

Value⁺



AB70

Manual

The Value+ Automotive Battery Tester (the Tester) is designed for a stationary battery system. It can automatically identify 12V and 24V battery.

The Tester is designed to help user understanding the overall state of the battery health, state of charge and discharge.

The Tester can quickly, easily and accurately :

- provide battery health information;
- provide the state of charge information;
- check battery level;
- check battery internal resistance; and
- the discharge capability.

The Tester have:

- overload protection;
- bad contact indication;
- reverse polarity protection; and etc.

Features of the tester include:

- battery internal resistance measurement;
- battery voltage measurement;
- discharge volts test;
- ripple voltage test;
- auto hold; and
- auto save.

The Tester is powered by the battery being test. It is no need to provide any additional power to the tester. It is no need to take the battery being test from the car. The Tester was designed to test the battery installed in cars.

With careful use, the Tester will provide years of reliable service

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READ BEFORE USE – SAFETY INFORMATION


WARNING

To prevent possible electrical shock, fire, personal injury and ensure safety operation and service of the Tester, please follow these guidelines:

- Read the instruction before use and follow all safety instructions.
- Use the Tester only as specified in the instruction card; otherwise, the Tester's safety features may not protect you.
- Do not use the Tester and/or the accessory if they look damaged and / or wet.
- Examine the case before you use the Tester. Look for cracks or missing plastic. Carefully look at the insulation around the terminals.
- Do not use the Tester if it operates incorrectly.
- Do not use the Tester just before, during or just after an electrical storm (electrical shock / high energy overvoltage!). Please make sure that your hands, your shoes, your clothing, the floor, switches and switching components are dry.
- Never use the Tester if it just brought from a place with great temperature difference.
- Do not use the Tester around explosive gas, vapor, or in damp or wet environment.
- Limit operation to the specified measurement category, voltage, or amperage ratings between the terminals or between each terminal and earth ground.
- Use extreme caution when working around bare conductors or bus bars. Contact with the conductor could result in electric shock.
- Avoid to use the equipment in the environment with strong magnetic fields, strong electrostatic fields and strong RF fields.
- Avoid simultaneous contact with battery and frame racks or hardware that may be grounded.
- Comply with local and national safety codes. Use personal protective equipment (approved rubber gloves, face protection, and flame-resistant clothes) to prevent shock and arc blast injury where hazardous live conductors are exposed.
- Do not touch voltages > 30 V ac rms, 42 V ac peak, or 60 V dc.
- Keep fingers behind the finger guards on the probes.
- Use only probes, clips, and adapters supplied with the Product.
- Connect the common clip before the live clip and remove the live clip before the common clip.
- Disable the Tester if it is damaged.
- Only use probes, test clips, and accessories that have the same measurement category, voltage, and amperage ratings as the Tester.
- Do not apply more than the rated voltage, between the terminals or between each

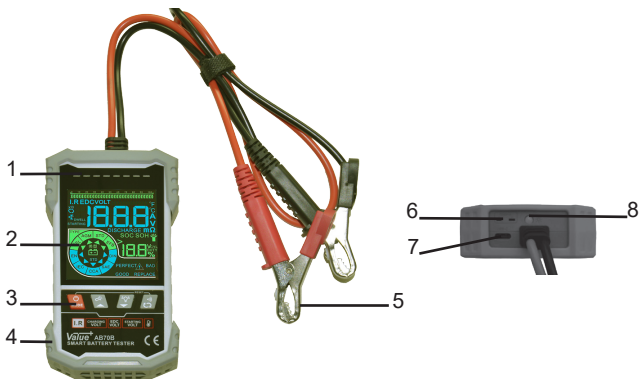
- terminal and earth ground.
- Use the correct terminals, function, and range for measurements.
 - Do not use clips if they are damaged. Examine the clips for damaged insulation, exposed metal, or if the wear indicator shows. Check clip continuity.
 - Do not touch the probes to a voltage source when the clips are connected to the current terminals.
 - Personal injury or damage to the equipment can occur if you attempt to make a measurement with a clip in an incorrect terminal.
-
- A " **Warning**" statement identifies hazardous conditions and actions that could cause bodily harm or death.
 - A " **Caution**" statement identifies conditions and actions that could damage the equipment or the object under test.

SYMBOLS

Symbol	Meaning
CE	Conforms to European Union directives.
	Risk of Danger

THE TESTER

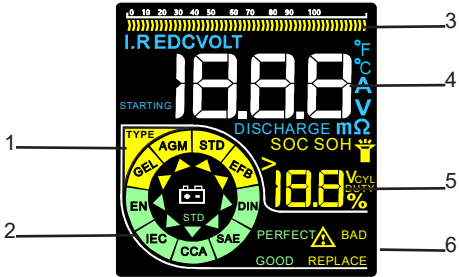
TESTER STRUCTURE



- 1) Process Indicators
- 2) Display
- 3) Push Button
- 4) Holster





- 5) Battery Clips
- 6) Temperature Probe Input Jack (AB70B only)
- 7) USB Power Socket
- 8) LED Flashlight

DISPLAY



- 1) Battery Type
- 2) Battery Standard
- 3) Analogue Bargraph
- 4) Testing Result
- 5) Steps Numbers / State of Charge / Battery Life
- 6) Battery Conditions

PUSH BUTTONS

	Mode	Function	Access
	Any	Function setting	Press to switch between: internal resistance test, charging voltage test, discharge voltage test, starting voltage test, & temperature measuring
	Any	Flashlight Switch	Press & hold for a few seconds to switch off / on the flashlight
	Internal Resistance	Setting the discharging current of Step 3 (P3)	Press once to increase 5A, press & hold to increase the value rapidly
		Select the test results showing on display after internal resistance test completed	Press to switch to display between: - internal resistance & state of charge; - voltage & battery life; & - current & battery life.
	Any	Backlight Switch	Press & hold for a few seconds to switch off / on the display backlight
	Internal Resistance	Setting the discharging current of Step 3 (P3)	Press once to decrease 5A, press & hold to decrease the value rapidly
	Any	Sound Switch	Press & hold for a few seconds to switch off / on the sound
	Internal Resistance	Setting the discharging current of Step 3 (P3)	Press to start the internal resistance test
	Temperature measurement	Unit Selection	Press to switch between °C and °F

OPERATING THE TESTER

Warning

To avoid electric shock, fire or personal injury:




- Connect the common clip before the live clip and remove the live clip before the common clip.
- Always disconnect the connections between the clips and the testing objects under test and remove clips away from the input terminals of the Tester after measurement.

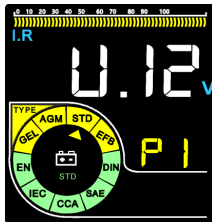
Caution

- The tester is only suitable to test 12V-24V batteries. If Voltage > 30V dc, the overload protection will be activated and no test is allowed.
- Battery Capacity Measuring Range is 3-200AH.
- The Tester is powered by the battery being test. It cannot work if the battery voltage is lower than 8V. Please fully charge the battery before test.
- If the battery power is not enough, charge the battery before test. Recommended to charge 10 more minutes after the battery is fully charged.

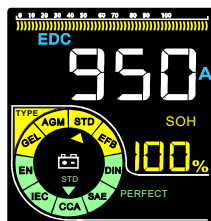
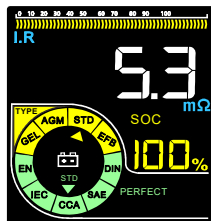
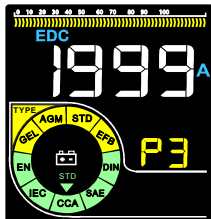
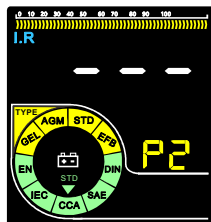
A. TEST BATTERY INTERNAL RESISTANCE

Connect the battery being test. The Tester will be automatically switch on and ready at the battery internal resistance mode.

- 1) Connect the black clip to the negative pole of the battery being test;
- 2) Connect the red clip to the positive pole of the battery being test;
- 3) Display of the Tester will switch on if the connection is good;
- 4) U.12V will be shown if the battery is 12V or U.24V will be shown if the tester is connected to 24V battery;
- 5) P1 will also show on the state of charge area;
- 6) Select the battery type by pressing  or ;
- 7) Press  to confirm;



- 8) P2 will show on the state of charge area;
- 9) Select the battery standard by pressing or ;
- 10) Press to confirm;
- 11) P3 will show on the state of charge area;
- 12) Press or to set the maximum discharge value of the battery being test (Press and hold the button to change the value rapidly);
- 13) Press to confirm;
- 14) P4 will appear. The Testing Result area will also display the progress (from 9 to 1). Please wait for the result;
- 15) After the test is completed, battery data will be shown;
- 16) Press or to switch the display between internal resistance, voltage, discharging ability, battery life (SOH) and battery capacity (SOC);
- 17) The Battery Conditions (Perfect, Good, Bad, or Replace) will also be displayed;
- 18) If any errors happen during test, press and together to reset the Tester and restart the test.



Capacity (AH)	CCA Value (A)
3.3	55
4	65
5	80
6	100
7	130
8	150
9	155
10	160
12	210
14	220
15	230
17	250
18	265
20	285
24	310
25	320
26	330

Capacity (AH)	CCA Value (A)
28	340
31	350
33	360
38	370
40	380
45	400
50	425
55	445
60	465
65	520
75	550
80	570
85	600
100	670
120	700
150	755
200	995

Table A1

Note :

If the battery parameters cannot be found, please refer to table A1 to set the discharge current.



B. TEST CHARGING SYSTEM

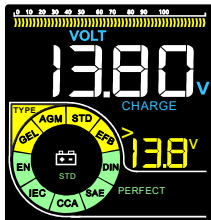
Warning

- **Make sure the car brake is not released during test.**
- **Never stand in front of the car during test.**
- **Keep the transmission in idle position. Never shift to D or R positions.**

This test is target on the battery charging system.

- 1) Start the car engine;
- 2) Connect the red and black clips to the battery;

- 3) The Tester will automatically switch on;
- 4) Press  to select this function;
- 5) Press  to start the test. The testing period is 90s. Within this period, increase the engine speed to 2500-3000rpm;
- 6) After the test is completed, the test result (Charging Voltage and state of charge) will be shown on the display.



Note :

If charging voltage is smaller than 12.8V for 12V battery, or smaller than 25.6V for 24V battery, check the drive belt and the wires conditions.

Test Results :

12V Battery - need to press the accelerator.

Engine Conditions	Battery Voltage	
	When headlamps & air conditions are switch off	When headlamps & air conditions are switch on
PERFECT	> 13.5	13.4 - 14.6
GOOD	13.2 - 13.5	13.2 - 13.4
BAD	13.0 - 13.2	> 13.2
REPLACE	< 13.0	

24V Battery - need to press the accelerator.



Engine Conditions	Battery Voltage	
	When headlamps & air conditions are switch off	When headlamps & air conditions are switch on
PERFECT	> 27.2	> 27.0
GOOD	26.8 - 27.2	25.0 - 27.0
BAD	25.2 - 26.8	> 25.0
REPLACE	< 25.2	

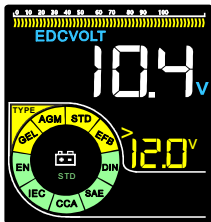
C. MAXIMUM LOAD TEST

Warning

- Make sure the car brake is not released during test.
- Never stand in front of the car during test.
- Keep the transmission in idle position. Never shift to D or R positions.

This test is target on the battery power during maximum load.

- 1) Start the car engine;
- 2) Connect the red and black clips to the battery;
- 3) The Tester will automatically switch on;
- 4) Press  to select this function;
- 5) Press  to start the test. The testing period is 90s. Within this time, increase the engine speed to 2500-3000rpm;
- 6) After the test is completed, the test result (Charging Voltage and state of charge) will be shown on the display.



Note :



If charging voltage is smaller than 12.8V for 12V battery, or smaller than 25.6V for 24V battery, check the drive belt and the wires conditions.

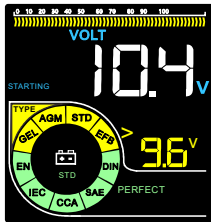
D. ENGINE START TEST

Warning

- Make sure the car brake is not released during test.
- Never stand in front of the car during test.
- Keep the transmission in idle position. Never shift to D or R positions.

This test is target on checking whether the battery in car can provide enough energy for starting.

- 1) Turn off the engine before test. Turn the key to off position (if any);
- 2) Connect the red and black clips to the battery;
- 3) The Tester will automatically switch on;
- 4) Press  to select this function;
- 5) Press  to start the test. The testing period is 90s;
- 6) After the test is completed, the test result (Charging Voltage and state of charge) will be shown on the display.



Note :

For 12V battery system, the system is in good condition if voltage > 10.7V. Please refer to the following table if voltage is < 10.7V.
 For 24V battery system, the system is in good condition if voltage > 17.5V. Please refer to the following table if voltage is < 17.5V.

For reference of 12V battery system,



Starting Voltage	Battery Discharging Ability	Suggested Solutions
> 10.7V	PERFECT	No action is needed
10.2 - 10.7V	GOOD	Keep Monitoring
9.6 - 10.2V	BAD	Change battery recently
< 9.6V	REPLACE	Change battery immediately

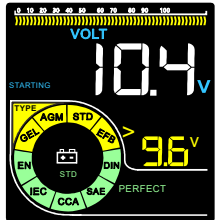
For reference of 24V battery system,

Starting Voltage	Battery Discharging Ability	Suggested Solutions
> 17.5V	PERFECT	No action is needed
16.0 - 17.5V	GOOD	Keep Monitoring
15.0 - 16.0V	BAD	Change battery recently
< 15.0V	REPLACE	Change battery immediately







E. MEASURING TEMPERATURE

This function is to measure temperature by using the k-type temperature probe.

- 1) Power the Testers
 - a) by connecting the red and black clips to a car battery; or
 - b) by connecting USB power source;
- 2) The Tester will automatically switch on;
- 3) Press  to select this function;
- 4) Press  to start the test. The testing period is 90s;
- 5) Connect k-type temperature probe to the Tester;
- 6) Place the temperature probe to the object being test;
- 7) The measured temperature will be shown on the display.



Users can calibrate the functions by following procedures:

- Press  and  together to enter the temperature calibration mode.
- Press  or  to adjust the value.
- After calibration is completed, press  and  together again to save the changes.

SPECIFICATIONS

Temperature	Operating: 0°C ~ 40°C Storage: -10°C ~ 50°C
Relative Humidity	<90%
Battery	N/A
Size	80 x 140 x 30mm
Weight	~300g (include battery)

Functions	AB70A	AB70B
Battery Type	12V/24V Starter Lead-Acid Battery	
Internal Resistance Measurement	✓	✓
Discharge Current	✓	✓
Battery Life Analyse	✓	✓
Battery Level Detection	✓	✓
Start Capabiltiy	✓	✓
Battery Quality	✓	✓
Display Backlight	✓	✓
Flashlight	✓	✓
Temperature Measurement		✓
Car Starting Test	✓	✓
Car Charging Capability		✓
Car Load Measurement	✓	✓
Overload Protection	✓	✓
Reverse Input Protection	✓	✓
CCA Range	100 - 1999	
Capacity Range	3AH - 250AH	
Resistance measurement method	Four (4) terminal Kelvin connections	
Battery Standard	STD/AGM/GEL/EFB/EN/IEC/CCA/SAE/ DIN	
Screen	55 x 57mm, 4C	
Powered by	The battery being test / USB Type-C	

MAINTENANCE

POWER

The Tester is powered by the battery being test. It is no need to power by external power source.

Only when measuring temperature and no battery is connected, external battery will be needed. Please connect to a type-C USB power source.

CLEANING

Caution

To avoid damaging the equipment, NEVER submerge them in water. DO NOT use abrasive cleaners, they will damage the case.

Wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents. Dirt or moisture in the jacks can affect the measurement.

AB70 Series Manual
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