

IONIZATION SOLUTIONS

Charged Plate Monitor

Model 280A

User's Manual



ABOUT SIMCO-ION

Simco-Ion develops, manufactures and markets system solutions to manage electrostatic charge. As the world's largest provider of electrostatics management products and services, Simco-Ion improves its customers' business results by providing a total solution to their electrostatic challenges. Simco-Ion Technology Group is a division of Illinois Tool Works (ITW), located in Alameda, California. For more information about Simco-Ion visit www.Simco-Ion.technology or call +1 (800) 367-2452. Simco-Ion is ISO 9001-2015 Certified.

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1. SAFETY WARNINGS

Carefully read the following safety information before installing or operating the equipment.

Failure to follow these safety warnings could result in damage to your ionization system and/or voiding the product warranty.

This instruction manual uses symbols to identify dangerous situations as follows:

GENERAL SAFETY

 **NOTE** – Statements identified with **NOTE** indicate precautions necessary to avoid potential equipment failure.

 **CAUTION** – Statements identified with **CAUTION** indicate potential safety hazards.

 **WARNING** – Statements identified with **WARNING** indicate potential serious injury hazards.

PRODUCT SAFETY

 **NOTE** – Do not attempt to operate at voltages other than those specified.

 **NOTE** – Do not allow dust, dirt or debris to block or obstruct air flow inlets or outlets.

 **NOTE** – This equipment must be correctly installed and properly maintained. Adhere to the following notes for safe installation and operation:

1. Read the instruction manual before installing or operating equipment.
2. Only qualified service personnel are to perform installation and repairs.
3. All equipment must be properly grounded, including the machine frame to which the equipment is mounted.
4. Turn off input power to the unit before connecting or disconnecting other equipment.
5. Do not operate the system close to fumes and flammable liquids.

 **WARNING – Electric Shock Hazard**
Electrical installation and repairs must be performed by a skilled electrical engineer according to the applicable national and local regulations. The equipment must be properly grounded. Grounding is required to ensure safe and proper operation and to prevent electrical shocks upon contact.

 **WARNING – Fire Hazard**
Keep the unit dry. Do not operate the unit in flammable or explosive environments.

2. DESCRIPTION

The Model 280A Charged Plate Monitor (CPM) is a microprocessor-based tool, providing an automated solution for measuring air ionization systems' performance. The unit features a simple push-button LCD interface and allows data transfer to computers for precise and specific test information. Five key push-buttons control all instrument functions.

Included with the unit is a CD with software for transferring data between the CPM and a computer.

The Model 280A CPM allows for testing where initial voltages of 1000V (or less) are involved. For further details, see ESD Association Standard S3.1 for Protection of Electrostatic Discharge Susceptible Items – Ionization.

The unit is completely portable, with up to six hours of operation on the internal battery and memory to store over 1000 tests.

Model 280A performs manual or automatic decay and balance tests for qualification and periodic verification of ionization equipment. It then stores the results and balance averages for manual tests and complete automatic test sequences up to a maximum of 1500 tests. Temperature and relative humidity are displayed in real-time and recorded with the test data.

DECAY Mode: A built-in high voltage generator charges the plate to a voltage specified by the user in decay mode—up to 1100 volts. During the test, the plate will discharge toward zero in the presence of ionization. The elapsed time of decay between a selected start voltage and a selected stop voltage is displayed.

BALANCE Mode: The plate is first grounded, then released from ground and allowed to float to any voltage in response to air ion imbalances. It displays the plate voltage, test duration, and minimum and maximum peak voltages. (Nearby charge sources will also induce a voltage on the floating plate.)

Self-tests include battery check and tests for functional errors. With non-volatile memory, setup and data are retained during storage.



WARNING – Electric Shock Hazard

When charged, the plate voltage can be more than 1100 volts with respect to ground. Although the charges and potentials are below those normally detected by human senses, A SHOCK HAZARD EXISTS.

- If you are handling the plate assembly or conducting a test, which involves touching the plate, expect a shock
- Do not charge large capacitors with this device

2.1 CPM Components

The 280A CPM features a large, central digital display used as an interface for all menus, buttons, and test information. A bar graph LED featured to the right of the central display indicates plate voltage.

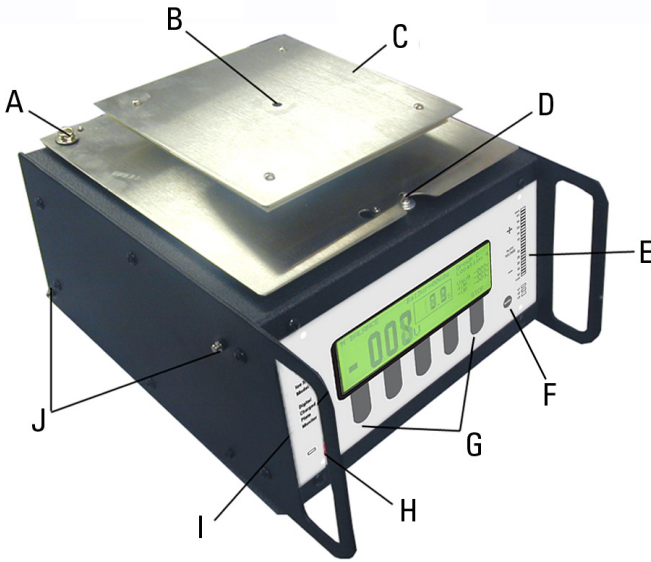


Figure 1. Charge Plate Monitor

- A. **Ground Snap:** Connects plate to the unit
- B. **Decay Verification/Confidence Test Hole:** Small hole uses the provided thumbscrew on the unit's back for confidence tests
- C. **Charge Plate:** Charges to specified voltage and is ion target for decay and balance test
- D. **Release Button:** When pressed, the plate is released from the unit
- E. **LED Bar Graph:** Three ranges are provided with a maximum resolution of fewer than 10 volts for making fast assessments of plate voltage and polarity around zero
- F. **Range Switch:** Select the bar graph LEDs (x1, x2, x5)
- G. **Soft Keys:** Used to select on-screen menu choices
- H. **Power On/Off Button**
- I. **Central Display Screen:** Interface for running tests and setting test data
- J. **Vertical Plate Mounts:** Allows plate to be mounted on the side of the unit

Front Panel

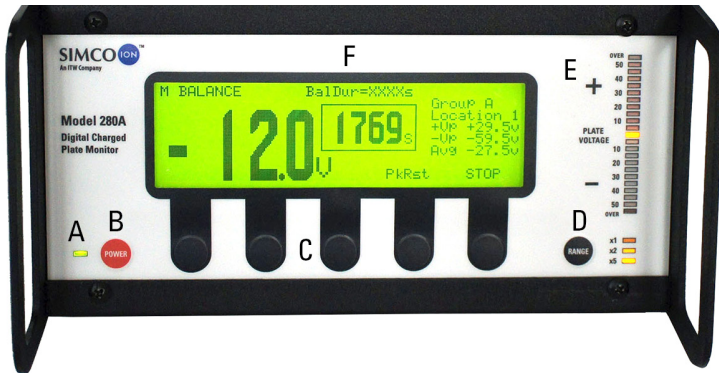


Figure 2. CPM Front Panel

- A. **Power LED:** Steady green light when CPM is powered by the AC line cord and blinking green light when powered by the battery
- B. **Power On/Off Button**
- C. **Soft Keys:** Keys correspond with the display screen to act as navigation buttons
- D. **Range Switch:** Select the bar graph LEDs (x1, x2, x5)
- E. **Bar Graph LED:** Shows plate voltage range at all times
- F. **Central Display Screen:** Shows all menu activity, provides soft key choices, displays current conditions and settings

Back Panel

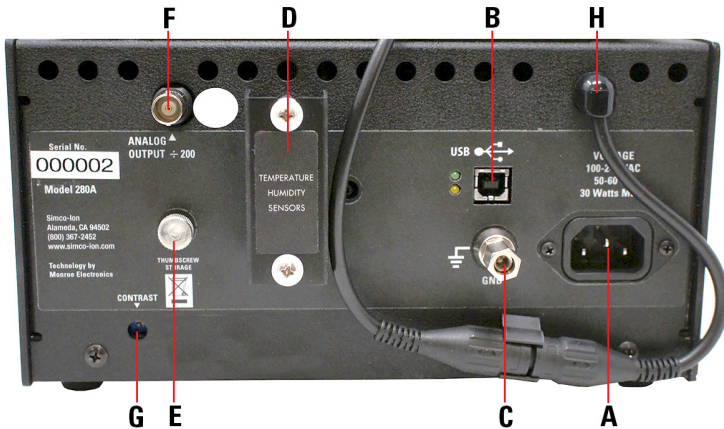


Figure 3. CPM Back Panel

A. Power Input Receptacle

B. USB Port: Connects to a computer for uploading and downloading test data

C. Ground Jack: Connects to provided ground cable or additional grounding devices

D. Temperature/Humidity Sensors: Takes measurements and logs read-only information, accessible through the Setup menu

E. Thumbscrew: Removes to connect to plate for confidence tests

F. Analog Output: The output monitors the plate voltage during any test (otherwise set to zero). The output is 1/200th of plate voltage

G. Contrast Trimpot: Manual trimpot adjusts the darkness and lightness of the screen, in addition to the backlight setting

H. Plate Connection with BNC Terminator: Connects to plate

Charge Plate

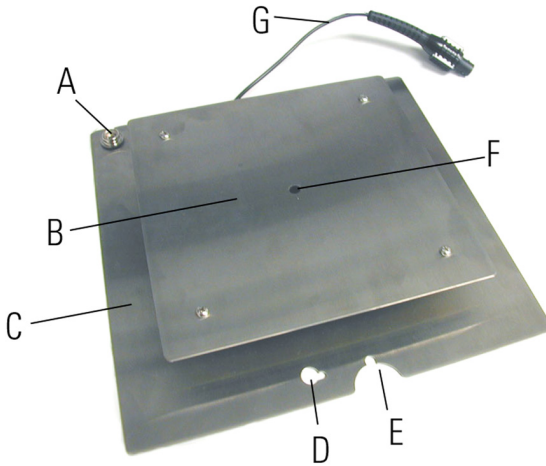


Figure 4. Charge Plate

- A. **Ground Snap:** Connects the plate to the unit
- B. **Charge Plate:** Top part of the whole plate is the active sensor
- C. **Grounding Plate:** Provides ground when correctly connected to the main unit ground connection
- D. **Front Notch:** Hold the plate in place
- E. **Release Notch:** Cutout for the release button on the main unit
- F. **Confidence Hole:** Receives the thumbscrew stored on the back of the unit
- G. **Connection Cable:** Connects to the unit cable to complete plate connection

NOTE – The Charge Plate can be disconnected from the Grounding Plate. For accurate readings, these plates must be connected when using the plate remotely.

Supplied Accessories

- **Plate Extension Cable:** Provides extra distance for remote plate placement
- **Grounding Cable:** Snaps to plate and unit for a ground connection
- **AC Power Cord**
- **Ground Extension Cable:** Provides additional grounding method and extends ground cable length
- **Software CD:** Contains software for communicating test data with a computer
- **USB Cable:** (Type A to Type B) for PC communication with the software

2.2 Performance

This instrument is a charged-plate monitor for evaluating the performance of ionization systems. It performs positive and negative decay tests and balance (offset voltage) tests to determine if an ionization system is operating effectively. It can be used to test all types of ionization systems as described in ESD Association Standard ANSI/ESD STM3.1 Ionization.

Over the years, new technologies have placed new demands on ionization systems, and the capabilities and features of the charged-plate monitors used to evaluate them. Simco-Ion has responded to these needs by incorporating many additional and improved features in the Model 280A Charged-Plate Monitor. The original Model 280A provided the following important capabilities for people evaluating ionization systems:

- Replacement of the fieldmeter normally used to monitor the plate voltage with a high-voltage follower amplifier to increase accuracy and reduce zero drift
- Wider bandwidth to evaluate AC ionization systems
- The ability to automate commonly repeated sequences of tests and store their test results for future review
- Adjustable start and stop voltages for decay tests
- A serial interface and applications software to control ionization tests from a computer

The improved Model 280A provides the following capabilities.

- The ability to resolve the plate voltage with 100 mV resolution
- Applications software to graphically display decay and balance waveforms in real-time
- The ability to measure the performance of the latest high-frequency AC ionization systems

3. SETUP AND MENUS

Upon power-up, you are presented momentarily with an identification screen, including the software revision level and your unit's serial number.

Within a few seconds, the **MAIN** screen (see the Main screen below) is presented. This screen should show the current date and time, ambient factors, power source information, and current test number and prompt the operator to "**Select Operation**". The test-numbering scheme begins with 1500 and displays the number of remaining tests.

3.1 MAIN Screen Menu

One of the menu options is **SETUP**. Once significant programming has been done and data taken, the **SETUP** mode should not be tamper! There is no **BACK** button. Thus, the first thing the user should become familiar with is **SETUP**. Press the "**SETUP**" key.

MAIN	280A	2.00	06/18/21	11:23:02A
	S/N	012245	AC	Bat=78°F 24C 26%RH
Select Operation			Test Avail. 1500	
MANUAL	AUTO	DATA	SETUP	

3.2 SETUP Screen Menu

The current menu is identified in the upper left corner of the screen as "**SETUP**".

Menu items are: **SYSTEM**, **MANUAL**, **AUTO**, **OPTION** and (back to) **MAIN**. Select **SYSTEM** to go to the **SETUP SYSTEM** menu. Press the "**SYSTEM**" key.

SETUP	06/18/21	11:23:02A
	AC	Bat=78°F 24C 26%RH
SYSTEM	MANUAL	AUTO
OPTION	MAIN	

3.3 Setup SYSTEM Menu

- **CLOCK** – Sets the system's real-time clock. This should be set to the current local date and time for all future tests to be properly stamped. Once new data (if any) has been entered, press **EXIT** and elect to **SET** the clock to the time shown on the **SETUP SYSTEM CLOCK** screen or **EDIT** to change the settings or **CANCEL** to change nothing and return to the **MAIN** menu.
- **RAM/EE** – The first screen under this option asks, "Clear all test data - Y/N?" A "Y(es)" response will permanently erase all accumulated test data from memory. The next two windows prompt a similar decision to restore defaults to Group/Location names and test setups. These decisions should not be taken lightly as *deletions are irreversible*.

SETUP SYSTEM	06/18/21	11:23:02A
	AC	Bat=78°F 24C 26%RH
CLOCK	RAM/EE	S/N
RETURN		

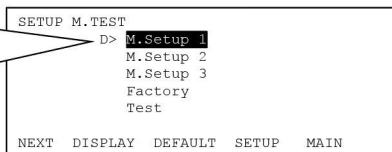
- **S/N** – Displays software revision number and instrument serial number. These cannot be modified.
- **RETURN** – Returns to **SETUP** Menu.

3.4 Setup MANUAL TEST Menu

In the **SETUP** screen (see Setup screen on page 12), press the “**MANUAL**” key.

This screen displays a list of five user-selectable manual test options. Three of them; M.Setup 1, M.Setup 2, and M. Setup 3, maybe modified. The "Factory" option uses "standard" settings, and the "Test"

The first three setups can be modified. M.Setup 1 is current selected as default setup for use.



option has settings used during factory testing of each unit. These two may not be changed.

Any manual test parameters may be viewed, or those of the first three edited to meet user requirements by highlighting the test and pressing the **DISPLAY** key. To change these parameters, see Programming Features for Manual Tests.

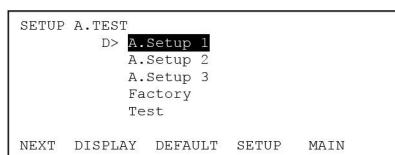
A symbol “D>” indicates which one is selected as the default test. To change the default, scroll to highlight one of the options using the **NEXT** key and press the **DEFAULT** key. The selected test will remain the default test until re-selected. Previously stored test results are not affected by a new default setting, but all subsequent tests will be made with the new default until changed by this method.

3.5 Setup AUTO SEQUENCE Menu

The **SETUP AUTO SEQUENCE** screen works the same. It displays a list of five user-selectable manual test options. Three of them, A.Setup 1, A.Setup 2, and A. Setup 3, may be modified. The "Factory" option uses "standard" settings, and the "Test" option has settings used during factory testing of each unit. These two may not be changed.

In the **SETUP** screen, press the “**AUTO**” key.

The parameters of any manual tests may be viewed, or those of the first three edited to meet user requirements by highlighting the test and pressing the **DISPLAY** key. See **Programming Features for Auto Sequence Tests** later in this manual.



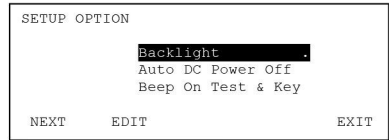
A symbol “D>” indicates which one is selected as the default test. To change the default, scroll to highlight one of the options using the **NEXT** key and press the **DEFAULT** key. The selected test

will remain the default test until re-selected. Previously stored test results are not affected by a new default setting, but all subsequent tests will be made with the new default until changed by this method.

3.6 Setup OPTION Menus

Options are for display backlighting, power off, and beep settings. The first two options apply to when the 280A unit is using battery power.

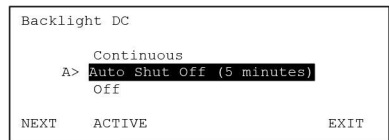
Highlight and press **EDIT** to view further options.



Backlight Menu

The (A>) symbol indicates the current choice.

Highlight desired choice and press **ACTIVE**. Then press **EXIT** change.

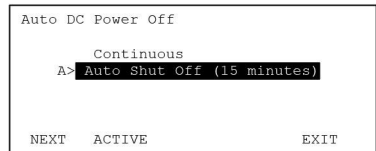


The display's backlight can be set to continuous lighting or shut off in 5 minutes when using the battery.

Auto DC Power Off Menu

When the 280A unit runs on battery, it can be set to run Continuously or auto shut off in 15 minutes.

Highlight the option by pressing the **NEXT** key, then press **ACTIVE**.



In the **SETUP OPTION**, highlight the option, then press the **EDIT** key.

The Beep has three options:

- **Beep On Test & Key:** Beep when a key is pressed, and the mode changes during the test
- **Beep On Test Only:** Beep only during the test when the mode changed
- **Beep Off**

4. OPERATION

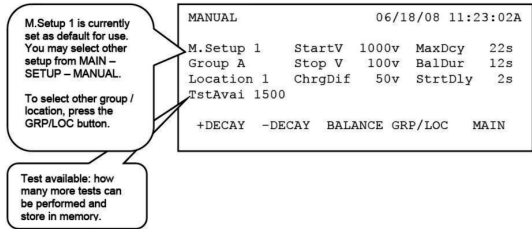
4.1 Manual Operation

The user can choose to run a positive decay, negative decay, or balance from the manual screen. The option exists to enter the group and location screen to select the ionizer's proper designation under test. See the **Manual** Test screen below.

Manual Test Screen

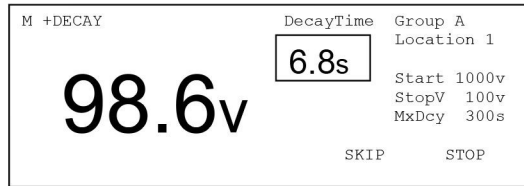
From the **MAIN** screen (see the Main screen on page 12), press the **MANUAL** key.

+/- Decays – Once a decay test is selected the unit switches screens displaying the plate voltage, timer, group/location and test parameters.



+ Decay Test

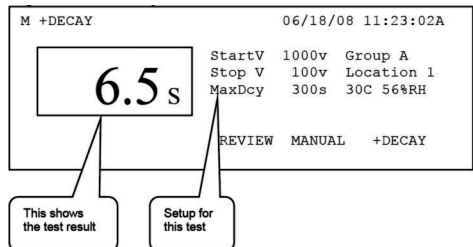
- **SKIP:** Allows the user to skip test delay time
- **STOP:** Abort the test, or when the decay test ends, the plate voltage reading will continue to display until the **STOP** key is pressed



Once the test is complete, a summary screen displays decay, test parameters, time, date, temperature, humidity, and test number. From the summary screen, another decay test can be run, a test data history screen can be accessed, or a return to the manual test screen can be selected.

+ Decay Test Result

- **REVIEW:** Review the test results
- **MANUAL:** Go back to the **MANUAL** screen
- **+ DECAY:** Start a + Decay test
- **REVIEW:** Displays the manual test results and settings as shown in the Review Manual figure below



Review Manual

- **NxtTst:** Scroll down to highlight the next test
- **ClrTst:** Delete the highlighted test data
- **Return:** To **MANUAL** screen

```
DATA Group A      Location 1  1000-100v
06/18/08 11:23:02A 30C 56%RH BalDu 60s
M-D 6.5s
M-D 6.3s
BAL +VP=+00.9v -VP=+00.2v Avg=+00.6v
1 of 3
NxtTst          ClrTst  Return
```

This shows the Setup for the highlighted test. StartV=1000v, StopV=100v. Balance duration=60 sec. Date and time of the test, Temperature and humidity reading.

Balance Test

STOP: Abort the test.

During the balance test the screen displays the plate voltage, test time, group/location, test parameter, average voltage and positive/negative peak voltage readings. Once the test is completed the summary screen appears with the same type of data and options available in the manual decay summary screen.

```
M +BALANCE          BalDur=60s      Group A
                        Location 1
12.6v              32s
                        +Vp  +01.2v
                        -Vp  +00.3v
                        Avg   +00.8v
                        PKRst  STOP
```

NOTE – Average Voltage Overflow

The instrument cannot calculate the average voltage for indefinite periods. Eventually, the average voltage computation will overflow. When this happens, the last calculated value for the average voltage will be displayed. The Avg line of the display will flash, signifying that the average voltage computation has overflowed and is no longer updating based on new data. The instrument continues to correctly indicate changes to the positive and negative peak voltages, +Vp and -Vp, respectively.

Confidence Test

One of the major weaknesses in all CPM's has been the inability to properly verify the main function of these devices, DECAY. It is possible to test the plate voltage, timer performance, and other parameters in all the existing instruments but not the actual decay function.

There is a test hole in the plate's center in the 280A charge plate (available in the 6 x 6 plate only). Remove the knurled thumbscrew from the unit's back panel and insert it into this hole, making sure that the head of the screw is making contact with the plate.

Then run a Decay test and a Decay test in a non-ionized environment. Both decays should be within a 4 to 6-second range, typical. By performing this test periodically, the user can be assured the unit is operating correctly.

4.2 Manual Test Programming

- **Start Voltage** – Range of 10V to 1000V, adjustable in 1V increments
- **Charge Differential** – This is the difference between the start decay voltage and how much overcharge the unit puts on the plate. It ranges from 10V to 100V and is adjustable in 1V increments
- **Stop Voltage** – Range of 0V to 995V, adjustable in 1V increments
- **Test Start Delay** – Range of 0 to 15-sec, adjustable in 1-sec intervals. This is the time delay from when you push the start key and when the test begins, allowing the user to exit the area to minimize their impact on the readings
- **Max Decay Time** – Range 10-sec to 9999-sec adjustable in 1-sec intervals. If the unit does not reach the stop voltage within this time, the unit will abort the test. This timer can be turned OFF
- **Balance Duration** – Range of 10-sec to 9999-sec, adjustable in 1-sec intervals. This can also be set for continuous readings with no time out



NOTE – Average Voltage Overflow

The instrument cannot calculate the average voltage for indefinite periods. Eventually, the average voltage computation will overflow. When this happens, the last calculated value for the average voltage will be displayed. The Avg line of the display will flash, signifying that the average voltage computation has overflowed and is no longer updating based on new data. The instrument continues to correctly indicate changes to the positive and negative peak voltages, +Vp and -Vp, respectively.

SETUP – MANUAL – M.Setup 1

From the MAIN Screen (see figure below), press **SETUP – MANUAL**. Then highlight the M.Setup 1, press **DISPLAY**. The following screen will appear.

Press **NEXT** or **PREV** to highlight the item, then press **EDIT** to make changes.

When finish, press **SAVE** to store the new settings or press **CANCEL** to discard the changes.

SETUP M.TEST				
M.Setup 1	StartV	1000v	MaxDcy	22s
Last enter	Stop V	100v	BalDur	12s
06/12/08	ChrgDif	50v	StrtDly	2s
10:20A				
NEXT	PREV	EDIT	CANCEL	SAVE

4.3 Automatic Operation

Once the desired test parameters are set up, the tests. All the parameters are shown on the

Auto Sequence Test

From the MAIN screen, press **AUTO**.

This shows the current Setup. To change/edit the setup, Press MAIN-SETUP-AUTO. Group & Location. If you want to change another location, press Grp/Loc. TstAvai: How many more test can be performed and stored.		AUTO		06/18/08
		11:23:02A		
A.Setup 1	StartV	900v	MaxDcy	300s
Group A	Stop V	90v	BalDur	20s
Location 2	ChrgDif	50v	StrtDly	1s
TstAvai 1500	#DecayCyc	3	CycDelay	3s
	DcySeq	++-	Bal (Y/N)	Y
Start		Grp/Loc	Cont	MAIN

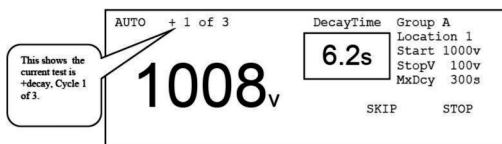
- **Start:** To start the auto sequence tests
- **Grp/Loc:** To select another group and location
- **Cont:** Perform auto sequence test Continuously. This will prompt for a time interval between each auto sequence test
- **MAIN:** Back to the **MAIN** screen

As soon as the start button is pushed, the screen switches to the autotest screen and proceeds to run the prescribed number of decays and balance (only if balance is set to run via the setup). The unit moves automatically from one test to another until it has completed the programmed sequence. At the end of the tests, the screen changes to display individual decay times, average decay time, balance results, including/peaks and average voltage, date, time, temperature, humidity, and group/location. From this point, you can select to run another test sequence or return to the automatic screen.

The group/location button will allow you to select the appropriate label for the ionizer under manual test mode.

Auto Sequence Tests

- **SKIP:** Allows the user to skip start delay time
- **STOP:** stop the test



When the auto sequence tests are finished, the data will be shown as below.

Auto Sequence Test Review

- **NxtCyc:** Highlight the next data row
- **MAIN:** Back to the **MAIN** screen
- **AUTO:** Start another auto sequence test

	3	+Decay	EndV	-Decay	EndV
Group A	1	6.5s	6.5s		
Location 2	2	6.5s	6.5s		
06/22/08	3	6.4s	6.5s		
03:32:56P					
30C 62%RH					
	Av	6.5s	6.5s		
		+Vp=+22.6	-Vp=-12.3	Vav=+04.5	
NxtCyc				MAIN	AUTO

4.3 Auto Sequence Test Programming

- **Start Voltage** – Same as manual
- **Charge Differential** – Same as manual
- **Stop Voltage** – Same as manual
- **Test Start Delay** – Same as manual
- **Max Decay Time** – Same as manual
- **Balance Duration** – Same as manual
- **Decay Cycle** – Range from 1 to 10, adjustable in increments of 1. This is the number of and –decays the unit will run in an automatic sequence

- **Decay Sequence** – Select either the decay sequence or the number of cycles selected in the Decay Cycle
- **Cycle Delay** – Range from 2 sec to 15 sec, adjustable in 1-sec increments. This is the amount of time from the finish of the last decay cycle to the next
- **Balance (Y/N)** – Select whether or not you want a balance test to run at the end of the decay cycle automatically
- **Continuous** – This feature allows you to perform a continuous series of tests on a selectable time basis. For example, you want to run a series of decay and balance every hour for the next day. From the automatic screen, select **CONT**, then select the desired test time interval from 1 minute to 24 hours. Once you have programmed the time, press **EXIT**, and you will advance to the next screen. From this screen, you have the option of pressing **CANCEL** or **START**. The **START** key begins the default automatic test sequence and will repeat that test sequence at the time interval selected. This continuous testing will continue until you stop the tests or the memory becomes full

From the **MAIN** Screen (see the Main screen on page 12), press **SETUP – AUTO**. Then highlight the A.Setup 1, press **DISPLAY**. The following screen will appear.

Auto Sequence Test Setup

Press **NEXT** or **PREV** to highlight the item, then press **EDIT** to make changes. When finish, press **SAVE** to store the new settings or press **CANCEL** to discard the changes.

SETUP A.TEST 1	StartV 1000v	MaxDcy 22s
A.Setup 1	Stop V 100v	BalDur 12s
Last enter	ChrgDif 50v	StrtDly 2s
06/12/08	#DecayCyc 3	CycDelay 3s
10:20A	DcySeq ++-	Bal(Y/N) Y
NEXT PREV EDIT CANCEL SAVE		

4.4 Additional Features

Group and Location

By accessing this screen, the tests can be organized to reflect the ionizers' locations. There are up to 17 Groups available, with a maximum of almost 700 locations. The total number of group/locations available will vary depending on how extensive the tests are for the individual locations (i.e., how many decays are run for each ionizer). Up to 1500 tests may be run. Using a PC connected to the unit's USB port, it is possible to custom label these groups/locations (i.e., Building 10 - Bench 2E). Via the same link, it is then possible to download all the test results stored in the unit into a spreadsheet on the PC.

Select Group/Location for the Test

- **NEXT:** To highlight the next group
- **NXTLOC:** Select the same group, next location from the current one
- **CANCEL:** Cancel the selection
- **SELECT:** Select the highlighted group. This will lead to select location screen

GRP/LOC	Default	Grp/Loc	Name	
Grp#	Name	#ofLoc	AMTest	
Current:	1	Group A	99	00
Group A	2	Group B	99	00
Location 1	3	Group C	99	00
MaxGrp 17	4	Group D	99	00
NEXT NXTLOC CANCEL SELECT				

Group A has 99 locations.
AMTest: A(uto sequence)
/M(annual) test Setup for
this Group:
0=Use Default setup
1=Use A/M Setup 1;
2=Use A/M Setup 2;
3=Use A/M Setup 3;
4=Factory
5=Test
AMTest can be set in the
PC software when
entering the

Test Parameter Setups

In both the Manual and Automatic Modes there are five distinct setups. Three of these are available to the user to customize as needed. The other two are the factory and test settings, which are not adjustable. Any of these can be selected as the default test setup.

Data Storage and Review

All test results are stored in the internal memory of the unit. They can be viewed through the screen or downloaded to a PC. Each test records the time, date, temperature, humidity and test results.

Review Data

From the **MAIN** screen (see Main Screen on page 12), press **DATA**.

- **RvwMan:** Review Manual test data. See Review Manual on page 16
- **RvwAuto:** Review Auto sequence data. See Auto Sequence Test Review on page 18
- **GRP/LOC:** Select group/location
- **CLR:** Erase data
- **MAIN:** Back to the **MAIN** screen

DATA
Group A
Location 1
TstAval 1450
RvwMan RvwAuto GRP/LOC CLR MAIN

Peak Reset

During a manual balance test where Balance Duration has been disabled the M BALANCE will show BalDur=XXXXs which means that the test will run continuously until STOPped. Pressing the PkRst key at any time will reset the displayed peak values to zero and the timer will continue to run until it reaches 999.9s then the decimal point will shift and the display will run to 9999s (or about 2 hours and 47 minutes). Beyond that, an overrun error is displayed.

Plate Voltage Bar Graph

Three ranges are provided with a maximum resolution of fewer than 10 volts for making very fast assessments of plate voltage and polarity around zero.

Power

The unit will run on either AC or battery power. The internal rechargeable battery will supply up to six hours of operation.

Charge Plate

A 6 X 6 plate comes standard with the 280A. When detached from the base unit, it comes with the ground plane plate or is taken off as a separate item. Mounting hardware allows the plate to be attached to the unit's side, connected to a tripod via ¼ -20 threaded insert, or put into any variety of situations to measure ionization. A 5-foot extension cable comes standard with the unit.

To release the detachable charge plate only, slide it forward. To remove the complete charge plate and ground plane assembly, press the release button with a suitable tool and swing the assembly slightly to the right.

There are several optional plate sizes available down to 1" x 1" for those space-restricted applications. Consult the factory for other sizes and availability.

Grounds

A ground snap is provided on one corner of the ground plane and a ground jack is provided on the back panel. The instrument chassis is normally connected to the ground via the power cord during AC operation and the ground plane is connected to the chassis when the unit is assembled. Grounding is essential to proper operation.

Analog Output

An analog output jack is provided on the back panel

5. MAINTENANCE

5.1 Cleaning



CAUTION – User maintenance should normally be limited to keeping the instrument clean and free from physical damage. Store the instrument in its protective carrying pouch when not in use.

Fingerprints and other contaminants may be removed from the case with a clean lint-free cloth dampened in a 70/30% mix of clean technical grade isopropyl alcohol and de-ionized water.



NOTE – Do not use soap or detergent to clean the case of the CPM.

5.2 Battery

Battery voltage is monitored and displayed on the **MAIN** screen. The normal range of operation is between 10V and 15V. When the battery has discharged to below 10V, a warning message is displayed, and the instrument shuts down 15 seconds later, terminating any activity in progress. Battery charge life depends on the type of tests being run and the **OPTION** menu settings. Testing may be resumed using AC power.

A complete recharge cycle takes 4-6 hours with power off.

5.3 Charge State Indicator

While the unit is connected to an AC power line and in an inactive state, the upper half (red) of the **PLATE VOLTAGE** bar graph serves as a battery state-of-charge indicator with a maximum float condition minimum, implying that the battery requires further charging. The "x1" and "x2" range lights will be lit. If the power cord becomes disconnected, the LEDs will continue to report the battery status for several minutes.

5.4 Calibration

Calibration is not a user function and is beyond the scope of this manual. Simco-Ion recommends the unit be calibrated on an annual basis, and/or when the instrument is damaged or repaired or called for more frequently by contract. Simco-Ion offers repair and calibration services for a fee. Additional information on CPM Calibration services can be obtained from the factory.

6. SPECIFICATIONS

All specifications are referred to plate voltage unless otherwise specified.

Display Voltage	240 x 64 character/graphic; 3.5 digit display (Decay and Peak reading)	Accuracy: $\pm 0.1\%$ of reading ± 3 lsd Resolution: 1V for readings $>99V$; 0.1V for reading $<100V$
Time	4 digit display	Accuracy: 0.1% of reading ± 1 lsd Resolution: 0.1 sec for readings <1000 sec; 1 sec for reading >999 sec
Electrometer	Dynamic Range: $\pm 1200V$ Follower Error: <10 mV Speed of Response: <10 msec for 1 kV to 0V (90-10%) Bandwidth: -3 db @ 1 Khz 20 Vp-p; 3 db @ 10 Hz 2000 Vp-p Noise: <12 mVrms	
Monitor Output	Divide by 200	Accuracy: Output: 0.1% of reading ± 12 mV Impedance: 1 kOhms
Monitor/Control Interface	USB	
Start Voltages	1000V $\pm 0.3\%$, standard	Range: ± 10 to $\pm 1000V$ Resolution: Settable to 1V Accuracy: 0.3% of setting $\pm 2.5V$
Stop Voltages	100V $\pm 3\%$, standard	Range: 0 to $\pm 995V$ Resolution: Settable to 1V Accuracy: 0.3% of setting $\pm 2.5V$
Charge Voltage	Range: 10V to 100V above the start voltage Resolution: Settable to 1V increments Accuracy: 0.3% of setting $\pm 2.5V$	
Charge Plate	Capacitance: 20 pF, $\pm 5\%$ (not including strays) Zero Drift: <100 mV/sec (no incident ion flow) Self Discharge: <200 mV/sec	
Peak Detector	Balance Test Bandwidth: <10 Hz (pulse width >50 msec less 10% error typical) Average Voltage Overflow: When averaging overflows, the last calculated value for the average voltage will be displayed, and the Avg line of the display will flash, indicating an overflow; the instrument continues to correctly indicate changes to the positive and negative peak voltages, +Vp and -Vp, respectively	
Temp Sensor	Range: 0-50°C	Accuracy: $\pm 2^\circ C$ (typ)
Humidity Sensor	Range: 10-80% RH @ 25°C	Accuracy: $\pm 5\%$ (typ)
Operating	Temperature: 5-35°C Humidity: $\pm 5\%$ typ from 10% to 80% RH @ 25°C (77°F) Battery Life: 6 hours Charge Time: <8 hrs to $>90\%$ capacity	
Power	Voltage: 90-250 VAC; 50/60 Hz	Wattage: $<12W$ operating
CPM	Size: 11 x 9 x 6" (280 x 229 x 152 mm)	Weight: 12.5 lb (5.7 kg)

Certification



7. WARRANTY AND SERVICE

Simco-Ion provides a limited warranty for the Model 280A Charged Plate Monitor. New products manufactured or sold by Simco-Ion are guaranteed to be free from defects in material or workmanship for two (2) years from date of initial shipment. Simco-Ion liability under its new product warranty is limited to servicing (evaluating, repairing or replacing) any unit returned to Simco-Ion that has not been subjected to misuse, neglect, lack of routine maintenance, repair, alteration or accident. In no event is Simco-Ion be liable for collateral or consequential damages. Consumable items such as, but not exclusive to, emitter points, emitter wires, batteries, filters, fuses or light bulbs are only covered under this warranty if found defective as received with the new product.

To obtain service under this warranty, please contact Simco-Ion Technical Support.

Customer Service Contact Information

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