OPERATING MANUAL

SOCTESTER

SOCTESTER AERO Battery Profile Load Analyzer

SOC-AERO-009-ALPHA

Introduction:

The SOC AERO Battery Profile Load Analyzer is intended to be used as directed in this manual. It is not intended that the tester be used on any other than the specific type of battery it was designed to test. Customization, including Preprogrammed AHR and Voltage settings, is available upon request.

Preparation For Initial Use

The tester is supplied with the following:

(1) - TESTER HARNESS (P/N SOC-AERO-009-ALPHA-CAB)
(1) - WALL PLUG POWER UNIT (117 VOLTS) (P/N SOC-AERO-009-P1-A)

If either of these items have not been supplied, contact your distributor.

Recommendations Prior To Initial Use:

Prior to initial use, charge the internal battery pack with the supplied wall plug power unit for at least 12 hours. Charger -> WALL PLUG POWER UNIT (117 VOLTS) (P/N SOC-AERO-009-P1-A)

An overnight charge prior to the Initial use of the tester is recommended.

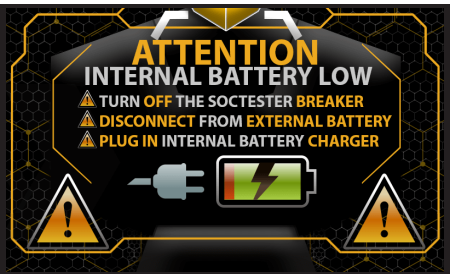
ONLY use the charger supplied with the SOCTESTER™. The use of an alternative charger may cause damage to the internal battery pack of the tester or the internal charging system of the tester.

An overnight charge after every use will ensure your tester is ready to perform the next day and lengthen the life of your internal battery pack.

If your tester is kept in storage, an overnight charge prior to use is recommended. If your tester is left in long term storage, a quarterly overnight charge is recommended.

Charge The Internal Battery

Charge the SOC internal battery pack for at least 12 hrs prior to first use.
Charge the SOC internal battery pack for at least 12 hours after each use.



LIMITED WARRANTY

THE SOCTESTER™ BATTERY TESTER IS GUARANTEED AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR 90 DAYS FROM THE DATE OF PURCHASE. ULTRASYSTEMS ELECTRONICS INC. WILL, AT ITS OPTION, REPAIR OR REPLACE DEFECTIVE PARTS OR UNITS.

THE PURCHASER AGREES TO ASSUME ALL RESPONSIBILITY FOR DAMAGES OR BODILY INJURY THAT MAY RESULT FROM THE USE OR MISUSE OF THIS TESTER BY THE PURCHASER, ITS EMPLOYEES OR AGENTS. UNDER NO CIRCUMSTANCES SHALL ULTRASYSTEMS ELECTRONICS INC. BE RESPONSIBLE FOR CONSEQUENTIAL DAMAGES.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES- EXPRESSED OR IMPLIED.

WARNING

THIS TESTER IS INTENDED FOR USE BY QUALIFIED PERSONNEL ONLY. IT IS IMPORTANT THAT OPERATORS OF THIS EQUIPMENT FOLLOW THE OPERATING INSTRUCTIONS CAREFULLY. PROPER BATTERY HANDLING PROCEDURES ARE MANDATORY AND THE MANUFACTURER'S INSTRUCTIONS MUST BE OBSERVED.

Step-By-Step Instructions:

IMPORTANT: In order to turn on the tester, you must first connect to the battery under test.

!The tester will not turn on, unless the harness is connected to the harness of the battery under test!

SIMPLE INSTUCTIONS - FRONT AND CENTER

Simple Instructions are displayed on the center of the front panel when you open the tester.

The use of the tester is extremely straight forward, but the detailed step by step instructions below should provide the end user with ultimate clarity by breaking down every step in great detail.

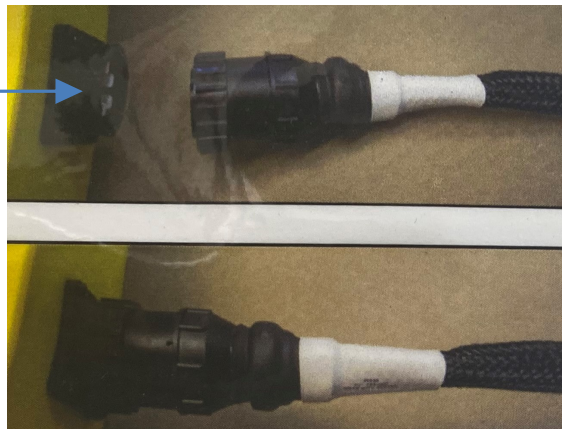
Step One: Connect Test Harness And Turn On The Breaker

CONNECT HARNESS

Connect the tester harness set into the mating connector on the right side panel of the tester.

Rotate the lock ring until the connector is firmly seated.

Connect the other end of the tester harness set into the mating connector on the test battery harness.



TURN ON THE BREAKER

After the cable set connection is secure, turn on the breaker and power up the tester.

IMPORTANT NOTE: !The tester will not turn on, UNTIL the tester harness is connected to the harness of the battery under test!

MAIN SETTINGS SCREEN

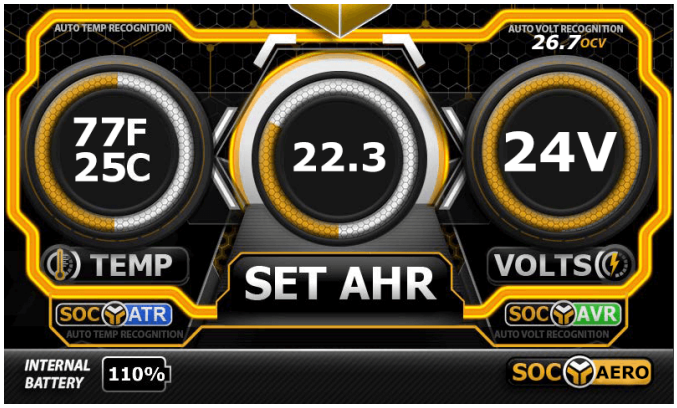
Turn on thebreaker,while connected to the battery under test, and the main settings screen will be displayed.

The Main Settings Screen will allow the end user to input and/or verify automatically recognized variables for the test sequence. There is only 1 manual input required by the end user, the TEMP setting variable, making the tester extremely simple to operate.

MAIN SETTINGS SCREEN

This is the Main Settings Screen that will be displayed when powering up the tester.

This screen will give the end user a full view of the test variables.

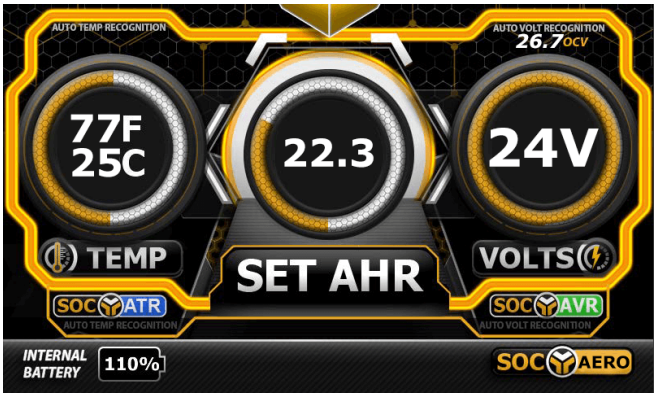


TEST VARIABLES:

TEMP SETTING - VOLTS SETTING - AHR SETTING

The OCV (Open Circuit Voltage) is also displayed above the "VOLTS" setting on the right side of the screen. The end user may view the starting OCV (Open Circuit Voltage) of the battery prior to test.

Step Two: Set The TEMP (BATTERY TEMPERATURE)



MANUAL INPUT:

TEMP (IR TEMPERATURE SETTING) VARIABLE

This is the only manual input required by the end user.

Set the TEMP for the battery under test by adjusting the TEMP knob clockwise or counter-clockwise to reach the required test variable for the battery under test.

Take the temp with the supplied IR thermometer and adjust the temp override option to the exact temp of the test battery.

AVR - ATR - INPUT SETTINGS

AUTOMATIC VARIABLE RECOGNITION

AUTOMATIC INPUT:

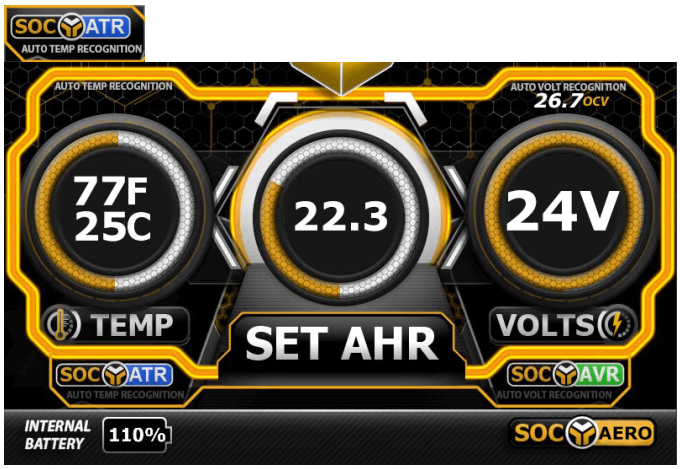
TEMP VARIABLE RECOGNITION AVR

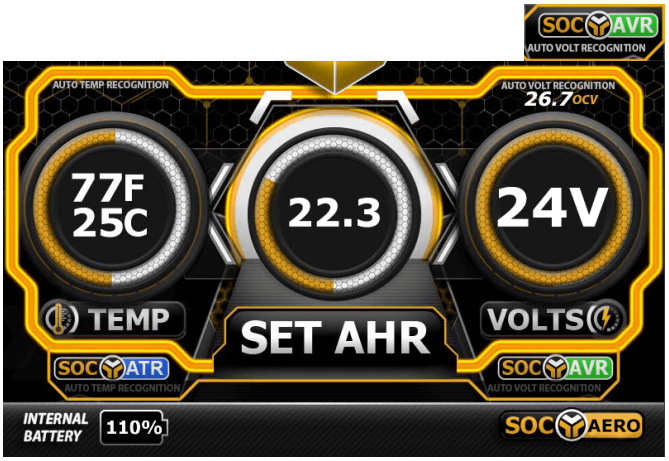
+PLUS OPTIONAL TEMP OVERRIDE

The Ambient Temperature of the surroundings will be recognized automatically and the variable will automatically be set for the test sequence.

This input is completely automatic, however, the temp setting allows for an optional manual override of the temperature variable.

Adjusting the left knob labeled **Temp** $_{OR}$ on the SOC control panel clockwise or counter-clockwise will override temperature and allow the user to set the required input variable.





AUTOMATIC VOLTAGE VARIABLE RECOGNITION - AVR

AUTOMATIC VOLTAGE VARIABLE RECOGNITION - AVR is engaged by default and will automatically select the required voltage variable of the battery under test.

The OCV (Open Circuit Voltage) of the battery under test will also be displayed above the battery test voltage setting.

This variable is completely automatic and there is no manual input required or allowed for this variable.

Step Three: Start The Test Cycle

Press The Start Button

Press the start button on the right side of the control panel to start the test cycle. At the end of the 43 second load cycle, the battery tester will beep and the True-state-of-charge and capacity of the battery under test will be revealed.

Interpreting Results

RESULTS SCREEN BREAKDOWN

The Results Screen

When the test has been completed, the tester will beep and the results will be broken down on the control panel display. The start button LED will also be illuminated indicating the state-of-charge of the battery **Green-Pass/Yellow-Marginal/Red-Fail.** The battery backdrop will also show **Green-Pass/Yellow-Marginal/Red-Fail** depending on the results of the test cycle.

Test Variables Are Displayed On The Left

All the test variables are displayed on the left side of the screen under "SETTINGS".

Voltage (AUTO)
AHR setting (MANUAL INPUT, OR PRE-PROG)
Temp Setting (AUTO, OR OVERRIDE)
OCV [Open Circuit Voltage] (AUTO)
Battery Chemistry (AUTO)

These are the test variables for the completed test cycle as manually input and/or auto input.

Quick View Results are Displayed On The Right

A quick view and reference of the testing cycle results will be displayed on the right.

Capacity results will be displayed in a numerical percentage % format.

Results will be written and color coded in Green-Pass/Yellow-Marginal/Red-Fail depending on the results of the test cycle.

Detailed Results Are Displayed In The Center

A detailed breakdown of the test results are displayed in the center of the screen. "TSOC Results" percentage results are shown center left as well as a written and color coded Green-Pass/Yellow-Marginal/Red-Fail on Center. The "ACTUAL AHR" (Ampere Hour Calculation) of the battery under test is found -center right- with the manual input AHR Setting directly above "ACTUAL AHR" for quick and direct reference to the calculation.

Quick Results Reference:

When the load test cycle has completed, the tester will beep and the results will be broken down on the control panel display.

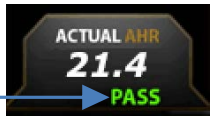
The start button LED will illuminate indicating the state-of-charge of the battery along with the corresponding PASS - MARGINAL - FAIL written results shown on the Control panel display with corresponding background colors.

GREEN = (GOOD/PASS) -

YELLOW = (MARGINAL) -

RED = (FAIL/BAD) -

The **"ACTUAL AHR"** (Ampere Hour Calculation) of the battery under test, based on the resulting TSOC value, will be calculated and written to the display. The Ampere Hour Calculation provides the end user with real time insight into the battery under test for on the spot decision making without the end user having to perform calculations.



Percentage Breakdown

TSOC% And Actual AHR Calculation

TSOC Percentage Break Down:

105%-110% (GREEN) This is a normal state-of-charge for many systems. It merely indicates the battery will yield energy exceeding the 20-hour rating. Some batteries, under ideal conditions, improve with age. Test twice.

100%-105% (GREEN) This is the normal state-of-charge and indicates the battery will deliver 100% of its rated capacity

90% (GREEN) Even new batteries may read 90%. The capacity of a new battery can improve with time however, and may later read 100%. This battery should be monitored to ensure further loss of battery capacity does not occur.

80% (YELLOW) A battery that reads 80% is considered to be marginal for normal use. Ensure the charging system for the battery is working correctly.

70% (YELLOW) A 70% indication means the battery no longer has sufficient capacity for normal use. If the charging system is working properly, the battery should be replaced. In use, it may yield erratic or unreliable performance.

60% and below (RED) A reading of 60% and below, on a properly charged battery, indicates the battery needs to be replaced.

Batteries that read 40% and below are usually not salvageable.

The tester will interrupt the load cycle of depleted batteries before 43 seconds. The tester will not run its complete load cycle on a depleted battery. If you have made the connections correctly and the tester does not complete the load cycle, or even turn on, your battery is probably completely depleted.

Batteries removed from storage that read less than 100%, but more than 50%, may need a precise recharge cycle to restore original capacity. These batteries should be float charged on precision automatic equipment for a minimum of 24 hours.

Successful Operation

Tips And Best Practices

*Important Tips And Recommendations For Proper Use:

It is important all of the terminals of the battery harness be clean.

Do not block the cooling fans of the SOCTESTER™ battery tester. It is important air flows freely through the battery tester cooling zones.

The test harness has been specially designed and must not be modified or altered in any way. Make certain the tester harness is connected directly to the harness of the test battery.

Internal Battery Pack Maintenance

INTERNAL BATTERY CHARGING

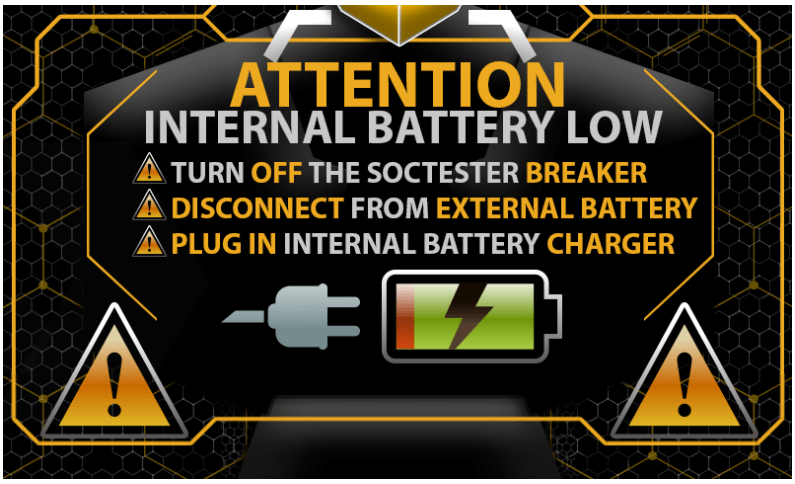
"Internal Battery Low"

If the "Internal Battery Low" indicator comes on during use, the internal battery pack needs to be recharged. Follow the directions on the display.

Prior to initial use, charge the internal battery pack

Prior to initial use, charge the internal battery pack with the supplied wall plug power unit for at least 12 hours. (P/N) WALL PLUG POWER UNIT (117 VOLTS) (P/N SOC-AERO-009-P1-A)

An overnight charge prior to the Initial use of the tester is recommended.



Charging Notes and Recommendations

The tester may be used with the internal battery Pack charger plugged in, but if the tester has reached maximum battery pack discharge and the "Internal Battery Low" screen is displayed, it is recommended to immediately turn of the tester, disconnect the tester from the external battery under test and plug in the wall charger while the tester is disconnected from any external battery.

The tester should remain disconnected from any external batteries, in the off position, with the wall charger plugged into the tester for at least 15 minutes of charge time prior to continuing to test batteries with the charger plugged into the tester.

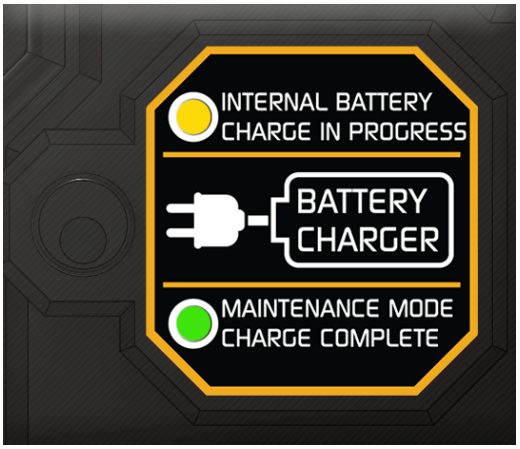
The "INTERNAL BATTERY CHARGE IN PROGRESS" Led will be illuminated during battery pack charging. The "MAINTENANCE MODE/CHARGE COMPLETE" Led will illuminate gradually when the system is reaching full charge and be at full brightness in maintenance mode when the charge is complete.

The AC power unit may be plugged in for extended periods of time if desired and overnight charging is recommended before every use and after every use.

An overnight charge after every use will ensure your tester is ready to perform the next day and lengthen the life of your internal battery pack.

If your tester is kept in storage, an overnight charge prior to use is recommended. If your tester is left in long term storage, a quarterly overnight charge is recommended.

ONLY use the SOCTESTER™ charger supplied with the SOCTESTER™. The use of an alternative charger may cause damage to the internal battery pack of the tester or the internal charging system.



Specifications

SOC-AERO-009-ALPHA

SPECIFICATIONS:

VOLTAGE: 24V (Customization Available)

AMPERE HOUR RATING: 9AH (Customization Available)

SHIPPING WEIGHT:20.5 lb.

SIZE: 14.9" X 12.1" X 9.6"

OPTIONS & REPLACEMENT PARTS

BATTERY TEST HARNESS

(P/N SOC-AERO-009-ALPHA-CAB)

(*Custom Cable Sets Are Available)

WALL PLUG POWER UNIT (117 VOLTS)

(P/N SOC-AERO-009-P1-A)