Owner's Manual & Safety Instructions

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

KZYEE

KS20

Battery Analyzer

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

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

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

⚠ WARNING

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

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Product Features

Using the conductivity method to measure, the test is accurate, fast and easy to operate, and the display is intuitive. This instrument is applied to the CCA, DIN, IEC, EN, JIS# and Others battery test.

This instrument tests by low frequency signal, without an external large load to discharge, the battery will not be damaged. The battery can be tested in car, the instrument itself without batteries, it will be charged directly by the battery under test, and it's easy to use.

Direction Key: Selection function or input data.

ESC Key: Cancel the function has been selected or the data has been inputted.

ENTER Key: Select the function to be operated or confirm the data has been inputted.

Precautions for use

1. This product is the testing tool for 12V and 24V vehicle.
2. The operating voltage range of this product is DC 9V to 30V, please do not connect

the batteries over the max voltage.

3. If testing in car and the engine is running, please switch off the engine and then turn the key to the OFF position.

4. If the battery is in a fully charge state, the voltage will be slightly higher than normal, please turn on the headlight 2 to 3 minutes until the voltage drops back to normal before testing.

5. Please do not store or use this product in an area exposed to direct sunlight, or exposed to high temperature or high humidity environment, otherwise it may cause deformation or damage to the product.

Technical parameters:

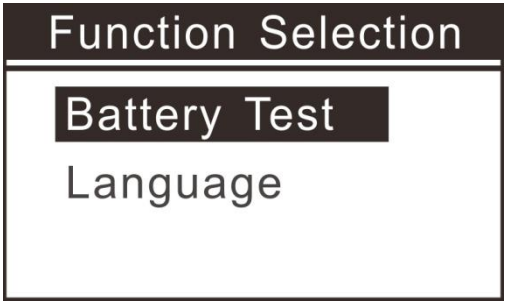
Testing voltage range: 9VDC to 30VDC

Applicable standards for the Battery:

CCA:	100~1700
IEC:	100~1000
EN:	100~1700
DIN:	100~1000
JIS:	Look up the table to contrast CCA

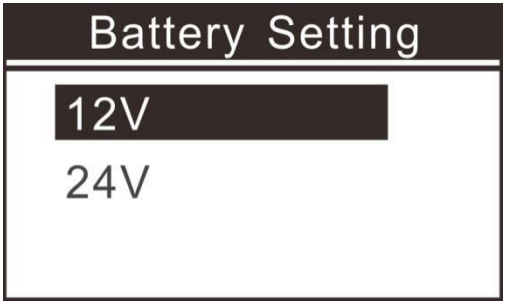
Instructions for Use:

While using this product, please clip the black clamp of the instrument to the cathode of the battery under test, and clip the red one to the battery anode. The instrument will automatically power on , and display the function selection menu, as shown in the following figure, there are two functions: “Battery Test” and “Language”.

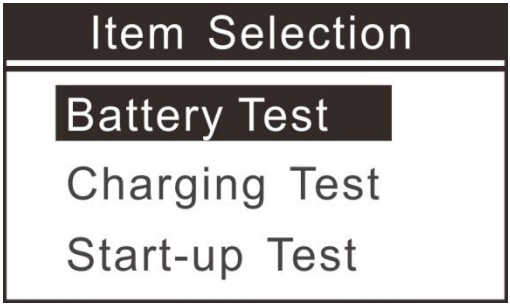


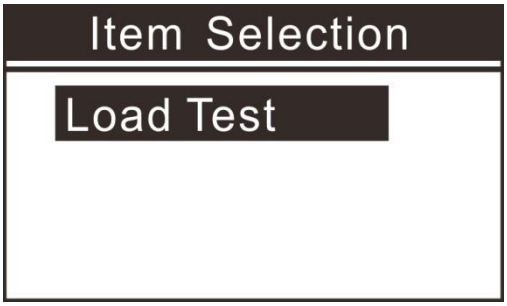
Use the Direction Key to select “Language”, and then press the ENTER key to enter the Language select menu, as shown in the following figure. Use the Direction Key to select the desired language, and then press the ENTER key to return to the function selection menu.

After setting the language, select the “Battery Test” function, press the ENTER key to enter the Battery setting menu, as shown in the following figure.



Press Direction Key to select the voltage of your battery, and then press ENTER key to enter the Item Selection menu.





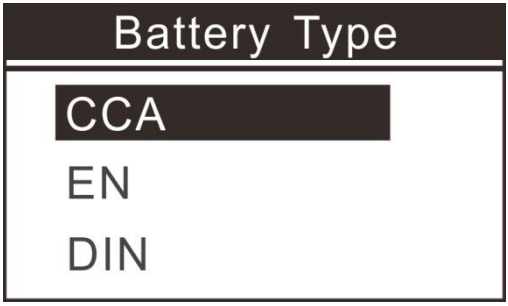
There are four options in the item selection menu.

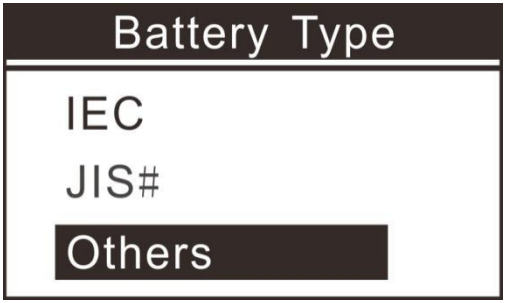
1. Battery test
2. Charging test
3. Start-up test
4. Load test

Press the ↑↓key can select the function that you need to test.

1. **Battery test**

Select the “Battery Test”, press the “ENTER” key to enter the interface of battery specification selection, there are six selections: CCA（SAE）, IEC, EN, DIN, JIS#, Others.

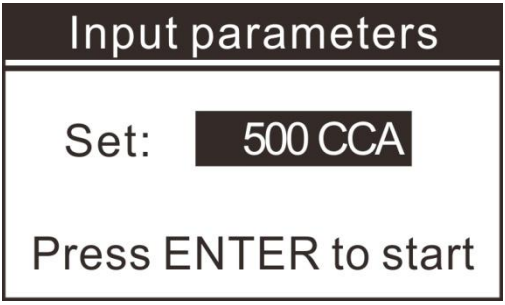




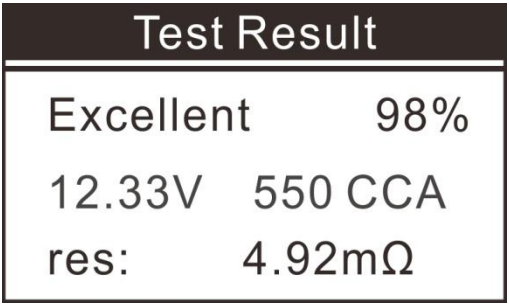
The battery specification can be found on the parameters of the battery label, for example:

CCA(SAE) is the battery specification, 310 is the parameter value of the battery.

Select the desired battery specification, press the "ENTER" key to enter the battery parameter input interface. Use the ↑,↓,←, → key to set the battery parameters(up/ down ±5, left/ right±100), as shown above is set as 310 CCA(SAE).



After setting the battery parameters, press the ENTER key to start analyzing the battery, the instrument will display the measurement results after about 4 seconds, the screen will show the battery start-up current, voltage, battery resistance, battery life and whether the battery need to be replaced.

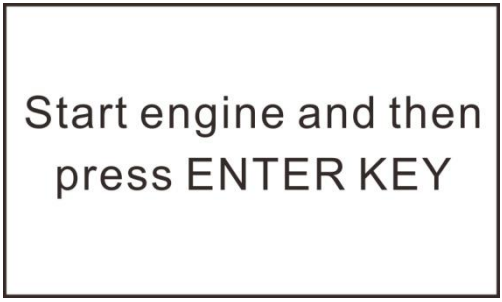


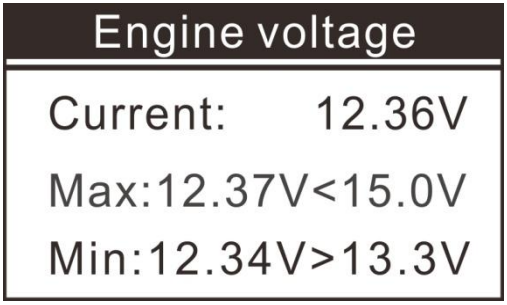
There are four test results:

Lifetime	Test Results	Remarks
＞80%	Excellent	The battery is in very excellent condition
>60%	Passable	The battery is passable
>45%	Attention	The battery is OK, but need to pay attention
<45%	Replace	The battery is at the end of its life, suggest to replace

2. Charging test

Select the “Charging Test” option, press the “ENTER” key to test the charging system of the car. The instrument will prompt to start the engine and then press the “ENTER” key again to enter the charging test, then read the maximum/ minimum value.





The MIN means the minimum voltage, the MAX means the maximum voltage, the first line voltage data shows the current voltage of the battery.

☆ If the voltage value is between 13.3V(26.6V for 24V battery) and 15.0V(30V for 24V battery) , it means the charging system is normal.

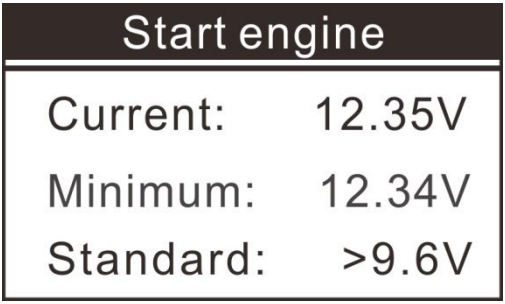
☆ If the voltage value is higher than 15.0V(30V for 24V battery), please check the voltage regulator.

☆ If the voltage value is lower than 13.3V(26.6V for 24V battery) , please check the connection point, cable and electric generator.

Data Reference(12V battery)		
State	Battery Voltage	Engine Performance
Do not turn on the headlight or the air-conditioning（Need to step on the accelerator to test）	Higher than 13.5	Normal
	13.2～13.5	General
	13.0～13.2	Need to pay attention
	Lower than 13	Need to bring it into factory to test immediately
Turn on the headlight or the air-conditioning（Need to step on the accelerator to test）	13.4～14.6	Normal
	13.2～13.4	General, need to pay attention
	Lower than 13.2	Need to bring it into factory to test immediately
The above data is only for your reference, if the battery has a problem, it will also influence the data.		

3. Start-up test

Select the “Start-up test” option, press the “ENTER” key to test the starter. As shown in the following figure.



The “Current” data displays the current voltage of the battery. The “minimum” data in second line shows the minimum value of the battery voltage during start up. The “standard” data in third line displays the reference value of the minimum battery voltage during start up.

Reference for starting voltage data:

12V battery	24V battery	Battery Performance	Battery Disposal
>10.7V	>21V	Good	No need to replace
10.2~10.7V	18~21V	General	Need to pay attention
9.6~10.2V	16~18V	Relatively Poor	Please replace it in time
<9.6V	<16V	Poor	Please replace it immediately

4.Maximum load system test

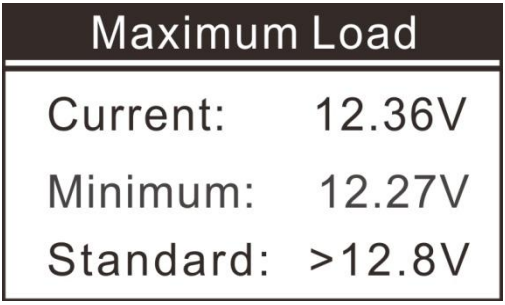
Preparation before testing: If the vehicle is in flameout status, please start the engine. After starting the engine, please clip the black clamp of the instrument to the cathode of the battery under test, and clip the red one to the battery anode, turn on all electrical systems (lights, air-conditioning, warning system). Increase the engine

speed to 2000 RPM for 15 seconds.

Select the “Load Test” item, press the ENTER Key, it will display the Maximum Load menu.

As shown in the following figure, read the minimum voltage of the battery, if the minimum voltage value is higher than 12.8V(25.6V for 24V battery), it means the system is normal.

If the minimum voltage value is lower than 12.8V(25.6V for 24V battery), please check if the generator belt is worn or the circuit is open circuit.



5. The Common Problems

1. The test principle of this analyzer

The vehicle battery gradually aging as time goes on, the main reason is that the plate surface of the battery is aging, the effectively chemical reaction can not occur any more , this is the main reason that most of batteries can not continue to use. In 1996, the International Institute of Electrical and Electronic Engineers (IEEE) formally put the conductivity test method as one of the test standard to detect lead-acid batteries, the IEEE standard 1118-1996 clearly states: “The battery conductance test is to add the AC signal which is in a known frequency and amplitude to both ends of the battery, then measure the generated alternating current, the AC conductivity value is the ratio of the AC current signal which is the same phase of the AC voltage to the AC voltage. ” The research and development of this product is based on this judgment data.

2. If the car is fitted with reverse current, will it influence the result?

All the reverse current will influence the test result of the instrument, so please

remove the reverse current before testing, to ensure the accuracy of the test.

6. Knowledge of the Battery

1. Different types of battery have the different internal resistance.

Although the battery type is the same, the internal resistance will be not the same because of the different chemical characteristics inside. The internal resistance of battery is very low, we usually use the milliohm unit to define it. It is a significant technical index to measure the battery performance. Under normal circumstances, if the internal resistance of the battery is low, the capability of high current discharge is strong; if the internal resistance is high, the capability of battery discharge is weak.

2. The amount of battery charge capacity cannot be measured by feeling

The working state of the battery can be measured by the hydrometer, the battery acid uses the distilled water and pure sulfuric acid to allocate, according to the proportion of 1.260/20℃. A new battery, if the amount of the battery acid is in the normal range, the acidity will be fixed, if the battery acid becomes less, distilled water should be added, in addition to maintain the water amount, the PH can be also maintained, if the battery is working properly, except the PH is fixed, its proportion value will also maintain a certain range.

Small Car Battery		
Voltage（V）	Electric Quantity（%）	Proportion
Higher than 12.7	100%	1.26-1.28
12.6	90%	1.24
12.4	70-80%	1.22
12.1	50%	1.16
Lower than 12	25%	Lower than 1.13

After fully charged, if the battery acid proportion value cannot reach to 1.26-1.28, and the measured voltage cannot reach higher than 12.7V, it means the battery charging capacity has declined. At this point, if the battery acid proportion value is allocated to 1.26 deliberately (increase the sulfuric acid proportion), the battery can not back to life, what’s worse, the battery will scrap faster, because the acidity will also increase, but it can not raise the voltage.

Battery Specification Table

The following data is for reference, the actual value is subject to the manufacturer's data.

JIS code conversion table

Battery Type		Cold Start Current			Battery Type		Cold Start Current		
New JIS	Old JIS		MF	CMF	New JIS	Old JIS		MF	CMF
26A17		200			36B20L	NS40ZL	275		
26B17		200	220	265	36B20	NS40Z	275	300	360
26A19	12N24	200			38B20		330	340	410
28B17		245			40B20	42B20	330		
28A19	N24	250			46B24	NS60	325	360	420
28B19	NS40S	245			46B24RS	NS60S	325	360	420
32A19	NX60	270	295		46B24LS	NS60LS	325	360	420
32B20R	NS40	270			46B26		360		
32B20L	NS40L	270			48D26R	N50	280	360	420
32C24R	N40	240	325	400	48D26L	N50L	280	360	420
32C24L	N40L	240	325	400	50D20		310	380	480
32C24RS	N40S	240			50D23		500		
32C24LS	N40LS	240			50D24	NT80-S6	390		
34B17		280			50D26			370	
34B19	NS40ZA	270	325	400	55D23		355	480	500
36B20R	NS40Z	275			55D24	NX100	435	420	500

JIS code conversion table

Battery Type		Cold Start Current			Battery Type		Cold Start Current		
New JIS	Old JIS		MF	CMF	New JIS	Old JIS		MF	CMF
55D26R	N50Z	350	440	525	95E41R	N100	515	640	770
55D26L	N50ZL	350	440	525	95E41L	N100L	515	640	77
60D23			520		105E41R	N100Z	580	720	880
65D23		420	540	580	105E41L	N100ZL	580		
65D26R	NS70	415	520	625	105F51	N100Z	580		
65D26L	NS70L	415	520	625		N110	600		
65D31R	N70	390	520	630	115E41	NS120	650	800	960
65D31L	N70L	390	520	630	115F51	N120	650	800	960
70D23		490	540	580	130E41	NX200	800		
75D32R	N70Z	450	540	735	130F51		800		
75D31L	N70ZL	450	540	735	145F51	NS150	780	920	
75D23		500	520	580	145G51	N150	780	900	1100
75D26R	N100-S	490			150F51	NT200-12	640		
75D26L	F100-SL	490			165G51	NS200	935	980	
80D26R	NX110-5	580	580	630	170F51	NX250	1045		
80D26L	NX110-5	580	580	630	180G51	NT250-15	1090		
	N90	500			195G51	N180	835		
85B60				500	195G51	NX300-51	1145		
95D31R	NX120-7	620	660	850	190H52	N200	925	1100	1300
95D31L	NX120-7	620	660	850	24H52	NX400	1530	1250	

DIN,EN type comparison table

Type		DIN	EN	Type		DIN	EN
52805	52815	180	240	54537	54545	190	300
53517		175	300	54801	54580	220	300
53520	53521	150	240	5458		220	300
53522		150	240	54590	4	210	330
53621	53646	175	300	55040	88056	265	450
53653	53624	175	300	55041	55042	220	360
53890	88038	175	300	55044	55414	265	450
54045		220	360	54046		300	510
54313	54324	220	330	55057	54827	320	540
54464		220	330	88156		320	540
54312	54317	210	360	55414	55421	265	450
54434	54437	210	360	55422		265	450
54449	54459	210	360	55423	55427	300	510
54466	54469	210	360	55428		300	510
54519	88046	210	360	55523	55530	225	420
54533	54612	210	360	55531	55545	225	420
54523	54524	220	300	55548	55559	255	420
54551	54579	220	300	55564	55565	255	420
54577	54578	220	300	55570		255	420

DIN,EN type comparison table

Type		DIN	EN	Type		DIN	EN
55811	56091	360	540	57218	57219	420	720
56048	56049	250	390		57223	420	720
56068	56069	250	390	57412	57413	400	680
	56073	250	390	58024		300	510
56077	56225	300	510	58516	58424	450	760
56312	56216	300	510	58512		430	750
56218	56219	300	510	58513	58514	320	540
56318	56312	300	510	58521	58522	320	540
56311	56323	300	510	58515	58820	395	640
56322	88066	300	510	88527	58815	395	640
56420	56580	300	510	58821	58827	395	640
56530	56618	300	510	58833	58838	400	680
56633	56638	300	510		88092	400	680
56619	56620	300	510	59029		350	570
56641		300	510	59040	59017	360	600
56818	56820	315	540	59018		360	600
56821	56828	315	540	59218	59219	290	480
57024	57029	315	540	59518	59519	395	640
57113	57114	400	680	59615	59616	360	600
	57589	400	680		60035	360	600
57217	57220	420	720	59618	59619	395	640

DIN,EN type comparison table

Type		DIN	EN	Type		DIN	EN
60016	60026	440	720		64318	540	900
	58811	440	720	66514		570	900
60038	60044	500	760	67018		600	1000
61017	61018	400	680	68021		570	900
61023	61047	450	760	68025		450	760
	62529	450	760	68034	68032	600	1000
62034	62038	420	680	70027	70029	630	1050
62045	63530	420	680		70038	630	1050
63531	63541	420	680	70036	68021	570	950
63545	63549	420	680		68040	570	950
64020		325	550	71014	71015	700	1150
64028	64035	520	760	72518		680	1150
64323	64317	540	900	73011		740	1200

Limited 90 Day Warranty

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

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

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

金正原 KZYEE