

Halton – PolluStop PEU, Aerolys AEU and Extenso XEU

Eurovent certified exhaust and supply units with pollution and air quality control



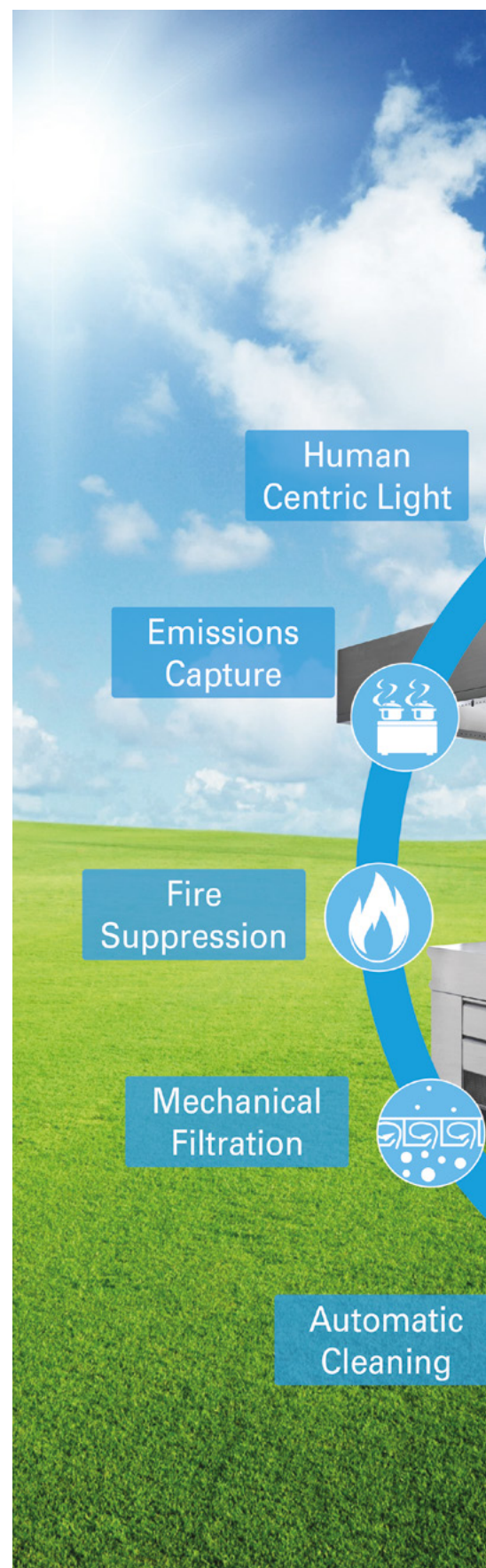
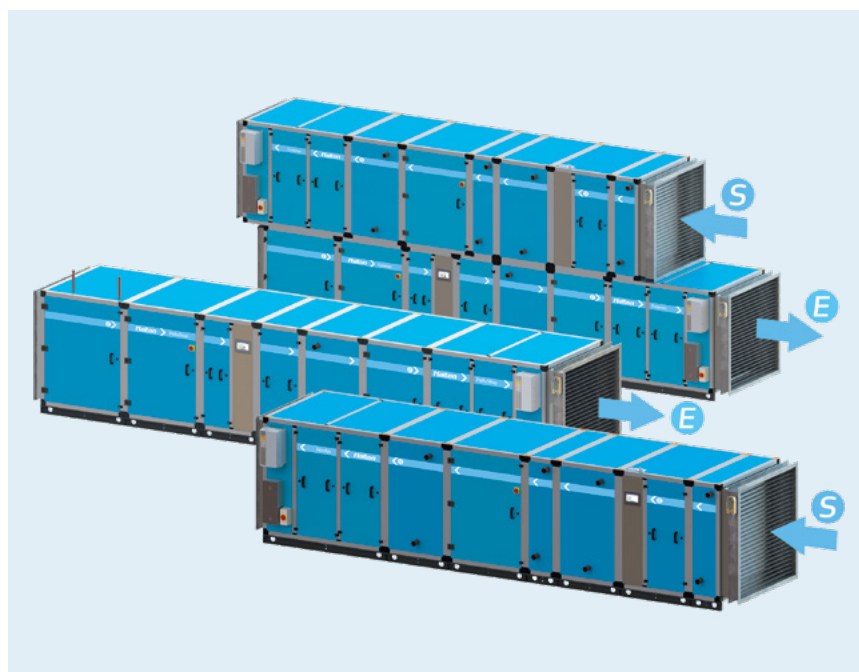
Halton Completes the Circle of

With the launching of the widest range of Eurovent accredited Air Handling Units specifically designed for the ventilation of professional kitchens, Halton completes the technology circle and provides the most efficient solutions for all stages of kitchen ventilation systems, from capture, extraction and discharge of the air to atmosphere, through to providing the cleanest and healthiest replacement air.

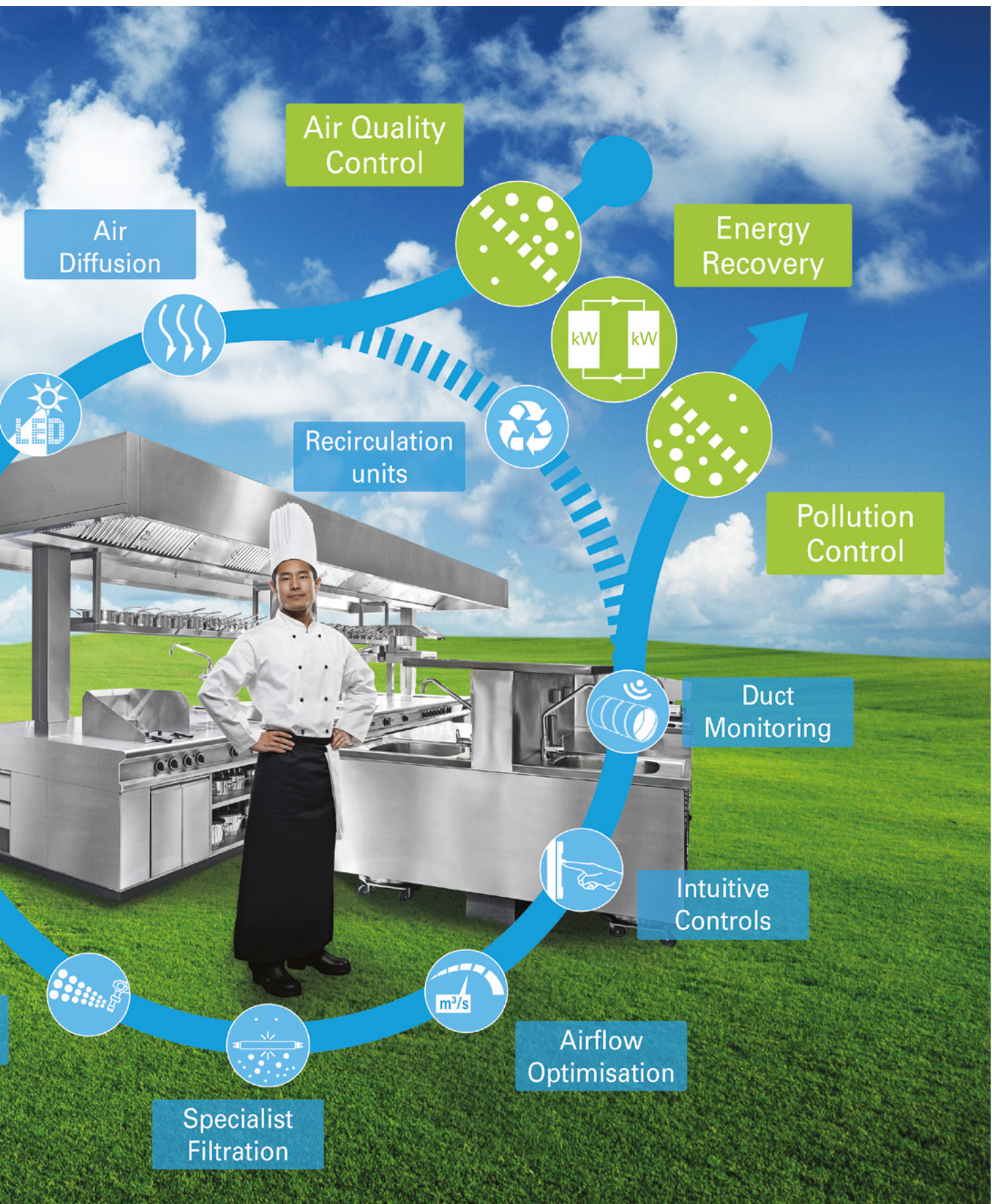
Before this launching, Halton was already providing the most comprehensive ventilation solutions, these being doubtless the most technological and advanced. The five times awarded Demand Controlled Ventilation system, M.A.R.V.E.L., is probably the best demonstration of this statement. In fact, combined with PolluStop PEU exhaust and Aerolys supply units, it is the most efficient solution for establishing a restaurant anywhere with the lowest possible energy consumption levels.

Extenso XEU combined unit completes the range. It provides all the features and options that are available from the individual PolluStop PEU and Aerolys AEU ranges of units, but with the added benefit that the single "footprint" of Extenso XEU is half that of the separate units.

Halton Completes the Circle!



High Performance Kitchens



How does Halton complete

By launching its Eurovent certified PolluStop PEU exhaust units to always keep pace with the stringent requirements demanded by the current trends in cooking activity.



Halton's PolluStop PEU exhaust units integrates Halton's ESP (Electrostatic Precipitator) as an additional cornerstone, incorporating the highest levels of emission control. Grease, odours, moisture, smoke and the inevitable headaches linked to fire safety, hygiene and neighbourhood complaints become history... which is not the case when initial capital investment is the prime consideration.

- Eliminate neighbourhood and safety concerns.
- Establish your restaurant wherever you choose.
- Eliminate the need for vertical duct risers, reduce the installation costs and increase the leasable surface.
- Benefit from reduced maintenance costs compared to traditional exhaust units.

By launching the range of Eurovent certified Aerolys AEU supply-air units, specifically designed for professional kitchens and urban pollution control.

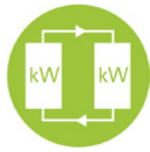
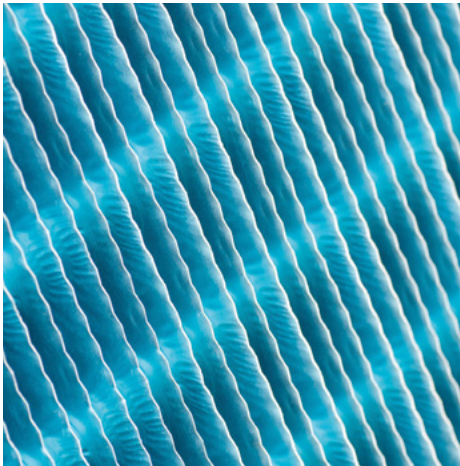


Halton's range of Aerolys AEU supply units is designed to comply with the highest hygiene requirements inside professional kitchens. It is not simply a question of pumping in air. Whatever its level, hygiene can rapidly be compromised if a correct balance between supply and exhaust is not maintained at all times and in each area of the kitchen. Aerolys AEU units provide a high level of air quality inside the kitchen and works "hand-in-hand" with PolluStop PEU exhaust units and Halton's airflow optimisation system M.A.R.V.E.L.

- Fresh air free of urban pollution and bacteria.
- Good thermal comfort.
- Constant balance between exhaust & supply.
- Guarantee of hygienic treatment of the supply air.

the circle?

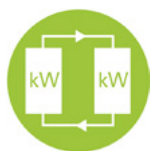
By completing, at the same time, the circle of heat recovery and preheating fresh air supplied into professional kitchens.



Speaking of a dominant trend with regard to heat recovery is an understatement. This provision is already compulsory in professional kitchens in some countries. Both PolluStop PEU exhaust and Aerolys AEU supply units can be equipped with an air-to-water heat recovery coil. This treatment process ensures that the system operates with clean air. It enables keeping the recovery effectiveness at a constant level over time, and greatly limiting heat-exchanger maintenance and cleaning costs. Heat Recovery can be combined with M.A.R.V.E.L. airflow optimisation system for unrivaled energy savings.

- Maximum recovery efficiency remaining constant over time.
- Huge energy savings.
- Maintenance costs reduced to the lowest possible level.
- Cost effective solution once pollution control is in place.

And continuing making savings by launching a Eurovent certified range of combined exhaust & supply units with combined air-to-air and air-to-water heat recovery.



Extenso XEU units are a combination of PolluStop PEU exhaust and Aerolys AEU supply units, resulting in a unique list of benefits. This combination makes it possible to incorporate highly efficient heat exchangers preventing any cross contamination, still fully compatible with Halton airflow optimisation system M.A.R.V.E.L. The savings can't be higher in the field of professional kitchens.

- Complete and consistent solution.
- Highest possible level of savings in combination with M.A.R.V.E.L.
- As for all other Halton technologies, unique and intuitive user interface: Halton's Touch Screen.

Establish your kitchen wherever

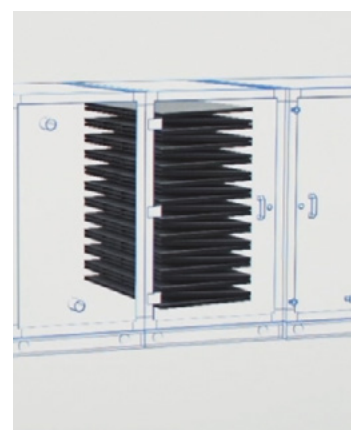
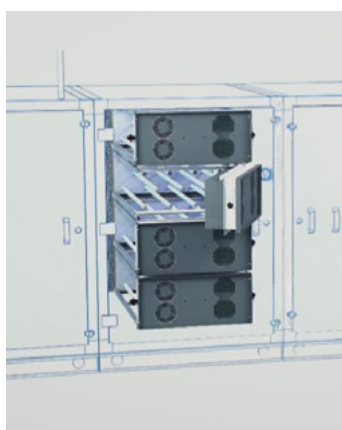
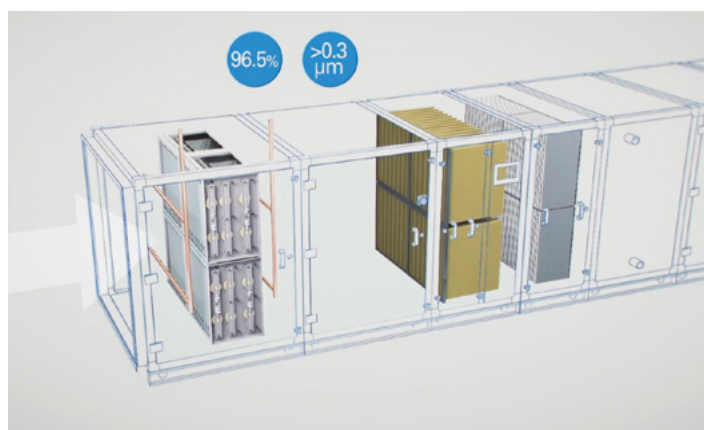
The revolution of emissions free kitchens

Halton's PolluStop PEU exhaust units have never been more at the vanguard of control emissions technology. Its advanced treatment process is based on two cornerstones.

Halton's self cleaning ESP (Electrostatic Precipitator) is the first one. It was specifically designed to be PolluStop PEU first line of defence by removing most of the unwanted moisture from the airstream along with much of the particulate matter generated by the cooking process.

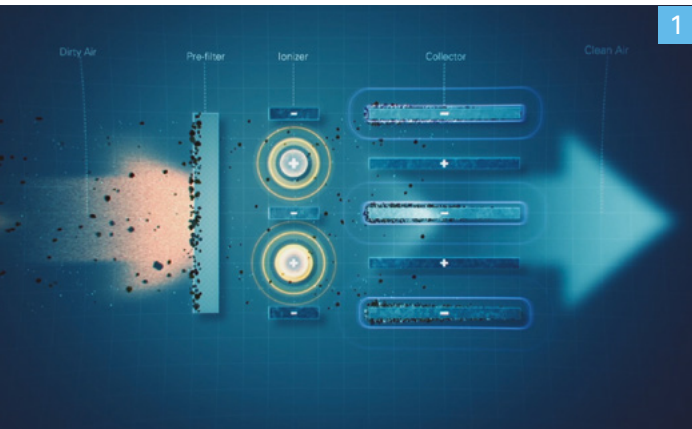
Halton's Capture Ray™ technology is the second one. It neutralises the grease particles but above all – and additional to any ESP – it also acts on grease vapours and VOCs... the two main factors for odour transfer.

When PolluStop PEU treatment process combines both the Capture Ray™ technology and Halton's ESP, the results are then unrivalled. One can truly speak about emissions free kitchens... with all the benefits that go along with it.



Dion and Pater Noster restaurants (London) whose kitchens are equipped with one PolluStop PEU unit. Discharge points are on the building fronts.

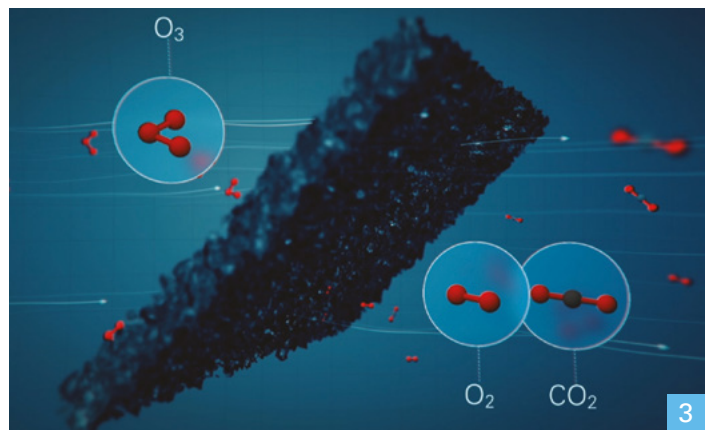
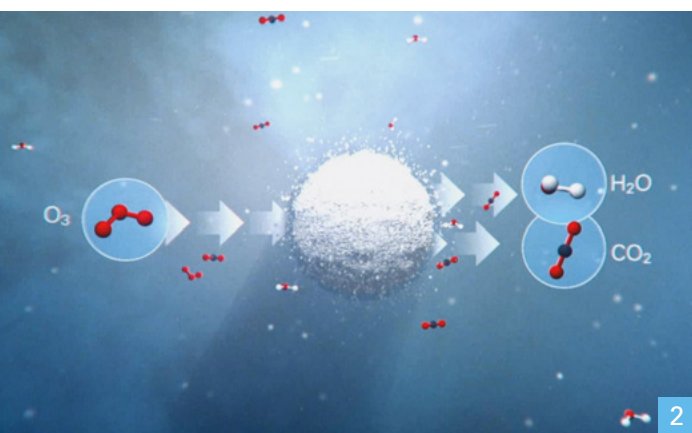
you choose!



1 - Halton's ESP removes most of the unwanted moisture from the airstream along with much of the particulate matter generated by the cooking process.

2 - Halton's Capture Ray™ technology, and its ozone producing UV-C lamps, neutralises the grease particles and also acts on grease vapours and VOCs.

3 - NFX-classified activated carbon is used to reduce the ozone level to under WHO recommendation when it is occasionally generated in excess, as part of the treatment process.



Peace of mind and cost effectiveness!

Halton's emissions free kitchens come along with a unique set of benefits that are often overlooked when considering only the initial investment. And yet, one can truly talk about cost effectiveness. See for yourself.

BE SAFE AND ESTABLISH YOUR KITCHEN WHEREVER YOU CHOOSE

Grease, odours, moisture, smoke and the inevitable headaches linked to fire safety, hygiene and neighbourhood complaints become history. Particularly, airborne particulates and cooking odours are reduced to such minimal levels that it allows restaurants or facilities to be safely established where it is of most value!

BENEFIT FROM MASSIVE SAVINGS ON ENERGY AND MAINTENANCE

Check out the unrivalled energy savings you can benefit from when designing an emissions free kitchen. And what to say about maintenance costs? The lifetime of downstream and more costly filters is increased by more than 80% thanks to Halton's ESP! The consumables are limited to the regular replacement of integrated and inexpensive pre-filters.

SAVE MONEY ON INSTALLATION

PolluStop PEU exhaust unit makes possible the discharge of exhaust air directly through the side of the buildings and not at roof level.

- It suppresses the internal or ugly external duct risers and saves money on installation costs.
- The suppression of internal duct risers, increases the leasable surface and corresponding revenues.

Cross high safety with comfort

Cross contamination? No way! Halton's controls make sure of that.

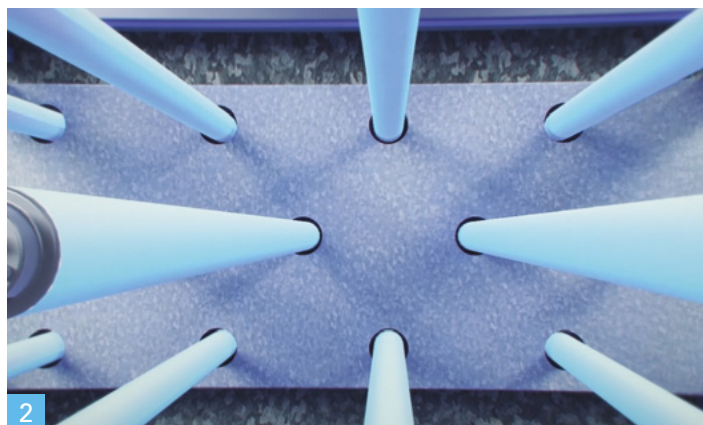
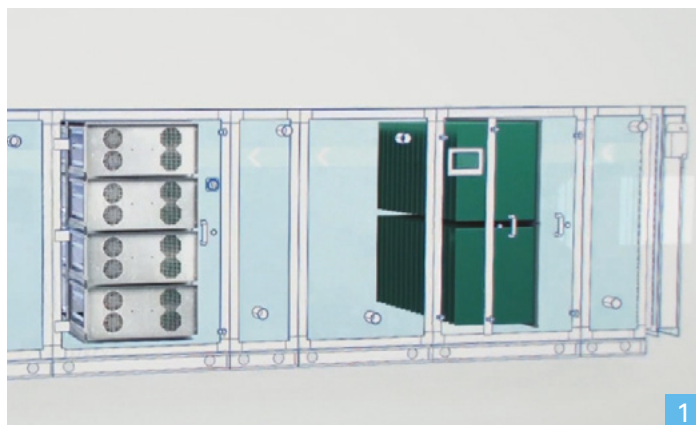
The Halton Aerolys AEU range of highly efficient Air Handling Units is designed to provide the strongest hygiene requirements inside professional kitchens. It is not only a question of blowing hygienic fresh air in. Whatever its level, hygiene can rapidly become compromised if a correct balance between supply and exhaust is not kept at all times and in each area of the kitchen. Preventing cross contamination is one of the core principles of a well-designed facility operating in accordance with a HACCP program.

See for yourself how challenging it is maintaining this balance. It depends first on the filters used on both PolluStop PEU exhaust and Aerolys AEU supply units. As they get dirty, the airflow rates decrease progressively and in a very different way between exhaust and supply. This balance is also subjected to the constant airflow variations of M.A.R.V.E.L. Demand Controlled Ventilation

system. It has the unique ability to adjust the exhaust airflow hood by hood, independently and depending on the cooking activities. The energy savings are unrivalled but it also means that PolluStop PEU units' exhaust airflows constantly vary and that Aerolys AEU units have to strictly follow the "rhythm" for the supply.

It may look somewhat technical, but Halton's controls and expertise work for you behind the scenes. The key to avoiding any problems is to offer comprehensive solutions combining efficient products with consistent controls. That's what Halton do. You can then be sure you will always get the correct supply & exhaust airflow levels, at the right time and the right place and with the right balance.

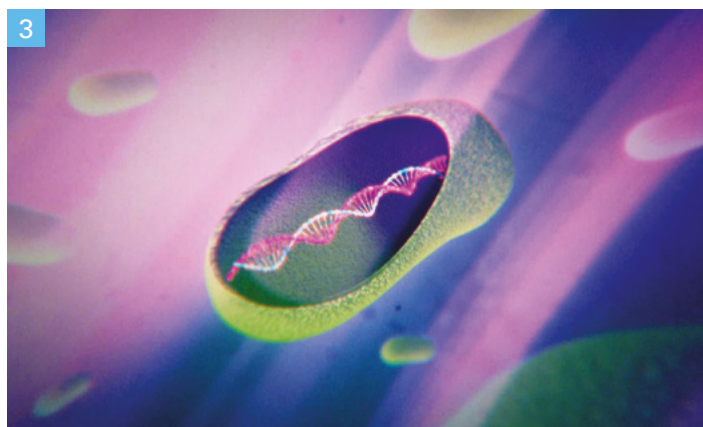
Just forget the technical nature of your ventilation! We efficiently manage it for you backstage.



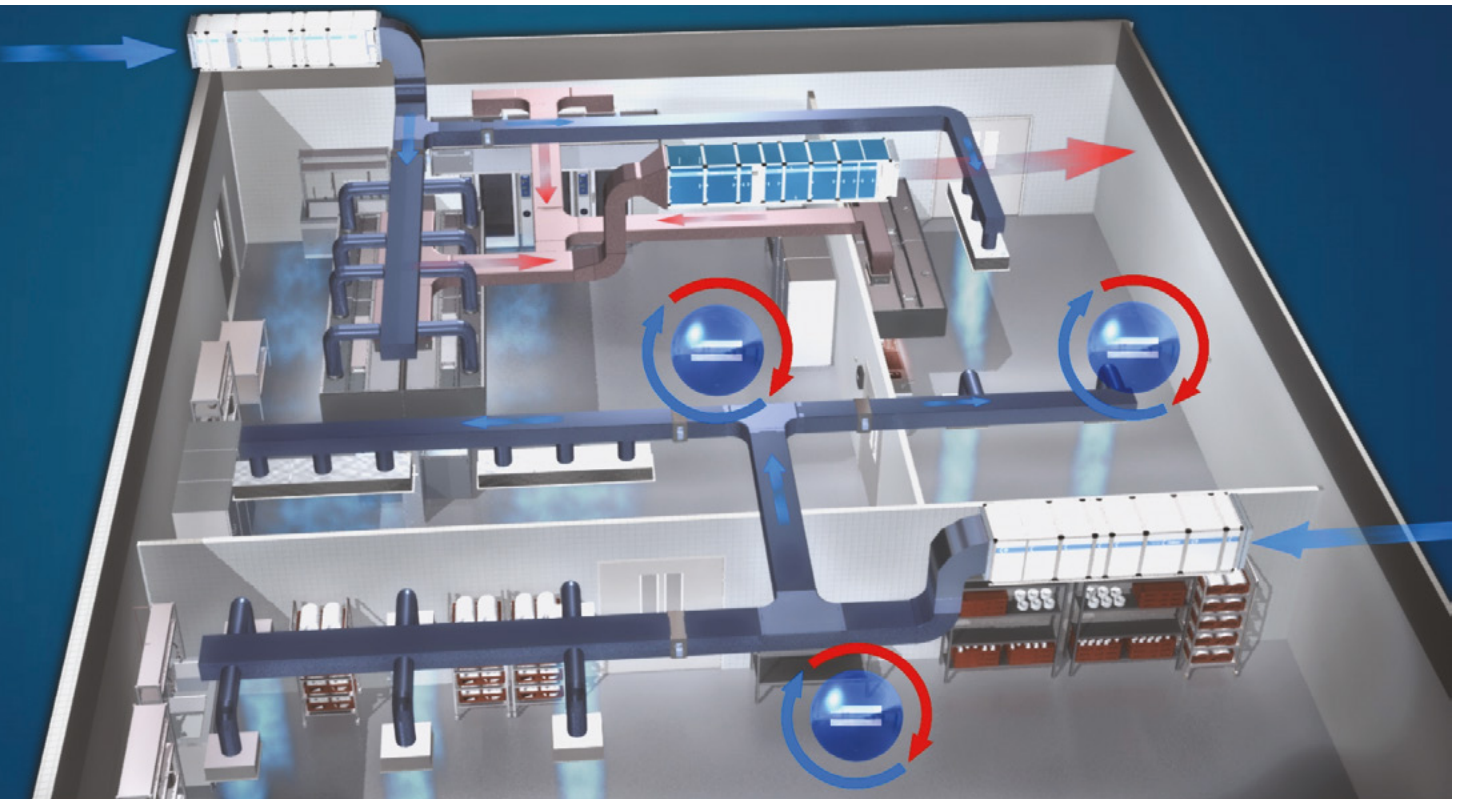
1 - 2 - Halton's Urban Pack comprises carbon impregnated bag filters followed by non ozone producing germicidal UV lamps.

3 - Halton's germicidal lamps neutralise airborne viruses and bacteria.

4 - Recovery coil used to preheat the fresh air blown in the kitchen. The balance can be provided by an additional device, such as hot water, gas or electric heating, and/or chilled water or DX cooling.



standards, not air flows!



Halton's Urban Pack: The healthiest replacement air.

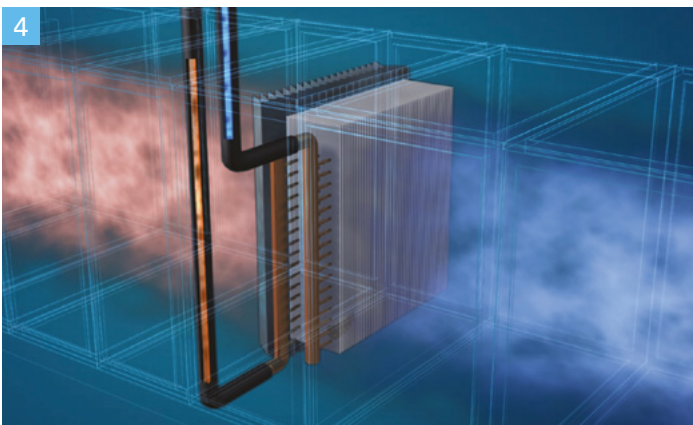
Let's now consider the quality of the supply air itself. In dense urban areas where car pollution can be critical, this aspect is a real challenge.

Aerolys AEU supply units can be equipped with an Urban Pack, comprising carbon impregnated bag filters plus non ozone producing germicidal UV lamps. This combination reduces incoming carbon dioxide and other unwanted

gases and all but eliminates airborne bacteria. When exposed to the ultraviolet light, viruses and microbes lose their reproduction capability. They quickly and effectively lose their infectivity and become inert. Pure and hygienic air! That is the result provided by Aerolys AEU supply units.

To evolve to a safe operation with ideal working conditions, all that remains is to add thermal comfort and deliver the air inside the kitchen without draughts and at a desirable temperature. Aerolys range comprises several heating and cooling options that are completed with advanced controls and Halton's range of kitchen specific air diffusers.

Heating and cooling the replacement air! This is one of the biggest costs for any kitchen ventilation system. Let's contemplate how Halton's exhaust and supply units reduce these costs to the bare minimum by combining airflow management and energy recovery!

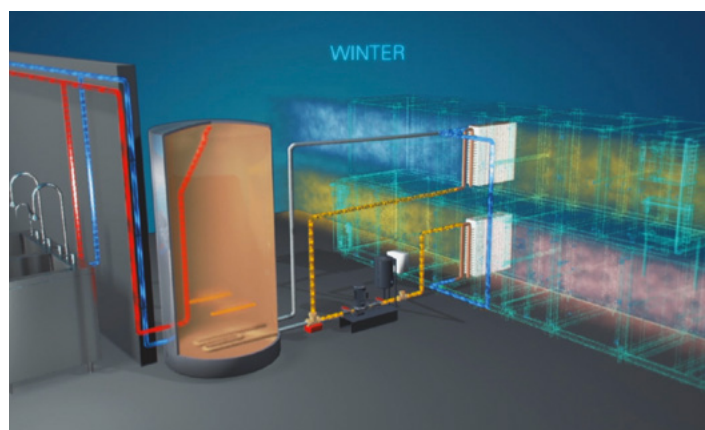
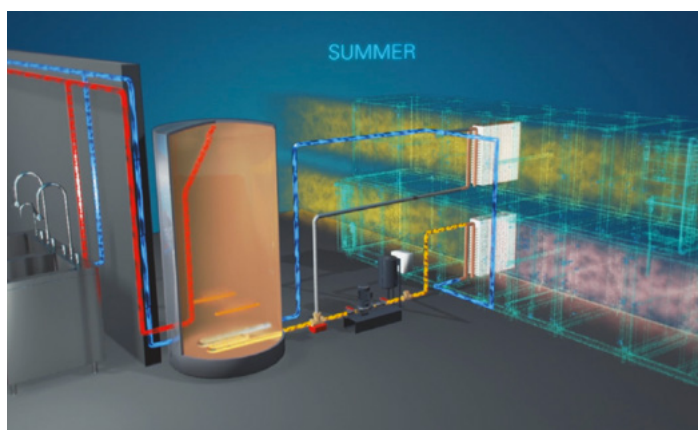


All this while benefiting from the

Highly efficient and sustainable heat recovery

Energy recovery is a provision that is already compulsory in professional kitchens in some countries. The absence of deposits on the exchanger surfaces, facilitates the recovery effectiveness at a constant level over time and to greatly limit heat-exchanger maintenance and cleaning costs.

The combined exhaust & supply unit Extenso XEU has the unique benefit of being able to offer both air-to-air and air-to-water heat recovery within a single compact unit. This enables energy to be recovered into the domestic hot water even when the incoming supply air is not calling for heat. Energy savings can't be higher!



Bring your savings to the highest possible level by combining heat recovery and M.A.R.V.E.L.

PolluStop PEU, Aerolys AEU and Extenso XEU units are fully compatible with M.A.R.V.E.L. technology which is the most efficient Demand Controlled Ventilation system.

M.A.R.V.E.L. has the unique ability to adjust the exhaust airflow hood by hood, independently and depending on the cooking activities. If just one hood requires more airflow, the others will continue to operate at a lower flow rate. It works the same way with the ventilated ceilings. This innovation generates up to 64% reduction in exhaust airflow rates... leading to massive savings, not gained at the expense of the heat recovery!

Icing on the cake: M.A.R.V.E.L. continually regulates the speed of the fans to obtain the required airflow rates with minimal pressure. Their power consumptions are thus kept to the bare minimum.

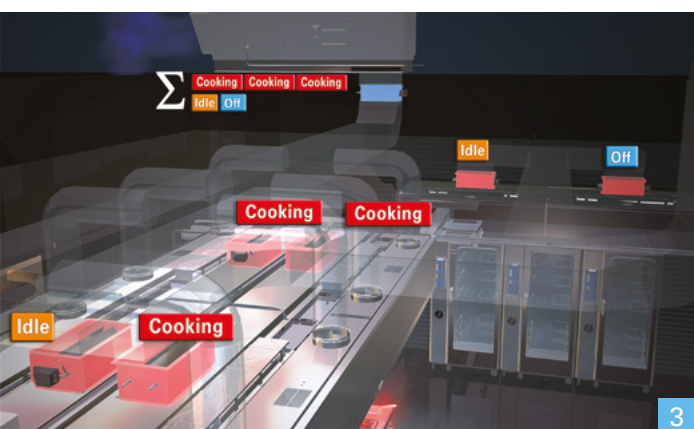
M.A.R.V.E.L. currently represents the most efficient Demand Controlled Ventilation system with the combination of massive savings on air conditioning and on

the fans operation. Combined with heat recovery, the energy savings then reach the highest possible level.

Can you really afford not to combine PolluStop PEU, Aerolys AEU and Extenso XEU units with M.A.R.V.E.L.?



highest energy savings!



1 - M.A.R.V.E.L. « scans » the surface of the cooking equipment to determine, in real time, the status of the cooking appliances: switched off, idle or in the process of cooking.

2 - 3 - Once the exhaust airflow needs are determined, the ABD dampers adjust their position to meet them hood by hood. PolluStop PEU and Aerolys AEU exhaust and supply units adjust their speed accordingly.

4 - Combined with the Capture Jet™ technology, M.A.R.V.E.L. provides the highest energy savings for cooling or heating the fresh air blown inside the kitchen.

The first kitchen specific range



Halton Foodservice participates in the Eurovent Certified Programme for Halton AHU range of exhaust and supply units (PolluStop PEU, Aerolys AEU and Extenso XEU). Diploma: 17.02.277.

Check on-going validity of certificate: www.eurovent-certification.com.

As part of this programme, the model box of PolluStop PEU exhaust unit has been tested according to 6 targets. The score Halton AHUs reached on each target are detailed below.

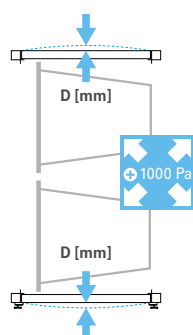
| | | |
|-------------------------------|---------------|--|
| Casing strength (CS) | D1(R*) | <div><div></div><div></div><div></div></div> |
| | | Max Deflection CS ≤ 4 mm |
| Thermal Transmittance (TT) | T4 | <div><div></div><div></div><div></div><div></div></div> |
| | | Max transmittance $1,4 < TT \leq 2,0$ W/m ² K |
| Thermal Bridging Factor (TBF) | TB4 | <div><div></div><div></div><div></div><div></div></div> |
| | | Max Bridging $0,30 < TBF \leq 0,45$ |
| Casing Air Leakage (CAL400) | L3(R*) | <div><div></div><div></div><div></div></div> |
| | | Max leakage $0,44 < CAL400 \leq 1,32$ l/s m ² |
| Casing Air Leakage (CAL700) | L3(R*) | <div><div></div><div></div><div></div></div> |
| | | Max leakage $0,63 < CAL700 \leq 1,9$ l/s m ² |
| Filter Bypass Leakage (FBL) | F9(R*) | <div><div></div><div></div><div></div><div></div><div></div></div> |
| | | Max bypass FBL $\leq 0,5\%$ |

Acoustical insulation

Sound insertion loss value of the Air Handling Unit.

| Frequency [Hz] | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-----------------|-----|-----|-----|------|------|------|------|
| Insulation [dB] | 13 | 17 | 31 | 32 | 33 | 36 | 42 |

Casing strength (CS)



It is the largest deformation of the sides of the unit [mm/m] under a positive or negative pressure of 1000 Pa, given as a difference in distance from a reference plane outside the unit to the external unit surface with and without test pressure. The deflection, related to the span, defines the casing strength.

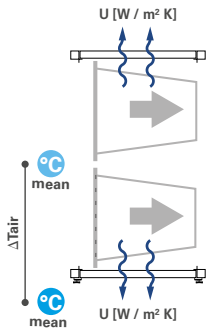
Classification:

| | |
|--------|--------------------------------|
| D1(R*) | Max deflection CS ≤ 4 mm |
| D2(R*) | Max deflection CS ≤ 10 mm |
| D3(R*) | Max deflection CS > 10 mm |

* R stands for Real Unit (M stands for Model Box).

of Eurovent accredited AHUs

Thermal transmittance (TT)

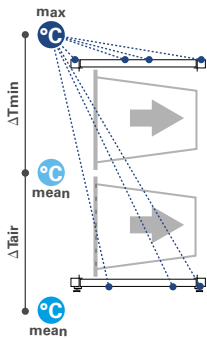


It is the heat flow per area and temperature difference $[W/m^2 K]$ through the casing of the air handling unit.

Classification:

| | |
|----|---|
| T1 | Max transmittance $TT \leq 0,5 W/m^2 K$ |
| T2 | Max transmittance $0,5 < TT \leq 1,0 W/m^2 K$ |
| T3 | Max transmittance $1,0 < TT \leq 1,4 W/m^2 K$ |
| T4 | Max transmittance $1,4 < TT \leq 2,0 W/m^2 K$ |
| T5 | No requirement |

Thermal Bridging Factor (TBF)

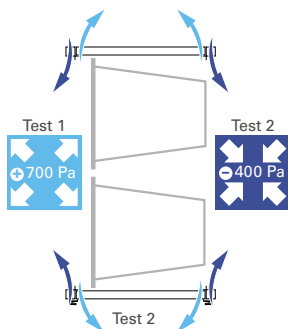


It is the ratio between the lowest temperature difference between any point on the external surface and the mean internal air temperature and the mean air-to-air temperature difference.

Classification:

| | |
|-----|-------------------------------------|
| TB1 | Max bridging $0,75 < TBF \leq 1,0$ |
| TB2 | Max bridging $0,60 < TBF \leq 0,75$ |
| TB3 | Max bridging $0,45 < TBF \leq 0,60$ |
| TB4 | Max bridging $0,30 < TBF \leq 0,45$ |
| TB5 | No requirement |

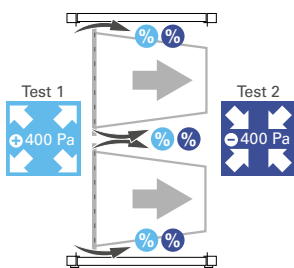
Casing Air Leakage (CAL)



The air leakage in volume per unit of time $[l/s m^2]$, related to the external casing area. The test is carried out under a negative pressure of 400 Pa and a positive pressure of 700 Pa.

| | | |
|---------------------------|--------|--|
| Classification (-400 Pa): | L1(R*) | Max leakage $CAL_{400} \leq 0,15 l/s m^2$ |
| | L2(R*) | Max leakage $0,15 < CAL_{400} \leq 0,44 l/s m^2$ |
| | L3(R*) | Max leakage $0,44 < CAL_{400} \leq 1,32 l/s m^2$ |
| Classification (+700 Pa): | L1(R*) | Max leakage $CAL_{700} \leq 0,22 l/s m^2$ |
| | L2(R*) | Max leakage $0,22 < CAL_{700} \leq 0,63 l/s m^2$ |
| | L3(R*) | Max leakage $0,63 < CAL_{700} \leq 1,9 l/s m^2$ |

Filter Bypass Leakage (TT)



Air bypass around filter cells as a percentage of rated air volume flow.

Classification:

| | |
|--------|---------------------------------|
| F9(R*) | Max bypass $FBL \leq 0,5\%$ |
| F8(R*) | Max bypass $0,5 < FBL \leq 1\%$ |
| F7(R*) | Max bypass $1 < FBL \leq 2\%$ |
| F6(R*) | Max bypass $2 < FBL \leq 4\%$ |
| F5(R*) | Max bypass $4 < FBL \leq 6\%$ |



National University of Singapore (Singapore)

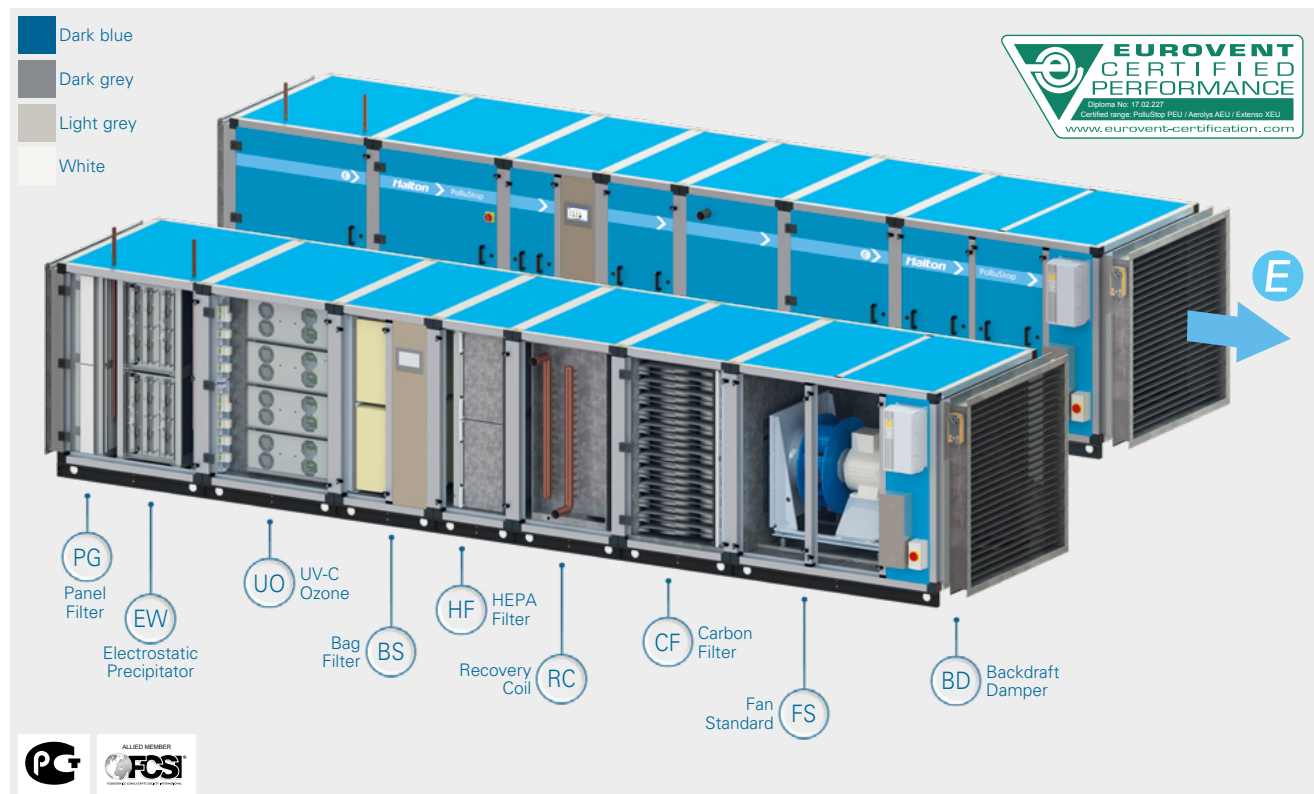
Halton AHUs

| | | |
|------------|---|-------|
| PEU | PolluStop - Eurovent accredited exhaust unit,with pollution control | p. 15 |
| AEU | Aerolys - Eurovent accredited supply unit, with air quality control..... | p. 19 |
| XEU | Extenso - Eurovent accredited combined Exhaust & Supply unit, with pollution and air quality control..... | p. 23 |

PolluStop PEU

EXHAUST UNIT WITH POLLUTION CONTROL AND HEAT RECOVERY

EUROVENT accredited, High efficiency Electrostatic Precipitator, Double skin



APPLICATIONS

The PolluStop PEU range of exhaust units was designed to work with Capture Ray™ technology whether integrated into hoods, ceilings or in the PolluStop PEU unit itself. UV-C lamps neutralise grease particles which are not contained by the primary filtering system. By increasing the lamps to a carefully selected number, cooking odours are minimised to such a level that it is no longer necessary to discharge the extracted air at roof-top level. NFX activated carbon filters are designed to arrest surplus ozone produced by the UV-C lamps when the cooking appliances are not running at maximum load. After UV treatment, the optional recovery coil in the PolluStop PEU unit can be used safely, efficiently and with minimal maintenance. It can be used to pre-condition the fresh air or pre-heat the domestic hot water.

- Eurovent accredited.
- Specially developed for kitchens in dense urban areas.
- Wide range of units, from 3,240 to 38,880 m³/h.
- Respects the neighbourhood due to minimal cooking odours.
- Saves energy due to the integrated heat recovery coil, sustainable over time.

- Acoustic insulation built into the unit's double-skin panels.
- Three control systems: the first controls filter pressure loss, the second controls the speed of the extraction fan and the third controls the UV-C lamps.
- The three systems are controlled with one interface: the Halton Touch Screen.
- Outdoor or vertical installation possible. There are a number of additional service possibilities, such as integration of all units' control systems, including the inverter.



Halton Foodservice participates in the Eurovent Certified Programme for Halton AHU range of exhaust and supply units (PolluStop PEU, Aerolys AEU and Extensio XEU). Diploma: 17.02.277.

Check on-going validity of certificate: www.eurovent-certification.com