

# AmericanAirFilter<sup>®</sup>

## SAAF<sup>™</sup> PORTA-Scrubber

### *Installation, Operation, and Maintenance Instructions*

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#### **1.0 Introduction**

##### **1.1 About This Document**

This document contains the information necessary to properly receive, assemble, install, operate, and maintain the SAAF<sup>™</sup> PORTA-Scrubber filtration system. The purchaser, installer, and/or operator of the filtration system MUST read and comply with this document in its entirety prior to installation of the equipment and its operation. Failure to comply with the requirements of this manual may void the product warranty.

**CAUTION:** These instructions are specific to the SAAF PORTA-Scrubber and SAAF Chemical Filtration Media. All ancillary tasks including, but not limited to, electrical and mechanical work, equipment handling, and safety procedures must be performed in accordance with industry accepted practice and all relevant local, state, and federal government codes, laws, and policies.

## 1.2 Packaging and Shipping, Receiving and Inspection, Handling and Storage

**1.2.1 Packaging and Shipping:** Unless otherwise defined in the purchase order and agreed by AAF, the PORTA-Scrubber and filters are packaged for domestic transit and shipped FOB the AAF factory. The method of shipment will be as specified in the customer's purchase order to AAF.

**1.2.2 Receiving and Inspection:** Obtain a copy of the purchase order and product drawing that was submitted by AAF in association with the order, and a copy of the bill of lading, along with any other shipping papers. Upon receipt of the equipment, or any part thereof, these documents shall be used to ensure that the correct product has been received.

For maximum protection, complete the following steps upon receipt of the PORTA-Scrubber and chemical media:

- Inspect the shipment and all associated documentation. Notify the carrier immediately if there is any visible damage to the packaging or the equipment, or a discrepancy in the shipping papers. If necessary, file an immediate claim with the carrier against such damage or discrepancy.
- Confirm that the equipment received agrees with the contents of the shipping papers.
- Confirm that the shipping documents agree with the purchase order. Refer to the product drawing submitted for the order as necessary.
- If it is determined that any equipment ordered on the purchase order has not been delivered and is not accounted for in the shipping papers, contact AAF immediately by calling 1-800-223-2003. Reference the AAF control number which will be listed on the shipping papers.

Each shipment may include:

- One or more individually packaged PORTA-Scrubbers.
- PolyKlean Blue filter pad.
- Packaged chemical filtration media.

Note that the PORTA-Scrubber, PolyKlean Blue filter, and gas phase media may ship from different locations and be received at different times.

**1.2.3 Handling and Storage:** Following receipt, inspection, and acceptance of the equipment, and prior to installation, the PORTA-Scrubber, the particulate filters, and chemical media shall be handled with great care. The PORTA-Scrubber ships mounted on a pallet for protection during shipping and handling. It is recommended that it remain on its pallet until it has been moved to its final installation location. PORTA-Scrubbers may be moved using a fork-lift.

**WARNING:** The tank cover top will not support the weight of the unit. Any attempt to lift the PORTA-Scrubber from the cover may result in serious equipment damage and severe personal injury. Do not walk on the top of the unit or use the top for storage of materials.

The components shall be retained and stored in their protective packaging until immediately prior to installation. Care shall be taken to ensure that the packages are not dropped or subjected to any impact loads.

At all times the equipment shall be protected from exposure to weather. The equipment shall be stored in a clean, dry, temperature controlled environment. All items shall be stored on pallets so that they are elevated above grade. Particulate filters and chemical filtration media shall not be stacked more than three (3) cartons high to prevent crushing. The gas phase media ships inside a carton enclosed in transparent protective plastic. Under no circumstances shall the filters be removed from this plastic protection until immediately prior to installation.

Filter products shall not be stored in areas where they may become contaminated by any chemicals, including acids or alkali's, in liquid, vapor, or gaseous form.

## 1.3 Product Descriptions

**1.3.1 PORTA-Scrubber:** Each PORTA-Scrubber when received shall be individually mounted on a shipping pallet and wrapped in plastic for protection during shipping. During use, contaminated air enters the bottom of the tank and travels up past a particulate filter and through the chemical media before being discharged from the top of the unit. The PORTA-Scrubber can be supplied in two airflow sizes, 200 and 500 cubic feet per minute (CFM) and in two models, powered and non-powered. Depending on application, different types of SAAF chemical filtration media can be installed (see 1.3.2 for details).



PORTA-Scrubber 200, with cast aluminum pressure blower.

**1.3.2 Gas Phase Chemical Media:** Gas phase chemical media is shipped in plastic bags within cardboard cartons or sling bags. The carton shown below has dimensions of 12" high x 12" wide x 12" deep and contains one cubic foot of SAAF chemical media. The weight of cartons will vary between 30 and 50 pounds, depending on the chemical media required.

Figure 1.3.2.1: Typical carton box  
12" high x 12" wide x 12" deep



SAAF Chemical Media	Target Contaminants
SAAFoxidant™	H <sub>2</sub> S, SO <sub>2</sub> , Formaldehyde, NO
SAAFcarb™	Volatile Organics (VOC), NO <sub>2</sub> Hydrocarbons (HC), Mercaptan
SAAFblend™ GP	H <sub>2</sub> S, SO <sub>2</sub> , VOC, HC, Mercaptan
SAAFcarb™ MA	H <sub>2</sub> S, SO <sub>2</sub> , Mercaptan
SAAFcarb™ MA.HT	Maximum H <sub>2</sub> S removal, Mercaptan
SAAFcarb™ MB	NH <sub>3</sub> , amines
SAAFcarb™ MC *	Cl <sub>2</sub> , HCl

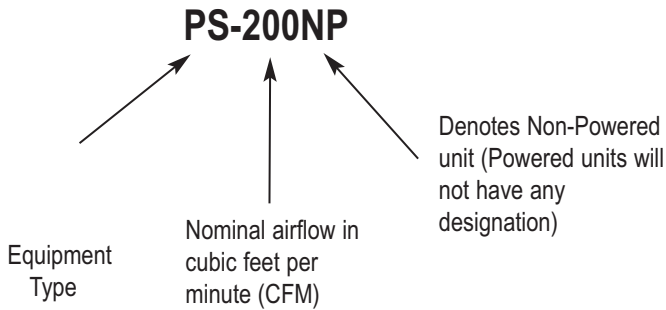
\* PORTA-Scrubbers designed for chlorine applications require special corrosion resistant materials. Contact your AAF representative for details.

**1.3.3 Particulate Filters:** The standard particulate prefilter will be AAF PolyKlean Blue pads. Depending on the size of the PORTA-Scrubber ordered, a round 24" diameter x 2" deep or a round 37" diameter x 2" deep may be supplied. PolyKlean Blue 2" deep filters are individually packaged.

Note that other optional or special filter arrangements may be supplied depending on the requirements of the project. Check the purchase order and the AAF submittal drawing(s) for details.

**1.4 Product Model Designations**

The PORTA-Scrubber model is designated as follows:



**Table 1: Examples of Typical PORTA-Scrubber Sizes**

Size designation	Height (in.)	Diameter (in.)	Inlet Size (in.)
PS-200	51¼	22¼	4"
PS-500	64¾	35½	6"

This list by no means exhausts the possibilities and the system provided may be different from those shown here. Consult the AAF drawing that was supplied on the purchase order in question.

**1.5 Product Drawings**

Details of standard PORTA-Scrubber systems are shown on the following AAF drawings:

Model	AAF Drawing Number
PS-200	123B-3052941-D
PS-200NP	123B-3040821-F
PS-500	123B-3040789-F
PS-500NP	123B-3040839-F

Copies of the appropriate drawings should have been supplied as part of the AAF submittals in response to the purchase order. Obtain and review the drawing(s) before proceeding with the installation of the filtration system. The PORTA-Scrubber drawings include the following details:

- Overall filter system dimensions
- Shipping weights
- Operating weights
- Sizes and quantities of the particulate and gas phase filters required
- Details of the gas phase chemical media supplied
- Details of the particulate filters supplied
- System design airflow
- Pressure losses across the filter system at nominal airflow design velocities
- Product details

If you are unable to locate the appropriate drawing, please contact customer service at 888.223.2003 to obtain a copy.

**1.6 Assembly – General Comments**

As indicated previously, the individual components that will comprise the filtration system may ship separately and will be required to be installed on site. The SAAF PORTA-Scrubber is a self-contained product and, consequently, a minimum amount of assembly is required. Refer to section 3.0, Installation Instructions, of this manual for further detailed instructions. Consult with an experienced installer to obtain an accurate estimate of the time, personnel, and equipment resources and tools that will be required to complete the assembly and installation of the filter system. Site assembly will be limited to moving and lifting individual components, screwing components together, and caulking. The PORTA-Scrubber weights and dimensions can be found on the product drawings. Packages of the chemical media will typically have a maximum weight of approximately 50 pounds (23kg). Particulate filters will typically weigh less than the chemical media filters.

Completion of the following preparations and provision of the following items will be the responsibility of the installer or others:

- Site preparation
- Connecting hardware for attaching inlet and outlet ducts
- Caulk, as required
- Inlet and outlet ducts, or other sheet metal parts, as required

These items will not be supplied by AAF unless noted specifically in the AAF quotation and in the accepted customer purchase order.

In general, assembly of the filter system will consist of the following:

- Preparation of the installation location
- Transportation of all components to the installation location
- Unpacking the PORTA-Scrubber
- Installing the PORTA-Scrubber
- Installing inlet and outlet ducts
- Unpacking particulate filters
- Installing particulate filters
- Unpacking chemical media
- Installing chemical media
- Cleaning the site
- Start-up and commissioning of the filter system

### 1.7 Related System Equipment

Ventilation systems can include other equipment including but not limited to:

- Fan(s), if not supplied as part of the PORTA-Scrubber
- Dampers
- Analog instrumentation
- Electronic instrumentation and controls

Neither the interface of these items with the filtration system supplied by AAF, nor the installation, operation, and maintenance of these items is covered in this manual. Whether these items are supplied by AAF or by others, consult the documentation specific to these products for appropriate instructions.

## 2.0 Principles of Operation

An understanding of the design and operating principle of the PORTA-Scrubber with chemical media is useful for effective installation, operation, and maintenance. The system is intended to remove corrosive and odorous gaseous contaminants from sewage pumping stations, laboratory vent hoods, and pressure relief valves of chemical storage tanks.

**WARNING:** Chemical tank on other high concentration applications may require constant airflow and other special operating instructions. Ensure that the design operating instructions are followed.

The heart of the system is the SAAF chemical media. The PORTA-Scrubber is a small high density polyethylene (HDPE) vessel that allows air to move across the chemical media bed in an upward direction. The method of contaminated removal is through physical adsorption or a combination of physical adsorption and chemical reactions, such as oxidation. AAF offers a variety of impregnated and un-impregnated dry granular chemical filtration media to handle a wide range of contamination problems. For more information on AAF's gas phase air cleaning products, contact your AAF representative.

The SAAF PORTA-Scrubber is one of the various systems designed to support the SAAF chemical media in the air stream and to allow easy installation, operation, and maintenance of the system.

**CAUTION:** All dry chemical media has the potential to generate a small amount of dust in the exhaust. If your scrubber will be located indoors without external exhausting, you will require additional particulate filtration on the exhaust. Solutions can range from an additional PolyKlean Blue pad downstream of the media bed to a separate filter box.

### 3.0 Installation Instructions

Consult the product drawing(s) submitted on this order before proceeding.

#### 3.1 Space Requirements

A minimum of 24" clear space must be available around the PORTA-Scrubber to perform routine maintenance. Additionally, it is recommended that 36" clear space be available in at least one direction. Additional space may be required for inlet and outlet ductwork.

#### 3.2 Foundation, Supports, and Anchoring

The foundation and/or supports must be designed to be adequate to support the filter system operating weight, and any seismic, live or other load requirements (if any), with a sufficient factor of safety as determined to comply with the requirements of all applicable governing codes, standards, and laws. Ensure that the foundation or support surface is level and smooth before proceeding. The filtration system may be designed for operation in either indoor or outdoor locations. Indoor applications may require additional particulate filtration. The equipment is not specifically designed to resist and operate under unusual dynamic loading situations such as high winds or earthquake conditions. If the equipment is required to function in such circumstances special precautions may be required to ensure that the equipment will remain intact, anchored and functioning. If this situation applies consult with a qualified professional engineer before installing the equipment.

### 3.3 Typical PORTA-Scrubber Details



Typical Powered PORTA-Scrubber



Typical Non-Powered PORTA-Scrubber

### 3.4 General Filter System Installation

**3.4.1 Installing the PORTA-Scrubber:** Keeping the PORTA-Scrubber on its shipping pallet, move it to its final installation location. Remove the plastic wrapping and straps that secure the PORTA-Scrubber to its pallet.

**WARNING:** The tank lid will not support the weight of the unit. Any attempt to support the unit from the tank lid may result in serious equipment damage and severe personal injury. Do not walk on the top of the unit or use the top for storage of materials.

### 3.4.2 Locating, Mounting, and Supporting the PORTA-Scrubber:

Position the PORTA-Scrubber in its final installation location. The support surface under the base of the frame shall be level, smooth, clean, and dry. The location shall not be subject to standing water or flooding. The circumference of the tank base shall be fully supported. Adjust the supports so that the base is level in all directions.

Provision for the anchoring hardware, support cradles, or any other supporting component will be the responsibility of the installer or others. These items will not be supplied by AAF unless noted specifically in the AAF quotation and in the accepted customer purchase order.

**3.4.3 Connection of inlet and outlet ducts:** Inlet and outlet ducts, when required, shall be connected to the inlet and outlet faces of the housing as shown in figure 4.

**WARNING:** The housing is not designed to support the weight of the inlet and outlet ducts. All ducts shall be supported independently of the housing. Any attempt to support the ducts from the housing may result in serious equipment damage and severe personal injury.

**3.4.4 Sealing the inlet and outlet duct connections:** A flexible coupling with stainless steel clamps is provided. All other provisions of the inlet and outlet ducts, the connecting hardware for the inlet, and the gaskets or caulk will be the responsibility of the installer or others. These items will not be supplied by AAF unless noted specifically in the AAF quotation and in the accepted customer purchase order.

Caulk generously, between the flanges of the connecting ducts and the housing to prevent air leaks. Any caulk used shall be a long life, flexible, non-drying caulking material. The caulk supplier shall ensure that the caulk shall meet the customer specifications for the application in which it is being used.

**CAUTION:** Many installations prohibit the use of certain caulking materials such as Silicone. The use of materials containing VOCs should also be avoided as they may have a negative effect on the life of the gas phase filters.

**3.5 Preparation for filter installation:** In order to maximize the life of the chemical filters and the particulate filters, it is recommended that filter installation be the final installation task before start-up and commissioning of the system. In preparation for filter installation, it is recommended that the following be completed:

- Completely clean the system to remove all construction debris and dirt, sweep and vacuum to remove visible dirt.
- Finalize and complete all caulking in the system.
- Finalize and complete all painting in the system.

It is recommended that all cleaning materials and paints used in the system be free of solvents. If this is unavoidable it is recommended that sufficient time be allowed for complete drying to occur and for the VOCs to disperse before installing the filters. This process can be accelerated by “blowing down” the system; i.e., operating the fan without the filters to ventilate the system. Consult with your AAF representative to obtain an appropriate product. Also, before “blowing down” the system, check that it is safe to operate the fan without the pressure load of the gas phase chemical filters. Consult the AAF submittal drawing for pressure information.

**3.6 Prefilter Installation:** A PolyKlean Blue filter pad shall be used to prevent the build up of dust, grease, and water on the gas phase chemical media.

Install the prefilters as shown in the sequence shown below. For best results AAF recommends the use of the 2" thick PolyKlean Blue filter media. Circular PolyKlean Blue pads will be cut with a 2" overlap.

Equipment Size	PolyKlean Blue Replacement Pad Part Number
PS-200	358-012-024
PS-500	358-012-037

Remove the polypropylene perforated screen from the bottom of the tank. Place the PolyKlean Blue pad directly onto the HDPE grating at the bottom of the vessel. Ensure there are no gaps between the filter pad and the side wall of the tank. Place the polypropylene perforated screen on the PolyKlean Blue pad.



*Step 1: Start with the tank empty and the HDPE grating exposed.*



*Step 2: Place the PolyKlean Blue pad on the HDPE grating.*



*Step 3: Place the perforated screen on the PolyKlean Blue pad.*

### 3.7 Installation of Media in the PORTA-Scrubber

There are several varieties of chemical media. Each media is designed to remove a specific contaminant, or group of contaminants. The arrangement of media in the scrubber is significant. Media bed #1 is located closest to the inlet. Review the drawing and ensure media is being placed in the correct bed.

Respirator masks, chosen in accordance with the safety instructions found in the MSDS for the chemical media, are required to be worn by all personnel during the media installation process, as well as all other personal safety equipment listed on the MSDS.

Installing Media by Carton:

Loosen latch and remove top hatch. Gradually pour the media in a controlled manner. Avoid causing significant impact loading by gradually metering the media into the PORTA-Scrubber. Media should be filled no higher than 4 inches from the tank lid.

### 3.8 Latches on Tank Cover

Place the cover on the PORTA-Scrubber tank and latch the cover as shown.



### 3.9 Fans

Sometimes the PORTA-Scrubber may be supplied with an externally mounted blower. See the AAF drawing for information and details. Blowers can be fitted with an optional power cord with a 115-volt plug.

CAUTION: All electrical work must be carried out in accordance with all appropriate governing electrical codes and standards.

WARNING: All electrical work has the potential to cause shock, injury, and even death. Disconnect all power whenever working on the system. Only qualified electrical personnel should work on the system at any time.

Provide an appropriate power supply as specified in the submittal information.

### 3.10 Standard Motors

Model	Voltage	Hertz	Phase	Horsepower
PS-200	115-230	60	1	0.5
PS-500	115-230	60	1	3.0

CAUTION: Use of the incorrect line voltage may result in irreparable damage to electrical components.

## 4.0 Start-Up Instructions

Immediately on start-up, examine the filter system for any apparent air leaks or other anomalies. Air leaks may be detected by noise or by use of a synthetic smoke puffing device at the external joints and seams of the filter system installation. Correct or repair any discrepancies, as necessary. Repeat this examination after 24 hours of operation and again after one week of operation.

## 5.0 Maintenance

5.1 PolyKlean Blue filter: A PolyKlean Blue pad has been included as part of the system. Under normal conditions, the filter can be expected to last for between 10 and 12 months before reaching its final recommended capacity loading (see the AAF drawings for details). However, this may vary under heavier or lighter particulate loading conditions. At an air velocity of 75 feet per minute the 2" deep PolyKlean Blue pad can be expected to have an initial pressure drop in the range of less than 0.1" water gauge. The recommended final pressure drop is 1.0 in. w.g.; however, it is recommended that the PolyKlean Blue pad be replaced whenever new chemical media is installed.

### 5.2 Chemical Media Monitoring

A discussion of sophisticated chemical media monitoring is beyond the scope of this manual. At its most simple, when the system is used to remove nuisance odors, the time to change out the chemical media is when the odor begins to be regularly detected on the clean side of the system. In more stringent applications, active real time electronic and passive coupon corrosion monitoring systems are available to determine the performance of the system. The remaining life of the media can be determined by taking a sample of media and returning it to AAF for analysis. Consult with your AAF representative regarding active and passive monitoring systems and media sampling for remaining life analysis.

### 5.3 Removal and Replacement of Particulate and Gas Phase Chemical Media

Before removing activated carbon media, it is recommended the media bed be grounded to release any electrostatic discharge. Removal of filters will be the reverse of the installation process described earlier in this manual. Filter and media replacement will be carried out exactly the same as at initial installation detail with use of manual or pneumatic methods. Reference appropriate safety precautions related to specific gases being handled at the facility and any operation instructions developed during the design phase of the project.

### 5.4 Disposal of Used Filters

Used chemical filtration media and particulate filters shall be packaged and disposed of in full accordance with all required and applicable laws and regulations. Consult with local environmental control authorities such as local, state, and federal EPA & OSHA authorities for direction. Material Safety Data Sheets (MSDS) are available on all products supplied by AAF. Contact your AAF representative for further information.

### 5.5 Cover Lid Sealing Gaskets

The proper maintenance of the cover lid sealing gaskets is critical to the performance of the system. Check the gaskets carefully whenever the gas phase chemical filters are replaced. If gaskets are worn, frayed, or damaged in any way they should be replaced. Check the seal between the lid and the tank whenever new SAAF chemical media is installed.

### 5.6 General System Maintenance

Ducts, external PORTA-Scrubber surfaces, latches, blower, and other system infrastructure should be checked at least every 6 months. Internal surfaces shall be examined whenever filters are replaced. Examine all components for the following:

**5.6.1 Cleanliness:** Sweep and vacuum all standing dust or dirt in the system. If using cleaning solvents, be mindful of the impact of solvents on the performance and life of the chemical media and take appropriate precautions to protect the system.

**5.6.2 Water:** The system should be completely dry at all times. The presence of standing water, condensation, or dampness is detrimental to the performance and life of the system. Determine and remove the cause for the presence of water in the system, dry the system, and examine all components for the presence of molds and other biological growth. Remove all contamination, clean and sterilize as necessary.

**5.6.3 Filter System Integrity:** Ensure that the unit contains the appropriate filter elements, both particulate and gas phase, and that these elements are correctly installed. Check for missing or improperly installed components and review the system seals. Check for air leaks at joints and seams and replace gaskets, worn hardware, and seal with caulk as necessary.

**5.6.4 Duct and System Integrity:** Examine the entire system to ensure that contaminated air cannot leak around the filter system. Check all perimeter seals and repair as necessary.

**5.6.5 Corrosion:** If metal components are corroded repair the corrosion and provide protective coatings as necessary. Be mindful of the impact of painting on the performance and life of the chemical media, and take appropriate precautions to protect the system. Determine the source of the corrosion and rectify.

## 6.0 Troubleshooting

Potential problems and causes listed are in no order of importance or priority. The causes are only a list of the most common items to check to correct a problem. If you find the cause of a problem, DO NOT assume it is the only cause of that problem. Different problems can have the same cause.

<b>Problem</b>	<b>Cause</b>
Odors and Smells	<ol style="list-style-type: none"><li>1. Chemical media is spent.</li><li>2. Missing or damaged filters.</li><li>3. Incorrect media installed.</li></ol>
Airflow (CFM) Too Low	<ol style="list-style-type: none"><li>1. Blower wheel turning in wrong direction.</li><li>2. Actual system static pressure is higher than expected.</li><li>3. Motor speed (RPM) too low.</li><li>4. Dampers or valves not adjusted properly.</li><li>5. Leaks or obstructions in duct work.</li><li>6. Filters dirty.</li><li>7. Inlet and/or discharge guards are clogged.</li><li>8. Duct elbow too close to blower discharge.</li><li>9. Improperly designed duct work.</li><li>10. Condensation of moisture blinding the particulate and/or chemical media.</li><li>11. Presence of moisture in the filters combined with freezing temperatures can cause the filters to become impassible.</li></ol>
Airflow (CFM) Too High	<ol style="list-style-type: none"><li>1. Actual system static pressure is lower than expected.</li><li>2. Motor speed (RPM) too high.</li><li>3. Filters not in place.</li><li>4. Dampers or valves not adjusted properly.</li></ol>
Excessive Vibration	<ol style="list-style-type: none"><li>1. Loose mounting bolts, wheel set screws, taper-lock hubs.</li><li>2. Worn or corroded blower wheel.</li><li>3. Accumulation of foreign material on blower wheel.</li><li>4. Bent motor shaft.</li><li>5. Worn motor bearings.</li><li>6. Motor out of balance.</li><li>7. Inadequate structural support.</li><li>8. Support structure not sufficiently cross braced.</li><li>9. Weak or resonant foundation.</li><li>10. Foundation not flat and level.</li></ol>
Motor Overheating	<p>NOTE: A normal motor will operate at 174°F.</p> <ol style="list-style-type: none"><li>1. Actual system static pressure is lower than expected.</li><li>2. Voltage supplied to motor is too high or too low.</li><li>3. Motor speed (RPM) too high or defective motor.</li><li>4. Air density higher than expected.</li><li>5. Motor wired correctly or loose wiring connections.</li></ol>
Excessive Noise	<ol style="list-style-type: none"><li>1. Wheel rubbing inside of housing.</li><li>2. Worn or corroded blower wheel.</li><li>3. Accumulation of foreign material on blower wheel.</li><li>4. Loose mounting bolts, wheel set screws, or taper-lock hubs.</li><li>5. Bent motor shaft.</li><li>6. Worn motor bearings.</li><li>7. Motor out of balance.</li><li>8. Motor bearings need lubrication.</li><li>9. System resonance or pulsation.</li></ol>
Fan Doesn't Operate	<ol style="list-style-type: none"><li>1. Motor wired incorrectly or loose wiring connections.</li><li>2. Incorrect voltage supply.</li><li>3. Defective fuses or circuit breakers.</li><li>4. Power turned off elsewhere.</li><li>5. Defective motor.</li></ol>

## SAAF™ PORTA-Scrubber

### 7.0 Spare Parts List

It is recommended that the following spare parts be stored at the installation site for routine maintenance purposes. The quantities required will depend on the size of the system. Consult with your AAF representative to determine actual quantities required. Minimum recommended quantities are provided in the table below.

AAF Part Number	Description	Recommended Spares
Refer to the original customer purchase order and the AAF submittal drawing	SAAF chemical media	One full replacement included in the system
358-012-024	24" round PolyKlean Blue filter for PORTA-Scrubber 200	One replacement included in the system
358-012-037	37" round PolyKlean Blue filter for PORTA-Scrubber 500	One replacement included in the system

To order replacement parts call: 1-888-223-2003.

### 8.0 Equipment Characteristics, Dimensions, Operating Weights, and Shipping Weights

#### PORTA-Scrubber Shipping & Operating Weights\*

Model	Shipping Weight	Operating Weight
PS-200	105 lbs (47 kg)	280 lbs (168 kg)
PS-200NP	55 lbs (25 kg)	230 lbs (105 kg)
PS-500	210 lbs (95 kg)	805 lbs (358 kg)
PS-500NP	175 lbs (79 kg)	770 lbs (336 kg)

\* Based on using media with a density of 35 lb/ft<sup>3</sup>. Depending on selection, media density may vary.