Industrial Electrostatic Air Cleaner

SMOG-HOG® Models MC-01B & MC-01C

User Guide

Parker

ENGINEERING YOUR SUCCESS.

KNOW YOUR EQUIPMENT

READ THIS MANUAL FIRST.

Your SMOG-HOG should provide many years of trouble-free service. This manual will help you understand the operation of your SMOG-HOG unit. For quick future reference, fill in the system and filter 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.

Unit Model #: _____

Unit Serial #:_____

High Voltage Power Suppy Part Number:

System Accessories:

_____

_____

_____

Installation Date: _____

Parker Hannifin Customer Service

1-800-343-4048

SAFETY PRECAUTIONS

We have provided many important safety messages in this manual and on the SMOG-HOG Electrostatic Air Cleaner. 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 the air cleaner, follow these basic precautions:

- Use two or more people to move and install the SMOG-HOG.
- The air cleaner must be properly grounded.
- Disconnect power before servicing.
- Replace all access panels before operating.
- Wear protective clothing and safety glasses when handling collection components or servicing the air cleaner.
- 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.
- Use nonflammable cleaners.
- Do not collect emissions which are explosive.
- Keep flammable materials and vapors, such as gasoline, away from air cleaner.
- The unit should be inspected frequently and dirt removed to prevent excessive accumulation which may result in flash-over or fire damage.
- The SMOG-HOG should not be used for support of personnel or material.
- Operate only in a safe and serviceable condition.

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1. Safety Precautions

This manual contains important safety information and precautionary measures. It is impossible to list all potential hazards associated with the SMOG-HOG in each application. Proper use of the equipment should be discussed with Parker or your local SMOG-HOG representative. Operating personnel should be aware of, and adhere to, the most stringent safety procedures.

General

- The SMOG-HOG should not be used in explosive atmospheres.
- The SMOG-HOG should not be used to collect emissions which are explosive.
- The SMOG-HOG should not be used to collect emissions with a temperature higher than 120˚F without approval from Parker.
- The SMOG-HOG should not be used to collect emissions with a water to oil ratio greater than 50:1 without consulting with Parker.

Application

- The SMOG-HOG is suitable exclusively for particulate emission filtration only. Any other or additional use is considered improper. Improper use may cause damage to equipment or injury to personnel.
- Parker will not accept liability for any damage resulting from such improper use. Risks are carried solely by the user.
- The SMOG-HOG is not suitable for filtration of gasses.

Operation

- The SMOG-HOG is only to be operated in a safe and serviceable condition.
- The SMOG-HOG should be shut down immediately in the event of a defect. Faults should be rectified before restarting the SMOG-HOG.
- Do not operate the SMOG-HOG with the component doors open.

Maintenance

- The SMOG-HOG should be switched off and isolated from the power source when performing maintenance and repair work.
- Only qualified personnel are to work on the electrical system.
- Exercise care when handling the SMOG-HOG collection components, wear protective clothing and safety glasses.
- Comply with local and national codes when disposing of contaminant collected on the collection components.

2. Unit Specifications

ACFM: 720 CFM @ 0" ESP

Voltage: 120 VAC FOR MC-01B; 400VAC FOR MC-01C

Weight: 315 lbs.

3. Description and Operation

The MC-01B/MC-01C is a three-stage air cleaner used to remove sub-micron hydrocarbon emissions and other airborne contaminants. The first stage is pre-filtration and consists of an aluminum mesh filter section and a coalescing filter section. The second and third stages are Penny-type electrostatic precipitators. Each of these precipitators, or unicells, consists of an ionizer section and a collector cell section.

3.1 Power Packs (Refer to Figure 5)

Each power pack converts 75 watts of 120 volt, single-phase AC power to high voltage DC for the ionizers and the collection cell sections. This combination of components is called a working module.

Standard power packs supply positive DC voltage of 10.0 KVDC to 11.5 KVDC to the ionizer circuit and 5.0 KVDC to 7.3 KVDC to the collection cell circuit.

Power packs are mounted in the component access door. Each power pack supplies power to one unicell. Each has a dedicated externally mounted indicator light and illuminates to indicate normal operation.

The maximum total current in the power pack's high voltage DC output circuit is less than 5 milliamperes, rated by UL as safe for operating personnel. The power pack is self-protecting against overloads (e.g., dirty unicell components, dead shorts to the ionizer and cell circuits). In the event of a dead short condition on the output side, the power pack deactivates and the indicator light will not illuminate. Upon removal of the dead short/ overload conditions, the power pack will automatically return to normal operation.

When 120 VAC power is removed from the power pack circuit, an internal resistor bleeds off residual charge from the ionizer and cell sections. As a precaution, however, when the component access door is opened, the blade of an insulated screwdriver should be used to ground components prior to handling.

⚠ CAUTION

Risk of electrical shock. Residual DC voltage will remain on high voltage components for a short time after power is removed. Prior to handling, ground components using an insulated screwdriver, refer to Figures 3 and 4.

3.2 Pre-filter Section

The aluminum mesh pre-filter serves two purposes. The first purpose is to protect the coalescing filter and subsequent unicells. It does this by removing the large “chunks” of contaminant from the air stream. The second purpose is to create uniformly distributed flow across the coalescing filter and unicells.

3.3 Coalescing Filter Section

The coalescing pre-filter removes a large portion of the emissions and contaminants from the air stream by the principal of coalescence. The sub-micron emissions coalesce or agglomerate and eventually become large enough to be drained away by gravity’s force.

3.4 Ionizer Section (Refer to Figure 2)

Each ionizer section consists of twelve 10 mil diameter tungsten steel wires. These wires are spring mounted and centered between aluminum ground plates. When high DC voltage is applied to the wires, an electrical generated field charges contaminant particles. Special convoluted insulators separate high voltage from the ground plates.

3.5 Collection Cell Section (Refer to Figure 2)

Each collection cell section consists of a series of parallel plates, alternately charged and grounded, with plates in-line with the direction of airflow. Charged plates are connected electrically and suspended from four triangular shaped insulators on each end plate of the unicell.

3.6 After-filter Section

After-filters keep agglomerated residues from being re-entrained as clean air exits the precipitator.

3.7 Blower Section

Air movement, is provided by a direct drive forward-curve blower. The blower, which is contained in the unit and is positioned after the precipitators, exhausts clean air.

4. Installation

4.1 Inspection of Equipment

Upon receipt of the unit, check for shipping damage. A damaged carton indicates that the equipment may have received rough handling during shipping which may have caused possible internal damage. Notify your delivery carrier and enter a claim if any damage is found.

4.2 Clearances

Component Access Door, Power Pack Enclosure Lid and Motor Control Panel Lid: A clearance of 48 inches is recommended for door opening, allowing for removal/installation of the unicell components and filters.

4.3 Supports

The SMOG-HOG is designed for bottom support or hanging support from the top of the unit. Bottom supports (available from factory) can be located onto any flat surface, such as a machine tool cabinet. Hanging supports from the top of the unit will require 1/2" all-threaded rod.

Whatever support is selected, the end user should ensure that the SMOG-HOG weight can be supported.

4.4 Leveling

Systems should be level. If a system is not level (front-to-back and side-to-side), place suitable shims between the system and support surface.

4.5 Ductwork

Quality ductwork is important to optimize system performance and to the integrity of the entire installation. Sealed connections prevent air and liquid leakage during operation. Oily emissions should have all-welded seams, with ductwork pitched to proper collection points, usually toward the SMOG-HOG. Duct velocities should generally be within 1500 to 2000 FPM. Gaskets and sealant must be compatible with the material collected and the temperature of the airstream.

⚠ CAUTION

Ductwork and accessories attached to the SMOG-HOG should be independently supported.

4.6 Drain (Refer to Figure 7)

Air passing through the system is under negative pressure. A drain trap should be installed to serve as a vacuum break and to assure proper drainage of the system during operation. The drain trap should be primed with the type of lubricant being collected in the SMOG-HOG. Connect drain pipe with drain trap (supplied by others) to the SMOG-HOG coupling.

4.7 Electrical Connection (Refer to Figure 8)

⚠ CAUTION

Electrical installation/connections should only be completed by qualified personnel and be in accordance with local and national regulations.

The SMOG-HOG is factory prewired. The motor control panel is integraded within the SMOG-HOG. Field wiring requirements are illustrated with dashed lines on the wiring diagram shipped with the SMOG-HOG, and also shown in Figure 8 and 8a.

5. Operation

⚠ CAUTION

Risk of electrical shock. A residual DC voltage will remain on high voltage components for a short time after power is removed. Prior to handling, ground components using an insulated screwdriver, refer to Figures 3 and 4.

5.1 Pre-Startup Checks

Loose Fittings. The SMOG-HOG is inspected before shipment. However, vibrations during transit and installation may have loosened certain bolts, nuts or other attaching devices. Check and tighten as required.

Installing Components. (Refer to Figures 1&2.) If unicells and filters were removed for unit installation, install unicells and filters.

Ductwork Connections. Check that all duct connections are completed. Blower RPMs are set to compensate for static pressure loss in ductwork. Starting the blower before ductwork is complete or before debris is removed can result in motor overload or other system damage.

5.2 Start-Up

The SMOG-HOG has been thoroughly tested prior to shipment from the factory; however, there may be some initial arcing of the components at startup. The arcing should cease after five minutes of operation.

The indicator light(s) on the unit are illuminated during normal operation of the power packs. If an indicator light fails to illuminate when the SMOG-HOG is on-line, refer to Troubleshooting (section 7). Intermittent arcs will occur occasionally as indicated by a blinking indicator light which is normal.

Depending upon specifications (by others), the SMOG-HOG may be electrically interlocked placing it on-line automatically or by a push button.

6. Maintenance and Manual Cleaning

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

⚠ CAUTION

Hazardous live and moving parts are exposed during the following procedures. Switch off/isolate the electrical supply to the SMOG-HOG before servicing.

⚠ CAUTION

Risk of electrical shock. A residual DC voltage will remain on high voltage components for a short time after power is removed. Prior to handling, ground components using an insulated screwdriver, refer to Figures 3 and 4.

⚠ CAUTION

Cleaning and servicing should only be completed by qualified and trained personnel.

⚠ CAUTION

Some collected contaminants may be hazardous. Consult MSDS or local safety personnel before servicing unit and for proper disposal of collected contaminants.

6.1 Routine Maintenance

Once the SMOG-HOG is operational, periodic maintenance is necessary to assure peak performance. Follow a common sense pattern of observation and log abnormal conditions.

The following is a checklist for maintaining the SMOG-HOG:

Check Power Pack Indicator Lights Daily. Blinking, dim or indicator light(s) not illuminated indicate abnormal conditions. If the indicator light is abnormal, proceed with component check below and/or refer to Section 7 “Troubleshooting.”

Check Appearance of the Unicell Components. With indicator lights illuminated, a visual check could show symptoms of a problem or confirm if manual cleaning is required.

To check the condition of the unicell components, place the system off-line. Open the component access door and ground the ionizer wire support bar and the collector cell, refer to Figure 3 and 4. Note the condition of the door feed- through insulators and cabinet walls. Experience will dictate whether contaminant buildup is excessive. Remember, dirty insulators and components cause a high voltage reduction. Whenever opening the component access door, clean the door feed-through insulators.

Remove unicell from the unit, noting the condition of contact springs (distorted? skewed?), standoff insulators (dirty?), ionizer wires (broken? sagging?), cell plates (dirty? bent? skewed?), and triangular insulators (dirty?) Ionizer wires should be taut and centered between ground plates. The cell plates should be parallel and centered.

Unicell cabinet tracks should be free of contaminant buildup, providing a ground contact.

Filter media should be clean, to allow air to pass through freely. Media should be in line within the frame and not sagging in the direction of airflow. Pumps should be free of debris. Door flange gasket should be in place and in good condition.

Refer to "When Are Components Clean?" for acceptable conditions/ appearance.

6.2 Manual Cleaning of SMOG-HOG® Components

While there are many methods of 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.

Type of Detergent. In general, the detergent used on most applications will be alkaline in nature. It is extremely important that the detergent have a built-in buffering agent to prevent deterioration to the aluminum. Even though the detergent is "buffered" (i.e., treated to prevent deterioration of the aluminum), prolonged contact (such as overnight soaking) could cause oxidation. Detergents are available through Parker for specific applications and contaminants.

Detergent Strength. Detergent concentration, or "strength," in a mixture with water varies with the application from 1:1 to 5:1 to even 20:1 parts water to parts detergent; refer to detergent manufacturer's directions. More or less detergent may eventually be required for effective cleaning at reasonable detergent cost. Typically, 20:1 is recommended as a starting point.

⚠ CAUTION

Never mix acid and alkaline detergents for manual cleaning. Detergent mixing could cause rapid heat release, gel formation or other undesirable condition.

Water Temperature. Detergents can be up to twice as effective in hot water, and hot water alone is very effective in softening built-up residuals. Water temperature should be 140°F to 180°F, not to exceed 190°F.

Agitation/Impingement. These methods are virtually identical, with impingement being the most extreme form of agitation. Any liquid movement over built-up residuals will dissolve some of the contaminant, allowing detergent to work on the next layer. A reduction in cleaning time duration usually results.

Cleaning Cycle Duration. In most cleaning methods, adequate time should be allowed for the detergent to dissolve 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.

Rinse Procedure. Cleaned components must be rinsed off quickly and thoroughly to remove any remaining contaminants. Even if the components appear to be clean, some detergent residual may remain. This should be removed because the residue may contribute to high voltage bleed-down when the components are placed in service. As with cleaning, hot water should be used for rinsing.

Dry-Out Time. Components should be dry before placing the system in operation. Startup of a wet system causes dead shorts and/ or arcing conditions. Wet unicells and filters should be placed in a warm room until dry. Techniques such as hand wiping insulators and blowing dry with compressed air will shorten the drying time.

6.3 Manual Cleaning Methods

The manual cleaning method selected for a given system will depend on the type of contaminant, rate of deposit, facility limitations such as cleaning time windows (process down time) and available utilities. Any one of the following three acceptable cleaning methods may be included in such a plan.

Hot Detergent Soak Tank. This method involves placing components in an agitated solution of hot water and detergent, and is the most effective cleaning method. With proper detergent selection, this procedure will quickly remove most contaminants.

Components should not be placed in highly concentrated detergent solutions or allowed to soak for extended periods (e.g., overnight), especially at elevated temperatures. Extended soaking (e.g., days) in solvent or detergent solution will cause oxidation and should be avoided.

Automatic Parts Washers. Certain commercially- available units combine and automate the features necessary for effective cleaning, including water heating, detergent injection, agitation, rinsing and drying.

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 collection cell plates to close-up and prolonged blasts of high temperature or high pressure water. Cell plates deform under continuous exposure to such conditions.

Other Cleaning Considerations

The previous methods address the cleaning of SMOG-HOG components only. The interior of the cabinet should be cleaned yearly (e.g., during normal planned maintenance downtimes) to reduce contaminant buildup. Each time manual maintenance is performed, the door feed-through insulators should be thoroughly cleaned. Voltage output of the power packs should also be checked when maintenance is performed.

Parker and/or your local representative can provide assistance in choosing the best method for cleaning SMOG-HOG components in your application.

6.4 When Are Components Clean?

After manual cleaning, the unicells and pre/afterfilters should have a clean, not necessarily "new," aluminum appearance. Moderate discoloration will not affect system efficiency. The following is a checklist for acceptable conditions:

• Ionizer Section

1. Aluminum frame and plates are free of contaminant buildup.
2. Standoff insulators are clean and white (dull appearance is acceptable). Cracked or carbon- tracked insulators have been replaced.
3. Wires and springs are intact and taut, centered between plates and free of coatings.
4. Contact springs and contact screws are properly aligned (contact springs not deformed).
5. Bent or broken parts have been repaired or replaced.

• Collection Cell Section

1. Aluminum frame is square, plates are parallel and hot plates are centered between ground plates.
2. Residual particulate has been removed between plates and at corner supports.
3. Triangular insulators are free of contaminant. Cracked or carbon-tracked triangle insulators have been replaced.
4. Contact springs and contact screws are properly aligned (contact springs not deformed).
5. Bent or broken parts have been repaired or replaced.

• Prefilters/Afterfilters

1. Media and frames are free of contaminant.
2. Frames are square and media is intact.
3. Filters are installed with drain holes down and the arrow on their frames pointing in the direction of airflow.

• Cabinet

1. Door feed-through insulators are clean and white, insulators have been replaced if cracked or carbon tracked.
2. Door gaskets are clean and intact.
3. Component tracks are free of contaminant (for component grounding).
4. Drain pumps and bottom drains are clear and free-flowing.
5. Walls, ceiling and doors are free of heavy buildup.
6. Blower has been checked for heavy buildup, cleaned if required.

7. Troubleshooting

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

⚠ CAUTION

Hazardous live and moving parts are exposed during the following procedures. Switch off/isolate the electrical supply to the SMOG-HOG before removing the unicells, filters and/or electrical components from the SMOG-HOG.

⚠ CAUTION

Risk of electrical shock. A residual DC voltage will remain on high voltage components for a short time after power is removed. Prior to handling, ground components using an insulated screwdriver, refer to Figures 3 and 4.

Before proceeding with troubleshooting, check for proper electrical alignment of contact springs and contact screws, refer to Figure 2. Improper electrical alignment and deformed contact springs can cause arcing, indicator light blinking or a dead short condition.

7.1 Tools Required

- High voltage probe, 0 to 15 KV, to check high voltage at power pack and at the ionizer and the collector cells.
- Volt-ohmmeter, to check 120 VAC input voltage and continuity.
- Basic set of hand tools.

7.2 Checkout Before Testing

Operating problems can generally be traced by reference to the indicator lights on the component access door. When the indicator light is illuminated, AC power is present at the power pack and high voltage is available to the unicell components. When the indicator light is dim or flashing, or not illuminated, an abnormal condition exists and the SMOG-HOG is operating below specifications and at reduced efficiency.

The following conditions could exist:

1. High voltages are below the normal operating range of the ionizer and/or collector cell circuit (dirty unicell components?). Operating Range:
   Ionizer: 10.0 to 11.5 KVDC
   Collector Cell: 5.0 to 7.3 KVDC
2. Unicells are not correctly installed, refer to Figure 2.
3. Contact springs deformed and/or misaligned.
4. Broken ionizer wires.
5. Bent parts.
6. Cracked and/or carbon track to the insulators (door feed-through insulator, ionizer standoff insulator, collector cell triangle insulator).
7. Wet components from manual cleaning.
8. Failed power pack.
9. Failed indicator light.
10. Loose wire connections to the power pack and/or indicator lamp.
11. Component access door interlock switch (120 VAC to power pack) is not properly engaged.
12. Disruption of service voltage (120 VAC) to the SMOG-HOG power pack circuit.

If there is not an obvious cause for the problem, proceed with troubleshooting.

7.3 Troubleshooting Procedures

If the power pack indicator light(s) are not illuminated, follow the procedures as outlined in this section, including the Troubleshooting Guide.

The power pack enclosure is mounted on the component access door, refer to Figure 1.

NOTE: Sections 7.4 to 7.9 will require activating or deactivating the component access interlock switch which will be referred as the interlock switch (120 VAC) to complete troubleshooting steps. Press push button to activate and release button to deactivate the 120 VAC circuit. The 120 VAC circuit also operates the SMOG-HOG blower.

7.4 Power Pack/AC Voltage Checks/Visual Inspection (Refer to Figures 1, 5 and 8.)

1. Refer to Section 7.3 “Note” before proceeding. Activate and deactivate interlock switch as required when performing troubleshooting steps.
2. Disconnect wires from terminals 5 and 6 from the power pack.
3. Measure voltage at disconnected wires from terminals 5 and 6.
4. If 120 VAC is not present at power pack(s) terminals 5 and 6, check for loose wire connections, operation of interlock switch and IM-AUX.
5. If 120 VAC is present, disconnect high voltage wires 8 and 7 from the power pack.

   a) Activate interlock switch.

   b) Is indicator light illuminated?
   Yes – Power pack is okay. Problem is within the ionizer and/or collector cell circuits, refer to Sections 7.5 to 7.8.

   No – Check indicator light voltage output, refer to Section 7.9. Also, perform Bench Test Procedure, Section 8, “Testing A Power Pack.”

   c) Visually inspect:
   Both door feed-through insulators (dirty, cracked and/or carbon tracked).

   High voltage wires from the power pack to the door feed-through insulators (damaged/burnt appearance).

7.5 DC High Voltage Checks Without Utilizing A High Voltage Probe (Refer to Figures 2 and 5)

1. Refer to Section 7.3, “Note,” before proceeding. Activate and deactivate interlock switch as required when performing troubleshooting steps.
2. Ionizer section may be shorted to ground. Remove the #8 wire from the power pack (#7 cell wire should be in place) and activate interlock switch. If the indicator light illuminates, open the component access door and remove the unicell. If the indicator light does not illuminate, proceed to Statement 3. Check unicell ionizer section for problems such as dirty unicell, broken ionizer wires, foreign objects across wires, cracked or dirty standoff insulators, deformed ionizer contact spring, incorrect ionizer contact spring alignment, bent parts and defective door feed-through insulator.
3. Cell section may have a dead short. With #8 wire in place, remove #7 wire from the power pack and activate interlock switch. If the indicator light illuminates, open the component access door and check the unicell. Remove the unicell and check for contaminant bridging across the plates or to the cabinet structure. Check unicell for proper plate-to-plate clearance, dirty unicell (contaminant buildup between the cell plates), deformed cell contact spring, incorrect cell contact spring alignment, buildup on or tracking across triangular insulators, bent cell plates and dirty door feed-through insulator.

7.6 Measuring for High Voltage (DC Only)

To correctly check power pack high voltage output, a high voltage probe with a scale from 0 to 15 KVDC is necessary, refer to manufacturer's instructions for proper usage.

7.7 Checking Ionizer Section (Refer to Figures 2 and 5)

1. Refer to Section 7.3, "Note," before proceeding. Activate and deactivate interlock switch as required when performing troubleshooting steps.
2. Make sure the component access door is closed and that ionizers and contact springs/contact screws are in place and correctly connected.
3. Place tip of probe to the ionizer door feed-through insulator. Ionizer voltage should read 10.0 to 11.5 KVDC with the indicator lamp illuminated.
4. If the ionizer voltage is low, open component access door and check for a voltage at the contact washer to the ionizer door feed-through insulator of 10.0 to 11.5 KVDC. If voltage is still low, refer to "Power Pack/AC Voltage Check." If not, the problem is within the ionizer components, broken wire, bridged or cracked standoff insulators, refer to Section 8, "Bench Test Procedure" for checking ionizer components.

7.8 Checking Collection Cell Section (Refer to Figures 2 and 5)

1. To measure high voltage to the collector cells, use the same procedure as described in Section 7.7, except at the cell door feed-through insulator.
2. Cell voltage should read 5.0 to 7.0 KVDC with indicator light illuminated.
3. Refer to Section 8, "Bench Testing Procedure For Checking Collector Cell Components."

7.9 Indicator Lights (Refer to Figure 5)

If satisfactory ionizer/cell voltage is present and the light remains off, the problem can be a defective light, circuit wiring or an internal problem within the power pack. A voltmeter can be used to check voltage at the indicator light. Perform voltage measurement with wires (from the power pack) connected to the indicator light.

The indicator light located on the power pack enclosure is polarity sensitive. For proper operation, the "+" (gold) terminal on the lamp should be connected to Terminal 9 on the power pack and the "–" (silver) terminal on the lamp should be connected to Terminal 2 on the power pack. If the lamp wires are reversed, the lamp will not illuminate.

Power Pack Indicator Lamp Output (LED): 10.0 VDC

7.10 Troubleshooting Guide

Problem	cause	solution
Blinking indicator lamp to the power pack enclosure, continuous clicking/ snapping noise.	1. Excessive contaminant buildup in the ionizer and/or collector cell components causing arcing. 2. Improper component electrical alignment. 3. Bent/deformed/warped cell plates. 4. Bent ionizer parts. 5. Deformed and/or misaligned ionizer and/or collector cell contact springs. 6. Dirty, cracked and/or carbon tracked insulators; door feed-through insulators, ionizer standoff insulators, cell triangle insulator. 7. Broken ionizer wires. 8. Ionizers and collector cell components are wet after manual cleaning.	1. Manually clean the unicell components and filter media, refer to sections 6.2 to 6.4 or isolate problem, refer to Sections 7.5 to 7.8. 2. Refer to Figure 2. 3. Carefully straighten cell plates. 4. Replace bent parts. 5. Replace contact springs. 6. Visually inspect all insulators and replace failed insulators (carbon track is a blackish streak embedded into the surface). 7. Replace ionizer wires. 8. Place unicells and filter media in a warm room to dry. Blowing dry with compressed air will shorten the drying time.
Indicator lamp fails to illuminate.	1. Refer to blinking indicator lamp Statements 1 through 8. 2. No 120 VAC to the power pack. 3. Power pack failure. 4. Indicator lamp failure.	1. Refer to blinking indicator lamp Statements 1 through 8. 2. Check engagement of component access door interlock switch. Check for loose wire terminations, broken wires. 3. Refer to Section 7.4. 4. Refer to Section 7.9.
Hissing noise to the ionizer components.	1. Loose ionizer wires. 2. Loose ionizer wire support bar. 3. Bent parts to the ionizer. 4. Ionizer wires coated with contaminant. 5. Cracked or dirty insulators.	1. Check ionizer wire springs and ionizer wire tautness. 2. Tighten wire support bar, convoluted insulator installation screws. 3. Replace bent parts. 4. Clean ionizer wires. 5. Clean or replace insulator, ionizer standoff insulators, ionizer/collector cell door feed-through insulator.
Cannot place SMOG-HOG on-line.	1. Circuit breaker tripped/fuses failed. 2. Interlock switch not engaging. 3. Check voltage to power circuit.	1. Restore power by resetting the circuit breaker/replacing fuses. 2. Check alignment/engagement of the interlock switch. 3. Refer to Figures 8 and 8a.

7.10 Troubleshooting Guide (Cont'd)

Problem	cause	solution
Poor ventilation at the process.	1. Blower rotation is incorrect. 2. Extreme buildup of contaminant to the filter media and unicell components, obstructing air flow. 3. Rags and/or debris have been thrown into the inlet duct/transition opening, obstructing air flow.	1. Check blower housing for arrow rotation. 2. Manually clean the filter media and unicell components, refer to Section 6.2 to 6.4. 3. Remove rags and/or debris from the inlet duct transition.
Oil/smoke is spewing from the SMOG-HOG exhaust discharge.	1. Unit drain sump is filled with oil. 2. SMOG-HOG drain pipe is not equipped with a drain loop assembly (drain trap). 3. Ionizer wires are coated with contaminant buildup. 4. Indicator lights are not illuminated or are blinking. 5. Unicell components are dirty. 6. Filter media is not installed.	1. Remove obstructions to the drain pipe/drain trap and clean interior of unit. 2. Install a drain loop assembly and prime drain loop with lubricant that is being utilized in the process equipment. 3. Clean all ionizer wires. 4. Refer to Sections 7.1 to 7.9. 5. Manually clean the unicell components and the filter media, refer to Sections 6.1 to 6.4. 6. Install filter media, refer to Figure 2.
Oil is dripping from the access doors.	1. Drain pipe and/or drain trap plugged. 2. Drain pipe not properly sloped for drainage to the process equipment. 3. Component access door gasket is deformed or torn.	1. Remove obstructions to the drain pipe and/or drain trap, and clean interior of unit. 2. Adjust drain pipe slope. 3. Replace component access door gasket.

8. Bench Test Procedure

THE FOLLOWING IS FOR THE USE OF TRAINED PERSONNEL ONLY

⚠ CAUTION

Risk of electrical shock. A residual dc voltage will remain on high voltage components for a short time after power is removed. Prior to handling, ground components using an insulated screwdriver, refer to Figures 3 and 4.

This procedure can be utilized to determine an electrical problem with a power pack or unicell before or after manually cleaning.

Tools Required

- One power pack.
- Two high voltage wires (or spark plug wire), 6' in length with test clips at each end of wire.
- One high voltage probe.
- One AC cord to activate power pack, 120 VAC, with ground wire.

High Voltage Operating Range

Ionizer Section: 10.0 to 11.5 KVDC

Collector Cell Section: 5.0 to 7.0 KVDC

Procedure (Refer to Figures 2 through 5)

Testing Ionizer Section

1. Select one ionizer section to be tested.
2. Connect one high voltage wire to ionizer contact spring and to the power pack connector identified as "ionizer".
3. Connect the other high voltage wire to metal frame of the unicell and to the ground stud on the power pack. This serves as a ground.
4. AC cord should be connected to power pack connectors #5 and #6 with ground wire secured to ground stud on the power pack.
5. Connect AC cord plug to wall outlet.
6. Measure high voltage with probe, ionizer voltage should be about 10.0 to 11.5 KVDC.
7. Disconnect AC cord plug from wall outlet.
8. Discharge high voltage with a screwdriver with plastic handle by touching the ionizer wire with the blade of a screwdriver and contacting screwdriver shaft to metal frame (refer to Figure 3).

Possible causes for below normal ionizer high voltages:

Ionizers: Dirty components (requires manual cleaning), bent parts, broken ionizer wires, cracked or carbon track standoff insulators, deformed contact spring, wet ionizer from washing.

Testing Collector Cell Section

The cell can be tested in the same manner as an ionizer with the following exceptions:

- Step 1 - Select one collector cell section to be tested.
- Step 2 - Connect one high voltage wire to the cell contact spring and to the power pack connector identified as "Collector".
- Step 3 - Connect the other high voltage wire to the metal frame of the unicell and to the ground stud on the power pack.
- Step 4 - Cell voltage should be 5.0 to 7.0 KVDC.
- Step 5 - Discharge high voltage by inserting a screwdriver blade between cell plates (refer to Figure 4).

Possible causes for below normal cell voltages:

Collector Cell: Dirty components (requires manual cleaning), warped/deformed/bent cell plates, contaminant bridging between the cell plates, deformed cell contact spring, wet collector cell from washing.

Testing a Power Pack

1. Connect AC cord to the power pack connectors #5 and #6 with ground wire secured to the ground stud on the power pack.
2. Connect AC cord plug to wall outlet. Measure high voltage with probe. Ionizer Operating Range: 10.0 to 11.5 KVDC Collector Cell Operating Range: 5.0 to 7.0 KVDC
3. Disconnect AC cord plug from wall outlet.
4. Replace power pack if high voltages are below the operating range.

9. Replacement Parts

9.1 Ionizer Wires Replacement
(Refer to Figures 2 and 6)

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

NOTE: IF REPLACEMENT WIRES ARE NOT AVAILABLE, REMOVE BROKEN WIRES AND SPRINGS FROM THE ASSEMBLY UNTIL PARTS ARE AVAILABLE. OPERATION WITH MISSING IONIZER WIRES WILL RESULT IN REDUCED OPERATING EFFICIENCY.

9.2 Replacement Parts

Replacement parts for unicell components and miscellaneous parts are identified in Section 9.5.

To order Parker parts, contact your local representative or call/write:

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

For prompt service, please specify:

1. Unit Model Number (nameplate)
2. Part Number or Part Description (refer to Section 9.5)

9.3 Returning Parts

When returning parts directly to Parker for any reason, call Parker for a return material authorization number (RMA). Mark this number prominently on the returned package to assure prompt handling and service.

9.4 Freight Cost

Freight cost on returned parts should be paid by the end user. Freight cost on parts shipped from Parker is prepaid by Parker and added to the cost of the parts.

9.5 SMOG-HOG Replacement Parts List

Part numbers are identified and illustrated as Item Numbers to Figures 1 and 2.

Item Number	Part Number	Quantity Required	Description
1	*02-10425-0001	2	Unicell 12-Wire Assembly
2	*02-10426-0001	24	Ionizer Wire (12 required per Unicell)
3	*03-0559	48	Springs for Ionizer Wires (24 required per Unicell)
4	*36-0068	2	Ionizer Contact Spring
5	37-0028	8	Ionizer Convoluted Standoff Insulator
6	*36-0012	2	Cell Contact Spring
7	*36-0077	2	Cabinet Ground Contact Spring
8	37-0026	4	Door Feed-Through Insulator
9	20-0005	1	Door Interlock Switch
10	39-0271	2	T-Handle Latch, Access Door
11	42-0168	5 ft.	Access Door Baffle Gasket
12	42-0168	9 ft.	Access Door Gasket
13	39-10008-0006	3	Hex Latch, Enclosure Access
14	03-10208-0001	4 per set	High Voltage Wire Set
15	21-1216	2	Power Pack
16	02-10561-G	2	Indicator Light (Green LED)
17	42-0149	6 ft.	High Voltage Enclosure Lid Gasket
18	42-0149	3 ft.	Motor Control Panel Lid Gasket
19	33-10026-0007	1	After-Filter, Aluminum Mesh
20	33-10026-0005	1	Pre-Filter, Aluminum Mesh
21	33-10026-0001	1	Coalescing Filter
22	32-10033-0002	1	Direct Drive, Forward Curve, Blower
23	10-11815-0002	1	Blank Inlet Cover
24	18-10688-0001	1	Inlet Collar
N/A	02-0031	1	Optional Drain Loop Assembly (Refer to Fig. 7)

*Recommended Spare Parts

Item Number	Part Number	Quantity Required	Description
N/A	20-0075	1	Fuse, 10A (MC-01C Only)
N/A	20-2955	1	Relay, DPDT, 120VAC (MC-01C Only)
N/A	20-10087-0001	1	Contactor, No Aux, 24VDC (MC-01C Only)
N/A	20-1460-0500	2	Fuse, FNQ-R-5 (MC-01C Only)
N/A	21-1277-1000	1	Transformer, 1000VA, 400:120 (MC-01C Only)

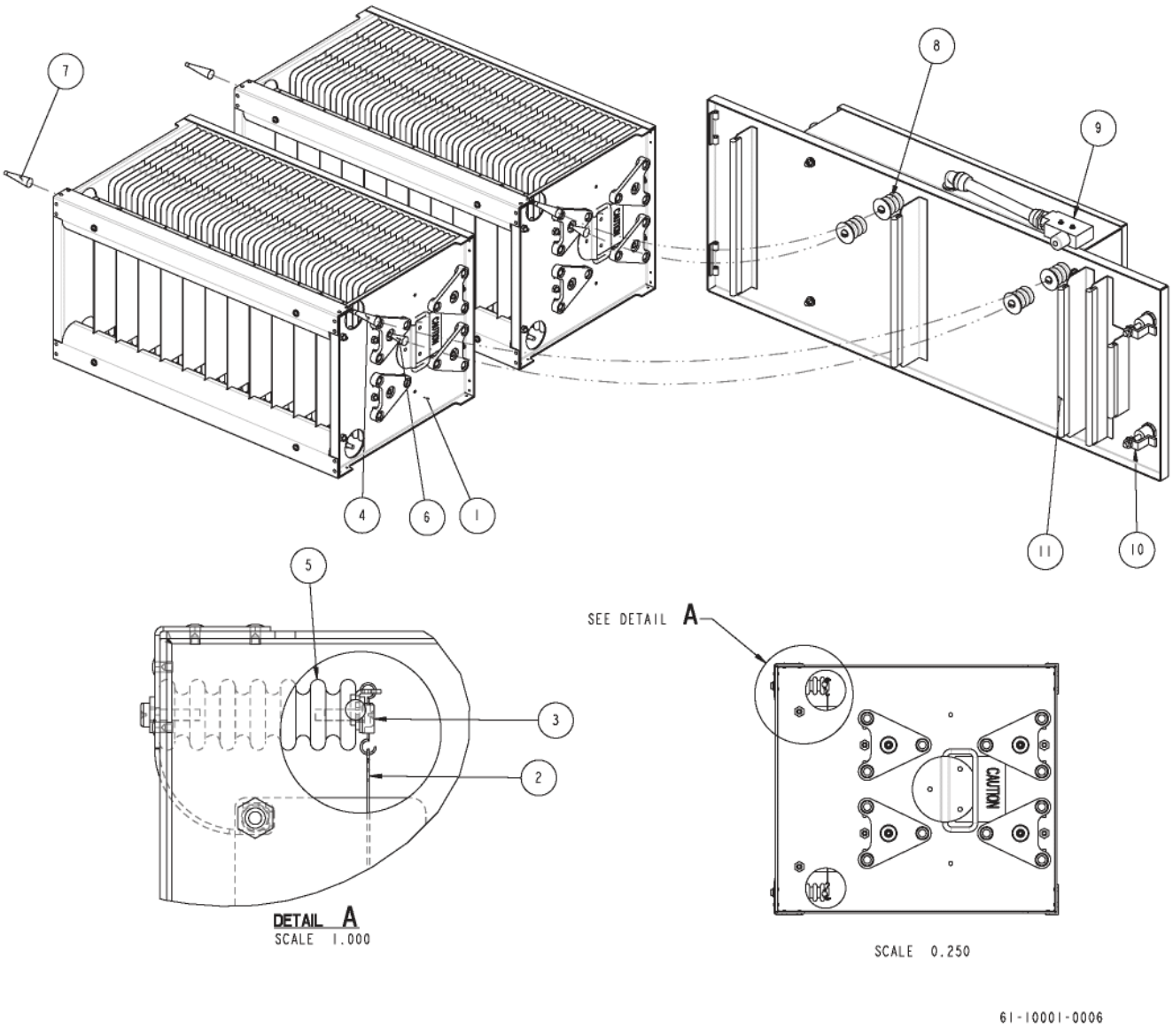


Figure 1. Unicell Contact Spring Arrangement

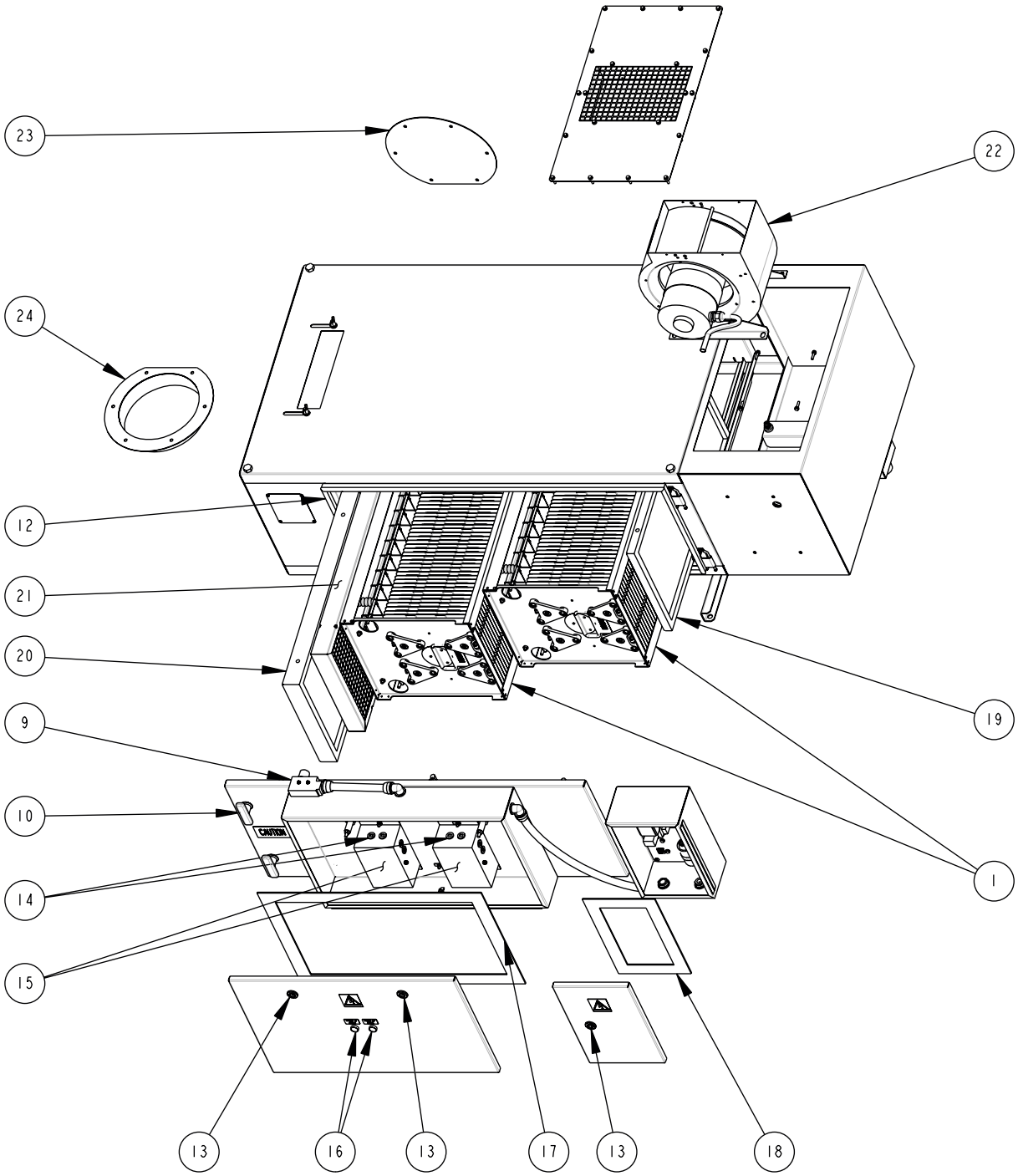


Figure 2. Component Layout

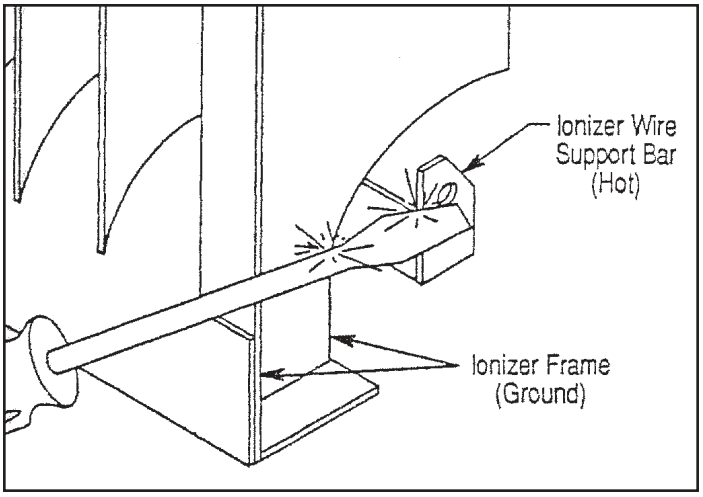


Figure 3. Grounding Ionizer Section

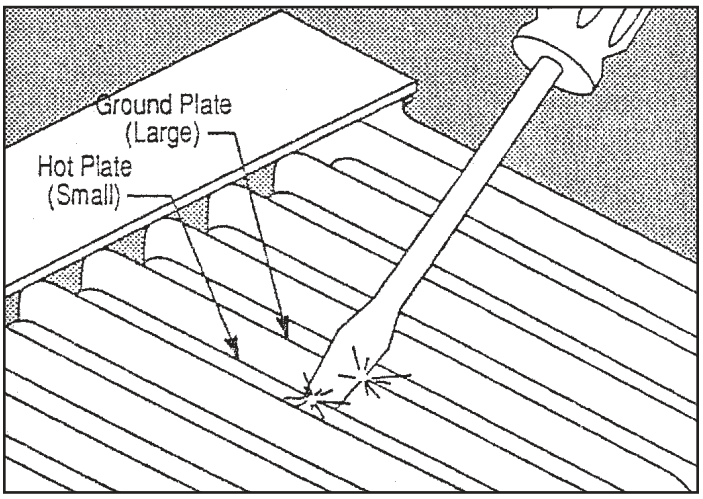


Figure 4. Grounding The Collector Cell Section

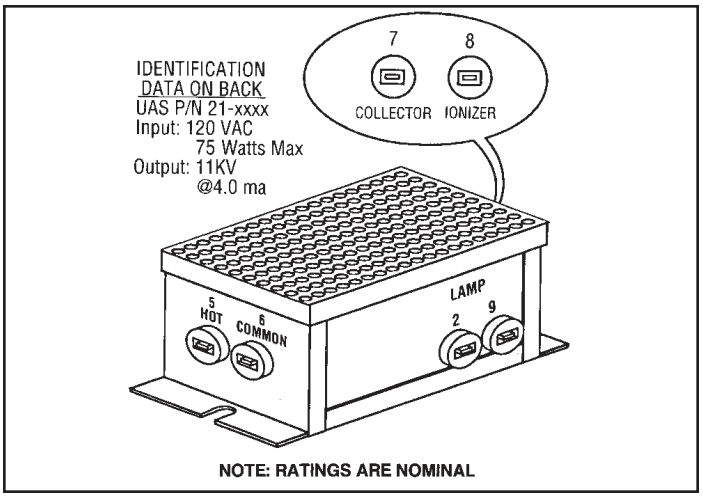


Figure 5. Power Pack Input/Output Connections

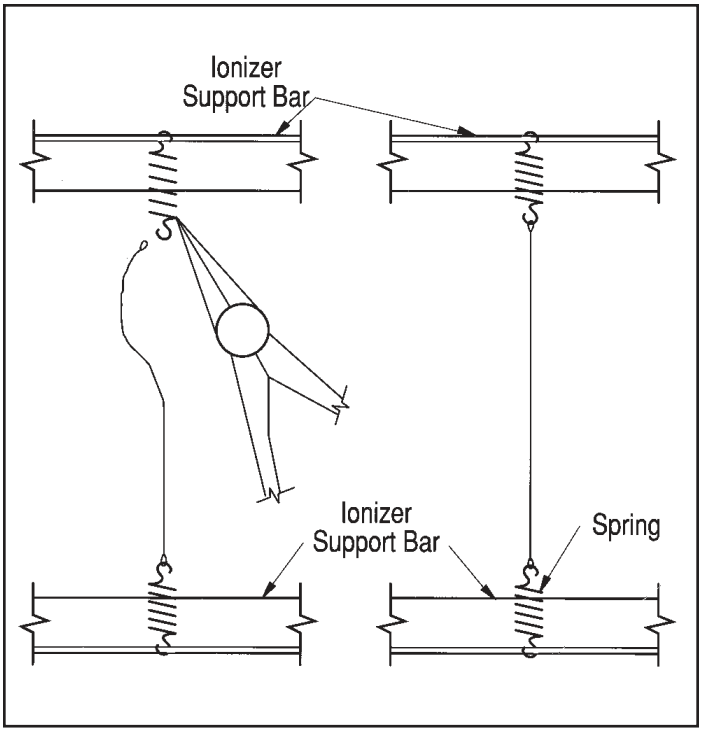


Figure 6. Replacing Ionizer Section

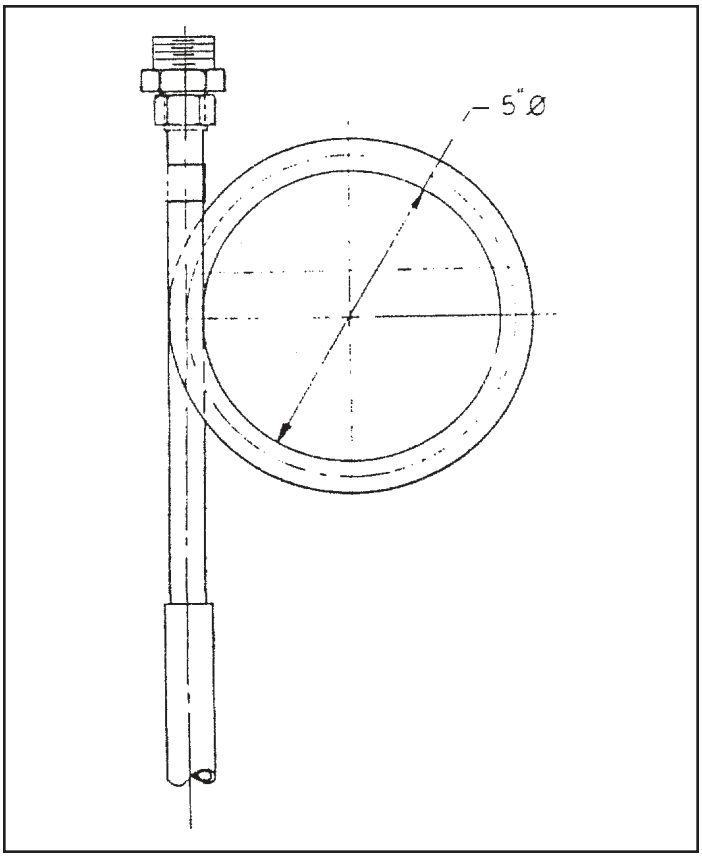
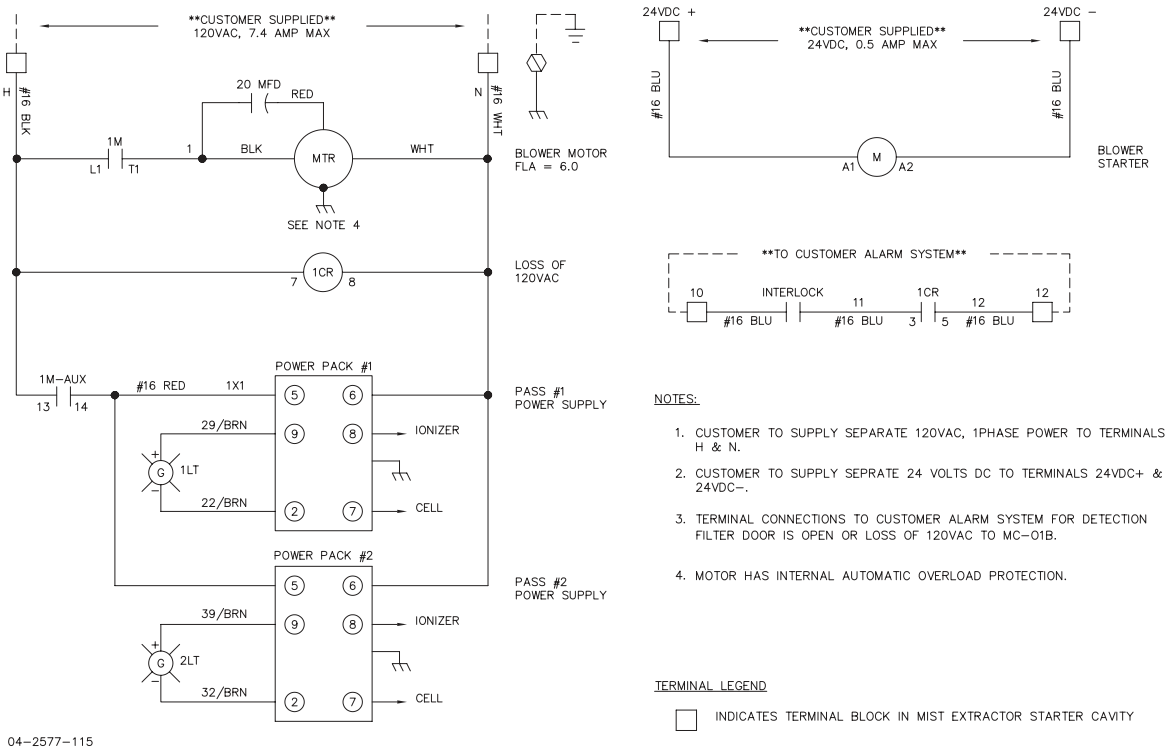


Figure 7. Drain Loop Assembly

Figure 8. MC-01B Wiring Diagram - 04-2577-115



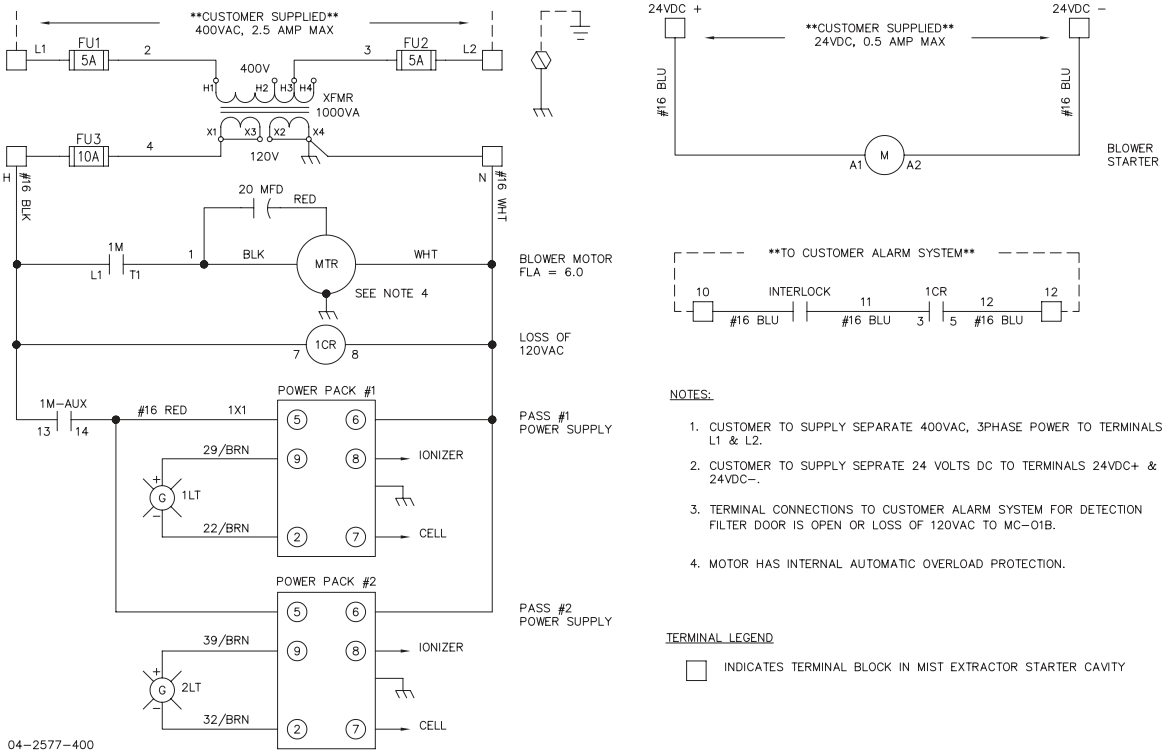
NOTES:

1. CUSTOMER TO SUPPLY SEPARATE 120VAC, 1PHASE POWER TO TERMINALS H & N.
2. CUSTOMER TO SUPPLY SEPRATE 24 VOLTS DC TO TERMINALS 24VDC+ & 24VDC–.
3. TERMINAL CONNECTIONS TO CUSTOMER ALARM SYSTEM FOR DETECTION FILTER DOOR IS OPEN OR LOSS OF 120VAC TO MC–01B.
4. MOTOR HAS INTERNAL AUTOMATIC OVERLOAD PROTECTION.

TERMINAL LEGEND

☐ INDICATES TERMINAL BLOCK IN MIST EXTRACTOR STARTER CAVITY

Figure 8a. MC-01C Wiring Diagram - 04-2577-400



NOTES:

1. CUSTOMER TO SUPPLY SEPARATE 400VAC, 3PHASE POWER TO TERMINALS L1 & L2.
2. CUSTOMER TO SUPPLY SEPRATE 24 VOLTS DC TO TERMINALS 24VDC+ & 24VDC–.
3. TERMINAL CONNECTIONS TO CUSTOMER ALARM SYSTEM FOR DETECTION FILTER DOOR IS OPEN OR LOSS OF 120VAC TO MC–01B.
4. MOTOR HAS INTERNAL AUTOMATIC OVERLOAD PROTECTION.

TERMINAL LEGEND

☐ INDICATES TERMINAL BLOCK IN MIST EXTRACTOR STARTER CAVITY

Product Warranty – SMOG-HOG® and DUST-HOG® Pollution Control Systems

1. Subject to the terms and conditions hereof, Parker Hannifin Corporation (PARKER) guarantees to the original purchaser 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 24 months from date of shipment, 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. The aforementioned PRODUCT warranty covers replacement parts only and 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.

2. 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.

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5. Defective PRODUCTS must be documented via PARKER support "Case Number" within thirty (30) days after the date of the alleged failure or defect by contacting Parker Technical Support via email at smoghog@parker.com, dusthog@parker.com, or via phone at 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 purchaser shall cooperate with PARKER in its investigation and provide full information and documentation concerning the PRODUCT and its usage.

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www.parker.com/igfg

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

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