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CE FC RoHS Made In China

TopDiag®

Automotive Circuit System Diagnostics

P180 Intelligent Circuit Tester

User manual and instructions P180

Contents

Safety Precautions and Warnings

To prevent personal injury or unnecessary damage while using the tool, please read this Owner's Manual carefully first and observe at least the following safety precautions when using the vehicle:

•This product is designed to be powered from a DC power source such as trucks,automobiles, small boats, and motorcycles. Do not connect to a power system with a voltage rating higher than that stated in this manual to avoid damage to the equipment.

• Do not test voltages in excess of the equipment's rated voltage, and be especially careful to avoid electric shock when testing voltages in excess of 30VAC RMS, 42VAC peak, or 60VDC.

• The cable and casing should be checked for cracks or breaks before use, and if they are broken, stop using them immediately.

• 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 rotating 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 equipments 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.

Product Descriptions

The content of this manual is edited based on the product (p180_v1.1).

The P180 is an electrical tester for the diagnosis of electrical systems in vehicles from 6 to 30 volts. It is easy to operate and has a wide range of usefulness, after simply connecting the tool to the vehicle battery:

- Quickly diagnose positive and negative circuits.
- Accurately trace and locate broken wires.
- Battery health status analysis.
- Test for continuity using the built–in auxiliary ground lead.
- Press the power switch to test the function of electrical components by conducting posi tive or negative battery current to the probe tip without the use of jumper wires.
- Immediately tests for poor ground contact without voltage drop testing,Short circuit pro tection is also available. If overloaded, the internal circuit breaker will trip.
- Trace and locate short circuits without wasting fuses. The tool's long cable allows you to test along the entire length of the vehicle, eliminating the need to constantly search for a suitable vehicle ground.

Products

Model: P180

Product Size: 165*40*27MM

Display: TFF color display (160 * 128 DPI)

Power Supply: 9–30V DC power system power supply

Working Temperature: 0 ~ 60℃ (32 ~ 140℉)

Storage Temperature: –40 ~ 70 ℃ (–40 ~ 158 ℉)

DC voltage Measurement: 0 V ~ 200 V ⩽ 1% error

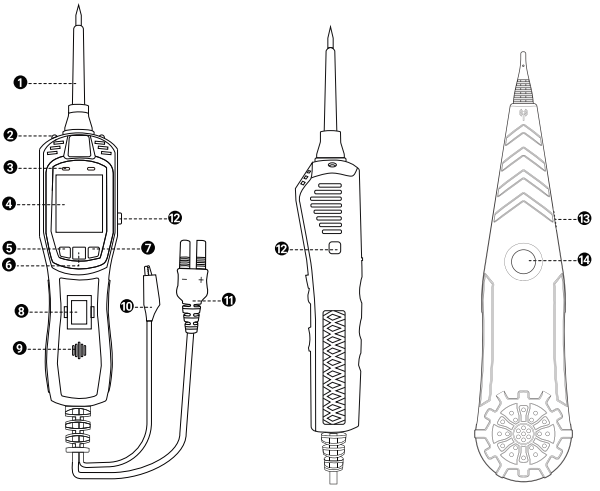
AV Voltage Measurement: –100 VAC ~ +100 VAC

Resistance: 0.1Ω –1MΩ Inaccuracies ⩽ 0.5% (Remarks: below 20Ω inaccuracies 5%)

Frequency: 1Hz~1MHz

Trip Current: 8AMPS for 1 hour 12AMPS less than 1 hour 16AMPS less than 5SEC

Exterior Description



❶ Probe: Contact with circuit or component to be measured

❷ LEDs: Illuminate dark or nighttime work areas

❸ LEDs: Red/green polarity indicator – identifies positive and negative polarity

❹ LCD Display: Shows test results

❺ Left Button: Short press to move the cursor upwards

❻ Ok Button: MODE selection, when browsing the options, used to select the test mode or quit

❼ Right Button: Short press to move the cursor downward

❽ Rocker Switch (Replaceable): Directs positive and negative battery current to the tip of the needle. Used to activate and test the function of electrical components

❾ Speaker: Different tones for power (B+) or ground (B–)

❿ Ground Clamp: Ground lead auxiliary test function

⓫ Adapter: Connects to powered alligator clips

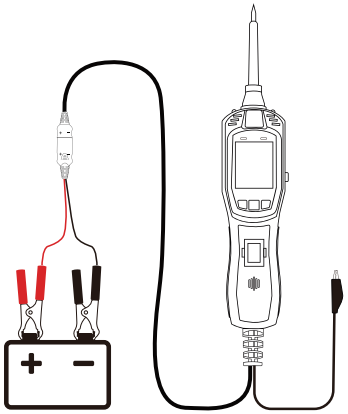
⓬ Reset Button: When the circuit breaker trips, you need to press this button to reset it.

⓭ Sensitivity Adjustment: Turn clockwise to increase the sensitivity of the received acoustic signal, turn counterclockwise to decrease the acoustic signal sensitivity.

⓮ Test Button: Press and hold button to receive acoustic signal

Connection Steps

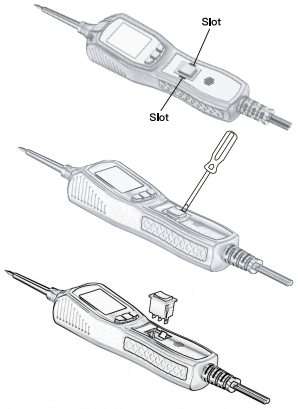
The tool is powered through the vehicle battery by connecting the red battery clip to the positive terminal of the vehicle battery and the black battery clip to the negative terminal. When the tool is first connected to the battery (power source), the display will show a power–on LOG and the headlight will come on to illuminate the test area at the tip of the probe.



Rocker Switch

If the rocker switch is used frequently, it may be bent at the contact point of the switch, which will eventually cause the switch to be damaged and need to be replaced in the following manner:

NOTE: The rocker switch is limited to DC voltage mode for activating and testing electrical components and must not be operated in any other mode.



1.Locate the two slots on either side of the Rocker Switch.

2.Carefully remove the Rocker Switch with an appropriate pry tool or small screwdriver. Donot apply excessive force.

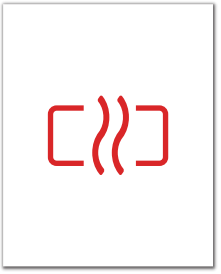
3.Position the new Rocker Switch into the switch cavity and carefully press straight down until the switch is flush with the housing.

Circuit Breaker

Circuit breaker has a short circuit protection function, and its internal circuit breaker will trip if overloaded.

When the short circuit breaker trips, the screen will appear as follows. At this time, the device is already in a protected state, even if the power button is pressed, the device will not direct current to the probe tip, which can effectively prevent unnecessary damage caused by accidental operation.

Note: When the unit has tripped you need to wait for 5 seconds to cool down and then press the side reset button for normal use.



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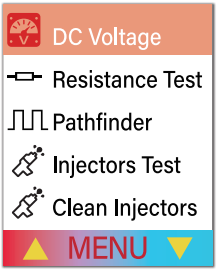
DC Voltage

The DC mode is for testing DC voltages. Voltage testing is done by simply touching the probe tip to the circuit and the P180 will display the voltage detected at the probe tip. If the voltage at the tip of the probe is within 0.5 volts of the source battery voltage and the circuit resistance is less than 10 Ohms, the red LED will illuminate, and if the speaker is on, a loud beep will sound.

When testing the ground circuit, as long as the total circuit resistance from the tip to battery ground is less than 10 Ohms, the green LED will illuminate and a low beep will sound from the speaker, providing a quick indication of an excessive voltage drop or circuit resistance. If the LED does not illuminate and the speaker does not sound, you can check for possible circuit problems.



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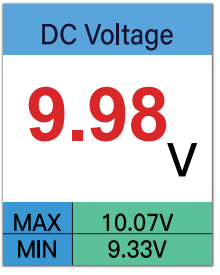

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Activate Components

Enabling power components in DC voltage mode is a key feature that makes the unit very useful during testing. The ability to supply battery power directly or ground to the probe tip allows the user to enable and dynamically test electrical components such as lights, motors and solenoids.

Connect the auxiliary ground lead to the negative or ground terminal of the component under test, then touch the tip of the probe to the positive terminal of the component and the green LED will illuminate indicating that the component continuity test has passed. While seeing the green LED, quickly press forward and release the power switch. If the green LED is off and the red LED is on, activation can continue. Rock the power switch forward and hold to power the component. As the power switch is cranked forward, power will flow from the positive terminal of the battery into the probe tip, through the tip into the positive terminal of the element, into and out of the element, back into the tool through the auxiliary ground wire, and then back to the ground terminal of the vehicle battery.

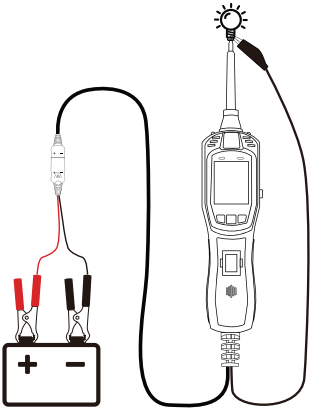
If the green LED goes out or the circuit breaker trips at this point, the tool is overloaded. The reasons for this situation are as follows:

*The contact you are probing is directly grounded or negatively pressurized.

*The component you are testing is short-circuited.

*The component is a very high current component (such as a starter motor).

Note: When the unit has tripped you need to wait 5 seconds for it to cool down and then press the side reset button for normal use.

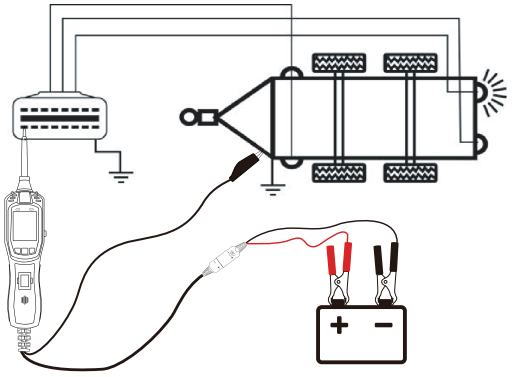


Testing Trailer Lights And Connectors

While the tool is in DC voltage mode, clip the auxiliary ground wire to the trailer earth wire and connect the contacts of the jack with the probe.

Then apply voltage to the tip of the probe. This will allow you to check the function and orientation of the connector and trailer lights.

If the circuit breaker trips, this contact may be grounded. Allow to cool for 5 seconds, then press the side reset button for normal operation.



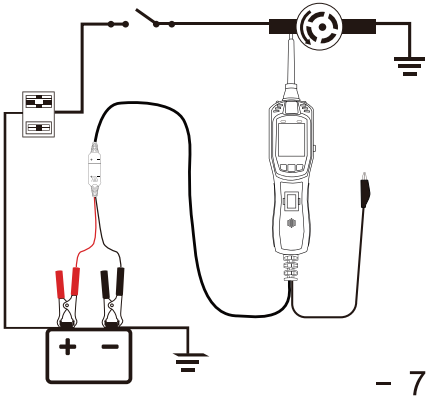
Activate The Interior Parts

When the tool is in DC voltage mode, touch the tip of the probe to the positive terminal of the component, the green LED should illuminate indicating connectivity to ground, while observing the green LED, press and release the power switch quickly forward, if the green LED goes out and the red LED comes on the activation can continue, if the green LED goes out or the circuit breaker is tripped at that instant, the tool has been If the green LED goes out at that moment or the circuit breaker trips, the tool is overloaded. this can occur for the following reasons.

*Contact you are probing is directly grounded or negative

*The component you are testing is short-circuited

*The component is a very high current component (e.g. starter motor).



WARNING: Applying random voltages to certain circuits may damage the vehicle's electronics. Therefore, it is strongly recommended that the vehicle manufacturer's wiring diagrams and diagnostic procedures be used during testing.

NOTE: If the circuit breaker trips, wait for it to cool (5 seconds) and then press the reset button to reset it. When energising a component, if the switch is pressed first and then the tip is touched to the component then the life of the power switch can be extended. Arcing will occur at the tip, not at the contacts of the switch.

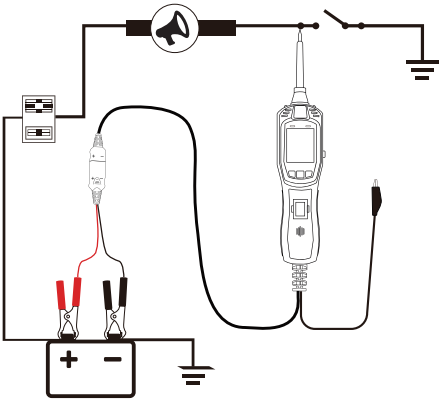
Grounding Activation Element

When the tool is in DC voltage mode, touch the tip of the probe to the negative terminal of the component, the red LED will light up, while observing the red LED, quickly press back and release the power switch, if the red LED goes out and the green LED lights up, activation can continue. If the green LED is off or the circuit breaker trips, the tool is overloaded. This can happen for the following reasons:

*The contact you are probing is a direct forward voltage.

*The component you are testing is a short-circuiting component.

*The element is a very high current element (e.g. starter motor).



If the circuit breaker trips, wait 5 seconds for it to cool down and press the reset button to reset it.

WARNING: When using this feature, if you are touching a protected circuit, grounding it may cause the vehicle fuse to blow or trip.

Check For Bad Ground Contact

Probe suspected ground wire or contact with probe tip and observe green LED. Press the power switch forward and release. If the green LED is off and the red LED is on, this is not a true ground. If the circuit breaker trips, the circuit is probably well grounded. Remember that high current components such as starter motors can also trip the circuit breaker.

Tracking And Locating Short Circuits

In most cases, a short circuit will cause a fuse or fusible link to blow or an electrical protec tive device to trip (i.e., a circuit breaker). This is the best place to start your search.

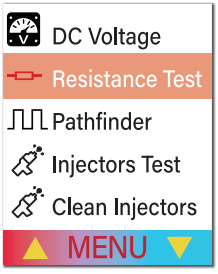
- Remove the blown fuse from the fuse box.
- Use the probe tip to activate and energize each contact of the fuse,The contact that trips the circuit breaker is the short circuit,Make a note of the identification code or colour of that wire.
- Locate that wire as far along the wiring harness as possible.

Example:

- If you are tracking a short in the brake light circuit, you may know that the wire must go through the harness at the door frame. Find the colour coded wire in the harness and expose it.
- Pass a probe tip through the insulation and press the power switch forward to activate the wire and energize it.
- If the breaker trips, you have identified a short in the wire. Cut open the wires and energise each end with the tip of the probe, again the end of the wire that tripped the circuit breaker is shorted, it will lead you to the shorted area, follow the wire in the direction of the short and repeat the process until you find the short.

Resistance Test

In the Mode List menu, select Resistance Test, in which the resistance value in the circuit can be checked. With the grounding aid clamp in the resistor or lap position and the probe connected to the other end of the circuit, the P180 will display the resistance detected at the probe end. If the resistance value is greater than 1 megohm, the LCD display will show “0L” , MAX for the maximum resistance value recorded, and MIN for the minimum resistance value recorded.



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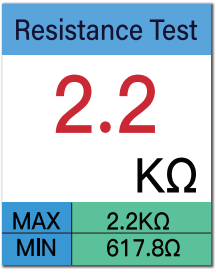

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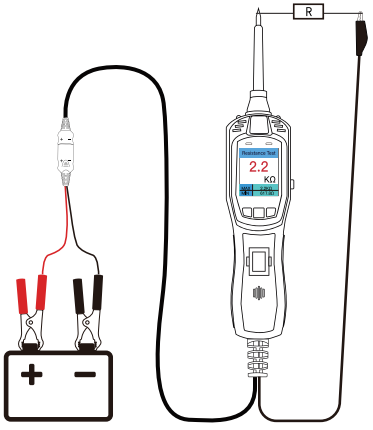
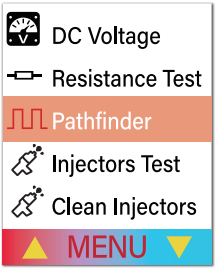


Breakpoint Detection

When using the pathfinder function, you need to use it together with the P181 wire finder. When a tool test reveals that the line is in an open circuit, you can plug the probe tip into the wire, turn on the pathfinder function, and send an acoustic signal to the wire, while the green LED will light up. At this point, simply press the test button on the P181 wire finder on time, the signal detection antenna from the tip of the probe along the wire, the P181 detects an acoustic signal from the wire, it will ring continuously with the same tone, indicating good wire continuity. Continue this process and when the tone stops, it indicates that the probe has just passed a break, open or poor contact in the wire.



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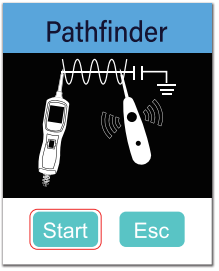

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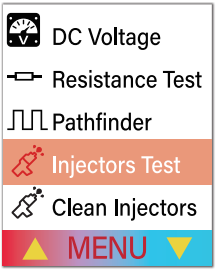
Injectors Test

- In the Test Options menu of P180, select Injector Inspection.
- Check the negative terminal on the injector, it can be present on the injector or on the PCM.
- These four data points represent the corresponding waveform points.
- When the engine is running (or starting), the P180's red and green indicator LEDs will flash to indicate a good signal from the ECM/PCM.
- The main screen displays complete injector circuit data for a quick overview of injector circuit diagnostics.



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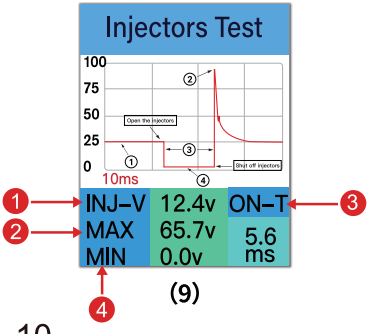

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1 INJ—V = Injector supply voltage

This parameter is the battery power supplied through the fuel injector itself and the measured voltage should be close to the full battery voltage. There may be some slight voltage drop in the circuit, and any source battery voltage loss greater than 0.5 volt should be investigated.

2 MAX = Induced impulse voltage

Normal inductive kicks range between 55 and 90 volts.You should see a similarvoltage number from each of injectors on the engine. Note: The height of theinductive kick is sometimes cut–off by an internal ECM diode to about 35 to 45volts. Note: This test does not apply to hi–pressure injectors used on diesel enginesand gasoline direct–injection en–gines.

3 ON–T = Injector Pulse Enable Time (ms)

This is the total amount of time that the fuel injector is energized and supplyingfuel to the cylin–der. This can be compared to scan tool PID data to see if commandedon–time equals actual on–time

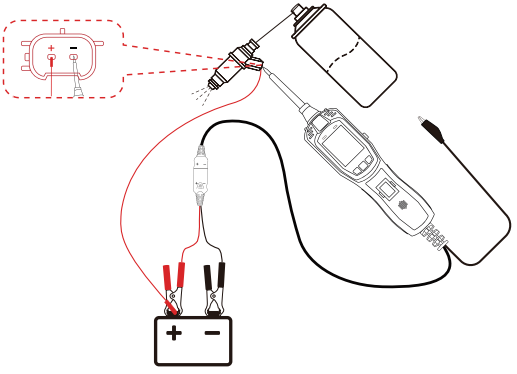
4 MIN = ECM Ground Voltage

The engine computer actuates each fuel injector by completing the grounding circuit with an internal transistor switch. When power is supplied to the fuel injector, the ECM ground voltage should be close to zero volts. The actual measured ECM ground voltage may vary and may be closer to 0.5 volts due to the internal resistance of the switching transistor.

Clean Injectors

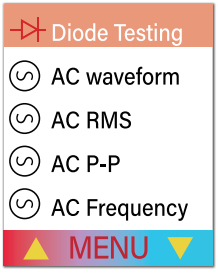
To use the injector cleaning function, you need to remove the injector from the vehicle, connect the cleaner, connect the injector positive terminal to the power supply positive terminal and the injector negative terminal to the P180 probe. In the Test Options menu of the P180, select Fuel Injector Cleaning, which has four modes:

- Mode 1: Probe output 1 pulse, pulse width 250ms mode
- Mode 2: Probe outputs 50 pulses, pulse width 7ms mode
- Mode 3: Probe outputs 100 pulses with a pulse width of 4ms mode
- Mode 4: Probe has 50 pulse outputs in 1450 ms, each with a pulse width of 7 ms



Diode Testing

In the mode list options list, select the diode test in this mode can detect the diode is good or bad and forward voltage drop, will be connected to the negative terminal of the diode grounding auxiliary clips, will be the probe contact diode positive, when the P180 shows the positive voltage drop voltage, that the diode is normal, when the P180 displays 0L or 0.0 Ω and the green LED indicator lights up, that the diode has been damaged, MAX for the MAX is the maximum forward drop voltage recorded, MIN is the minimum forward drop voltage recorded.



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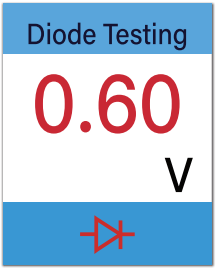

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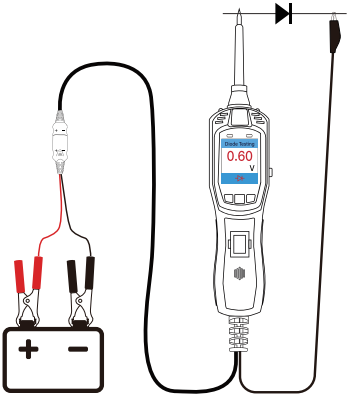
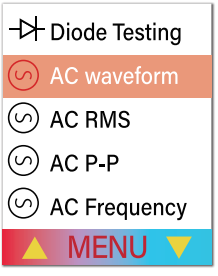


AC Voltage Measurement

In the Mode List option menu, select AC Waveform Test, which is used to measure pulsed waveform signals. Touching the circuit with the tip of the probe, the P180 will display the RMS average AC voltage reading and will also display the AC voltage frequency and duty cycle on the bottom line.



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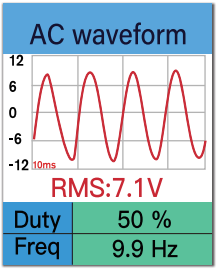

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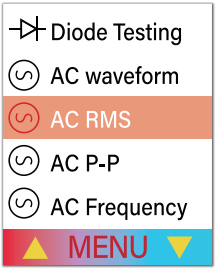
AC RMS

In the Mode List option menu, select AC RMS Test, which is designed to measure AC voltage and can be used for any AC voltage or pulse waveform signal that requires an RMS average voltage measurement. By touching the circuit with the probe tip, the main display area will show the RMS average AC voltage reading and will also show the RMS min/max AC voltage on the bottom line, a short press of the left button will clear the RMS max/min AC voltage values.



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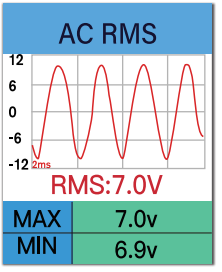

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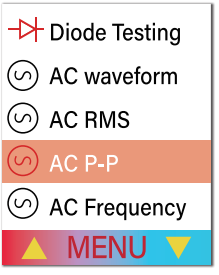
AC Peak-To-Peak

In the Mode List Options menu, select AC P–P Test, P–P represents the peak–to–peak AC voltage. In AC RMS, which displays the average AC voltage, P–P will not average the readings, but will display the total voltage difference from the lowest to the highest extreme voltage in the AC signal. In this mode, the P180 will display the AC voltmeter with the tip voltage and a min/max voltage reading at the bottom. The voltage displayed is the total voltage potential between the lowest and highest voltages sensed on the measured AC signal. The total peak–to–peak voltage appears in the main display area.MIN displays the minimum absolute voltage and MAX displays the maximum absolute voltage.A short press on the left button clears the maximum/minimum AC voltage value.The P180 can measure P–P AC voltages from –100V to +100V.

For example, if the AC signal alternates from –50V to +50V, the P180 will display a P–P voltage of 100V, a minimum voltage of –50V, and a maximum voltage of +50V.



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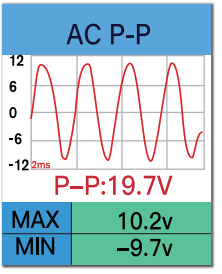

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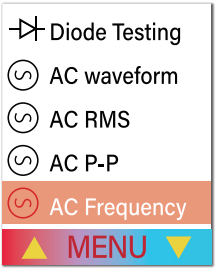
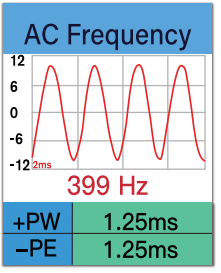
AC Frequency

The frequency counter mode is used to measure the frequency of an AC voltage signal. By touching the tip of the probe to the circuit, the main display area will show the frequency in Hertz (cycles per second), and will also show the – and + pulse widths in milliseconds on the bottom line.

The P180 can measure frequencies from 1Hz to 1MHz.



(18)

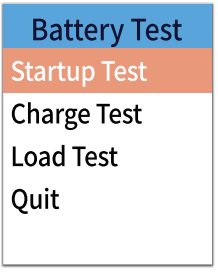


(19)

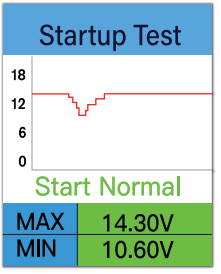
Startup Test

The start test detects the current starting performance of the battery and helps to determine the service life of the battery.

Select Battery Test→Startup test according to the product interface prompts to operate, view the test results.



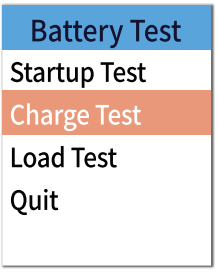
(20)



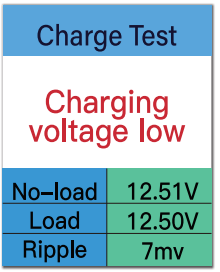
(21)

Charge Test

Select Battery Test→Charge Test, operate according to the product interface prompts to view the test results.



(22)

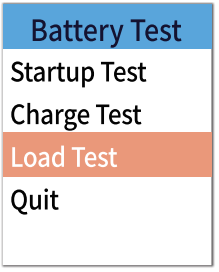


(23)

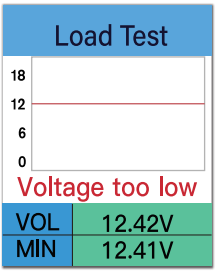
Load Test

The electric load test can record the voltage fluctuation of the car's open and close load in real time, which can accurately determine the health status of the battery.

Select Battery Test→Load Test, enter the function and follow the on-screen prompts to view the test results:



(24)



(25)

Langauge

After the device is powered on, press the direction key to select [Setup] function, press OK to confirm, select the language built-in English, Spanish, German, French, Italian, Portuguese, Polish, Japanese, Korean and other multi-languages, select the corresponding language and press OK to confirm.

(26)

(27)

After Sales & Service

One year warranty

JDiag Technology promises to provide warranty service for 1 year from the date of original purchase, if the product is purchased from an official source, the following conditions must be met:

1) The warranty is limited to repair or replacement of new equipment at no additional cost, provided that the official sales invoice or a copy of the invoice is provided.

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) JDiag 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. JDiag Technology reserves the right to make changes at any time without notice.

Service Process

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

For repairs or returns, please contact the dealer or contact your sales representative directly.