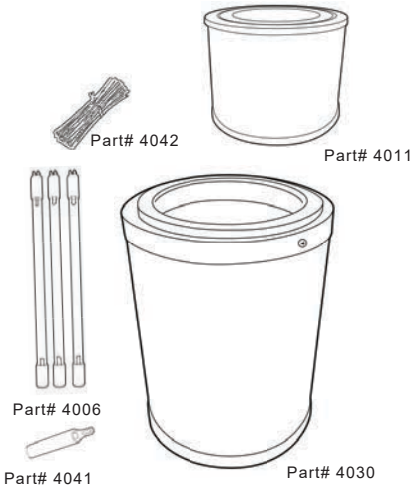
Scientific Air Management

HEPA Filter Replacement
UVC-Light Array Replacement
Carbon Canister Replacement

SAM Model 400 Service Kit Guide HEPA Filter, UV-C Light Array, and Carbon Filter Canister Replacement

SAM Service Kit User Installation Manufacturer: Scientific Air Management LLC © Revised 01.10.2019

IMPORTANT NOTICE WARRANTY INFORMATION
SAM REPLACEMENT PARTS are manufactured and tested to be effective for one year. Use only Scientific Air Management Parts.



Service Kit Part# SK5001 HEPA Filter Replacement Kit.
Service Kit Part# SK 5002 Annual Service Replacement Kit.
Per facility protocol, shipping box and bag can be used for bag-out of expired HEPA filter.

Part# 4011 - 1 each HEPA Filter Canister
(HEPA Filter Replacement an be purchased individually)
Part# 4006 - 1 each UV-C 3 Bulb Light Array Replacement
1 each UV-C 6 treated plastic black twist ties - Part # 4042
1 each Carbon Filter Canister Filter Replacement Part# 4030
1 each #27 Security Screw Tip (Tool Required) - Part# 4041

CAUTION:

Use only Scientific Air Management Manufactured Service Parts for proper Canister Gasket fitting and Manufacturer Warranty Compliance.

For assistance: 800.923.9309

WARNING!
Skin or eye damage may result from directly viewing the light produced by the lamp in this apparatus. ALWAYS disconnect the power before re-lamping or servicing.

Service Kit Guide
UV-C Light Array and Carbon Filter Canister Filter Replacement

SAM Filtration and UV-C Components are manufactured and tested to be effective for one year.

Portable air filtration units require proper consumable parts replacement for their effective continued operation. This procedure should specify recommended personal protective equipment (PPE) when performing service on the unit. The maintenance procedure should be performed in an area safely away from any patient locations. It is recommended that it be done in an authorized maintenance location that has appropriate ventilation. The area should be a contained area and easily cleaned. Based upon manufacturer's recommendation and any additional suggested protocol from facility maintenance, a standard routine service procedure should be developed for this unit. Such maintenance should include but is not limited to:

- Disconnecting power source (unplug this unit) before any service performance procedures.
- Authorized designated maintenance personnel familiar with these instructions.
- All Consumable Components are manufactured to be effective for one year. Facility Protocol may require more frequent change. Always follow facility details on "bag out" protocol and proper disposal of consumable components. Since these components may be contaminated, expired parts should be treated as such and handled with appropriate PPE.

Getting Started

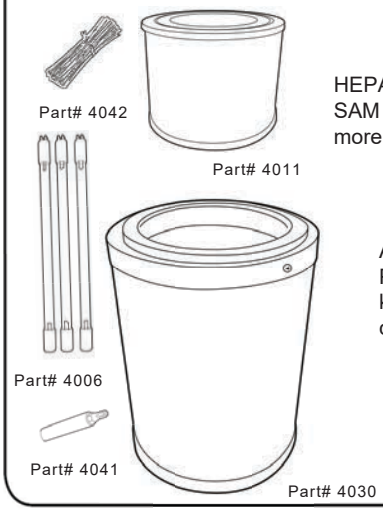
Personnel: Facility authorized Maintenance Personnel familiar with these instructions and PPE, "bag-out" protocol procedures.

Work Area: Facility authorized facility maintenance area

Tools Required: Security Screw Tip #27 (provided in Kit SK5002) and proper hand held screw tip device (not included)

Parts Requirement: 1 each Part # SK 5001 or SK 5002

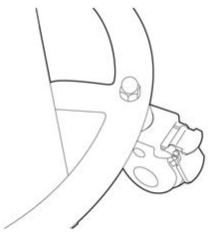
Parts Needed



HEPA Replacement Service Kit Part# SK5001 SAM HEPA Canister Filter. Purchased alone for more frequent filter changes.

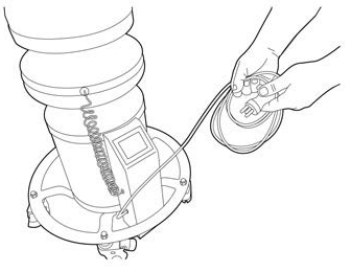
Annual Service Kit (including HEPA Filter) Part Number # SK5002. Purchased as a kit as part of annual procedure filter change.

Step 1



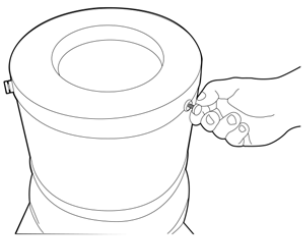
Place unit on level flooring with enough area to work within a 5 foot radius around unit. Using toe-locks on each wheel press outer most tab down to lock wheels in place.

Step 2



Once unit is locked into place - be sure unit is unplugged. We suggest wrapping the cord into a coil and placing under the unit - out of the way.

Step 3



Locate the three(3) Black Plastic Thumb Screws at the very top of the unit along the HEPA Canister Housing. Unscrew (counter clock wise) each of the three (3) Thumb Screws removing them completely. Place screws in secure location for later use to complete filter change procedure.

HEPA Filter Replacement Instructions

Step 4

With all three (3) thumb screws removed lift top plate from HEPA Canister Housing to reveal HEPA canister filter.

Step 5

Remove HEPA canister filter from HEPA Canister Housing. Dispose of used HEPA canister filter per facility protocol for expired HEPA filtration materials.

Step 6

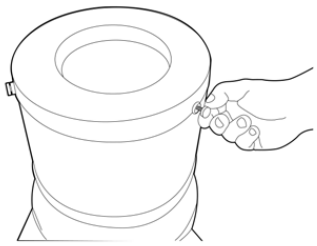
Position replacement HEPA canister filter in unit. Be sure to have the Black Solid closed top of HEPA canister filter facing upward with the filter canister open end facing down towards Motor Housing.

Warning! Steps 5 and 6 require exposing the Motor and Fan Housing to possible debris. NEVER let any objects fall or be misplaced into the Motor and Fan Housing area!

Step 7

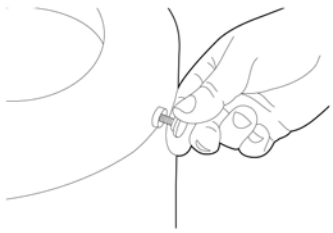
With replacement HEPA Filter Canister positioned properly level and closed Black Solid top of canister facing up, place HEPA Canister Housing Lid back onto HEPA Canister Housing,

Step 8



Note: HEPA Canister Housing Lid will be a snug fit as to apply downward pressure compressing the anti-leakage gaskets. Align the screw holes properly.

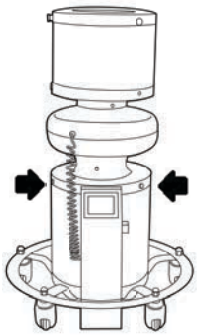
Step 9



With screw holes in proper position replace thumb screws and hand tighten (clock wise) until firmly seated. Unit is now HEPA Canister Filter renewed .

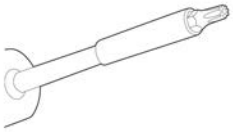
The HEPA Filter Canister replacement portion of service is now complete. If proceeding to Annual Service Kit Replacement the unit is now ready for UV-C Light Array and Carbon Final Filter Canister Replacement.

Step 10



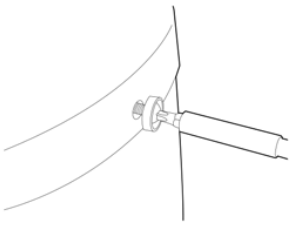
Locate the three (3) Security Screws (1/4"x3/4" #20) for the Carbon Filter Canister Housing just below the Motor Housing Shroud. See illustration.

Step 11



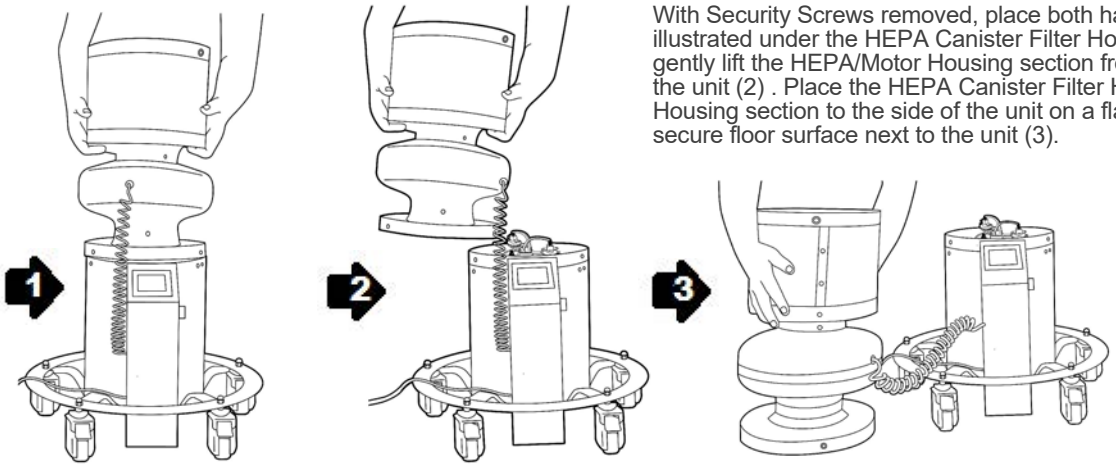
Place the provided Security Screw Tip (#27) into the proper hand held screw device. DO NOT use powered screw driver devices .

Step 12



Remove the there (3) Security Screws (counter clock wise). Look for the there (3) Poly Washers as part of Security Screw Assembly. Place Security Screws and Poly Washers Assemblies in secure place for future use.

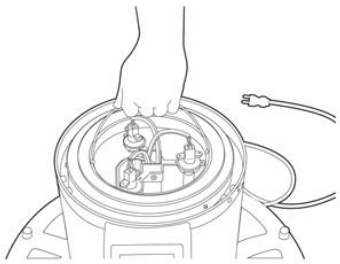
HEPA Filter Canister and Motor Housing Removal



With Security Screws removed, place both hands as illustrated under the HEPA Canister Filter Housing (1) and gently lift the HEPA/Motor Housing section from the base of the unit (2) . Place the HEPA Canister Filter Housing/Motor Housing section to the side of the unit on a flat clean secure floor surface next to the unit (3).

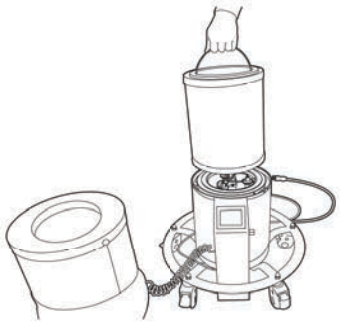
Warning! Steps 14 through 32 require exposing the Carbon Canister and UV-C Light Array to possible debris. Be sure to NEVER let any objects fall or be misplaced into the The Carbon/UV-C Housing area!

Step 14



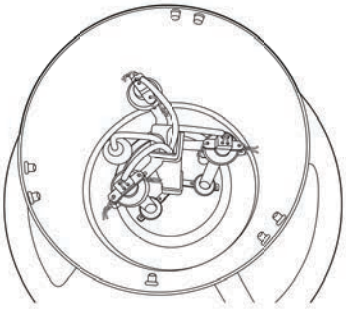
Locate the Carbon Canister Lift Handle directly on the inside of the top of the Carbon Canister.

Step 15



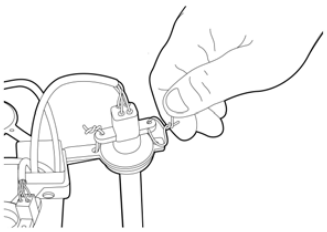
Using the Carbon Canister Lift Handle to remove the Carbon Cannister by gently pulling it directly up and out of the base Carbon and UV-C Housing Section. Disregard the expired Carbon Canister..

Step 16



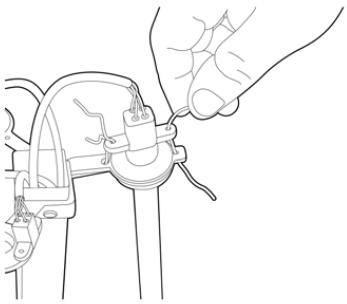
With Carbon Canister removed UV-C Light Array is accessible for servicing . See Illustration

Step 17



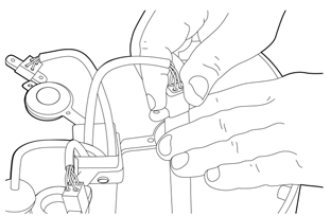
Each UV-C Light Electrical Assembly Post will have two (2) twist ties each, for a total of six (6) twist ties. Untwist the ties for each UV-C Light Assembly Post.

Step 18



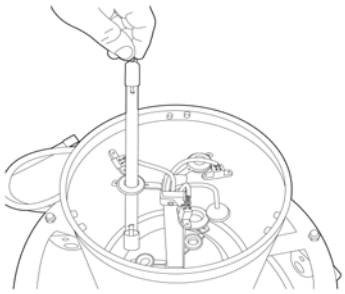
Remove each twist tie and dispose of properly.

Step 19



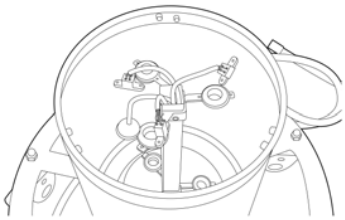
Gently grasping the UV-C Light Electrical Assemble top "female" Section, pulling upward to separate it from the UV-C Bulb "male" Electrical Pin Counter part. Continue procedure for all three (3) UV-C Light Bulb Assemble Posts.

Step 20



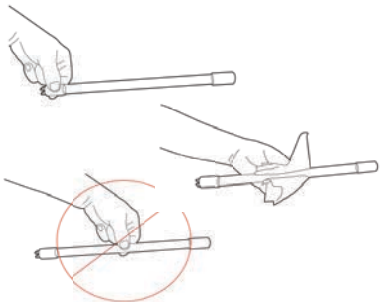
Pulling UV-C Light Bulb straight up to remove from Circular Rubberized UV-C Bulb Holders. Continue procedure to remove all three (3) UV-C Light Bulbs. Dispose of expired UV-C Light Bulbs in line with facilities protocol.

Step 21



With all expired UV-C Light Bulbs removed from Light Array Assembly Posts unit will will look like this. See illustration.

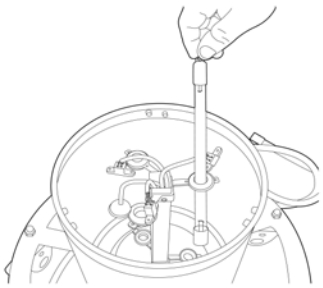
Step 22



Locate the three (3) NEW UV-C Replacement Light Bulbs. Handle the NEW replacement Bulbs with clean material (tissue or shop raga) or handling by the ceramic end caps only. .

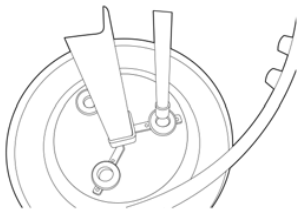
Warning! Steps 5 and 6 require exposing the Motor and Fan Housing to possible debris. NEVER let any objects fall or be misplaced into the Motor and Fan Housing area!

Step 23



Handling replacement bulbs as recommended, slide bulbs into the top of the UV-C Light Array Assembly Post Circular rubberized light bulb holder be sure that UV-C Light Bulb Electrical Pin connectors (male) are facing up.

Step 24

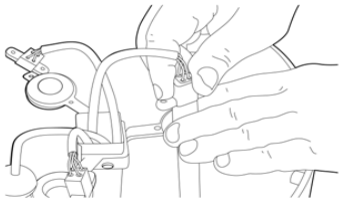


Continue sliding UV-C Light Bulb through Top UV-C Bulb Circular Holder to align within UV- C Bulb Bottom Circular Holder resting on the bottom.

Step 25

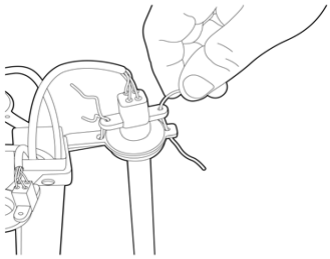
Connect UV-C Light Bulb Electrical Assembly Pins (male) with Coordinating Electrical Assembly Plug (female). Continue for all three (3) UV-C Light Bulb Electrical Pin and Plug Assemblages.

Step 26



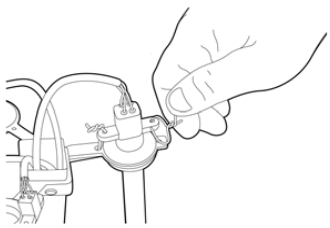
Note: Proper alignment requires Male Electrical Pins (rectangular pattern) to match Female Receptor rectangular pattern. This is the only alignment requirement, UV-C Light Bulb Electrical Assembly will not fit easily if improperly aligned - do not force.

Step 27



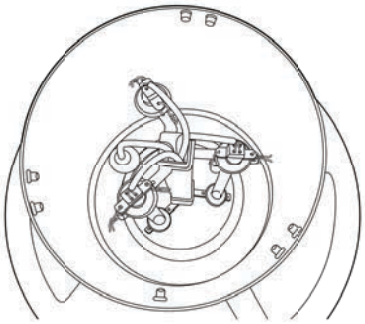
Place provided Twist Ties through corresponding UV-C Light Bulb Electrical Assembly Connectors (male and female) Bracket Holes, continue for all Six (6) UV-C Light Bulb Electrical Connectors Assembly Bracket Holes.

Step 28



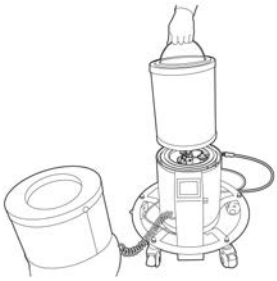
*Hand tighten all Six (6) Twist Ties - Do **NOT** over tighten.*

Step 29



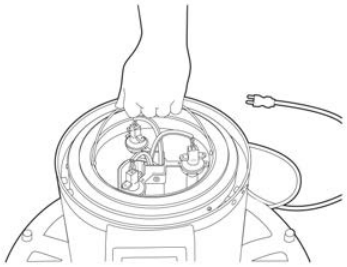
Completed UV-C Light Array with Replacement UV-C Bulbs installed correctly will look like this illustration.

Step 30



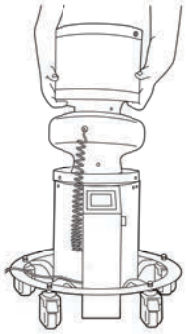
Using Canister Handle - slide New Replacement Carbon Canister into Carbon Canister Base Housing. Any position, as long as flat and level, will do.

Step 31



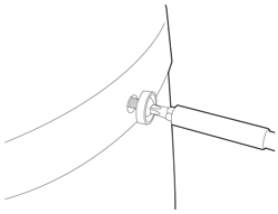
Once Replacement Canister is seated flat and level, fold Carbon Canister Handle down into the interior of canister.

Step 32



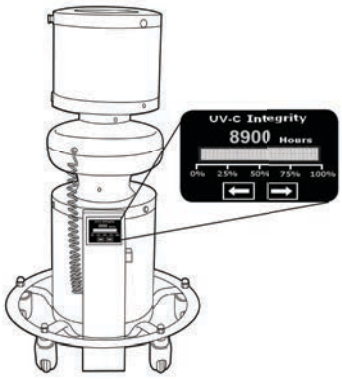
Placing hands under HEPA Canister Housing, lift the Canister Housing/ Motor Housing Section to place back on to UV-C/Carbon Canister Housing Section, Line ups screw holes.

Step 33



Using Security Screw Tip (#27) replace Poly Washer and Security Screws back into Security Screw holes. Hand tighten firmly - do NOT over tighten. Unit is now Consumable Replenished and ready for one (1) year service.

RESET THE DIGITAL ON BOARD DISPLAY

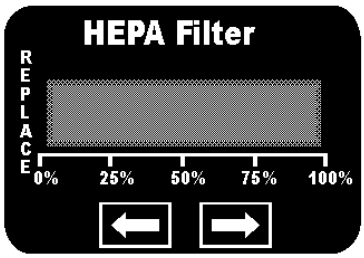


When powered on, display screen will automatically return to previous readings. **See Reset Instructions.**

❖ Important Final Step ❖

Resetting the On Board Digital Display Metering Screen. For more information see Digital Display Screen User Guide.

Resetting Digital Display

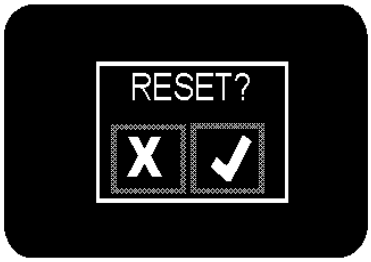


Reset Request works from any Screen Display Position. Hidden touch points are in each four (4) corners of screen. Pressing each corner in sequence will display Reset Request.

Screen Reset Sequence

From any Screen Display, starting at top left of screen, press each corner in the clock-wise 1-2-3-4 squence as shown above.

Metering Reset



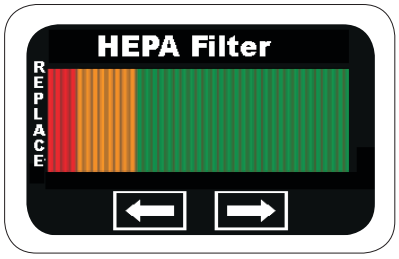
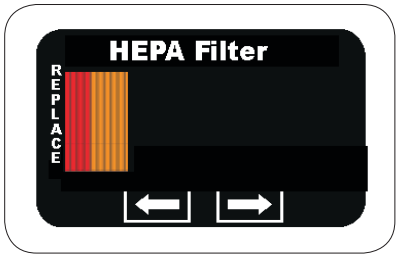
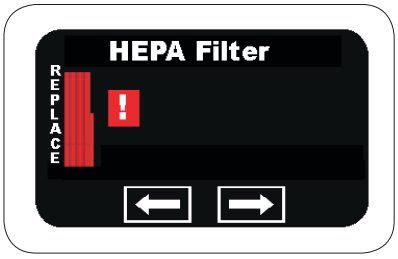
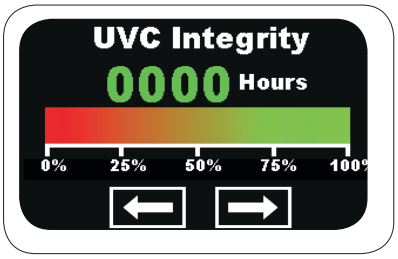
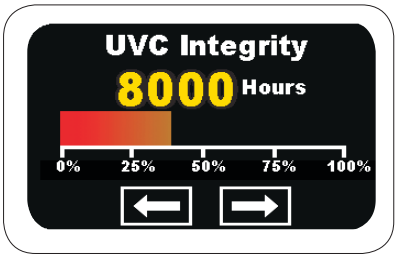
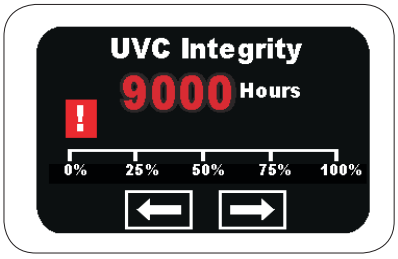
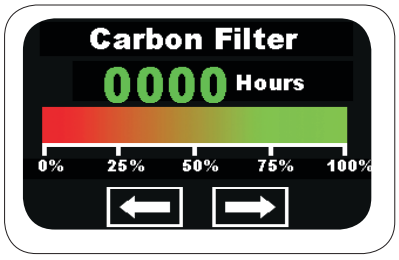
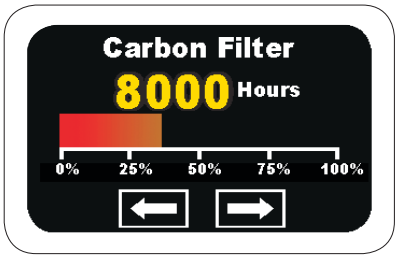
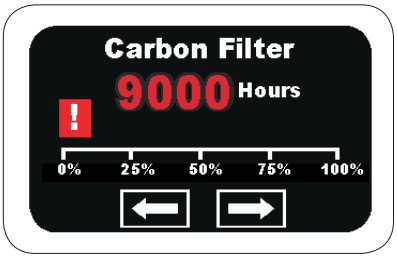
Once sequence is completed the above RESET display will appear for five (5) seconds. Confirm RESET pressing screen on Yes (Green Check Mark) and Digital Display will RESET back to original - new usage-setting.

On Board Digital Monitoring and Performance Screen Instructions

The SAM 400 has an on-board efficiency and continuous operational metering digital display screen. There are four continual meter readings:

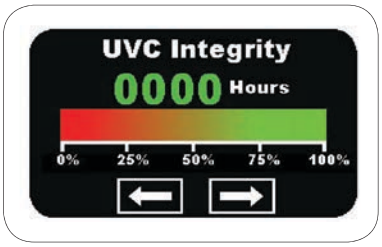
1. HEPA Filter Integrity
2. UV-C Light Integrity-Intensity Status
3. Final Carbon Filtration Integrity-Saturatuion Status
4. CFM Air Processed (Particulates Pathogen) Volume Status (Instructions next page)

Monitoring operations will display the four (4) metered screen readings every five (5) second on a continuous loop. Left and Right Arrows can be pressed to access previous or next screen. If unit is powered off the metering is stored in non-volatile memory.

Fully Operational	Fully Operational ***Scheduled Service Required with-in 40 days.***	***Diminished Operation Service Required.***
		
Green and Amber bar represent full filter functional capacity. No action required.	Amber bars represent full filter functional capacity but need scheduled service.	RED bars with alert alram demished filter non-functional capacity. Change HEPA Filter.
		
Green digits, Green and Amber bar represent full UV-C functional capacity. No action required.	Amber digits and Amber bar represent full functional capacity but need scheduled service.	Red digits and Red bar with Alarm diminished UV-C capacity. Change UV-C Light Array.
		
Green digits, Green and Amber bar represent full Carbon Filter function capacity. No action required.	Amber digits and Amber bar rep-resent full functional capacity but need scheduled service.	Red digits, Red bar with Alarm diminished capacity. Change Carbon Filter.

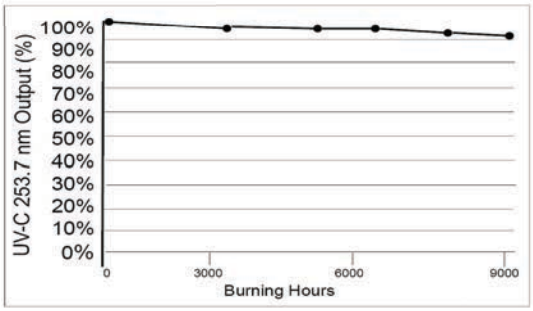
SEE DIGITAL SCREEN SERVICE AND MAINTAINANCE INSTRUCTIONS

UV-C Lights Monitoring - Intensity Maintenance Curve



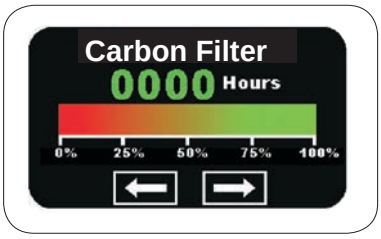
Scientific Air Management uses exclusively manufactured 253.7 nanometer (nm) wavelength UV-C light fixtures. UV-C 253.7 nm lights create extreme germicidal capabilities with zero ozone production. The useful life of our UV-C lights are greatly increased by precision design of our ignition, on/off cycle, and ballast electrical construction. Further enhancing the effective germicidal longevity of our UV-C is the inherently designed HEPA pre-filter and air flow, keeping the UV-C light fixture debris free and constantly cooled. UV-C lights are rated and output tested for 100% gradually to 92% intensity for 9000 hours.

253.7% nm UV-C array



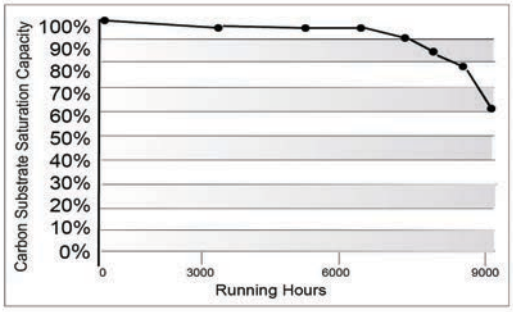
253.7% nm UV-C lights are rated and factory certified for 100% gradually to 92% intensity for 9000 hours.

Carbon Filter Monitoring - Absorption Maintenance Curve



Scientific Air Management uses uses a proprietary treated granular activated carbon process to accomplish physical adsorption and chemisorption. Granular carbon has a much larger particle size with a small external surface, thus making the total number of pores and filtration surface vast (up to five micron miles). Carbon used in our canisters is chemically impregnated for several ranges in containment filtration to assist in the adsorption process. This process decreases moisture absorption while increasing filter efficacy and longevity. Carbon filtration longevity is enhanced by particulate pre-filter HEPA .

Operating in average facility humidity 30.06 inHg bm reading.



Manufacturer certified for adsorption (100%) to break out absorption (0%) at standard rate fan speed induction. Chart represents 100% through gradual 65% non-breakout capacity for 9000 hours.

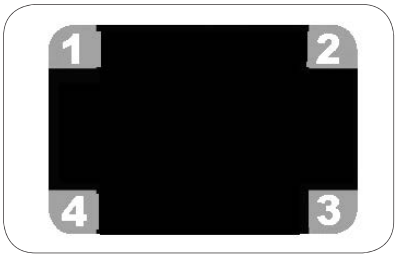
UV-C and Carbon Monitor Screens Reset Screen

Entry to this screen requires the user to press on the 4 corners of the screen, clock-wise, (1-2-3-4) in the specific sequence as shown.

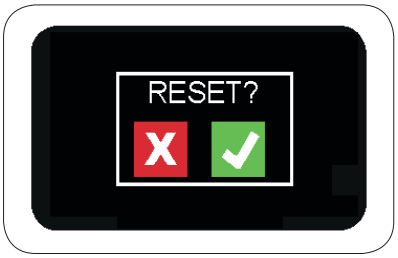
If a screen change occurs during the time the user is entering the number. sequence the sequence will continue unaffected.

If the sequence is not entered correctly, the reset sequence will immediately cancel and the screen cycle will continue unaffected. The user must also complete the sequence within 5 seconds to avoid cancellation.

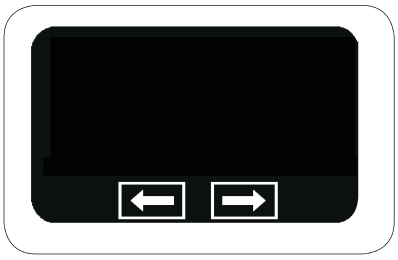
The user has 5 seconds to confirm or reject the reset request before the screen disappears and the 4-screen sequence resumes.



A successful number sequence will display the reset screen.



Manual Scroll Arrows

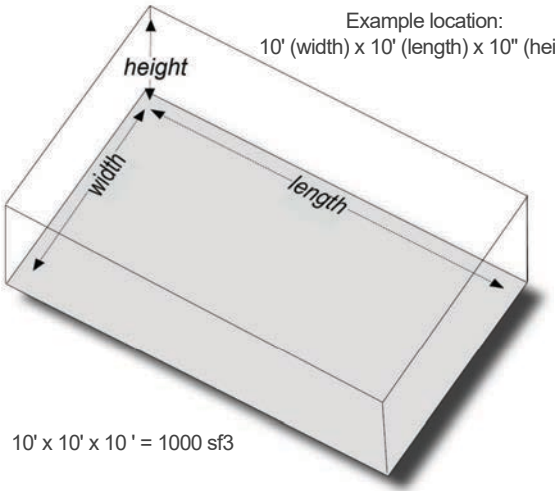


Left and Right arrow buttons at the bottom of each screen allow the user to jump forward or back from each screen without having to wait for the five (5) second timeout.

CFM Air Processed Monitor

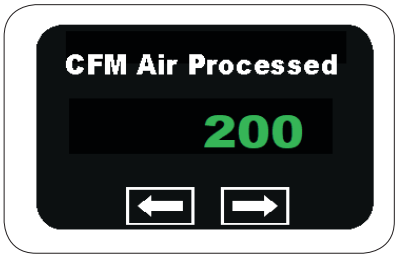
The SAM 400 includes a CFM Air Processed reporting system. This enables the user to estimate and report the amount of air processed (particulate, pathogen, mold, and odor removal) for any given location and time period.

By calculating the location's Cubic Foot volume this meter will correlate the amount of times that location's air was "scrubbed" and brought down to "zero contaminates" in a room via air changes.



Example location:	1000	SF^3
*SAM CFM (Cubic Feet per Minute):	200	CFM
Air Room Change (ACH):	12x	ACH
**ACH for disinfection:	3x	Passes
Minutes Room Processed Time:	36	Minutes
Hour Room Processed Time:	1.6x	Per Hour
24 Hr. Room Processed Time:	15x	Per Day

Location has been processed for whole room pathogens particulates, mold, and odors: *15 times in 24 hours*.



Place unit in desired location. Power unit up. Reset CFM Air Processed Monitor (see below).

After desired time period, record CFM Air Processed (24 hours in this example) Estimate cubic feet of location (see example to left).

* SAM operates at 400 CFM on Full Fan Speed. CFM of 200 is average induction fan speed at "medium" rheostat switch position, or maintiance air flow level.

**Per certified studies an average of 3 "passes" or room air changes are required for full room pathogen, particulate, mold, odor, and VOC elimination.

CFM Air Processed Monitor Reset from the Reset Screen

Entry to this screen requires the user to press on the 4 corners of the screen in a specific sequence as shown.

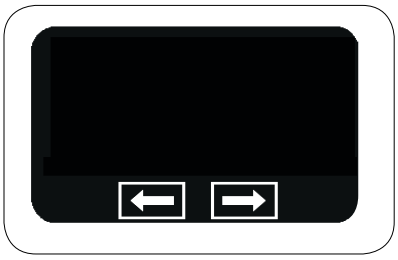
If a screen change occurs during the time the user is entering the number sequence the sequence will continue unaffected.

If the sequence is not entered correctly, the reset sequence will immediately cancel and the screen cycle will continue unaffected. The user must also complete the sequence within 5 seconds to avoid cancellation.

The user has 5 seconds to confirm or reject the reset request before the screen disappears and the 4-screen sequence resumes.

A successful number sequence will display the reset screen.

Manual Scoll Arrows



Left and Right arrow buttons at the bottom of each screen allow the user to jump forward or back from each screen without having to wait for the five (5) second timeout.

Scientific Air Management

Preventive Maintenance Service Guide

The SAM 400 is designed, manufactured, and tested for continual 24/7 use at peak performance for over one year with minimum maintenance requirements.

Preventive maintenance tasks:

Item	Schedule	Visual Inspection	Functioning	Non-Functioning	Discontinue Service
HEPA Filter	Monthly	HEPA Monitor Screen	See Display Instructions	Screen Indicates Service Schedule Service	No
HEPA Filter Replacement	Facility Protocol		HEPA Service Kit Instructions		
Fan Motor	Monthly	Listen For Running Smoothly. No Clicking	Running Smooth Quite "Fan" hum	Clicking or Buzzing Call Manufacturer	Yes
UV-C Light Array	Monthly	UV-C View Port UV-C Monitor Screen	Illuminated Green See Display Instructions	Call Manufacturer Schedule Service	Yes
Carbon Final Filter	Monthly	Carbon Monitor Screen Odor	See Display Instructions	Schedule Service	Yes
Electrical Outlet Cord	Monthly	No breaks or rips in outer Insultation Lose connection at junction box	No tears or rips in outer Insultation		Yes
Rheostat Switch	Monthly	ON/OFF/Speed Control	No on/off No Speed Control	Call Manufacturer	Yes
Monitor Display Screen	Monthly	Scroll Through Readings	Illuminated with Readings	Call Manufacture	No
Caster Wheel Assemble	Monthly	Unit Rolls Easily	Easily Maneuverability	Call Manufacturer	No
		No sticking or off center wheels	Toe Locks functioning	Call Manufacturer	
Annual Service Required	Manufacturer Service Requirement		See Service Instructions	Call Manufacturer	No

- SAM HEPA filter cartages have been tested for over one (1) year high efficiency usage under normal operating conditions (non-construction, non-high humidity areas).
- HEPA filtration replacement: (Optional See HEPA Filter replacement Guide) though not required for peak performance some institutions require more frequent HEPA filtration replacement. See HEPA Replacement and Parts Order Instructions attached.

1. HEPA filters are manufactured to be effective for one year. If Facility Protocol requires more frequent changes, be sure to include facility details on "bag out" protocol and proper disposal of filters. Since these filters might be contaminated, they should be treated as medical waste and handled with appropriate PPE.

2. Operational check for proper operation, fan motor, speed control, instrument lights, see above.

3. Exterior cleaning of unit if needed can be accomplished with facility cleaning material. Never use petroleum or acetone based cleaners. Never wet or submerge device or parts.

4. Changing of UV-Clamps and Carbon Filer Chambers per manufacturer requirements (based on hours of usage) can only be performed by authorized maintenance personal as outlined in the Service and Maintenance Guide.

5. General Institutional Prototypical safety check (electrical & mechanical) recommended.

6. Pre-Filter for HEPA induction. Pre-filters for construction or abnormal high volume particulate conditions are NOT standard on all models. Contact distributor for details. Pre-filter can be cleaned on a schedule or as needed bases. Pre-filter can be washed in water and disinfection solutions, air or mechanical dried. Replaced when dry.