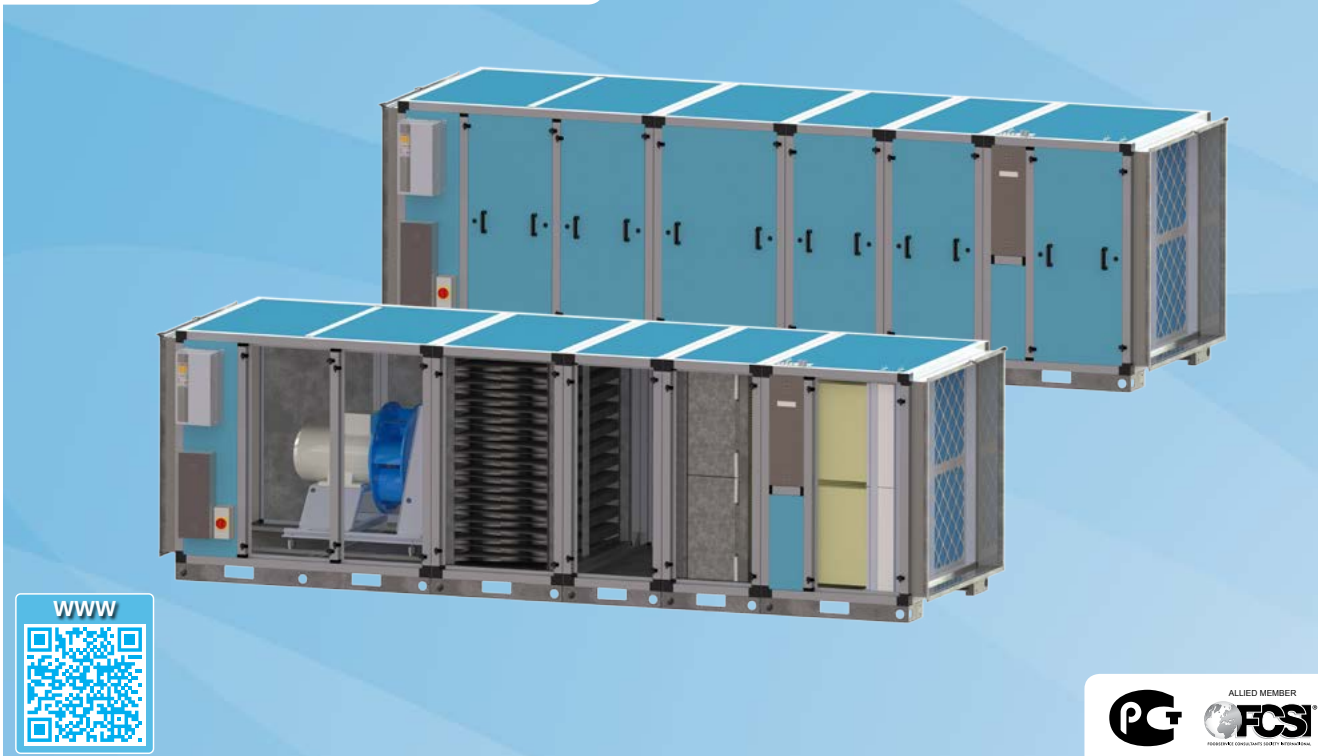


## PST

Pollustop advanced Air Purification units

PST/1306/UK



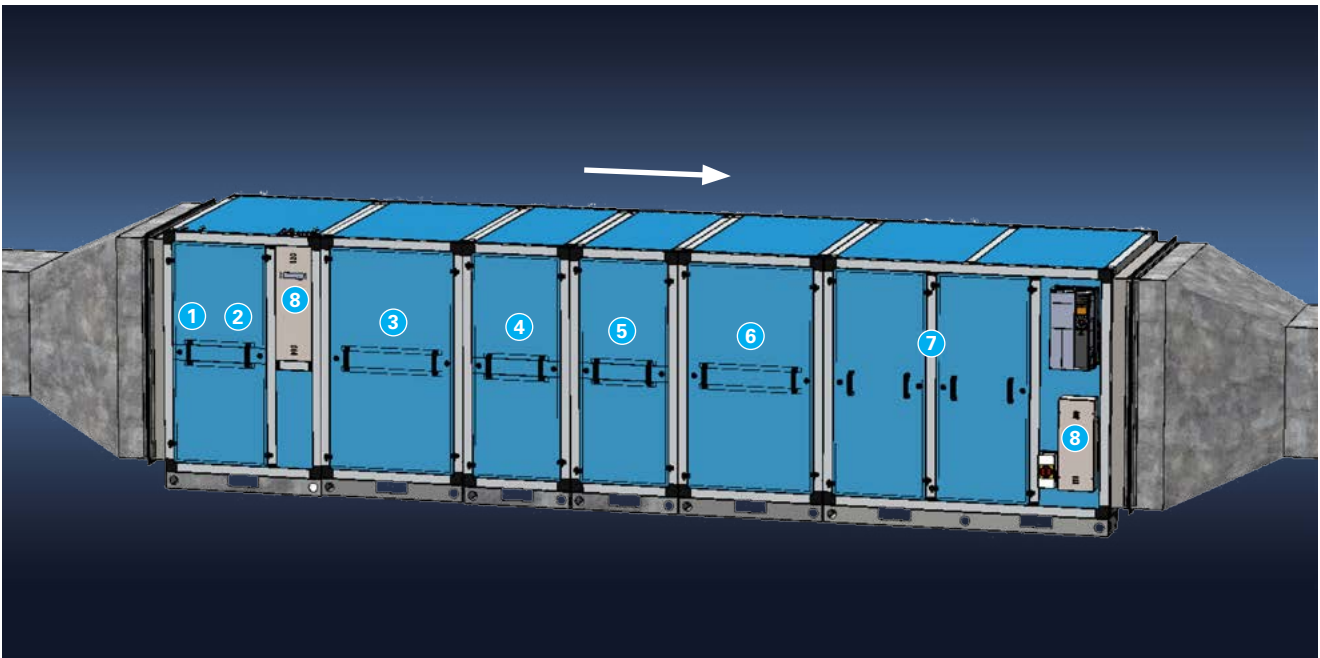
- **Especially developed for commercial kitchens operating in dense urban locations**
- **Allows low level discharge for exhaust ductwork**
- **Respects the neighbourhood due to minimal cooking odours and pollution (improved external air quality in surrounding areas of the kitchen)**
- **Lower energy consumption due an efficient heat recovery system, sustainable over time**
- **Increased filter lifetimes due to the Capture Ray™ technology which neutralises grease and odours**
- Easy to maintain by just replacing the disposable filters
- Permanent monitoring of the filters pressure loss to warn users or maintenance operator remotely when filters have to be replaced
- Fan speed regulation system allowing the operation of the Pollustop at a constant exhaust airflow level
- Controls belong to Halton Foodservice Control Platform (compatible with all Halton High Performance Kitchen technologies and solutions)
- Communication with the BMS and distant control capabilities
- Extremely silent construction: In-built acoustic insulation with double skin panels.

Pollustop is a standard range of modules designed to be incorporated into commercial kitchen ventilation systems where the control of airborne pollutants at the discharge point is a requirement. There are 10 standard units ranging in duty from 0.9 m<sup>3</sup>/s (3240 m<sup>3</sup>/h) to 9.0 m<sup>3</sup>/s (32400 m<sup>3</sup>/h).

The Pollustop range was conceived to compliment the Capture Ray™ UV-C Kitchen hoods or ventilated ceilings. It is now widely understood that certain ultraviolet lamps, when incorporated within the exhaust plenum of a kitchen extract hood, will remove airborne grease that is not removed by the primary hood grease filters. It is also the case that, by increasing the UV lampage to a carefully-selected level, airborne cooking odours will be so minimal that it can negate the need to discharge the vitiated air at a high level from the building.

When the kitchen is not running at maximum load, the Activated Carbon module simply adsorbs the excess ozone produced by the UV-C lamps placed in either the kitchen hoods or the Pollustop itself.

After UV treatment, a heat recovery coil can then be used in a totally safe and efficient manner, as airborne grease is removed. It can be used to heat the incoming fresh air into the kitchen or to pre-heat water.



### General Construction

Each module is manufactured using a Penta-Post extruded aluminium section. Infill panels and access doors are of a double-skin construction and finish flush with the inside and outside of the unit. The outer skin is 0.7 mm thick EGP Leathergrain Plastisol-coated steel. The inner skin is formed from 20g galvanised steel. Rockwool RW3 slab (orange label) mineral fibre with a density of 65 kg/m<sup>3</sup> is sandwiched between the inner and outer skins.

Each access panel is fully removable, with locks securing the panel to the frame, and black handles for safe removal. Each module is supplied with a 100x50x5mm rsc base and joined to the next using unit connectors with M8 HSS set screws and nuts.

Here is the typical configuration of one complete PST solution:

#### 1 - Panel Filters

Used to remove the largest particles. Disposable pleated panel type, grade EU4.

#### 2 - Capture Ray™ UV-C (to remove grease and odors)

UV-C lamps neutralise the odours, the grease vapours and the remaining grease particles contained in the exhausted air.

#### 3 - Bag Filters (to remove smaller particles)

Used to remove the particles coming from the grease neutralisation which can be considered as a kind of ash. Disposable microfibre glass type, grade EU8.

4 - HEPA Filters (to remove smoke to <0.3 microns) Used to remove ultra fine particles (carbon-based particles mainly). Disposable metal cased type, grade EU11.

#### 5 - Heat Recovery Coil

Used to recover the heat removed from the kitchen by the ventilation system, to preheat the makeup air or the cold water.

#### 6 - Activated Carbon Filters

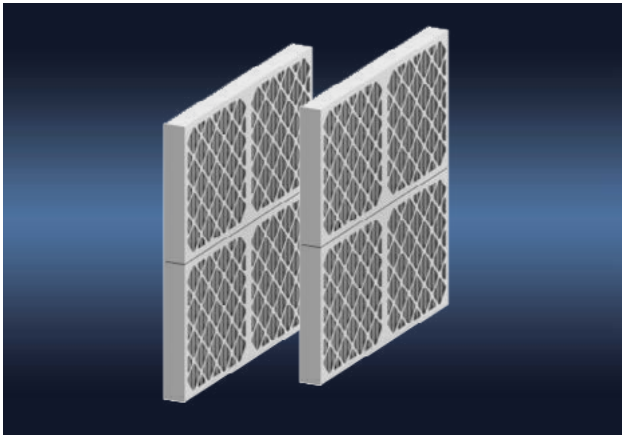
Used to remove ozone generated by the UV-C lamps to <0.06 ppm. Rechargeable cells containing NFX grade carbon granules.

#### 7 - Fan Section

The fan is optimised for a very compact construction design. It utilises an IEC-three phase motor with a PTC for fail-safe operation.

#### 8 - Control and monitoring systems

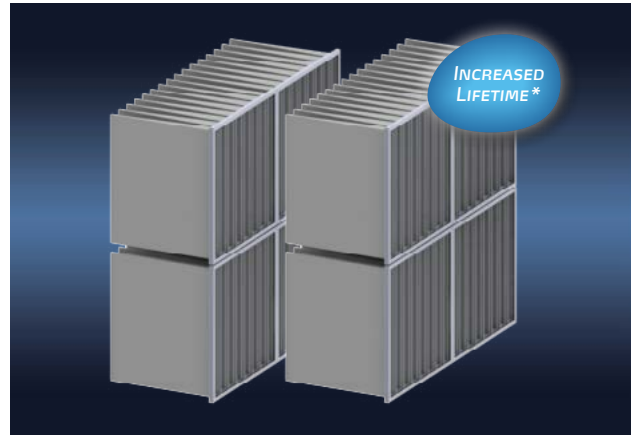
The Pollustop units, whatever their configuration, are controlled with the new Halton Foodservice Control Platform. It allows constant monitoring of the filter pressure losses, the running of the fan at a constant exhaust airflow rate and the safe management of the UV lamps.



### First filtration stage: Disposable panel filters

- Halton pleated filter G4 (EU4)
- Purpose: remove large particulate
- Efficiency > 95% (efficient for 5 microns and above)

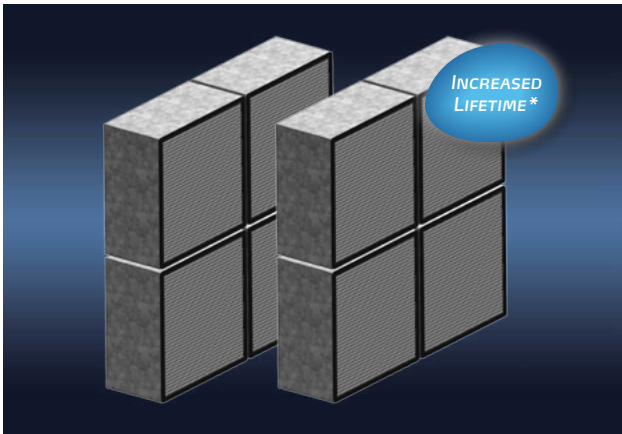
Replacement frequency assumes high efficient KSA cyclonic filters are used in the hoods or in the ventilated ceilings as primary filters. Regular replacement helps to support the longevity of the disposable bag filter.



### Second filtration stage: Disposable bag filters

- Halton bag filter F8 (EU8)
- Purpose: remove medium-sized particulate
- Efficiency >95% (efficient for 0.4 microns and above)

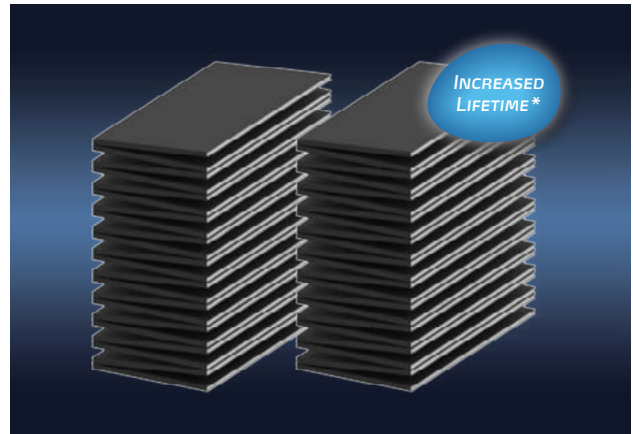
Replacement frequency assumes high efficient KSA cyclonic filters are used in the hoods or in the ventilated ceilings as primary filters and panel filters are replaced when dirty.



### Third filtration stage: Absolute filters

- Halton absolute filter HEPA H11 (EU11)
- Purpose: removal of ultra-fine smoke particles
- Efficiency > 95% DOP (efficient for 0,3 µm)

Replacement frequency assumes high efficient KSA cyclonic filters are used in the hoods or in the ventilated ceilings as primary filters and that panel & bag filters are replaced when dirty.

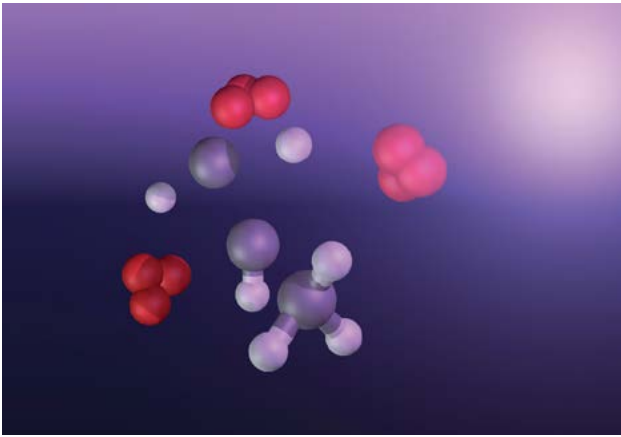


### Fourth filtration stage: Activated carbon filters

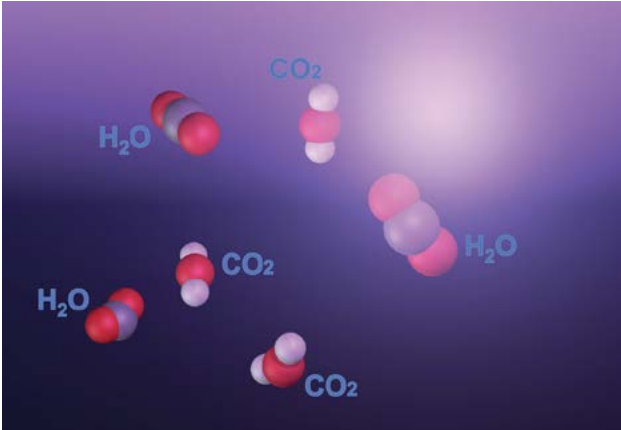
- Always combined with UV-C Capture Ray™ technology
- Halton activated carbon (NFX grade)
- Goal: removal of surplus ozone generated by UV-C lamps

Replacement frequency assumes high efficient KSA cyclonic filters are used in the hoods or in the ventilated ceilings as primary filters and the strict respect of the other filters replacement frequency. Potassium permanganate granules in one "colour cell indicator" turn from pink to white when cells have to be replaced.

\* Increased lifetime due to the Capture Ray™ technology which neutralises grease and odours. Particle filters are less strained while carbon filters goal is to deal with ozone generated by UV lamps only. Contact our customer service for an estimation of the filters lifetime for your project.



Photolysis is photodecomposition which is a chemical breakdown of the grease molecules by photons.



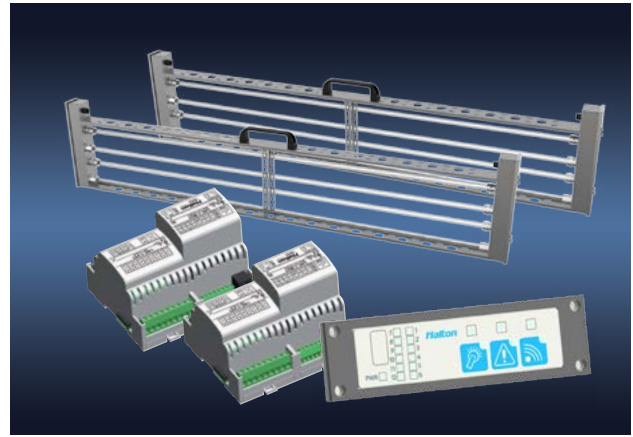
Ozonolysis is the oxidation of the Volatile Organic Compounds (VOC) and part of the odours by the ozone generated by the UV-C lamps.

### Capture Ray™ UV Grease Removal Technology

- Cleaning costs are reduced due to the absence of grease deposits after the UV modules
- Lifetime of Pollustop filters is significantly increased
- Heat recovery feasibility, efficiency and payback time are improved due to lower maintenance needs
- Drastically reduces odours in exhausted air

The UV neutralization operates through two simultaneous actions. The Photolysis is the direct effect of the UV-C radiation (light). Photolysis works by photodecomposition which is the chemical breakdown of the grease molecules by photons.

The parallel action to Photolysis is Ozonolysis; This is the oxidation of grease molecules and airborne cooking odours by Ozone that is generated by the lamps. As Ozone is a gas it is carried with the air flow. Depending of the location of the UV module, the oxidation is therefore present in the ductwork as well as the UV chamber.



PST/1306/UK

### Integration of UV lamps and UV control system

- Capture Ray™ Ultraviolet cassette with complete controls and safety features
- Compact size with increased performance, removes the need for a remote control cabinet
- Plug and Play CE-certified control system, part of Halton Foodservice Control Platform

The UV control module of Halton Foodservice Control Platform (FCP) displays the status of the UV units (whether they are integrated in the Pollustop or directly in the hoods). It relays any faults within the system.

Warning messages include the following;

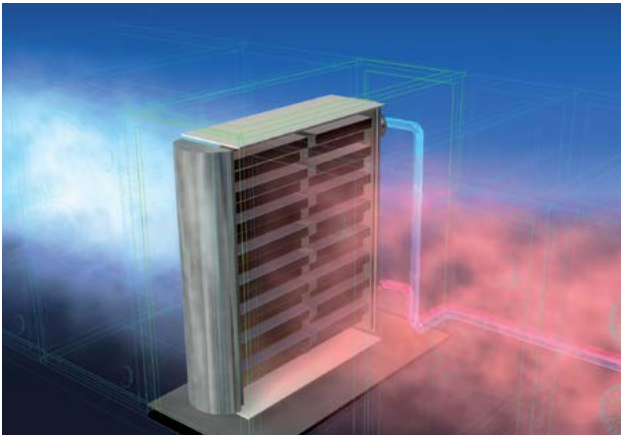
- UV lamps life time exceeded
- Ballast fault
- Low pressure alarm (or airflow)
- Grease filter(s) removed (when UV are integrated in the hoods or ventilated ceilings exhaust plenums)
- Communication error between units.

For improved maintenance the UV system can be accessed with a PC or a notebook. Accessible information includes;

- Live air volume & pressure
- Actual UV working hours for individual ballasts.
- Access to reset working hours for replaced lamps.

Additional add-on modules /features.

- SMS/GSM modem for remote maintenance.
- BMS (Building Management System) connectivity.
- External input, such as fire alarm & remote shut-down.



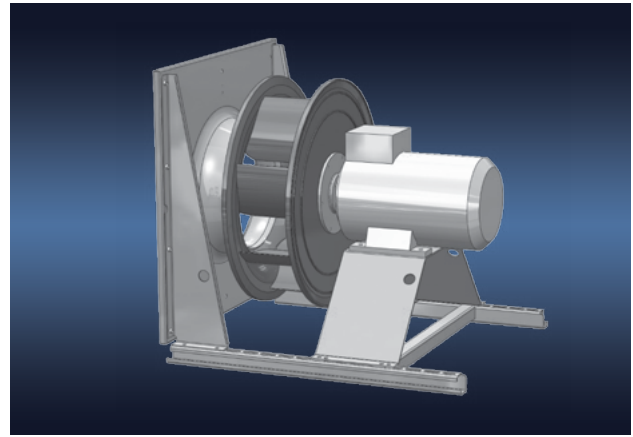
### Heat recovery section

- Reduces the energy consumption required to heat the supply air to the kitchen or the hot water
- Heat recovery feasibility, efficiency and payback time are improved due to the grease removal UV technology
- Contributes towards achievement of green certification standards (like LEED or local thermic regulations)

The Capture Ray™ technology, whether integrated in the PST unit or in the hoods/ventilated ceilings, neutralises the grease vapour and particles contained in the exhausted air. It prevents grease buildup on the fins of the heat recovery coil. The recovery efficiency is then kept to its maximum level whilst simultaneously reducing the coil's cleaning costs down to the lowest possible level. Heat recovery benefits are sustainable through time.

The Pollustop recovery unit is based on a high efficiency Runaround Coil System (copper tube/aluminium fins, 4 to 6 rows). The coil can be piped to serve a matching coil in the supply-air system. It is possible to recover up to 175 kW on a PST07 unit with an average temperature of 30°C for the exhausted air.

For even more efficiency, the coil can be piped to a tank for pre-heating the incoming domestic hot water service in the kitchen – Typically, with a 6 to 9°C temperature rise.



PST/1306/UK

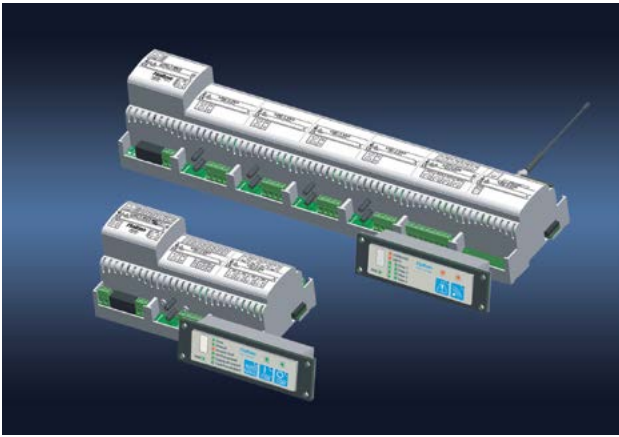
### Fan section

- Impeller with 7 backward curved blades from 225 to 1120 mm diameter
- Light weight composite impeller, offering greater efficiency compared to other powder coated steel impellers
- The rotating diffuser provides high efficiency and excellent acoustic performance

A full range of high efficiency direct drive fans allows management of, depending on the PST configurations, up to 2000 Pa pressure loss for up to 29160 m<sup>3</sup>/h airflow rate (free blowing).

The fans are optimised for a very compact construction design. They utilise three phase motor whose efficiency is rated by IEC (International Electrical Commission). They are equipped with a thermic protection for fail-safe operation and with integrated pressure port for a reliable exhaust airflow rate measurement.

Every fan section is equipped with a VFD of Danfoss type (other VFDs on request), with a safety switch and a control cabinet all pre-wired from factory.



### Fan control and filter pressure losses monitoring

- Unique control system for filter monitoring and the regulation of the exhaust/supply fans
- Compact size with increased performance. Removes the need for a remote control cabinet
- Plug and Play CE-certified control system, part of Halton Foodservice Control Platform (FCP)

**The filter control module** determines in real time the pressure loss level of each of the filters. It warns the user when one or several filters are missing or when the filters reach the “Dirty” or “Overload” status and need to be replaced. As an option, the fan can be switched off when the filters reach the “Overload” status to protect the fan or avoid any overpressure inside the kitchen (due to a deviation of the balance between exhaust and supply).

**The fan control module** adjusts the speed of the fan to compensate for pressure loss as the filter becomes dirty. The exhaust airflow can then be kept constant, avoiding any unbalance between exhaust and supply air.

For improved maintenance the fan and filter control systems can be accessed with a PC or a notebook.

Additional add-on modules /features.

- **Coming soon:** compatibility with M.A.R.V.E.L. Demand Controlled Ventilation system (variable exhaust airflow rate depending on the cooking appliances activity and whatever the filter pressure loss).
- SMS/GSM modem for remote maintenance.
- BMS (Building Management System) connectivity.



PST/1306/UK

### LCD Touch Screen (Optional universal user interface)

- Totally intuitive visual user interface for optimum ease of use
- Allows the system to be used by the kitchen staff without specific training
- Make the commissioning settings easier and faster
- Universal conception to manage all technologies of Halton's High Performance Kitchen (HPK) concept separately or at the same time

Halton's LCD Touch Screen has been developed for high ease of use by the staff, as well as during the installation and commissioning of the system by the contractor. It integrates the following functions:

- Configuration of the PST unit with the different kind of filters selected and the number of UV-C racks used if applicable;
- Representation of the products with clear drawings allowing the potential alarms to be placed where they occur and statuses to be explicitly displayed;
- Access and modification of all the settings without PC for a faster commissioning (with an access control);
- Possibility to manage easily additional functions provided by auxiliary modules to adapt the system to specific requirements (e.g. analog outputs or GSM module).

The LCD Touch Screen is fully compatible with all the other Halton technologies which can be combined with the PST Pollustop units:

- Capture Ray™ technology (for hoods or ceilings);
- M.A.R.V.E.L. Demand Controlled Ventilation system;
- KGS duct safety system;
- Water Wash or Water Mist technology.

# PST units controls are part of the Halton Foodservice Control Platform (FCP)

Halton's Foodservice Control Platform (FCP) has been developed to handle and manage all the innovative solutions of Halton's High Performance Kitchen (HPK) concept. Whatever the type and number of technologies installed in one kitchen, they can all be managed at the same time by this unique control system. The standard user interface of every technology is then replaced by a unique one: Halton's Touch Screen.

Halton's Touch Screen is not only able to handle several technologies at the same time, it constitutes also a powerful communication gateway. It can manage GSM functions, being controlled remotely by a distant computer or even feed Halton F.O.R.M. (Facilities Optimization and Resource Management) system with detailed information. F.O.R.M. system is then able to provide a real time global status of the equipment, energy efficiency analysis or maintenance planning tools.

## Halton FCP's Touch Screen (option): an intuitive and fully communicative interface

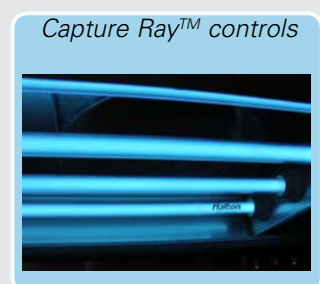
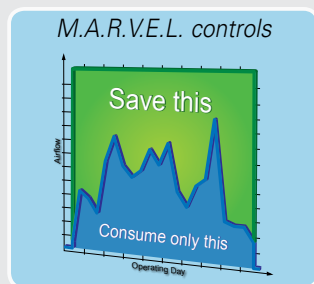
Halton F.O.R.M. \* system



Distant connection



GSM alerts



\* Facilities Optimization and Resource Management



### Hygiene, safety and maintenance

- Components are easy to access and clean
- Maximum hygiene and maintenance

The Capture Ray™ technology avoids any non hygienic and non safe long-standing grease or condensate deposits in the exhaust ductwork and around its discharge point. When UV lamps are shared between the hoods/ventilated ceilings and the PST unit itself, grease buildup is drastically reduced in the whole exhaust ductwork providing the highest hygiene and safety.

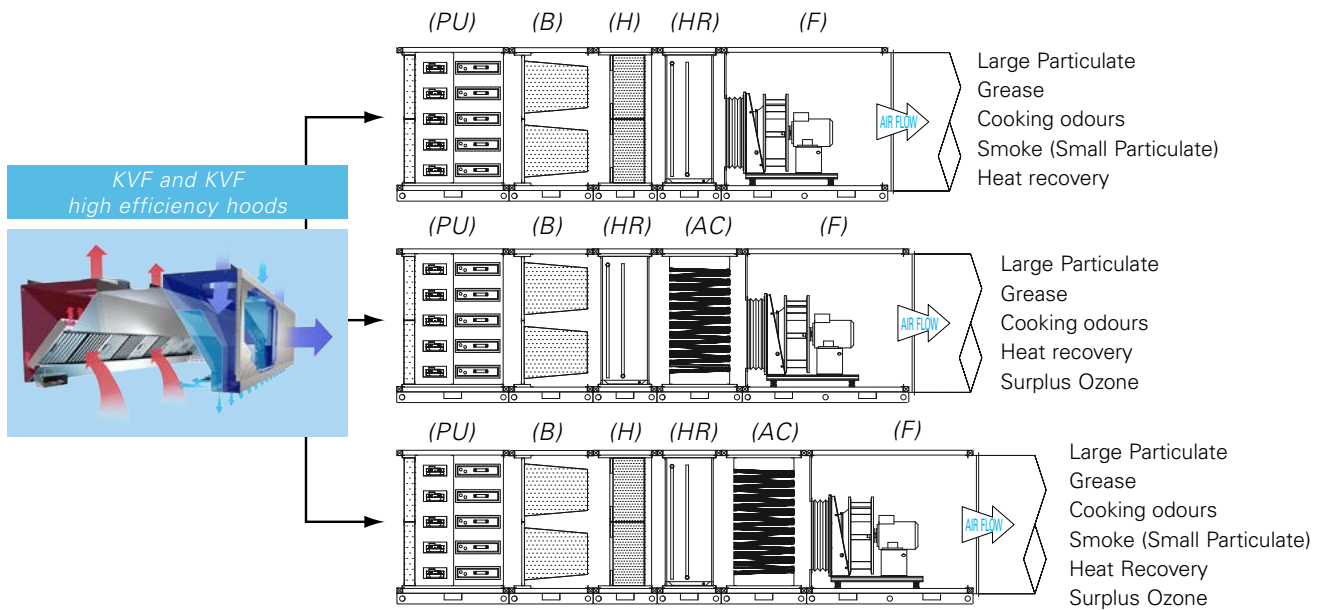
In addition, the Pollustop units are designed to make the access and replacement of the filters as well as the cleaning of the inner parts easier. Due to the controllers, which belong to the Halton Foodservice Control Platform, users or remotely based maintenance operators can be automatically warned when any filters need replacing.

Depending on local regulations, the PST units can be equipped with a by pass to get around the filters in case of fire.

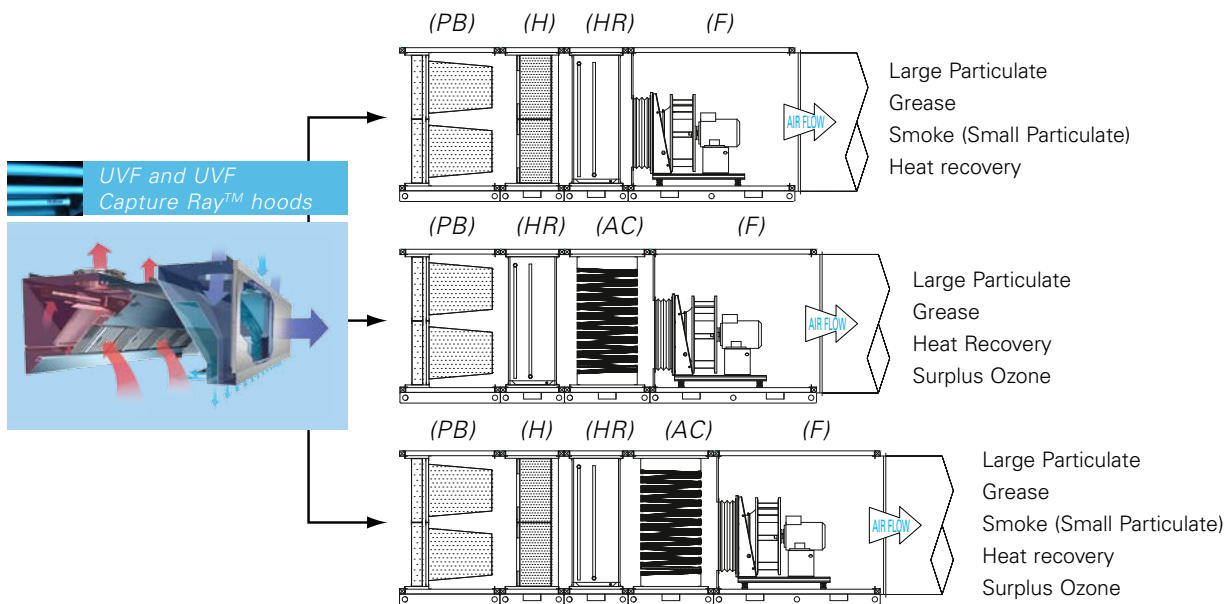
All of these features bestow upon the Pollustop units some of the highest possible levels of hygiene, safety and ease of use.



**TYPICAL POLLUSTOP CONFIGURATIONS (when UV integrated in the PST unit)**



**RECOMMENDED POLLUSTOP CONFIGURATIONS (when UV integrated in the hoods or ventilated ceiling)**



**TYPICAL POLLUSTOP CONFIGURATIONS (when UV integrated in both the PST unit and the exhaust device)**

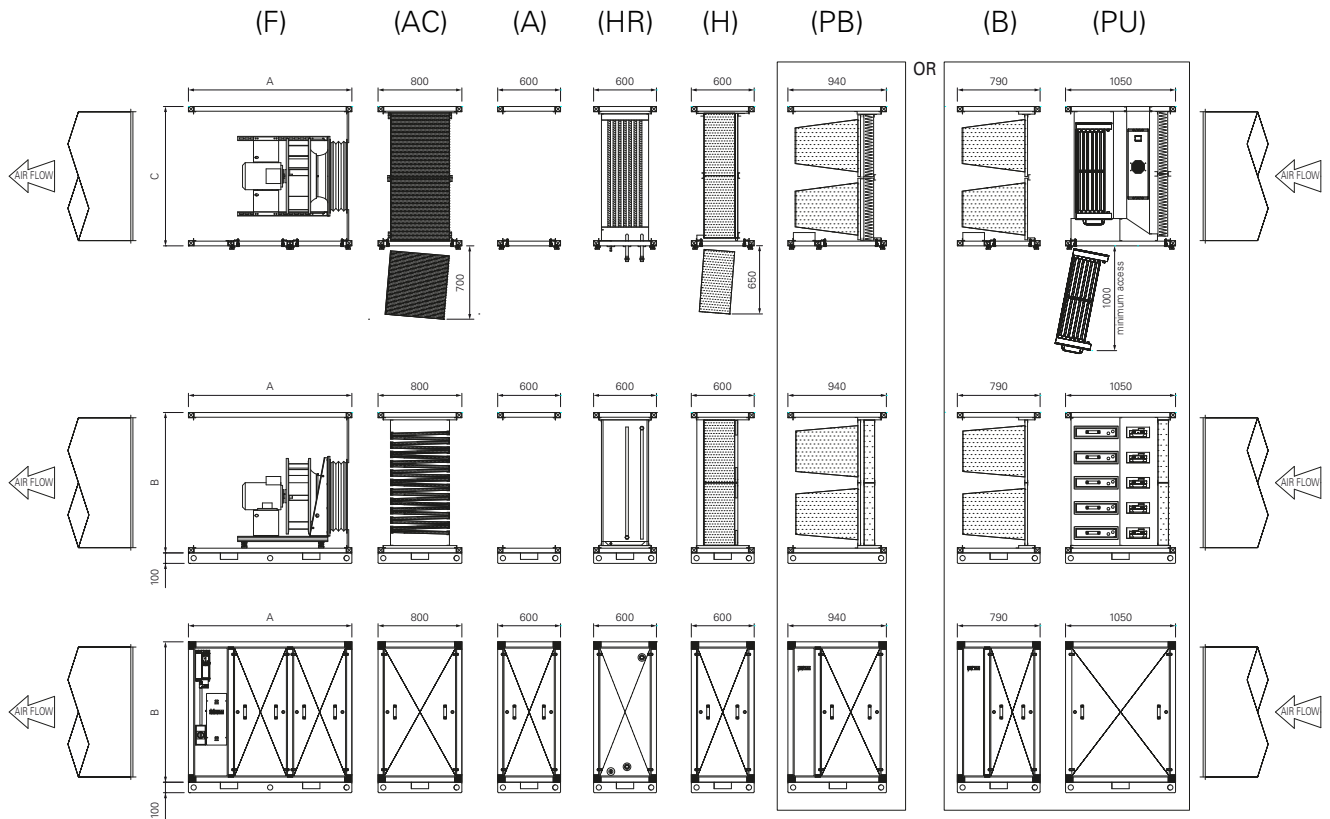
These configurations are used when the space available in the hoods (mainly) or ventilated ceiling(s) does not allow to fit the number of UV lamps required for an optimal odour suppression and when there's a demand for radical limitation of the grease deposits in the whole exhaust ductwork. Carbon filters are necessary in such configurations. The rest of the principles above are applicable.

### RANGE AND GENERAL DIMENSIONS

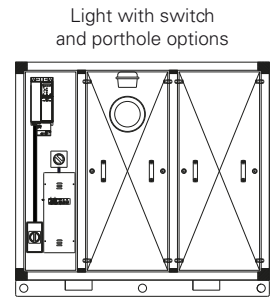
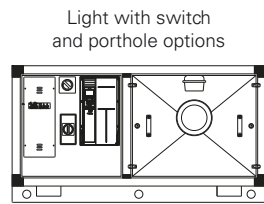
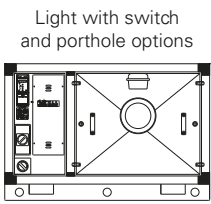
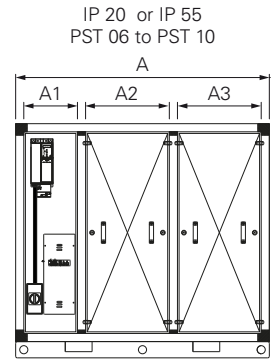
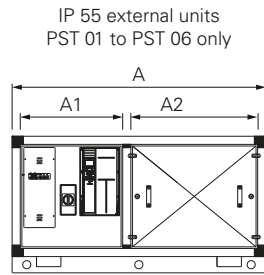
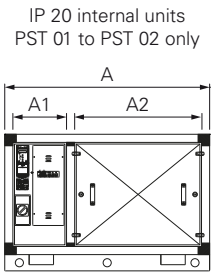
Unit size	PST 01	PST 02	PST 03	PST 04	PST 05	PST 06	PST 07	PST 08	PST 09	PST 10
Nominal airflow [m <sup>3</sup> /s]	0,9	1,8	2,7	3,6	4,5	5,4	6,3	7,2	8,1	9,0
Nominal airflow [m <sup>3</sup> /h]	3240	6480	9720	12960	16200	19440	22680	25920	29160	32400

Panel & Bag Filter Module	(PB 01 to 10)	Bag Module	(B 01 to 10)
HEPA Filter Module	(H 01 to 10)	Heat Recovery Module	(HR 01 to 10)
Activated Carbon Filter Module	(AC 01 to 10)	Extract Fan Module	(F 01 to 10)
Panel & UV-C Module	(PU 02 to 10)	Access Module	(A 01 to 10)

#### Dimensions of the modules



Dimensions of the fan section



Dimension table

Model	IP rating	A (mm)	A1 (mm)	A2 (mm)	A3 (mm)	B (mm)	C (mm)
PST 01	IP20	1248	318	780	-	740	730
PST 01 ext*	IP55	1560	630	780	-	740	730
PST 02	IP20	1260	330	780	-	740	1330
PST 02 ext*	IP55	1560	630	780	-	740	1330
PST 03	IP20 or 65	1560	330	515	515	1040	1330
PST 04	IP20 or 65	1560	330	515	515	1340	1330
PST 05	IP20 or 65	1560	330	515	515	1340	1630
PST 06	IP20 or 65	1560	330	515	515	1340	1930
PST 07	IP20 or 65	2060	330	765	765	1640	1930
PST 08	IP20 or 65	2060	330	765	765	1940	1930
PST 09	IP20 or 65	2060	330	765	765	1640	2570
PST 10	IP20 or 65	2060	330	765	765	1940	2570

\* Outdoor installation

**FILTER DATA AND ACOUSTIC INSULATION**

Filter data

Type	Grade	$\Delta P(Pa)$ clean..dirty..overload
40 % panel filter	EU4	55..125..150
95% bag filter	EU8	125..250..300
95% hepa filter	EU11	155..400..550
99% carbon filter	NFX	65..140..160

Acoustic insulation of the PST panels

Frequency (Hz)	63	125	250	500	1k	2k	4k	8k
SRI (dB)	17	19	32	39	43	44	45	44



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The company has a policy of continuous product development, therefore we reserve the right to modify design and specifications without notice. For more information, please contact your nearest Halton agency. To find it:  
[www.halton.com/locations](http://www.halton.com/locations)