TRION®

Air Purification Systems

UL® LISTED

READ AND SAVE THESE INSTRUCTIONS

Air Boss® ATS Series

Electrostatic Precipitators
Commercial & Industrial Applications

Electrostatic Precipitators for Commercial & Industrial Applications

Air Boss® ATS Series

Air Treatment Systems

Table of Contents

SAFETY NOTE

Factory designed access to all electrically-charged high voltage components contain electrical interlocks for the safety of operating personnel. Any additional access that may be provided in the system, where there is access to high voltage, must be equipped with such interlocks.

Installation

Unpack and Inspect
At the time the unit is received, all shipping containers and their contents should be examined for damage. Any damage occurring in shipment must be immediately reported to the carrier, an inspection report completed and a claim filed at the receiving point.

The unit modular sections are shipped completely assembled and joined and, where size permits, the electronic air cleaner ionizing-collecting cells are shipped inside the cabinet. On large units, the upper tier of cells may be shipped in separate containers. The Control System, detergent feeder and other separate accessories are shipped in the containers as noted on the packing list.

INSTALLATION WARNING
Precautions must be taken to protect the ATS System and its subsystems if it is installed outdoors or in extreme environments. Condensation, freezing, and elevated temperatures must be considered.

Position Air Cleaner Cabinet
If necessary, to remove weight for ease in handling, the filtration elements can be removed from their respective cabinets. Position the unit in the designated location giving consideration to the following points.

- Excluding the exhaust fan section, there are access doors on one side of the section modules. Provide sufficient clearance (39" **minimum**) in front of the doors on at least one side for service and element removal.
- Level the unit to ensure proper drainage from the drain pans. After the cabinet has been properly located, it must be secured in place by bolting or welding. Reinstall any section elements removed during installation. **Make sure air flow direction is correct.**

CAUTION
In addition to the above space requirement, installation of the Model ATS in NFPA applications shall have a clearance of at least 18 inches to a combustible material, 3 inches to limited combustible material, and 0 inches to noncombustible material. Any reduction in clearance or exceptions must be in compliance with NFPA and acceptable to the Authority Having Jurisdiction.

WARNING
Fire Suppression Systems
Extreme caution should be exercised when this unit is installed in applications that are collecting volatile or potentially flammable contaminates such as cooking grease and petroleum based oils. Trion strongly recommends a fire suppression system be installed in the ductwork and on the Model ATS in cases where these contaminates are collected on the cell plates and collect on the attached ductwork. Contact the factory for questions or concerns regarding a fire suppression system.

WARNING
Motor/Starter Disconnects – UL Listing
To maintain agency listing on this equipment, all customer provided Combination Motor Starter/ Disconnects shall be UL Listed (NLDX) and utilize at least a UL type 1 enclosure.

Connect Adjoining Duct Work
When the adjoining ducting is installed on the air entering side, the bottom of the horizontal duct should be relatively flat and sloped toward the section housing drain pan for an 18-inch length. This will enable any wash water splashback occurring during the washing operation to run back into the drain pan. Secure the adjoining ducting to the section housing utilizing the .375" holes provided. The seams should be made air and watertight by caulking or gasketing. Upstream ducting conveying warm air and subjected to cold temperatures must be insulated to prevent excessive condensation.

Drains
Connect a drain line to the 2" NPT couplings provided in the drain basins of the impinger and electronic air cleaner sections in accordance with the governing plumbing codes. The drain line must be sealed with a trap or other means to prevent air bypass. If a trap is used, it should hold sufficient water to overcome the system's negative air pressure and to ensure that loss of liquid from evaporation between cleaning periods will not break the seal. The drain line should not be smaller than the drain coupling on the ATS, or it will restrict the flow of water.

Water Supply
The items required for field installation in the wash water supply are a strainer, a back flow preventer (not supplied), and the detergent system.

Unless otherwise specified, the water supply should be hot (140°F recommended-WATER HEATER NOT SUPPLIED BY TRION) at the volume specified for the given unit, and at a full flow pressure between 40 and 50 PSIG.

WARNING
Precautions should be taken in the event the water supply, detergent system and drains are subjected to freezing temperatures.

Although not required, a pressure gage and a manual isolation valve are recommended. The components should be located within the system to provide for service access.

Control System
Mount the Control System, with the high voltage power supplies, in the selected location. It must be mounted indoors. Mount the enclosure so the controls are at eye level to ease in monitoring unit operation and as close to the ATS unit as practical. Allow 36" in front of the Control System for service.

WARNING
EXERCISE EXTREME CAUTION WHEN WORKING WITH HIGH VOLTAGE AND COMPLY WITH NEC AND ALL APPROPRIATE LOCAL CODES.

Wiring

High Voltage Wiring
The high voltage wiring requires connecting the power supplies to the ionizing-collecting cells located in the electronic air cleaner section cabinet. On multicell units, the wiring between the cells within a tier is automatically made with intercell spring contacts.

Two high voltage wires must be run to each row of cells in the ATS, one for the ionizers and one for the collectors. These special wires are furnished by Trion. Two power supplies may be required to power a row of cells. These power supplies will be jumpered together in the Control Panel (at the factory). Ring type connectors have been factory installed at the cell end of the leads. After the leads have been run and cut to the proper length, spade connectors (shipped on their respective power supply terminals), should be secured by both crimping and soldering. For working ease, the power supplies may be removed from their retaining slide channels by removing the single bolt in the top corner of the circuit board. Each lead is to be run in separate rigid conduit and must be a continuous run. (DO NOT SPLICE.)

Control Wiring
The control wiring should be completed using rigid conduit in accordance with electrical codes. Refer to the Custom Wiring Diagram created for this system.

The Control System connects to: Facility Power (typically 120/240vac); Detergent system; Manifold drive motors*; Solenoid valves*; Door interlocks*; exhaust fan motor starter/disconnect; Temperature sensor (when specified); Fire suppression control (when specified); Building Management System (when specified)

*One each for impinger and electronic air cleaner

Fire Suppression System (when specified to be factory supplied)
The installation of the fire suppression nozzles, fire sensor device, the components within the chemical cylinder housing and the interconnections of the components have been completed at the factory. The authorized fire control contractor must complete the

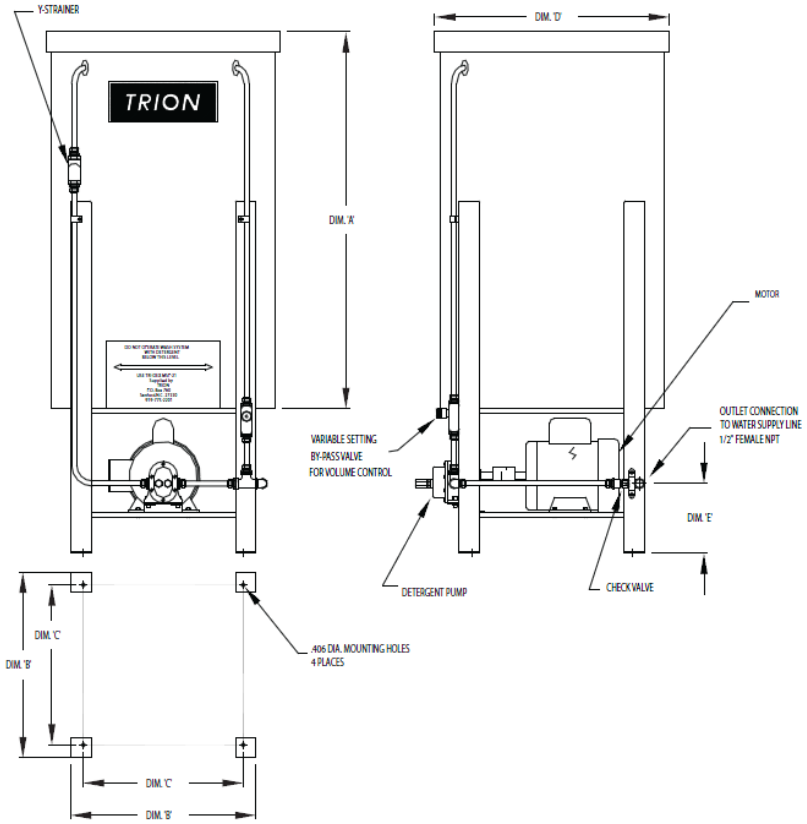
remote mechanical “Pull,” any other hookup or tie-in, final test and inspection.

Mount the fire extinguishing system instructions in the designated area that is conspicuously located. This should be in the kitchen or a well occupied work area and is normally near the control.

Detergent System

The detergent system (Figure 1) should be located as close to the unit as practical. Service space must be provided for periodical manual filling of the detergent tank, and to gain access to the pump and motor assembly. After positioning, the unit must be secured in place. The Detergent System should not be installed more than 30ft below the ATS System. **DO NOT FILL THE DETERGENT SYSTEM WITH DETERGENT UNTIL THE SYSTEM IS READY TO BE COMMISSIONED.**

Note: Trion Tridex Detergent is specially formulated for use with Trion electronic air cleaners. Use of other cleaners and detergents, not specifically approved by Trion, can cause possible failures in the unit and will void any warranties on our equipment.



TANK SIZE	WEIGHT		MOTOR HP	MAX PUMP CAPACITY @60 PSI	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'	DIM 'E'
	EMPTY	FULL	120V/60HZ/1PH						
16 GAL	50 LBS	200 LBS	1/2	3 GPM	42.00	11.49	9.50	15.50 DIA. ±.50	6.31 $\pm^{.50}_{.25}$
30 GAL	50 LBS	330 LBS	1/2	3 GPM	44.00	14.74	12.75	20.00 DIA. ±.25	6.31 $\pm^{.50}_{.25}$
55 GAL	115 LBS	585 LBS	3/4	6.5 GPM	50.50	17.86	15.50	23.00 DIA. ±.25	6.75

DETERGENT SYSTEM OUTLINE
FIGURE 1

Operation

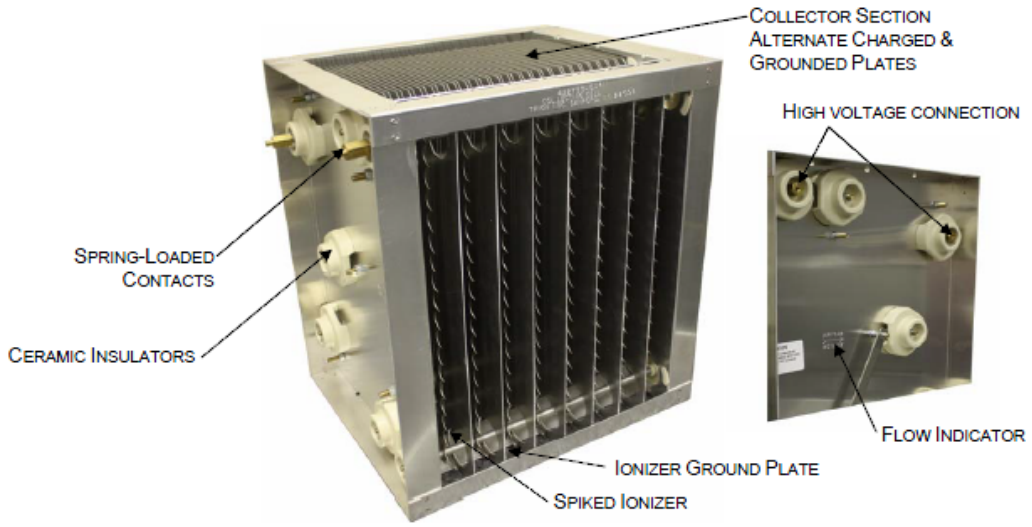
WARNING: RISK OF ELECTRIC SHOCK
These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

Description and Principles of Operation

The basic ATS units can be made up of five modular sections. Each of the first three sections employs different mechanisms to remove and capture particulate matter from the air. The modular sections can be built in several widths and heights to accommodate different air flow requirements. Refer to the System Outline drawing for information on the specific system design for this project.

The first section, the **Impinger**, is primarily designed for capturing relatively large liquid particulate. The impinger has two layers of baffles that create an air flow pattern which causes the liquid particulate to collect and flow down the baffles. Holes in the frame permit the liquid to drip into a drain basin below.

The second section houses an electronic air cleaner, technically known as an **Electrostatic Precipitator**. Basically, airborne particles are electrically charged as they pass through a high voltage field. The field is created by applying 12,500vdc to a spiked ionizer and placing it next to a grounded plate. As the charged particles continue into the cell, collector plates, charged at 6,250vdc, push the particles onto the collector's grounded plates.



ELECTROSTATIC PRECIPITATOR CELL

The ionizing-collecting cells (contaminate collecting elements) are housed in the cabinet on slide rails. They can be removed from the cabinet as required, through the end access door, by sliding them out like drawers. On multicell units, all of the electrical connections between cells in a given tier are automatically made through spring loaded contacts. When installing the cells into the cabinet, observe the directional arrows on the cell end plates. The side of the cell containing the spiked ionizer blades must always be located on the air entering side.

The **Media Module** is the third section of the ATS System. In most cases, the media is a bag filter which is made up of a series of long deep pockets arranged side-by-side. Ultra-fine fibers are used in the media to that trap up To 95% of the remaining particulates.

In the event of an electrical outage in the electronic air cleaner, the bag filter acts as a backup collector. Also, in some applications, the bag filter will collect any contaminant that may “blow-off” the electronic air cleaner. When the bags become saturated with contaminant they must be removed and replaced.

The fourth section of the ATS is a **Carbon Odor Control Module**. Panels, filled with activated carbon granules, are arranged in a V-shaped bank providing a large surface area for the air. The surface of each granule is extremely porous and absorbs materials that are in a gaseous or vaporized state that cannot be removed by the previous filter sections. Using the carbon filters without the pre-filtration (by the bag filters) is not recommended. When the panels have become saturated or fully loaded they may be replaced with new or reactivated carbon.

The fifth section, the Exhaust Fan/Motor, has been sized to handle the air flow requirements for the systems and the adjoining ducting.

Fire Suppression System

When the fire suppression system has been specified to be factory furnished it consists of strategically located chemical spray nozzles located in the impinger and electronic air cleaner modules. The fire suppression chemical is stored in a cylinder housed in a weatherproof enclosure mounted on one side of the exhaust fan module. A fusible link, mounted downstream from the impinger module in the electronic air cleaner module, activates the system by sending a signal to a control head discharging the chemical cylinder.

In addition to the electrical detection device, a remotely located pull station is provided for mechanical activation of the system manually.

Depending on the installation and any local, or other governing requirements, the ATS unit fire suppression system may be linked with other fire suppression devices. When the fire suppression system is activated, everything except the exhaust fan is turned off. **After the fire suppression system has been activated, an authorized fire suppression contractor must put it back into service.**

When a fire control system is specified, both the impinger and electronic air cleaner sections contain chemical spray nozzles.

Wash System

The automatic Wash System periodically cleans the accumulated contaminant from the cells. The wash system consists of a series of nozzles mounted on long manifolds on both sides of the cells. Gear motors rotate the manifolds, spraying water and detergent on the contaminated surfaces. Pans in the bottom of each washed section collect effluent and drain it to waste. A Detergent Feeder System adds specially formulated soap into the wash system. The amount of detergent needed for each wash is adjustable and depends on water temperature and the type and amount of contaminant collected.

The events in a wash cycle are:

1. Power supplies and exhaust fan is are turned OFF (1min allows the exhaust fan to coast to a stop)
2. Water spray wets the cells (30sec)**
3. Water spray and detergent (1min)**
4. Soak (2min)**
5. Water Spray rinses the cells with clear water (2min)**
6. Drip dry allows most of the water to drain from the cell (4min)
7. Forced dry uses the exhaust fan to air dry the cells (60min)

**If the system is equipped with an Impinger or has multiple Electrostatic Precipitator sections, Steps 2-5 will repeat until all sections have been washed.

At the end of the forced dry cycle, the unit will go into standby mode, unless special programming is requested. While in standby, the unit will still have fire suppression capabilities.

Some contaminate is harder to remove and may require a stronger detergent solution. Average settings have been factory set. Best possible settings for any given installation, however, are determined through experience. Visually examine the collecting elements after the first few washings.

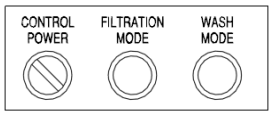
Note: Trion Tridex Detergent is specially formulated for use with Trion electronic air cleaners. Use of other cleaners and detergents, not specifically approved by Trion, can cause possible failures in the unit and will void any warranties on our equipment.

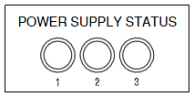
Control System

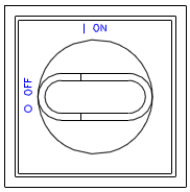
The control system is custom configured to support the ATS System designed for this project. The primary purpose of the control system is to coordinate the wash system, control the exhaust fan, and the activation of the high-voltage power supplies. A programmable clock is used to activate the wash cycle automatically. All of the control functions reside in a programmable controller (PLC) that is pre-programmed at the factory to meet the requirements of this system. Limit switches on the Impinger and Electrostatic Precipitator section doors prevent the activation of the filtration or wash modes, unless the doors are closed completely. Opening the doors during either filtration or modes will shut down the system until the door is secured.

If the facility is equipped with a Fire Alarm system, this can be wired into the controls to turn off all ATS functions except the exhaust fan (which helps evacuate fire smoke). The exhaust fan will remain on until the Fire Suppression mode is cleared (see below).

The normal ATS System program is designed to complete the wash cycle and shut down. This allows the system to be washed at the end of production and then wait to be restarted manually at the beginning of the next day. The ATS can be programmed to execute the wash cycle and then return automatically to the filtration mode.







Operator Devices on the face of the control panel allow manual control of the system.

- The illuminated Control Power switch turns ON/OFF the power for the control panel. If the system power is turned off, fire protection programming is not operating.
- The black Filtration Mode push-button allows the ATS to be started and stopped. A momentary push when the system is not filtering will turn on the exhaust fan and activate the power supplies. Holding down the push-button for 5 seconds will turn off the filtration mode.
- The blue illuminated Wash Mode push-button will start the wash cycle manually.
- To reset Fire Suppression Mode, hold down the Filtration Mode and Wash Mode push-button simultaneously for 5 seconds.
- Amber LED's on the panel indicate the operation of the power supplies in the control panel.
- A main disconnect turns off the power to the entire control panel and allows the enclosure door to be opened.

Kitchen Exhaust Systems

For safe and proper operation adhere to the following instructions and procedures:

- Exhaust systems shall be operated during all periods of cooking in restaurant applications.
- Filter-equipped exhaust systems shall not be operated with filters removed.
- The posted instructions for manually operating the fire extinguishing system shall be kept conspicuously posted in the kitchen and reviewed periodically with employees by the management.
- Listed exhaust hoods shall be operated in accordance with the terms of their listings and the manufacture instructions.
- Cooking equipment shall not be operated while its fire-extinguishing system or exhaust system is out of service.

Initial Start-up

Check Out for System Start-up

Prior to equipment start-up, the fire extinguishing system employed in the ATS unit (and possibly adjoining equipment) must be inspected by properly trained and qualified personnel. This includes all actuation components including remote manual pull stations, mechanical or electrical devices, detectors, fire-actuated dampers, etc. These items shall be checked for proper operation during the inspection in accordance with the manufacturers listed procedures. In addition to these requirements, the specific inspection requirements of the applicable NFPA standard shall also be followed. If required, certificates of inspection shall be forwarded to the authority having jurisdiction.

When the installation has been completed, assure that the equipment is ready for start-up by checking the following:

- Inspect the inside of the adjoining ductwork and ATS System to be sure it is clean and free of any debris or construction materials. Especially note the opening in the drain basin for any restrictions. The ducting, where secured to the cabinet collars, should be sealed watertight with either gasketing or caulking.
- Inspect the ionizing-collecting cells to see that all of the ionizing blades are intact and that no large pieces of foreign material are lodged between the plates. Also verify that the cells are properly installed in the cabinet with the spiked ionizing blades located on the air entering side (Follow the air flow directional arrows).
- Check that the high voltage wiring is connected to the proper terminals, both at the ionizing-collecting cells and on the power supplies.
- Be sure that the drain lines from the drain basins are completely connected and properly terminated. A trap or seal of some type should be incorporated in the line to prevent air bypass.
- Check the water supply line to be sure water is available and that the strainer, back flow preventer (by others) and detergent system are properly installed and connected.
- Be sure that electrical power is available, that the wiring is completed, and that the exhaust fan is ready to energize.
- Be sure that all access doors are closed.
- Close the system electrical supply switches, making power available to the control and exhaust fan motor starter. Check to verify exhaust fan rotation is as shown on the rotation indicator arrow.
- Turn the “ON-OFF” selector switch to the control “ON”. The exhaust fan should run and the power supplies should be energized. If the exhaust fan does not start, press the Filtration Mode push-button. Electrical arc-over within the ionizing-collecting cells may occur. It is a normal occurrence caused by accumulation dust from construction or other sources in the cells and should soon subside. If the arc-over is continuous and does not subside, recheck the routing of the high voltage leads between the power supplies and the cells. The ionizer lead must be connected to the ionizer and the connector lead to the collector. If arc-over still occurs, or difficulty other than that outlined above, refer to the Trouble Shooting reference chart Section IV.
- Be sure the detergent tank is clean, and then fill the tank with detergent. To adjust the volume of detergent used during the wash cycle, use an Allen wrench to loosen the set screw on the knurled knob of the control valve (see Figure 1). Make note of the detergent level prior to a wash cycle. After a wash cycle, use the chart to determine the amount

of detergent required for your system and adjust accordingly. Turning the knob clockwise increases the volume and counter clockwise decreases the volume. When adjustment has been made, be sure to retighten the set screw.

System	Detergent Required
ATS-2	.2
ATS-4	.4
ATS-6	.63
ATS-8	.91
ATS-10	1.2
ATS-12	1.4

Programming Time Clock for Automatic Wash

The time clock provides flexible timing for daily and/or weekly programming. Setting the clock is simple and fast by means of push buttons and display prompts. This timer combines 24 hour/7 day timing. The time clock should be programmed for 1 minute duration for each programmed wash cycle. A Lithium battery provides 5 year backup.

1. Press RESET
2. PROGRAM THE TIME
3. Push the mode switch to ◷
4. Press Day, h+(hour) and m+(minute) until correct.

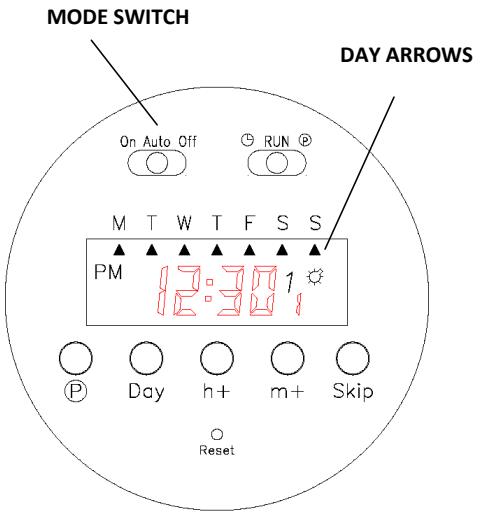
TO PROGRAM WASH TIME FOR THE SAME TIME EVERY DAY

1. Push the mode switch to Ⓟ
2. Press the Day button until all of the Day of Week arrows are showing.
3. Press h+ button until start hour is correct.
4. Press m+ button until start minute is correct.
5. This has selected the ON time.
6. Press Ⓟ button to select OFF time. Program number will be 2.
7. Press the Day button until all of the Day of Week arrows are showing.
8. Press h+ button until hour is same as ON time.
9. Press m+ button until time is 1 minute after the ON minute.
10. Push the mode switch to RUN.
11. When in doubt, press RESET and start over.

ADDITIONAL CLOCK NOTES

The clock is very versatile. It can be programmed to wash at different times each day. It can be programmed with different schedules for weekdays and weekends. It can be programmed to not wash on one or more days of the week. The ON/AUTO/OFF switch must be in the AUTO position for the clock to signal a wash cycle. The switch can be used to override any programming. In the OFF position the clock will not signal for a wash cycle. If it would suit the customer better, the clock may be left in the OFF position and the unit can be put into a manual wash cycle at any time by pressing the WASH button on the control panel.

For a complete set of instructions go to http://www.borggeneral.com/pdf/884.pdf.



Routine Maintenance

Washing Frequency

The frequency that the collected dirt is to be washed from the unit depends upon the type and amount of contaminate in the air being cleaned. Greasy contaminate tends to harden after collection and should be washed often. Likewise, units operating under extremely heavy loads should be washed more often as a large build-up of collected material will have a tendency to “blow-off” if permitted to remain on the collecting elements for long periods of time. It is recommended to wash at least once a week, for most applications except kitchen exhaust. Kitchen exhaust applications should be washed daily. Schedules may

then be altered as needed after visual examinations of the collected material contained on the ionizing-collecting cells. Also, daily washing is not unusual for units operating on heavy welding fume, kitchen exhaust hoods or similar applications.

Detergent
Effective washing is dependent upon detergent. The detergent reservoir level should be checked on a routine basis, a minimum tank level established. Never let the tank run dry which will damage the pump. The inside of the tank should be kept clean, free from dirt and foreign objects. The detergent as supplied by Trion, is formulated specifically for electronic air cleaners and should not be diluted when charging the tank. If substitutes are used, they must be approved by Trion (so as to not void the warranty) and should be safe for use in ventilation systems.

Electrical Operation
The front of the control panel has indicating lights for the power supplies. Check the lights daily to ensure that the electronic air cleaners are operating.

Preventative Maintenance

Washing frequency – as required. The washing schedule and detergent reservoir level as outlined under routine maintenance is again referenced here as excessively large contaminant buildup on the collecting elements invites down time. Established routine washing is a preventative maintenance requirement.

Fire control system - Every 4 to 6 months or as required. Inspection, cleaning and servicing of the fire extinguishing system and all listed exhaust hoods shall be completed by properly trained and qualified personnel.

All actuation components, including remote manual pull stations, mechanical or electrical devices, detectors, fire-actuated dampers, etc., shall be checked for proper operation in accordance with the manufacturers listed procedures. In addition to these requirements, the specific inspection requirements of the applicable NFPA standard shall also be followed. If required, certificates of inspection and maintenance shall be forwarded to the authority having jurisdiction.

Grease removal devices and components – every 4 to 6 months. All shall be completely cleaned, at frequent intervals prior, to surfaces becoming heavily contaminated with grease or oily sludge. It may be advantageous to remove items, such as impingers, metal mesh filters, ionizing-collecting cells or other grease removal devices for cleaning. When a cleaning service is used, a certificate showing date of inspection and/or cleaning should be maintained on the premises. Areas not cleaned will be noted. Flammable solvents or other flammable cleaning aids shall not be used.

WARNING
DO NOT USE HIGH PRESSURE CLEANING EQUIPMENT TO CLEAN CELLS. THE EXCESSIVE HEAT AND PRESSURE WILL CAUSE THE PLATES TO WARP AND IN TURN POSSIBLY CAUSE EXCESSIVE ARCING.

Turn off and lock out the power to the ATS Control System and associated systems. The fire suppression system shall not be rendered inoperable during the cleaning process.

Care shall be taken not to apply cleaning chemicals on fusible links or other detection devices of the automatic extinguishing system.

When cleaning procedures are completed all access panels, doors, and cover plates shall be replaced. Dampers and diffusers shall be positioned for proper airflow.

Water Wash Manifolds
The water wash spray pattern should be checked on each nozzle every 4 to 6 months to ensure that a full spray pattern is developed. Distorted patterns are usually caused by dirt in the nozzle orifice, which can be cleaned by inserting a small gage, soft copper wire into the orifice. If any one manifold contains several nozzles that are restricted, the drain plug at the idler end of the manifold should be removed, after the nozzles have been cleaned, and the manifold flushed with clean water. The main supply line strainer and the strainer in the detergent system should be checked and cleaned. Check the wash manifold drive belt and linkage connections and replace or tighten as required.

Power Supplies and Control
Examine the electrical components located inside the control enclosure every 12 months for any accumulated dirt or dust.

Exhaust Fan Bearings
Grease the two exhaust fan bearings at the grease fitting provided every 4 to 6 months with Shell Alvania #2, Texaco Multifac #2 or Mobilux #2. At this time, examine the exhaust fan for any accumulated dirt and clean as required.

Troubleshooting

WARNING
EXERCISE THE USUAL PRECAUTIONS WHEN WORKING WITH HIGH VOLTAGE. THE MAXIMUM OPERATING OUTPUT FROM THE POWER SUPPLY IS 5.5MA (11.0MA WHEN CONNECTED IN PARALLEL) AND 15,000VDC.

IF DOOR INTERLOCK SWITCHES ARE CLOSED AND CIRCUIT IS ENERGIZED, DO NOT TOUCH HIGH VOLTAGE. WHEN THE CIRCUIT IS DE-ENERGIZED, ALWAYS BLEED OFF REMAINING STATIC CHARGE WITH AN INSULATED HANDLED SCREW DRIVER BY SHORTING FROM THE HIGH VOLTAGE CONNECTION TO THE FRAME OF THE COLLECTING CELL.

WARNING: RISK OF ELECTRICAL SHOCK
THE SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE SERVICE INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.

Introduction
This section on trouble shooting provides a description of potential malfunctions, their cause, location and correction. A Trouble Reference Chart listing the most probable causes and corrections follows the general text.

Indicating lights are installed in the face panel of the control to monitor the electrical operation of each power supply and the ionizing-collecting cells they energize. The quantity of power supplies per unit is dependent upon unit size with at least one supply to each cell tier. You should have a volt-meter with a 20KVDC high voltage probe.

Secondary Voltage (13KV)
The most common outage is a short in the high voltage circuit and is best located through the process

of elimination. A flickering light with an arcing noise is an indication of a high resistance short circuit. If the light is OFF it is an possible indication of a dead short or no 120vac power to the power supply. To isolate the short to any one of these three components, proceed as follows:

- Disconnect both high voltage leads from their respective terminals on the power supply and support them away from any point of contact
- Energize the power supply:
  - If the light still flickers or does not glow; the trouble is indicated to be in the power supply. First, replace the power supply in its entirety.
  - If the light glows steady with the leads disconnected, the power supply is indicated to be normal.
- Next reconnect both high voltage leads to their respective terminals on the power supply and disconnect them at the ionizing-collecting cells. Support them away from any point of contact and energize the power supply.

Note: In order to complete the primary circuit to the power supply, it will be necessary to close both the access door electrical interlock switch.

- If either high voltage lead is defective, the light will indicate the trouble. Each lead may then be checked separately by disconnecting them, one at a time, from their respective terminals at the power supply. When a lead is found to be defective, replace it in its entirety. Do not repair or splice.
- If the light glows steady with the leads disconnected at the cells the trouble is then indicated to be in the ionizing-collecting cells. The trouble can then be isolated to a single cell or ionizing or collector section of a given cell as follows:
  - First determine if the short is in the ionizing section or the collecting section by connecting each high voltage lead to its respective section, one at a time, and energizing the power pack. (The lead not connected must be supported away from any point of contact.) The short symptoms will still exist for the section in which the short is located. If the trouble causing the short is bridging both sections, then the short will be indicated in both sections when they are individually connected.
  - When the short is isolated to a cell tier, remove all the cells within the tier and visually check the sections indicated to contain the short.
    - If the short is in the ionizer section look for a broken or defective insulator.
    - If the short is in the collector section look for a large piece of foreign material bridging the collector plates or a defective insulator.
    - If the short is indicated to be in both sections, it will probably be a foreign object bridging the air gap between the ionizer and the collector.

Primary Voltage (120V)

Although open circuits can occur in the secondary they usually take place in the primary. If the unit contains only one power supply and the indicating light does not glow the outage is probably one of the following:

- Supply line power to the control disconnected.
- Access door interlock in impinger or ionizer/ collector section of electronic air cleaner.
- Faulty power supply. Look for charred or burned components or a loose wiring connection.

Troubleshooting Reference Chart

Symptom	Probable Cause	Correction
Power Supply Indicating Light OFF	Input Power	Check 120vac to Power Supply
	Interlock Switch not engaged	Close the door
	Interlock Switch failure	Replace Switch
	Extremely dirty insulators	Clean
	Cracked insulators	Replace
	Foreign object between plates	Remove
	Bent or warped plates	Remove
	Leads grounded (short circuit)	Replace
Indicating Light flickering	Reversed high voltage leads	Reconnect leads
Poor filtration	Loose or defective intercell connection (on multicell units)	Tighten or replace
	Foreign object adrift in ionizer or plate section of cell	Remove
	Dirty cells	Clean or replace cells
Low air flow	Metal mesh filters dirty	Clean
	Bag filter saturated	Replace

Spare Parts

Recommended spare part quantities are usually based on the unit size and the amount of units per installation. For specific recommendations, consult the Trion factory or nearest Sales Office. Consideration, however, should be given to stocking the following components.

Description	Quantity
Complete Power Supply	1ea
Power Supply Indicating Light	1ea
Ionizing-Collect Cell Insulator	6ea
Trion Detergent	55gal

Part numbers are not listed as they are subject to change.

Always state Unit Model and Serial Numbers when ordering parts.

TRION®

Air Purification Systems

Trion®

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