

Tailored solutions from people who care



Custom Air Quality Solutions for Commercial Kitchen Exhaust

FILTRO PRECIPITADOR DOS ETAPAS

1.0 Electrostatic Air Cleaner

1.1 Equipment Description

- 1.1.1 The Air Cleaner shall be used to cleanse the contaminated air from commercial kitchen exhaust hoods containing grease, oil, smoke, fumes, odor, and dust particles.
- 1.1.2 The unit shall be modular in construction and shall have individual sections of prefilter, ionization collector section, and postfilter.
- 1.1.3 Optional additional passes of ionization collector sections with or without automatic washing systems; single and multiple passes of odor neutralizing section(s); utility or inline blowers; controls packages are all available.
- 1.1.4 All sections can be enclosed in an optional weather-resistant outdoor rated housing.

1.2 Equipment Specifications

- 1.2.1 The air cleaning system
modular two stage Penny-type electrostatic precipitator.
- 1.2.2 Manufacturer shall supply the unit with expertise in design and manufacturing of products specified in this section with a minimum of 45 years of documented experience.
- 1.2.3 Unit shall comply with UL 867 and UL 710 standard or equivalent standards. The units shall be in complete accordance with ASHRAE standard 52.2 for air cleaners test and rating of efficiency, resistance and dust holding capacity.
 - 1.2.3.1 Ozone generation concentration shall not exceed 0.05 PPM.

1.3 Principle of Operation

- 1.3.1 The heavy duty pre-filter(s) and post-filter(s) (aluminum mesh) shall remove large particles, and evenly distribute air across the cells.
- 1.3.2 The electronic filter shall remove the smaller grease, oil, smoke and dust particles.
- 1.3.3 The principle of operation shall be based on electrostatic precipitation.
- 1.3.4 The particle shall pass by an ionizing wire, which will induce a positive charge on the particle. The particle then shall pass between closely spaced aluminum plates (fins), which are held at a positive charge and a ground.
- 1.3.5 As the charged particle travels between the two aluminum plates it shall be forced away from the plate held at the identical polarity and drawn towards the grounded plate. Once attached the particle shall remain on the plate until cleaned off during washing.

1.4 Unit Housing

- 1.4.1 Housing shall be 16 gauge (1.5mm) and 14 gauge CRS with epoxy coat finish construction. All critical seams shall be welded.
- 1.4.2 Each section shall include single door access, located on one side of the unit. The access door shall be mounted on metal hinges and secured with gasket sealed knob style latches allowing for component access and removal. All doors shall be gasketed to prevent air and water leakage.
- 1.4.3 High voltage contacts on the housing shall be made of stainless steel.
- 1.4.4 High voltage supply is to be located in the door.
- 1.4.5 All drainage piping shall be metal.
- 1.4.6 The contractor should install a drain trap to serve as a vacuum break.
- 1.4.7 Between each section should be sealed with a permanent seal.
- 1.4.8 Each unit shall have track guides for proper alignment of cell, making it possible to change the direction of airflow by reversing the orientation of electronic collector cell(s).

1.5 Finish

- 1.5.1 The external casing finish shall be a durable industrial grade semi-gloss baked on epoxy ester, not less than 3-mil minimum thickness.

1.6 Prefilter and Postfilter

- 1.6.1 Access to the heavy duty pre-filter and post-filter shall be from the side through the same hinged door used to gain access to the electronic cells.
- 1.6.2 Separator section shall be designed for an equal airflow across the entire air-cleaning unit.
- 1.6.3 All liquid and solid particulate removable by the separator shall be collected and drained from the collector system during operation.
- 1.6.4 Frame
Washable aluminum.
- 1.6.5 Media
Washable aluminum 1.00 inch thick mesh layered to optimally remove larger particles of grease and dust before the main filter. Face of each prefilter shall be 4 square feet (1.47 square meters).

1.7 Electronic Cells

Electronic cells described in this section refer to a full size cell. Half size cells also can be specified.

- 1.7.1 Ionizing-collecting cells shall be of one-piece construction 10.75 inches (273 mm) deep in direction of airflow. Face area of each cell shall be 4.08 square feet (0.38 square meters) and the effective collecting area 240 square feet (22.29 square meters).
- 1.7.2 Frame
All support framing, end plates and ionizer ground electrodes shall be 0.080-inch (2.03-mm) thick aluminum.
- 1.7.3 Handle shall be located on the side of the cell for removal of the cell from the air cleaner. The handle shall be grounded to the frame of the cell. Engraving shall be on the handle indicating "this side out".
- 1.7.4 Contacts shall be made of stainless steel on the front of the cell. They shall make contact with the ionizing, collector and ground sections of the cell.
- 1.7.5 Ionizer Section
 - 1.7.5.1 Ionizing wires shall be a minimum of 11 per electronic cell, with a length of 20.32 inches (533.4 mm) each.
 - 1.7.5.2 Ionizing wires shall be constructed of 0.010 inches diameter (0.25 mm) tungsten for prevention of corroding or breaking. Wires shall be fixed at one end and spring mounted on the other for ease of maintenance.
 - 1.7.5.3 There shall be 10 grounding plates between the wires to stabilize the ionization field for better performance. Grounding plates shall be no greater than 1.964 inches (49.89 mm) apart, and 0.063 inches (1.6 mm) thick.
 - 1.7.5.4 Insulators for the ionizer shall be made of ceramic measuring 1.0 inches (25.4 mm) thick by 2.25 inches (57.15 mm) square with a center hole measuring 0.275 inches (6.95 mm) in diameter. The insulators should have a protective coating of glazing to retard tracking. Insulators shall not number less than 4 in the ionizer section.

- 1.7.6 Collector Section
 - 1.7.6.1 Grounding plates shall be a minimum of 0.025 inches (0.635 mm) thick aluminum. The plates shall be 7.64 inches (194 mm) deep in the direction of airflow. Grounding plates shall be a minimum of 54 quantity per cell. Spacing between grounding plates shall be at 0.3678 inches (9.34 mm). Spacing between the grounding plates and the charged plates shall be at 0.1839 inches (4.67 mm).
 - 1.7.6.2 Charged plates shall be a minimum of 0.025 inches (0.635 mm) thick aluminum. The plates shall be 7.14 inches (181.36 mm) deep in the direction of airflow. Charged plates shall be a minimum of 55 quantity per cell. Spacing between charged plates shall be at 0.3678 inches (9.34 mm).
 - 1.7.6.3 Spacers shall be made of aluminum to hold the ground and charged plates apart at given lengths. Rods shall be 0.25 inches (6.35 mm) in diameter. The spacers shall run the length of the cell to the frame of the cell. There shall be at least 11 rods total per cell.
 - 1.7.6.4 Insulators for the collector shall be made of ceramic measuring 0.8 inches (20.32 mm) thick by 2.25 inches (57.15 mm) square with a center hole measuring 0.275 inches (6.99 mm) in diameter. The insulators should have a protective coating of glazing to retard tracking. Insulators shall not number less than 10. Insulator shall be out of the air stream.
- 1.7.7 Markings shall be on the cell to inform clean weight of the cell. Engraving shall be on the cell indicating direction of the airflow.

1.8 Power Supply

- 1.8.1 Power supply shall be of a 100% solid state type.
- 1.8.2 Power supply shall be mounted within the air cleaner, out of the air stream and wash components.
- 1.8.3 Voltages
 - 1.8.3.1 Input voltage shall be 108-132 VAC, 60 HZ, 1 phase or 216-264 VAC, 50/60 HZ, 1 phase.
 - 1.8.3.2 Output High frequency with built in short circuit and arc protection, providing a dual high voltage output of (+)9.5 KVDC for the ionizer and (+)4.7 KVDC for the collector.
- 1.8.4 Optional HE power supply available to boost ionizer voltage to (+)12 KVDC to increase efficiency.
- 1.8.5 The power supply shall operate over a temperature range of -20 to 140 degrees F (-38 to 85 degrees C).
- 1.8.6 Be self-protecting.
- 1.8.7 Accommodate a neon light indicating the performance status.

1.9 Interlock Switches

- 1.9.1 Location – Integrally grounded, door operated electrical safety interlock switch shall be provided to prevent access to the high voltage collector cells without first interrupting the primary input power.

1.10 OPTIONAL Programmable Logic Controller (PLC)

- 1.10.2 Shall have a touch screen display.
- 1.10.3 Shall have dry contacts to control fan and high voltage power supply
- 1.10.4 PLC Inputs
 - 1.10.4.1 Heat sensor input that can be wired to a heat sensor install in the kitchen that can trigger the system to turn on the fan and EAC.
- 1.10.5 Optional HMI screen available to allow remote installation and control of unit PLC. HMI is connected by Ethernet to a maximum of 8 units.

1.11 1 Year Limited Parts Warranty is Included.

2.0 Odor Neutralizer

2.1 Equipment Description

2.1.1 The Odor Neutralizer shall be used to cleanse the contaminated air from kitchen exhaust hoods containing gases and vapors (odors).

2.2 Equipment Specifications

2.2.1 The Odor Neutralizer

Carbon Module.

2.2.2 Manufacturer shall supply the unit with expertise in design and manufacturing of products specified in this section.

2.3 Principle of Operation

2.3.1 The principle of operation shall be based on adsorption in the airstream. Adsorption is the process where a gas is taken to a porous substance and held there.

2.3.2 Activated Carbon is used only to adsorb materials that are in the gaseous or vaporized state. Materials that cannot be removed by particulate filters.

2.3.3 Gases and vapors travel through the carbon filter and are adsorbed into the micropore structure of the carbon.

2.4 Carbon Media

2.4.1 Carbon

2.4.1.1 Base material shall be of Virgin Coconut Shell allowing for high affinity.

2.4.1.2 Particle size shall be 4 x 8 allowing for a range of adsorbent retention.

2.4.1.3 Carbon tetrachloride activity shall initially be at 60 minimum.

2.4.1.4 Hardness number shall be 97 minimum.

2.4.1.5 Density shall be an average of 31 pounds per cubic foot (497 kg per cubic meter).

2.4.1.6 Total ash content shall not exceed 2%.

2.4.1.7 Iodine number shall be greater than 1050.

2.4.2 Panels

2.4.2.1 Panels shall be of a V-bank configuration.

2.4.2.2 Panels shall be 26 gauge (.45 mm) galvanized steel.

2.4.2.3 Panels shall hold a minimum of 18 pounds (8.18 kg) carbon each. Panels shall measure approx. 23.625 inches (60 cm) by approx. 23.625 inches (60 cm). Panels shall be approx. 2-inch (5.08-cm) thick minimum.

2.4.2.4 Airflow shall not exceed a face velocity of 65 ft per minute (19.8 meters per minute).

2.4.2.5 Panels shall be bulk refillable.

2.5 Safety Filter(s)

2.5.1 MERV 14 (ASHRAE Standard 52.2-1999)

2.5.2 Nominal 24" x 24" x 4"

2.5.3 Gradient Density Microfiberglass Media

2.5.4 Frame: 24 gauge Aluminized Steel

2.5.5 Media Separators: Corrugated Aluminum with hemmed safety edge

2.5.6 Faceguard on Upstream and Downstream Side of Filter