UNIVERSAL AIR & GAS PRODUCTS CORPORATION
www.uapc.com

Email: info@uapc.com

1140 KINGWOOD AVENUE - **NORFOLK, VA 23502** **TEL: 757-461-0077 • FAX: 757-461-0808**
4715 STOCKHOLM COURT - CHARLOTTE, NC 28273 **TEL: 704-374-0600 • FAX: 704-374-1008**
Quality Equipment and Service Since 1962

INSTALLATION, OPERATIONAL AND SERVICE MANUAL

MI-1a

STANDARD MODEL

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I. OPERATING PRINCIPLE

The **Universal Air** precipitator is composed of four (4) basic components: the ionizing section, the collecting section, the power pack and blower. The first two combine to form the collecting cell.

The collecting cell(s), within the air cleaner housing, is ahead of the air-moving unit. The airborne particles (as small as 1 / 2,500,000 of an inch) that enter the precipitator acquire a positive electrical charge. The charged particles continue into the collecting plate section, where they are repelled by another electrical field onto the collector plates.

Periodically, the collecting cell(s) and mechanical filters must be removed for cleaning.

A power pack converts 115 volts alternating current to 7,500 volts direct current to supply the necessary voltage for the ionizing-collecting cell(s).

II. ELECTRICAL CIRCUIT

In the primary circuit, 115-V, 60-cycle, single phase, AC enters the power pack through a safety switch that is mechanically operated by the screw retaining the power pack cover, then through a toggle switch which is used as an “on” and “off” switch.

When the power pack cover is removed, it opens the safety switch to prevent shock from contact with the circuit.

The primary power enters a power supply, which produces the necessary voltage for the operation of the precipitator.

The blower is controlled by a switch and must be on with the power supply for adequate cleaning.

!! CAUTION !!

(i) The power pack must be grounded when being bench tested.
(ii) Discharge the secondary circuit with an insulated handle screwdriver before touching any of the components.

III. INSTALLATION

A. Determine Location of Precipitator

The **Mighty Ion** can remove only those particles that reach its collecting element(s). It is, therefore, important that the unit(s) are installed near the source of heavy pollution approximately five (5) feet from the inlet. In the case of multiple units, they should be spaced approximately forty (40) feet apart, depending upon the CFM capacity of the units.

The unit(s) should be positioned so as to provide a perimeter movement of air. The output of each unit should be directed into the intake of the next unit. If the room is wider than seventy-five (75) feet, it may be necessary to install additional units through the center portion of the room or provide circulation to disperse the air to its perimeter. Airflow should not be directed into heater discharge.

DO NOT locate the air cleaner inlet too close to the corner of a room. Air will bypass the unit and not be cleaned. DO NOT locate the air cleaner outlet too close to a corner or wall. The air will bounce back and restrict recirculation.

Whenever space permits, the unit(s) should be hung aproximately six (6) feet from the wall and approximately ten (10) feet from the floor using the eye bolts provided. It is better, however, to have a rigid mount for the unit(s) for ease of maintenance. A minimum of twenty-seven (27") inches must be provided for collecting cell removal clearance.

IV. ELECTRICAL REQUIREMENTS

The precipitator power pack is equipped for 115V or 220V, single phase operation only. The blower motor can be operated on 115V.

Plug in the primary cord. The precipitator is ready for operation by turning the blower switch and power pack switch "on".

V. MAINTENANCE

Effective air cleaning performance requires regular cleaning of the collecting cells. Prefilters usually require cleaning at the same time.

CAUTION: The precipitator collecting cell(s) is a delicate instrument and should be handled gently. Avoid grasping the cell at the plate section or setting it on any protruding objects. A bent or warped collecting plate will cause the cell to arc frequently and reduce its performance.

VI. PREPARATION FOR CLEANING

Unscrew the time delay screw from the safety interlock box. Unlatch the cell access door and discharge the collecting cell with an insulated handle screwdriver. Remove collecting cell.

VII. CLEANING FREQUENCY

Cleaning of the collecting cell will vary from one installation to another, depending on many application-related factors. For most common applications, cleaning frequency is from once a week to once a month or when the precipitator begins to arc frequently. With a heavy dirt loading, more frequent washing will usually be required. If a very heavy build-up of dirt is found on the collecting cell(s) after washing, they should be washed more frequently. A wash reminder schedule should be posted after a frequency schedule is established.

VIII. CLEANING PROCEDURE

The best cleaning procedure is usually soak-washing. Recommended cleaning compounds, depending on the character of the contaminant collected, vary. Regular commercial dishwasher detergent is effective in many cases. As an alternate, the standard cleaners used on plant and process equipment may be used if they are inhibited to be safe with aluminum.

If the collected contaminant is a dry dust or powder, it can adequately be cleaned by rapping the collecting cell against the side of a dust bin or blowing off the dust with a blast of compressed air. Eventually, it will become necessary to provide a soak-washing. Detergent steam can also be used effectively or a detergent solution under pressure.

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IX. SOAK-WASHING

Provide a suitable soaking container large enough to hold at least one collecting cell completely immersed in solution.

Hot water should be used to readily dissolve the selected detergent suitable for local water conditions. CAUSTIC cleaners CANNOT be used. They will destroy the aluminum.

Soak the collecting cell and mechanical filters in the dissolved solution for approximately twenty (20) minutes. After soaking, slosh the collecting cell and mechanical filters to remove loosened dirt. Length of soaking should be determined by quantity and tenacity of dirt build-up.

Rinse the collecting cell and mechanical filters thoroughly to remove all traces of detergent and allow to drip dry.

Examine the collecting cell for broken ionizer wires or bent collector plates, and then replace the cell in the precipitator housing. At this time, it is advisable to clean the insulator which supports the high voltage jumper.

Turn on the blower and power pack. If the collecting cell arcs, turn off the power pack and allow the blower to thoroughly dry the collecting cell(s). (A spare collecting cell will eliminate any down-time of the precipitator.)

X. TROUBLE SHOOTING

A malfunction is indicated by the green light flashing. The difficulty can be isolated to either the power pack or the collecting cell, as follows:

(i) Remove power pack cover.
(ii) Disconnect the high-voltage lead by removing the nut at the thru-panel insulator.
(iii) Pull the high-voltage lead away from any point of contact.
(iv) Turn “on” switch.
(v) Depress the safety switch button and hold for a couple of minutes.

If the green light is flashing or is off, the difficulty is in the power pack. If it stays lit, the difficulty is in the collecting cells or the access panel insulator.

A. Power Pack Difficulty - To check this possibility see above malfunction and if the problem is in the power pack the problem lies with the power supply. Consult factory for new power supply.

B. Collecting Cell Difficulty -- Trouble in the collecting cell may be the result of one or more of the following:

(1) Collecting cell still wet after washing.
(2) Water wash system leaking.
(3) Broken or loose ionizing wire(s).
(4) Foreign objects between collector plates.
(5) Extremely dirty collecting cell.
(6) Bent or warped collector or end plates.
(7) Cracked or porous insulators in either the ionizing or collecting plate section. This condition would develop after washing and probably in the collecting plate section. An OHMmeter in some instances may provide a reading.
(8) On multi-cell units, the jumper must be between the cells.

(9) When handling the collecting cell, it is possible for the high-voltage plate supports stamped with airflow directional arrow) to drop out of their recess. A slight shift in either direction will put them in place. Proper positioning can be determined by observing the centering of the four (4) tie rods of the high -voltage plate support in the holes of the larger end plates.

C. Insulator Difficulty -- A cracked or porous insulator may cause a ticking sound, cause the meter needle to flick or to read high. The defective insulator can be isolated by energizing the unit for several minutes and then touching the insulators. The defective insulator will become warm. *Do not touch while power is on. Always unplug before touching any componets.*

(1) A defective stand-off insulator in the power pack or ionizing section of the collecting cell can be determined by removing the screw from the ground side. The screw will be corroded.
(2) A defective collecting cell plate support insulator will cause rust to form around the hole in the plate support.
(3) A defective thru-panel bushing (two-piece) will become corroded inside.