Halton - Ecology-E
Electrostatic Precipitator with Automatic Cleaning

Acceptance by The New York City Department of Environmental Protection.
Halton Foodservice specializes in indoor climate solutions for commercial kitchens and restaurants.

Our expertise, flexibility and proprietary technology, enable us to create memorable customer experiences and pleasant working environments increasing the profitability and productivity of food service operations around the world.
System Description
Ecology-E is a factory packaged system that includes a side access housing with integral wash system, pre filters, post mist eliminators, electrostatic collectors, safety bag filter, odor control media, system control, detergent dispenser, and accessories. The factory assembled system is custom designed for your particular requirements and can be supplied in modules.

MC8 System Controller
The MC8 System Controller is programmed to start and stop the system according to your schedule. At a preset time, the control also initiates a water/detergent wash cycle to clean away collected contaminants. Spent wash water is drained from the bottom drain pan, Ecology-E is then dried and ready to continue operations. Start, stop and wash functions can also be initiated manually. The MC8 control is web enabled for remote monitoring of the Ecology-E.

System Accessories
Ecology-E is furnished with these standard accessories.

- **Wash System**: detergent dispenser, detergent concentrate, backflow preventer, solenoid valve, pressure gauge, wye strainer, ball valve
- **High Voltage**: power pack, cable, terminations
- **Control**: MC8 PLC panel, pre programmed to start and stop the system and cycle the precipitator section through wash, rinse, dry and return to normal operation.

Utilities
- **Electrical**: Multiple Options Available
- **Wash Water & Detergent**: 1 1/2” or 2” line (model dependent) (See Selection Table for consumption)
- **System Drain**: Integral 3” FNPT

Options
Ecology-E consists of 3 base sections.

- **Electrostatic Precipitator**: collects smoke and grease particles
- **Sorbent Media**: removes odor molecules
- **Blower**: captures and transports smoke, grease and odors

All 3 sections are furnished in one factory assembled unit. Ecology-E can also be furnished in individual modules to eliminate rigging/installation conflicts.
## Ecology-E Size Selection Table

<table>
<thead>
<tr>
<th>Model HRH or HLH -YYXX-W-SF-C-SW</th>
<th>Face Area (ft²)</th>
<th>(1,2) Air Volume (cfm)</th>
<th>Dimensions</th>
<th>(3) Wash Cycle</th>
<th>(4) Weight (lb)</th>
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(1) Efficiency 95% based on independent testing to standard EN-1822-5. (2) Capacities rounded to the nearest 500 cfm. (3) gpm @ 50 psi. Typical wash cycle = 4 minutes. (4) Total system net weight, including accessory components. (5) Actual length L is determined by final blower selection and transition configuration.
Unit Selection Guide

1. From the Size Selection Table on Page 4, select the Model with the Air Volume and Dimensions that meet the space available for installation.

2. Two units of the same height may be arranged side-by-side to create a larger, multi-section unit. Specify one unit with left hand and one unit with right hand access doors.

3. Each unit is shipped complete with Power Pack, System Control, Detergent Dispenser and System Accessories as shown on Page 2.
The air pollution control system shall be furnished as follows.

A. Housing shall be fabricated from 14 gauge CRS, continuously welded to form a leak tight enclosure. Each housing section shall include a side access door mounted on lift off hinges and overcenter lever closure latches. The electrostatic precipitator section access door shall be furnished with electrical interlock. The housing shall be permanently attached and supported by a 6” x 10.5 lbs/ft steel channel perimeter base. The base shall have universal mounting lugs at the 4 corners and along the length as necessary. The entire housing/base assembly shall be pretreated and powder coated with thermoset polyester paint, inside and outside. The housing shall contain the following sections.

1. Inlet & Outlet Transitions shall be configured to maximize uniform air distribution across the internal face area of the unit and shall contain listed duct access doors to facilitate regularly scheduled inspections. The inlet transition shall be furnished with a 2” rectangular duct collar. The outlet transition shall be furnished with a 2” round blower connection collar. Outlet transition connection to the blower shall be made using high temperature flexible fabric held in place with compression clamps.

2. ESP Section shall be engineered and fabricated to structurally house and support pre filters, ionizer-collector cells, mist eliminators, oscillating wash system and wash water drain pan.

   Pre filters & Mist Eliminators shall be 2” thick, constructed of aluminum frame and non-woven aluminum mesh filter media.

   Ionizer-Collector Cells shall be fabricated from 3003-H14 grade aluminum, except ionizer electrodes shall be 316 grade stainless steel. Aluminum components shall be of the following gauge: framework 0.10”; ionizer ground plate 0.10”; repelling & collector plates 0.32”. 316 SS. Ionizer electrodes shall be of the serrated design with vertical serrate spacing of 1.0” max. Ionizer & collector assembly shall be the tie rod/spacer type. Cell framework shall be assembled using stainless steel dome head rivets. High voltage insulators shall be of the radial design with no high voltage penetrations.

Wash System shall be fabricated from Type M copper tube, consisting of vertical headers and horizontal manifolds with brass spray nozzles. There shall be a header/manifold assembly to wash each cell tier, inlet and outlet, simultaneously. Manifolds shall oscillate during the wash cycle ensuring full wash coverage of the cells.

Drain Pan shall be sloped ¼” per linear foot and shall terminate through a 3” NPT female coupling.

3. Sorbent Media/Odor Control Section shall be engineered and fabricated to structurally house and support safety bag filters and sorbent media panels.

   Safety Bag Filters shall be 15” deep with a minimum media surface area of 49 ft²/1,000 cfm. Filters are of high-density polyester microfiber media with galvanized steel headed frame, UL 900 listed, with an efficiency of 95% per ASHRAE Standard 52.2. Filters are held in position by integral extruded aluminum tracks with nylon pile seal gasketing to prevent air bypass.

   Sorbent Media Panels Activated Carbon Panels, furnished in a refillable panel with galvanized steel perimeter frame, covered on both sides with perforated plate and enamel painted. Carbon is composed of virgin coconut shell granular activated carbon with a minimum carbon tetrachloride activity of 60% per ASTM D-3467, is 4 x 8 US mesh size, and impregnated with active ingredients to enhance cooking odor molecule removal. Carbon shall have a bulk density of 32 lbs/ft.³, and sized for a minimum gas residence time of 0.15 seconds (applied at the rate of 110 lbs/1k cfm). Carbon panels shall be held in place by extruded aluminum tracks, integral to the housing. Tracks shall contain flexible, bulb seal gasketing to eliminate air bypass. As an option, other formulations of sorbent media may be furnished as specified.
4. Blower shall be AMCA certified, belt driven utility set or mixed flow tubular type as specified, UL 762 listed and sized to perform the specified air volume and resistance to air flow. The blower shall operate on (specify) ___ volts, ____ phase, ____ hertz and shall be mounted on 1” deflection, restrained spring isolators. Blower motor control shall be either motor starter or variable frequency drive (specify).

B. System Control
The control shall be a PLC type operating on 24V DC, include an RS-232/RS-485 selectable serial port, 4 digital inputs and 8 analog inputs. The 8 analog inputs shall capable of 0-2.4 V DC, 0-10 V DC, 4-20 mA, dry contact (5 mA, 10 V), thermistor (3K, 10K) and R/TC/RTD (50, 100, 500, 1000 ohm) inputs. Additionally, the controller shall allow for 8 digital outputs and 2 analog outputs. The analog outputs shall be capable of 0-10 V DC and 0-20 mA outputs. The memory and non-volatile memory size shall support all programming and archive needs without constraint and the controller shall allow for up to 32 controllers in a network. The controller shall provide for USB 2.0 and Ethernet connectivity. Controller shall have a real time clock with 300 hours backup, as well as be capable of standalone operation. Controller shall allow for monitoring and control via USB and Ethernet, also allowing for firmware and software updates via USB and Ethernet. Server data collection with web portal and notification shall be supported, as well as simple and complex block programming with full complement of programming functions.

Controller shall be shall bear the ETL, US/Canada, certification for energy management equipment per standard 916 as well as E212368 and CSA-C22.2. It shall also comply with FCC Part 15, class B requirements for electromagnetic interference.

C. High Voltage Power Pack
The Power Pack shall be the Pulse Width Modulation type with 120V, 50/60Hz universal voltage input and dual 10-14 and 5-7 kV DC adjustable output with maximum current of 38 mA.

Ambient operating temperature range shall be 32° - 122°F (0° C to + 50° C)

Under normal operating condition (including output short circuit condition) current sensing circuit shall limit average output current to 38 mA.

Under abnormal conditions (output current exceeding 38 mA) the converter shall shut down and softly restart after the delay. This process shall repeat as long as over current condition persists.

The Power Pack enclosure shall be a NEMA 1, furnished with hinged cover and safety interlock.

The cover face shall contain a digital meter that displays kV DC and mA, primary input LED indicator, HV output LED indicator, fault LED indicator and voltage output adjustment potentiometer. 50 feet of high voltage cable (red for ionizer and blue for collector) shall be furnished (if needed, longer lengths must be specified).

Power pack shall carry the following agency approvals: cURus, UL 867 Recognized, CSA Recognized, CE Mark.

D. Detergent Dispenser shall be furnished including a (specify) 55, 100 or 260 gallon detergent polyethylene reservoir, pump, motor, flow volume control valve, low level detector and ½” Type M copper tubing. The pump shall be the positive displacement, self-priming, rotary vane type with carbon graphite pump chamber, 316 SS shaft and built-in relief valve preset at 170 psi. Motor shall be ½ HP, split phase, ODP type with thermal protection, NEMA 48Y frame and shall operate on 100-120/200-240 VAC, 50/60 HZ, 1 PH. A volume of detergent concentrate, equal to the reservoir capacity, shall be included. During system commissioning dispenser shall be adjusted to an output of 1:20 detergent to water ratio.

E. Brass Plumbing Components required for operation of the wash water inlet supply line, shall be factory furnished for installation by the installing contractor as follows: ball valve; double independent check valve type backflow preventer; pressure gauge; electric solenoid valve and wye strainer. These components shall be sized to accommodate the water flow rate of the wash system. A ½” brass ball valve shall be furnished for installation in the detergent dispenser outlet line.

Options: The air pollution control unit may be furnished as a one piece assembly or as individual modules to accommodate shipping, rigging and installation limitations (specify).
ABOUT US

Halton Group is the global technology leader in indoor air solutions for demanding spaces. The company develops and provides solutions for commercial and public premises, healthcare institutions and laboratories, professional kitchens and restaurants as well as energy production environments and marine vessels. Halton’s mission is to provide its end-users with safe, comfortable and productive indoor environments that are energy-efficient and comply with sustainable principles.

The company was founded in Finland in 1969. Today, Halton Group has production units in ten and R&D units in eight countries. Licensed production is carried out in four countries. Halton Group employs nearly 1500 people in over 30 countries. The company’s turnover in 2016 was approximately 200 million euros. For more information, visit www.halton.com.

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