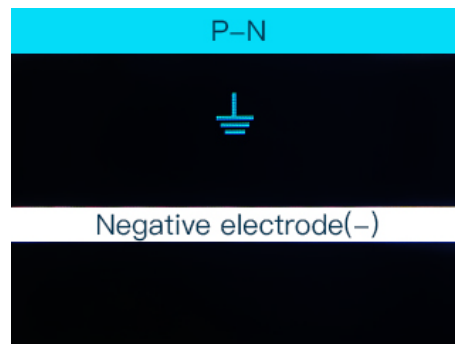
2.8.2 Positive Interface:

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

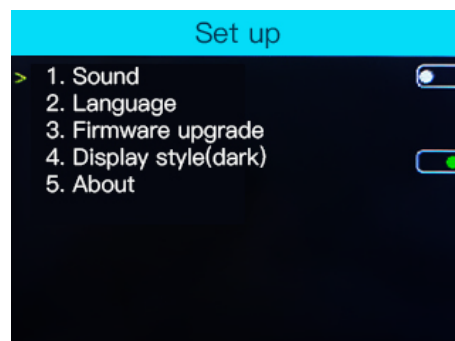


2.8.3 Negative Interface:

After detected Negative signal , it will display Ground icon and Negative (-) symbol.

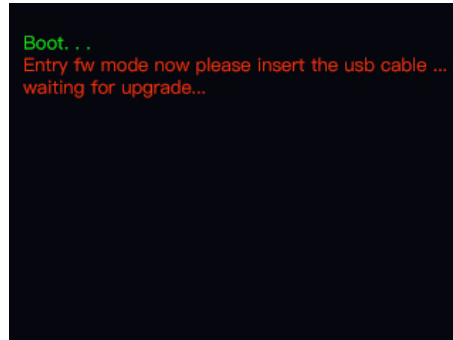


2.9 Setting



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.

2.10 Online Update



1. 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.
2. 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.

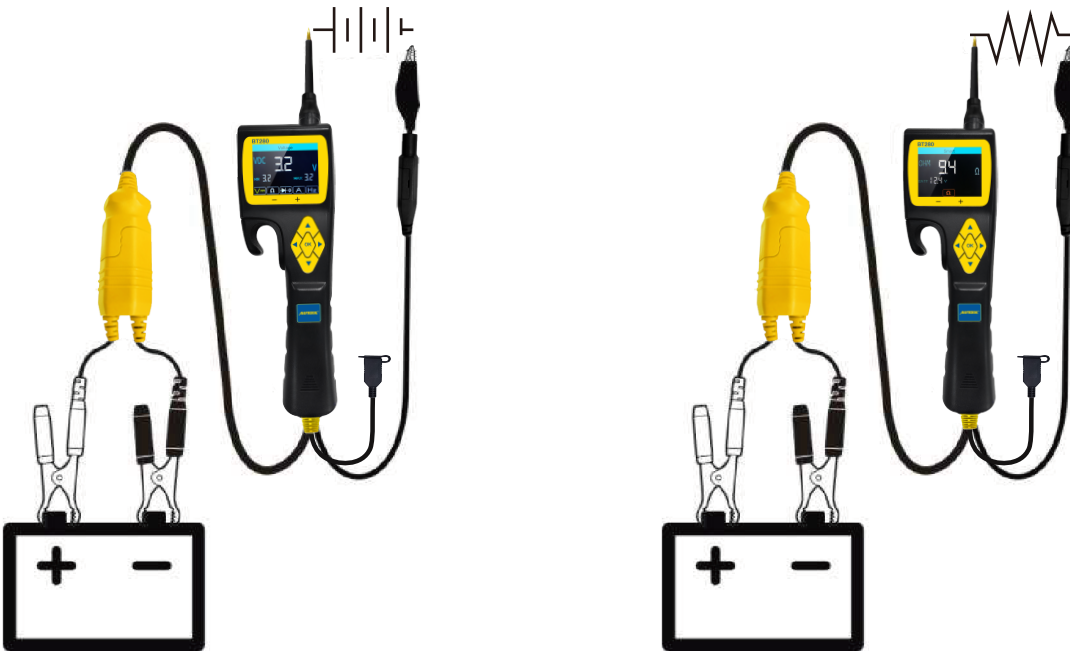
Test Applications

3. Test Applications

3.1 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 “OL”

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.

Warning: Do not perform any tests on any ECU module ,SRS (air bag) system before the system is completely disabled or unplugged.

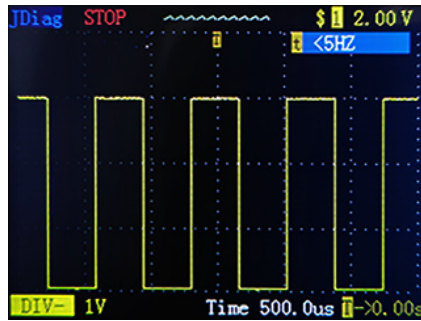
Note: You can use the Probe Tip to pierce the plastic insulation on a wire to run test.

3.2 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.

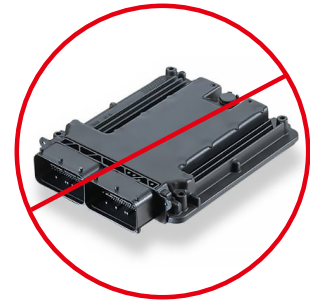
- Enter into **Oscilloscope Mode** , use the Probe Tip with Chassis ground or auxiliary ground lead.
- Connect the vacuum pump to M.A.P. sensor.
- Touch the Probe Tip to the positive terminal of the M.A.P. sensor and observe the LCD screen.Generally it should be with a Sine Waveform in good condition.
- 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.

3.3 Activating Components in Your Hand

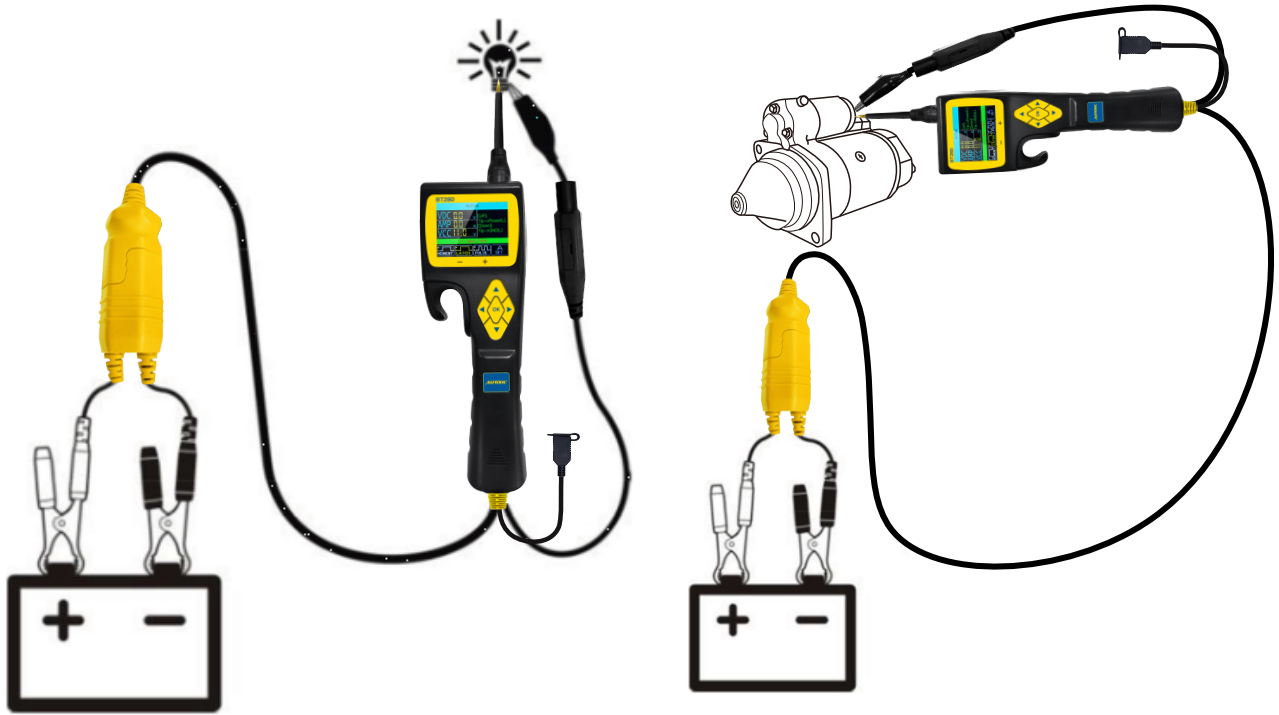
For Example: Test a Bulb Working Condition



- 1) Hook up the Battery Clip to power supply
- 2) Enter into **Component Activation** , Select **MOMENT** mode function.
- 3) Connect the auxiliary ground lead to the negative terminal of the component being tested, 3.Connect the Probe Tip to the positive terminal of the component, Press “UP” button to trigger activation test.
- 4) 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 happen 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).

3.4 Activating Components in Vehicle

Warning: 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.

Warning: Do not perform any tests on any ECU module, SRS (air bag) system before the system is completely disabled or unplugged.

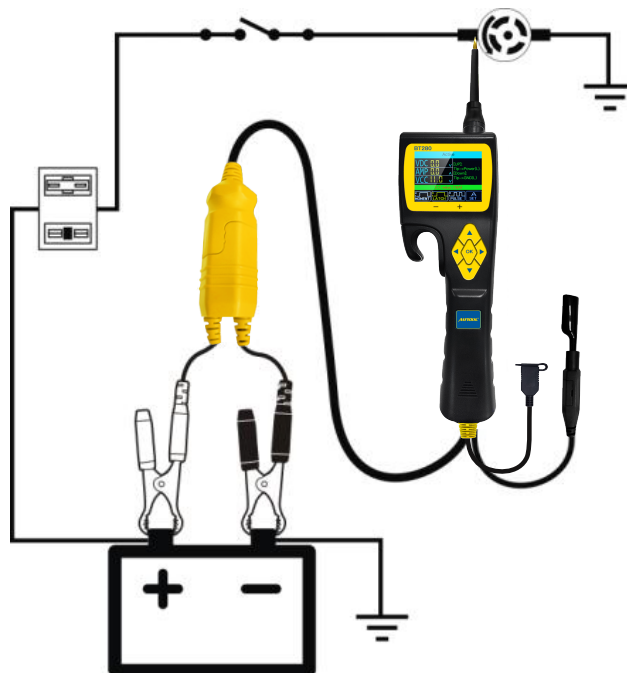
Warning: Supply Power to electrical system will cause damage to the vehicle's sensitive electronic components, so we strongly recommend that you refer to the vehicle manufacturer's schematic diagram and diagnostic process .

Test Procedure:

- 1) Hook up the Battery Clip to power supply.
- 2) Enter into **Component Activation** , Select **MOMENT** mode function.
- 3) Connect the auxiliary ground lead to the negative terminal of the component being tested.
- 4) Connect the Probe Tip to the positive terminal of the component, Press **"UP"** button to trigger activation test.
- 5) 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 have 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**)

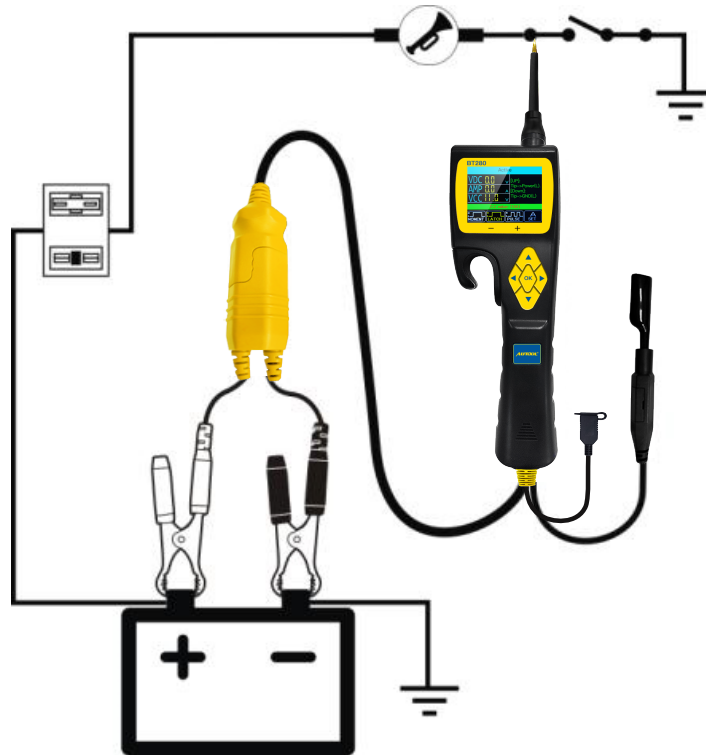
3.5 Activating Components w/Ground

Test Procedure:

- 1). Hook up the Battery Clip to power supply
- 2). Enter into Component **Activation** , Select **MOMENT** mode function.
- 3). Connect the auxiliary ground lead to the negative terminal of the component being tested.
- 4). Connect the Probe Tip to the positive terminal of the component, Press **“DOWN”** button to trigger activation test.
- 5). The LCD screen will display the value of VDC, AMP, and VCC.

If the Probe restarts 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 happen 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**)

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

3.6 Checking for Bad Ground Contacts

Use the Probe Tip to find the suspected ground wire.

- 1) Enter into **Component Activation** interface. Select **MOMENT** mode function, Set the overload current to 1A.

- 2) Connect Probe Tip to a suspected wire.
- 3) 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.

3.7 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.

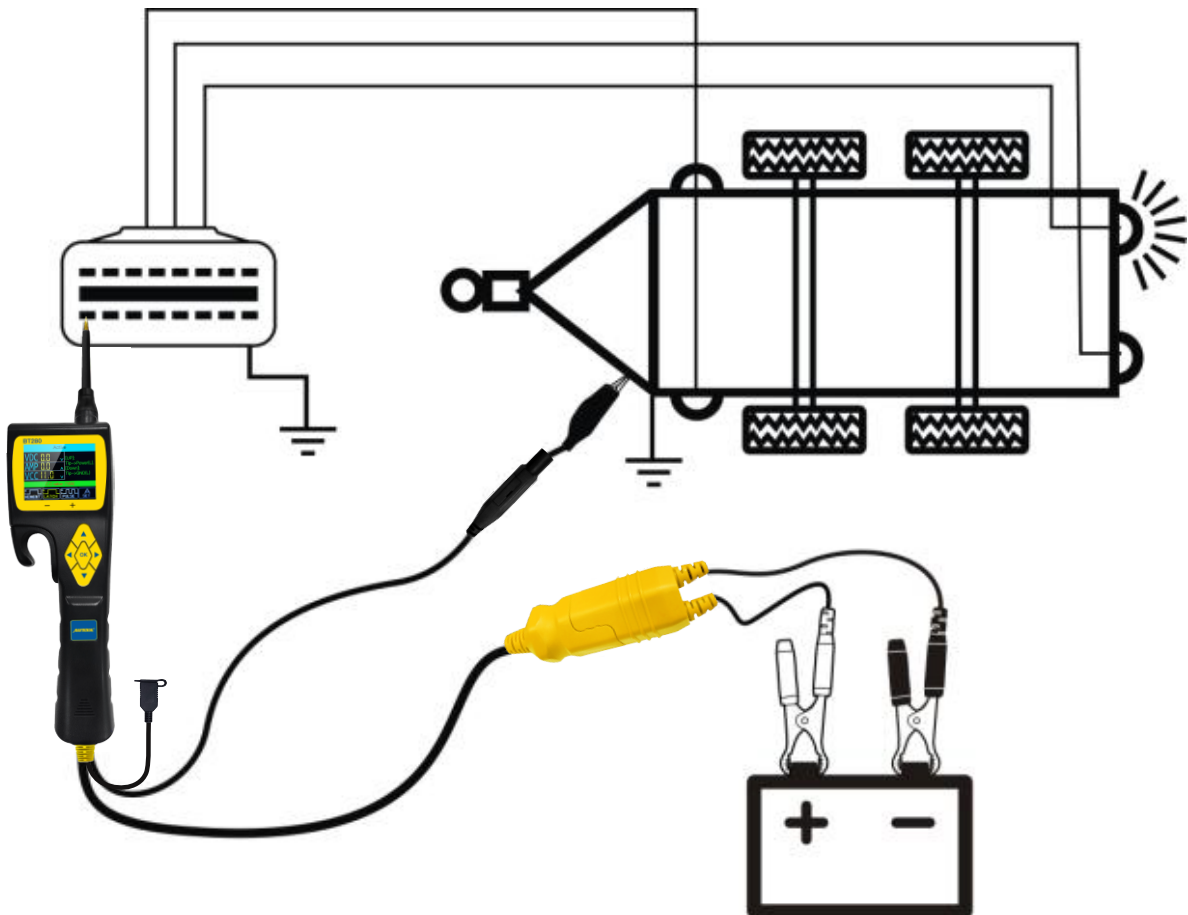
- If you are tracing a short circuit in the brake light circuit, you will know that the wiring harness must pass through the wire at the door sill, Locate the color-coded wire in the harness and expose it .
- While in **Component Activation** interface Select **MOMENT** mode. Use

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.

3.8 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.



Warranty and Service

4. Warranty and Service

4.1 One year warranty

Autool Technology promises to provide warranty service for 1 year from the date of original purchase, if this product is purchased from an official channel, which must meet the following conditions:

- 1) The warranty are limited to repairing or replacing new equipment, without additional cost, but need to mention for regular sales invoices or copies of invoices.
- 2) The warranty does not cover the unauthorized disassembly of this product due to flooding, lightning strikes, or outside repair shops not authorized by the company ,The personnel have repaired it and considered damage caused by improper use.
- 3) Autool Technology is not responsible for any damages caused by use, misuse or installation and testing. Some countries limitations on the duration of implied warranties are not allowed, so the above limitations may not apply to you.
- 4) All information in this manual is based on the latest and effective information at the time of publication, and there is no guarantee of its accuracy or completeness. Autool Technology reserves the right to make changes at any time without notice.

4.2 Service Process

If you have any questions in the process of using this product, please contact your local authorized dealer directly, or visit our official website for consultation.

If you need to repair or return the goods, please contact the distributor or the sales reps who contacted you directly.



CE FC RoHS
Made in China



EC REP

Prolinx GmbH
Brehmstr. 56, 40239 Duesseldorf
Germany

设计说明

尺寸：214*278mm（单页尺寸）

装订：骑马钉装订