Battery Analyzer
User's Manual

---Model:MST-8000---

Warning

NOTE: It means that you can learn about the important information to use this equipment better.

CAUTION: It means potential damage to the parts; and give you attention how to prevent it.

WARNING: It means potential property damage, body hurt or death.

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Catelog

Preface

The plate of the battery will be oxidized after used for a long period of time. The result is the surface of the plate is oxidized, and the effective chemical reaction can not go on. It is the main reason that the battery can not be used.

The IEEE has been determined that the conductance technology is one kind of the lead-acid battery testing standard. It is shown clearly in IEEE stardard 1118-1996: The conductance technology is that adding a constant frequency and amplitude A.C. to the battery terminals, the electric current is divided by the voltage is the conductance value. The product is designed according to the principle.

Specifications

DC Voltage: 9V~18V
Working Temperature: -30℃~+50℃
Accuracy: ±0.5mΩ
Frequency OfTesting Range: 100Hz
Packing Dimensions: 320x240x55mm
Product Dimensions: 207x103x37mm

Graphic Representation Of The Product

1. Paper box: Heat sensitive print paper in store.
2. Right Key: Select function or input file.
3. Left Key: Select function or input file.
4. Quit: Quit current function or cancel inputed file.
5. Confirm: Into selected function or ensure inputed file.
6. Display: Show different functions and the measured data.
7. Body: The shell of this analyzer.

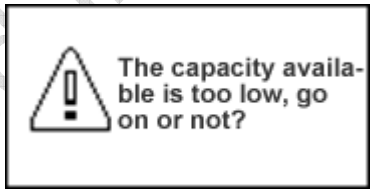
Operation Procedure

Get Ready For Work

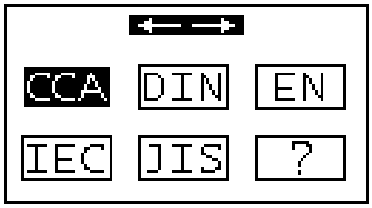
1. Connect the terminal post clips(red and black)to the appropriate terminal of the battery, the red to the positive and the black to the nagative, keep them connected well.
2. After the equipment initializing, it will show main manu screen automaticly as the picture shows. After starting, the first item will be displayed, charging the current item with"← →"key, the words under the picture sign explain the current item's function.

Battery Test

1. In main manu screen push the "← →"key, select "Battery Test", then push"↵"to ensure battery test function.
2. If the voltage is too low, the analyzer will display the information as the picture shows, suggesting to charge it before testing. In this case, push any one key will over the show.



3. Select the standard according to the data plate on the battery or the user's manual of the battery as the picture shows. The "?" means the standard is not known. The operating procedure is as follows:

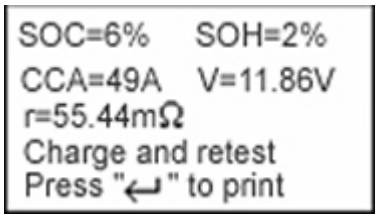


"← →" Left or right move the cursor.
" ↵" Ensure the current standard.
"■" Retune to the upper manu screen.

4. When push the "↵ "key, the display will show: push "← →"key, the battery size range(CCA) will increase or reduce at 5 amount one step. It is get from the data plate on waiting test battery or user's manual.

5. After input the file, push the "↵ ", the display will show as the right figure, start analysising.

6. The results will be shown on the display as the right figure.



r: The internal resistance of the battery, the CCA is bigger, the resistance will be small.

Note: The internal resistance standard will be different as it is made of different materials used by various manufactures, so there is no united

standard.

CCA: The full loud cold cranking current from the tested battery, it used to determine the battery condition. CCA is bigger, the internal resistance will be smaller.

V: The current voltage of the battery.

SOH: Life-Span, indicating the battery condition, suggested to replace it when the life-span is below 45%.

Life-Span	Testing Result	Remarks
SOH>80%	Great	Great Condition
81%>SOH>60%	Good	Good Condition
61%>SOH>45%	Caution	Life-Spanwill be over, caution
SOH<44%	Suggest Replace	Life-Span has been over, replace

Print the tested data

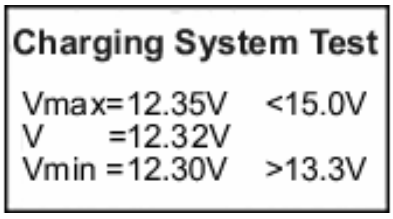
After testing, push"↵ "key, print the tested data and the time of testing. Push"■"key will return to the upper manu screen.

Note:

a) Before testing, make sure that the engine is not started and all electronic equipments are turned off.

b) After the automobile runs a period time, do not tesr it at once, because the available voltage of the battery is a little higher than normal, please turn on the headlight for about 2~3 minutes, waiting the voltage get down to normal before testing.

Charging System Test



1. Connect the clip of the analyzer to the terminal of the battery. The red clip to the positive, the black to the negative.

2. In the main manu screen,after selecting "Charging System Test"(The second item)by push"← →"key, push " ↵"key to start Charging System Test, the tested data is shown as the right figure.

SOC: The current voltage of the charging system and charged in %.

Note:

1) The normal voltage of the charging system is at 13~15V.

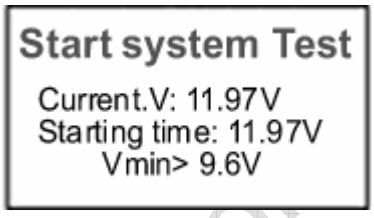
2) If the available voltage is over 15V, please check the regulator. If it is below 13V, please check the connected point, the wire and the alternator.

3) To check the charging system is OK or not, start the engine and

accelerate it exceed 2000rpm for about 15 seconds, read the voltage in the left of the screen under the display(Max) and the right(Min), if the voltage is 13.3V to 15V, it means the charging system is OK.

4) The analyzer will record the lowest voltage, push "■"key to delete and quit , then restart the test.

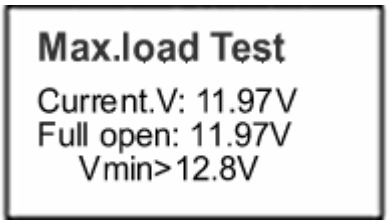
Start System Test



1. Turn off the engine. Connect the clip of the analyzer to the terminal of the battery, the red clip to the positive and the black to the nagative.
2. In the main manu, select "Start System Test" function(the third item), push"↵ "key to confirm, the result data will be shown as the right figure.
3. Start engine.
4. The available starting voltage will be got in the analyzer and in store.
5. If the starting voltage is over 9.6V, it means the starting system is Ok, otherwise it means the starting system is bad. Please check the connected points of the parts interelated, the wire and the starter.

Note: The lowest voltage will be stored in the analyzer, to deleet it please push "■"key then quit to get into start system test again.

Max.load Test



1. Start the engine. Connect the clips to the battery, the red to the positive and the black to the negative.
2. After pushing "← →"key to select in the main manu, push the " ↵ "key to get into the Max.load test, switch on all the electronic equipments according to the pointing out on the display, push any key to continue, as the right figure shows.
3. Accelerate the engine to 2000rpm, and keeping 15 seconds.
4. Read the lowest volage, it is also the "full load"volage, if the voltage is below 12.8V, it probably means the load has problem. Pleas check whether the alternator belt is weared, and whether the wire is shorted.

Note: The analyzer will record the lowest voltage, push "■"key to deleet then to quit and get into the Max.load test function.

Caution

1. This analyzer is used to test 12V batteries of automobile.
2. The DC voltage for the analyzer is in the range of 9V~18V, do not test the batteries contacted.
3. The vlotage of just charged battery will be over the normal a bit, please turn on the headlights for about 2~3 minutes, waiting the voltage to get down to normal before testing.
4 Please do not store up the tseter and use it at high tempurature and high humidity place.
5. The battery size range is fit for the analyzer:
   a) CCA: 100-1700
   b) IEC:100-1000
   c) EN: 100-1700
   d) JIS: Should look up the coversion table to compare CCA.
   e) DIN: 100-1000
   f) Unknow size range: Should test the internal resistance,CCA and the voltage

Battery Standards

1.CCA: Cold Cranking Ampere(International Battery Association standards), it means in the provision of a low temperature(genaral provision in 0℉ or -18℃ condition) the maximum output current value from the battery.
2.DIN: German standard, in 0℉ or -18℃ condition, the current can reach a value and keep for 30 seconds at 9.0V, or at 8.0V for 150 seconds.
3.IEC: International Battery Association standars, in 0℉ or -18℃ condition, the average strenth of the current can keep for 60 seconds at 8.4V.
4.BSR: British standard, in 0℉ or -18℃ condition, the average strenth of the current can keep for 180 seconds at 6.0V.
5.BCI: International Battery Association standards, in 0℉ or -18℃ condition, the current can keep for 30 seconds at 7.2V.

Appendix: The Conversion Tables Of Battery Size Range

Table 1

EN and DIN Conversion Tables									
Specification			CCA		Specification			CCA	
Type	Same Type		DIN	EN	Type	Same Type		DIN	EN
52805	52815		180	240	56420	56322	88066	300	510
53517			175	300	56530	56618	56638	300	510
53520	53521	53522	150	240	56618	56619	56620	300	510
53625	53638	53836	175	300	56633	56647	56641	300	510
53646	53621	88038	175	300	56820	56821		315	540
53653	53624	53890	175	300	57024	57029		315	540
54038	54039		175	300	57113	57539		400	680
54232			175	300	57114	56821	88074	400	680
54313	54324	54464	220	330	57218	57219		420	720
54317	54312	88146	210	360	57220	57217		420	720
54437	54466	54459L	210	360	57230			380	640
54459	54434	88046	210	360	57412	57413	57412L	400	680
54469	54449	54465	210	360	57512	57513	57531	350	570
54519	54533	54612	210	360	58515	58424		450	760
54523	54524		220	300	57521	58513		320	540
54537	54545	54801	190	300	58522	58514		320	540
54551	54580		220	300	58815	58821		395	640
54533	54577	54579	220	300	58820	58515	58527	395	640
54584	54578		220	300	58827			400	640
54590			210	330	58838	58833	88092	400	640
54827			240	360	59040	59017	59018	360	600
55040	88056		265	450	59218	59219		290	480
55041	55042		220	360	59226	59215		450	760
55044	55414	88056	265	450	59514			320	540
55046			300	510	59518	59519		395	640
55056			320	540	59615	59616		360	600
55057	54827	88156	320	540	60018	30019		250	410
55068	55069	55548	220	390	60026	58811		440	720
55218			255	420	60044	60038		500	760
55414	55415	55421	265	450	60527	60528		410	680
55422	55566	55040	265	450	61017	61018		400	680
55428	55423	55427	300	510	61023	62529		450	760
55457			265	450	61047	61048		450	760
55529			220	360	62034	62038	62045	420	680
55531	55545	55559L	255	420	63013			470	680
55559	55530	88056	255	420	63545	63549		420	680

55564	55552	55563	255	420	64020	64317	64318	325	550

55564	55565	55548	255	420	64028	64035		520	760
55570	55567	55565L	255	420	64036			460	760
56012			230	390	64317	64318	64323	540	900
56048	56068	56069	250	390	65513			540	900
56049	56069	56073	250	390	65514	65515		570	900
56077	56530		300	510	67043	67045		600	1000
56091	55800		360	540	68032	68034		600	1000
56111	55048		300	540	70029	70038	70027	630	1050
56218	55092		300	510	70036	68040	68021	570	950
56219	56216		300	510	71014	71015		700	1150
56220			280	510	72512			680	1150
56225	56323		300	510	73011			740	1200
56318	56312	56311	300	510					

Table 2

JIS Specification Conversion tables of batteries									
Specification		CCA			Specification		CCA		
JIS(New)	JIS(Old)		MF	CMF	JIS(New)	JIS(Old)		MF	CMF
26A17R		200			55B24RS	NT80-S6S	430	420	500
26A17L		200			55B24LS	NT80-S6LS	430	420	500
26A19R	12N24-4	200	220	264	55D26R	N50Z	350	440	525
26A19L	12N24-3	200	220	264	55D26L	N50ZL	350	440	525
28A19R	NT50-N24	250			60D23R		520		
28A19L	NT50-N24L	250			60D23L		520		
32A19R	NX60-N24	270	295		65D23R		420	540	580
32A19L	NX60-N24L	270	295		65D23L		420	540	580
26B17R		200			65D26R	NS70	415	520	625
26B17L		200			65D26L	NS70L	415	520	625
28B17R		245			65D31R	N70	390	520	630
28B17L		245			65D31L	N70L	390	520	630
28B19R	NS40S	245			70D23R	35-60	490	540	580
28B19L	NS40LS	245			70D23L	25-60	490	540	580
32B20R	NS40	270			75D23R		500	520	580
32B20L	NS40LS	270			75D23L		500	520	580
32C24R	N40	240	325	400	75D26R	F100-5	490		
32C24L	N40L	240	325	400	75D26L	F100-5L	490		
34B17R		280			75D31R	N70Z	450	540	735
34B17L		280			75D31L	N70ZL	450	540	735

34B19R	NS40ZA	270	325	400	80D23R		580		
34B19L	NS40ZAL	270	325	400	80D26L		580		
36B20R	NS40Z	275	300	360	85B60K				500
36B20L	NS40ZL	275	300	360	85BR60K				500
36B20RS	NS40ZS	275	300	360	95D31R	NX120-7	620	660	850
36B20LS	NS40ZLS	275	300	360	95D31L	NX120-7L	620	660	850
38B20R	NX60-N24	330	340	410	95E41R	N100	515	640	770
38B20RS	NT60-N24S	330	340	410	95E41L	N100L	515	640	770
38B20L	NX60-24L	330	340	410	105E41R	N100Z	580	720	880
38B20LS	NX60-24LS	330	340	410	105E41L	N100ZL	580	720	880
40B20L		330			105F51R	N100Z	580		
40B20R		330			105F51L	N100ZL	580		
42B20R		330			115E41R	NS120	650	800	960
42B20L		330			115E41L	NS120L	650	800	960
40B20RS		330			115F51R	N120	650	800	960
40B20LS		330			115F51L	N120L	650	800	960
46B24R	NS60	325	360	420	130E41R	NX200-10	800		
46B24L	NS60L	325	360	420	130E41L	NX200-10L	800		
46B24RS	NS60S	325	360	420	130F51R			800	
46B24LS	NS60LS	325	360	420	130F51L			800	
46B26R		360			145F51R	NS150	780	920	
46B26L		360			145F51L	NS150L	780	920	
46B26RS		360			145G51R	N150	780	900	1100
34B19RS	NS40ZAS	270	325	400	80D26R	NX-110-5	580	280	630
34B19LS	NS40ZALS	270	325	400	80D26L	NX110-5L	580	280	630
46B26LS		360			145G51L	N150L	780	900	1100
48D26R	N50	280	360	420	150F51R	NT200-12	640		
48D26L	N50L	280	360	420	150F51L	NT200-12L	640		
50D20R		310	380	480	165G51R	NS200	935	980	
50D20L		310	380	480	165G51L	NS200L	935	980	
50D23R	85BR60K	500			170F51R	NX250-12	1045		
50D23L	85B60K	500			170F51L	NX250-12L	1045		
50B24R	NT80-S6	390			180G51R	NT250-15	1090		
50B24L	NT80-S6L	390			180G51L	NT250-15L	1090		
50D26R	50D20R		370		195G51R	NX300-51	1145		
50D26L	50D20L		370		195G51L	NX300-51L	1145		
55D26R		355	480	500	190H52R	N200	925	1100	1300
55D23L		355	480	500	190H52L	N200L	925	1100	1300
55B24R	NX100-S6	435	420	500	245H52R	NX400-20	1530	1250	
55B24L	NX100-S6L	435	420	500	245H52L	NX400-20L	1530	1250	