

kaise

BATTERY CHECKER

Instruction Manual

SK-8535



KAISE CORPORATION

Thank you for purchasing "BATTERY CHECKER SK-8535". To obtain the maximum performance of this instrument, read this Instruction Manual carefully, and take safe measurement.

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SAFETY PRECAUTIONS (strict observance is required)

This instruction manual contains the important contents to prevent harm to user or others and damage of property, and to use the instrument safely and correctly.

Read this manual carefully and obey the contents after having understand the following terms and symbols.

- Following symbols in this manual describe the harm and damage that would be caused by incorrect ueage.



WARNING

This symbol in this manual advises the user of an electrical shock hazard that could result in serious injury or even death.



CAUTION

This symbol in this manual advises the user of an electrical shock hazard that could cause injury or material damages.

- Caution marks that require your attention (equivalent marks have the same meanings.)



This symbol shows the warnings and cautions.



This symbol shows the prohibited matters.



This symbol shows the matters that is forced to do.

SAFETY PRECAUTIONS (strict observance is required)

WARNING

Take the measurement under well-ventilated environment.

The hydrogen gas which stayed around battery catches fire from the spark that occurred when connecting the Battery Clips and might explode.



Make sure that the shift lever is set to "Parking" position (set to "Neutral" for stick shift vehicle).

The vehicle runs accidentally and could cause unexpected accident, electric shock, fire or damage to the instrument / vehicle.



Make sure that the parking brake is applied.

The vehicle runs accidentally and could cause unexpected accident, electric shock, fire or damage to the instrument / vehicle.



Keep the instrument away from babies or children.

Important to prevent any accident, injury, or electric shock hazard.



Do not use this instrument with the hands or Battery Clips wetting.

Accident, electric shock, fire, or damage to the instrument / vehicle may occur.



Do not take the measurement around inflammables such as gasoline or oil.

Fire or explosion may occur.



Do not take the measurement for the battery which does not have enough battery fluid.

It causes combustion and the explosion of the battery.



Do not drive the vehicle keeping the instrument connected.

Accident, electric shock, fire, or damage to the instrument / vehicle may occur.



Do not work in the dark place.

Accident, electric shock, fire, or damage to the instrument / vehicle may occur.



Do not get the instrument wet.

Fire or electric shock may occur.



Do not use the faulty instrument that can recognize such as display trouble, switch failure.

Stop using the instrument immediately and consult with your local dealer. Using the faulty instrument may cause the unexpected accident, fire, or electric shock.



Do not touch the USB port with finger or insert the foreign objects in the USB port.

Accident, electric shock, fire, or damage to the instrument may occur.



Do not place this instrument in any place where it will be subjected to direct sunlight, high temperatures or the inside of the sun-heated vehicles.

Fire, electric shock or damage to the instrument may occur.



Do not touch the heated part of the engine such as exhausting parts.

Important to prevent burn injury.



SAFETY PRECAUTIONS (strict observance is required)

WARNING

Be careful about your hands, gloves and clothes not to be caught in the engine belt or cooling fan.

Important to prevent injury.



Do not use the instrument if it is in the abnormal condition.

Stop using the instrument immediately and consult with your local dealer when recognizing smoke, strange smell, or abnormal noise.

Using the faulty instrument may cause the accident, fire, or electric shock.



Do not attempt to disassemble or modify the instrument.

Fire, electric shock, or damage to the instrument may occur.



Do not use the cables with which coating were damaged.

Fire or electric shock may occur.



CAUTION

Be careful not to get the battery fluid into eyes or not to attach it to skin and clothes.

Loss of eyesight or injury may occur. If it gets into eyes, rinse immediately and submit to medical treatment.



Be careful not to jam the fingers in the Battery Clip.

It causes injury.



Be careful about the instrument or the cables not to be caught in the engine belt or cooling fan.

Short circuit or wire breaking may occur that could cause unexpected accident, electric shock, or damage to the instrument / vehicle.



Be careful about the instrument or the cables not to touch the heated part of the engine such as exhausting parts.

Important to prevent any accident, or damage to the instrument / vehicle.



Connect the Battery Clips to the battery with the correct polarity.

Reverse connection causes damage to the instrument.



When testing the battery on vehicle, take the measurement after stopping the engine and turning off the power supply of all in-vehicle apparatuses.

It causes injury or damage to the instrument.



Disconnect this instrument from battery soon after finishing the test.

It causes consumption of the battery and the ignition.



Do not hit, thrust and make scratch on the LCD display part.

It causes trouble or damage to the LCD.



Do not use the other USB cable except the supplied one.

Damage to the instrument or PC may occur.



OPERATING PRECAUTIONS

- Do not apply the engine oil to the metal part of the Battery Clips or USB Plug to prevent contact failure.
- Do not apply engine oil, gasoline, antifreeze or battery fluid to the instrument to prevent any damage on its surface.
- Do not polish the case with the fluid that contains alcohol to prevent the cracking.
- Use this instrument under the environment of -10°C to 50°C, 80%RH or less to obtain the accurate measurement. (Printer is operating at 0°C to 50°C)
- Cables which coating are heat damaged might cause the short circuit. Do not use them and replace into the new ones.
- Disconnect this instrument from battery soon after finishing the test to prevent trouble of this instrument and running out of battery power.
- Do not touch the inside of the printer with finger to prevent trouble of this instrument.
- Do not put serious pressure on Printer Lever or Printer Cover to prevent trouble or damage to this instrument.
- If Date and Time are not able to set, built-in battery for backup is exhausted. Ask KAISE AUTHORIZED SERVICE AGENCY through your local dealer for repair service.
- Keep this instrument in supplied Carrying Case to avoid malfunction of the printer trouble by dust penetration.

Cautions for Handling

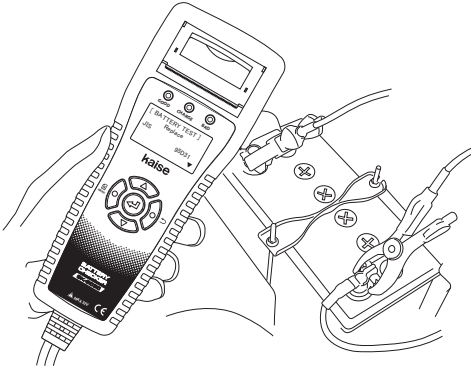
- Do not apply mechanical shock.
The shock such as dropping or beating might damage the instrument and may cause the trouble.
- Do not pull cables forcibly.
Pulling the cables forcibly, such as when removing the Battery Clips from the battery or USB Plugs from USB Port, may cause trouble such as the breaking of wire.

Cautions for Safekeeping

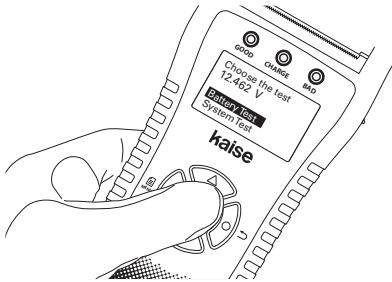
- Keep away the instrument from the following place.
 - Dusty area
 - The place where has the water splash
 - The place where applies the hard shock
 - -20°C or less, 60°C or more, 70%RH or more
 - The place where has the condensation
 - The place where is exposed to direct sunlight

FEATURES

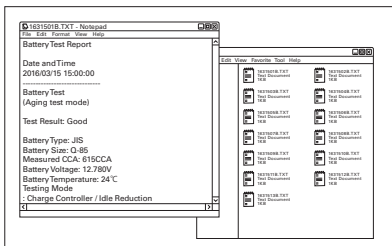
- SK-8535 can test State of Charge (SOC), State of Health (SOH), Start Performance and Charging System of the car battery.



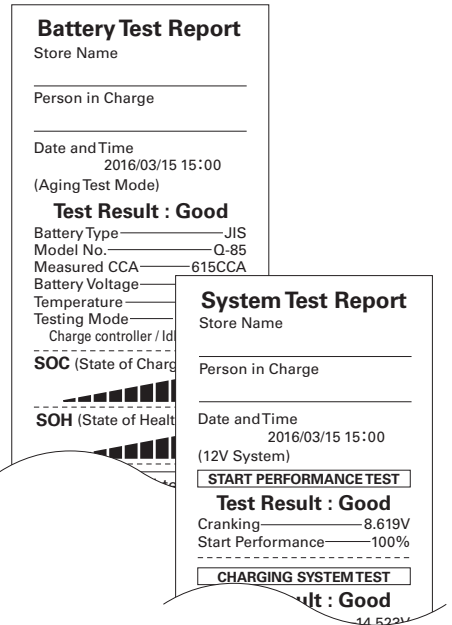
- Auxiliary battery for hybrid car is testable.
- Portable instrument that can operate with one hand.



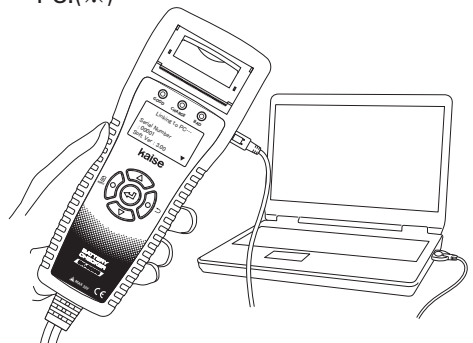
- Capable of saving the test results up to 359 data. Moreover, the test data can edit on PC as text data by using the supplied USB cable.



- Batteries for the vehicle equipped with charge control system or idle reduction system are testable.
- Test result can be printed on site by built-in printer. English or Japanese selectable.



- The software is upgradeable by connecting supplied USB cable with PC.(※)

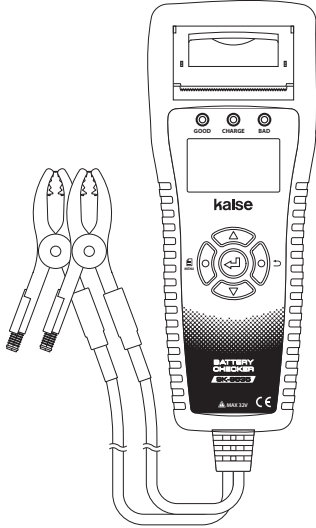


※PC with Internet access is necessary.

UNPACKING AND INSPECTION (Check before use)

Confirm if the following items are contained in the package in good condition.
If there are any damages or missing items, ask your local dealer for replacement.

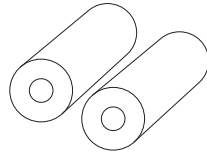
① Battery Checker...1 pce.



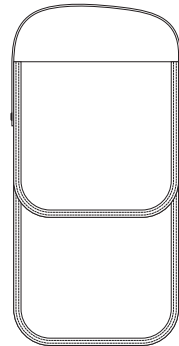
② USB Cable (934)...1 pce.



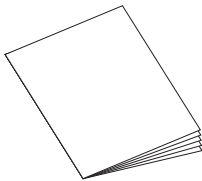
③ Printer Paper...2 rolls
(installed, and spare)



④ Carrying Case...1 pce.



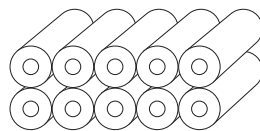
⑤ Instruction Manual...1 pce.



※The following desiccant is enclosed in the package for maintenance of quality. Throw it away after opening the package.



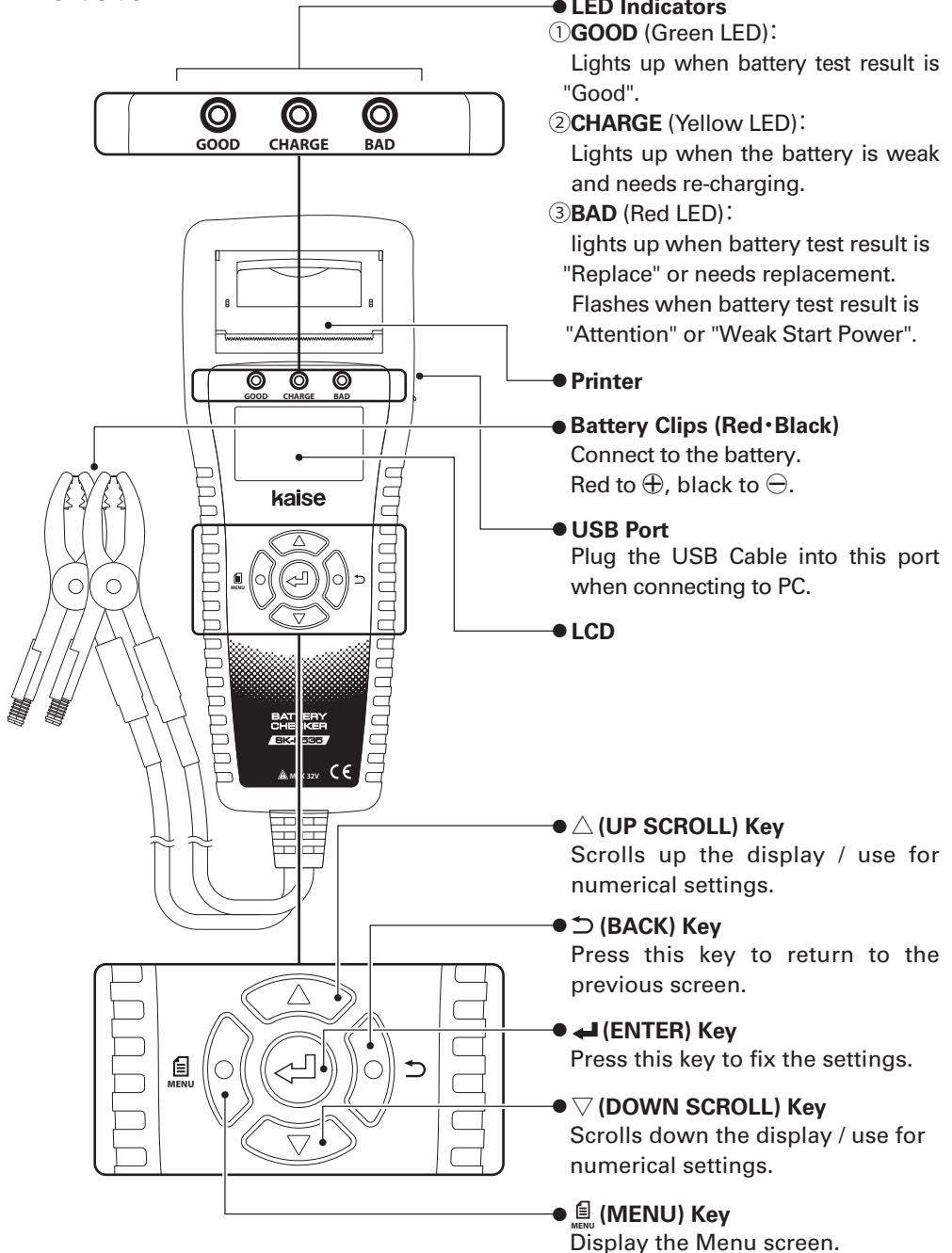
Available Printer Paper (10pcs per set)
Parts number : 851
(Paper width : approx. 57mm,
length : approx. 5.8m)



•Use above parts number when ordering.

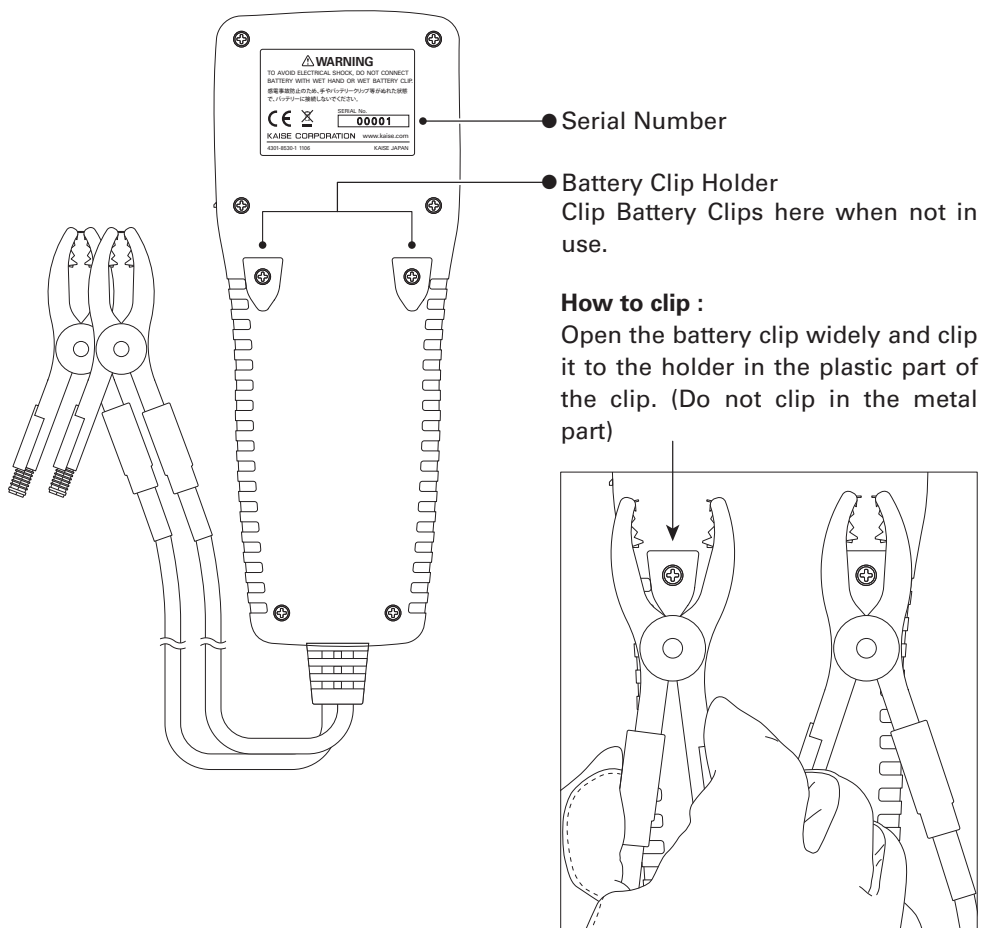
NAME ILLUSTRATION

Front Side



NAME ILLUSTRATION

Rear Side



CAUTION

- Do not clip in the metal part of the Battery clip. To prevent any damages of the Battery Clip and Clip Holder.

SPECIFICATIONS

1. General Specifications

1. LCD	Dot presentation, 128×64dots
2. LANGUAGE	English, Japanese (Default: English)
3. DISPLAY RATE OF VOLTAGE MEASUREMENT	1 time/second
4. LED INDICATION	Green: Lights up when battery test result is "Good" Yellow: Lights up when battery is weak and needs re-charging Red: Lights up when battery test result is "Replace" Flashes when battery test result is "Attention" or "Weak Start Power"
5. PRINTER	Built-in
6. BATTERY CABLE LENGTH	Approx.70cm (Clip and Bush are not included)
7. POWER SUPPLY	Testing battery or USB connection
8. TESTING VOLTAGE	DC8V to 32V (Testing battery), DC5V (USB Connection)
9. TESTABLE BATTERIES	12V lead batteries ※For 24V battery, only Start-up Performance Test or Charging System Test are possible.
10. TESTABLE BATTERY STANDARDS	JIS, DIN, EN, SAE, BCI, CCA and Industrial Rating
11. TESTABLE BATTERY PERFORMANCE	CCA: 100 to 1400, Industrial Rating: 1.0mΩ to 50.0mΩ
12. MEASURABLE TESTS	12V battery: Battery Test / Start Performance Test and Charging System Test 24V battery: Start Performance Test and Charging System Test
13. TEMPERATURE COEFFICIENT FOR VOLTAGE MEASUREMENT	Accuracy at 23°C±5°C×0.01/°C
14. DATA SAVING	Test results can be saved to the internal memory up to 359 data. ※The data can be sent to PC via USB connection
15. SOFTWARE UPDATE	From web site via USB connection
16. OPERATING TEMPERATURE & HUMIDITY	-10°C to 50°C, less than 80%RH (in non-condensing)
17. STORAGE TEMPERATURE & HUMIDITY	-20°C to 60°C, less than 70%RH (in non-condensing)
18. SAFETY LEVEL	CE marking approved EN61326-1
19. DIMENSION	248mm(H)×96mm(W)×50mm(D) ※Cable and Bush are not included
20. WEIGHT	Approx. 550g ※Printer paper is not included

※Specification and appearance are subject to change without notice.

2. Measurement Specifications (23°C±5°C, <80%RH in non-condensing)

Battery Voltage

Range	Accuracy	Resolution	Maximum Input
16.000V	(8V to 16V): ±0.15%±3dgt	1mV	Lower than 32V
32.000V	(16V~32V): ±0.15%±3dgt		

※Overload indication: "Over voltage" is displayed.

Temperature

Range	Accuracy	Resolution	Maximum Input
-20°C to 60°C	±3°C	1°C	-20°C to 60°C

※Accuracy is applied when measuring after leaving under constant temperature more than an hour.

BEFORE USE

1. Technical Words

●What is CCA?

CCA stands for Cold Cranking Amperes. It is defined as the current a battery at 0°F (-18°C) can discharge for 30 seconds and maintain at least 7.2V (for JIS, SAE and BCI). And it is defined as the current a battery at 0°F (-18°C) can discharge for 10 seconds and maintain at least 7.5V (for EN and DIN). The battery which has the bigger CCA, the higher ability to start an engine, CCA is one of the criterion for selection of the battery.

CCA definition of various standards

Standards	CCA Definition	Countries
JIS	The current discharge at 0°F (-18°C) for 30 seconds and maintain at least 7.2V.	Japan
SAE		USA
BCI		USA
EN	The current discharge at 0°F (-18°C) for 10 seconds and maintain at least 7.5V.	EU
DIN		Germany

●What is SOH (State of Health)?

SOH is the health condition of the battery, the state is expressed in percentage (%).

Definition of SOH in this product:

SK-8535 defines SOH 30% as the threshold of the battery replacement recommendation.

Test result shows "Replacement is necessary" when measured SOH is 30% or less and test result of SOC is not "Charge/Retest".

※SOH(%) is calculated as the ratio of CCA standard value to CCA measured value.

※SOH(%) fluctuates due to the rate of deterioration and charging condition.

●What is SOC (State of Charge)?

SOC is the charging condition of the battery, the state is expressed in percentage (%).

Definition of SOC in this product:

SK-8535 defines as SOC 100% when the battery voltage is higher than 12.756V. (Higher than 13.056V for the battery for industry)

※SK-8535 does not show the exact measurement voltage when testing the battery just after an engine shutdown or just after charging. Test the battery after reducing the stimulated condition according to the procedure mentioned in page 12.

BEFORE USE

●What is Ripple Voltage?

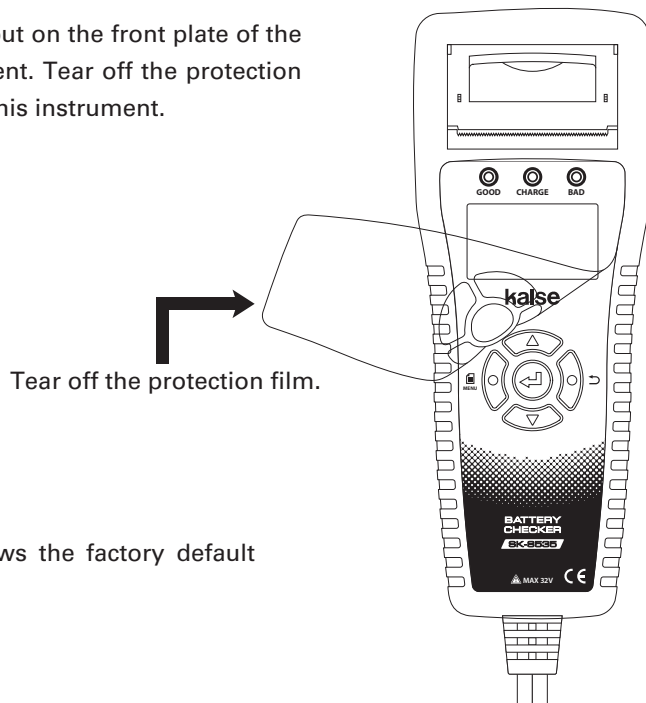
Ripple Voltage is the feeble change of charging voltage which occurs when rectifying the generated voltage by diode. If diode is damaged, the ripple voltage fluctuated sharply and adversely affects battery and in-vehicle apparatus.

2. Language / Date & Time Settings

- Set date and time before using this instrument. (Refer to "5. Date and Time Setting" in page 37).
- Language changeable from English (default setting) to Japanese or simplified Chinese. (Refer to "6. Language Setting" in page 38).

3. Others

- Protection film is put on the front plate of the unit before shipment. Tear off the protection film before using this instrument.



- Initial display shows the factory default settings.

BATTERY TEST

CAUTION

- This instrument forced to be restarted if the testing battery is extremely exhausted and cannot afford to supply the workable current.
- Test the battery in the state of the engine shutdown to obtain the accurate measurement.
- When testing 24V battery, test each 12V battery which is connected in series.
- When testing the battery on vehicle, test the parked car after turning off the power supply of all in-vehicle apparatuses which are using the electricity from battery and locking the car door to obtain the accurate measurement.
- Test result may change when testing the same battery repeatedly. Also, test result may change when testing the weak battery after using the printer.
- Test result may change, even when testing the same battery, depending on the battery condition or change the storage environment.
- Test results may be higher than usual just after driving. When testing the battery test of such a car, test it after doing the following procedure.
 - Turn on the headlights for approx. 20 seconds.
 - Turn off the headlights and test it more than 3 minutes after turning off the headlights.

In case of the test result is "Charge/Retest" by turning on the headlights, shorten the time of turning on the headlights after re-charging the battery, and lengthen the time of intervals before testing.

When you do not perform the procedure mentioned above or testing battery unit just after charging, test after an interval more than 2 hours.

- This instrument judges the battery condition with testing the basic use of the lead battery such as charge-discharge characteristics. Test result is not for judging whether the special control function can use for the vehicle or not.
- This instrument is for testing fundamental battery performance, charging and discharging ability, but not for judging the capability of actuating the special control function such as idle reduction system.

For the batteries working with such functions, charging ability may be weakened in its using process. When the relevant functions cannot be activated, check the system details in the maintenance manual of the vehicle.

- The maximum CCA displayed with this unit is up to 1400CCA.

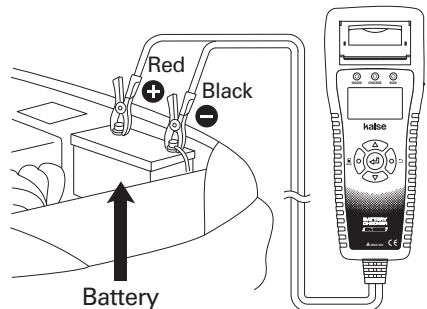
BATTERY TEST

Test Preparation

- Make visual inspection for the battery to be tested before connecting battery clips to the battery terminals.
- Replace the battery terminals if there is corrosion or crack occurs on the terminals.
- Connect the battery clips to the battery terminals tightly without loosening.
- Clean up the battery terminals and battery clips if there is greasy dirt.
- Do not test the battery which has any damages on its body or terminals. Replace immediately.
- As for the battery which battery fluid almost decreases to LOWER line, refill the purified water and make auxiliary charging.
- Replace the battery which battery fluid is discolored and decreases under the LOWER line.

Test the SOC (State of Charge) and SOH (State of Health) of the battery.

- ① Connect Black and Red battery clips to minus \ominus and plus \oplus battery terminals.
- ※ Connect them to the nearest part of the terminals is acceptable if the clips cannot catch the battery terminals.
In this case, CCA may be measured lower than the actual value.

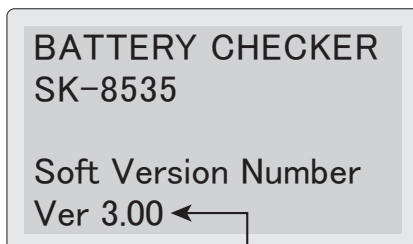


CAUTION

- Make sure to connect the battery clips tightly to battery terminals to obtain the accurate measurement.
- Clean up the battery terminals and the battery clips before testing to obtain the accurate measurement.

BATTERY TEST

- ② The instrument turns on automatically and enters "Choose the test" screen (step ③) after displaying the model number / software version number.



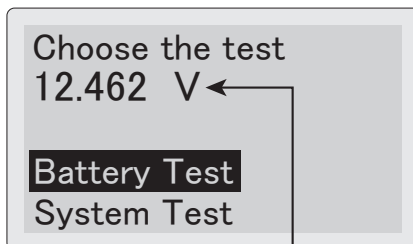
Current version number

- ③ Select **Battery Test**, press **↵ (ENTER) Key**.

※ Display shows the connected battery voltage.

-  **(MENU) Key :**

Move to MENU screen. (see page 35)



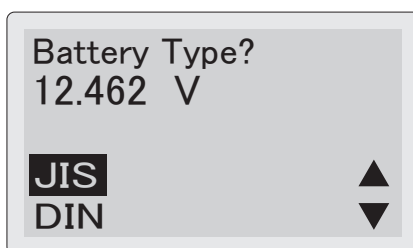
Battery voltage

- ④ Select the battery type to be tested. Select the battery type, and press **↵ (ENTER) Key**.

※ Battery test does not work when the battery voltage is higher than 13.6V. LCD shows WARNING.

※ When the battery voltage is higher than 16V, LCD shows "OVER VOLTAGE" warning.

※ When testing the batteries for industrial, golf cart, leisure boat, or deep-cycle, select "Input CCA" if the CCA is shown on the battery. Otherwise, choose "Industry".



BATTERY TEST

⑤ Select testing mode.

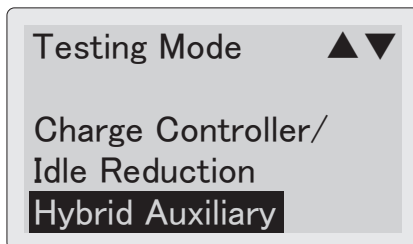
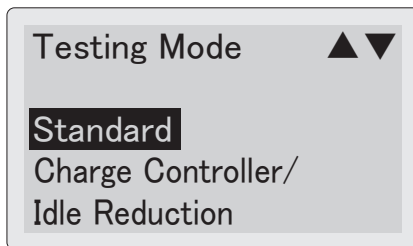
Select "Standard" for normal batteries.

Select "Charge Controller / Idle Reduction" when testing following batteries ;

- Charge control / idle reduction compatible batteries
- Batteries in Charge control / idle reduction vehicles

※ LCD shows "Industrial Rating" screen when selecting "Industry" at ④ in page 14.

- When testing the auxiliary battery for hybrid car, select "Hybrid Auxiliary" and press **↵ (ENTER) Key**.

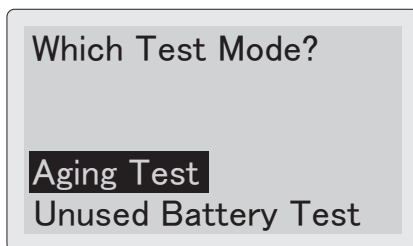


⑥ Select Test Mode.

Aging Test : for deterioration check.

Unused Battery Test :

for condition check of unused battery



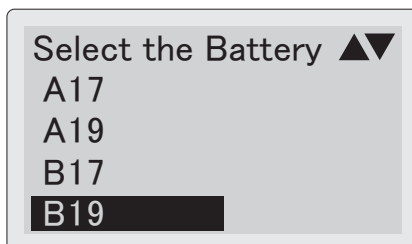
BATTERY TEST

⑦ The following screen is displayed depending on the selected battery standards.

● "JIS"

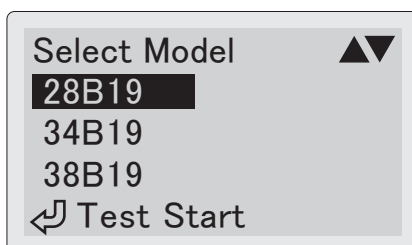
Select the battery group from the list, and press **↵ (ENTER) Key**.

The list is classified by battery size or functions such as idle reduction or hybrid auxiliary.



Select battery number to be tested.

Press **↵ (ENTER) Key** to start battery test.



※ Selected battery standard is retained.

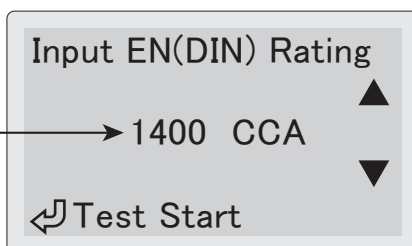
※ If knowing only battery size like B24, D31, etc., select JIS of the greatest specifications which is replaceable.

● "EN(DIN)" / "SAE(BCI)" / "CCA input"

Input the CCA rating using **△ (UP SCROLL) / ▽ (DOWN SCROLL) Keys**.

Press **↵ (ENTER) Key** to start battery test.

※ Selected battery rating is retained.



Input CCA rating

BATTERY TEST

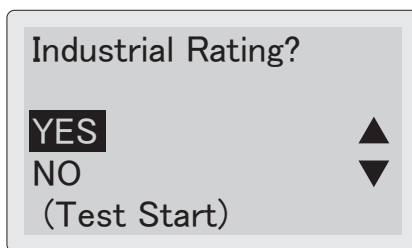
● "Industry"

Select "YES" if you can input the industrial rating (internal resistance $m\Omega$) and press

↵ (ENTER) Key.

When choosing "NO", battery test starts.

※ Battery condition (good / bad) is not tested when choosing "NO".



- Remove the all electric loads connected to the battery to be tested to obtain the accurate measurement.
- Battery test is effective for only 12V lead battery.
- Generally, industrial battery is recommended to be replaced when the internal resistance comes up to double of the unused battery. Based on this, SK-8535 judges "Bad" when the test result becomes double of the input industrial rating.

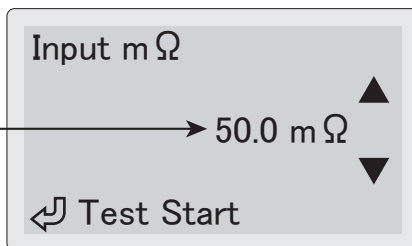
(When selecting "YES")

Input $m\Omega$ value with using △(UP SCROLL) /

▽(DOWN SCROLL) Keys.

Press ↵ (ENTER) Key to start battery test.

Input $m\Omega$ value



※ Input internal resistance ($m\Omega$) value if it is available on the battery body or its manual. If not, test the new (full-charged) battery selecting "NO" in the above step to record the initial internal resistance. Input that value from the next testing.

※ Battery condition (good / bad) cannot be tested without inputting internal resistance ($m\Omega$) value.

※ Selected resistance value is retained.

BATTERY TEST

● Input Battery Temperature

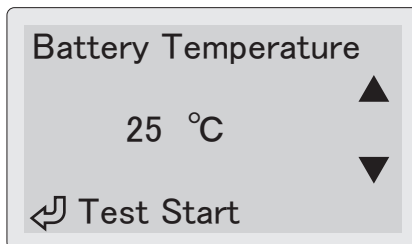
(when selecting manual temperature input in page 39, "8. Temperature Setting")

Input battery temperature in °C using Δ (UP SCROLL) / ∇ (DOWN SCROLL) Keys.

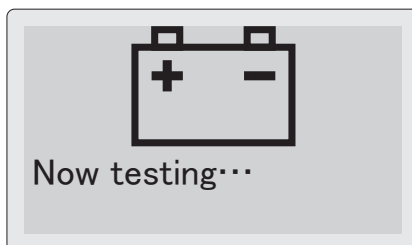
Press \blacktriangleleft (ENTER) Key to start battery test.

※ Input the temperatures of the battery fluid or \oplus terminal.

※ Selected temperature value is retained.



⑧ "Now testing..." is shown on LCD during battery testing.

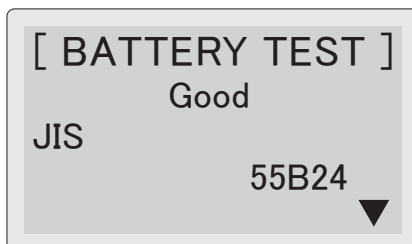


⑨ Read the test result on LCD.

Scroll the display with Δ (UP SCROLL) / ∇ (DOWN SCROLL) Keys.

You can also check the results by LED.


- Green lights up when test result is "Good"
- Green & Yellow lights up when the battery is fine but needs re-charging
- Yellow lights up when re-charging and retest are needed.
- Red flashes when the test result is "Caution"
- Red lights up when battery replacement is needed.



※ You can see following results on LCD.

- | | | |
|-------------------------|---|-------------------|
| • Battery test result | • CCA value (Standard mΩ for Industry) | • Battery voltage |
| • Selected battery type | • Measured CCA (measured mΩ for Industry) | • Testing method |
| • Model (JIS only) | • Temperature | • Testing Mode |
| • SOH (State of Health) | • SOC (State of Charge) | • Comment |

BATTERY TEST

● Press  (MENU) Key : Move to Menu screen (Print / Save Data / Delete Save Data) in page 30.

※ For the vehicle equipped with higher grade battery, start performance of engine may have no problem even if the judgment result is "Replace". In this case, battery replacement is recommended to prevent suddenly battery breakdown.

※ The battery which is not charged for a long term may be judged "Replace" due to decreasing CCA by self-discharge even if it is a new battery. Keep the battery with periodical auxiliary charge to prevent deterioration by leaving with exhausted condition for a long term.

⑩ Press  (ENTER) Key.

Select "Yes" to finish the test and return to the battery type select screen (③ in page 14).

Do you want to exit?

YES

NO



CAUTION

● Do not pull Battery Clips forcibly when detaching from the battery. It may damage the battery terminals.

※ If the instrument displays right error message, disconnect battery clips from the battery and inspect following points.

① **Check for the battery and vehicle**

Make sure there are no dirt or abnormality on the battery terminals and terminal cables.

② **Check for SK-8535**

Make sure there are not any dirt or abnormality on the metal part of battery clips and clip cables.

※ Battery may be damaged if keeping getting errors in spite of checking above.

When the error message is kept displaying or measurement error is displayed even if testing another battery, ask repair service to us, KAISE CORPORATION through your local dealer.

Error

Restart the unit and test again.
Check error point.

CCA VALUE LIST (Battery Manufacturers and Their Models)

List to help you for checking the battery type either EN(DIN), SAE(BCI) or CCA Input and their CCA values.

- Find the battery number (model name) and check its battery type and CCA.
- Input the CCA printed on the battery if it is different from the listed one.

This publication CCA value is subject to change without notice.

AC Delco			
EN(DIN)		SAE(BCI)	
Model	CCA EN(DIN)	Model	CCA SAE(BCI)
20-55	630	26-6MF	550
20-55D	525	34-6MF	535
20-60	500	34-7MF	700
20-66	500	58-5MF	430
20-70	650	58-6MF	560
20-72	700	58R-6MF	585
20-80	780	65-6MF	650
20-90	850	65-7MF	850
20-92	600	75-6MF	650
20-100	800	75-7MF	735
20-110	1000	78-6MF	675
27-44	400	78H-6MF	675
27-45H	400	78-7MF	770
27-50P	500	78DT-7MF	850
27-54H	500	79-6MF	880
27-55	500	86-7MF	690
27-60P	550	90-6MF	600
27-63H	550	101-6MF	690
27-66	550	DCD26L	500
27-70P	630	DCD26R	500
27-80	780	85BR60K	610
27-85	770	Voyager Marine	
27-90	850	Model	CCA SAE(BCI)
30-55	525	M24MF	400
30-66	500	M27MF	550
30-72	700	M31MF	625
Deep cycle			
Model		CCA SAE(BCI)	
DC24		500	
DC27		580	
DC31		660	
1111		750	
1150		625	
1151		625	
31-901CT		900	
759		950	

BOSCH			
PS-I Battery		Silver	
Model	CCA EN(DIN)	Model	CCA EN(DIN)
PSI-4C	360	SL-4C	360
PSI-6C	480	SL-4D	360
PSI-6H	600	SL-4E	420
PSI-7C	680	SL-4K	300
PSI-7G	640	SL-4L	300
PSI-7H	680	SL-4P	420
PSI-1A	760	SL-5D	420
High TEC AGM Battery			
Model	CCA EN(DIN)	SL-6C	480
HT-70-PN	760	SL-6H	600
HT-95-PN	850	SL-7C	680
Silver X			
Model	CCA EN(DIN)	SL-7F	680
SLX-5K	550	SL-7G	640
SLX-4E	460	SL-7H	680
SLX-4K	300	SL-8B	760
SLX-4L	300	SL-8C	720
SLX-6C	650	SL-1A	760
SLX-6H	610	SL-1B	850
SLX-7C	790	US Power Max	
SLX-7F	730	Model	CCA SAE(BCI)
SLX-7H	730	UPM-78DT	830
SLX-8B	810	UPM-75	650
SLX-8C	810	UPM-65	750
SLX-1A	910	UPM-58	600
SLX-1B	850	UPM-58R	600
		UPM-34	610

CCA VALUE LIST (Battery Manufacturers and Their Models)

ATLAS EN

Model	CCA	EN(DIN)
572-20	610	
571-13	640	
544-59	390	
4DLT	890	
543-17	410	
554-57	480	
562-19	540	
568-18	550	
580-43	640	
585-15	720	
600-38	850	

BCI

Model	CCA	SAE(BCI)
78DT-600	600	
58-560	560	
75-550	550	
78-600	600	

AGM

Model	CCA	SAE(BCI)
AGM-RD26	730	
AGM-YD26	750	

VARTA

Ultra Dynamic

Model	CCA	SAE(BCI)
570901076	760	
595901085	850	

Silver Dynamic

Model	CCA	EN(DIN)
552401052	520	
554400053	530	
561400060	600	
563400061	610	
563401061	610	
574402075	750	
577400078	780	
585200080	800	
600402083	830	
610402092	920	

EXIDE EA Series

Model	CCA	EN(DIN)
EA530	540	
EA602	600	
EA640	640	
EA722	720	
EA770	760	
EA1000	900	

Eco Power X

Model	CCA	EN(DIN)
EPX50	450	
EPX55	520	
EPX62	570	
EPX65	630	
EPX75	730	
EPX80	640	
EPX100	870	

For American Cars

Model	CCA	SAE(BCI)
EX78DT	850	
EX75	730	
EX65	850	
EX58	540	
EX58R	580	
EX34	630	
EX86	525	
EX36R	650	
EX31	700	

Orbital Series

Model	CCA	SAE(BCI)
ORB34XCD	750	
ORB78DT	770	
ORB75DT	690	

Gel Battery

Model	CCA	SAE(BCI)
G210	1100	

HEXA

Model	CCA	SAE(BCI)
58-6MF	585	
58R6MF	585	
34-72	535	
65-7MF	650	
75-6MF	650	
78-6MF	675	
M24MF	550	
M27MF	570	
M31MF	625	

Moll (モル) MOLL AGM

Model	CCA	EN(DIN)
81070	760	
81095	850	

m3 plus

Model	CCA	EN(DIN)
83046	420	
83056	500	
83058	540	
83071	590	
83075	660	
83085	710	
83091	760	
83095	800	
83110	850	

Kamina

Model	CCA	EN(DIN)
07715	360	
54459	360	
54464	360	
54577	300	
54579	300	
55565	420	
55559	420	
56219	480	
56638	510	
57024	540	
57414	680	
57539	640	
60038	850	
60032	680	
595203076	760	
61042	800	

ODYSSEY

Model	CCA	SAE(BCI)
LB545	230	
LB680	280	
LB925	470	
LB1200	630	
LB1700	900	

OPTIMA Red Top

Model	CCA	SAE(BCI)
1050S	815	
1050U	815	
925S	730	
925U	730	

Yellow Top

Model	CCA	SAE(BCI)
D1400S	975	
D1000S	765	
D1000U	765	
YT-925SL	660	
YT-925U	660	
YT-B24	460	

Blue Top

Model	CCA	SAE(BCI)
D1400M	975	
D1200M	845	
D900M	765	
SLI-4.2L	815	

GS YUASA

EU Series

Model	CCA	EN(DIN)
545-042	420	
555-054	540	
560-064	640	
562-048	480	
570-064	640	
574-068	680	
580-072	720	
600-080	800	

GUIDES TO CHECK THE BATTERY CCA VALUES

●EN-standard Batteries

Check the model number shown as 9-digits numbers like "575121072".

Last 3 numbers mean 1/10 of its CCA value.

For example of the above number, CCA value should be "720 CCA" ($072 \times 10 = 720$).

●DIN-standard Batteries

Check the model number shown as 5-digits numbers like "54459".

The second and third numbers mean 20Ah of the battery.

For example of the above number, it should be "44Ah".

Find the nearest Ah in the following table and input the "Standard-CCA" value.

●Others

For the batteries that do not have the above numbers, please check following points.

1) Check the last 3 numbers of the model number and try to input it as CCA value.

Example 1: 048 → 480 CCA / Example 2: 570 → 570 CCA

2) Check if 20Ah is printed on the battery surface. If printed, find the nearest Ah in the following table and input the "Standard-CCA" value.

※Note : Be sure to check 20Ah not like 5Ah and others.

20Ah	Standard-CCA	Higher-CCA
35	300	360
40	320	390
45	340	420
50	380	420
55	450	540
60	500	620
65	560	700
70	620	720
75	680	750
80	720	780
85	740	800
90	800	850
100	810	850
110	820	1000

※Values in this table are the reference only. For more accurate testing, ask the battery manufacturer for CCA value.

※Re-input the "Higher-CCA" value when the test result became higher than the "Standard-CCA" value.

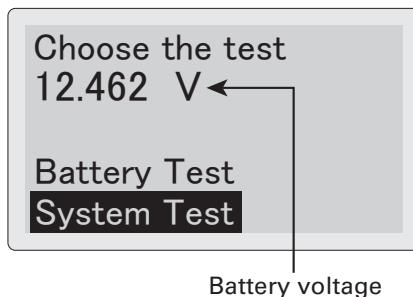
SYSTEM TEST

Test the Start Performance (check the engine starting ability) and Charging System (checking generating condition of alternator).

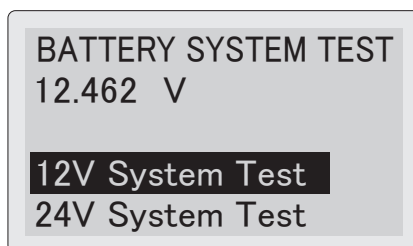
① Connect the instrument to the battery to be tested (see ① to ② in pages 13 to 14).

Select **System Test**, press **↵** (ENTER) Key.

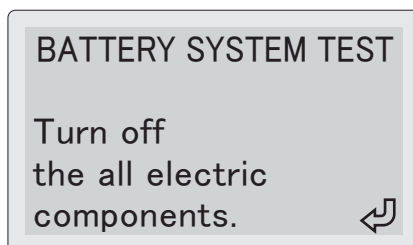
※ Display shows the connected battery voltage.



② Select the battery to be tested either 12V or 24V. Press **↵** (ENTER) Key.

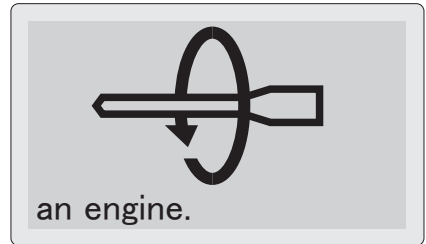
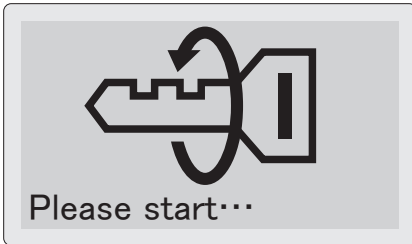


③ Turn off the all electric components and press **↵** (ENTER) Key.

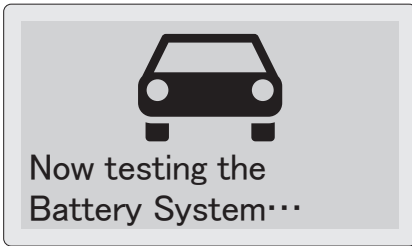


SYSTEM TEST

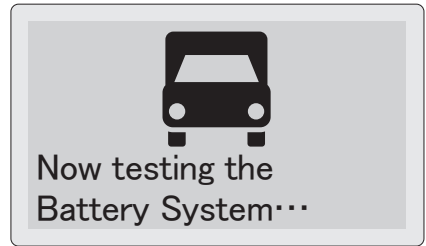
- ④ Start the engine when the instrument displays the following message.



- ⑤ System test takes about 30 second maximum. Follow the message on the screen.



12V System

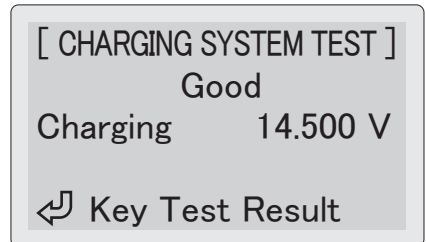


24V System

- ⑥ Charging System Test screen is displayed as shown in right.

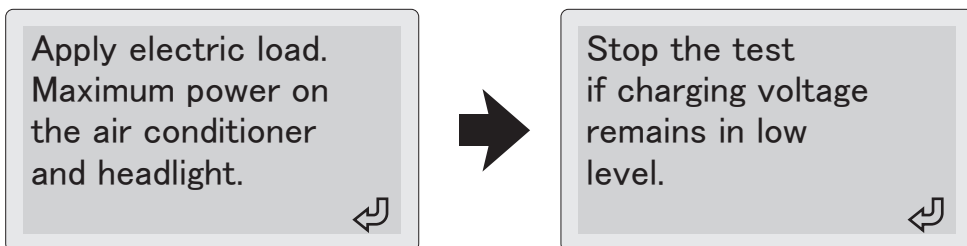
Press **← ENTER Key** to fix the charging voltage which is varied depending on the generating condition of the alternator.

Then, the instrument displays system test result as ⑦ in page 25.



SYSTEM TEST

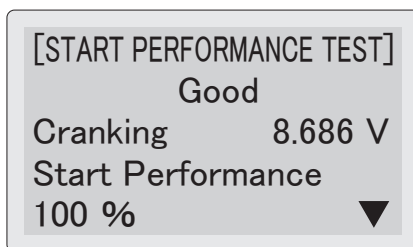
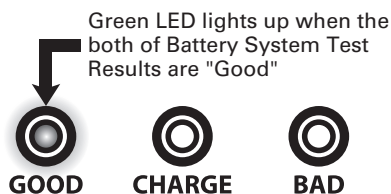
- ※The instrument displays the following message when the charging voltage is less than 13V. When measuring the vehicle with charge control system, turn on some electric components to apply electric load to the battery.
- ※For 24V system test, the message is shown when the charging voltage is less than 26V.



- ⑦ Test Result screen as shown in the right is displayed when finishing the system test. You can scroll the screen with \triangle (UP SCROLL) / ∇ (DOWN SCROLL) Keys.


You can also check the results by LED.

- Green LED lights up when the all test results are "Good".
- Red LED flashes when engine starter system is weak.
- Red LED lights up when the whole charging system including starter system is weak.



- ※You can see following results on LCD.
 - Start performance test result
 - Starting voltage (cranking battery voltage)
 - Start performance (the ability that battery starts an engine)
 - Charging system test result
 - Charging voltage (battery voltage at the time of charging)
 - Ripple voltage (ripple voltage of diode)
 - Comment

SYSTEM TEST

● Press  (MENU) Key : Move to Menu screen (Print / Save Data / Delete Save Data) in page 30.

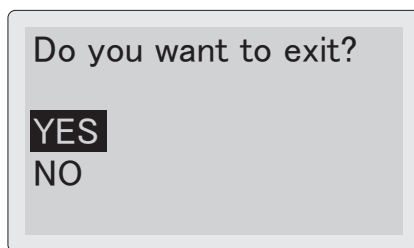
※ Though the lowest operatable / testing voltage of this instrument is 8V DC, the testing carries out normally even if the battery voltage drops lower than 8V DC during Start Performance Test.

※ Start Performance Test is not applicable to check the starter motor condition.

※ The message "Start Performance 0%" means that the tested battery almost has no power to start an engine. It does not mean the starting probability.

⑧ Press  (ENTER) Key.

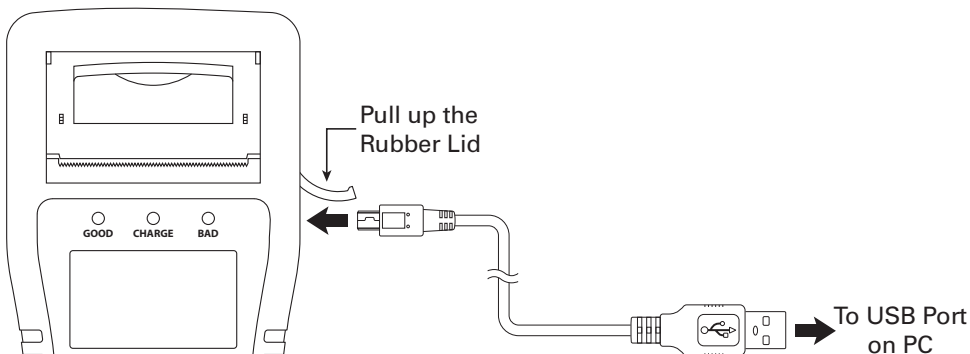
Select "Yes" to finish the test and back to the test select screen (① in page 23).



PC CONNECTION

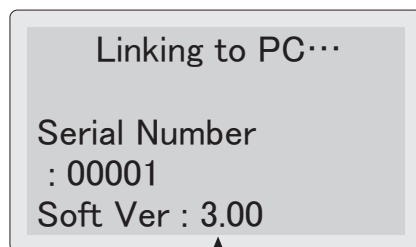
SK-8535 can connect to PC via provided USB cable. You can send test data to PC in text format.

- ① Insert the provided USB cable to the USB port on the right side of the unit and connect another side to PC.



- ② The instrument turns on automatically when connecting to active PC. Messages as shown in the right are displayed.

- ※ Internal memory is recognized as mass-storage device (kaise SK-8535 USB Device) when PC connection is completed.
- ※ If your PC does not recognize the SK-8535, try to use another USB port or to connect through commercially available USB hub.
- ※ It may take time to recognize the devise.



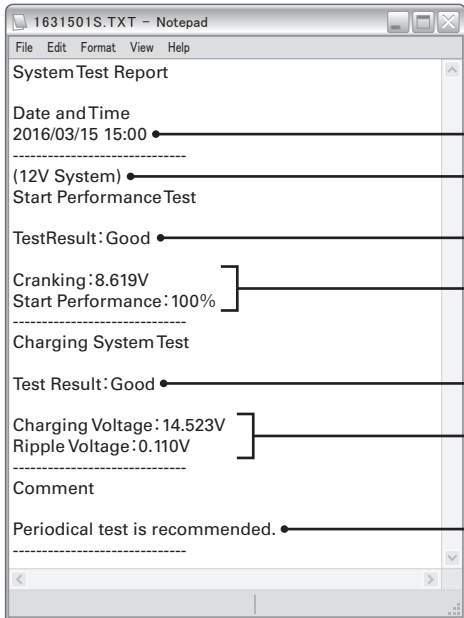
Current version number is displayed.



- Detach USB Cable after completing USB removing process from PC to prevent unexpected trouble.

PC CONNECTION

System Test



The screenshot shows a Notepad window titled "1631501S.TXT - Notepad" containing a "System Test Report". The report text is as follows:

```
System Test Report  
Date and Time  
2016/03/15 15:00  
-----  
(12V System)  
Start Performance Test  
TestResult: Good  
Cranking: 8.619V  
Start Performance: 100%  
-----  
Charging System Test  
Test Result: Good  
Charging Voltage: 14.523V  
Ripple Voltage: 0.110V  
-----  
Comment  
Periodical test is recommended.  
-----
```

Annotations on the right side of the image point to specific lines in the report:

- Testing date and Time (points to "2016/03/15 15:00")
- 12V / 24V System (points to "(12V System)")
- Engine start performance test result (points to "TestResult: Good")
- Battery condition at engine starting (points to "Cranking: 8.619V" and "Start Performance: 100%")
- Charging system test result (points to "Test Result: Good")
- Battery conditions (points to "Charging Voltage: 14.523V" and "Ripple Voltage: 0.110V")
- Comments for test result (points to "Periodical test is recommended.")

※ Test data are displayed in the language used for data saving.



④ Detach USB Cable after completing "Safety Remove Hardware" process from PC.

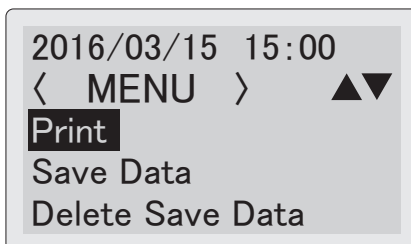
MENU


1. Print Out

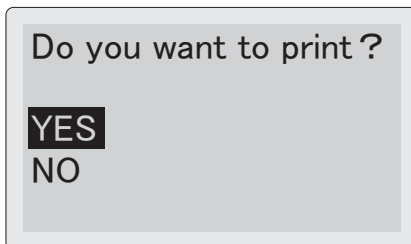
Print out the Battery Test and System Test results from built-in printer.

※Unclear printing or unstable operation of this instrument may occur when using weak battery for printing. In this case, save the test results in reference to "2. Save the Test Result" in page 33, then print them out with good battery or PC in reference to " PC Connection" in page 27.

- ① Press  (MENU) Key in Battery Test result (⑨ in page 18) or System Test result (⑦ in page 25) screens to enter Menu screen.
Select " Print" and press  (ENTER) Key.

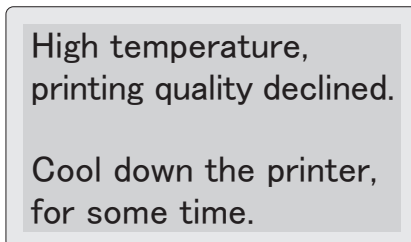


- ② Select "YES" and press  (ENTER) Key.
The instrument starts printing.



※If printing becomes dark by continuous printing, stop printing for a while for cooling down the printer thermal head.

※When the thermal head is too much heated, warning shown on LCD and printing stops.
Leave the unit for a while for cooling down.



※The instrument displays right screen during printing. After finishing, go back to test result screen.

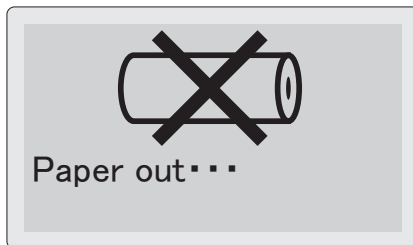
※Make sure to close printer cover to avoid any printing error.

※When paper jam occurs, open the printer cover and fix the paper.



MENU

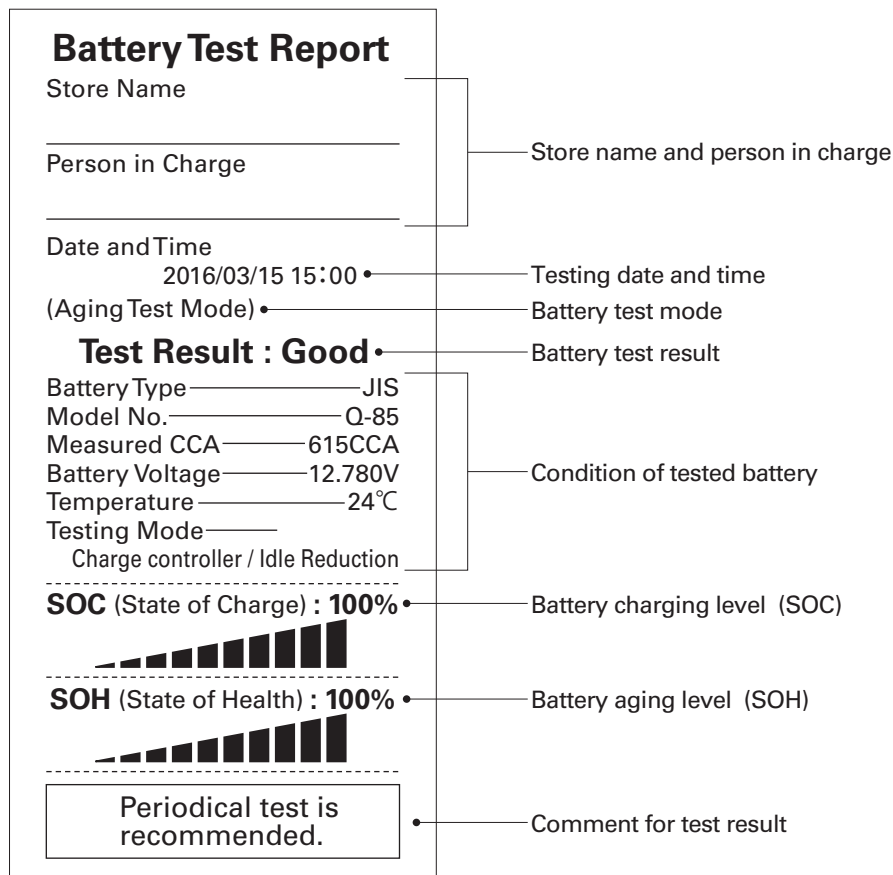
- ※The instrument displays right screen when printer paper is almost empty or unset. Set new printer paper as per "1. Changing the Printer Paper in page 40.
- ※This screen may not be displayed depending on the sensor sensitivity.



Printing Sample

- ※Saved data is printed out with a current setting language of this instrument.
(e.g. : The data saved in Japanese is printed in English if the present setting is "English".)

■ Battery Test



System Test

System Test Report

Store Name _____

Person in Charge _____

Date and Time 2016/03/15 15:00 •

(12V System) •

START PERFORMANCE TEST

Test Result : Good •

Cranking _____ 8.619V

Start Performance _____ 100%

CHARGING SYSTEM TEST

Test Result : Good •

Charging Voltage _____ 14.523V

Ripple Voltage _____ 0.110V

Periodical test is recommended. •

Store name and person in charge

Testing date and time

12V / 24V System

Engine start performance test result

Battery conditions at engine starting

Charging system test result

Battery conditions

Comment for test result

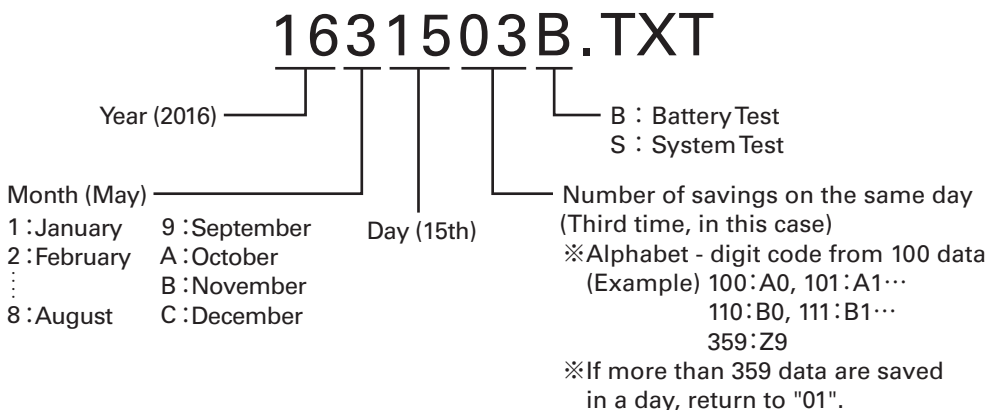
MENU

2. Save the Test Result



Save the results of Battery Test and System Test up to 359 data.

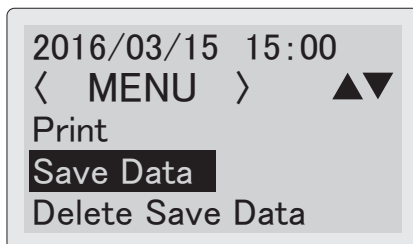
※Each data is saved with following file name.


■Example of file name (In case of the third time on the same day, May 15th, 2016)

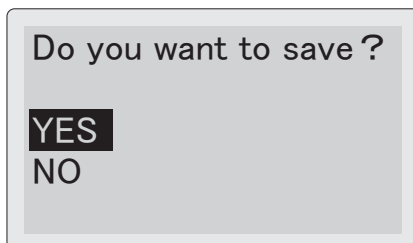


※Saved date and time reflect the date and time settings of this instrument. Make sure to set them correctly in reference to "5. Date and Time Setting" in page 37.

① Press  (**MENU**) Key in Battery Test result (ⓐ in page 18) or System Test result (ⓑ in page 25) screens enter Menu screen. Select "Save Data" and press  (**ENTER**) Key.



② Select "YES" and press  (**ENTER**) Key to save the test data.



MENU

※Up to 359 data can be saved to the internal memory. The instrument displays this WARNING if the saved data exceeds 359. Delete unnecessary data in reference to "4. Delete the Saved Data" in page 36.

–WARNING–
Can't save the data.
The number of saved data exceed the limit.

※The instrument displays this WARNING when the memory capacity shortage. Delete unnecessary data in reference to "4. Delete the Saved Data" in page 36 to make the storage capacity.

–WARNING–
Can't save the data.
Out of memory capacity.

※The instrument displays this WARNING when the same data already exists. Delete the relevant in reference to "4. Delete the Saved Data" in page 36.

–WARNING–
Can't save the data.
The same file name existed.

※File name consists of the saving date. Refer to "Example of file name" in page 33 for details.

※The instrument displays this message when the system error occurs. Stop test and format the removable disk in reference to "2. Formatting the Removable Disk" in page 42.



System Error
Can't save the data.

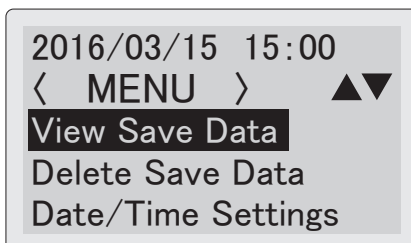
※All of the saved data are deleted after formatting removable disk.


MENU

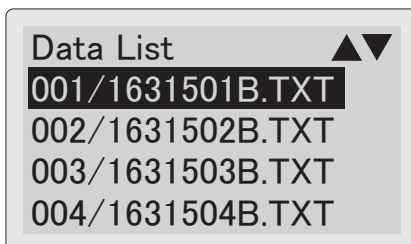
3. View the Saved Data

Recall the saved data to see on the screen.



- ① Press  (MENU) Key in "Choose the Test" screen (③ in page 14) to enter Menu screen. Select "View Save Data" and press  (ENTER) Key.




- ② Select the data that you want to see, and press  (ENTER) Key.



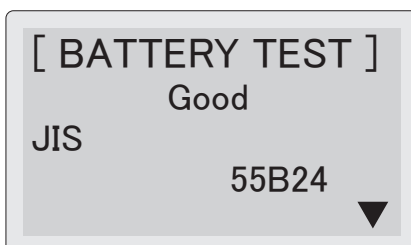
- ※ If there is no saved data, "No data found" is displayed.

- ③ Saved data are displayed as shown in the right. Scroll the data by  (UP SCROLL) /  (DOWN SCROLL) Keys.

- ※ Press  (MENU) Key to print the viewing data. See "1. Print Out" in page 30 for details.

- ※ Saved data is displayed in a current setting language of this instrument.

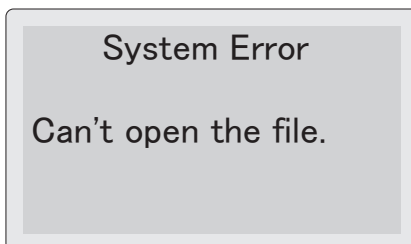
(e.g.: If English is set now, every data saved in Japanese are displayed in English.)



- ※ The instrument displays this message when the system error occurs.

Stop test and format the removable disk in reference to "2. Formatting the Removable Disk" in page 42.


- ※ All of the saved data are deleted after formatting removable disk.




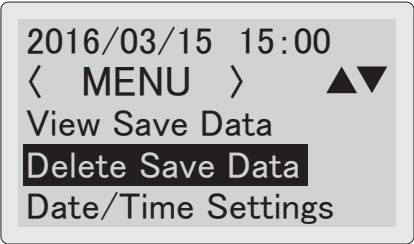
MENU

4. Delete the Saved Data


Saved data can be deleted in the following procedures.

- ① Press  (MENU) Key in "Choose the Test" screen (③ in page 14) or test result screens (⑨ in page 18 / ⑦ in page 25) to enter Menu screen.

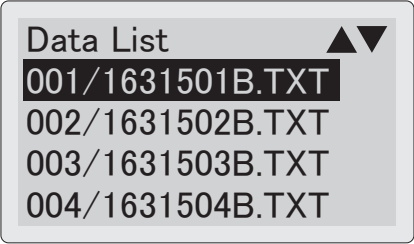
Select "Delete Save Data" and press  (ENTER) Key.




2016/03/15 15:00
< MENU > ▲▼
View Save Data
Delete Save Data
Date/Time Settings

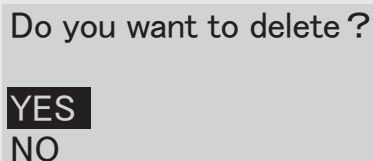
- ② Select the data to delete from the data list, and press  (ENTER) Key.

※ If there is no saved data, "No data found" is displayed.



Data List ▲▼
001/1631501B.TXT
002/1631502B.TXT
003/1631503B.TXT
004/1631504B.TXT

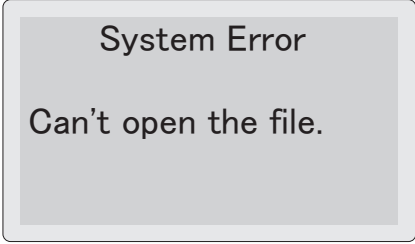
- ③ Select "YES" and press  (ENTER) Key to delete the test data.



Do you want to delete ?
YES
NO

※ When system error occurs, the message as shown in the right is displayed. Stop testing and format Removable Disk in reference to "2. Formatting the Removable Disk" in page 42.



※ All saved data are deleted after formatting removable disk.

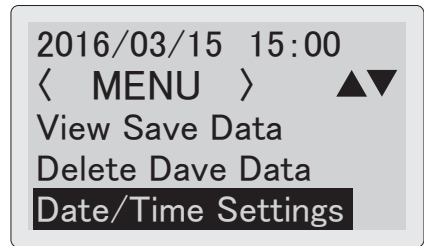


System Error
Can't open the file.

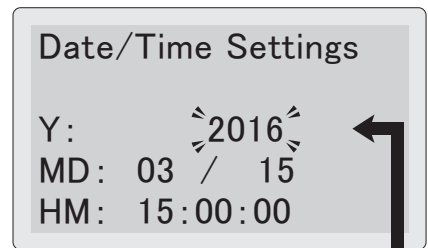
MENU

5. Date and Time Setting





- ① Press  (**MENU**) Key in "Choose the Test" screen (③ in page 14) or test result screens (⑨ in page 18 / ⑦ in page 25) to enter Menu screen.
Select "Date/Time Settings" and press  (**ENTER**) Key.

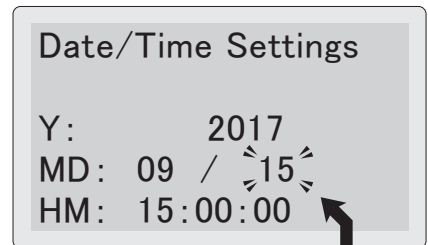


- ② Date/Time Setting screen is displayed.
(Year (Y) is blinking)




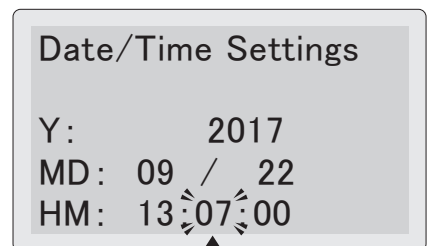
Year blinks.

- ③ Set "Year" with using  (**UP SCROLL**) /  (**DOWN SCROLL**) Keys and press  (**ENTER**) Key. Then "Month" starts to blink.
Set "Month" and press  (**ENTER**) Key, Set the "Day" in the same way.



The next setting blinks by pressing  (**ENTER**) Key.



- ④ Set Time (HM) until minute.
Press  (**ENTER**) Key. Date/Time Settings are fixed with resetting "Second" to 00 and return to Menu Screen (previous Step ①).

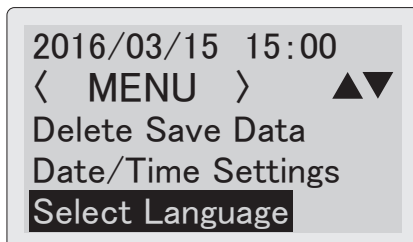



Set until minute,
then press  (**ENTER**) Key.

MENU

6. Language Setting



- ① Press  (MENU) Key in "Choose the Test" screen (③ in page 14).
Select "Select Language" and press
 (ENTER) Key.

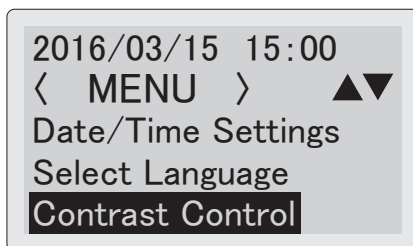





- ② Select preferred language and press
 (ENTER) Key.
Language is fixed and return to Menu screen.

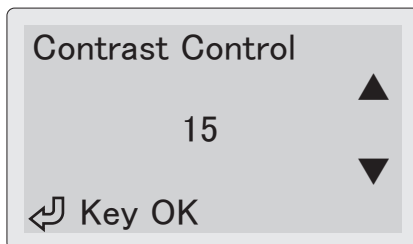


7. Contrast Adjustment

- ① Press  (MENU) Key in "Choose the Test" screen (③ in page 14) or test result screens (⑨ in page 18 / ⑦ in page 25) to enter Menu screen.
Select "Contrast Control" and press
 (ENTER) Key.



- ② Adjust LCD contrast in the range of 0 - 30 with  (UP SCROLL) /  (DOWN SCROLL) Keys.
Press  (ENTER) Key to fix the contrast and return to Menu screen.





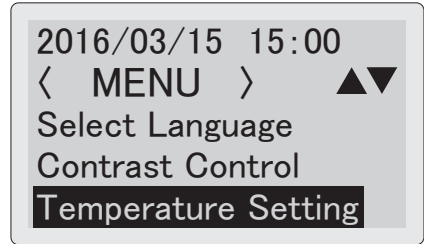
MENU


8. Temperature Setting

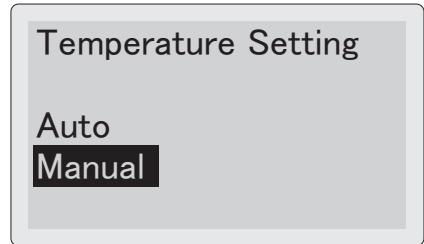
Set the battery temperature input mode in Battery Test.

Default setting is "Auto". You can change it to "Manual" if necessary.

- ① Press  (MENU) Key in "Choose the Test" screen (③ in page 14) to enter Menu screen. Select "Temperature Setting" and press  (ENTER) Key.



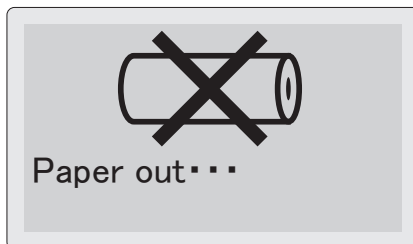
- ② Select "Manual" if you prefer to input the battery temperature manually in Battery Test (see page 18). Press  (ENTER) Key to return to Menu screen.
- ※Default setting is "Auto".



MAINTENANCE

1. Changing the Printer Paper

The instrument displays this screen when the printer paper is running out or unset. Set the new one in the following procedure.



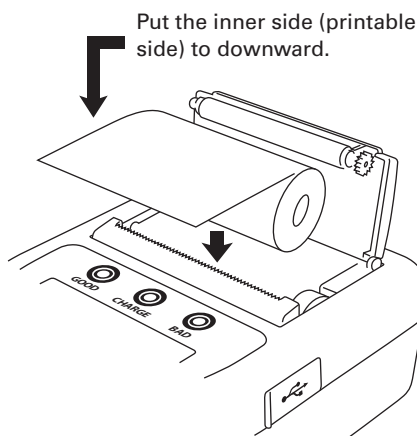
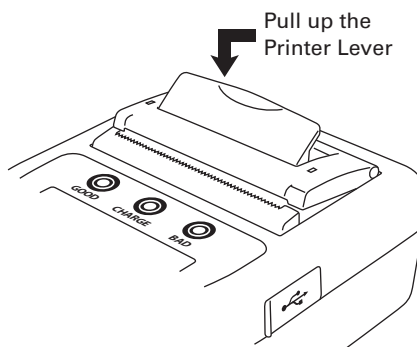
① Pull up printer lever as shown in the right. printer cover lifts up.

※ Do not pull up / open the printer lever or printer cover forcibly to avoid any damage to the instrument.

② Open the printer cover and remove old printer paper.

③ Prepare the new paper.
Peel off the fixing seal, and put it into the printer compartment.
Be sure to put the inner side (printable side) to downward as shown in the right.

④ Pull the paper forward so that it extends past the serrated edge of the paper slot.



CAUTION

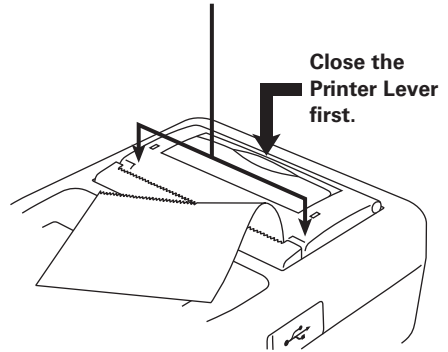
- Do not pull up / open the printer lever or printer cover forcibly to avoid any damage to the instrument.
- Be sure to put the printer paper facing the inner side (printable side) to downward. Cannot print on the reverse side.

MAINTENANCE

⑤ Close the printer lever, then close the printer cover with putting it over the pulled out paper. Cut off the extra paper.

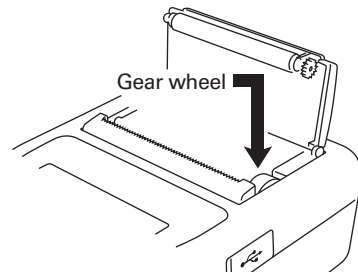
※ Be sure to push the both ends of printer cover when closing. Pushing center part may damage the cover or the printer module.

Close the printer cover pushing both ends. (Do not push center part.)



CAUTION

- To avoid any trouble or damage to the printer module, be sure to close the printer lever first when closing printer cover.
- Be sure to push the both ends of printer cover when closing. Pushing center part may damage the cover or the printer module.
- To prevent discoloration, do not place the printer paper under in any place where it will be subjected to direct sunlight or high temperatures / humidity.
- Keep this instrument in the supplied carrying case to avoid malfunction of the printer trouble by dust penetration.
- Be careful not to put the dust in the printer compartment to prevent any malfunction of the printer.
- Be sure not to reach the dust into the gear wheel part to prevent printer trouble.
- Do not keep this instrument in the dusty area to prevent printer trouble.



MAINTENANCE

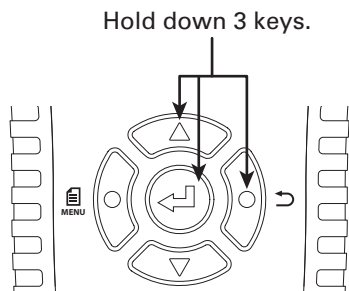
2. Formatting the Removable Disk



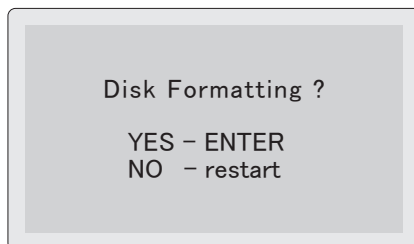
CAUTION

● All of the saved data are deleted after formatting removable disk.

- ① Connect the instrument to car battery (see page 13) or PC (see page 27) holding down **← (ENTER)**, **△ (UP SCROLL)**, and **↶ (BACK) Keys**. The instrument turns on.



- ② The instrument displays this message.
Press **← (ENTER) Key** to start formatting the removable disk.
※ Turn off the instrument to quit the formatting.
※ The instrument also displays this screen when the removable disk is fragmented.
Format the disk in the same way.



- ③ The instrument displays this message after formatting is done. Turn off the instrument.



MAINTENANCE

3. DMP Folder

When measurement error occurs during the battery test process, the instrument creates DMP folder in the removable disk to save the internal error data. You do not need to delete this.



4. Periodical Check and Calibration

Periodical check and calibration is necessary to make safety measurements and to maintain the specified accuracy. The recommended check and calibration term is once a year and after the repair service. This service is available at KAISE AUTHORIZED SERVICE AGENCY through your local dealer.

5. Software Version Update

- You can update the internal software from our website (<http://www.kaise.com/NewEnglish.htm>) when it is available. Download the file in reference to the loading procedures.

6. Others

- If the metal part of the battery clip is soiled, wipe it off with soft cloth to obtain the accurate measurement.
- If Date and Time are not able to set, internal backup battery is exhausted. Ask KAISE AUTHORIZED SERVICE AGENCY through your local dealer for repair service.

TROUBLE SHOOTING & REPAIR

If there are any failure with this instrument, check the following trouble shoots before asking repair service. Ask KAISE CORPORATION AUTHORIZED SERVICE AGENCY through your local dealer when there are any questions or troubles with this instrument.

Symptoms	Possible Causes and Necessary Treatments
<p>Cannot turn on the instrument</p>	<ul style="list-style-type: none"> ● Battery Clips are connected in the wrong polarity. → Connect Black clip to minus ⊖, and red clip to plus ⊕ battery terminals. ● Battery voltage goes down to 8V or lower. → Recharge the battery. ● Weak connecting of battery cable or USB cable. → Insert their plugs deeply. ● Metal parts of battery clips or battery terminals have problems. → Make them clean and check if there are not damaged.
<p>Cannot save, view and delete data</p>	<ul style="list-style-type: none"> ● System error is occurring. → Format the Removable Disk in reference to "2. Formatting the Removable Disk" in page 42.
<p>Instrument freezes with English letters on LCD</p>	<ul style="list-style-type: none"> ● Removable disk is fragmented. → Format the disk in reference to "2. Formatting the Removable Disk" in page 42.
<p>Printer does not work</p>	<ul style="list-style-type: none"> ● Printer paper is set in reverse. → Place the paper correctly in reference to "1. Changing the Printer Paper" in page 40. ● Printer is jammed. → Open the printer cover and fix the paper jam.
<p>Date / Time are not saved</p>	<ul style="list-style-type: none"> ● Backup battery (built-in) is exhausted. → Ask KAISE AUTHORIZED SERVICE AGENCY through your local dealer for repair service.
<p>LCD displays Measurement Error</p>	<ul style="list-style-type: none"> ● Metal part of the battery clip or battery terminal is soiled. → Remove it cleanly. ● There in an abnormality in the battery. → Check visually the appearance of the battery; dirt of the terminal, abnormality of the terminal cable, etc.

WARRANTY

SK-8535 is warranted in its entirety against any defects of material or workmanship under normal use and service within a period of one year from the date of purchase of the original purchaser. Warranty service is available at **KAISE AUTHORIZED SERVICE AGENCY** through your local dealer. Their obligation under this warranty is limited to repairing or replacing SK-8535 returned intact or in warrantable defect with proof of purchase and transport charges prepaid. **KAISE AUTHORIZED DEALER** and the manufacturer, **KAISE CORPORATION**, shall not be liable for any consequential damages, loss or otherwise. The foregoing warranty is exclusive and in lieu of all other warranties including any warranty of merchantability, whether expressed or implied.

This warranty shall not apply to any instrument or other article of equipment which shall have been repaired or altered outside of **KAISE AUTHORIZED SERVICE AGENCY**, nor which have been subject to misuse, negligence, accident, incorrect repair by users, or any installation or use not in accordance with instructions provided by the manufacturer.

KAISE AUTHORIZED DEALER

kaise

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Product specifications and appearance are subject to change without notice due to continual improvements.