

Excell-HVAC



Kitchen Ecology Unit

Ecology Unit: What is it?

An Ecology Unit, as name indicates, is a set of filtration process arranged systematically in a machine to get rid of the unwanted impurities from the kitchen exhaust air. It's an air purification Unit which removes oil, grease/fatty material, smoke, and odor from kitchen exhaust air. This purification may be achieved using mechanical filtration, electronic filtration and most of the time using combination of both. Mechanical Filtration System consists of a series of mechanical filters arranged systematically whereas Electronic Filtration Units consist of electrostatic precipitators (Collectors) along with mechanical filters for air purification. An odor-removal-system using activated carbon/charcoal and an exhaust fan follows mechanical/electronic filtration system.

Following are the modules/sections of a regular Ecology Unit:

Aluminum Pre-Filter (G2 Grade – UL 900):

Metallic washable pre-filters with different thicknesses made of slitted and expanded aluminum with hundreds of baffles made to arrest the oil, grease and dust. Owing to their excellent dirt holding capacity and ability to perform in high moisture conditions, they are suitable for use as grease filters in kitchen hoods. The average arrestance is 57-81% and classified as G2 in accordance with ASHRAE rating MERV 4. This filter is designed to remove high oil and grease content from the exhaust air. The metallic filter is washable type and requires regular maintenance by washing the filter in a solution of detergent & warm water and dried with compressed air.



Electrostatic Precipitator (ESP):

two stage Electrostatic Precipitator having a charging (ionizing) section as first stage and collection section as second stage is included in the unit. The charging section consists of ionizing wires of 0.010 inches diameter Tungsten to prevent corrosion and damage. Wires are fixed at one end and spring mounted on the other for ease of maintenance. Collection plates are of minimum 0.025 inches thick aluminum. The ESP includes a solid state, dual voltage and self-regulating power supply. The power supply is housed in a hinged power door and is sealed from the airstream. The ESP includes a 2" thick pre aluminum mesh filters. The ESP can either supplied in manual wash type or auto wash type as per the project requirement. A drain-pan and drain connection can be provided in the cabinet if required for removal of excess oil and grease flowing down.

Bag Filters (F7/F8/F9 Class): (UL 900)

Single header pocket bag filters are made from high quality synthetic media. It comprises of a unique matrix of primary and secondary synthetic fibers with a thin layer of high strength spun bond scrim on the air leaving side to increase filter stability and prevent particle migration. This media design ensures a low initial pressure drop, a high dust holding capacity and a long filter service life. The filters are designed for a continuous operating temperature up to 93 °C. The filters are classified F7/F8/F9 in accordance with EN779-2012 Standard and can be supplied as per above classification or any other classification as required.



HEPA Filters (H13/H14 Class):

HEPA filters consisting of rigid pleated media pack with aluminum separator, provide high efficiency air filtration on fine particles at the lowest possible resistance. The media pack is enclosed in a galvanized steel frame assembly. The HEPA filter incorporated in our units is rated above 99% efficiency (99.997%) on 0.3 micrometer challenge aerosol with Class H13 European classification in accordance with EN1822 Standard.

Cartridge Type Carbon Filter:

The carbon filter has a galvanized steel frame measuring different size according to requirement with provision to fit multiple cartridges filled with carbon media to control odor. The cartridges are made of galvanized steel with each cartridge measuring 145mm in diameter and 450 mm in length. Each canister can hold up to 2.8 kg of carbon media. The quantity of cartridges depends upon the air volume and the application intended.



V Bank Rigid Carbon Filters:

Carbon filters having pleated compact filter with activated carbon media as standard. Other carbon media can be provided as per project requirement to control specific odors. These are high impact polystyrene cells having pleat packs arranged in V shape to utilize maximum quantity of media for the given face area. The filters can be installed or removed by sliding in the tracks provided in the cabinet. Each filter size is 24" x 24" x 12" thickness and contains 4.5 kg of densely packed granular microstructure carbon ensuring higher effective active area per kg of media, resulting in high efficiency in odor removal.

Exhaust Fan:

The unit includes belt driven centrifugal backward curved Double Inlet Double Width fans with AMCA certification. The fan scroll is hot galvanized sheet steel. The impellers are manufactured from high grade cold rolled steel with epoxy coating. The impellers are statically & dynamically balanced from factory. All fans are fitted with high quality ball bearings. The motor is TEFC, class 'F' insulation and IP55 protection. The motors are fitted on adjustable motor base plate for easy belt adjustment. Fan drives are rated at %150 of maximum motor power. The fan motor assembly is mounted on spring vibration isolators. The fan carries AMCA SEAL for certified air & sound performance ratings.



The Body:

All the above sections are enclosed in a double skin mild steel construction with the mechanical/electronic filters, carbon filters and fan fitted inside the cabinet. The outer skin is 0.9mm MS, powder-coated and the inner skin is of 0.7mm galvanized steel sheet. The framework is made MS profiles, welded and powder-coated. The standard sandwich panel is 25 mm thick filled with either rockwool, or fiberglass as insulation material. The cabinet can also be manufactured with 50 mm thick panels if required. The cabinet has removable type access doors for cleaning, maintenance & replacement of filters. The entire cabinet is mounted on a MS C-channel with same reinforcements across the unit base. The cabinet can also be supplied with a drain pan and drain connection if required for removal of excess oil and grease flowing down the ESP.

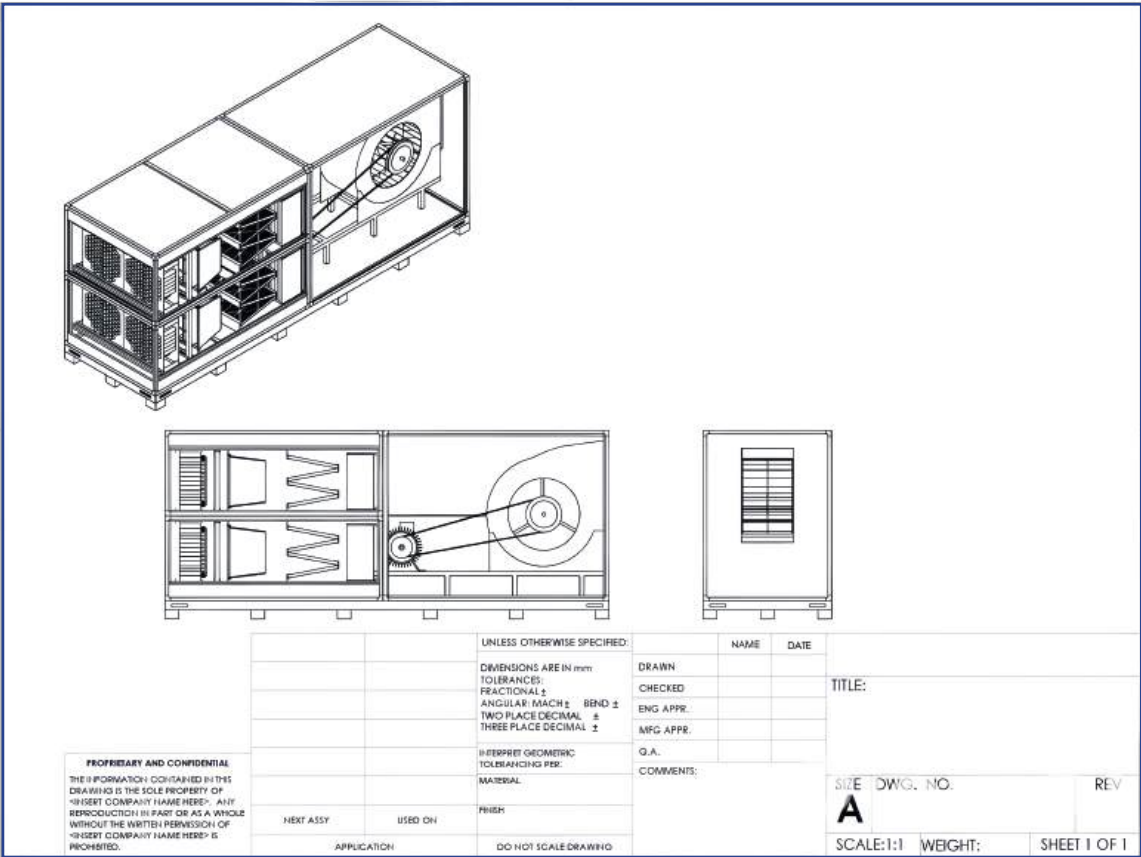


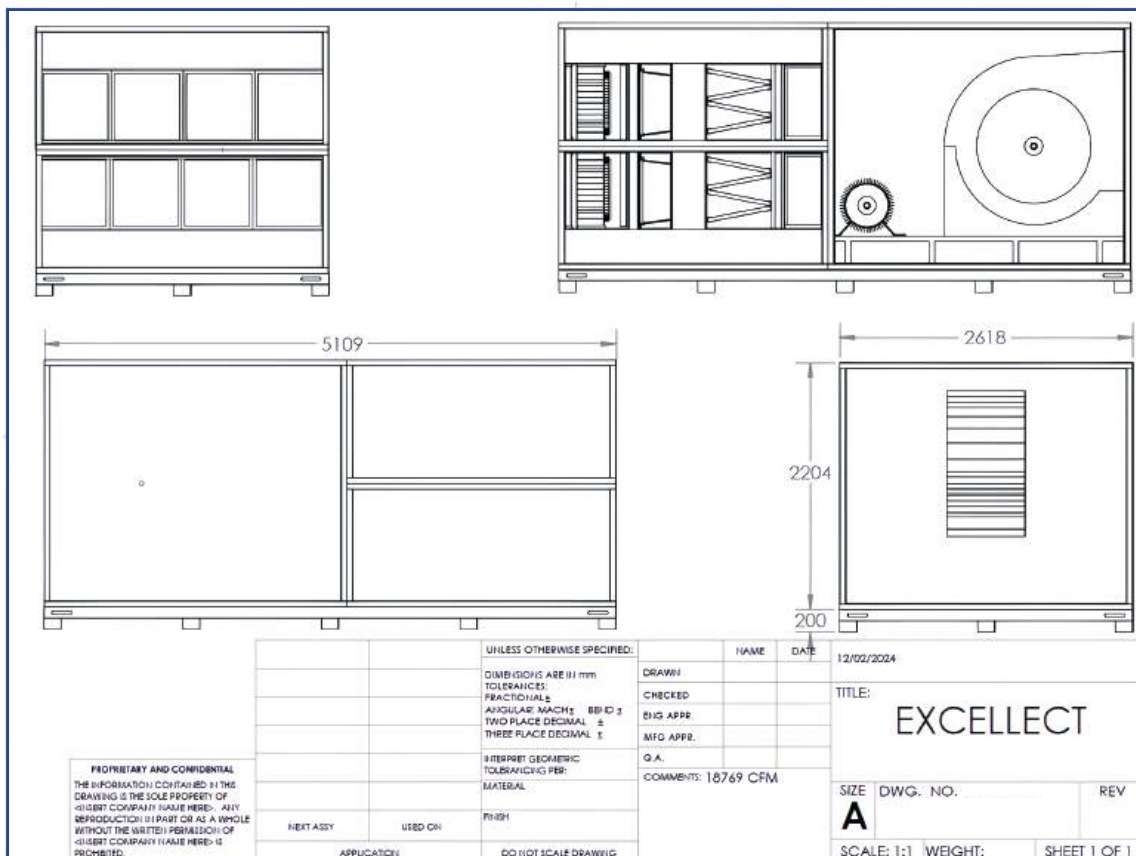
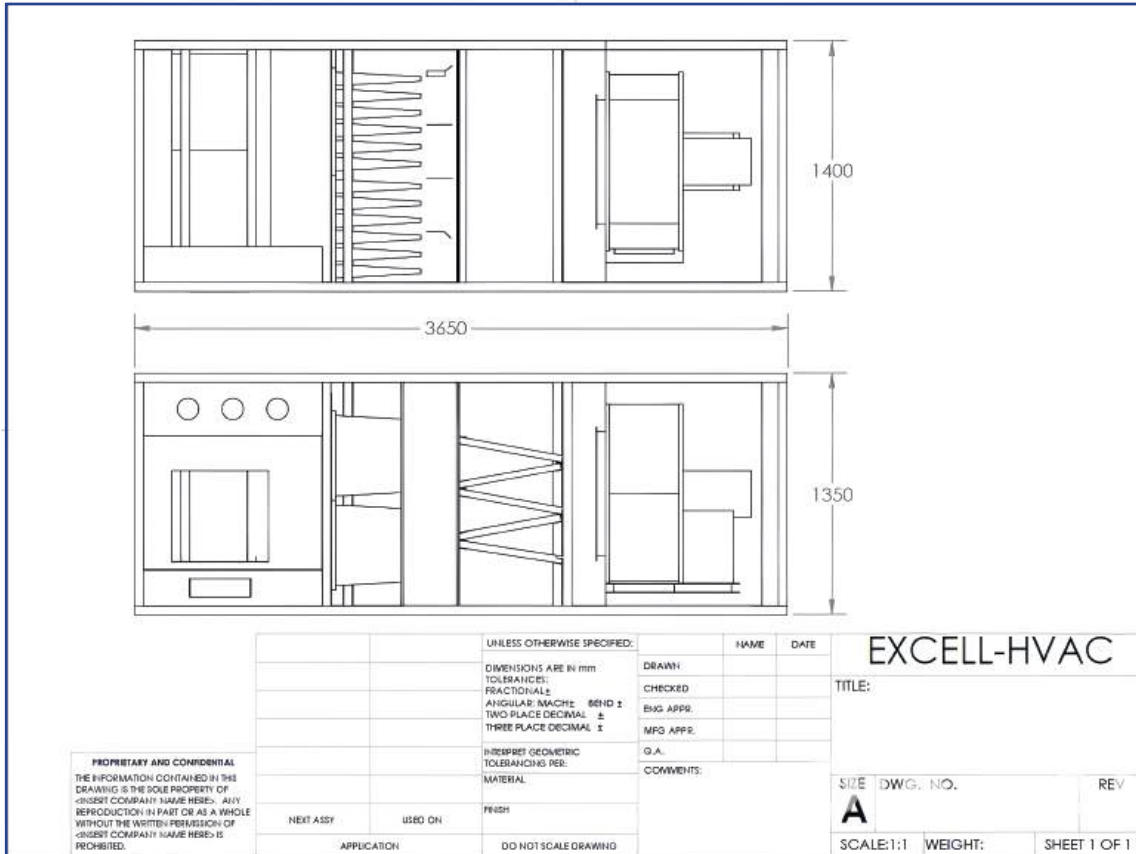
Filter Status Panel:

A filter status panel can be provided to indicate the status of the individual mechanical filters using digital-differential-manometers with pilot light & buzzer alarm indication for filter dirty signal in order to clean or replace the respective filters.

Fan Control Panel:

The unit can be supplied with an IP65 rated cabinet housing either STAR or DELTA or digital VFD controls (for the ecology unit fan/motor). The panel includes switch having variable speed selector for controlling the fan speed, Hands – Auto - Off and fire alarm interfacing. The filter status indications can be incorporated in this panel so as to have a single control panel for fan starter and filter status. The panel incorporating filter status will indicate the status of the individual mechanical filters and pilot light & buzzer alarm indication for filter dirty signal in order to clean or replace the respective filters. The panel can also be supplied with provision to provide the status of the filters to the building management system (BMS).





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