

PUREAIREPRO

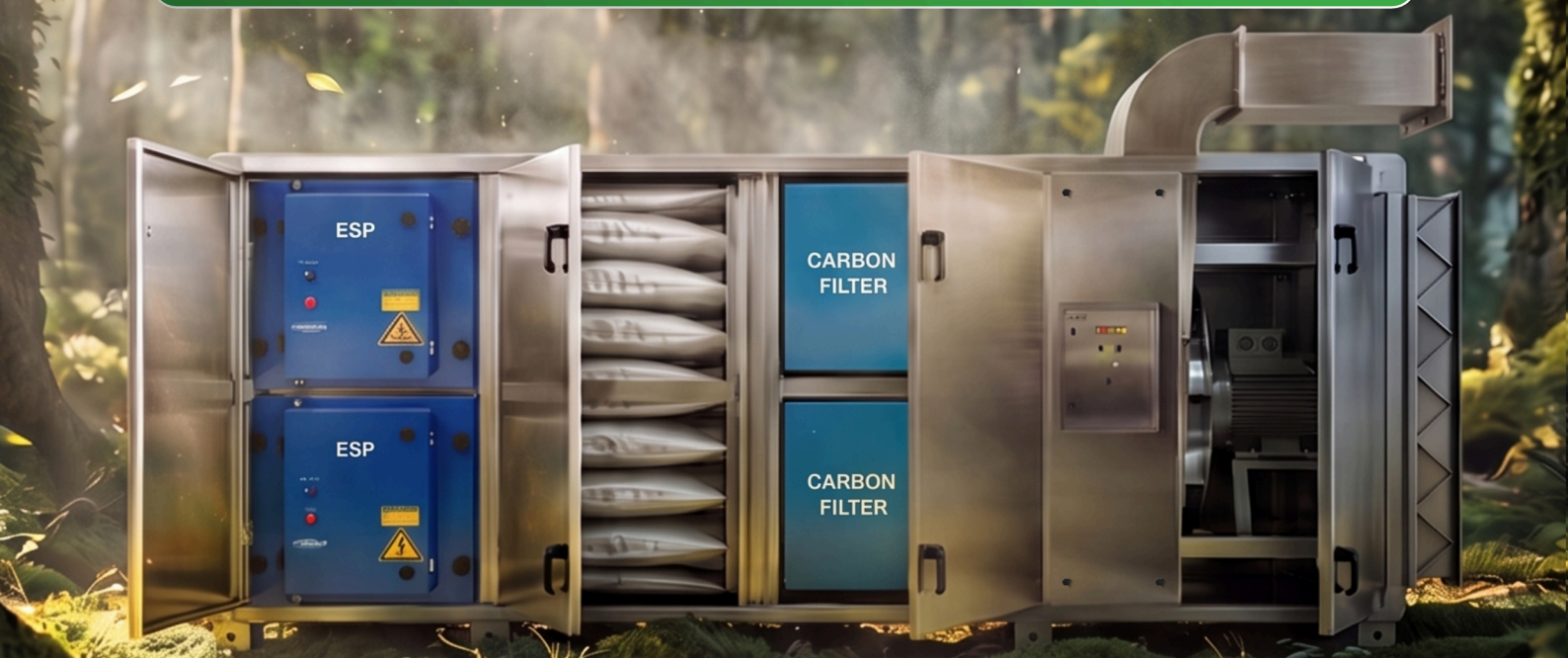
Kitchen Ecology Unit

Breathe Easy
Cook Better

www.pureairepro.com

About us

PUREAIREPRO specializes in advanced ecology units and air filtration systems for commercial kitchens and industrial environments. Since 2006, the company has provided high-performance solutions designed to remove smoke, grease, odors, and airborne pollutants, helping create cleaner, safer, and more sustainable working spaces. Their systems combine ESP, UV-C, and activated carbon technologies to deliver efficient air purification and environmental protection. PUREAIREPRO's ecology units are designed to meet stringent industry requirements and are available with UL-certified components and configurations, ensuring enhanced safety, reliability, and compliance with recognized international standards. In addition to air purification, PUREAIREPRO focuses on energy-efficient and low-maintenance solutions that meet modern environmental and safety standards. Their ecology units are widely used in restaurants, hotels, food courts, and commercial kitchens, ensuring improved indoor air quality while supporting smooth and reliable kitchen operations.



PUREAIREPRO

6 Stage Filtration

Energy Efficient

Experience the
Clean Air



Clean Air Everywhere



Benefits

A Kitchen Ecology Unit is an advanced air pollution control system designed to remove grease, smoke, odors, and fine particulate matter from commercial kitchen exhaust air before it is discharged into the atmosphere.

1. Improved Air Quality

Effectively captures grease particles, smoke, and airborne contaminants, creating a cleaner and healthier kitchen environment for staff and customers.

2. Odor Control

Reduces cooking odors before they leave the exhaust system, helping maintain a pleasant atmosphere both inside the facility and in surrounding areas.

3. Environmental Compliance

Helps commercial kitchens meet local environmental and air-quality regulations by minimizing emissions and pollutants.

4. Enhanced Fire Safety

By removing grease-laden particles from exhaust air, the system reduces grease buildup in ductwork and lowers the risk of kitchen fires.

5. Suitable for Urban Installations

Ideal for restaurants, hotels, food courts, hospitals, and commercial kitchens located in densely populated areas where clean exhaust discharge is essential.

6. Reduced Maintenance Costs

Minimizes grease accumulation in ducts, fans, and exhaust systems, reducing cleaning frequency and extending equipment lifespan.

7. Energy-Efficient Operation

Modern ecology units are designed for continuous operation with optimized airflow and filtration performance, helping improve overall system efficiency.

8. Healthier Working Environment

Removes harmful smoke, fumes, and fine particles, contributing to better indoor air quality and increased employee comfort.

9. Multi-Stage Filtration

Typically combines grease filtration, electrostatic precipitation (ESP), carbon filtration, and UV technology for comprehensive air purification.

10. Protects Brand Reputation

Cleaner exhaust emissions help businesses maintain a professional image and demonstrate commitment to environmental responsibility.

Key Advantages

Kitchen Ecology Units provide advanced filtration of grease, smoke, odors, and airborne contaminants from commercial kitchen exhaust systems. They improve air quality, enhance fire safety, reduce maintenance costs, support environmental compliance, and ensure cleaner exhaust discharge for restaurants, hotels, hospitals, and food service facilities.



Stage 1
Aluminium Pre-filter

Stage 2
Electrostatic precipitator (ESP)

Stage 3
Activated Carbon Filter

Stage 4
Poly Bag Filter

Stage 5
UV-C Germicial Irradiation Filter

Stage 6
Exhaust Fan

6 Stage Filtration



6-Stage Filtration Air Treatment Unit

This industrial air handling/filtration unit delivers comprehensive air purification through six progressive stages housed in a stainless steel cabinet:

Stage 1 – Aluminium Pre-filter: Captures large airborne particles like dust, lint, and debris, protecting downstream components and extending filter life.

Stage 2 – Electrostatic Precipitator (ESP): Uses electrically charged plates to attract and trap fine particulates, smoke, and oil mist that bypass mechanical filters.

Stage 3 – Activated Carbon Filter: Adsorbs odors, volatile organic compounds (VOCs), gases, and chemical fumes through porous carbon media.

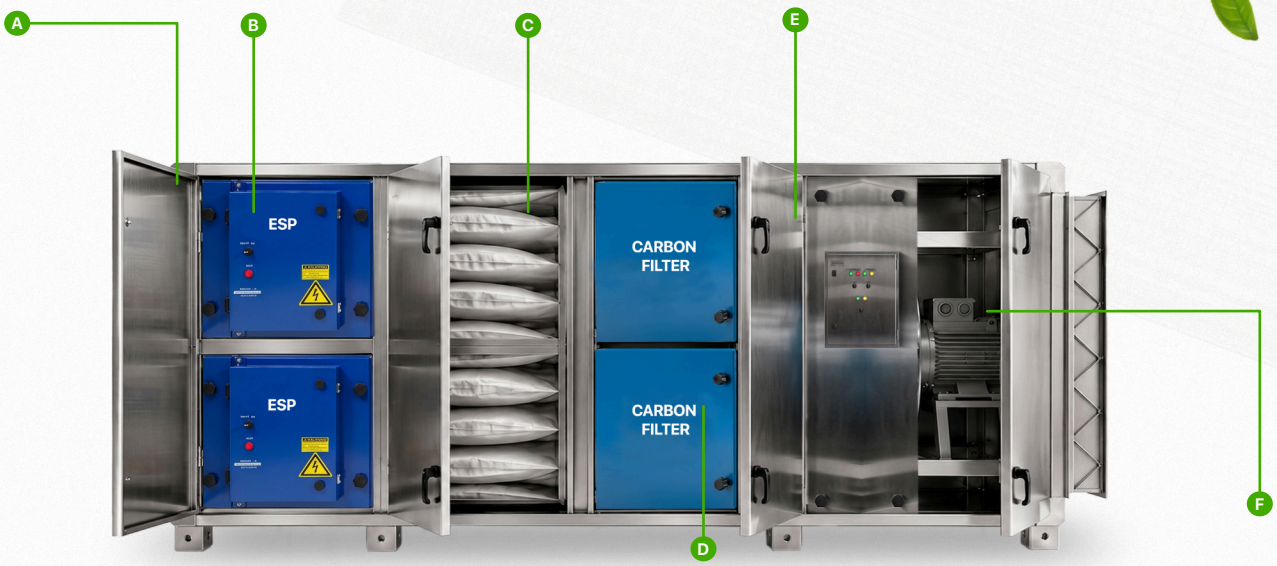
Stage 4 – Poly Bag Filter: High-capacity bag filters capture finer particulate matter, improving overall air quality before final polishing.

Stage 5 – UV-C Germicidal Irradiation: Ultraviolet light neutralizes bacteria, viruses, and mold spores, ensuring biologically clean output air.

Stage 6 – Exhaust Fan: Drives filtered air through the ductwork and expels it from the system, maintaining consistent airflow.

Ecology Unit

KITCHEN EXHAUST FILTRATION SYSTEM



Application	Casing Material	Construction	Fan Integration
Commercial Restaurant Kitchen	316 Grade Stainless Steel	Single/Double Skinned Panel Design	Plug Fan

Model	Dimensions	Airflow Range		External Static Pressure	Fan
		CFM	CMH(m^3/h)		
Pureairepro E-100-DSP	2000 x 643 x 534 +100 (legs)	1000-2300	1699-3907	500 Pa	K3G310-PV69-03
Pureairepro E-200-DSP	2100 x 1103 x 630 +100 (legs)	2400-4700	4077-7985	500 Pa	K3G450-PA31-03/G02
Pureairepro E-300-DSP	2200 x 1564 x 800 +100 (legs)	4800-7000	8155-11893	500 Pa	K3G560-PB31-03
Pureairepro E-400-DSP	2300 x 2025 x 800 +100 (legs)	7100-9400	12062-15970	500 Pa	K3G560-PC10-N1
Pureairepro E-500-DSP	2450 x 2486 x 960 +100 (legs)	9500-11700	16140-19878	500 Pa	8300100182

All dimensions may differ based on the fan selection



A Alumininum Pre-filter

Primary mechanical barrier — the first line of defence against bulk grease and coarse particulates entering the filtration system.

Filter media: Aluminium mesh / multi-layer expanded metal construction

- UL Listed, commercial-grade Aluminium Pre-filter
- Thickness: 2 inches (50 mm) for adequate grease-holding capacity
- Efficiency rating: MERV 8 per ASHRAE Standard 52.2 — captures particles ≥ 3 µm
- Grease capture efficiency: ~40% of total grease load, protecting downstream stages
- Frame: Rigid aluminium extrusion — corrosion-resistant, fully washable, and reusable
- Maintenance: Remove, degrease, and reinstall; typical service interval every 2–4 weeks depending on cooking load
- Purpose: Extends service life of electrostatic cells and bag filters by preventing premature loading



B Electrostatic Precipitator (ESP)

High-voltage ionisation stage that electrostatically charges and collects sub-micron grease aerosols and smoke particles invisible to mechanical filters.

- UL Listed, commercial-grade Electrostatic Precipitator (ESP)
- Operating principle: Two-stage electrostatic precipitation — ioniser wires charge particles; collector plates attract and retain them
- Target particle range: 0.01 µm – 1.0 µm (sub-micron grease mist, cooking smoke, fine aerosols)
- Collection efficiency: >95% on sub-micron grease particles at rated airflow
- Cell voltage: High-voltage DC supply (~8,000–12,000 V ioniser; ~4,000–6,000 V collector)
- Certification: UL Listed — meets UL 867 standard for electrostatic air cleaners
- Maintenance: Cells slide out for periodic wash-down; power-wash or dishwasher-safe (check OEM guidance)
- Safety: Automatic high-voltage shutdown on cell removal; arc-fault protection built in



C Poly bag filter

High-efficiency final mechanical stage that captures fine residual particulates not collected by the ESP, ensuring clean air discharge.

- UL Listed, commercial-grade Poly Bag Filter
- Filter class: MERV 13 per ASHRAE Standard 52.2 — equivalent to EN779 F7
- Depth: 15 inches (380 mm) multi-pocket (bag) design for high dust-holding capacity
- Efficiency: 90–95% on particles 1.0–3.0 µm; >98% on particles ≥ 3 µm
- Media: Synthetic non-woven polyester micro-fibre — moisture-resistant and dimensionally stable
- Pocket count: Multiple pockets increase effective media area, reducing face velocity and pressure drop
- Initial pressure drop: Typically 80–120 Pa at rated airflow; replace at terminal pressure drop per design spec
- Frame: Rigid galvanised or plastic header frame — sealed to prevent bypass leakage
- Purpose: Polishes exhaust air, captures any ESP-escaped particles and carbon fines, meets emission standards



(D) Activated Carbon Filter

Chemical adsorption stage that eliminates odours, VOCs, and gaseous cooking by-products before discharge to atmosphere.

- Brand / model: Trion V-Carbon — granular activated carbon in flat panel (tray) configuration
- Adsorption mechanism: Physical adsorption — microporous carbon surface traps gas-phase molecules
- Target contaminants: Cooking odours, hydrogen sulphide (H_2S), nitrogen dioxide (NO_2), acrolein, aldehydes, and other VOCs
- Carbon bed depth: Sufficient for meaningful dwell time at design face velocity
- Face velocity recommendation: ≤ 0.5 m/s to maximise contact time and adsorption efficiency
- Carbon type: Virgin activated carbon (coconut shell or coal-based) with high iodine number (≥ 900 mg/g)
- Service life: Typically 6–12 months depending on cooking type and hours of operation; replace when breakthrough odour is detected
- Panel configuration: Modular trays allow partial replacement without full system shutdown



(E) UV-C Germicidial Irridation filter

Primary mechanical barrier — the first line of defence against bulk grease and coarse particulates entering the filtration system.

- UL Listed, commercial-grade UV-C Germicidial Irridation filter
- UV wavelength: 253.7 nm (UV-C band) — optimal germicidal wavelength for DNA/RNA disruption
- Micro-organism inactivation: Bacteria, viruses, moulds, and fungal spores in the exhaust airstream
- Odour reduction: Photolysis of residual VOC molecules not fully captured by carbon stage
- Lamp type: Low-pressure mercury UV-C lamps or UV-C LED arrays (OEM-specified)
- Dose: System designed to deliver sufficient UV dose (μW·s/cm²) at design airflow velocity
- Safety: Enclosed within duct — no direct UV exposure to personnel; end-of-lamp-life indicators recommended
- Lamp life: Typically 9,000–12,000 hours; replace annually or per lumen-output monitoring
- Controls: Interlocked with system fan — UV lamps de-energise when airflow stops
- Application benefit: Particularly recommended for high-volume cooking operations (grills, fryers) and where discharge is near occupied areas



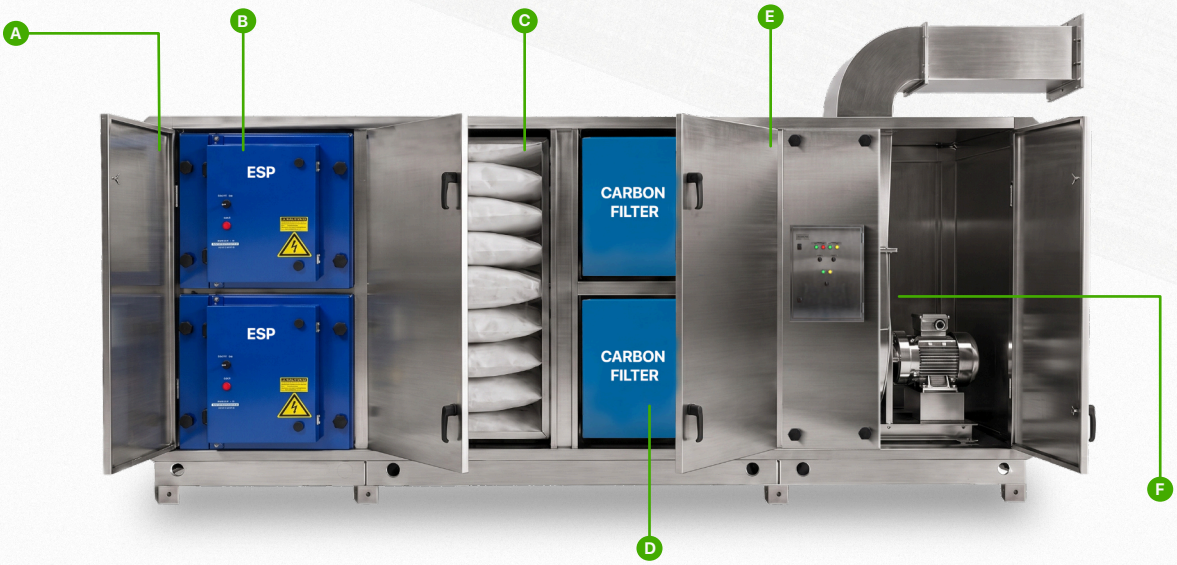
(F) Plug EC Fan

System air-mover — engineered to overcome the cumulative static pressure of all filtration stages and deliver design airflow under all operating conditions.

- High-efficiency EC centrifugal plug fan with backward-curved, single-intake impeller, designed for reliable and energy-efficient air movement in commercial kitchen ventilation and Ecology Unit applications. The fan incorporates an electronically commutated (EC) motor with integrated control electronics, providing variable-speed operation, high efficiency, soft start, motor protection and advanced monitoring capabilities.
- Fan type option B: EC (Electronically Commutated) direct-drive plug fan — integrated VFD, IE5 motor efficiency class
- Duty point: Selected and matched to system total static pressure (TSP) at design volumetric airflow (CFM / m³/h)
- Speed control: Variable Frequency Drive (VFD) enables demand-controlled ventilation — fan speed adjusts to cooking load
- Drive arrangement (belt-drive): Adjustable sheaves for field airflow balancing; belt and bearing inspection access provided
- Motor: TEFC (Totally Enclosed Fan-Cooled), suitable for grease-laden air; Class F insulation minimum
- Casing: 316 stainless steel fan section with integral acoustic insulation — meets noise attenuation requirements
- Access: Hinged or removable access panel for fan wheel inspection, cleaning, and belt tensioning

Ecology Unit

KITCHEN EXHAUST FILTRATION SYSTEM



Application	Casing Material	Construction	Fan Integration
Commercial Restaurant Kitchen	316 Grade Stainless Steel	Single/Double Skinned Panel Design	UL Centrifugal Fan

PUREAIREPRO E-SERIES SS304 DOUBLE SKIN

Model	Dimensions (Length x Width x Height)	Airflow Range		External Static Pressure	Fan
		CFM	CMH (m^3/h)		
Pureairepro E-100-DS	2620 x 825 x 1138 +100 (legs)	1000-2300	1699-3907	750Pa	CMRHUL
Pureairepro E-200-DS	2645 x 1203 x 1240 +100 (legs)	2400-4700	4077-7985	750Pa	CMRHUL
Pureairepro E-300-DS	2665 x 1664 x 1355 +100 (legs)	4800-7000	8155-11893	750Pa	CMRHUL
Pureairepro E-400-DS	2915 x 2125 x 1600 +100 (legs)	7100-9400	12062-15970	750Pa	CMRHUL
Pureairepro E-500-DS	3010 x 2586 x 1785 +100 (legs)	9500-11700	16140-19878	750Pa	CMRHUL

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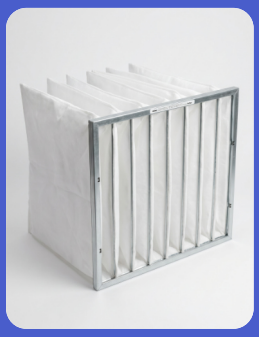
- UL Listed, commercial-grade Aluminium Pre-filter
- Thickness: 2 inches (50 mm) for adequate grease-holding capacity
- Efficiency rating: MERV 8 per ASHRAE Standard 52.2 — captures particles ≥ 3 µm
- Grease capture efficiency: ~40% of total grease load, protecting downstream stages
- Frame: Rigid aluminium extrusion — corrosion-resistant, fully washable, and reusable
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- Odour reduction: Photolysis of residual VOC molecules not fully captured by carbon stage
- Lamp type: Low-pressure mercury UV-C lamps or UV-C LED arrays (OEM-specified)
- Dose: System designed to deliver sufficient UV dose (μW·s/cm²) at design airflow velocity
- Safety: Enclosed within duct — no direct UV exposure to personnel; end-of-lamp-life indicators recommended
- Lamp life: Typically 9,000–12,000 hours; replace annually or per lumen-output monitoring
- Controls: Interlocked with system fan — UV lamps de-energise when airflow stops
- Application benefit: Particularly recommended for high-volume cooking operations (grills, fryers) and where discharge is near occupied areas

(F) Exhaust Fan



System air-mover — engineered to overcome the cumulative static pressure of all filtration stages and deliver design airflow under all operating conditions.

- Certification: UL 762 — standard for power ventilators for restaurant exhaust appliances
- Fan type option A: SWSI (Single-Width, Single-Inlet) backward-inclined centrifugal fan with belt drive
- Fan type option B: EC (Electronically Commutated) direct-drive plug fan — integrated VFD, IE5 motor efficiency class
- Duty point: Selected and matched to system total static pressure (TSP) at design volumetric airflow (CFM / m³/h)
- Speed control: Variable Frequency Drive (VFD) enables demand-controlled ventilation — fan speed adjusts to cooking load
- Drive arrangement (belt-drive): Adjustable sheaves for field airflow balancing; belt and bearing inspection access provided
- Motor: TEFC (Totally Enclosed Fan-Cooled), suitable for grease-laden air; Class F insulation minimum
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