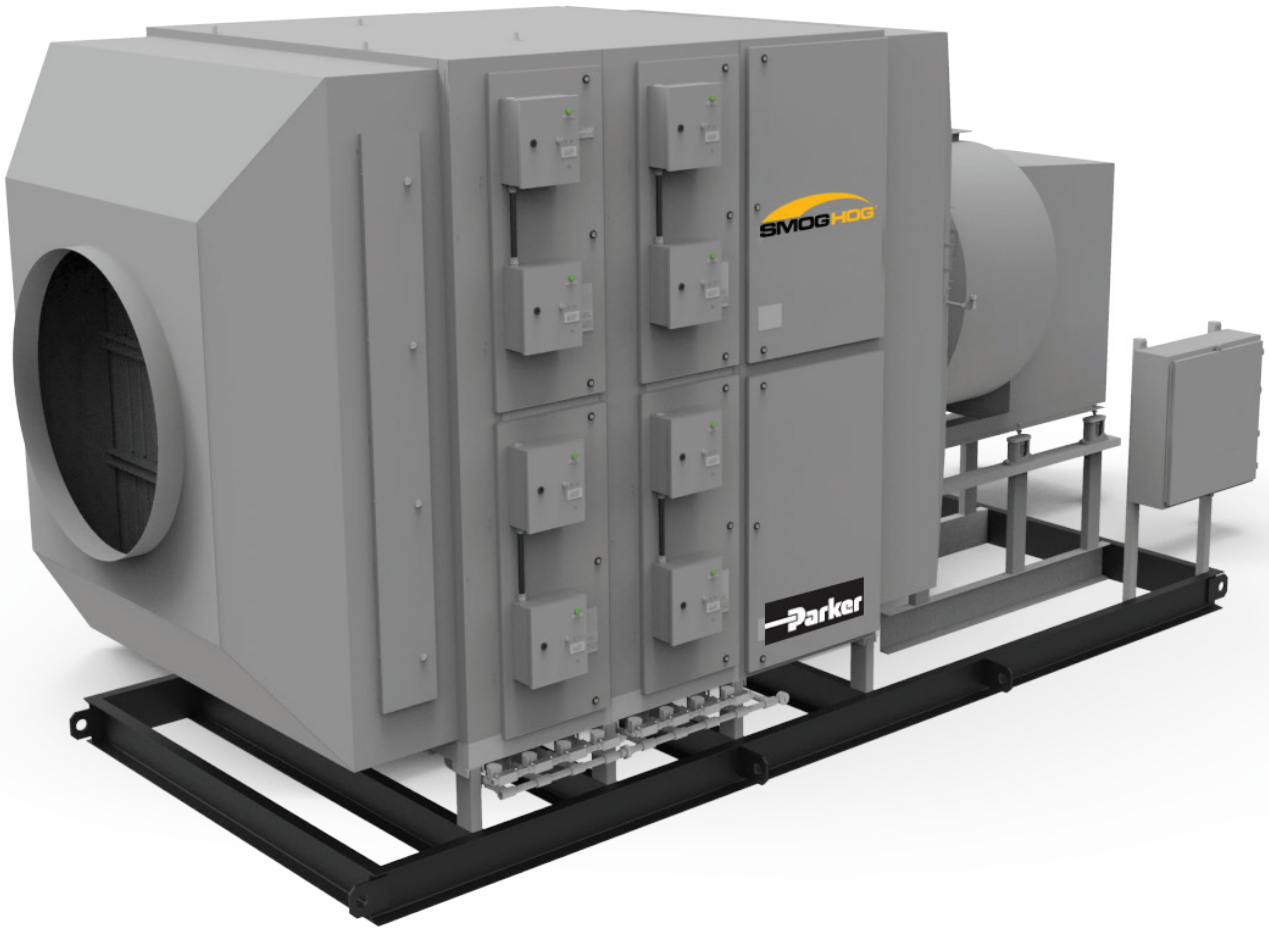


SMOG-HOG® Electrostatic Air Cleaner Owner's Manual

Model PSG

Parker

ENGINEERING YOUR SUCCESS.

KNOW YOUR EQUIPMENT

READ THIS MANUAL FIRST.

Your Smog-Hog® PSG should provide many years of trouble-free service. This manual will help you understand the operation of your PSG unit. It will also help you understand how to maintain it in order to achieve top performance. For quick future reference, fill in the unit information in the spaces below. Should you need assistance, call the Parker customer service number shown below. To expedite your service, have the following information available when contacting Parker.

Parker Order #: _____

Unit Model #: _____

Unit Serial #:_____

System Accessories:

_____

_____

_____

Installation Date: _____

Parker SMOG-HOG or DUST-HOG Customer Service

1-800-343-4048

Table of Contents

Page

SAFETY PRECAUTIONS

We have provided many important safety messages in this manual on your Smog-Hog PSG. Always read and obey all safety messages.

This is the safety alert symbol.

This symbol alerts you to potential hazards that can kill or hurt you and others. All safety messages will follow the safety alert symbol and the word “DANGER” “WARNING” or “CAUTION”. These words mean:

⚠ DANGER — Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING — Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION — Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION — CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

IMPORTANT SAFETY INSTRUCTIONS

⚠ WARNING

To reduce the risk of fire, electric shock, or injury when using your air cleaner, follow these basic precautions:

- Wear protective clothing and safety glasses when handling collector components or servicing the unit.
- Use proper lifting and rigging equipment to install your electronic precipitator.
- The electronic precipitator should be properly grounded prior to servicing.
- Disconnect power before servicing.
- Replace all access panels before operating.
- Do not operate the unit with component doors open.
- Electrical connections should only be made by qualified personnel and be in accordance with local and national codes and regulations.
- Do not use in explosive atmospheres.
- Do not collect emissions which are explosive
- Use non flammable cleaners.
- Keep flammable materials and vapors, such as gasoline, away from unit.
- The unit should be inspected frequently and contaminants removed to prevent excessive accumulation which may result in flash-over or fire damage.
- Operate only in a safe and serviceable condition.
- The process air stream should have a wet bulb/dry bulb differential of at least 15° F and maximum temperature below 140° F (120° F for integral blowers).
- Ambient and process air stream temperature maximum is 120° F for units with integral blowers.
- Ambient and process air stream temperature maximum is 140° F for collecting most mist and smoke particles. Operating at process air stream temperatures above 140° F will have a negative effect on particle collection and filtration efficiency.
- Ambient and process air stream temperature maximum is 170° F for the collection cells. Prolonged exposure to high temperatures significantly shortens the life span of the collection cells. Spikes above 170° F will not cause failure of the cells and should be minimized with the average process air and collection cell temperature not exceeding 170° F.

COMBUSTIBLE DUST HAZARDS –
SMOG-HOG® and DUST-HOG® Pollution Control Systems

Pursuant to National Fire Protection Agency (NFPA) Standards, the owner/user is required to test their dust mixtures to evaluate and understand potential combustion or deflagration hazards that may exist. In addition, NFPA standards require the owner/user to perform and have record of a Dust Hazard Analysis (DHA) if there is potentially a combustible material involved within or exposed to the process.

The DHA serves as a systematic review of the process to:
1) Identify where fires and explosions can occur;
2) Identify the potential causes and consequences, and;
3) Determine if existing and proposed safeguards are sufficient.

It is the responsibility of the owner/user to evaluate, interpret and document any associated risk in their process including adherence and compliance to any and all applicable local, state and federal codes, standards, laws and regulations.

It is the sole responsibility of the equipment owner/user of record to coordinate and perform sample material collection and combustion/explosivity testing of any and all dust and material that will be extracted and filtered by the Air Pollution Control (APC) filtration equipment and to notify Parker of the results prior to any discussion involving equipment specification and solution recommendation. It is recommended to utilize a Certified Industrial Hygienist (CIH) or certified safety expert that is properly trained, licensed and approved and to use a licensed and approved dust testing facility for proper dust and material analysis, testing protocol and reporting procedures. A sample of testing facilities and list of Industrial Hygiene (CIH) and other occupational and environmental health and safety (OEHS) consultants can be located through AIHA (American Industrial Hygiene Association) website.

To minimize the risk of fire or explosion, user must ensure proper installation, operation and maintenance of Parker equipment. Since application, installation, operation and maintenance are beyond the control of Parker, Parker disclaims any liability or responsibility for damage from fires or explosions regardless of origin. Parker recommends that all APC dust collection equipment, installation and application conform to any and all applicable local, state and federal standards, codes, laws and regulations including the addition of appropriate fire or explosion protection systems including but not limited to venting, mitigation, suppression and isolation when and where required. Installation of Parker equipment should be by a licensed contractor that is also experienced in potential fire and explosion hazards and adheres to related local, state and federal codes, standards, laws and regulations. Parker is not an expert nor certified design consultant in relation to spark, fire or explosion mitigation including but not limited to detection, mitigation, suppression and isolation pf combustible dusts and materials. Therefore, Parker recommends that any industrial air filtration system recommendation, design or solution be reviewed, approved, stamped and signed by an industry expert consultant in air filtration systems, combustible dust/materials or certified safety expert such as a Certified Industrial Hygienist (CIH) or a Certified Professional Engineer (PE) who is a licensed and certified expert with industrial filtration system design and application including adherence and compliance to any and all applicable local, state and federal codes, standards, laws and regulations.

Pursuant to Parker's Offer of Sale (terms and conditions) and by accepting the purchased equipment, Buyer and owner/user agree to defend, indemnify, and hold harmless Parker, its successors, assignees, suppliers, shareholders, directors, officers, employees, agents, and affiliated companies from all losses, costs, damages, demands, claims, liabilities, fines, penalties or any other expenses (including attorneys' fees, court costs, and expert fees) (collectively "losses"), caused or contributed to in any way by Buyer or owner/user's failure to follow these instructions and/or failure to properly install, apply, operate, or maintain the equipment purchased from or supplied by Parker, or losses caused or contributed to in any way by Buyer's and owner/user's failure to provide accurate information, specifications or dust explosivity values.

THIS MANUAL IS COMPILED FOR GENERAL INFORMATION AND DOES NOT NECESSARILY REPRESENT ALL OPTIONS OR ACCESSORIES. CONTACT PARKER CUSTOMER SERVICE 1-800-343-4048 FOR ADDITIONAL INFORMATION

1. Introduction

You are about to install and operate a SMOG-HOG® PSG operating on the principle of electrostatic precipitation. PSG removes submicron, airborne particulate with high efficiency and at a uniquely low expenditure of energy. With proper handling and installation, the PSG becomes a powerful tool in controlling objectionable emissions from a wide range of processes. The PSG can vary in options, consisting of working groups of collection components which may, in turn, be preceded or followed by complimentary conditioning equipment. The PSG may take the form of a simple component cabinet for inclusion in a large air handling system or may be a self-sufficient air pollution control package. Since the PSG generally becomes an integral part of a process exhaust network, installation should be carefully planned, starting with mechanical layout drawings and electrical wiring diagrams provided by Parker. Reading this manual is important to the successful installation and operation. The PSG Series has been built to rigid specifications. As with all precision equipment, the system requires periodic care and maintenance. This manual contains instructions for standard maintenance and manual cleaning of components. If the system is equipped with In Place Cleaning, there is a separate owner's manual. If assistance is required please contact Parker Industrial Gas Filtration and Generation Customer Service, 4087 Walden Avenue, Lancaster, NY 14086, 1-800-343-4048.

1.1 Description of Operation

PSG Series is a two-stage, Penney-type electrostatic precipitator used for removal of submicronic hydrocarbon emissions of smoke and other airborne contaminants. The two "stages" consist of an ionizing section and a collecting section, combined in one assembly as a unicell. Each ionizing section consists of a series of (10 mil) wires charged to a high DC voltage and centered between a like series of grounded plates. This high voltage differential generates an intense electrostatic field where airborne particles are "ionized," i.e., positive polarity. Each collecting section consists of a large number of parallel cell plates, alternately charged at high DC voltage (the same polarity as the ionizer but about half the voltage magnitude) and ground potential, thus forming a magnetic field. Charged particles are simultaneously repelled by the cell charged plates (smaller dimensional plates) and attracted to cell ground plates (large dimensional plates). The result being a highly efficient removal of charged particulate from the airstream as it passes through the electrostatic precipitator. The total current to both the ionizer and collector cell circuits is below 5 milliamps which is non lethal. Unicell components are usually preceded and/or followed by mesh filters to assure even distribution of air, at low velocity. Air movement is provided by a system blower located behind the unicell components that exhausts cleaned air at a specified cfm rate. More complex systems can include other conditioning equipment.

1.2 System Definitions

PSG Series is designed for rigorous, often continuous, smoke and particulate removal duty. The system includes mechanical pre filters (as applicable), unicells (combination ionizer and collection cell), power pack enclosures and pre/after filters. The PSG Series has been tested to operate in accordance with national listing standards of agencies such as Underwriters' Laboratories (UL) and ETL, with local approvals from selected cities as required. PSG units are designed for installation in customer ducting where other system components, including the blower, may be provided by others. PSG systems can include blowers, skids and other factory-assembled equipment, which arrives in the field ready for installation.

1.3 Unit Nomenclature

PSG systems may include various combinations of features connected in series in the direction of airflow. The PSG's configuration code is defined with a series of letters. Refer to Figure 1. On "single-wide", (the width of one module which is one or two or three unicells placed in series) the access doors to collecting components face the operator as air flows from left to right. Opposite side access right to left is also available. "Double wide" (the width of two modules placed side by side) have access doors on both sides, each door accessing one module, left to right, and right to left in one system. Air which flows through one set of unicells will make a single cleaning "pass." When an application dictates, multiple passes can be placed in series in the direction of airflow. A two-pass system is illustrated in Figure 2.

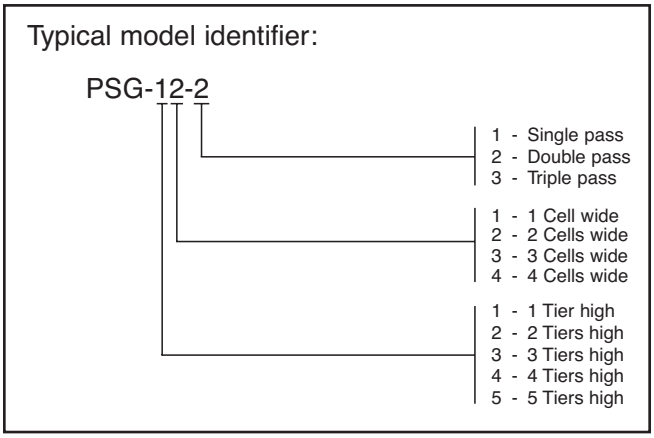


Figure 1
PSG SERIES NOMENCLATURE

1.4 Description of Components

1.4.1 Power Packs

Each power pack converts 115 volt, single-phase AC power to high voltage DC for one or two or three unicells (each with one ionizer and one collecting section). This combination of components comprises a working "module." Standard packs supply positive DC voltage of 11.0 (nominal) KVDC to each ionizer and 5.5 KVDC to each collection cell. Power packs with special ratings are supplied on certain applications. Power packs are mounted in power pack enclosures located on the module doors to the PSG.

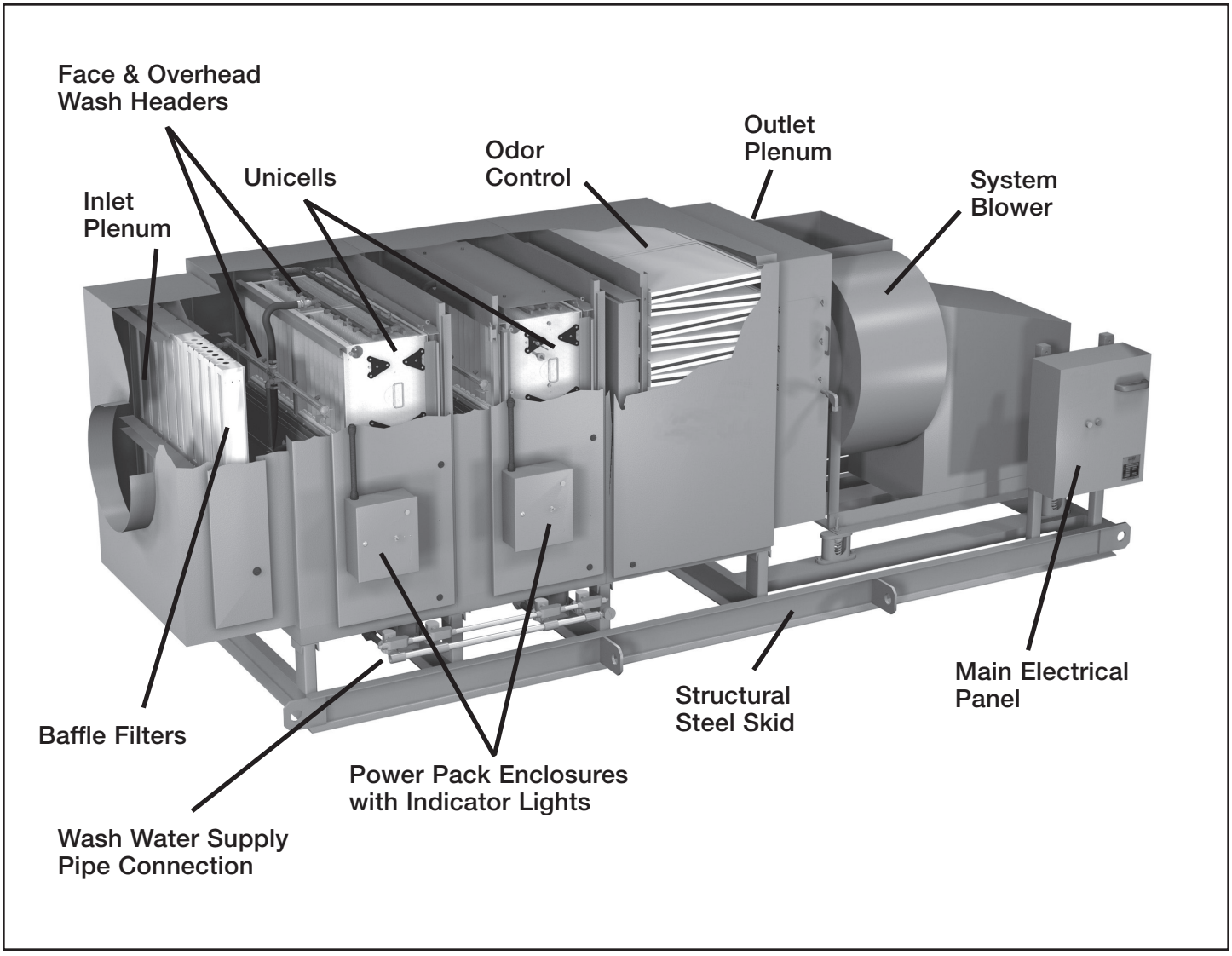


Figure 2
PSG SERIES SYSTEM

Each pack supplies power to a discrete module of unicells with a dedicated, externally mounted indicator light that illuminates to indicate normal operation. The PSG power pack meets UL safety standards. In the event of a short circuit or overload condition to the output side, the power pack's high voltage collapses and the indicator light is in the flashing mode. Upon removal of the overload, the power pack automatically returns to normal and the indicator light will be illuminated. The power pack is self-protecting against overloads (e.g. dirty components, short circuits in ionizer and cell circuits) and is self regulating when the AC voltage supply varies from 90 to 132 VAC.

1.4.2 Unicell Ionizer Section

Each unicell supports ten (10) 10 mil tungsten steel ionizer wires spring mounted and centered between aluminum ground plates. Refer to Figure 6. When high DC voltage is applied to the wires, a powerful field charges contaminated particles. Ionizer standoff convoluted insulators are part of the ionizer wire support bar(s) which separates high voltage from grounded chassis.

1.4.3 Unicell Collector Cell Section

Each unicell contains a series of parallel plates, alternately charged and grounded, whose planes are in-line with the direction of airflow. Refer to Figure 6. Charged plates are connected electrically and suspended from four triangular shaped insulators on each end of the unicell. The ground plates are independently supported.

1.4.4 Filters
Prefilters and afterfilters can take many forms but are normally of the mechanical type, aluminum metal mesh and encased in an aluminum frame. Filters provide even air distribution and collect large particles.

1.4.5 Junction Boxes
PSG mounted junction boxes are equipped with terminal strips for 115 VAC single phase power entry. On factory-assembled systems, three phase field connection is usually to a single point to a unit Main Electrical Panel or a unit Blower Panel. Refer to unit System Layout Drawings and unit Electrical Drawings which define the required field installation for each application.

1.4.6 Other Equipment
The PSG may be supplied with in-place cleaning, inlet plenum with baffle filters or aluminum filters, outlet plenums, pre piped for fire protection, carbon or potassium permanganate odor filters, skid mounted, insulated enclosure, cooling/heating coils, and blower. System components may be shipped skid mounted, or as subassemblies. Planning is required to understand the scope of the installation, from handling to assembly to the connection of utilities.

2. Installation Planning
Prior to receipt of equipment, drawings should be reviewed and plans completed for handling and installation. Site selection, support structure, utilities, drains, ductwork and work sequence need to be coordinated.

NOTE: INSTALLATION MUST BE IN ACCORDANCE WITH NFPA 96, Removal of Smoke and Grease Laden Vapor from Commercial Cooking Equipment

⚠ CAUTION

Unit electrical panels provide the necessary electrical interlocks and controls for the PSG. If electrical control panels supplied by others are not per Parker specifications the PSG is operating in an UNSAFE mode, voiding the warranty.

The following are general guidelines.

2.1 Location
Systems should be located as near as possible to the emission source, but with consideration given to utility proximity and safe maintenance access. Indoor location is preferred since it eliminates climate associated problems such as servicing the system, heat traced/insulated wash water and drain pipes or an insulated system enclosure.

2.2 Clearances
2.2.1 Component Access
A clearance of 32” is recommended for maintenance and component removal/installation to the access door(s) side, refer to unit System Layout Drawing for clearances.

2.2.2 Electrical Enclosure Access
A side clearance of 48” usually is recommended for access to electrical panels, refer to NEC for specified clearance.

2.2.3 Bottom Working Clearance
Plumbing access should be at least 12” beneath the unit.

2.3 Supports
2.3.1 Skidded Systems
Lifting points for skid mounted PSG Series systems are illustrated to the unit System Layout Drawings including installation notes. Field structural support design is the responsibility of the installer. Good design practice should be followed in allowing adequate clearance for plumbing, conduit installation, and maintenance.

2.3.2 Unskidded Systems
When PSG Series components are shipped unassembled, care should be taken to provide adequate bearing support on the field support structure.

CAUTION

Ducting and accessories attached to the PSG unit should be independently supported.

2.3.3 Utilities/Drains
Mechanical, electrical service requirements and system entry points are clearly marked on the unit System Layout Drawing and unit Electrical Drawings. The PSG main drain pipe should be have a drain trap. Refer to Figure 5. When a PSG is equipped with In Place Cleaning, operating water pressure (working pressure), flow rates (gpm) and hot water specified are based on factory testing, refer to unit System Layout Drawing or In Place Cleaning Owner’s Manual for specifications. Failure to achieve In Place Cleaning specifications will result in an ineffective wash cycle, increasing system maintenance costs. If the PSG is located outside and there are climate associated problems (32°F or below), exposed piping wash/drain including solenoid valves and fire suppression piping must be heat traced and insulated. Do not heat trace the solenoid valve coil.

2.3.4 Ducting
Quality ducting is important system performance. Sealed connections prevent air and liquid leakage during operation. Welded duct connections are required with ducting pitched towards the PSG. Duct design air velocities are typically 1,500 to 2,500 FPM. Gaskets and sealant, where used, should be compatible with the material collected and the temperature of the airstream. Wet airstreams (high humidity) typically require insulation to prevent condensation.

3. Installation

⚠ DANGER

CRUSH AND ELECTROCUTION HAZARD
Use adequate safety measures when lifting and assembling heavy components. Consult site safety personnel for recommendations. Location should be clear of all obstructions, such as utility lines and building clearances.

3.1 Receiving Inspection

The PSG system components are thoroughly checked and tested at the factory. Although precautions have been taken to ensure against shipping damage, be sure to carefully inspect contents upon delivery. Notify your carrier immediately and enter a claim for any damage found. Check the material received against shipping papers for any shortages.

NOTE: Damage to cartons, skids, shrink wrap, etc., may indicate that rough handing has caused internal damage. Careful inspection, including the opening of all shipping containers, should precede acceptance of equipment.

Certain items (e.g., detergent containers) may be drop shipped and/or shipped separately. Be sure to inspect such items before marking and storing. Open all cartons. Notify the trucking company and Parker immediately if cartons or any other shipping list items are missing. Handling SMOG-HOG skidded systems and subassemblies are usually shipped to the job site on flatbed trailers. Most can be handled by forklift truck but final placement may require a crane refer to unit System Layout Drawing for weights, sizes and notes detailing responsibilities of the installing contractor.

3.2 Unloading By Forklift

As shown in Figure 3A, the PSG unit, duct transition or skidded system may be unloaded by use of forklift trucks. Extreme caution should be exercised to guarantee that the load is lifted at its center of gravity. When placing the unit on the ground, blocks should be located under the component exactly where placed during shipment. The preferred method of forklift removal of large components involves using a spreader bar. Refer to Figure 3B. This guarantees vertical pull on lifting eyes/lugs on the system or component.

3.3 Unloading By Crane

Handling of large, skidded PSG systems is a job for a competent rigger. Figure 3C is for a typical PSG unit and Figure 3D illustrates lifting lugs for a skidded system. Spreader bars should be located over the two front lugs and the two rear lugs of the system skid, with a spacer bar between them to assure vertical pull. Lugs are located to minimize tilting during lift.

CAUTION

When systems are shipped disassembled, certain sections may be fastened together to minimize truck space. Remove shipping bolts prior to handling these components.

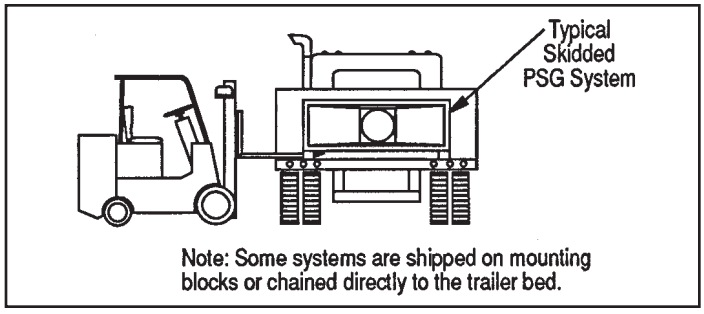


Figure 3A
Unloading by Forklift

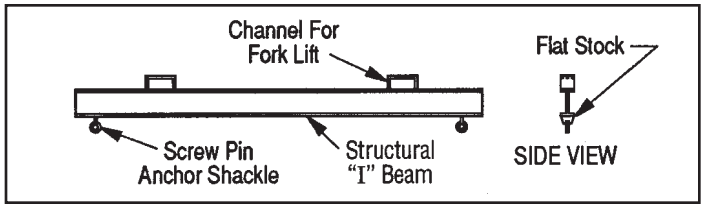


Figure 3B
Typical Spreader Bar

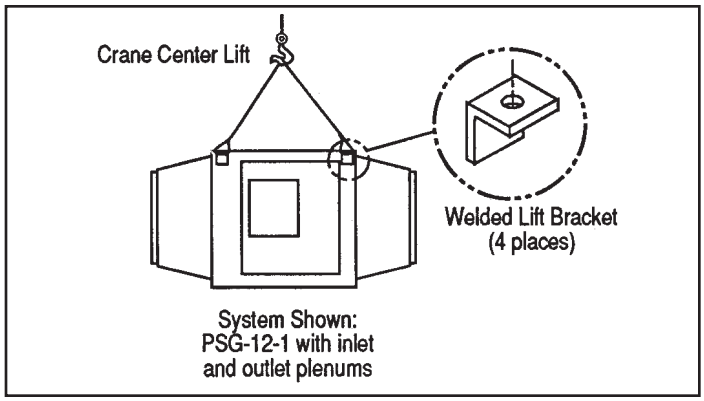


Figure 3C
Lifting A PSG Unit

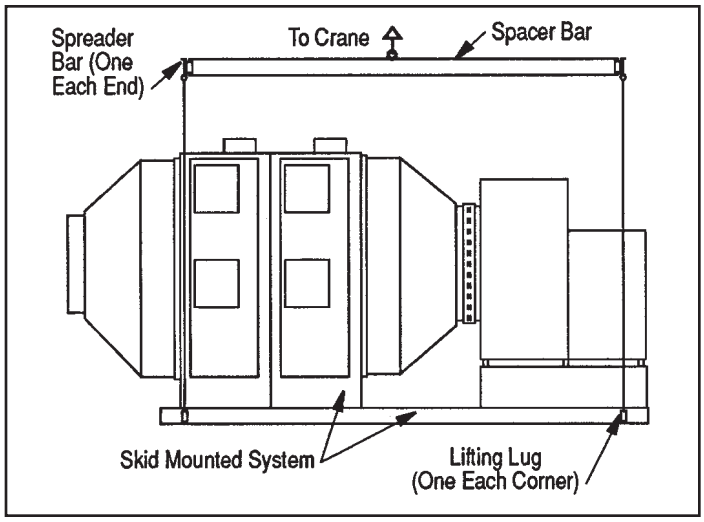


Figure 3D
Suggested PSG System Lifting Configuration

3.4 Unit Storage or Delay to System Installation

If PSG installation is delayed for an extended period (one month or more), protect system components as follows:

1. Store in a cool, dry location. Do not disassemble. Do not remove components.
2. Cover duct and unit openings with plastic sheeting and duct tape; cover plumbing openings with plastic hole plugs.
3. Cover skidded systems with plastic sheeting and seal with duct tape. Do not use black plastic sheeting. When removing components from storage, check gaskets, seals and electrical components for long term effects of exposure to moisture and dust before proceeding with installation.
4. The system exhaust blower should be protected from the weather. Failure to do so could damage the motor, bearings, belts, and electrical components. The following are guidelines.
    - Store in an area with no vibration.
    - Cover blower with a tarp do not use a black tarp which will promote condensation.
    - Remove drive belts.
    - Rotate fan wheel monthly

Also consult the blower manufacturer for storage and start up recommendations.

3.5 Installing The System

Skidded PSG systems arrive from the factory ready for final plumbing and wiring, with proper planning refer to Section 2, Installation Planning final installation should be straightforward. When PSG subassemblies are to be installed on customer's structure, further instructions are in order.

3.5.1 PSG Systems

The majority of skidded systems are shipped with unicells and filter installed. The system may be lifted into place without removing the unicells and filter. However, when job circumstances and or shipping requirements dictate, unicells and filters are shipped on a separate skid. These components should not be installed until the system is in place. Individual units should be rigidly mounted, with front-to-back bearing support in the direction of airflow. Clearance for plumbing access should be provided under each unit, refer to Installation Planning. The PSG main drain pipe should have a drain trap and multiple passes may be manifolded into a common drain. Structural field installed support channels should not interfere with proposed plumbing and wiring. Where the PSG is to be suspended, refer unit System Layout Drawing. Do not support ducting, plumbing or other field hardware from the PSG.

3.5.2 Inlet/Outlet Plenums

As supplied by Parker, transition plenums have all-welded seams. Inlet plenums include baffle filters or aluminum media to promote even air distribution across subsequent system components.

3.5.3 Motor/Blowers

Motor/blower assemblies installed in the field should be equipped with vibration isolators and adequate structural support. When supplied by others, the motor/blower assemblies should meet air volume specifications to the PSG model; refer to unit System Layout Drawing.

3.5.4 Pre-conditioning Equipment

For the PSG to operate at peak efficiency, certain pre-conditioning equipment may be required. When supplied by Parker, this equipment should be installed per unit System Layout Drawing and unit Electrical Drawings. Incorrect installation of such devices as cooling coils or other equipment may alter system performance and void the unit warranty.

3.5.5 Order of Installation

When the PSG is shipped in sections refer to the unit System Layout Drawing for proper installation.

⚠ WARNING

The PSG unit should be secured with appropriate hardware by the installing contractor.

3.5.6 Leveling

As base-mounted sections are installed, each section should be leveled to ensure proper drainage and mutual alignment. If a unit is not level within 1/8" (front-to-back and side-to-side), place suitable Shims between unit and support structure surface. Shims should run the entire length of the mating surfaces. Skidded systems should be level to within 1/8" per 4 feet of length and width.

3.5.7 Blowers with Vibration Isolators

Skid mounted units with blowers are normally shipped with vibration Isolators between blower and skid. These assemblies are shipped with isolators in a restrained condition, remove shipping bands.

3.5.8 Drain Pipe Connections

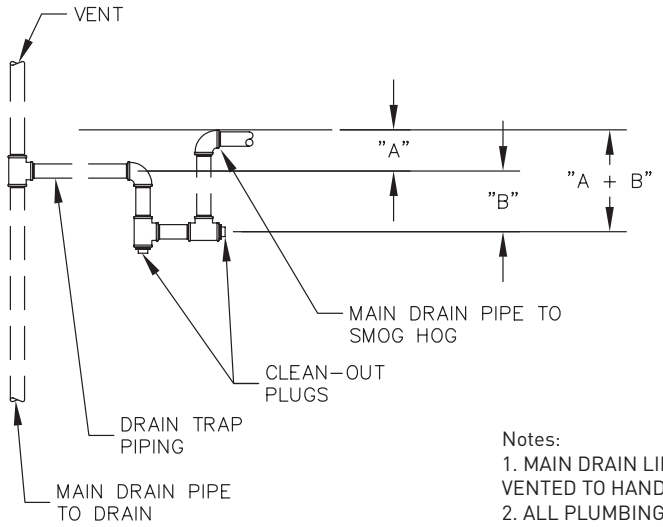
The PSG modular cabinet is supplied with drain connections refer to unit System Layout Drawing. The number of drain connections will depend on the PSG model. All PSG cabinet drain connections should be connected to one main drain pipe with a drain trap and properly sloped to the building drain pipe connection. Refer to Figure 5. Air passing through the system is under negative pressure. A drain trap is required serving as a vacuum break and to assure proper drainage during system operation. The trap "height is equal to the system static pressure, plus three additional inches of water. Cleanout plugs should be installed to the trap to facilitate cleaning. If required per code a grease trap should be installed. Drain pipes should be heat traced and insulated if particulate tends to solidify at expected ambient temperatures. This precaution also applies to drain and water pipes exposed to cold climates.

3.5.9 Wash Water Supply Connections

Wash water is required for systems with In-Place Cleaning, refer to the unit System Layout and the In-Place Cleaning Owner's Manual for installation, operation and specifications.

3.5.10 Heating/Cooling Coils

For systems with heating or cooling coils, refer to unit System Layout Drawing.



"A" + "B" = 12 INCHES

"B" = 9 INCHES

DRAIN PIPE DIAMETER TO MATCH SMOG HOG CABINET DRAIN CONNECTION(S) DIAMETER

SMOG HOG DRAIN CONNECTIONS SHOULD BE MANIFOLDED WITH THE INSTALLATION OF ONE DRAIN TRAP

Notes:

1. MAIN DRAIN LINE SHOULD BE SUFFICIENTLY SLOPED, SIZED, AND VENTED TO HANDLE ALL DRAINS MANIFOLDED.
2. ALL PLUMBING SHOULD CONFORM WITH ALL STATE AND LOCAL CODES.
3. THIS ILLUSTRATION IS NOT MEANT TO BE A RIGOROUS AND ALL ENCOMPASSING DESIGN. APPROPRIATE DESIGN CRITERIA AS PROVIDED BY A PLUMBING/MECHANICAL CONTRACTOR SHOULD BE UTILIZED TO ENSURE PROPER CONTROL OF DRAINAGE EFFLUENT FROM THE SMOG HOG SYSTEM. PARKER ACCEPTS NO RESPONSIBILITY FOR THE PLUMBING DESIGN OR INSTALLATION.

44–0781

Figure 5
Drain Trap

3.5.11 Electrical Field Installation

⚠ DANGER

ELECTRICAL SHOCK HAZARD

⚠ CAUTION

When electrical control panels are supplied by others an electrical interlock should be provided for the power pack circuit to the Smog-Hog PSG and the system exhaust blower. This provides safe operation of the PSG. Do not operate the power pack circuit with the system exhaust blower off line.

All electrical work should be performed by a qualified electrician in accordance with local electrical codes. Disconnect electrical power before installing or servicing electrical components. The PSG is manufactured per job specifications and Parker specifications, refer to unit Electrical Drawings. Dashed lines on unit Electrical Drawings identify field wiring requirements and possible certain recommended equipment not supplied by Parker. When additional equipment is specified for field installation, refer to unit System Layout Drawing and unit Electrical Drawings. If the PSG is skid mounted, interconnection wiring may have been completed at the factory. Do not mount auxiliary electrical equipment on or inside Parker equipment unless specifically authorized by Parker. Such unauthorized action may void the system warranty.

Parker provides solid-state programmable logic controllers (PLC) on various systems. The PLC operates on a low (24 VDC/120 VAC voltage and is susceptible to faults induced by the close proximity to higher voltage wires. Accordingly, the following should be observed during electrical installation:

1. Three-phase leads should not be located within 4 inches of the solid-state controller.
2. Care should be exercised when drilling conduit entry holes to protect PLC and other electrical components from metal chips and dust. Failure to comply with these instructions can result in a fault condition requiring repair or replacement by authorized service personnel. Costs of such repair or replacement are the responsibility of the user/installing contractor.

3.5.12 Remote Status

This panel serves as a monitoring device indicating the operational status to each power pack enclosure for the end user; refer to unit Electrical Drawings or Sequence of Operation documentation to determine if the remote status panel is part of the PSG system. The remote status panel or unit Main Electrical Panel (if amber lights are integrated to main panel) should be located remotely from the PSG system preferably in an area which is accessible and not installed by the PSG system. The panel located by the PSG system serves no purpose since there is an indicator light to each power pack enclosure. The remote status could also consist of a beacon light assembly located in an accessible area for monitoring. The illumination of the beacon light indicates a failed condition to one of the power pack enclosures. Flasher modules for each power pack enclosure is either located in a separate panel, the unit Main Electrical Panel, or in each power pack enclosure.

3.5.13 Building Maintenance System (BMS)

An alternative to the remote status panel is the BMS (signal relay modules) which also includes additional features other than only monitoring the power pack enclosure(s); refer to unit Electrical Drawings or Sequence of Operation documentation to determine if the BMS is part of the PSG system. Some of the additional features (from the PSG system to BMS), a common signal indicating high voltages are not within specifications to the power pack enclosures, indicating the operational status of the PSG system, indicating the operational status of the In Place Cleaning System, (from BMS to PSG system), placing PSG system on or off line, and fire system contact disabling the PSG power pack circuit and make up blower. Signal relays for the BMS are usually located in the unit Main Electrical Panel or the power pack enclosures, refer to unit Electrical Drawings. The Building Maintenance System (BMS) is supplied by others.

THE FOLLOWING SECTIONS ARE FOR THE USE OF TRAINED SERVICE PERSONNEL ONLY.

⚠ WARNING

The PSG unit should be inspected frequently and collected contaminant removed from the system regularly to prevent excessive accumulation which may result in a flashover or risk of fire.

⚠ WARNING

Hazardous live and moving parts are exposed during the troubleshooting procedures.

⚠ WARNING

Power pack enclosure(s) service voltage is 120VAC. This can be lethal. Voltage (120 VAC) is present within the power pack enclosure even though the toggle switch is placed in the off position.

⚠ CAUTION

Risk of electrical shock. The high voltage circuits to the ionizer and collector should be grounded before removing the power pack, high voltage wires, door feed-through insulators and unicell(s). The grounding procedure can be accomplished by waiting one minute after placing the toggle switch in off position to the power pack enclosure or refer to Figures 12 and 13. The power pack total current output is limited to a maximum of 5 milliamps to assure personnel safety.

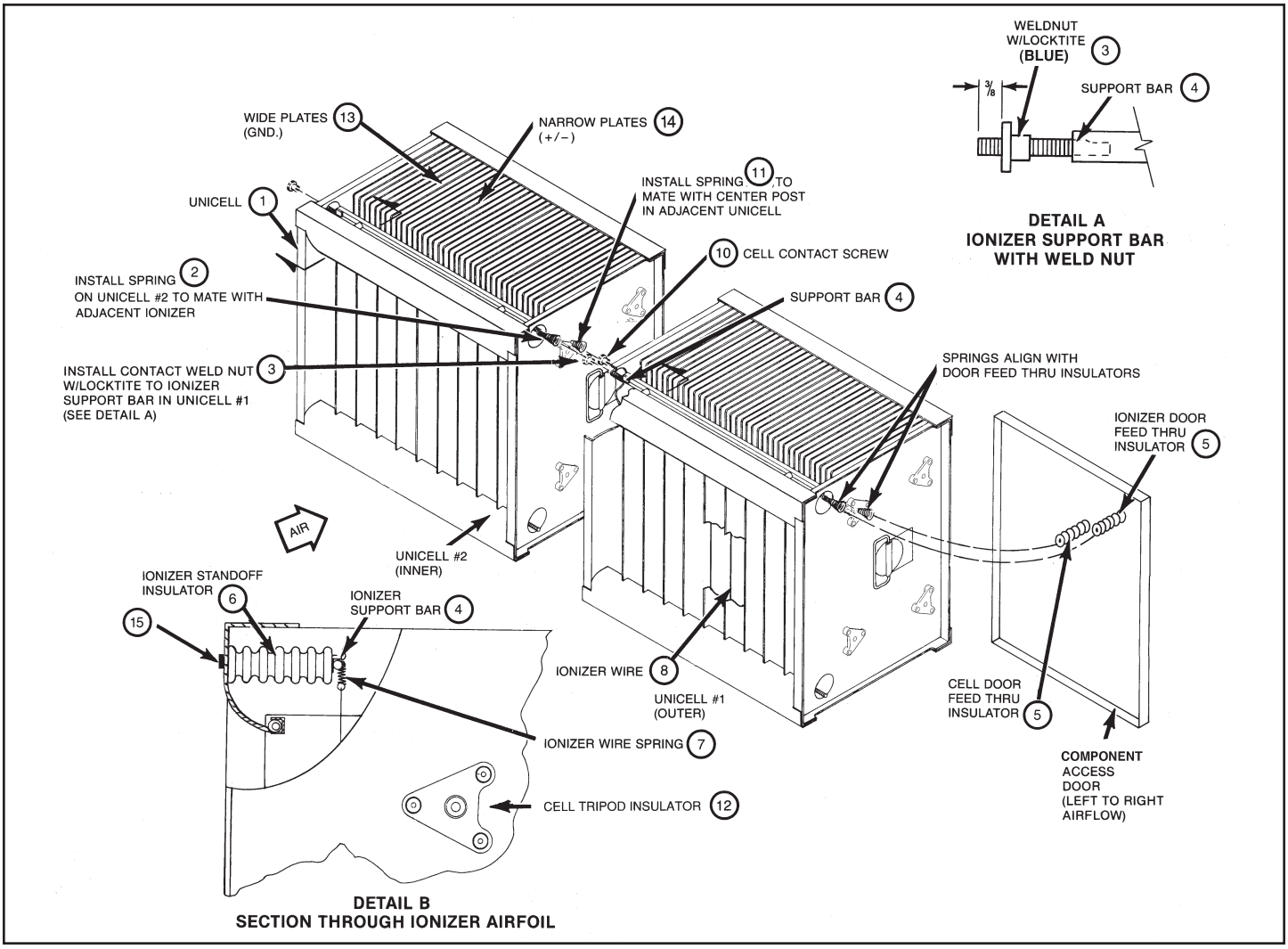


Figure 6
Unicell Electrical Alignment and Parts List

ITEM NO.	PART NO.	DESCRIPTIONS	QUANTITY REQUIRED
		REPLACEMENT PARTS	
1	02-1921	UNICELL ASSEMBLY	1
2	36-0068	IONIZER CONTACT SPRING	1
3	30-0452	CONTACT WELD NUT	1
4A	18-0674	IONIZER SUPPORT BAR (TOP)	1
4B	18-0670	IONIZER SUPPORT BAR (BOTTOM)	1
5	02-0749	IONIZER/CELL FEED THRU INSULATOR ASSEMBLIES	2
	37-0026	INSULATOR ONLY	2
6	37-0028	IONIZER STANDOFF INSULATOR	4
7	03-0559	IONIZER WIRE SPRING	20
8	03-0738	IONIZER WIRE, 10 MIL SST	10
9	30-0387	CELL CONTACT SCREW	1
10	30-0384	FLAT WASHER 1/4" SST	1
11	36-0012	CELL CONTACT SPRING	1
12	37-0061	CELL TRIANGULAR INSULATOR	8
13	10-0158	WIDE PLATE (GND.)	37
14	10-0157	NARROW PLATE (+/-)	38
15	36-0142	SCREW 8-32 x 1/2"	4

4. Operation

4.1 Start-up Checks

4.1.1 Installing Components

If unicells and filter media were removed for shipment or installation, refer to Figure 6 for proper installation and electrical contact alignment. Filter media is installed as after filters (after the unicell) with In Place Cleaning. Do not install filter media as pre filters (before the unicell) with In Place Cleaning. This will reduce the effectiveness of the wash cycle by 50 percent. The filter media is utilized as pre and after filters if the PSG is not equipped with In Place Cleaning. The PSG inlet plenum, if supplied by Parker, will have baffle filters or aluminum media. The inlet plenum should be inspected that all baffle filters or aluminum filters are installed.

4.1.2 Ducting Connections

Blower speeds are factory set by the blower manufacturer to compensate for static pressure losses in ducting as specified by others. Starting the blower before ducting is complete or before debris is removed can result in motor overload or other system damage.

4.1.3 Blower Rotation

For proper airflow, the blower should be operating in the correct direction. If the blower is operating in the reverse direction, air will move in the proper direction, but at significantly reduced rates. To check rotation:

1. Place PSG unit off line.
2. Remove blower housing from the blower to observe the pulley rotation.
3. Place the PSG unit on line for approximately one minute.
4. Place PSG unit off line.
5. As the blower pulley slows down, observe the direction of rotation.
6. Note directional arrow located on the blower housing.

⚠ WARNING

Extreme care should be exercised when operating blowers with motor/drive belts exposed. Loose fitting clothing can easily be drawn into these moving parts.

7. If blower wheel was not rotating in the correct direction, disengage main three-phase fused disconnect switch.

⚠ WARNING

Do not attempt to rewire "live" electrical connections.

8. Open power panel and reverse any two of the three wires at the terminal strip (LI, L2, and L3).
9. Engage the main three phase fused disconnect switch and place the PSG on line, checking blower rotation.

4.1.4 Blower Belt Tension

The drive belt tension adjustment is critical within the first 24 hours of the system exhaust blower operation. During this 24 hour period, the initial stretch of the belt occurs which requires a belt tension adjustment. If this tension adjustment is not completed the belt will wear prematurely, requiring a replacement. A drive belt tension gage should be used for adjusting belt tension. If fan belt tension is improper, set tension by adjusting the motor slide base. Loosen four bolts holding the motor to the base and turn the adjustment bolt(s) on the base. Check with a steel straight edge to make sure that motor pulley and blower pulley is still aligned. Tighten motor mounting bolts. Figure 7 illustrates a typical motor/blower arrangement (motor/blower configurations will vary).

CAUTION

Improper tension on drive belts will cause premature failure of belts.

4.1.5 Blower Current Measurement

Using an ammeter measure the current amperage of the blower motor. The measurement should not exceed the full load ampere (FLA) rating identified on the blower motor nameplate. If the overload relay is tripping perform the following: check overload relay for proper setting per motor FLA, measure blower rpm and design static pressure to determine that actual conditions are per blower specifications. Blower rpm can be measured with a tachometer. Design or total static pressure (TSP) is the summation in static pressure between the blower inlet and outlet. This summation is best checked with a manometer and pitot tube measuring readings from (a) the exhaust transition near the blower inlet and (b) the exhaust stack after the blower outlet. If the actual static pressure is higher than the blower specifications, and or the blower rpm is higher than the blower specifications, reduce the blower speed by opening the variable pitch pulley as described in the next procedure. Blower specifications or blower curve refers to the established operating conditions set by the blower manufacturer, rpm, cfm (air volume), and TSP. A reduction in blower rpm will decrease the TSP. A new pulley set may be required to reduce the blower rpm and amperage. The blower can be supplied either by Parker or by others. A blower curve can be requested through the blower manufacturer with the serial number.

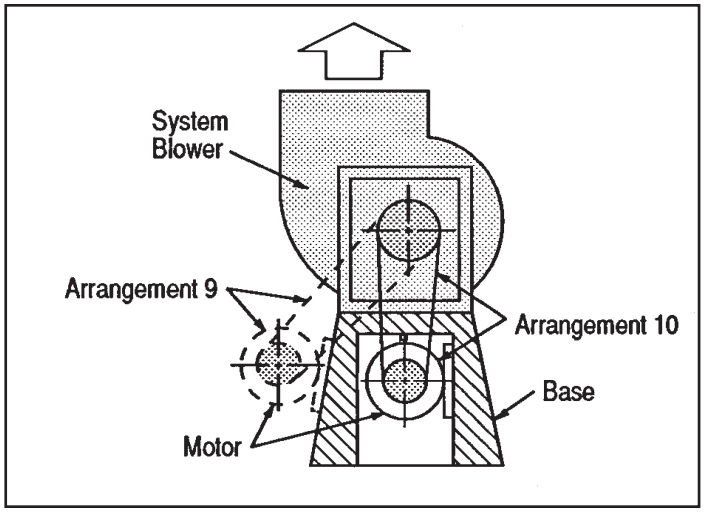


Figure 7
Typical Motor/Blower Configuration

4.1.6 Adjusting Motor Variable Pitch Pulley

Increasing blower speed (RPM) will increase airflow (CFM) and current amperage. Refer to Figure 8. To increase speed, close the variable pitch pulley (from "normal," as in Figure 8A, toward "full closed," as in Figure 8B). Decreasing blower speed will decrease airflow (CFM) and current amperage. To decrease speed, open the variable pitch pulley (from "normal,"as in Figure 8A, toward "full open," as in Figure 8C). To adjust the variable pitch pulley:

1. Loosen motor base nuts, adjust motor slide base and remove the drive belt.
2. Loosen set screw "A" to clear the drive key between pulley halves.
3. Remove the key.
4. Adjust pulley in increments of one turn to the desired setting.
5. Install key and tighten set screw "A."
6. Install drive belt.
7. Loosen set screw "B."
8. Align belt centerlines of motor and blower pulleys using straight edge and square.
9. Set belt tension using a belt tension gage.

Some system exhaust blowers will not have an adjustable motor pulley.

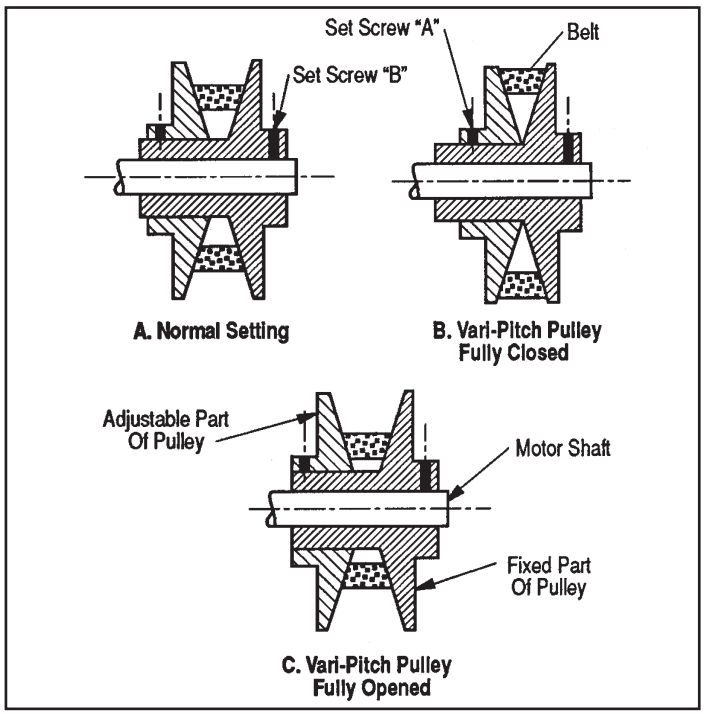


Figure 8
Adjustment Motor Pulley Settings

CAUTION

Improper blower speeds adversely affect system performance. Contact Parker before adjusting motor variable pulley settings.

4.1.7 Power Pack Operation

The power pack voltage range is 90 to 130 AC, 60 Hz, supplied by the unit Main Electrical Panel or electrical panel supplied by others. If the electrical panel is supplied by others the power pack circuit should be electrically interlocked with the blower circuit. The PSG will be operating in an unsafe mode if an electrical interlock is not installed. The power pack indicator light on the unit is illuminated when high voltage output is within specifications. If the indicator light is flashing or fails to illuminate refer to Section 10 Troubleshooting.

4.1.8 Remote Status Panel

The remote status panel (a remote amber light to each power pack enclosure indicator light circuit identified by a letter/number) will display the following conditions. The amber light(s) could be integrated with the unit Main Electrical Panel or as a separate panel, refer to unit Electrical Drawings.

Amber light(s) will be illuminated under normal conditions, high voltages within specifications.

Amber light(s) are in the flashing condition, high voltages are not within specifications. The PSG system is online.

Amber light(s) are not illuminated, PSG system is off line, or amber light/flasher module has failed, refer to troubleshooting section.

Maintenance procedures and the majority of the troubleshooting section refer to the power pack enclosure indicator light.

Check operation of each amber light by placing the power pack toggle switch in the off position, one at time, amber light should be flashing corresponding to module identification on remote status panel.

The remote status can be in the configuration of a beacon light instead of individual amber lights. The beacon light is common to all the modules. The beacon light is illuminated when a failure occurs to one or more modules.

4.1.9 Power Pack Enclosure Push Rod and Grounding Bar

Each power pack enclosure has a captive, spring loaded "push rod" extending into the module.

Factory-set, the push rod serves the following purposes:

1. High voltage DC power is automatically shut down with the unicells removed from the module.
2. Whenever a module door or power pack enclosure lid cover is opened, the limit switch is disengaged, placing 115 VAC off line to the power pack.
3. Opening either of the module door or the power pack enclosure lid cover also releases the spring loaded push-rod, placing the grounding bar in contact with the cell door feed through insulator acorn nut, removing residual cell voltage.

CAUTION

The opening of only the module door is such that the grounding bar may not completely short out the cell circuit. As a precaution, perform the grounding procedure, refer to Figures 12 and 13.

During normal operation, with unicells in place, the component door (10) and the power pack door closed (3), the push rod (5) is in contact with unicell endplate (6). Push rod extension (1) is in contact with the ground bar (2) and bends to contact the limit switch (4). Refer to Figure 9. Upon opening the component door (10), the push rod (5) is released from the unicell endplate (6) and spring (7) compression is relieved, breaking the contact of the push rod extension (1) from the ground bar (2), placing AC voltage off line to the power pack and causing the grounding bar to contact the acorn nut (8). Refer to Figure 10. When opening the power pack door (3), the spring (7) remains compressed but the grounding bar (2) is pulled from the push rod extension (1) as the power pack door (3) is opened. AC voltage is placed off line to the power pack by opening the limit switch (4) which the unicells are grounded through the acorn nut (8), but with the contact spring (12) fully compressed. Refer to Figure 11.

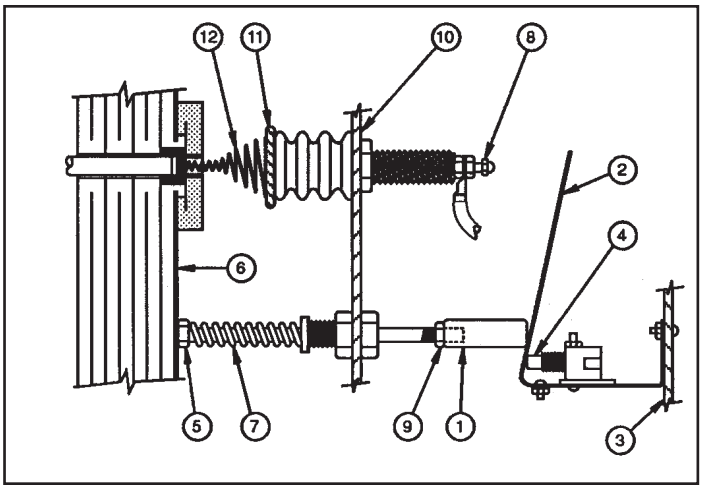


Figure 9
Component Door and Power Pack Door Closed

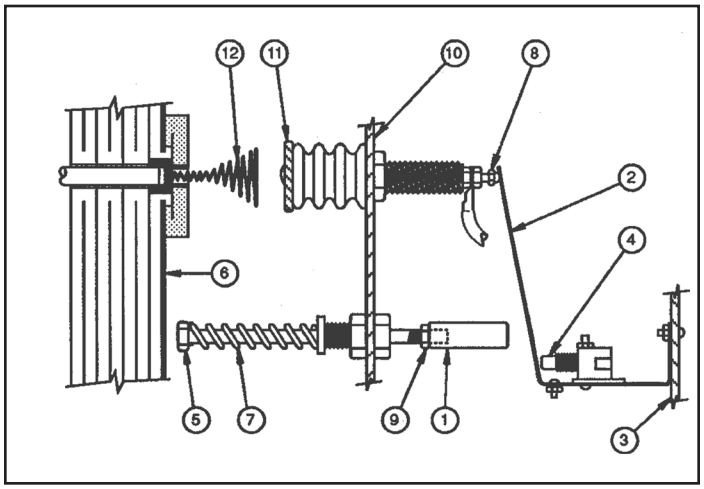


Figure 10
Component Door Open and Power Pack Door Closed

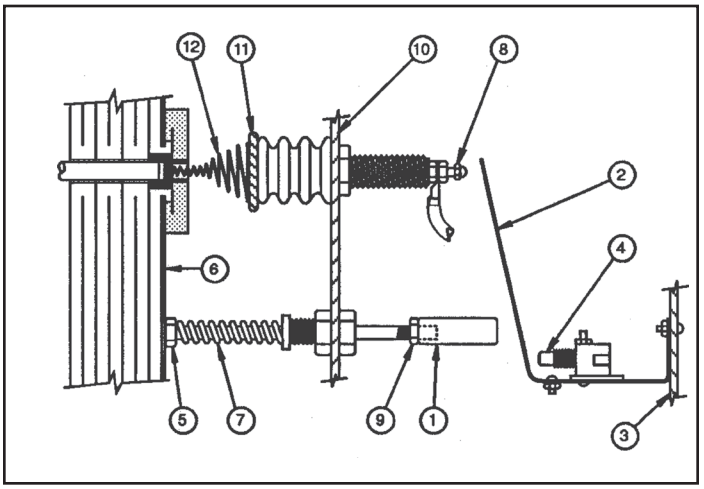


Figure 11
Component Door Closed and Power Pack Door Open

4.1.10 Odor Control

Odor filtration removes troublesome gases from the air stream as a post treatment to the PSG unicell components. The media can consist of carbon (18 to 20 pounds per filter) or potassium permanganate (28 to 30 pounds per filter). PSG system servicing solid fuel cooking will have potassium permanganate.

The odor control cabinet consists of a number of odor filters as dictated by size of the PSG system. The odor filter dimension is 22" x 22" x 2" at a designed velocity of 50 – 100 fpm. The life of the media is generally three to six months with a proper primary filtration (unicell components) maintenance program. Contaminant collection to the odor filters will decrease the service interval. The original filter frames should be retained. There is a slide gate to the filter frame for dumping the spent media and installing new media. A service company should be selected which is familiar with installing new media into the original filter frames.

The odor filters should be installed one to two days prior to placing the system on line. The odor filter service life will decrease if the odor filters are installed before the one to two days recommendation.

- Remove plastic sleeves
- Slide odor filters into the cabinet tracks with gaskets parallel to the back of the cabinet, and such that gaskets on adjacent filters seal against each other.
- Odor filters are installed in a "V" bank configuration.
- Do not slide the filters with the gasket(s) in the filter tracks.

4.1.11 In-Place Cleaning

The spray nozzles to the wash headers can become clogged or otherwise obstructed due to debris within the field piping. At initial start-up, water should be purged before final pipe connection at the PSG. The Y strainer to the detergent injector tee assembly should also be checked for debris. A wash cycle should be initiated before placing the PSG on line, refer to the In-Place Cleaning section of this manual for the start up operational procedure.

4.1.12 Placing PSG Online

Depending upon job specifications or other requirements, the PSG may be placed on line by a customer-supplied switch, or a time clock, or through a building maintenance system (BMS), refer to unit Electrical Drawings. Upon PSG start-up, the system blower is placed on line and the power packs are placed on line after a 45 second delay. The indicator light on each power pack enclosure should be illuminated. The power pack enclosure toggle switch should be checked if the indicator light is not illuminated. If the indicator light is not illuminated after checking the toggle switch or the indicator light is flashing. Refer to Section 10 Troubleshooting. The unit Main Electrical Panel has a 40 second time delay at start-up for the power pack circuit. This represents a standard precaution since PSG operates in applications where combustible gases could be present in process enclosures or process duct at start-up. The time delay of 40 seconds purges the duct before activating the power pack circuit to assure safe operation. For operation of auxiliary system equipment, refer manufacturer's owner's instructions for proper operating procedures.

4.1.13 Parker On Site Start Up

The PSG system may include on site start up by a Parker Field Service Technician. Usually this is listed on the order acknowledgment. As installation nears completion, allow at least two weeks for scheduling a Field Service Technician. Contact Parker Customer Service for a start-up request form. The completion of the request form is required before scheduling a Parker Field Service Technician. The on site start up consist of a complete mechanical and electrical inspection including the operation of all supplied Parker equipment. A Parker Field Service Technician is available for on site service at a daily rate plus travel and expenses.

5. Maintenance and Manual Cleaning

⚠ CAUTION

The PSG unit should be inspected frequently and collected contaminant removed from the system regularly to prevent excessive accumulation which may result in a flashover or risk of fire.

5.1 Recommended Maintenance

Once the system is operational, periodic maintenance is necessary to assure proper performance. Follow a regular pattern of system observation and log abnormal conditions. Since systems reflect the process under control, maintenance patterns will vary accordingly.

5.1.1 Check Power Pack Enclosure Indicator Lights

The PSG should be monitored daily by observing that the indicator light is illuminated to each power pack enclosure or by the remote status panel or remote beacon or BMS. Occasional arcing (flashing of an indicator light) is normal. An established arcing condition or dead short condition (continuous flashing of an indicator light) or the indicator light is not illuminated is not normal should be corrected. Refer to Section 10 Troubleshooting.

5.1.2 Unicell(s) Weekly Visual Inspection

A visual inspection of a few modules could identify problems such as moderate to extreme contaminant build up to the unicells even though the indicator lights are illuminated. This will be helpful in scheduling a manual cleaning of the components, refer to Section 6 and 7. To check the condition of the unicells, place the PSG off line. Open the module door and perform the grounding procedure, refer to Figures 12 and 13, inspect the condition of the unicells, filters, door feed-thru insulators and interior of the cabinet. Experience will dictate whether contaminant build-up is excessive. Contaminant build up will decrease high voltage to the ionizer and collector cell circuits and also system efficiency. When accessing a module, always clean the two door feed-thru insulators. Inspect the ionizer section of each unicell, noting the condition of the contact spring (distorted?, bent? missing?), ionizer weld nut (missing?), ionizer standoff insulators (contaminant build up) and ionizer wires (contaminant build up?, missing?), repair or replace. Ionizer wires should be taut and centered between ground plates. Ground plates between each ionizer wire should be straight and parallel. Unicell module support tracks should be free of contaminant build-up for ground contact.

Inspect the collector cell section of each unicell, noting the condition of the contact spring (distorted? bent? missing?) cell contact screw (missing?), cell plates (bent? warped?) should be parallel and straight, repair or replace. Cell hot plates (smaller dimensional plates) should be centered between ground plates (larger dimensional plate). Cell plates should not have contaminant bridging between the cell plates or at support structure corners or the triangular insulators Unicell module support tracks should be free of contaminant build-up for ground contacts.

5.1.3 Filters, Drain Sumps, and Access Door Gasket Inspection

Inspect filters, noting the condition (contaminant build up? media separation? bent frames?) should not have contaminant build up restricting airflow, repair or replace.

Module drain sumps should not have moderate to extreme contaminant build up or an accumulation of wash water if equipped with In Place Cleaning, clean module sumps as required. Component access doors gaskets should be in-place and in good condition.

5.1.4 Perform An In-Place Cleaning Wash Cycle

If the PSG is equipped with In Place Cleaning, a daily wash cycle is required. Refer to In Place Cleaning section of this manual and Sequence of Operation Instructions. A typical seven day wash cycle would be six day waterwash without detergent with the seven day a detergent wash. The "Detergent Frequency Selection" can be increased up to everyday. The auto wash cycle is initiated by a Parker Wash Controller, with the wash cycle sequencing, wash cycle times, and detergent frequency through the unit's PLC. A wash cycle can be manually initiated, identical operation as the auto wash cycle, at the unit Main Electrical Panel for an additional wash cycle. A wash cycle whether a manual or by time clock can only be initiated with the PSG off line. The wash cycle frequency could be increased or decreased depending on visual inspection of the components and high voltage measurements. When the PSG is placed on line after a wash cycle, the power pack enclosure(s) indicator light(s) may intermittently or continuously flash for approximately 60 minutes. If this condition exceeds 60 minutes refer to Section 10 Troubleshooting.

5.1.5 Manually Cleaning System Components

The system components could require manual cleaning, weekly, bi weekly, monthly, one to three months interval, every six months, or yearly depending upon application/high voltage measurements. Refer to Sections 6, 7, and 8. Manual cleaning should not exceed yearly.

6. In Place Cleaning System

The In-Place Cleaning System is a preventive maintenance tool designed to remove contaminants from SmogHog electrostatic precipitators, extending manual cleaning intervals. The In-Place Cleaning System consists of a series of spray nozzles installed above and in front of the SmogHog collection components for all in-place cleaning equipped PSG units. Standard loading PSG units just have spray nozzles in front of the SmogHog collection components. Wash water to these spray nozzles is supplied either directly from the end user water supply or from a recirculating reservoir. Since these latter systems tend to be custom designed for the application, dimensions and operational parameters are stated on the system layout drawings and electrical drawings.

This manual describes a cleaning system with the end user supplying the water/piping. In this system the detergent pump assembly directs the detergent to the injector tee assembly installed to the wash water supply pipe which is connected to the SmogHog, refer to Figure 1. The In-Place Cleaning System wash cycle is initiated and controlled to completion by the Wash Control Panel.

6.1 FACE AND OVERHEAD HEADERS

Face and overhead headers are factory installed into each tier, refer to Figure 6. Each tier is identified externally with a power pack enclosure and a module identification nameplate, identified by a letter/number. Face headers direct the wash water in the direction of airflow to the SmogHog collection components. The overhead headers direct the wash water from above the collection components. Face and overhead headers are operated by one or two solenoid valves. The number of solenoid valves and sequencing varies with the size of the SmogHog, refer to the Sequence of Operation Instructions shipped with the SmogHog.

6.2 INJECTOR TEE ASSEMBLY

Figure 1 illustrates the typical configuration of the detergent pump assembly and the point of detergent injection into the wash water supply pipe with the exception of the solenoid valves at the SmogHog. The detergent is injected through a metering orifice plate, located within the injectors tee assembly, which provides the proper detergent ratio (20:1) with the wash water. A detergent check valve provides directional flow which eliminates the back-flow of wash water into the detergent reservoir.

The detergent pump pressure should be 5 to 10 PSIG higher than the operating water pressure. Parker supplies pressure gauges to the injector tee assembly for the water and the detergent, to monitor these pressures during a cleaning cycle.

The Y-strainer is located at the field wash water connection to the injector tee assembly serves to reduce debris to the solenoid valves and the internal spray nozzles within the SmogHog cabinet.

1). Backflow preventer - eliminates the detergent from contaminating the water supply within the building.

2). Water pressure regulator adjusts the operating water pressure which should not exceed 60 PSIG during a wash cycle.

3). Ball valves with unions allow for servicing/removal of hardware to the injector tee assembly.

6.3 DETERGENT PUMP ASSEMBLY

The detergent reservoir and diaphragm pump are mounted on a common base including miscellaneous piping and valves, refer to Figures 1 and 2. The detergent reservoir supplies detergent to the pump which directs under pressure to the injector tee assembly and onto the SmogHog. The high-pressure detergent pump is used when the injector tee assembly is located remotely from the detergent pump assembly. The pump inlet piping is equipped with a ball valve, directly below detergent reservoir for servicing, and a Y-strainer to eliminate debris. The assembly is equipped with a mini-ball valve at the pump outlet for adjusting operating pump pressure.

A detergent pump discharge hose, 1/2 inch transparent PVC braided, is supplied for observing flow of detergent from the pump. The PVC hose is factory installed to the pump outlet hose barb. Field installation is required for the other end of the PVC hose to the injector tee assembly.

The detergent pump is wired to a junction box on the tank stand.

6.4 WASH CONTROL PANEL

The Wash Control Panel provides the control for the wash cycle. Control functions may vary with application, refer to wash panel document provided with order.

Note: The blower circuit is interlocked with the wash system to prevent initiating a wash cycle when the SmogHog is in operation. To initiate a wash cycle, the SmogHog should be placed off line. Consequently, the SmogHog cannot be placed on line while a wash cycle is in progress. A wash cycle can be interrupted by pressing the “Wash Stop” button in order to place the SmogHog on line. However, the high voltages to the ionizer/collection cell circuits will not be in the normal operating range due to the wetness of the collection components.

A wash cycle can be initiated by the “Wash Start” button, identified as the Manual Mode, or as programed in the wash controller. The wash cycle is sequenced through a number of “modes” by a programmable logic controller (PLC). Each mode has a specified time length. All mode time lengths are fixed with the exception of the wash mode.

The description and sequencing of a wash cycle in this manual is a generalization to familiarize the end user. Refer to the wash control panel documents for specific operation. The following actions are required by the end user to initiate or stop a wash cycle.

6.5 MANUAL MODE

1). Place Smog-Hog off line.

2). Press “Wash Start” illuminated button in which the PLC will initiate and begin the wash cycle sequencing. The “Wash Start” indicator light push button will be illuminated.

3). The PLC will complete the wash cycle. End user intervention is not required to end the wash cycle. The wash cycle can be placed off line before completion, by pressing the “Wash Stop”. When the wash cycle is completed or the “Wash Stop” push button is pressed, the “Wash Start” indicator light push button will not be illuminated. Restarting a wash cycle, by pressing the “Wash Start” push button will initiate the wash cycle at the beginning of the program.

6.6 AUTO MODE

In this mode the wash cycle is initiated by the wash controller which places the SmogHog off line. End user intervention is not required. Wash sequencing is identical to the Manual Mode. The “Wash Stop” push button can be utilized to stop a wash cycle. Restarting a wash cycle by pressing the “Wash Start” illuminated push button will initiate the wash cycle at the beginning of the program.

Note: The programming of the wash controller should be performed by the end user or the Parker Field Technician. Refer to wash controller instructions.

Step	Mode of Operation	Time (Minutes)
1	Fan Coast	1.0
2	Pre-rinse	0.5 per each tier solenoid valve
3	Wash	2.0 per each tier solenoid valve
4	Rinse	1.5 per each tier solenoid valve
5	Drain	2
6	Fan dry-out	30

Note: A tier solenoid valve is for a row of components either unicells or separate ionizers and collector cells in which tiers are arranged one above another. A tier is identified by a letter/number (e.g. A2, A1, B2, B1, C2, C1, D2, D1, E2, E1, and F2, F1).

The wash cycle cleans the system from the top tier to the bottom tier.

Model:
PSG - One tier solenoid valve for one to three unicell components, discharging wash water to the face header spray nozzles.
(On heavy load wash systems, wash water is discharged to the face and overhead header spray nozzles simultaneously)

Step: **Description:**

1 - Dwell time for system blower to stop.

2, 3, 4 - Main water solenoid valve open to the injector tee assembly.
- Tier solenoid valve is open. Tier solenoid valves are individually sequenced at the SmogHog by the Wash Control Panel.

3 - *Detergent pump is activated.

5 - Dwell time to drain wash water from the SmogHog.
- Main water solenoid valve and tier solenoid valves are closed.

6 - The system exhaust fan is activated.

*Detergent pump is set in the HMI.

7. INSTALLATION

7.1 WASH WATER SUPPLY PIPE

The wash water supply pipe should be a 1” NPT to the SmogHog wash pipe connection. Piping runs may dictate larger diameter piping which should be determined by the installing contractors or plant maintenance. The wash water supply pipe will require heat tracing and insulation if exposed to cold ambient conditions, refer to Figure 1. The In-Place Cleaning System effectiveness depends on the wash water temperature. Detergents are twice as effective in hot water. The water temperature specification for the In-Place Cleaning System is 140º to 170º F, not to exceed 180º F, refer to Section 8.7.

7.2 INJECTOR TEE ASSEMBLY

The injector tee assembly should be installed in close proximity to the SmogHog. As illustrated in Figure 1, the injector tee assembly is installed horizontally to the wash water supply pipe and not exposed to cold ambient conditions. Additional equipment is required which is supplied by others: backflow preventers, water pressure regulators, and two ball valves, refer to Figure 1.

7.3 DETERGENT PUMP ASSEMBLY

The detergent pump assembly should be installed at a level location, not rated for outside/wet conditions. Ten feet of braided 1/2 inch diameter hose is supplied by the factory for connection to the injector tee assembly, refer to Figure 1.

Maximum pipe length from the detergent pump assembly to the injector tee assembly is 80 ft of 1/2 inch diameter pipe which should be limited to five elbows and a 10 ft “head.” A high pressure detergent pump will be required if conditions exceed specifications.

Detergent pump assembly field installation:

1). PVC hose or piping (not to exceed 1/2 inch diameter) from the detergent pump outlet to the bottom hose barb connection at the injector tee assembly.

2). Connect power into junction box on tank stand.

7.4 WASH CONTROL PANEL

If the Wash Control Panel is not assembled to the SmogHog skid, the panel should be installed at an accessible location in the close proximity of the detergent pump assembly. The selected location should conform to code, refer to PSG Electrical Drawings for field wiring.

7.5 DETERGENT FILLING

Before filling the detergent pump assembly with detergent, five gallons of water should be put into the detergent pump assembly to check for external leaks. After a two-hour dwell period, check for external leaks underneath the tank and to the detergent pump piping circuit. Repair external leaks if required and proceed filling the tank with detergent into the five gallons of water.

Note: The initial detergent fill into the five gallons of water will not reduce the detergent effectiveness. The concentrated detergent is provided in 5-gallon pails that are added directly to the tank. The tank is then filled with water to the 55-gallon mark. Occasionally for heavy load applications two 5-gallons pails per 55-gallon tank will be recommended. Providing a hose bib in close proximity to the detergent tank will facilitate the filling of the detergent tank.

7.6 DRAIN / DRAIN TRAP

SmogHog units are supplied with drain connections as identified on the system layout drawing. Pipe diameter and number of drains on a SmogHog will depend on the model. Drain pipes will require heat tracing and insulation if exposed to cold ambient conditions.

Air passing through the SmogHog is under negative static pressure condition. A drain trap will be required to serve as a vacuum break maintaining drainage of fluids (wash water and contaminant residuals) with the system blower on line.

7.7 IN-PLACE CLEANING SYSTEM / OPERATIONAL SPECIFICAITONS

Operating water pressure: 40 to 50 psi (not to exceed 60 psi)

Operating detergent pump pressure: 5 to 10 psi above the operating water pressure

Wash water temperature: 140º to 170º F (not to exceed 180º F) Hot

Water Flow Rates: Refer to system layout drawing

8. OPERATION

8.1 OPERATIONAL CHECKS AND ADJUSTMENTS

Check the following before operating a wash cycle:

1). All ball valves or equivalent are open, refer to Figure 1. Shut-off valves can also be located on the backflow preventer.

2). Place power on line to the SmogHog and the Wash Control Panel.

Note: If the SmogHog is operational, place SmogHog off line. A wash cycle will not initiate if the SmogHog is on line due to the blower circuit interlocked with the wash system.

3). Verify power running to tank stand junction box is on.

4). Press the “Wash Start” push button to start a wash cycle.

Note: Refer to Sequence of Operations instructions within the Wash Control Panel.

5). The following adjustments should be completed during the pre-rinse and wash modes:

a). During the pre-rinse mode, confirm the operating water pressure. If required, adjust the water pressure regulator to specifications by turning the adjustment screw clockwise to increase pressure, counter clockwise to decrease pressure.

Specifications: 40 to 50 psi

Notes: Consistently low and/or fluctuating operating water pressures (under 40 psi) at the Smog-Hog will result in poor removal of contaminants from the collection components. This can increase maintenance costs. Pressure fluctuations can occur due to “demand” within the facility which will reduce the effectiveness of the wash cycle. A wash cycle should be operated when “demand” is at a minimum. A booster pump may be required if the operating water pressure is below the specifications of 40 psi.

b). During the wash mode, which is after the pre-rinse mode, adjust the detergent pump operating pressure with the mini-ball valve located at the detergent pump outlet, refer to Figure 1 for detergent pressure gauge. The detergent operating pressure should be 5 to 10 psig higher than the water operating pressure. For example, if the water operating pressure is 50 psig, the detergent operating pressure should be 58 to 60 psig. The injector tee assembly supplied by Parker, includes gauges to observe the operating pressures.

Note: The detergent (diaphragm) pump is self priming and can operate in the dry mode if detergent is depleted in the reservoir. Detergent Ratio: 20 to 1 or five percent concentration at 5 to 10 psi above the operating water pressure.

c). Press the “Wash Stop” pushbutton before proceeding to statement (d).

d). To establish correct solenoid valve sequencing, the following procedure should be completed.

- Initiate a wash cycle to check the tier solenoid valve sequencing.

- Tier solenoid valve sequencing should be checked per Sequence of Operation instructions. This can be accomplished by an audible click at each tier solenoid valve or by opening each component access door when each tier solenoid valve is activated. Wash water should be discharging from the spray nozzles at the component access door which is open. Immediately close the component access door to reduce the discharge of wash water from the SmogHog cabinet.

9. MAINTENANCE

9.1 MANUAL CLEANING

The In-Place Cleaning System is an effective measure in prolonging the removal of collection components (unicells or ionizers, collector cells, and filter media) for manual cleaning. Collection components will require manual cleaning periodically as determined by visual inspection, noting the degree of contaminant buildup, high voltage measurements by utilizing a high voltage probe, or a prolong period before the power enclosure(s) indicator light(s) illuminate after a wash cycle. Periodically, before and after a wash cycle, a set of components should be removed from one component access door to determine the effectiveness of the wash cycle. “Clean” components need not be clean to a point that the components appear to be “New” in appearance. There will be tarnish contaminant surface residuals on the components. The SmogHog owner’s manual provides information on measuring high voltages and manual cleaning collection components.

9.2 WASH SYSTEM COMPONENT INSPECTION

The following wash system components should be inspected monthly:

- Detergent Pump Assembly. Check for piping leaks, condition of wires, and any other visible defects. Correct as necessary.

- Plumbing. Inspect PVC hoses, connections and manifolding to the SmogHog for evidence of leaks or deterioration.

- Check Valve. Residual deposits could occur within the detergent check valve requiring periodic cleaning. (Located at the detergent PVC hose connection to the injector tee assembly).

- Solenoid Valves. Normal operation of solenoid valves used in the In-Place Cleaning System can be determined by an audible click at each solenoid valve located at the injector assembly and the SmogHog cabinet.

9.3 SOLENOID VALVE DISASSEMBLY

1). Discharge static water pressure within the wash water piping at the Smog-Hog by placing ball valve in the closed position (located before the injector tee assembly) and operate a wash cycle for two minutes. (Press “Wash Start” pushbutton) after two minutes, press the “Wash Stop” pushbutton.

2). Unscrew coil screw from coil and remove coil by lifting up from the plunger assembly.

3). Unscrew bonnet assembly which includes the plunger assembly from the valve body.

Note: Carefully lift off bonnet/plunger assembly to eliminate the spring loaded plunger from discharging from the assembly.

4). The o-ring diaphragm, and strainer can be disassembled from the valve body.

Note: Be careful not to damage the machined surfaces.

5). Clean and inspect parts for debris and damage as identified in statement 4 and also including:

a). Valve stem not bent, perpendicular to the valve body/ bonnet.

b). Plunger spring not deformed.

c). Plunger moves freely within valve stem.

10. ILLUSTRATIONS

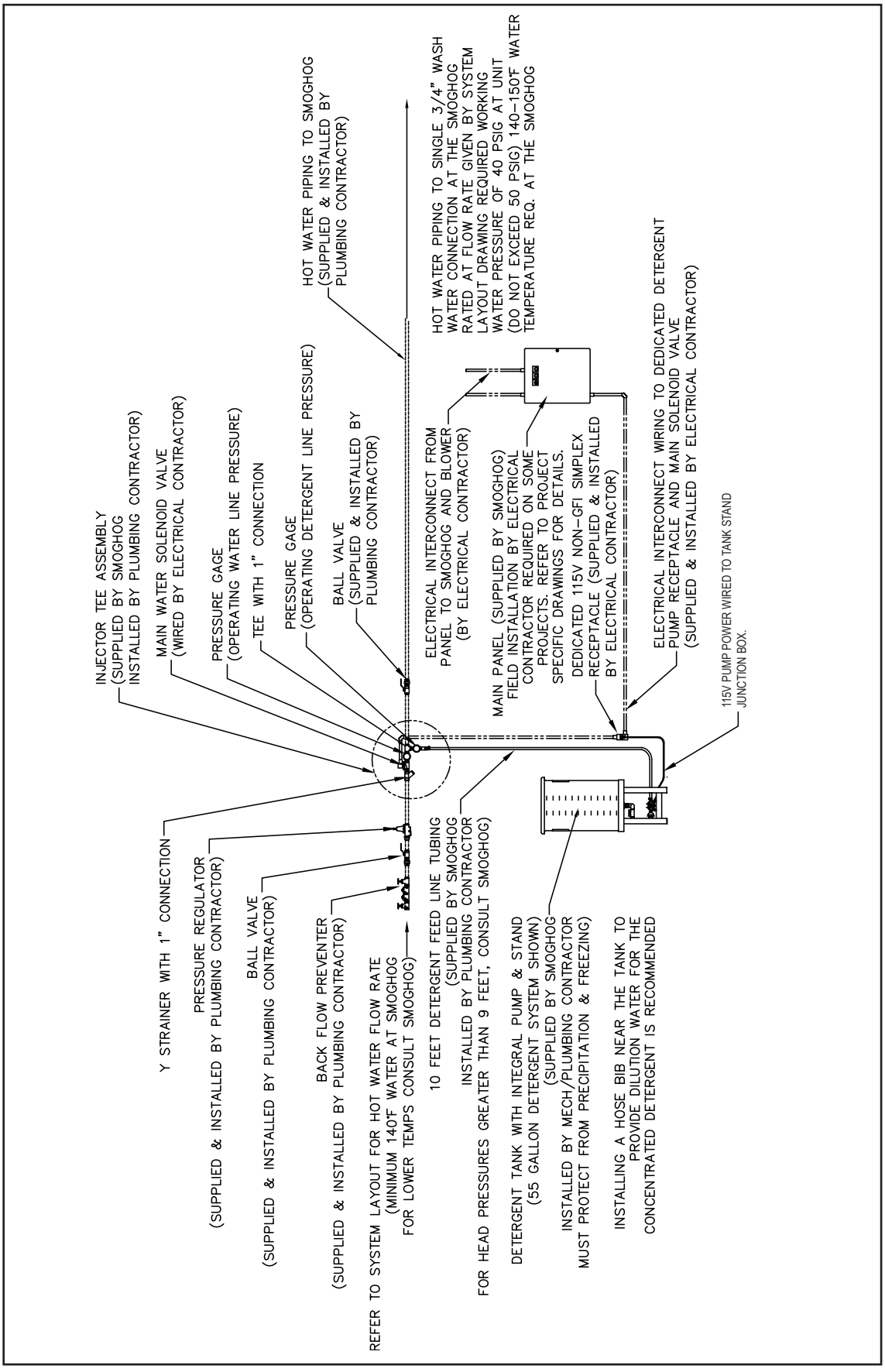


FIGURE 1 - IN-PLACE CLEANING SYSTEM INSTALLATION SCHEMATIC

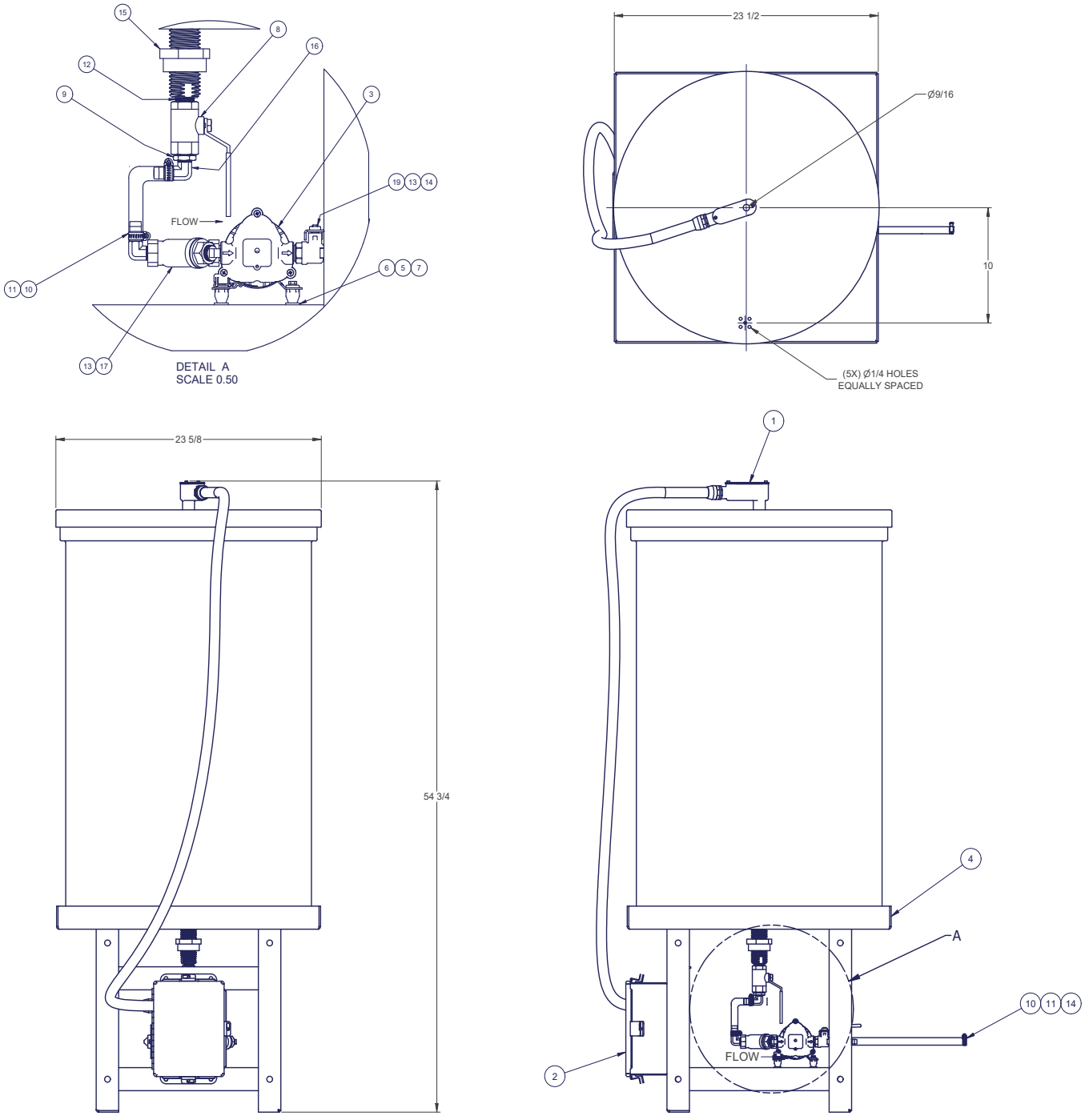


FIGURE 2A - DETERGENT PUMP ASSEMBLY - 55 GALLON AND 110 GALLON

DETERGENT PUMP ASSEMBLY PARTS LIST - 55 GALLON

ITEM	QTY	PART	DESCRIPTION
1	1	02-11564	DETERGENT PUMP LEVEL SWITCH ASSEMBLY
2	1	03-10919	WASH TANK LEVEL KIT JUNCTION BOX
3	1	07-0085	PUMP 1.3 GPM 115V 60HZ
4	1	18-11579	TANK STAND WELDMENT W/JUNCTION BOX (55GAL)
5	4	30-0043	WASHER-LCK,#10,ZP
6	4	30-0065	WASHER-FLT,SPH,#10,ZP MI070-10
7	4	30-0575	BOLT-HX,10-32 X 1,ST,ZP
8	1	38-0252	VALVE-BALL,1/2"NPT
9	1	38-0388	BSHG-BS,RDCR,HX HD,1/2"EXT THR
10	4	38-0390	CLMP-HOSE,WORM DRIVE,1/2"
11	12 FT	38-0392	TBNG-PVC,CLR,1/2"ID X .75"OD
12	1	38-0705	NIPL-BS,CLOSE,1/2"
13	3	38-0732	NIPL-BS,CLOSE,3/8"
14	1	38-0734	BRB-BS,HOSE,1/2"H X 3/8"NPT
15	1	38-1811	FTNG-PVC,BLKHD,INT THD,1/2"NPT
16	2	38-1953	BRB-BS,HOSE,1/2"H X 3/8"MPT 90
17	1	38-1954	STRNR-W/50 SCRN, 45359 NPT BRASS
18	1	38-1972	TANK WITH COVER 55 GAL
19	1	TP7203	MINI BALL VALVE 3/8IN

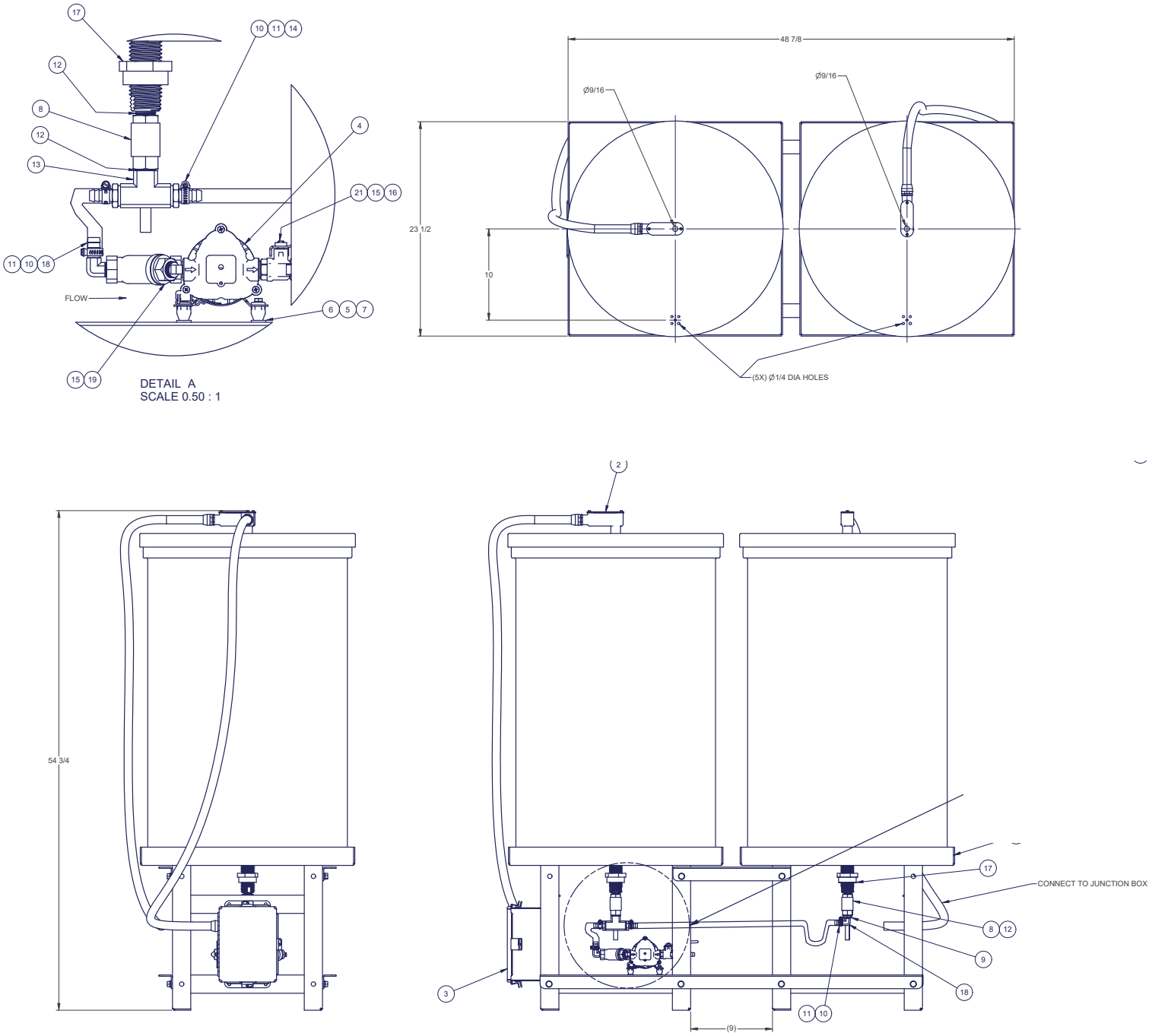


FIGURE 2B - DETERGENT PUMP ASSEMBLY - 110 GALLON

DETERGENT PUMP ASSEMBLY PARTS LIST - 110 GALLON

ITEM	QTY	PART	DESCRIPTION
1	1	02-10563-0001-L	TANK STAND ASM 110GA LVL SW
2	2	02-11564	DETERGENT PUMP LEVEL SWITCH ASSEMBLY
3	1	03-10919	WASH TANK LEVEL KIT JUNCTION BOX
4	1	07-0085	PUMP 1.3 GPM 115V 60HZ
5	4	30-0043	WASHER-LCK,#10,ZP
6	4	30-0065	WASHER-FLT,SPH,#10,ZP
7	4	30-0575	BOLT-HX,10-32 X 1,ST,ZP
8	2	38-0252	VALVE-BALL,1/2"NPT
9	1	38-0388	BSHG-BS,RDCR,HX HD,1/2"EXT THR
10	5	38-0390	CLMP-HOSE,WORM DRIVE,1/2"
11	15 FT	38-0392	TBNG-PVC,CLR,1/2"ID X .75" OD
12	3	38-0705	NIPL-BS,CLOSE,1/2"
13	1	38-0706	TEE-BS,1/2"NPT
14	2	38-0718	BRB-BS,HOSE,1/2"H X 1/2" MPT
15	3	38-0732	NIPL-BS,CLOSE,3/8"
16	1	38-0734	BRB-BS,HOSE,1/2"H X 3/8"NPT
17	2	38-1811	FTNG-PVC,BLKHD,INT THD,1/2"NPT
18	2	38-1953	BRB-BS,HOSE,1/2"H X 3/8"MPT 90
19	1	38-1954	STRNR-W/50 SCRN, 45359 NPT BRASS
20	2	38-1972	TANK WITH COVER 55 GAL
21	1	TP7203	BALL VALVE 3/8IN

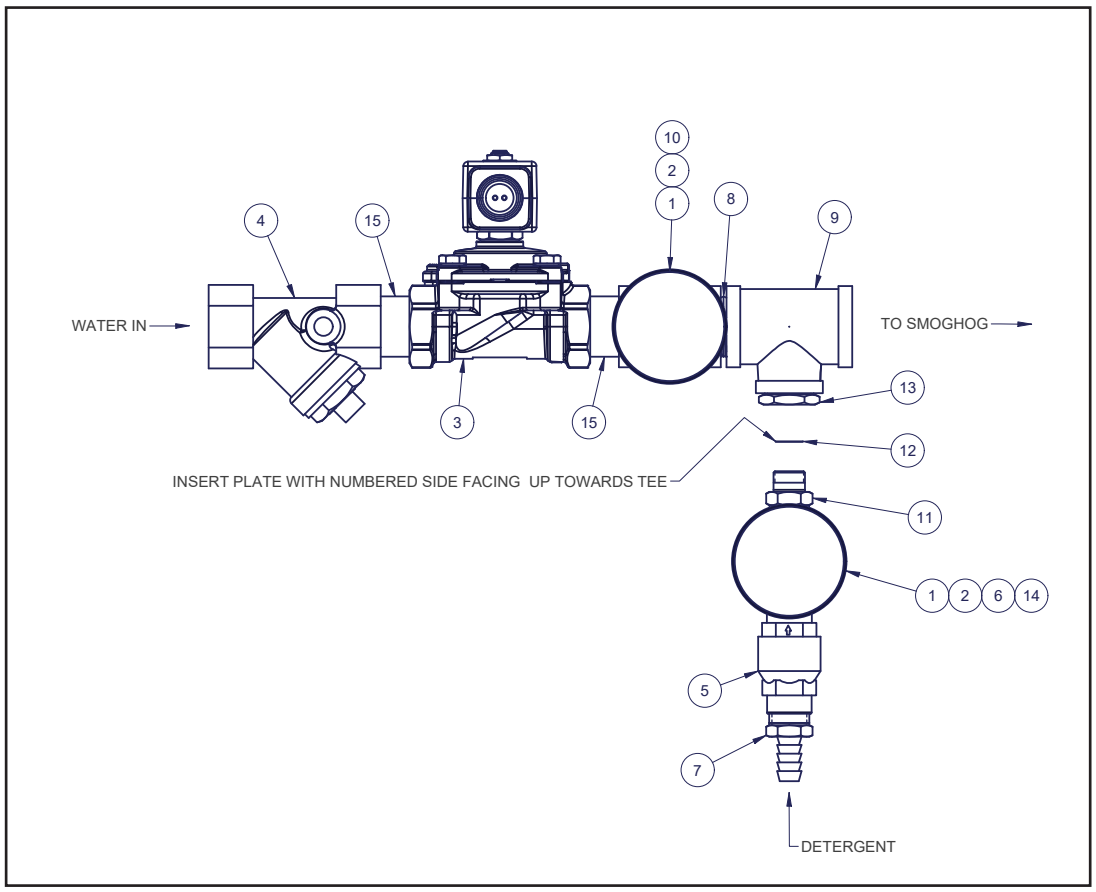
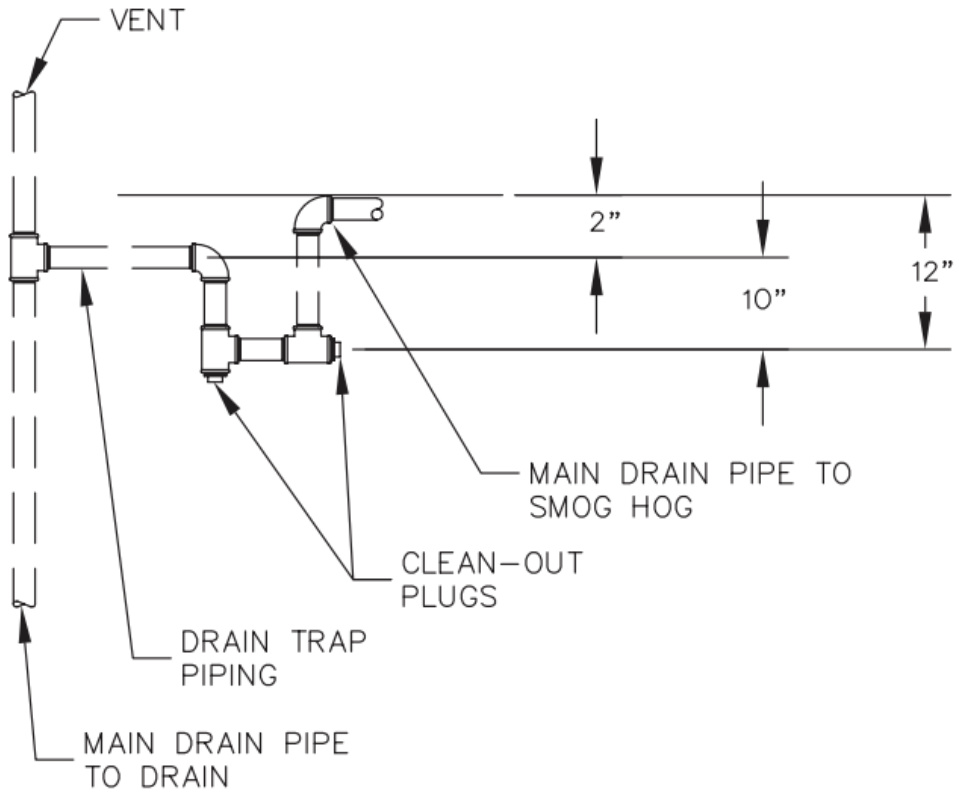


FIGURE 3

INJECTOR TEE ASSEMBLY

Part # 02-11614

ITEM	QTY	PART	DESCRIPTION
1	2	07-0007	2-1/2" DIA PRESSURE GAUGE, 0-100 PSI, 1/4" NPT BACK MOUNT
2	2	07-0027	1/4" PRESSURE SNUBBER, BRASS
3	1	20-10508	VALVE 24VDC SOL 1IN W/ COIL
4	1	38-0199	STRNR-W/40 SCRN,1"NPT
5	1	38-0255	CHECK VALVE 1/2 NPT
6	1	38-0705	NIPL-BS,CLOSE,1/2"
7	1	38-0718	BRB-BS,HOSE,1/2"H X 1/2" MPT
8	1	38-1817	NIPL-BS,CLOSE,1"
9	1	38-1819	TEE-BS,RDCR,1"X 1"X 3/4"
10	1	38-1821	TEE-BS,RDCR,1"X 1"X 1/4"
11	1	38-1824	NOZZLE, BRASS, 1/2 NPT X 11/16-16
12	1	38-1825-128	4916-128 ORIFICE PLATE, STAINLESS STEEL
13	1	38-1826	ADPT-BS,3/4 NPT X 11/16-16
14	1	38-1827	TEE-BS,RDCR,1/2"X 1/2"X 1/4"
15	2	38-10027-0001	NIPL-BS, 1" NPT X 2"



DRAIN PIPE DIAMETER TO MATCH SMOG HOG CABINET DRAIN CONNECTION(S) DIAMETER

SMOG HOG DRAIN CONNECTIONS CAN BE MANIFOLDED WITH THE INSTALLATION OF ONE DRAIN TRAP

NOTE:

1. MAIN DRAIN LINE SHOULD BE SUFFICIENTLY SLOPED, SIZED AND VENTED TO HANDLE ALL DRAINS MANIFOLDED.
2. DRAIN TRAP PIPING SHOULD BE SIZED ACCORDING TO FLUID FLOW.
3. THIS ILLUSTRATION IS NOT MEANT TO BE A RIGOROUS AND ALL-ENCOMPASSING DESIGN. APPROPRIATE DESIGN CRITERIA (AS PROVIDED BY A PLUMBING/MECHANICAL CONTRACTOR) SHOULD BE UTILIZED TO INSURE PROPER CONTROL OF DRAINAGE EFFLUENT FROM THE SYSTEM. ALL PLUMBING SHOULD CONFORM WITH STATE AND LOCAL CODES.
   UAS ACCEPTS NO RESPONSIBILITY FOR PLUMBING DESIGN OR INSTALLATION.

FIGURE 4 - DRAIN TRAP

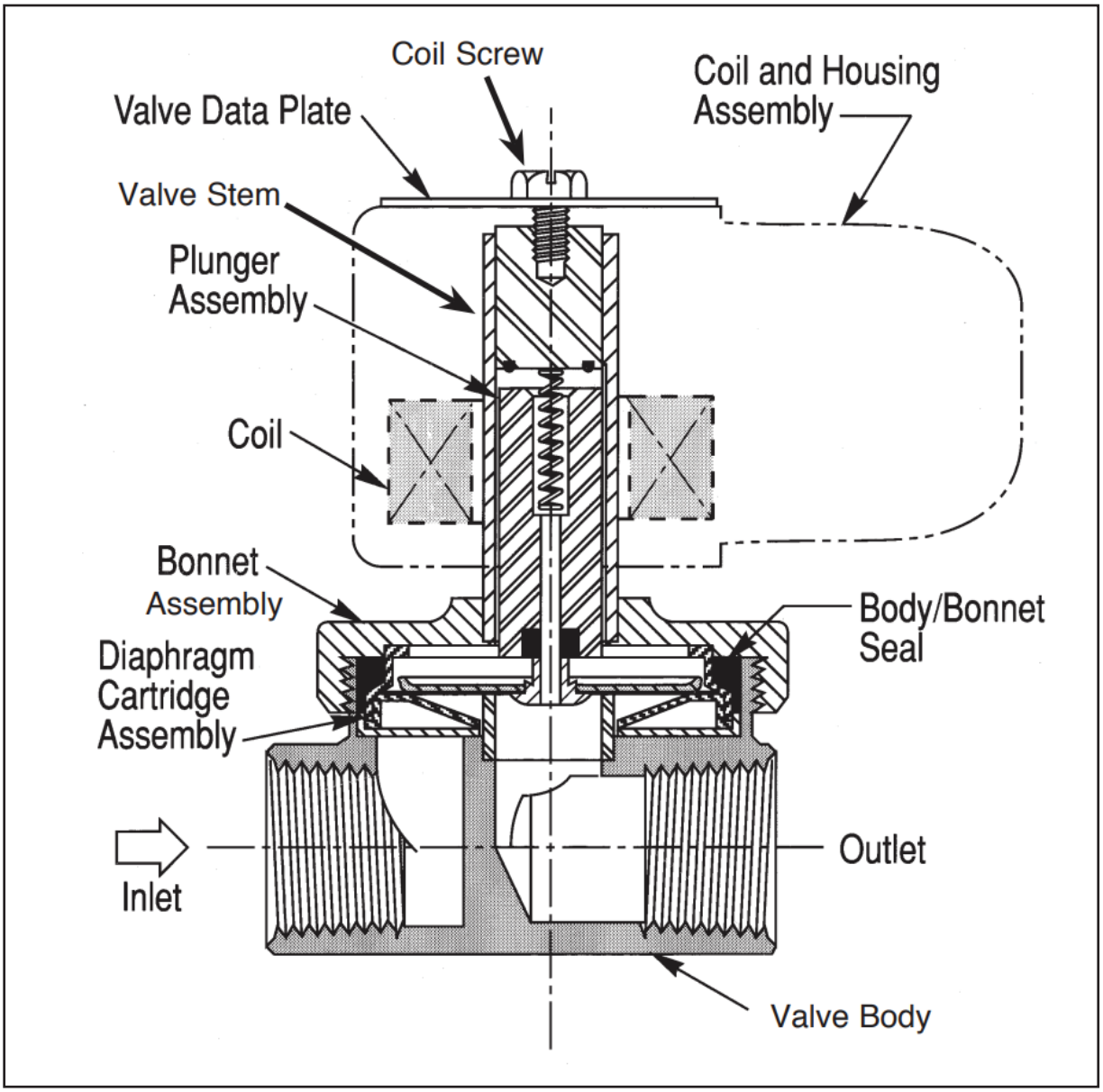


FIGURE 5
TYPICAL SOLENOID VALVE

Part No.	Description
20-10507	3/4” SOLENOID VALVE, 24VDC

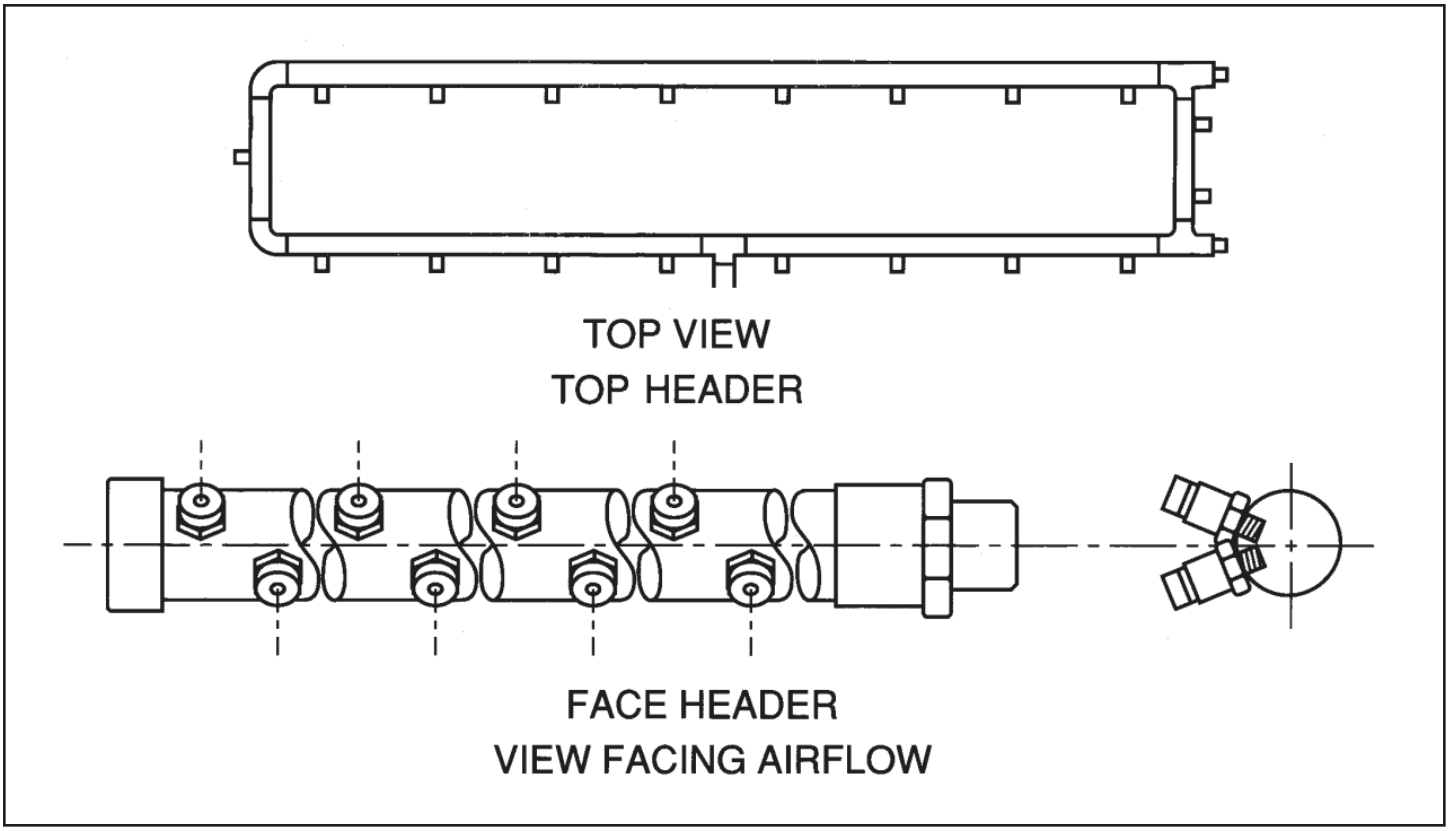


FIGURE 6
FIXED HEADER NOZZLE CONFIGURATIONS
HEAVY LOADING PSG

SPRAY NOZZLES

Item	Part No.	Description	TOP	FACE
1	38-0659	FLAT SPRAY (FULL JET0 1/8” K 2.5	2	N/A
2	38-0420	WHIRLJET 1/8” B2-3W	11/23/25	N/A
3	38-0026	1/8” GG6SQ	N/A	8/8/12

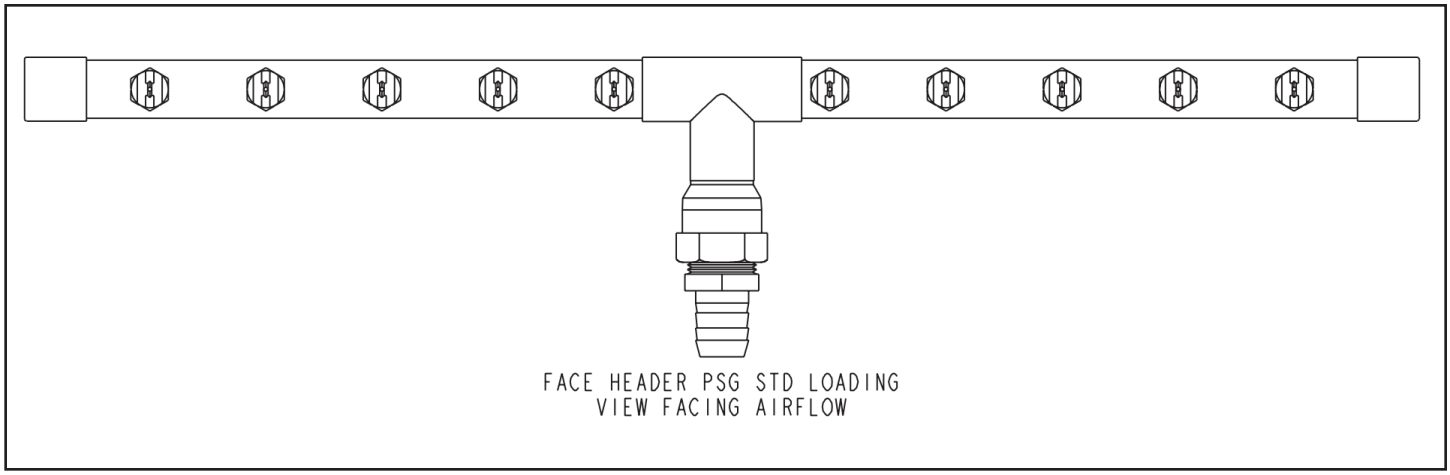


FIGURE 7
FIXED HEADER NOZZLE CONFIGURATION
STANDARD LOADING

SPRAY NOZZLES		PSG	QUANTITY PER HEADER
Item	Part No.	Description	
1	38-0852	VEEJET, FLAT SPRAY, H-1/8-VV-110-06	10/22/33

11. Manual Cleaning of SMOG-HOG® Components

There are a number of methods for manual cleaning, certain key cleaning criteria contribute to the effectiveness of every method. These include the type of detergent, detergent strength, water temperature, agitation/impingement, duration, rinse procedure and dry-out time.

11.1 Type of Detergent

In general the detergent used on most hydrocarbons (e.g., oily residues) will be alkaline in nature. It is extremely important that the detergent have a built-in buffering agent to reduce aluminum deterioration.

11.2 Detergent Strength

Detergent concentration in a mixture with water varies with the application from 1:1 to 25:1 parts water to parts detergent. For any contaminant condition, the best course is to use a cleaning solution per the detergent manufacturer's directions. More or less detergent may eventually be required for effective cleaning at reasonable detergent cost. The standard factory detergent concentration setting is 5% (20:1).

⚠ CAUTION

Never mix caustic and alkaline detergents for any manual or in-place cleaning. Detergent mixing could cause rapid heat release, gel formation or some other undesirable condition. Complete purging of system piping and soak tanks is required when changing detergents.

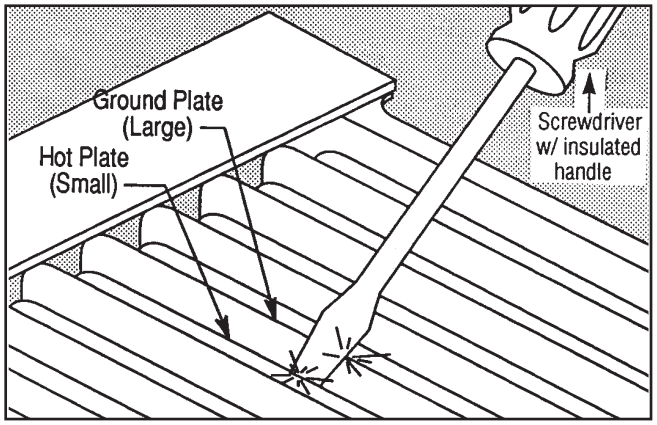


Figure 12
Grounding The Collector Cell Section

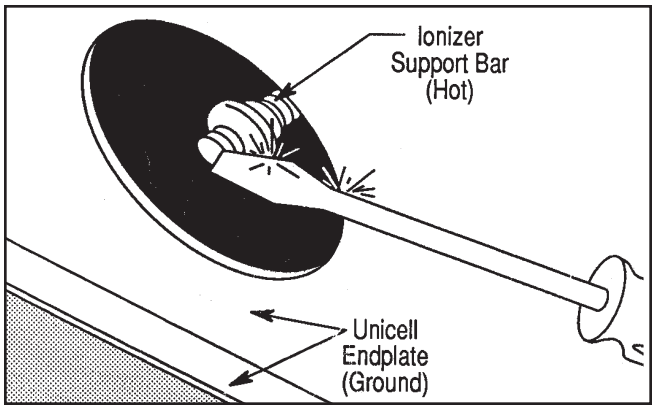


Figure 13
Grounding The Ionizer Section

11.3 Water Temperature

Detergents can be up to twice as effective in hot water. Hot water alone is very effective in softening built-up residue. Water temperature should be 140°F to 170°F, not to exceed 180°F.

11.4 Agitation/Impingement

These methods are virtually the same, with impingement being the most extreme form of agitation. Any liquid movement over built-up residue will remove a layer, allowing detergent to work on the next layer. A reduction in cleaning time duration usually results.

11.5 Cleaning Cycle Duration

In most cleaning methods, adequate time should be allowed for the detergent to remove the contaminant thoroughly. Reaction time will vary depending on detergent strength, temperature and agitation. Guidelines for mixing, heating and expected results are included on specification sheets for most detergents. Time is necessary for effective cleaning. Soaking may seem slower and less effective than high impingement and/or hot water above 180°F. Personnel should be forewarned about using excessive pressure or temperature to shortcut the cleaning process. High pressure or stream spray cleaning at point blank range until cell plates edges are shiny is not effective. Not only will penetration to the cell core not occur, but warping and bending of the plates may result as well. Patience and thoroughness of cleaning best preserve the integrity of the components in the long term. Soaking and gentle rinsing provides for best results.

11.6 Rinse Procedure

Cleaned components should be rinsed off quickly and thoroughly to remove remaining contaminants. If the components appear to be clean, some detergent residue may remain. This should be removed because the residue may contribute to voltage bleed-down when the unicell is placed in operation. Also, even though the detergent is "buffered" prolonged contact could cause oxidation. As with cleaning, hot water should be used for rinsing.

11.7 Dry-Out Time

Unicells and filter media should be dry before the PSG is placed into operation. Startup of a wet system will cause dead short conditions to the ionizer and collector cell circuits. Wet unicells and filter media should be placed in a warm room for drying. Techniques such as hand wiping insulators and blowing dry unicells and filter media with compressed air will decrease drying time. Another method for drying cleaned components is installing the unicells and filter media in the PSG and placing on the system blower on line, with all power pack enclosure toggle switches placed in the “off” position for 30 minutes.

12. Manual Cleaning Methods

The manual cleaning method selected will depend on the type of contaminant, rate of deposit, facility limitations such as cleaning time windows (process downtime) and available utilities. All cleaning methods listed in this section are acceptable.

12.1 Soak Tank

This is the most effective method which involves placing unicells and filter media in an agitated solution of hot water and detergent. With proper detergent selection and concentration, this procedure will quickly remove most contaminants. Unicells and filter media should not be placed in highly concentrated detergent solutions or allowed to soak for extended periods, (e.g., overnight), especially at elevated temperatures. Extended period of soaking in solvent or detergent solution will degrade components (oxidation) over time and should be avoided.

12.2 Portable Pressure Washer

A self-contained pressure washer with a spray wand can be an effective cleaning method, providing it is used with caution. Care should be taken not to expose the unicells to close-up and prolonged blasts of high pressure/temperature, causing cell plate deformity, requiring a replacement set of unicells and filter media.

12.3 Automatic Parts Washers

Certain commercially available units which are effective combine and automate the features necessary for effective cleaning, including water heating, detergent injection, agitation, rinsing and drying.

12.4 Other Cleaning Considerations

The previous methods address the cleaning of unicells and filter media. The PSG cabinet should also be periodically cleaned (i.e., during normal planned downtimes) to reduce contaminant build up. High voltage output of the power packs should also be checked when manual cleaning is performed.

13. Appearance Of Components After Cleaning

Components should have a clean, not necessarily “new,” aluminum appearance. Discoloration will not affect system efficiency. The following are acceptable conditions for the system components. Parts should be replaced as required.

13.1 Unicell

1. Frame, end plates and cell plates are free of contaminant build-up (residual contaminant has been removed between cell plates, and ionizer wire support bars).
2. The frame is square, cell plates are parallel, cell hot plates (small dimensional plates) are centered between ground plates (large dimensional plates).
3. Ionizer standoff insulators and cell triangular insulators (front and rear) are cleaned (no residual coating). Cracked or carbon-tracked insulators have been replaced.
4. Ionizing wires and springs are intact and taut, centered between ground plates with no contaminant build up or coating.
5. Contact springs and contact screws are properly located and not deformed replace missing or deformed contact hardware.
6. Bent or broken parts have been repaired or replaced.

13.2 Prefilters/Afterfilters

1. Aluminum media and frame are free of contaminant.
2. Frame is square and media is intact.
3. Filters are always installed with drain holes down and arrow on each frame pointing in the direction of airflow.

13.3 Cabinet

1. Door feed-thru insulators are cleaned and white.
2. Door gaskets are cleaned and intact.
3. Component tracks are free of contaminant build up (for unicell grounding).
4. Module drain sumps are cleaned and free-flowing.
5. Interior is free of extreme contaminant build-up.
6. Blower wheel and housing is free of extreme contaminant build-up.
7. Preconditioning equipment (inlet plenum with baffle filters, cooling coils, etc.) has been checked for excessive pressure drop, cleaned if necessary.
8. Nozzles on all in-place cleaning system headers are not plugged.

14. Part Replacement Procedures And Adjustments

14.1 Ionizer Wire(s) Replacement

Refer to Figure 14.

1. Remove damaged wire from each spring.
2. Replace spring if damaged or missing.
3. Loop one end of new wire over bottom spring. Pull top wire loop with pliers over top spring.
4. Wire should now be taut and centered.

⚠ NOTICE

If replacement parts are not available, remove broken wires and tension springs from the ionizer section until parts are available. The unicell can be placed in service with missing ionizer wires.

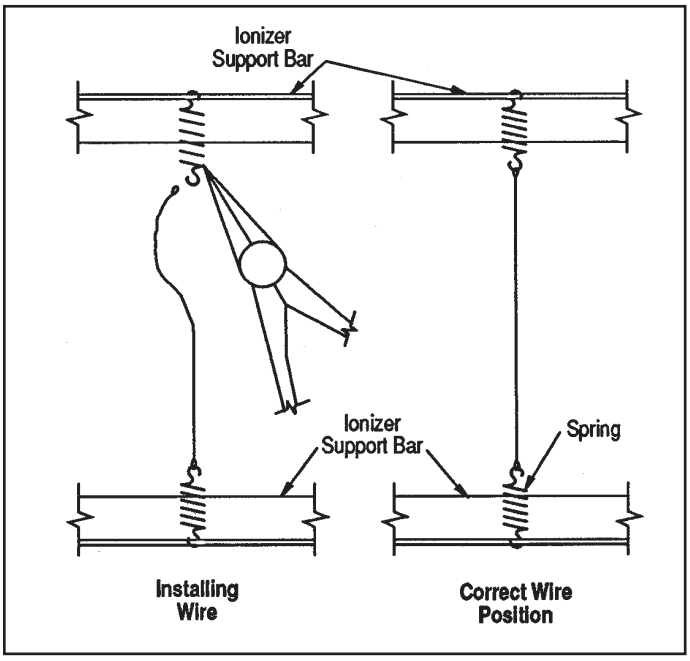


Figure 14
Ionizer Wire Installation

14.2 Door Feed-Thru Insulator(s) Replacement

1. Place system off line.
2. Open power pack enclosure lid cover.
3. Remove high voltage wire by removing #10-32 hex nut.
4. Remove insulator retaining nut.
5. Open module door and remove the long screw from the insulator.
6. Remove the insulator from the interior of the module door.
7. Clean silicone sealant from module door surface.
8. Install replacement insulator, reversing the procedure, and applying a thin coat of silicone sealant to base of insulator.

14.3 Indicator Light Replacement

1. Open the power pack enclosure lid cover.
2. Disconnect the red and black wires from the indicator light which is connected to wires “9” and “2”.
3. Remove indicator light installation nut. The indicator light located on each power pack enclosure is polarity sensitive. For proper operation, the two wires from the indicator light should be connected as follows, red wire connected to “9” wire from the power pack, black wire connected to “2” wire from the power pack. If the wires are reversed, the indicator light will not illuminate. The power pack indicator light circuit is DC voltage.
4. Install the replacement indicator light reversing the procedure.

14.4 Component Access Door(s) Gasket Replacement

Should leakage occur an adjustment of the latch paws on the back of the door handles may solve the problem. Extreme care should be exercised in compressing door gasket beyond the design limits. Before adjusting for gasket deflection, check for the following:

1. Door or cabinet damage.
2. Deformed or torn gasket.
3. Leakage from some other source. Unicell components should be removed and replaced with great care to preserve gasket integrity. Should damaged gasket require replacement, contact Parker for the correct gasket material, BUNA-N (42-0168) or Silicone (42-10206), or Rope Gasket (42-10205).

MODEL	INLET PLENUM DOOR	MODULE DOOR	ODOR DOOR
PSG-11, -12, -13, -14	5 FT (6 FT)	7 FT (8 FT)	12 FT (10 FT)
PSG-21, -22, -23, -24	9 FT (9 FT)	11 FT (12 FT)	18 FT (14 FT)
PSG-32, -33, -34	12 FT (12 FT)	16 FT (16 FT)	24 FT (18 FT)
PSG-42, -43, -44	16 FT (17 FT)	11 FT (12 FT)	18 FT (14 FT)
PSG-52, -53, -54	21 FT (6 FT)	16 FT (16 FT)	24 FT (18 FT)

- Rope gasket lengths are noted in parentheses.
- All lengths are per door.

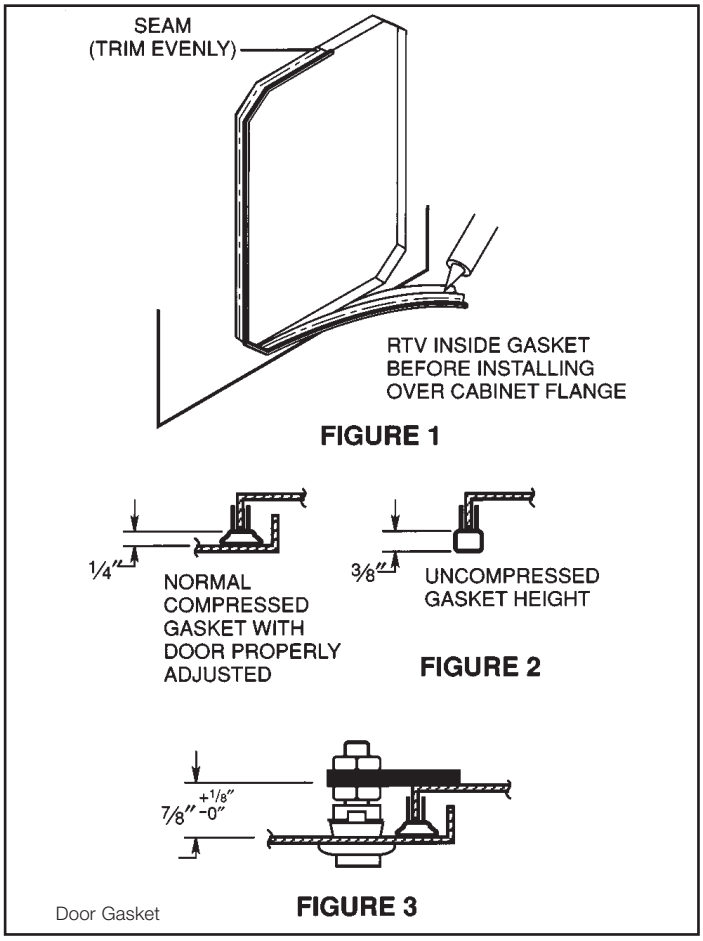


Figure 15
Door Gasket Installation

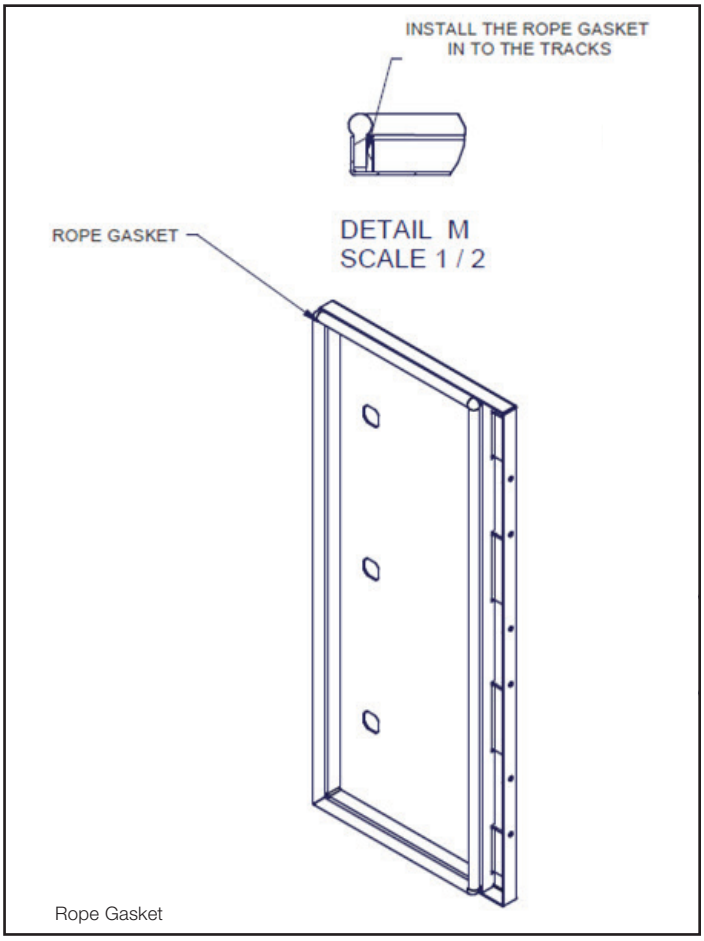


Figure 16
Rope Gasket Installation

To Change Door Gasket
Refer to Figure 15

1. Remove existing gasket, making sure to scrape off any residual silicone sealant.

2. Trim one edge of gasket neatly and evenly.

3. The door gasket internally has three lips to one side of the gasket and one lip to the other side. The door gasket should be installed with the three lips towards the interior of the cabinet.

4. The door gasket should be formed to the complete cabinet lip edge before applying silicone sealant. Place the trim edge at the top center of the cabinet lip edge and press gasket in place, ending at the same location. Do not trim excess.

5. Remove door gasket and apply silicone sealant to the inside of gasket or on the inside edge of the cabinet lip edge. Place the trim edge at the top center of the cabinet lip edge and press gasket in place, ending at the same location, trim excess. Remove excess silicone sealant and make sure the gasket is firmly bottomed on the lip edge by tapping with a rubber mallet or the gasket may not seal against the door properly.

6. Check that the distance from the inner face of the access door to the latch tongue measures 7/8". Slight adjustments may be necessary due to sheet metal variations.

To Change Rope Gasket
Refer to Figure 16

1. Remove the gasket to be replaced and scrape off any residual fire barrier silicone sealant from the door.

2. Measure the rope gasket according to the door groove and cut the edge of the gasket evenly straight. The door gasket should be formed to the complete door gasket groove before applying fire barrier silicone sealant.

3. Apply fire barrier sealant evenly in the groove. Place the rope gasket in the groove and press the gasket in place, starting and ending at the same place.

4. Sealant becomes tack-free in about 90 minutes; Full cure is approximately one day.

5. Make sure that the rope gasket is firm in place.

14.5 Power Pack Enclosure Push Rod Adjustment

Tools required:

- 6” adjustable or 5/16” open-end Wrench. Refer to Figure 9.

1. Close module door (10) with unicells installed.
2. Open power pack enclosure lid cover (3).
3. Loosen 5/16” hex jam nut (9), then back off push rod extension (1) to end of threads.
4. Close power pack enclosure lid cover, listening for point where limit switch (4) is engaged.
5. Adjust rod extension (1) inward until limit switch (4) engages approximately one inch before the power pack enclosure lid cover closes (3).
6. Tightened hex jam nut.
7. Close power pack enclosure pack lid cover (3) and latch.

9.6 Blower Lubrication

The blower bearings require lubrication at a 2 to 3 month interval (petroleum lubricant lithium NLGI grade 2 grease). The bearings should be lubricated with the blower in operation. A hand operated grease gun is required performing one to two injections slowly, do not exceed two injections. Excessive injections/grease will cause bearing seal failure, contributing to bearing failure.

15. Troubleshooting

⚠ CAUTION

Troubleshooting should only be completed by qualified and trained personnel.

⚠ CAUTION

Hazardous live and moving parts are exposed during the troubleshooting procedures.

⚠ WARNING

Power pack enclosure(s) service voltage is 120VAC. This can be lethal. Voltage (120 VAC) is present within the power pack enclosure even though the toggle switch is placed in the off position.

⚠ CAUTION

RISK OF ELECTRICAL SHOCK.

The high voltage circuits to the ionizer and collector should be grounded before removing the power pack, high voltage wires, door feed through insulators and unicell(s). The grounding procedure can be accomplished by waiting one minute after placing the toggle switch in off position to the power pack enclosure or refer to Figures 12 and 13. The power pack total current output is limited to a maximum of 5 milliamps to assure personnel safety.

The PSG system can consist of one or more modules. Each module represents an independent collection system, 1, 2 or 3 unicells in series with a power pack enclosure. The power pack enclosure indicator light is the reference in determining the module status. The indicator light illuminated represents a working module, usually within high voltage specifications. An indicator light flashing or not illuminated exhibits an abnormal condition.

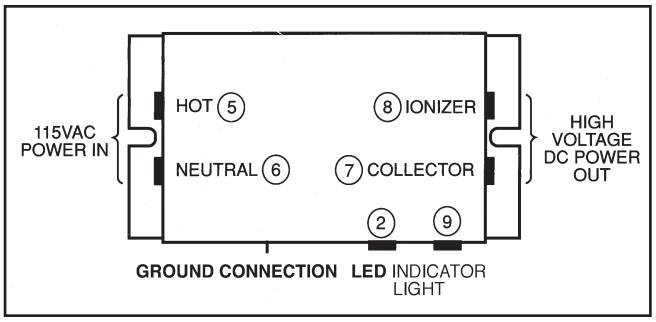


Figure 17
Power Pack Input and Output Connections

15.1 Tools Required

- Multimeter
- High voltage probe accessory for the multimeter
- High voltage test cables (2), 3’ in length with test clips at each end
- Basic hand tools
- *One power pack (Parker Part Number 21-1216)
- AC cable with three prone plug (for the wall receptacle), opposing end of cable should have two connectors for the power pack and a test clip for the ground wire. The ground wire should be secured to the ground stud on the power pack.

* A power pack can be utilized from one of the modules.

15.2 Perform Before Troubleshooting

The following should be checked to the module(s) in which the indicator light(s) is flashing or is not illuminated. Corrections should be completed and parts replaced.

- Toggle switch is in the on position to the power pack enclosure.
- Check adjustment of the push rod which engages the interlock switch refer to Section 9.5 “Adjusting Push Rods”.
- Proper electrical alignment to the unicell components, refer Figure 6, correct if necessary.
- The proper numbers of unicells are installed to the module.
- Unicell components have a moderate to extreme contaminant build up, manually clean the unicell components.
- Ionizer wires and tension springs missing or broken, remove broken wires/springs from the drain sump and or the unicell components
- Ionizer standoffs, cell triangular and or door feed through insulators display moderate to extreme contaminant build up, broken or carbon tracked insulators, clean or replaced (imbedded black streak which cannot be removed by cleaning, replace insulator).

15.3 Troubleshooting Procedure

Each power pack enclosure is equipped with an interlock switch for the power pack 120 VAC circuit. Since the power pack enclosure lid cover is open for troubleshooting the interlock switch should be engaged (manually or by other means) after placing the toggle switch in the on position and disengaged when placing the toggle switch in the off position.

All connectors on the power pack are identified with name and wire number with the exception of the ground connector (green wire to this connection). Refer to Figure 17. Step 1 and Step 2 does not require a high voltage probe.

If there is a dead short condition or arcing condition usually the problem is within the collector cell. The power pack should be confirmed that the power pack is operational, start with step (1), before proceeding to the step (2). In the event of a dead short condition the power pack is designed to “shut down” the high voltage to the ionizer and collector cell circuits causing the indicator light to flash. When the dead short condition is removed possibly by the exhaust blower or In Place Cleaning System (if so equipped) or manual cleaning the high voltage output will return to normal. The indicator light will be illuminated. The power pack is self protecting from dead short conditions. The ionizer section supports 10 mil tungsten wires which apply a high voltage positive charge to the contaminant particles.

The cell section contains plates alternately charged collecting the contaminant particles from the ionizer section.

High voltage problems can generally be isolated by reference to the indicator light. If the indicator light(s) are illuminated and the unit is moving air but efficiency is below normal (unicells not dirty, smoke discharging from the exhaust blower) check for properly aligned unicells. Refer to Figure 6.

A high voltage probe is required to measure high voltages to the ionizer and collector circuits to the unit and performing the “Bench Test Procedure”. As an accessory, a high voltage probe can be purchased for a multimeter.

High Voltage Specifications:

Ionizer Circuit Operating Range: 10.0 to 11.8 KVDC

Collector Cell Circuit Operating Range: 5.0 to 7.5 KVDC

There are two factors which will elevate ionizer voltages above 12.0 KVDC.

1. The ionizer wires are heavily coated with contaminant (two to three times or greater, the diameter of the wire). This will decrease collection efficiency.

2. There are “run away” voltages to the power pack requiring power pack replacement, above 12.0 KVDC to the ionizer circuit, and 7.5 KVDC to the collector cell circuit.

There will 7.5 KVDC. This is also caused by “run away” voltages to the power pack requiring power pack replacement. A high voltage measurement can be performed by removing both the high voltage wires from the power pack to determine high voltage output refer to “Testing the Power Pack” in the “Bench Testing Procedure”. The high voltage measurement should not exceed “High Voltage Specifications”.

15.4 STEP 1 — Checking the Power Pack Indicator light is flashing or not illuminated

The toggle switch should be placed in the off position to the power pack enclosure, open power pack enclosure lid door, and disconnect both high voltage wires (Ionizer #8 and Collector #7) from the power pack. The high voltage wires should carefully be placed away from the ionizer and collector cell power pack connectors, eliminating the high voltage wires from contacting the power pack connectors. Place the toggle switch in the on position and engage interlock switch; the indicator light should be illuminated. If the indicator light is illuminated the power pack is operational, proceed to step (2). If the indicator light is flashing (high voltage wires #8 and #7 disconnected from the power pack), the power pack requires replacement. If the indicator light is not illuminated proceed with following until the problem is located and corrected.

The following steps refer to the wiring diagram within the power pack enclosure or Figure 18.

Verify there is 120 VAC to the power pack, place the toggle switch in the off position and remove the 120 VAC wires from the power pack terminals 5 and 6. Connect the multimeter to the two 120 VAC wires and place the toggle switch in the on position and engage the interlock switch.

Confirm 120 VAC to the power pack enclosure terminals, not the power pack terminals 5 and 6.

Verify the interlock switch operation (120 VAC) to the power pack enclosure (measure voltage to the primary side of the interlock switch and engage interlock switch before measuring voltage to the secondary side. The mechanical engagement of the limit switch should be checked refer to Section 9.5.

Place system off line and check the tightness of all wire terminal screws and inspect for disconnected wires at the power pack enclosure or remote electrical panel terminal blocks.

Inspect the fuses or circuit breaker to the power pack circuit.

Indicator light and circuit should be checked. Check wire connections (#9 and #2) to the power pack, and to the indicator light assembly. The LED requires correct wiring polarity. The LED will not illuminate if the wiring polarity is incorrect.

The power pack has two terminals for the indicator light, identified as #9 (+), and #2 (-). The factory wiring numbers are identical.

LED has two wires (red and black) from the assembly, wire #9 to the red wire, wire #2 to the black wire.

VDC measurement with wires #9 and #2 disconnected from the power pack: 7.9 to 10.0 VDC, with #9 and #2 connected 3.8 to 6.0 VDC.

Place toggle switch in the off position and connect all wires which have been disconnected.

Parts should be replaced as required.

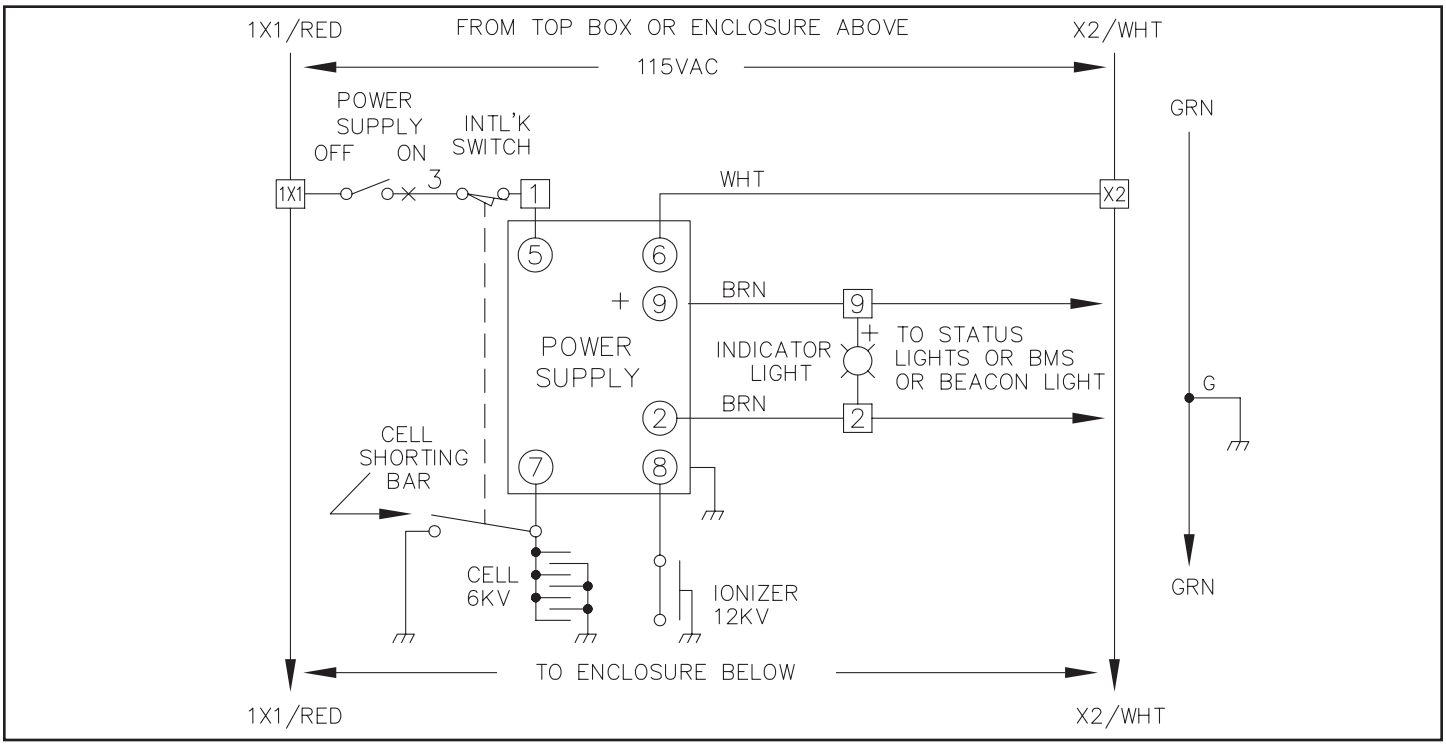


Figure 18
Power Pack Enclosure Wiring Diagram

15.5 STEP 2 — Checking the Unicell Components Indicator Light is Flashing

Do not proceed with step (2) until step (1) is completed. The following steps are the process of elimination in identifying the problems to the ionizer/collector cell circuits. There are four conditions which could occur with a flashing indicator light.

1. The high voltages are below specifications to the ionizer and or the collector cell circuit(s).
2. There is an arcing condition to the ionizer and or collector cell circuit(s).
3. There is a dead short condition.
4. The power pack has failed. Refer to Step 1.

(a) Place the toggle switch in the off position, and open power pack lid door. Disconnect high voltage wire #8 to the ionizer connector with high voltage wire #7 (Collector) connected to the power pack and place the toggle switch in the on position, and engage interlock switch.

The indicator light should be illuminated. If so, the cell circuit is operational proceed to (b). If indicator light is flashing perform the following.

- Place toggle switch in the off position, open component door, and remove the unicell(s).
- Place toggle switch in the on position, and engage interlock switch. The indicator light should be illuminated. If the indicator light is illuminated the problem is within the collector cell section. If the indicator light is flashing the problem is the high voltage feed through insulator (dirty, cracked, carbon tracking) and or the high voltage wire (broken wire or wire insulation has deteriorated causing a dead short condition).

Parts should be replaced as required.

Remove the unicells and inspect for the following:

Collector Cell Conditions Causing Failure

- Dirty collector cell(s) (contaminant build up bridging the cell plates and or on cell triangular insulators front/rear) requiring manual cleaning.
- "Wet" collector cell(s), not properly dried after a wash cycle or manual cleaning procedure, use compressed air to accelerate the drying time.
- Deformed collector cell contact springs contacting a "grounded surface".
- Misaligned contact springs (contacting a grounded surface) between the outer and inner most cells if module is equipped with two unicells and or at high voltage feed through insulators. Refer to Figure 6.
- Bent cell plate(s) contacting the opposing cell plate(s).
- Warped cell plate (s) which could be due to high duct operating temperature, consult Parker.
- Carbon tracking to the cell high voltage feed through insulator and or cell triangular insulators, imbedded black streak which cannot be removed by cleaning (replace insulator).
- Surface oxidation to unicell component requiring a replacement.
- Unicell is structurally weak, loose steel rivets, deterioration to cell plate spacers or paper thin cell plates due to utilizing the improper detergent.

Parts should be replaced as required or replacement of unicell.

Sometimes a flashing indicator light will clear itself by removing the unicell(s) from the module and then installing the unicell(s) back into the module.

The Bench Test Procedure will determine which unicell(s) are causing a flashing indicator light. Refer to Section 10.7.

Place toggle switch in the off position; connect all wires which have been disconnected and install unicell(s).

(b) Indicator light is illuminated with the high voltage wire #7 connected to the collector cell connector on the power pack. Place toggle switch in the off position and connect high voltage wire #8 to the ionizer connector on the power pack. Place the toggle switch to the on position and engage the interlock switch.

The indicator light should be illuminated? If so, the unicell(s) are operational. If the indicator light is flashing perform the following.

Sometimes a flashing indicator light will clear itself by removing the unicell(s) from the module and then installing the unicell(s) back into the unit.

The Bench Test Procedure will determine which unicells are causing a flashing indicator light, refer to Section 10.7.

Place toggle switch in the off position; connect all wires which have been disconnected and install unicell(s).

15.6 High Voltage Probe Measurements

A high voltage probe (refer to manufacturers instructions) is required to measure high voltage output from the power pack. Refer to Figure 19. The component door should be closed with the indicator light illuminated. If the indicator light is flashing or not illuminated perform step 1 and if required step 2.

1. Place toggle switch to the power pack enclosure in the on position.
2. Open the lid door to the power pack enclosure and connect the ground wire from the high voltage probe to the bare metal push rod.
3. Engage the interlock switch and place the tip of the high voltage probe to the ionizer door feed through insulator. The high voltage measurement should be 10.0 to 11.8 KVDC. If the ionizer voltage is below specifications refer step 2, “Ionizer Conditions Causing Failure”. Bench Testing may also be required. Low ionizer voltage will decrease the collector cell voltage, but low cell voltage will not affect the ionizer voltage.
4. Engage the interlock switch and place the tip of the high voltage probe to the collector cell door feed through insulator. The high voltage measurement should be 5.0 to 7.5 KVDC. If the collector cell voltage is below specifications refer step 2, “Collector Cell Conditions Causing Failure.” Bench Testing may also be required. Low ionizer voltage will decrease the collector cell voltage.

The high voltage probe can be used to determine which circuit is arcing by isolating each circuit ionizer or collector cell.

1. Disconnect high voltage wire #7 (collector cell) and measured high voltage to the ionizer circuit (high voltage wire #8).
2. Connect high voltage wire #7 and disconnect high voltage wire # 8.
3. Measure high voltage to the collector cell circuit (high voltage wire #7) Fluctuating high voltage during a measurement will indicate an arcing circuit.

15.7 Bench Test Procedure

⚠ CAUTION

RISK OF ELECTRICAL SHOCK.

The high voltage circuits to the ionizer and collector should be grounded before removing the power pack, high voltage wires, door feed through insulators and unicell(s). The grounding procedure can be accomplished by waiting one minute after placing the toggle switch in off position or refer to Figures 12 and 13. The grounding procedure statement is not identified within the bench test procedure but should be performed. The power pack total current output is limited to a maximum of 5 milliamps to assure personnel safety.

This procedure can be utilized to determine an electrical problem with the unicell(s) or a power pack or testing the unicell(s) after manual cleaning.

Do not use a power pack that is not within the high voltage specifications, refer to "Testing the Power Pack" (Page 23).

High Voltage Specifications:
Ionizer Circuit Operating Range: 10.0 to 11.8 KVDC
Collector Cell Circuit Operating Range: 5.0 to 7.5 KVDC

Testing the Ionizer

1. Select one unicell to be tested.
2. Connect one high voltage wire to the ionizer contact spring and to the power pack connector identified as "Ionizer #8".
3. Connect the other high voltage wire (use as a ground wire) to the metal frame of the unicell and to the ground stud on the power pack.
4. AC cable should be connected to the power pack conectors 5 and 6 with ground wire secured to the ground stud on the power pack.
5. Connect AC cable plug to the wall outlet.
6. Measure high voltage with the high voltage probe, ionizer voltage should be 10.0 to 11.8 KVDC, not to exceed 12.0 KVDC. If ionizer voltage exceeds 12.0 KVDC, the ionizer wires are moderately to extremely coated with contaminant (clean ionizer wires), or the power pack is not within specifications.
7. If there is an arcing condition, determine the problem and repair.
8. Disconnect AC cable plug from the wall outlet.

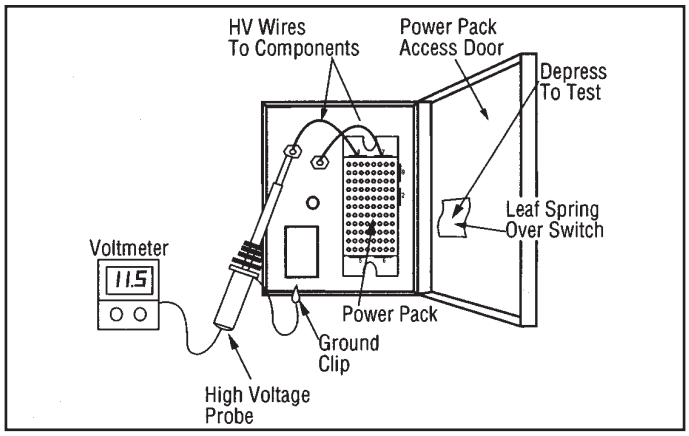


Figure 19
High Voltage Measurements at the Power Pack

Refer to "Ionizer Conditions Causing Failure" in Section 10.5.
Ionizer may not be within high voltage specifications, even though manually cleaned, due to the service "age" of the unicell. The unicell should be replaced.

Parts or unicell should be replaced as required.

Testing Collector Cell

1. Select one unicell to be tested.
2. Connect one high voltage wire to the collector cell contact spring and to the power pack connector identified as "Collector #7".
3. Connect the other high voltage wire (use as a ground wire) to the metal frame of the unicell cell and to the ground stud on the power pack.
4. AC cable should be connected to the power pack conectors 5 and 6 with ground wire secured to the ground stud on the power pack
5. Connect AC cable plug to the wall outlet.
6. Measure high voltage with the high voltage probe, collector cell voltage should be 5.0 to 7.5 KVDC, not to exceed 7.5 KVDC. The collector cell will not maintain high voltages above 7.5 KVDC. The collector cell will continuously arc. Usually this condition is caused by a power pack above the High Voltage Specifications. The power pack should be replaced.
7. If there is an arcing condition, determine the problem and repair.
8. Disconnect AC cable plug from the wall outlet.

Unicell may not be within high voltage specifications, even though manually cleaned, due to the service "age" of the unicell. The unicell should be replaced.

Parts or unicell should be replaced as required.

Testing the Power Pack

1. Connect AC cable to the power pack connectors 5 and 6 with the ground wire secured to the ground stud on the power pack.
2. Connect AC cable plug to wall outlet.
3. Measure high voltage with high voltage probe at the connectors "Ionizer #8" and "Collector #7", refer to high voltage specifications.
4. Disconnect AC cable plug from the wall outlet.
5. Replace power pack if high voltage measurements are above or below high voltage specifications.

15.8 Troubleshooting Guide

Problem	Possible Causes	Recommended Solutions
System will not start or only operate a short duration	Main electrical disconnect switch in the off position.	Place disconnect switch in the on on position.
	The unit start/stop switch is in the off position.	Press the unit start switch in the on position.
	Fused have failed.	Replace the fuses.
	Overload relay has tripped.	Compare FLA rating of the motor to the overload relay setting, adjust as required and measure amperage.
	Poor wire connections.	Check wire connections at motor and all wire terminations.
Insufficient airflow	Blower rotation is incorrect.	Check blower rotation per directional arrow on the blower housing. Refer to Section 4.1.3.
	PSG access door(s) are open.	Check drive belts and motor condition.
	PSG has extreme internal contaminant build up due to poor maintenance.	Close PSG access door(s).
	Internal debris within the duct and or PSG cabinet.	Manually clean the PSG unit. Refer to Sections 6, 7 and 8.
The power pack enclosure indicator light is not illuminated	Power pack enclosure toggle switch is in the off position.	Remove debris.
	Power pack enclosure(s) push rod assembly is not properly adjusted.	Refer to Section 9.5.
	Power pack has failed.	Refer to Section 10.4.
The power pack enclosure indicator light is flashing.	Unicells are not properly electrically aligned.	Refer to Figure 6.
	Unicell(s) have a moderate to extreme contaminant build up.	Refer to Sections 6, 7 and 8.
	High voltage measurements are not within specifications.	Refer to Section 10.3.
	Power pack has failed.	Refer to Section 10.4.
System efficiency is poor. Smoke is discharging to the atmosphere.	Power pack enclosure(s) toggle switch are in the off position.	Check power pack enclosure(s) toggle switch position.
	Unicells are not properly electrically aligned.	Refer to Figure 6.
	Unicell(s) have a moderate to extreme contaminant build up.	Refer to Sections 6, 7 and 8.
	Power Pack has failed.	Refer to Section 10.4.
	Power pack enclosure(s) push rod assembly is not properly adjusted.	Refer to Section 9.5.
	Fuses have failed to the power pack circuit.	Replace fuses.
	Air volume (ACFM) is not within specifications.	Measure air volume, call Parker Customer Service for specifications.

PROBLEM	POSSIBLE CAUSES	RECOMMENDED SOLUTIONS
The wash cycle will not start in the manual and/or auto mode.	The SmogHog is on line.	Place the SmogHog off line by pressing the unit “Stop” push button, refer to Section 2.4 for information on the electrical interlock.
	Service voltage (120 VAC) has been interrupted to the Wash Control Panel.	Confirm that 120 VAC is present at the Wash Control Panel, refer to Electrical Drawings for assistance.
	Fuses failed within the Wash Control Panel.	Replace fuse(s) and determine if there is an electrical problem, refer to Electrical Drawings.
	The programmable logic controller (PLC) is not operational.	Confirm 120 VAC is present at the PLC, refer to Electrical Drawings. The LED indicators, “Power” and “Run” should be illuminated to the PLC. If the “Fault” LED indicator is illuminated contact Parker SmogHog Customer Service at 800-252-4647.
	Auto mode is not operating per selected time.	Check program time and mode of operation to the time clock, refer to time clock instructions within the Wash Control Panel.
	Time is not displayed on time clock.	Time clock is in sleep mode due to 120 VAC not present at the Wash Electrical Panel.
Detergent consumption is low or no consumption.	Detergent reservoir is empty.	Fill the detergent reservoir.
	The detergent pump assembly ball valve is in the closed position.	Open ball valve, refer to Figure 2, view “A” item (10). The ball valve in Figure 2 is illustrated in the open position.
	Detergent pump doesn’t have power.	Check connections to and from tank stand junction box.
	The detergent operating pressure is not 5 to 10 psi above the operating water pressure.	1. Adjust the detergent operating pressure pump, refer to Section 4.1 (5b). Check that detergent is visible to the PVC transparent hoses, inlet and outlet to the detergent pump. 2. Remove screen from Y-strainer, checking for debris, refer to Figure 2 item (11). 3. Check for obstructions and kinks to the PVC hoses and rigid piping (supplied by others). 4. Check detergent pump flow, by disconnecting the PVC hose at the injector tee assembly & placing hose in bucket. Use an AC extension cord and connect to a “live” AC outlet. (Flow rate: 1.0 GPM). Replace detergent pump if not within flow rate specifications.
	Detergent Frequency Adjustment is configured to skip a detergent wash.	Refer to wash control document regarding the configuration of detergency frequency.
	“Wash Time Selection” is in test mode reducing detergent consumption.	Refer to “Sequence of Operation” instructions to determine/adjust “Wash Time Selection.”
	Metering plate is obstructed with debris.	Clean metering plate, refer to illustration Figure 3 Item (9).
	Auto mode is not operating per selected time or time is not programmed.	Check program time and mode of operation in wash controller.
Operating water pressure is low or at 0 (zero) psi.	The water supply valves (supplied by others) are closed.	Open the water supply valves.
	The Y-strainer screen is obstructed with debris.	Clean the screen to the Y-strainer located to the injector tee assembly, refer to Figure 3 Item (1).
	Main water solenoid valve and/or cell wash solenoid valves are not operating per Sequence of Operation Instructions.	Repair problems by referring to the Sequence of Operation Instructions and the Electrical Drawings located in the Wash Control Panel.
	The spray nozzles are plugged at each tier as identified as A1, B1, C1, D1, etc.	Operate a wash cycle and open individual module component access doors to determine location of plugged spray nozzle(s).
Detergent consumption is high.	External leaks from the detergent pump assembly and/or piping.	Repair external leaks.
	“Wash Time Selection” has been increased in time length.	Decrease “Wash Time Selection” to the original setting.
	Metering plate has been removed from the injector tee assembly.	Replace metering plate, refer to Figure 3 Item (9).
Wash water is back-flowing into the detergent tank.	There is debris within the check valve to the injector tee assembly.	Remove check valve and clean, refer to Figure 3 Item (13).

16. Ordering Parts

17.1 Replacement Parts

Common replacement parts are illustrated within this manual. For further assistance call Parker Customer Service.

Parker Hannifin
Industrial Gas Filtration and Generation Division
4087 Walden Avenue
Lancaster, NY 14086
1-800-343-4048

For prompt service, please specify:

1. Unit Model Number (nameplate)
2. Unit Serial Number
3. Part Number or Part Description (see illustrated parts)

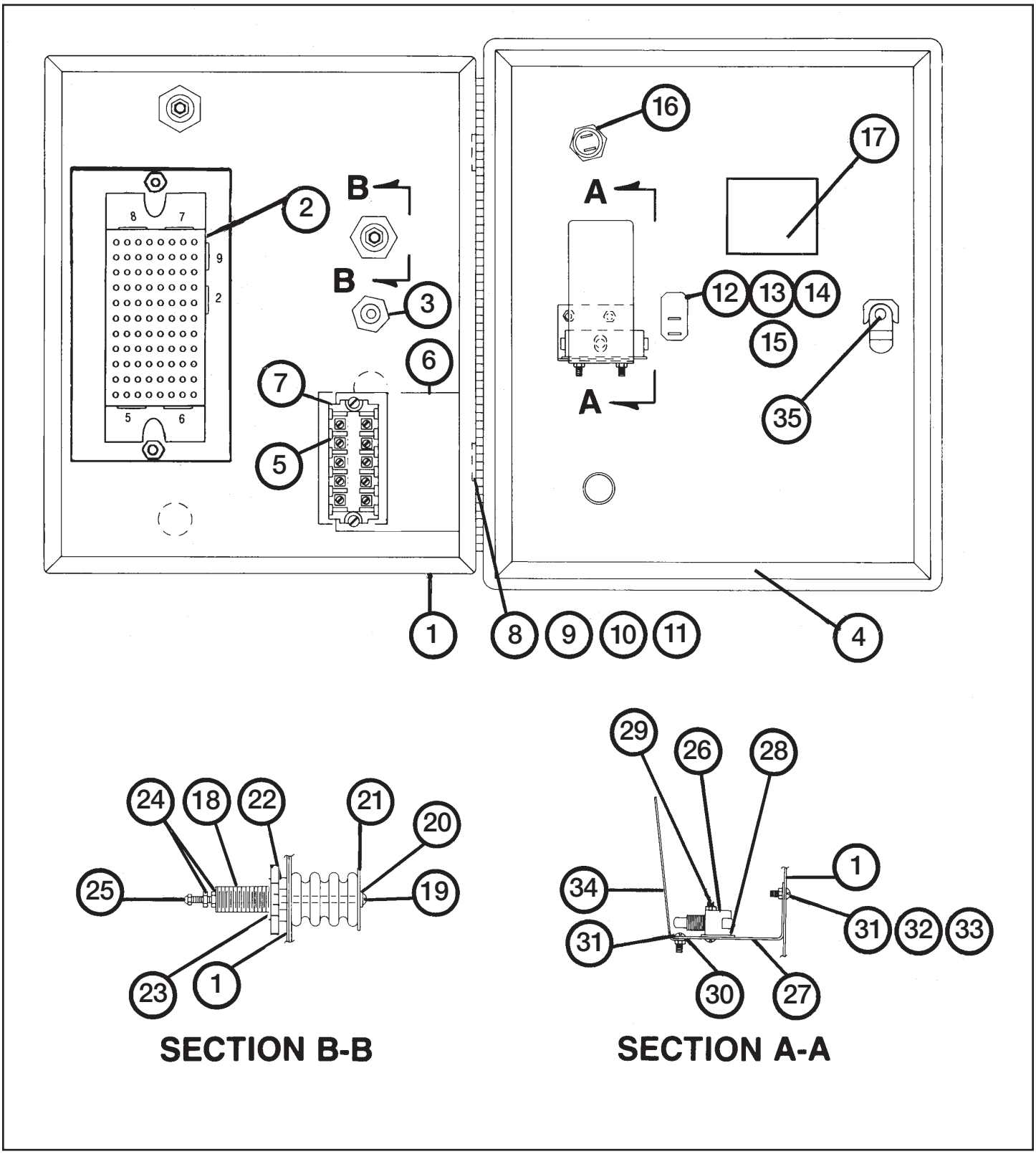
17.2 Returning Parts

When returning parts directly to Parker, call Customer Service at 1-800-343-4048 for a return authorization number (RMA). Mark it prominently on the returned package to assure prompt handling and service.

17.3 Freight Cost

Freight cost on returned parts must be prepaid by the sender. Freight cost on parts shipped from Parker is prepaid by Parker and added to the cost of the parts.

17. Power Pack Enclosure Assembly



POWER PACK ENCLOSURE ILLUSTRATION

17.1 Power Pack Enclosure Assembly Parts List

ITEM NO.	PART NO.	DESCRIPTION	QUANTITY REQUIRED
1	20-1396	Power Pack Enclosure	1
2*	21-1216D	Power Pack	1
3	02-1651	Shorting Out Assembly	1
4	42-10063-0001	Gasket For Lid Cover	1
5	20-2835	Terminal Block	1
6	10-11034-0002	Terminal Bracket	1
7	41-2435-5	Terminal Label	1
8	30-0121	Screw RD HD ½"	1
9	30-0065	Flat Washer #10	1
10	30-0040	Lock Washer #10	1
11	30-0003	Hex Nut 10 x 32	1
12	20-0326	Toggle Switch SPST	1
13	30-0045	Lock Washer ½"	1
14	20-0002	Label "Off/On"	1
15	20-0035	Hex Cap Switch Seal	1
16	02-10561-G	LED Light	1
17	41-2535	Wiring Diagram Label	1
18	02-0749	Door Feed Through Insulator Assembly	2
	37-0026	Door Feed Through Insulator	2
19	30-0398	Round Head Screw, #10-32 x 4" SST	2
20	30-0412	Lock Washer, #10 EXT. Tooth, SST	2
21	30-0367	Fender Washer, ¼" x 1 1/2", SST	2
22	35-0013	Spacer	2
23	30-0310	Pal Nut, 5/8"-16	2
24	30-0003	Hex Nut, #10-32 x 1"	4
25	30-0249	Hex Cap Nut, #10-32 SST	2
26	20-1239	Interlock Switch, SPST (N.O.)	1
27**	10-1077	Mounting Switch Bracket L/R	1
	10-1076	Mounting Switch Bracket R/L	1
28	37-0031	Switch Insulator	1
29	30-0016	Screw 6-32 x 1"	2
30	30-0345	Nut Plate	2
31	30-0118	Screw 6-32 x ½"	4
32	30-0038	Lock Washer #6	2
33	30-0001	Hex Nut 6-32	2
34	10-0961	Interlock Switch Arm Ground Bar	1
35	39-10008-0006	Hex Latch	1

* Standard power pack part number. System could have a special power pack, refer to part number on the power pack (21-XXXX) before ordering replacements.

** L/R left to right airflow unit, R/L right to left airflow unit, as viewing from the component door side.

FDNY COA #5585 CONDITIONS of APPROVAL

1. Prior to installation of the PSG electrostatic air cleaner, plans must be filed with and accepted by New York City Department of Building (DOB). Additionally, a copy of DOB docketed plans shall be transmitted to the Fire Department for review and approval.
2. Actuation of the fire protection system shall cause shutdown of electric power to the electrostatic precipitator without causing shut down of the exhaust fan. Grease exhaust duct on outlet of electrostatic precipitator shall terminate outside the building.
3. Prior to use of the refe4renced PSG electrostatic air cleaner, the fire extinguishing system shall be subject to the FDNY Range Hood Inspection Unit's approval.
4. ESP modules should be visually inspected weekly in order to identify problems such as moderate to extreme contaminant build up which can occur even though the high voltage indicator lights are illuminated.
5. Installation, maintenance, cleaning procedures and use of above referenced products shall comply with all applicable New York City Fire Code, New York City Electrical Code, Construction Codes, rules and regulations.
6. The entire PSG electrostatic air cleaner shall be inspected, cleaned and replaced if necessary, by the manufacturer trained and/or certified agent. A record of such inspection and cleaning shall be kept on the premises for inspection.
7. Certificate of Approval number shall be plainly and permanently stamped or otherwise affixed upon each product by the manufacturer or the local sales representative of the manufacturer. **NOTE:** product must already be identified with Certificate of Approval number before it arrives at New York City job site.
8. The Fire Suppression system should be serviced by an authorized fire suppression company semi-annually. The fusible links used in the system are to be changed annually and are date stamped by NYC code.
9. Intertek's ETL listing requirements and safety limitations shall be complied with and manufacture's installation, maintenance procedures and safety limitations shall be complied with.
10. All installations shall be subject to inspection by representatives of the Bureau of Fire Prevention which may result in added requirements being imposed.
11. The Fire Department Certificate of Approval does not constitute an endorsement or recommendation of your products by the Fire Department, but is a certification that your product, as represented, meets the standards as of the date of issuance.
12. End users that fail to comply with the conditions as outlined in the acceptance will be subject to enforcement action which may include fines and imprisonment.

Product Warranty –

SMOG-HOG® and DUST-HOG® Pollution Control Systems

1. Subject to the terms and conditions hereof, Parker-Hannifin Corporation (PARKER) warrants that major structural components on MCB, PNP, SDC, SFC, and SHM series will be free from defects in materials and workmanship for ten (10) years from the date of shipment from Parker. Subject to the terms and conditions hereof, warrants to the original Buyer of any Parker product (PRODUCT) installed and used as recommended by PARKER in normal service, that if the PRODUCT fails or is materially defective within twenty-four (24) months from date of installation or thirty (30) months from the date of shipment (whichever is earlier), of such PRODUCT, then PARKER, at PARKER'S sole option, will replace the PRODUCT with the same or equivalent PRODUCT, repair the PRODUCT or refund the original purchase price for the PRODUCT. Such replacement, repair of payment by PARKER shall be in complete satisfaction of any and all liability of PARKER and its agents with respect to such PRODUCT. Excluded from any Parker warranty are hose, electrical motors or consumable products such as flexible hose, belts, filter cartridges, filter media, ESP cells, electrical components, gasketing, or any component defined by PARKER as a consumable item.

2. Parker IGFG's warranty policy covers defects that are due to manufacturing quality. Equipment must be installed, commissioned and maintained in accordance with Parker IGFG recommendations as documented in the specific user manual related to your dust or wet collector product. This warranty does not cover defects due to poor environmental conditions, improper installation, or wear and tear items. This warranty shall be void in case of:

a) Any buyer's modifications not explicitly approved by Parker IGFG Division,
b) Misuse or failure in maintenance - not in accordance with Parker's product recommendations,
c) Use of unauthorized or non-genuine Parker replacement parts,
d) Damage caused by corrosion, abrasion, abnormal use or misuse, misapplication, or normal wear and tear,
e) Equipment not properly installed, operated and maintained under normal conditions and recommended applications.

As Buyers exclusive remedy for any defects in the equipment, Parker will exchange or repair any defective parts during the warranty period, provided such parts are returned, prepaid, to Parker factory. The obligation of Parker is limited to furnishing replacement parts EXW Parker factory or making repairs at Parker factory of any parts that are determined, upon inspection by Parker, to be defective. In no event will Parker be responsible for labor or transportation charges for the removal, reshipment or reinstallation of the parts. Replacement parts will be provided via INCOTERMS EXW from Parker's Lancaster NY location. Parker makes no warranty as to goods manufactured or supplied by others.

3. THE FOREGOING IS THE ONLY WARRANTY, GUARANTEE OR REPRESENTATION OF ANY KIND MADE WITH RESPECT TO THE SUBJECT PARKER PRODUCTS. NO IMPLIED WARRANTY, INCLUDING ANY IMPLIED WARRANTY OF NONINFRINGEMENT, DESIGN, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, APPLIES TO THE PRODUCT, AND NO OTHER EXPRESS WARRANTY OR GUARANTY, EXCEPT AS MENTIONED ABOVE, GIVEN BY ANY PERSON, FIRM OR CORPORATION WITH RESPECT TO THE PRODUCT SHALL BIND PARKER. PARKER SHALL NOT BE LIABLE FOR LOSS OF REVENUES OR PROFITS, EXPENSE FOR SUBSTITUTE EQUIPMENT OR SERVICE, STORAGE CHARGES, OR ANY OTHER SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY THE USE, MISUSE OR INABILITY TO USE THE PRODUCT REGARDLESS OF THE LEGAL THEORY ON WHICH THE CLAIM IS BASED, AND EVEN IF PARKER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. NOR SHALL RECOVERY OF ANY KIND AGAINST PARKER BE GREATER IN AMOUNT THAN THE PURCHASE PRICE OF THE PRODUCT SOLD BY PARKER AND CAUSING THE ALLEGED DAMAGE. WITHOUT LIMITING THE FOREGOING, YOU ASSUME ALL RISK AND LIABILITY FOR LOSS, DAMAGE OR INJURY TO YOU AND YOUR PROPERTY AND TO OTHERS AND THEIR PROPERTY ARISING OUT OF USE, MISUSE OR INABILITY TO USE THE PRODUCT NOT CAUSED DIRECTLY BY THE NEGLIGENCE OF PARKER. THIS LIMITED WARRANTY IS GIVEN ONLY WITH RESPECT TO A PRODUCT PURCHASED FROM PARKER OR AN AUTHORIZED PARKER DISTRIBUTOR.

4. IN NO EVENT IS PARKER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, NONCOMPLETION OF SERVICES, USE, LOSS OF USE OF, OR INABILITY TO USE THE PRODUCT OR ANY PART THEREOF, LOSS OF DATA, IDENTITY, PRIVACY, OR CONFIDENTIALITY, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT PARKER'S WRITTEN CONSENT, WETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL PARKER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCT.

5. Defective PRODUCTS must be documented via PARKER support "Case Number" within thirty (30) days after the date of the alleged failure or defect and within the warranty period by contacting Parker Technical Support via email or phone:

smoghog@parker.com or dusthog@parker.com
800-343-4048, option 2

The claim must specify in reasonable detail:
1) Product Serial Number or Parker Sales Order # and approximate Date of Purchase;
2) Where or from whom the product was originally purchased;
3) Description of problem symptom;
4) Description of troubleshooting effort details;
5) Description of physical location and/or environment details. The Buyer shall cooperate with PARKER in its investigation and provide full information and documentation concerning the PRODUCT and its usage.

Upon receipt of the claim, Parker IGFG will review and determine if the parts replaced need to be returned for quality evaluation and root cause investigation. If a part is required to be returned, Parker IGFG will issue a Return Material Authorization (RMA) to Return via email. Parts should be returned to Parker IGFG, freight collect, within 45 days accompanied by the RMA packing slip placed on the package. If the repaired part does not need to be returned you will be advised to field scrap it and the claim will be processed. Proof of the defect (written description and pictures of the parts units in question) is required.

NOTE: ANY PART NOT RETURNED WITHIN THE REQUIRED 45 DAYS WILL NOT BE REIMBURSED ON THE CLAIM.

On claims that require repaired parts return, the claim will be processed after the part has been evaluated by the Parker IGFG Quality Department for verification of failure mode. The claims will be paid in the form of a credit to the customer's account. Parker reserves the right to withdraw any quotation or proposal or reject any purchase order without liability.

Worldwide Filtration Manufacturing Locations

North America

Compressed Air Treatment

Industrial Gas Filtration and Generation Division
Lancaster, NY
716 686 6400
www.parker.com/igfg

Haverhill, MA
978 858 0505
www.parker.com/igfg

Engine Filtration

Racor
Modesto, CA
209 521 7860
www.parker.com/racor

Holly Springs, MS
662 252 2656
www.parker.com/racor

Hydraulic Filtration

Hydraulic & Fuel Filtration
Metamora, OH
419 644 4311
www.parker.com/hydraulicfilter

Laval, QC Canada
450 629 9594
www.parkerfarr.com

Velcon
Colorado Springs, CO
719 531 5855
www.velcon.com

Process Filtration

domnick hunter Process Filtration SciLog
Oxnard, CA
805 604 3400
www.parker.com/processfiltration

Water Purification

Village Marine, Sea Recovery, Horizon Reverse Osmosis
Carson, CA
310 637 3400
www.parker.com/watermakers

Europe

Compressed Air Treatment

domnick hunter Filtration & Separation
Gateshead, England
+44 (0) 191 402 9000
www.parker.com/dhfns

Parker Gas Separations
Etten-Leur, Netherlands
+31 76 508 5300
www.parker.com/dhfns

Hiross Zander
Essen, Germany
+49 2054 9340
www.parker.com/hzfd

Padova, Italy
+39 049 9712 111
www.parker.com/hzfd

Engine Filtration & Water Purification

Racor
Dewsbury, England
+44 (0) 1924 487 000
www.parker.com/rfde

Racor Research & Development
Stuttgart, Germany
+49 (0)711 7071 290-10

Hydraulic Filtration

Hydraulic Filter
Arnhem, Holland
+31 26 3760376
www.parker.com/hfde

Urjala, Finland
+358 20 753 2500

Condition Monitoring
Parker Kittiwake
West Sussex, England
+44 (0) 1903 731 470
www.kittiwake.com

Process Filtration

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Parker Twin Filter BV
Birtley, England
+44 (0) 191 410 5121
www.parker.com/processfiltration

Asia Pacific

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Castle Hill, Australia
+61 2 9634 7777
www.parker.com/australia

China
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+86 21 5031 2525
www.parker.com/china

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+91 22 4391 0700
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www.parker.com/japan

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+82 31 359 0852
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+65 6887 6300
www.parker.com/singapore

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Filtration Division
Sao Paulo, Brazil
+55 12 4009 3500
www.parker.com/br

Pan American Division
Miami, FL
305 470 8800
www.parker.com/panam

Africa

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www.parker.com/africa

IOM_PKR_PSG_2020 Rev B
P/N: 44-1083 Rev B

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MANAGEMENT SYSTEM CERTIFICATION
DNV·GL
ISO 9001 = ISO 14001

State of California ONLY
WARNING: Proposition 65
The products described herein can expose you to chemicals known to the State of California to cause cancer or reproductive harm.
For more information: www.P65Warnings.ca.gov