

ESP

ELECTROSTATIC PRECIPITATION

Electrostatic precipitator for commercial kitchen exhaust
captures grease and smoke down to 0.01 microns.

3,000–96,000 CMH



CONTENTS

Enpura ESP

Enpura supplies, installs and services electrostatic precipitators for commercial kitchen exhaust across the UAE and the wider GCC. This catalogue covers the technology, applications, installation configurations and full specifications of the Enpura ESP range.

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ENPURA ESP ELECTROSTATIC PRECIPITATION



Cooking-oil fume is the hardest load in the building

Commercial kitchen exhaust carries cooking-oil fume — vaporised oil, grease aerosol and smoke. Most of it is ultrafine: particles far below one micron that pass straight through mesh and baffle grease filters, then condense inside ductwork, fans and roof plant.



WHY IT MATTERS

Fire risk

Grease accumulates on duct walls, fan scrolls and dampers, turning the extract system into a continuous fuel path.

Regulatory exposure

Visible or non-compliant discharge invites inspection, penalties and, in the worst case, forced closure.

Complaints & nuisance

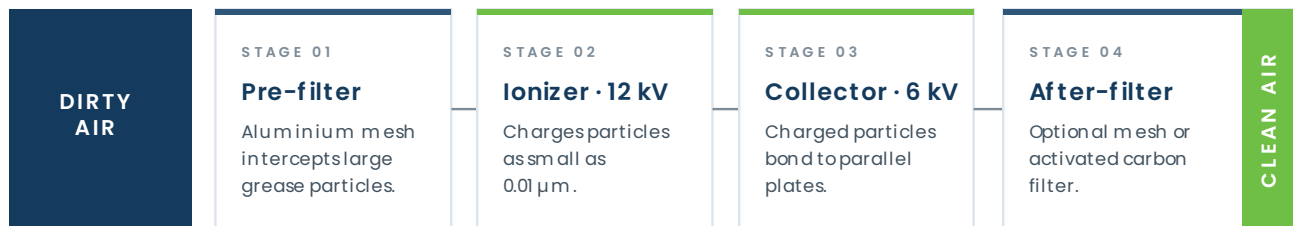
Odour and a visible plume at roof level draw complaints from neighbouring tenants and guest floors.

Property damage

Oily residue stains facades, soils rooftop plant and shortens the service life of AHUs and condensers.

How electrostatic precipitation works

A two-stage electrostatic field charges fume particles, then collects them on parallel plates — capturing what mechanical filters miss, at a fraction of the resistance to airflow.



01 Exhaust air enters the unit and passes an aluminium mesh pre-filter, which intercepts the coarse grease fraction.

02 It then enters a high-intensity ionising field, where a 12 kV corona imparts an electrical charge to every particle it meets — down to 0.01 microns.

03 The charged stream passes into the collection section: a stack of closely pitched parallel plates held at 6 kV and alternating in polarity. Particles are repelled by plates of the same polarity and driven onto the opposite plate, where they bond and stay.

04 Clean air leaves the unit. An optional mesh or activated-carbon after-filter handles any residual particulate and odour before discharge.

Two-zone, bi-voltage field

A 12 kV ionising section charges the particles; a separate 6 kV collection section captures them.

Low pressure drop

72 Pa at rated airflow — far below dense mechanical media, so fan power and duct sizing stay modest.

95%

single-pass DOP removal

95%

double-pass, calculated

Engineered for performance

Every cell is built around a stable high-voltage field and corrosion-resistant materials — efficiency that holds up under heavy-duty kitchen loads.

01

Staggered spiked ionizer

Double-sided staggered 316 stainless-steel blades improve discharge and resist oil fouling, holding the field at full strength between cleans.

02

Dual-zone, bi-voltage field

A 12 kV ionising zone and a 6 kV collecting zone charge then capture in sequence, rather than compromising on a single voltage.

03

High-frequency PWM power pack

A solid-state supply holds constant output voltage, with arc detection, automatic reset and restart lockout.

04

Large dust-trapping capacity

Small-pitch, large-area collector plates and a tuned airflow path maximise the grease held between wash cycles.

05

Washable “forever” cell

The aluminium ionizer/collector cell is the primary filter. Withdraw it, wash it, reinstall it — there is no media to buy and replace.

06

Modular and stackable

Join units side by side or stack them vertically to reach any duty from 3,000 up to 96,000 CMH.



The washable cell

Aluminium ionizer and collector in one withdrawable assembly, with 316 stainless spiked ionizer blades. 5.92 m² of effective collecting area per cell, 232 mm collector plate depth.

Safe to operate, simple to service

High-voltage protection, mechanical interlocking and pull-out cells keep the unit safe for kitchen staff and quick for maintenance teams.

POWER-PACK PROTECTION

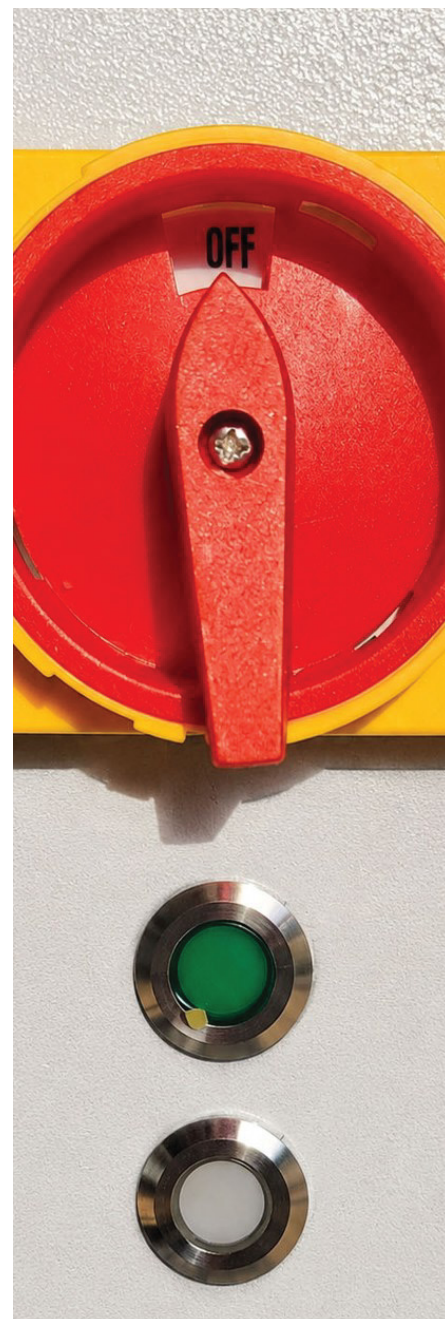
- Arc protection
- Short-circuit protection
- Open-circuit protection
- Automatic high-voltage shutdown
- Automatic recovery and restart lockout

SAFETY DESIGN

A door-interlocked main isolator allows the cell access door to open only when power is off. High voltage is cut the instant the interlock breaks, so the cell is never reachable while the field is live.

MAINTENANCE

Cells slide out for washing and reinstall in minutes. A cleaning-cycle reminder keeps efficiency high, and BMS terminals report operation, fault and cleaning status to the building system.



Where it's used

Suspended, wall, frame or duct mounted, indoors or on the roof, with reversible airflow — the Enpura ESP range fits the full spread of commercial kitchen exhaust layouts.



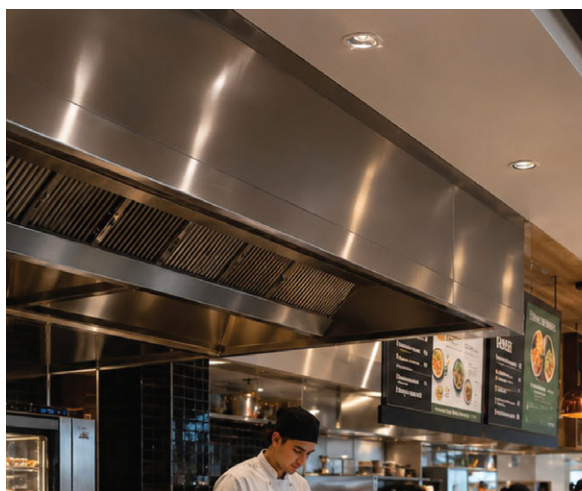
Hotels & restaurants

À la carte and banquet kitchens with steady, sustained fume loads.



BBQ, grill & teppanyaki

Heavy grease and visible smoke — pair with a carbon after-filter and a shorter wash cycle.



Food courts & canteens

High-volume continuous service across several cooking lines on one extract.



Institutional kitchens

Hospitals, schools and staff canteens working to strict hygiene and emissions standards.

Installation configurations

Suspended, wall, frame or duct mounted — indoors or at roof level. Three arrangements cover most commercial kitchen exhaust systems.



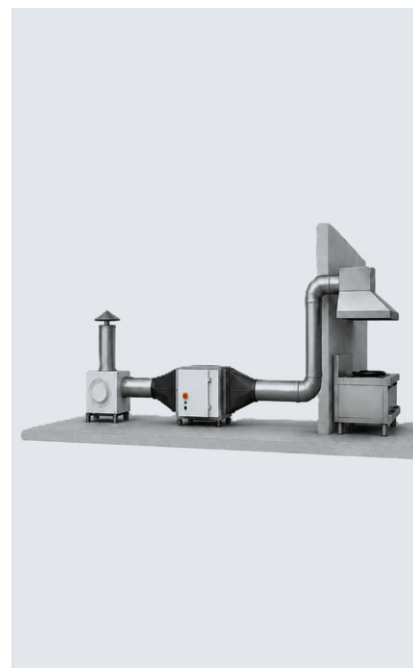
1 Indoor, ceiling suspended

Hung from the slab above the cooking line, keeping valuable floor and plant-room space clear.



2 Outdoor, roof mounted

Unit and extract fan at roof level, with optional activated carbon for odour before discharge.



3 Outdoor, floor standing

Floor-mounted on the roof slab alongside the exhaust fan, with clear access for cell withdrawal.

Allow 70 mm service clearance on the cell withdrawal side. Airflow direction is left-to-right or right-to-left and is set at the factory — confirm the required direction on order.

Four base models. Built to scale.

Choose the base model that matches your design extract rate, then combine units side by side or stack them vertically to reach larger duties.

MODEL	CELLS	AIRFLOW	AIRFLOW	POWER	SIZE (MM)	WEIGHT
ENP-ESP-3000	1	3,000 CMH	1,765 CFM	52 W	699 × 600 × 620	57 kg
ENP-ESP-6000	2	6,000 CMH	3,531 CFM	68 W	1,159 × 600 × 620	89 kg
ENP-ESP-9000	3	9,000 CMH	5,297 CFM	83 W	1,619 × 600 × 620	122 kg
ENP-ESP-12000	4	12,000 CMH	7,062 CFM	96 W	2,079 × 600 × 620	155 kg

Rated airflow gives up to 95% single-pass DOP removal. All models share the same 600 × 620 mm cross-section, 12 kV / 6 kV field and 72 Pa pressure drop.

96,000 CMH

Eight ENP-ESP-12000 units.
One modular system.

Units combine in parallel and stack vertically, so a single extract system can be built up from the same base modules — and extended later without replacing what is already installed.



Sizing an Enpura ESP

Five steps from the kitchen ventilation schedule to a specified unit. Enpura's application team will review any selection against the project drawings on request.

01 Establish the design extract rate

Take the total exhaust airflow for the hood or hood group from the kitchen ventilation schedule, in CMH.

02 Select at or above that figure

Choose the base model whose rated airflow meets or exceeds the design rate. At rated airflow the unit delivers up to 95% single-pass removal.

03 Allow for the cooking load

For heavy grease and smoke — BBQ, grill, Teppanyaki, high-volume wok — size one step up, specify a carbon after-filter, or shorten the wash cycle.

04 Confirm space and access

Check the unit envelope against the plant space and allow 70 mm clearance on the cell withdrawal side. Confirm the airflow direction before order.

05 Scale beyond 12,000 CMH

Combine units in parallel or stack them vertically. Eight ENP-ESP-12000 units give a single 96,000 CMH system.

INDICATIVE SELECTION

KITCHEN TYPE	TYPICAL EXTRACT RATE	SUGGESTED MODEL
Café, coffee shop, reheat kitchen	up to 3,000 CMH	ENP-ESP-3000
Hotel restaurant, single à la carte line	3,000 – 6,000 CMH	ENP-ESP-6000
Banquet or central production kitchen	6,000 – 9,000 CMH	ENP-ESP-9000
Food court, large central kitchen	9,000 – 12,000 CMH	ENP-ESP-12000
Multi-outlet or campus-scale extract	12,000 – 96,000 CMH	Multiple units, combined

Indicative only. Always confirm the selection against the project hood schedule and extract calculations.

ENP-ESP-3000

The compact single-cell unit for cafes, small a la carte kitchens and single-hood lines.



AIRFLOW
3,000 CMH · 1,765 CFM

ESP CELLS
1 × electrostatic filter cell

DIMENSIONS
699 × 600 × 620 mm (L × W × H)

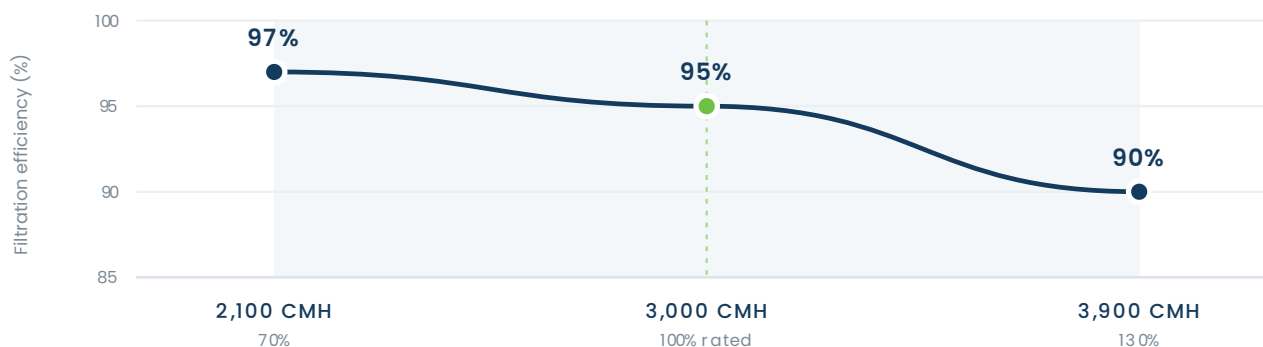
WEIGHT
57 kg

POWER
52 W

COLLECTING AREA
5.92 m² effective

AIRFLOW RATE	3,000 CMH (1,765 CFM)
AIRFLOW DIRECTION	Left-to-right or right-to-left, reversible (factory set)
NUMBER OF CELLS	1 pc electrostatic filter cell
INPUT VOLTAGE	220–240 V, 50/60 Hz, 1 PH (110 V on request)
OUTPUT VOLTAGE	12 kV ionising / 6 kV collecting
PRODUCT POWER	52 W
PRESSURE DROP	72 Pa with pre-filter / 115 Pa with pre- and after-filter, at rated airflow
PARTICLE CAPTURE	0.01 – 10 microns
EFFICIENCY	Up to 95% DOP single-pass · 99% double-pass (calculated)
INSTALLATION	Suspended, wall, frame or duct mounted
FINISH	Outdoor epoxy powder coating · RAL 7035, or two-tone RAL 7035 + RAL 7024. Custom colours on request.
OUTDOOR USE	Suitable for outdoor installation

PURIFICATION EFFICIENCY VS. AIRFLOW



Higher airflow shortens dwell time in the collection section, which lowers single-pass efficiency. Select at or below rated airflow.

ENP-ESP-6000

The workhorse of the range – hotel restaurant kitchens and mid-size production lines.



AIRFLOW

6,000 CMH · 3,531 CFM

ESP CELLS

2 × electrostatic filter cell

DIMENSIONS

1,159 × 600 × 620 mm (L × W × H)

WEIGHT

89 kg

POWER

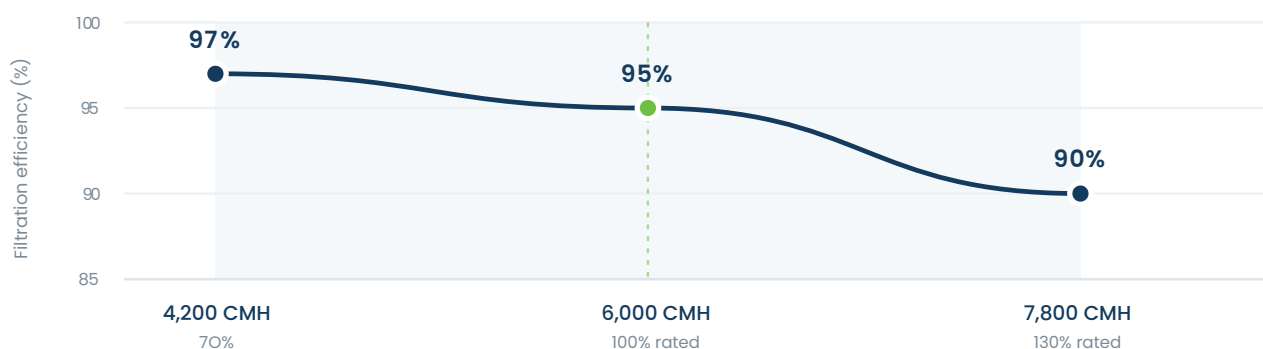
68 W

COLLECTING AREA

11.84 m² effective

AIRFLOW RATE	6,000 CMH (3,531 CFM)
AIRFLOW DIRECTION	Left-to-right or right-to-left, reversible (factory set)
NUMBER OF CELLS	2 pcs electrostatic filter cell
INPUT VOLTAGE	220–240 V, 50/60 Hz, 1 PH (110 V on request)
OUTPUT VOLTAGE	12 kV ionising / 6 kV collecting
PRODUCT POWER	68 W
PRESSURE DROP	72 Pa with pre-filter / 115 Pa with pre- and after-filter, at rated airflow
PARTICLE CAPTURE	0.01 – 10 microns
EFFICIENCY	Up to 95% DOP single-pass · 99% double-pass (calculated)
INSTALLATION	Suspended, wall, frame or duct mounted
FINISH	Outdoor epoxy powder coating · RAL 7035, or two-tone RAL 7035 + RAL 7024. Custom colours on request.
OUTDOOR USE	Suitable for outdoor installation

PURIFICATION EFFICIENCY VS. AIRFLOW



Higher airflow shortens dwell time in the collection section, which lowers single-pass efficiency. Select at or below rated airflow.

ENP-ESP-9000

Banquet and central production kitchens where several cooking lines share one extract.



AIRFLOW
9,000 CMH · 5,297 CFM

ESP CELLS
3 × electrostatic filter cell

DIMENSIONS
1,619 × 600 × 620 mm (L × W × H)

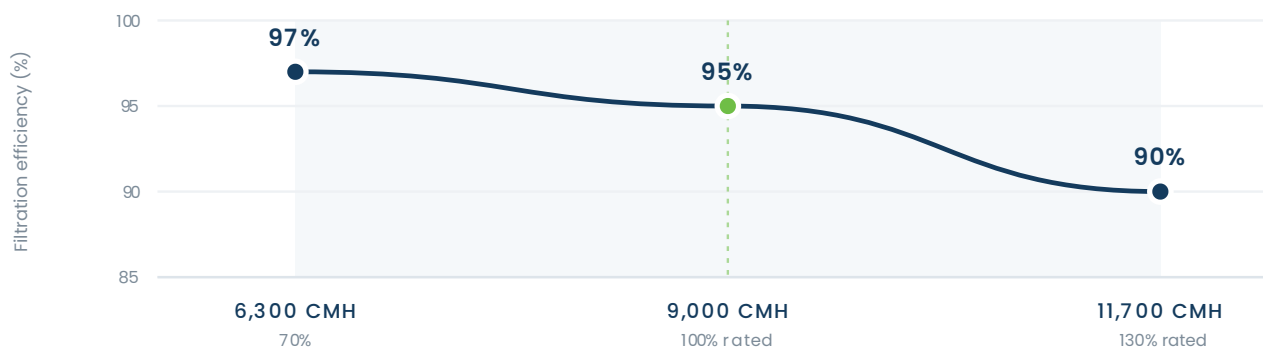
WEIGHT
122 kg

POWER
83 W

COLLECTING AREA
17.76 m² effective

AIRFLOW RATE	9,000 CMH (5,297 CFM)
AIRFLOW DIRECTION	Left-to-right or right-to-left, reversible (factory set)
NUMBER OF CELLS	3 pcs electrostatic filter cell
INPUT VOLTAGE	220–240 V, 50/60 Hz, 1 PH (110 V on request)
OUTPUT VOLTAGE	12 kV ionising / 6 kV collecting
PRODUCT POWER	83 W
PRESSURE DROP	72 Pa with pre-filter / 115 Pa with pre- and after-filter, at rated airflow
PARTICLE CAPTURE	0.01 – 10 microns
EFFICIENCY	Up to 95% DOP single-pass · 99% double-pass (calculated)
INSTALLATION	Suspended, wall, frame or duct mounted
FINISH	Outdoor epoxy powder coating · RAL 7035, or two-tone RAL 7035 + RAL 7024. Custom colours on request.
OUTDOOR USE	Suitable for outdoor installation

PURIFICATION EFFICIENCY VS. AIRFLOW



Higher airflow shortens dwell time in the collection section, which lowers single-pass efficiency. Select at or below rated airflow.

ENP-ESP-12000

The largest single unit, and the building block for modular systems up to 96,000 CMH.



AIRFLOW

12,000 CMH · 7,062 CFM

ESP CELLS

4 × electrostatic filter cell

DIMENSIONS

2,079 × 600 × 620 mm (L × W × H)

WEIGHT

155 kg

POWER

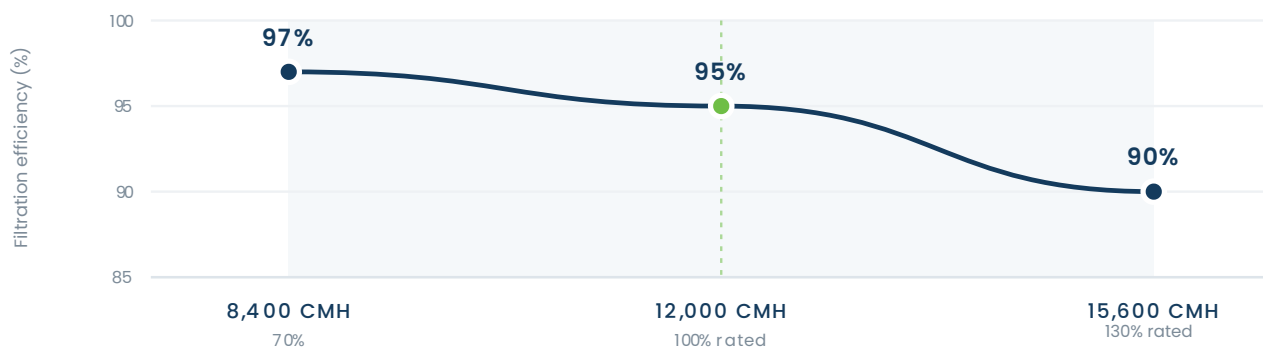
96 W

COLLECTING AREA

23.68 m² effective

AIRFLOW RATE	12,000 CMH (7,062 CFM)
AIRFLOW DIRECTION	Left-to-right or right-to-left, reversible (factory set)
NUMBER OF CELLS	4 pcs electrostatic filter cell
INPUT VOLTAGE	220–240 V, 50/60 Hz, 1 PH (110 V on request)
OUTPUT VOLTAGE	12 kV ionising / 6 kV collecting
PRODUCT POWER	96 W
PRESSURE DROP	72 Pa with pre-filter / 115 Pa with pre- and after-filter, at rated airflow
PARTICLE CAPTURE	0.01 – 10 microns
EFFICIENCY	Up to 95% DOP single-pass · 99% double-pass (calculated)
INSTALLATION	Suspended, wall, frame or duct mounted
FINISH	Outdoor epoxy powder coating · RAL 7035, or two-tone RAL 7035 + RAL 7024. Custom colours on request.
OUTDOOR USE	Suitable for outdoor installation

PURIFICATION EFFICIENCY VS. AIRFLOW



Higher airflow shortens dwell time in the collection section, which lowers single-pass efficiency. Select at or below rated airflow.

Construction & controls

Common to every model in the range. Cell count, unit length and weight are the only variables between ENP-ESP-3000 and ENP-ESP-12000.

Pre-filter & after-filter

- Pre-filter: 460 × 468 × 21 mm aluminium mesh, one per cell.
- After-filter (optional): 460 × 468 × 21 mm aluminium mesh, one per cell.
- UV module (optional): 2 pcs per cell, dualwavelength 185 & 254 nm, 80 W per cell.

Power & protection

- High-frequency solid-state power supply.
- Protection: arc, short-circuit, open-circuit, automatic HV shutdown, automatic recovery, restart lockout.
- Safety: power off when any access door is open.

Electrostatic filter cell

- Cell size: 460 × 466 × 361 mm, one per rated 3,000 CMH.
- Ionizer: spiked design, 8 blades, 316 stainless steel.
- Collection: 0.15 m² face area, 232 mm plate depth, 5.92 m² effective collecting area per cell.

Controls & monitoring

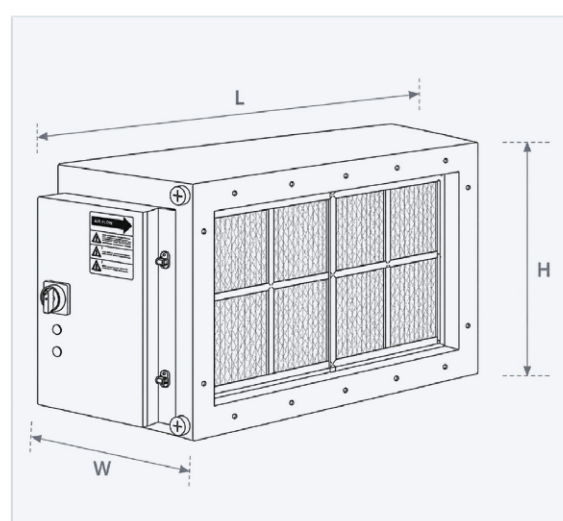
- Power switch with indicator lamps.
- BMS: volt-free terminals for operation, fault and cleaning status.
- Display: LED power and operation indicators; HV / current display optional.

OVERALL DIMENSIONS (L × W × H, MM)

ENP-ESP-300	699 × 600 × 620
ENP-ESP-6000	1,159 × 600 × 620
ENP-ESP-9000	1,619 × 600 × 620
ENP-ESP-12000	2,079 × 600 × 620

REQUIRED SERVICE CLEARANCE

70 mm on the cell withdrawal side.



Options & accessories

Every Enpura ESP is configured to the project. The items below are specified at order and fitted at the factory.

Activated carbon after-filter	Adsorbs residual odour downstream of the collection section. Recommended for BBQ, grill and any discharge close to occupied areas.
Aluminium mesh after-filter	A second mesh stage that catches any re-entrained particulate. Adds 43 Pa to the unit pressure drop
UV module	Dual-wavelength 185 & 254 nm lamps, 2 pcs per cell, for additional odour and organic breakdown. 80 W per cell.
HV / current display	Front-panel readout of high-voltage and current, for commissioning and fault diagnosis.
BMS interface	Volt-free terminals reporting operation, fault and cleaning status to the building management system.
110 V input	Factory-configured 110 V power pack in place of the standard 220–240 V supply.
Custom finish	RAL 7035 as standard, two-tone RAL 7035 + RAL 7024, or any custom RAL to match the project specification.
Mounting accessories	Suspension brackets, floor-standing frames and duct flanges to suit the installation configuration.

Non-standard sizes, airflow rates and enclosure arrangements can be built to order. Send the hood schedule and plant-space drawings to Energia and the application team will return a proposed configuration.

Service & maintenance

The cell is the filter, so performance depends on the wash cycle rather than on replacement media. Intervals below are a starting point – adjust them from what comes off the first few cleans.

INDICATIVE WASH INTERVALS

DUTY	CELL WASH INTERVAL	PRE-FILTER CHECK
Light – caf e reheat, low grease	8 – 12 weeks	With every cell wash
Medium – a la carte restaurant	4 – 6 weeks	Every 2 – 3 weeks
Heavy – BBQ, grill, teppanyaki, wok	2 – 3 weeks	Weekly

CELL WASHING PROCEDURE

- 1 Isolate the unit at the door-interlocked main isolator and confirm the indicator lamp is out.
- 2 Open the cell access door. High voltage is cut automatically as the interlock breaks.
- 3 Withdraw the pre-filter, then the ionizer/collector cell or cells.
- 4 Soak for 15–20 minutes in warm water with an alkaline degreaser, rinse thoroughly and drain.
- 5 Dry completely before reinstalling. Refit the cell and pre-filter, close the door and restore power.

Do not

Pressure-wash the ionizer blades, run the unit with a wet cell, or use solvent-based cleaners on the collector plates.

Energia service

Scheduled maintenance contracts, cell exchange programmes, spare cells and ionizer blade replacement, with response across the UAE



Cleaner kitchen exhaust, lower running cost.

Electrostatic precipitation engineered, supplied and serviced by
Energia across the UAE and wider GCC.

THE ENPURA RANGE

Enpura MCS • UVGI air disinfection

Enpura ESP • electrostatic precipitation

Enpura BPI • bipolar ionisation



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