UWF / UWF-OD / UWI / UWI-OD

Capture Jet™ hood combined with UV-C Capture Ray™ and Water Wash technologies
With (F) or without (I) makeup air on the front / UV On Demand option (OD) / M.A.R.V.E.L. compatible

New version

Improved hood's capture efficiency

The optional UV on Demand technology extends UV lamps lifetime

Halton Skyline LED Culinary light inside

UWF/I hoods are Halton's "all in one" solution, resulting in some unique benefits. It is a combination of the technologies and benefits of UVF/I and KWF/I hoods that make it one of the most efficient kitchen ventilation solutions.

It is suitable for LEED(1) projects and can be used in all closed, open or show kitchens particularly those with an intense level of activity (central kitchens, hotels, hospitals, etc).

The Capture Ray™ technology neutralises the grease carried by the exhausted air and also drastically reduces the odours emissions for the kitchen while the Water Wash automatically carries out the regular cleaning of the filters, with no outside intervention necessary.

UWF/I hood models are also equipped with the Capture Jet™ technology. UWF hoods are equipped with a low-velocity make up air on the front face.

- HACCP(2) certified.
- Considerable energy savings: 30 to 40% less exhaust airflow rates thanks to Capture Jet™ technology.
- Huge savings on maintenance and enhanced safety: Two-level filtering with highly-efficient KSA cyclonic filters (UL, NSF and LPS 1263 certified). Neutralisation of remaining grease particles and vapours due to the Capture Ray™ technology.
- No grease deposits in the exhaust plenum and ductwork. The Water Wash technology automatically cleans the filters with no staff intervention.
- Cleaning costs are reduced to the minimum possible level while hygiene and fire safety levels are at the highest.
- The Capture Ray™ technology also reduces drastically the odours emissions.
- UWF-OD UWI-OD - The UV On Demand option activates the lamps only when cooking appliances are actually used and saves up to one lamps set where other UV systems require two.
- UWF UWF-OD - Better capture and comfort due to a low-velocity diffuser built into the front face.
- Secure access to the UV-C lamps and CE-certified plug & play control system.
- Water Wash control cabinet with LCD touch screen (Halton Touch Screen) as an intuitive user interface.
- Halton Skyline LED culinary light provides the best visual comfort while contributing to further improve the safety and the energy savings.
- Other characteristics and benefits similar to UVF/I and KWF/I hoods.

(1) Leadership in Energy and Environmental Design
(2) Hazard Analysis Critical Control Point

Description of the main technologies

New version

Improved hood's capture efficiency

The optional UV on Demand technology extends UV lamps lifetime

Halton Skyline LED Culinary light inside

Capture Jet™ technology
Up to 40% reduction in airflow rates

Cyclonic filter (KSA)
95% efficient on 10 µm and above particles

UV-C Capture Ray™
Neutralises grease vapours and particles

UV On Demand
UV lamps activated only when needed (UWF-OD and UWI-OD)
Option

Hot Wash technology
Washes down the filters and plenum automatically

Halton Touch Screen (HTS)
Unique and intuitive LCD user interface for all systems

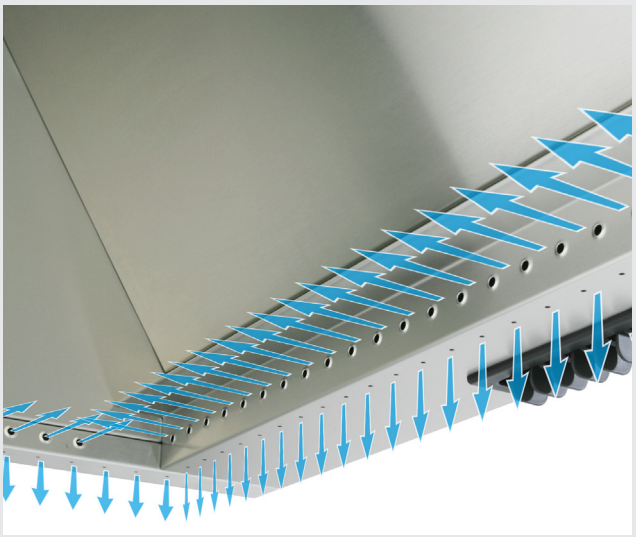
Halton Skyline (HCL)
Kitchen specific and LED based Culinary Light

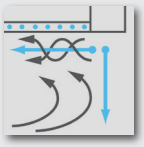
Integrated makeup air
Better smoke capture and comfort (UWF and UWF-OD)

Testing & Balancing (T.A.B.™)
Quick airflow rates measurement

UWF/I

Capture Jet™ hood combined with UV-C Capture Ray™ and Water Wash technologies
With (F) or without (I) makeup air on the front / UV On Demand option / M.A.R.V.E.L. compatible





Capture Jet™ technology

ENERGY EFFICIENCY

30 to 40% reduction in exhaust airflow rates.

INDOOR ENVIRONMENT QUALITY (IEQ)

The capture efficiency combined with reduced airflow rates improve the working conditions.

SAFETY

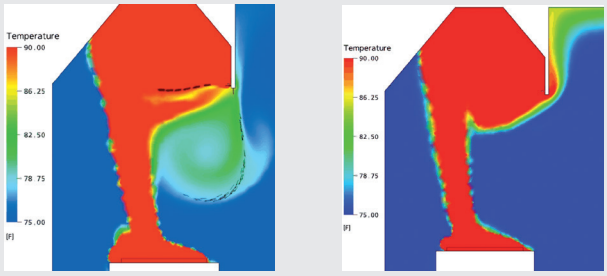
Cooking vapours are not dispersed and food safety is improved.

All hoods fitted with the constantly evolving Capture Jet™ technology (patented) bring about a 30 to 40% reduction of exhaust airflow rates compared to classic hoods.

The latest generation of the Capture Jet™ technology rests on the association of two sets of nozzles supplied with an extremely low supply air volume (a maximum of 30 m³/h/ml of hood). These nozzles fit to the lower part of the hood front as well as the sides, so as to literally encircle the covered cooking areas.

- The horizontal nozzles increase the driving speed to the lower part of the hood front thanks to the Venturi effect. They therefore push vapours back towards the filters.
- The vertical nozzles form a curtain of air that increases the hoods' containment volume, protects the capture zone from draughts and considerably minimises the dispersal of vapours. Thanks to these vertical nozzles, a hood installed at a height of 2 metres is as efficient as if it was installed at a height of 1.85 m or 1.90 m.

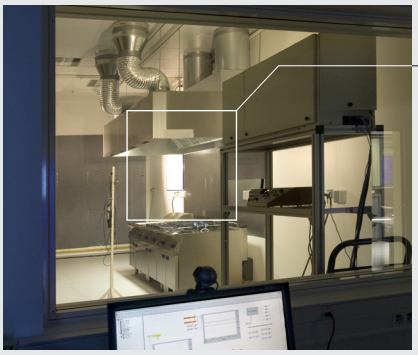
WITH Capture Jets | WITHOUT Capture Jets



Digital simulation on the efficiency of the Capture Jets thanks to the association of two sets of nozzles

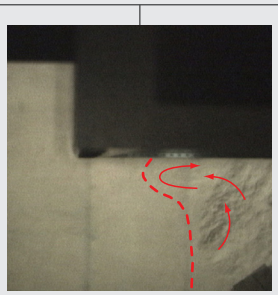
It is possible to bring the reduction of exhaust airflows to 64% by combining Capture Jet™ and M.A.R.V.E.L technologies.

1 Schlieren tests on a hood WITH and WITHOUT Capture Jets



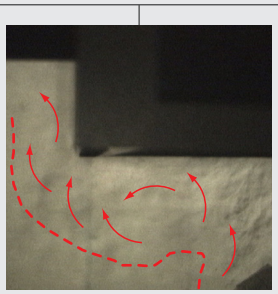
The Schlieren system shows the convective flows of cooking appliances so that the hoods' capture efficiency can be reliably and objectively measured.

WITH Capture Jets
3600 m³/h



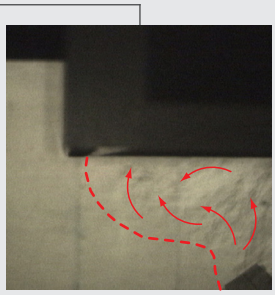
All vapours released by the appliances are captured and evacuated at a rate of 3600 m³/h.

WITHOUT Capture Jets
3600 m³/h



With this same rate of 3600 m³/h, a traditional hood without Capture Jets is inefficient.

WITHOUT Capture Jets
6000 m³/h



The airflow of a hood without Capture Jets must be 6000 m³/h in order to be considered efficient.

Highly-efficient KSA cyclonic filters

ENERGY EFFICIENCY

Reduces the energy used by fans, by minimising loss of pressure.

SAFETY

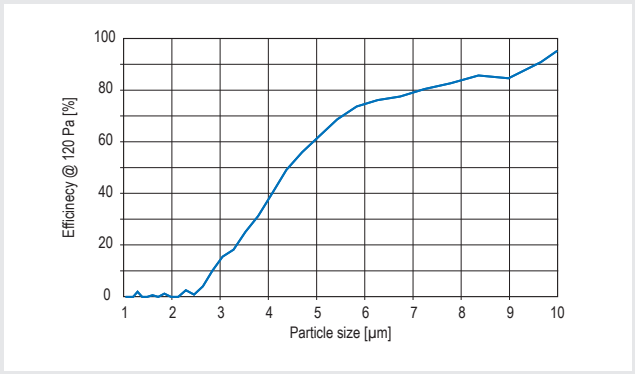
95% efficiency on 10 µm particles minimises build-up of grease deposits and improves fire safety and food safety.

KSA cyclonic filters are composed of vertical honeycomb sections. Opening only at the top and bottom, they are designed to force the air to swirl inside. The centrifugal effect is significant and, above all, continuous – especially in comparison to the action of traditional filters. Particles are thus thrown against the honeycomb walls with much higher force. KSA filters are **95% efficient on 10 µm particles**.

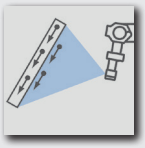
- Improved hygiene and fire safety thanks to less grease deposits in the exhaust plenums and ducts.
- Lower maintenance costs due to lower cleaning frequency.
- Improved noise levels thanks to limited pressure loss.
- A must for the use of UV-C Capture Ray™ technology.
- Unbeatable Efficiency/Pressure loss ratio.

KSA filters are accredited by the UL (Underwriter Laboratories) as flame-retardant and have NSF (National Sanitation Foundation) Hygienic and safety approval. They are fitted on all hoods and ventilated ceilings.

Schlieren tests on a KSA filter



Tests carried out by VTT according to VDI 2052 (part 1) "Ventilation Equipment for kitchens. Determination of Capture Efficiency of Aerosol Separators in Kitchen Exhaust"



Water Wash automatic cleaning technology

SAFETY

Improved hygiene and fire safety by automatic cleaning of the filters and the exhaust plenum.

ECONOMIC ADVANTAGE

Dispenses with the laborious job of dismantling / cleaning / reassembling the filters. Personnel entirely dedicated to preparing meals. Additional sets of filters are no longer necessary.

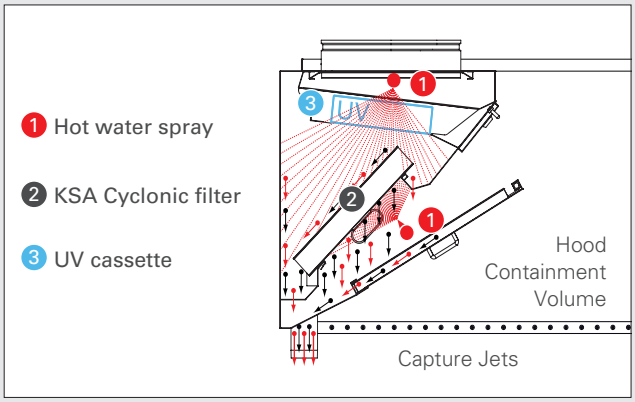
In large kitchens, filters may require to be cleaned once a week. Water Wash technology is designed to automatically carry out these regular cleaning operations, with no outside intervention necessary. It removes the laborious task of dismantling, cleaning and reassembling the filters.

If applicable, the Water Wash technology cleans also automatically the UV-C lamps used for the Capture Ray™ technology and which are also integrated in the exhaust plenum.

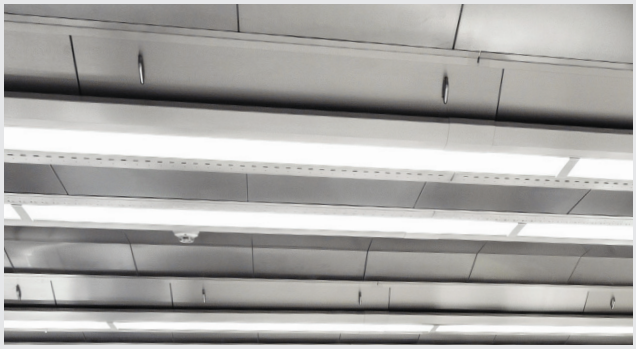
A traditional cleaning of the filters and, still if applicable, a manual cleaning of the UV-C lamps should be still carried out once a year, depending on the kitchen activity.

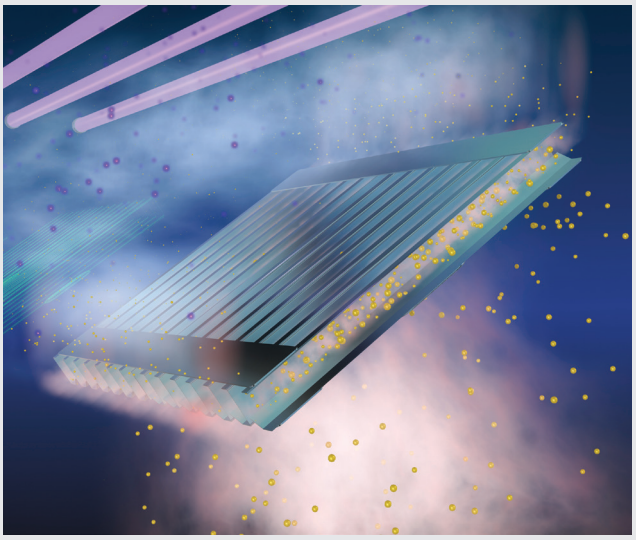
Users can devote themselves entirely to their core business: creating and preparing food on their menus. Additional sets of filters in large kitchens are no longer necessary. Return on investment is rapid due to considerably lower maintenance costs, particularly in kitchens with an intense level of use or where the regulation demands a very frequent cleaning of filters.

The water wash technology is available for both hoods and ventilated ceilings. The exhaust plenums are then watertight and closed. They are equipped with ramps that house spray nozzles, designed specifically to quickly and efficiently clean the filters and the plenum. Each ramp is connected to a control cabinet that has a Halton Touch Screen as a user interface. The cabinet's controllers are part of Halton's Foodservice Control Platform (see hereafter).



Cross-section of a hood exhaust plenum equipped with the Water Wash technology (filters and plenum spraying ramps).





UV-C Capture Ray™ technology

SAFETY

Minimises grease deposits in ducts. Improved hygiene and maximum fire safety.

CONTROLLED EMISSIONS

Odours are drastically reduced at the point of discharge.

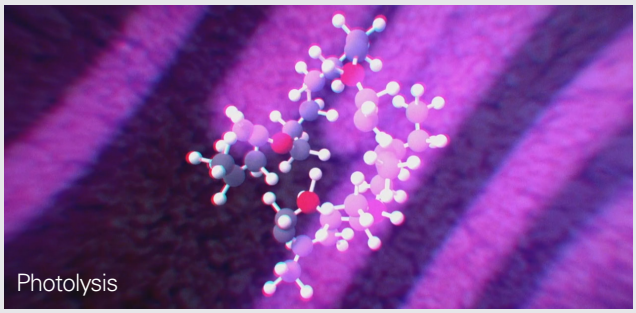
ECONOMIC ADVANTAGE

Significant maintenance savings. Facilitates heat recovery. Negates the need to discharge at roof level.

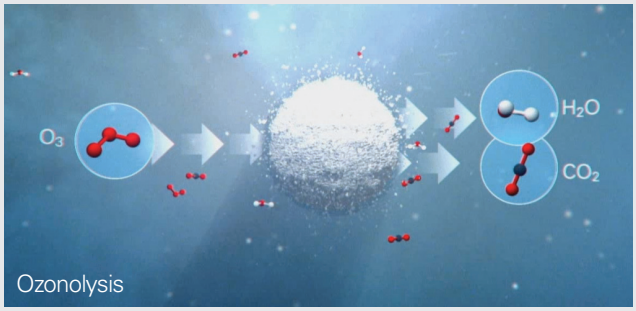
UV-C Capture Ray™ technology is designed to neutralise grease particles, grease vapours and organic compounds which are not retained by the primary filtering system, despite its efficiency. By increasing the number of UV-C lamps to a carefully determined level, the odours conveyed through the air become so weak that it may no longer even be necessary to discharge air at roof level.

Capture Ray™ technology is based on the use of UV-C lamps. Neutralisation of grease particles, grease vapours and odours depends on two simultaneous phenomena. Photolysis is the direct effect of UV-C radiation. It works by photodecomposition whereby grease molecules are broken down by photons. Ozonolysis is the oxidation of grease molecules by ozone that is generated by the lamps. As ozone is a gas, it is carried with the airflow. Oxidation therefore takes place in the exhaust plenum as well as in the ductwork.

- The ductwork is kept clean:
  - Cleaning operations may be less frequent;
  - Fire safety and hygiene of the ductwork are maintained;
- Grease carried by the air is brought to so low a level that it makes heat recovery constant and efficient over time with the lowest maintenance cost.
- The emission of odours at the point of discharge is controlled. The neighbourhood is respected.



Photolysis is photodecomposition whereby grease molecules are broken down chemically by photons.



Ozonolysis is the oxidation of volatile organic components (VOC) and some of the odours by ozone.

View inside an exhaust plenum fitted with UV-C lamps after several weeks of use.

On Off

« UV On Demand » technology

ECONOMIC ADVANTAGE

Up to 44% average reduction in UV lamps operational hours. Energy savings adds to the maintenance costs reduction.

CONTROLLED EMISSIONS

Odours are still drastically reduced at the point of discharge when cooking appliances are in use. When they are not, the levels of excess ozone are reduced where it is not practical to combine the UV Hoods with a Halton PolluStop.

Halton developed a technology that monitors, in real time, the cooking appliances activity, thus activating the UV lamps only when it is strictly required.

This technology is based on Halton's IRIS sensor (Infrared Radiation Index Sensor). Also used for M.A.R.V.E.L. Demand Controlled Ventilation system, it scans the surface of the cooking appliances to monitor, in real time, the cooking appliances activity. This enables activating the UV lamps accordingly i.e. only in cooking mode and not continuously, as soon as the fan is switched on.

This is a safe and responsible approach that saves on lot on the UV lamps lifetime, thus reducing the maintenance costs while also saving energy.

This option becomes standard when the hoods are equipped with M.A.R.V.E.L. technology.

One in two sets of UV-C lamps saved and 635€ electricity savings a year on only two hoods installed at Shake Shack restaurant, central London.

- The restaurant is equipped with two UV Capture Ray™ hoods (6 UV lamps each) and a PolluStop exhaust air handling unit. It opens 88 hours a week.
- The cooking block comprises two griddles, 2 fryers and a fry scuttle for a total electric power of 50 kW. The cooking appliances operate 92 hours a week. The UV lamps of a traditional system are on while the main fan is running – 92 hours per week too.
- Over 4 weeks monitoring, the UV on Demand technology reduced the number of operational hours of the lamps by an average of 44% (up to 50% depending on cooking appliances use). In other words, and compared to the maintenance cost of the traditional systems, it saves up to one UV lamps replacement out of two.
- The electricity consumption of the lamps was reduced by 47 kWh per week which represents 635€ a year (0,26€/kWh).

Halton Touch Screen (HTS)

SAFETY

Users can easily control ventilation equipment, thus reducing the risk of misuse or unwanted stoppages.

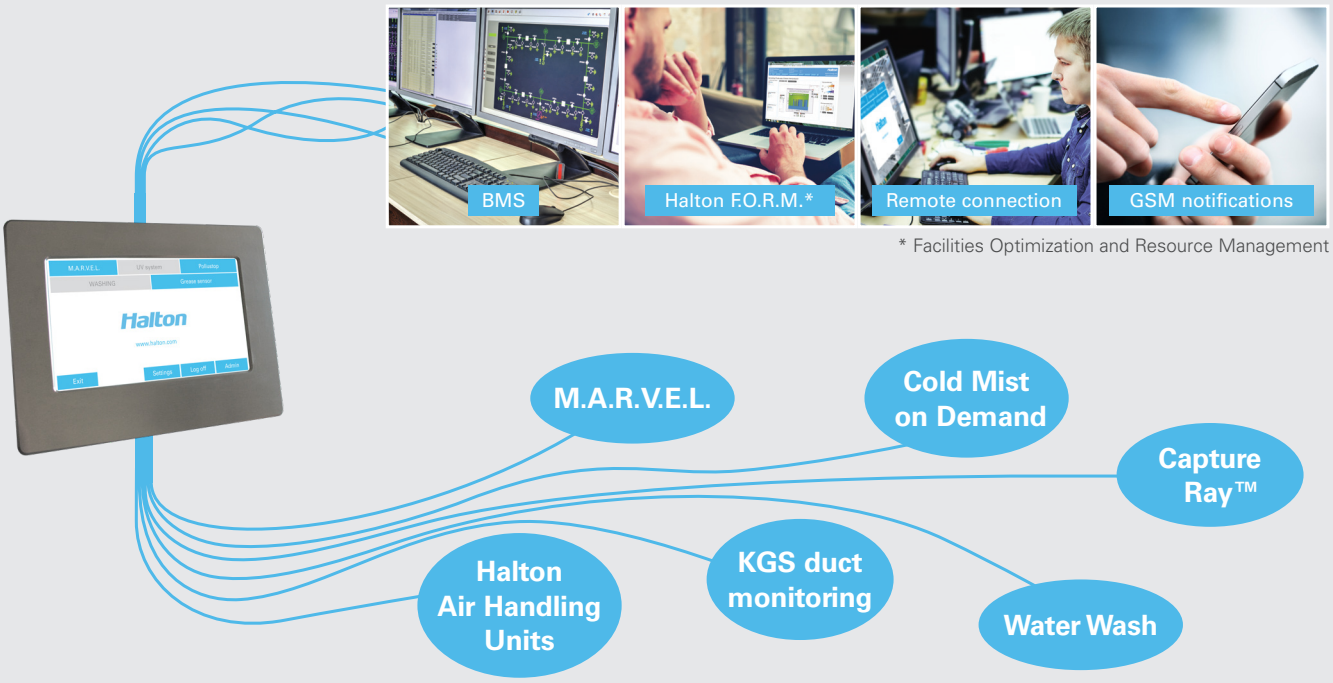
MAINTENANCE

Preventative or curative maintenance operations are easier to organise.

The Halton Touch Screen is part of the Foodservice Control Platform, designed by Halton for Halton products. Each component is designed for targeted functions in order to fully and simply meet the particular requirements of all the solutions of the Halton High Performance Kitchen concept.

- The Halton Touch Screen is based on the use of clear diagrams.
- Information or alarms can be explicitly positioned on products or informative screens.
- This makes information easy to read and interpret, even by personnel with little knowledge of ventilation systems.
- It makes commissioning of installations quicker and simpler.
- In the event of a fault, the cause is quicker to find and any preventative or curative maintenance operations are easier to organise.
- The Touch Screen can be monitored remotely. It can also supply the Halton F.O.R.M.* platform with detailed information on the working order of equipment.

Your Kitchen Ventilation at your fingertips!



* Facilities Optimization and Resource Management

UWF/I

Capture Jet™ hood combined with UV-C Capture Ray™ and Water Wash technologies
With (F) or without (I) makeup air on the front / UV On Demand option / M.A.R.V.E.L. compatible

Culinary and Human Centric Light (Halton Skyline)

INDOOR ENVIRONMENT QUALITY (IEQ)

Close to sunlight render and increased lighting levels for a better colour and texture render. Ideal working conditions.

SAFETY

The sensible areas of the kitchen benefit from a better light for a better safety and quality control.

ECONOMIC ADVANTAGE

Drastic energy savings leading to reduced payback times.

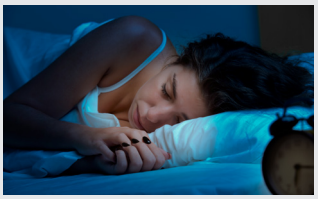
The impact of lighting in professional kitchens has often been regulated to simply satisfying illumination levels without regard for personnel wellbeing.

The link between good lighting, better working conditions and productivity, is now widely recognized. However, what often occurs when a kitchen benefits from excellent lighting levels, the staff is dazzled from reflected light. When dazzling does not occur, the kitchen typically suffers from a lack of illumination that is more harmful for the safety of the staff and hygiene of the kitchen.

Halton Skyline is the first LED based lighting technology specifically developed for professional kitchens. Everyone agrees the light it provides is simply the closest possible to natural light.

- Halton Skyline remarkably respects the food colour and texture from raw ingredients to plated presentation. The two spot models developed for Halton Skyline have respectively a CRI of 83 (@4000K) and 95 (@2800K).

- Halton Skyline provides the best visual comfort, without alteration over time and without dazzling the staff, thus also playing an active role in the kitchen safety. Among others, Halton Skyline's shielding angle is up to two times higher than DIN EN 12464-1[(1)] demand.



- Halton Skyline's Human Centric version is a biodynamic lighting centered on users needs. It creates daylight-similar sequences depending on the kitchen activity, further improving their working conditions and Wellbeing. You would think you were outside!

- A state of the art lighting technology that, at its core, saves significantly on energy and maintenance. With a luminous efficacy of 120 lm/W, Halton Skyline consumes up to 2,8 times less than fluorescent tubes.

Integrated low velocity makeup air

ENERGY EFFICIENCY

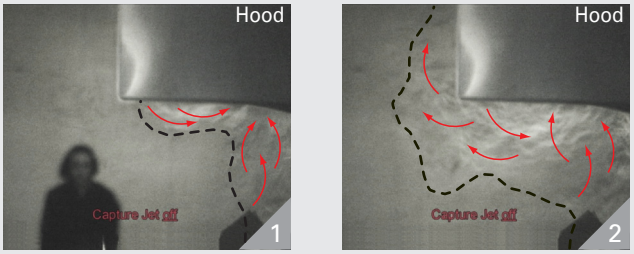
Contributes to the exhaust airflow rates reduction achieved thanks to the Capture Jet™ technology.

INDOOR ENVIRONMENT QUALITY (IEQ)

Better working conditions and productivity thanks to a better air quality, a draughts reduction, lower noise levels and a positive impact on the perceived temperature.

Draughts have to be declared public enemy number one.

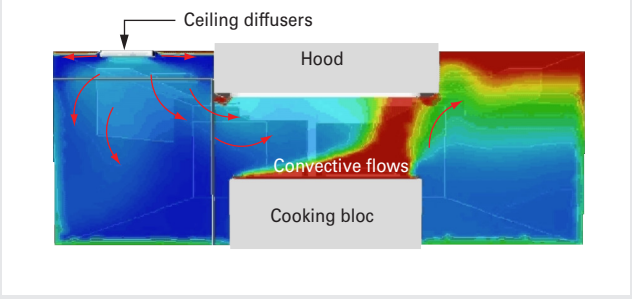
The heat and smoke generated by the cooking appliances are extremely dispersible. When they rise up toward a hood or a ventilated ceiling, they are left to their own and are hence very sensitive to draughts. At a point that the air displacement generated by one people walking close by is high enough to disperse them as shown below on a Schlieren test made on a hood which is not equipped with the Capture Jet™ technology.



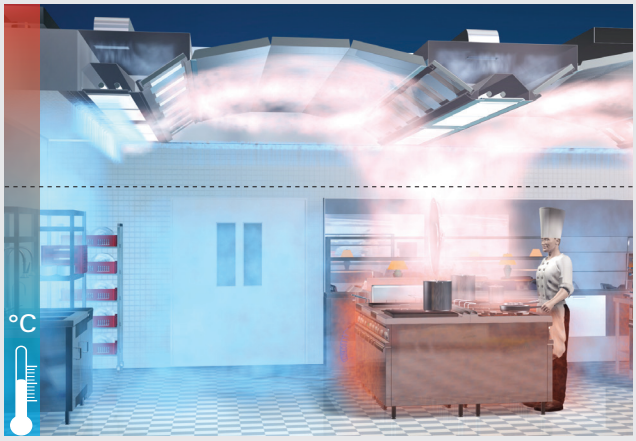
In situation of total Capture, a "user" goes along s standard hood at a normal pace (1). The draught generated is enough to disperse the thermal plumes and cause spillages (2).

"Mixing" diffusers are inadvisable.

In narrow spaces like professional kitchens, mixing diffusers indeed inevitably generate even stronger draughts, harmful for the staff comfort and for the efficiency of hoods and ventilated ceilings.



Low velocity makeup air from ceiling enhances both the kitchen ventilation efficiency and the comfort.

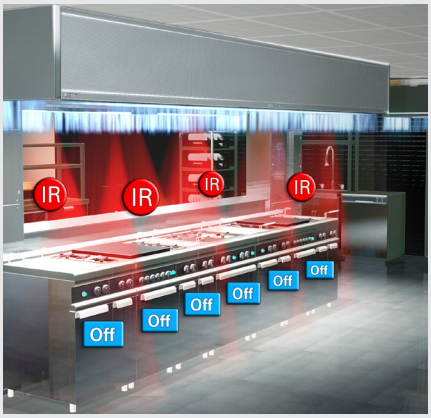


It enables the kitchen air to be renewed on the principle of air displacement. Fresh air naturally drops to low level and fills the working area from that level. The absence of flow turbulences prevents this fresh air from mixing with convective flows from the cooking equipment.

In addition, a comfort limit naturally appears in the kitchen's environment through stratification. Below this limit height i.e. above head level, air quality is optimal.

Low velocity makeup air from ceiling allows not only to improve the air quality inside the kitchen but also to improve the Capture and Containment efficiency of the Capture Jet™ hoods and ventilated ceilings. It leads to energy savings thanks to a reduction of the exhaust airflow rates.

Recommended combinations



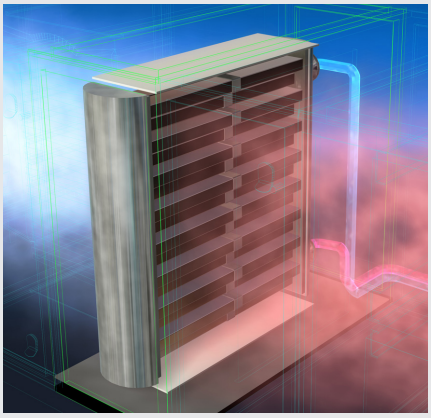
M.A.R.V.E.L. Demand Controlled Ventilation (MRV)

ENERGY EFFICIENCY

Up to 64% reduction in exhaust airflow rates in association with Capture Jets. Reduces drastically the cooling/heating energy consumption and the energy use of supply and extract fans.

INDOOR ENVIRONMENT QUALITY (IEQ)

Reduces noise and draughts through constantly modulating air flows to the correct level to evacuate all vapours.



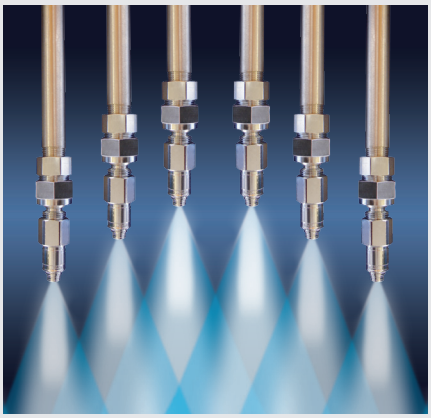
Halton exhaust and supply Air Handling Units with heat recovery

ENERGY EFFICIENCY

The drastic reduction of the grease quantity carried by air makes the heat recovery stable over time and really cost effective. Further increase your savings!

INDOOR & OUTDOOR ENVIRONMENT QUALITY

Benefit from the healthiest replacement air and establish your kitchen wherever you chose without fearing the neighbourhood complaints.



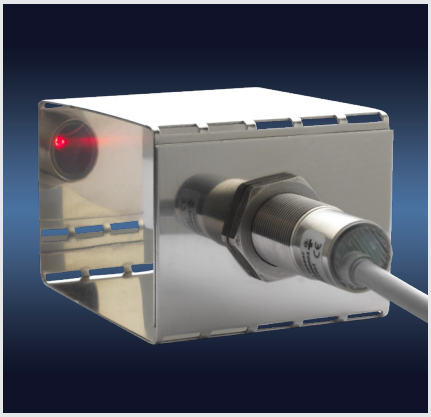
Built-in Fire Suppression System (FSS)

SAFETY

The kitchen and the rest of the building are protected by fires being extinguished at source. Plenums and exhaust connections are also protected from the spread of fire.

ECONOMIC ADVANTAGE

Integration of the system in the factory to provide better respect for products and to optimise costs.



Monitoring system of duct networks (KGS)

SAFETY

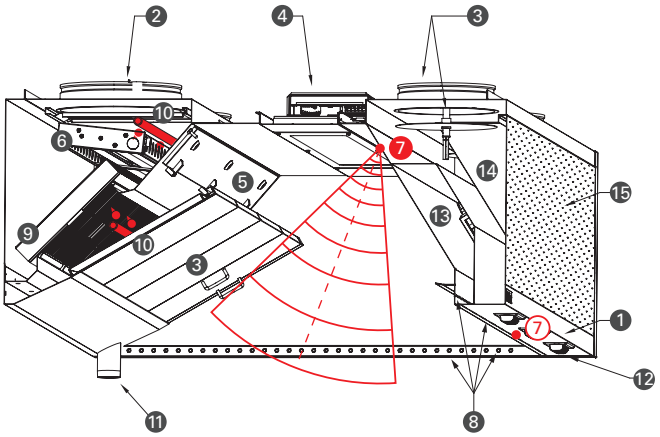
Efficient and cost-effective prevention tool for hygiene and fire safety due to the assessment of grease build-up in the ductwork.

ECONOMIC ADVANTAGE

Allows for cleaning of ducts only when really necessary and not in a programmed and often unnecessary way. Maximum safety at minimum cost.

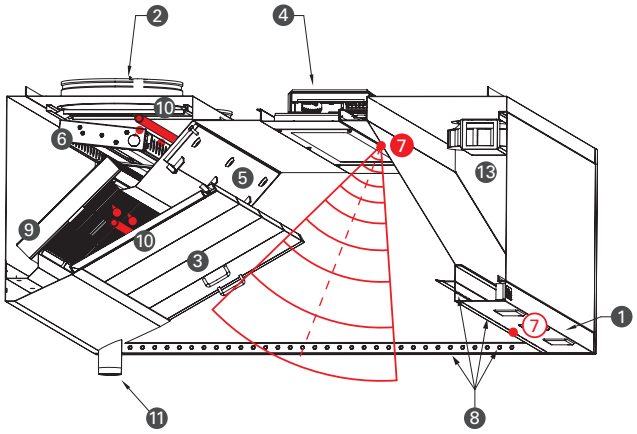
Technical descriptions

UWF UWF-OD



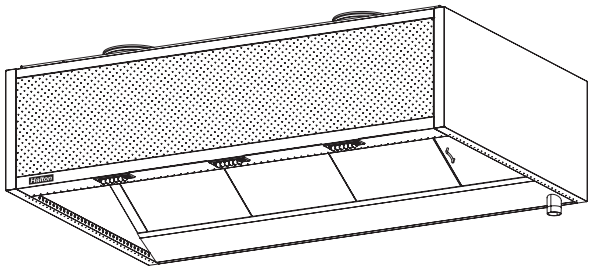
CODE	DESCRIPTION
1	Outer casing – visible parts in stainless steel AISI 304
2	Exhaust air connection and balancing damper
3	Supply air connection and balancing damper (type MSM)
4	Halton Skyline LED light fitting and controls
5	UV access door
6	UV lamps rack
7	Option IRIS sensor(s) (UV on Demand version only)
8	Capture Jet™ nozzles

UWI UWI-OD



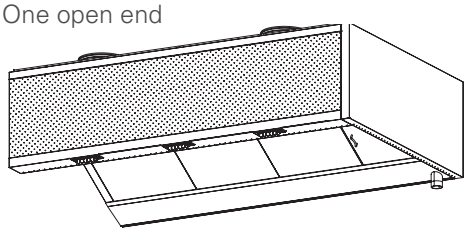
CODE	DESCRIPTION
9	KSA filters
10	Water wash technology spraying nozzles
11	Washing water drain pipe
12	Personal supply air nozzles
13	Capture Jet™ fan
14	Option Capture Jet™ fan air inlet plenum
15	Perforated front face

STANDALONE HOOD AND ASSEMBLY OF MODULAR SECTIONS

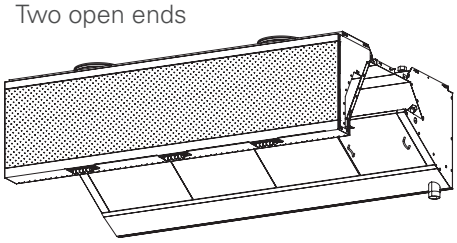


UWF & UWF-OD
Standalone hood

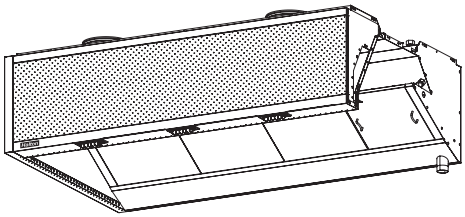
One open end

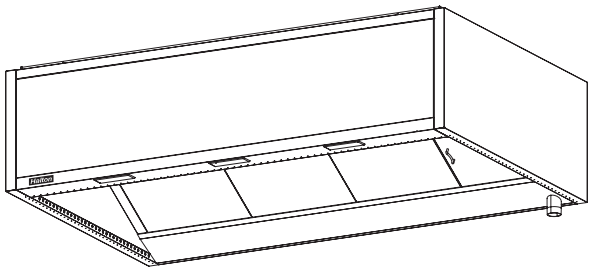


Two open ends



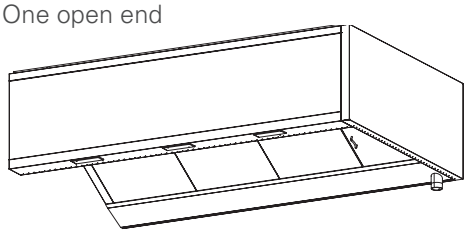
Assembly of modular sections
One open end



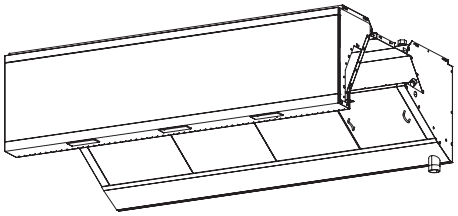


UWI & UWI-OD
Standalone hood

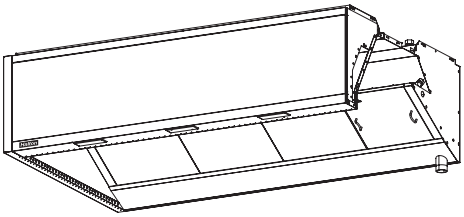
One open end



Two open ends



Assembly of modular sections
One open end



QUICK SELECTION DATA

L (section length)	L1 (active length)	Recommended Exhaust air volume(1)		Recommended make up air volume		Capture Jets air volume (with width = 1300)	
		l/s	m^3/h	H = 555	H = 400	l/s	m^3/h
1600	1500(2)	420 … 654	1515 … 2358	200 l/s or 720 m^3/h per linear meter of front face MSM 100% open ΔPst = 48 to 52 Pa	157 l/s or 565 m^3/h per linear meter of front face MSM 100% open ΔPst = 45 to 70 Pa	44	158
2100	2000	560 … 872	2020 … 3144			52	188
2600	2500	700 … 1090	2525 … 3930			61	218
5100	5000	1400 … 2180	5050 … 7860			102	368
7600	7500	2100 … 3270	7575 … 11790			144	518
10100	10000	2800 … 4360	10100 … 15720			186	668

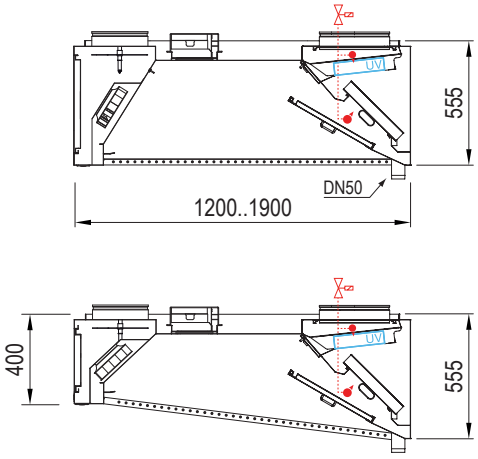
(1) Minimum at a T.A.B.™ reading of 59 Pa (505 m^3/h or 140 l/s per filter)... maximum at a T.A.B.™ reading of 144 Pa (786 m^3/h or 218 l/s per filter)
(2) Minimum active length for a small UV rack: 1300 mm. Minimum active length for a big UV rack: 2000 mm.

DIMENSIONS

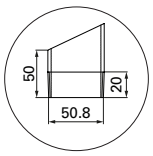
	Exhaust			Supply		Light
	1 Ø315	2 Ø315	3 Ø315	2Ø250	4Ø250	
L	M	N	M, N	O	P	Q
1600	L1/2	275	-	450	-	1020
2100	L1/2	275	-	450	500	1320
2600	-	275	L1/2, 550	450	500	1320
3100	-	275	L1/2, 550	450	500	1320

- Above 3000 mm active, hoods are an assembly of separate sections to make transportation and site handling easier.
- Number of exhaust and supply connections to be determined based on the sections length and on the calculation of the exhaust airflow rates depending on the cooking appliances. Rectangular connections on request.
- Other air supply possibilities for the Capture Jet™ fan on request.
- Hot and cold water inputs on the left side. Other location on request.

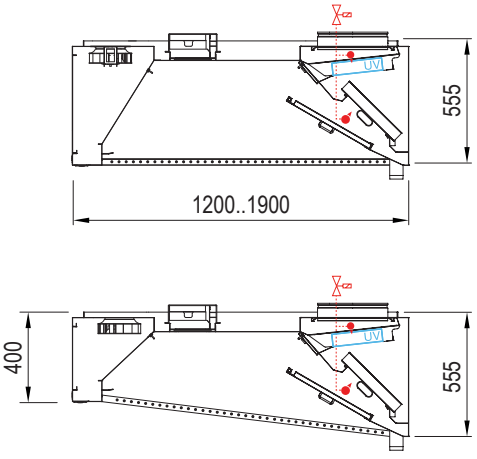
UWF UWF-OD

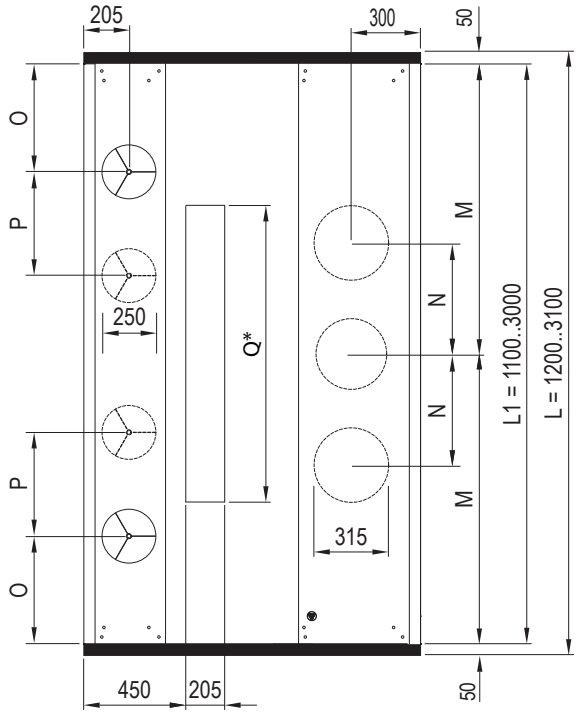


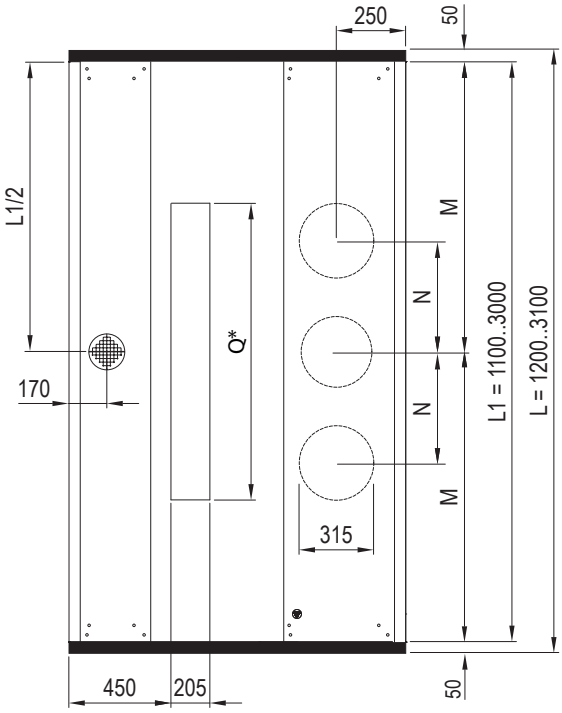
DN50 drain



UWI UWI-OD



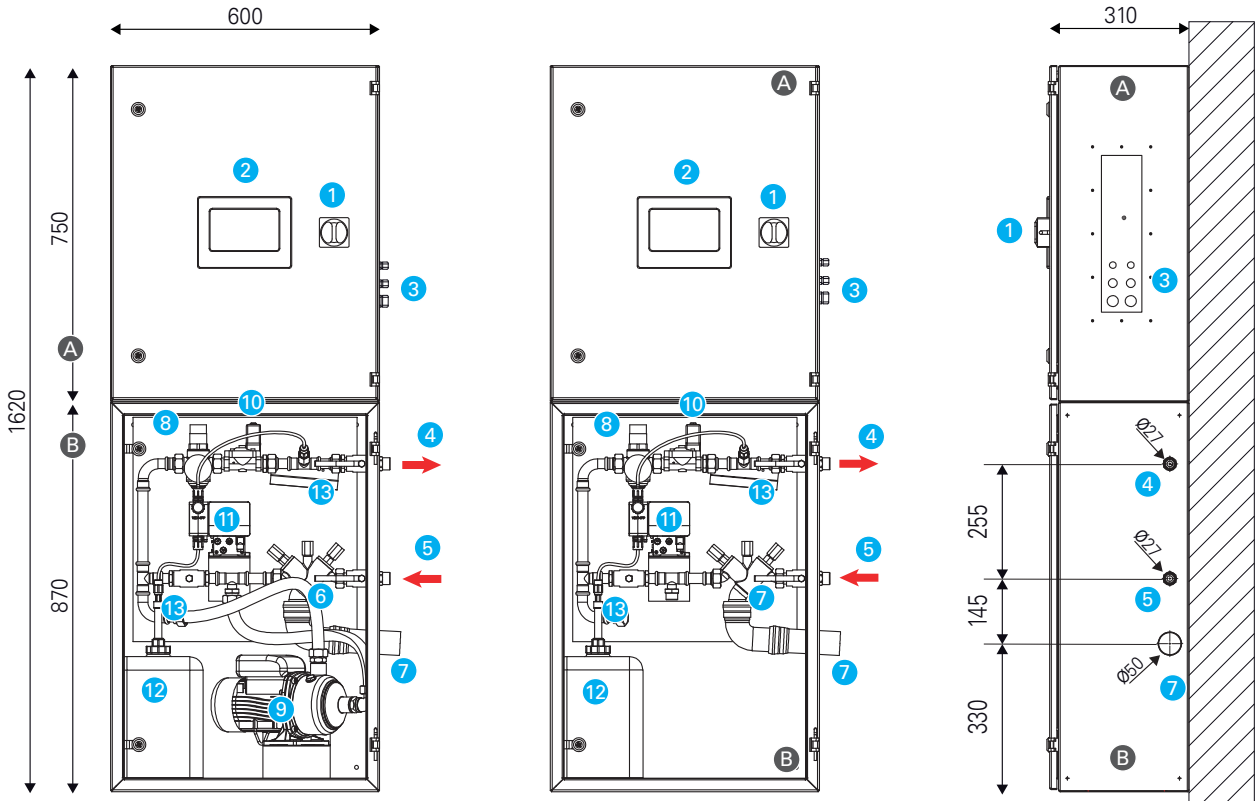




Notes

Dimensions and description of the CCW control cabinet

UWF UWF-OD UWI UWI-OD Hoods / Hot Wash on open schedule



Right handed door, inlets and outlets on request

The control cabinets comprise 2 separate compartments to segregate the hydraulic and electronic components and comply with safety regulations.

Ⓐ - Controls and electrical module

Ⓑ - Hydraulic module

Controls and electrical unit:

1 - Main switch

2 - User LCD touch screen (remote on option*)

3 - Compression glands (left-handed on request)

Hydraulic unit:

4 - Hot water outlet - DN 20 (20/27) threaded nipple

5 - Hot water inlet - DN 20 (20/27) threaded nipple

6 - Hot water backflow preventer

7 - Backflow preventer water outlet
Male PVC DN50 (46/50)

8 - Hot water pressure reducer

9 - Booster Pump and support (optional)

10 - "Washing" solenoid valve

11 - Detergent dosing pump

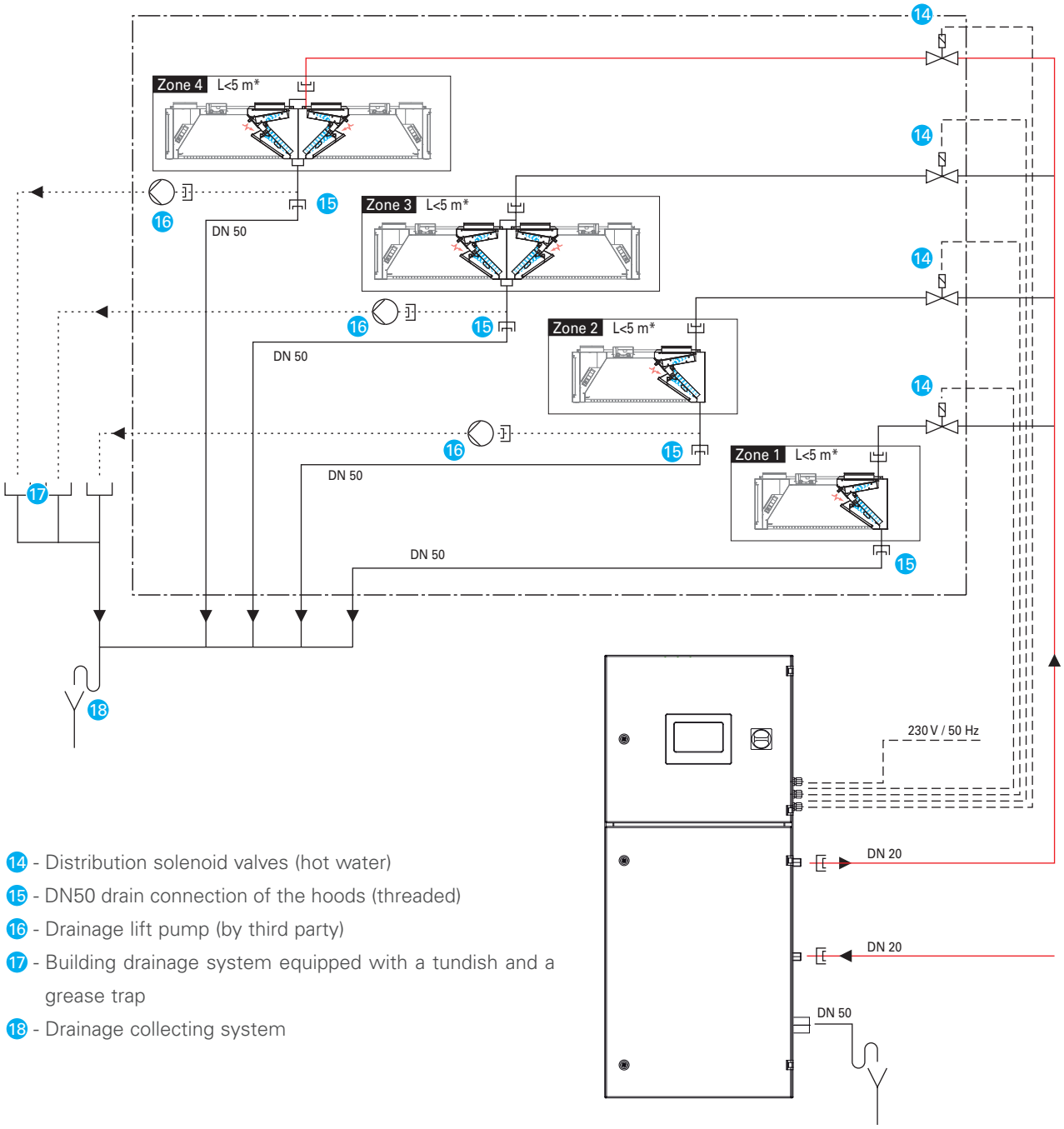
12 - Detergent tank

13 - Detergent level probe

General requirements (Hot Wash):

Inlet water temp. (Wash):	45 - 55°C
Pressure required:	3 bar at hood nozzles
Water flow (Wash):	15 l/mn/m @ 3 bar (1)
Cabinet pressure loss (Wash):	2.5 bar @ 45 l/mn
Power supply (max):	800 W @ 230 V / 50 Hz

(1) Flow for both KSA filters and UV lamps.



14 - Distribution solenoid valves (hot water)
15 - DN50 drain connection of the hoods (threaded)
16 - Drainage lift pump (by third party)
17 - Building drainage system equipped with a tundish and a grease trap
18 - Drainage collecting system

* The maximum exhaust plenum length refers to the Hot Wash circuit. It varies depending on the distance between the control cabinet and the last exhaust plenum served.

EXHAUST Pressure drop, sound data and airflow measurement

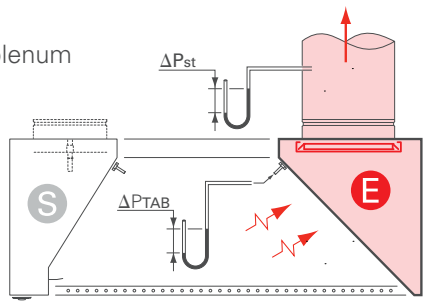
ΔP_{st} = Exhaust section static pressure loss

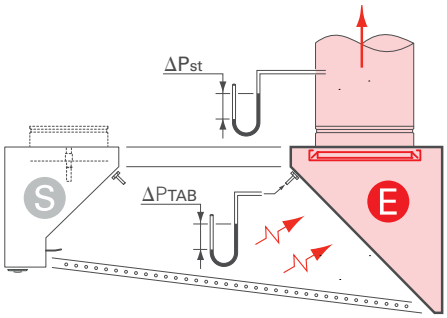
ΔP_{TAB} = T.A.B.™ pressure for airflow rate measurement

30,70,100 = Damper opening in %

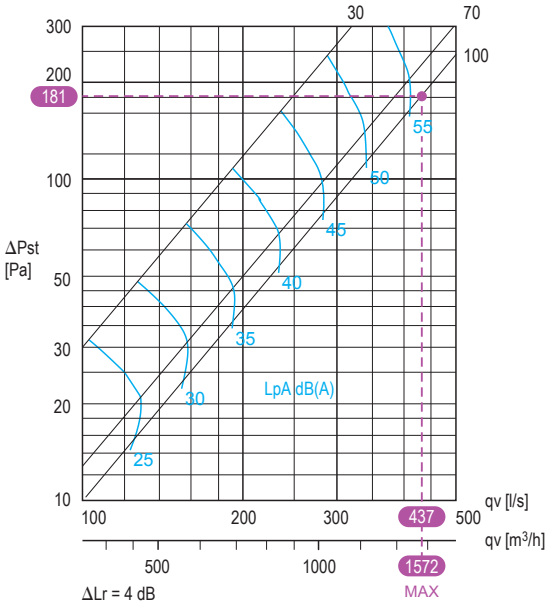
Exhaust plenum

H = 555

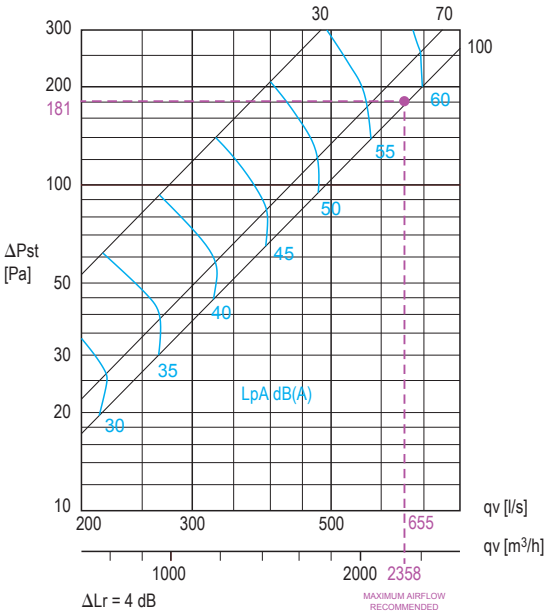




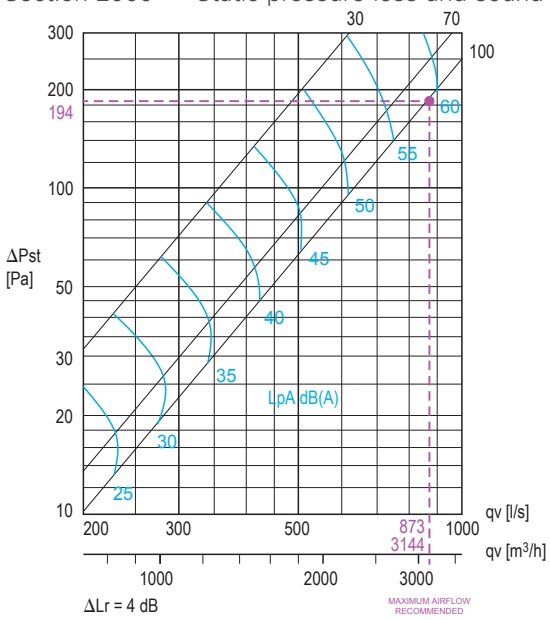
Section 1000 Static pressure loss and sound data



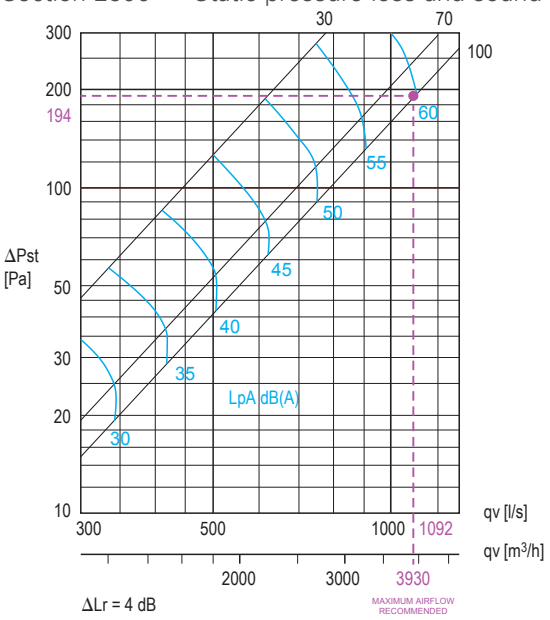
Section 1500 Static pressure loss and sound data

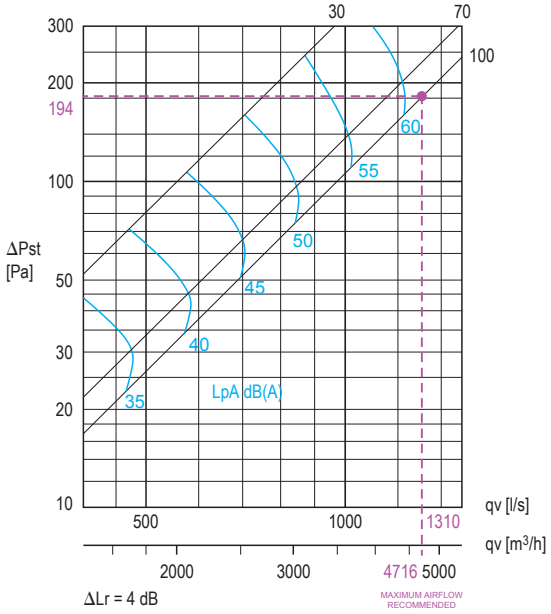


Section 2000 Static pressure loss and sound data



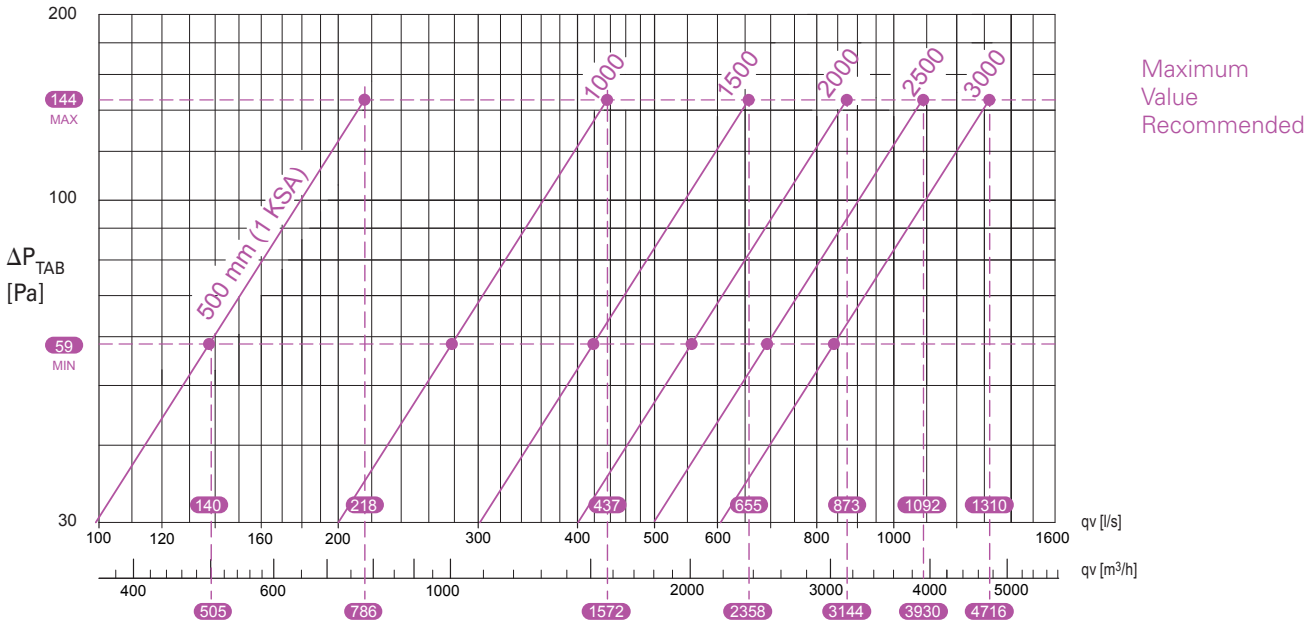
Section 2500 Static pressure loss and sound data





Exhaust airflow rate measurement with T.A.B.™ ports

Recommended pressure T.A.B.™ 59-144 Pa (@505 and 786 m³/h per filter)



Maximum
Value
Recommended

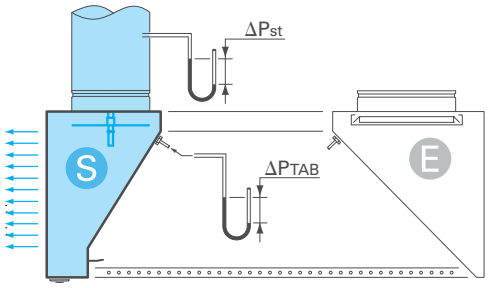
Exhaust airflow rate measurement using k factors

Number of KSA filters	k factor [m³/h]	k factor [l/s]
1	65,5	18,2
2	131	38,3
3	196,5	57,4
4	262	72,0
5	327,5	90,0
6	393	104,7

With the T.A.B.™ pressure measurement, it is also possible to check the exhaust airflow with the following formula:

$q_e = k \times \sqrt{\Delta P_{TAB}}$ [Pa]

SUPPLY Pressure drop, sound data and airflow measurement



Supply plenum

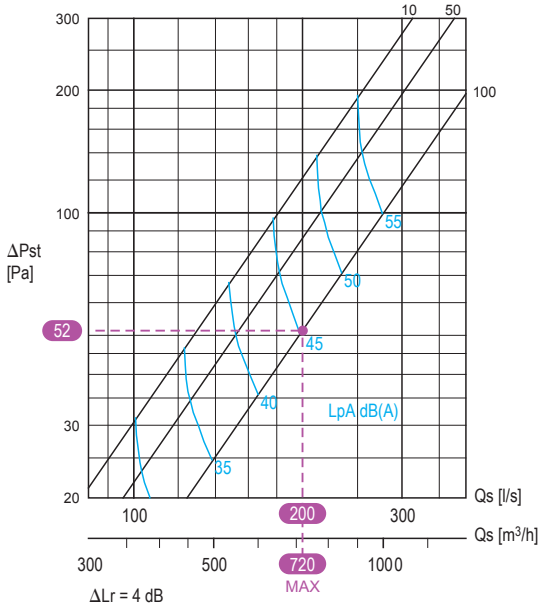
H=555

ΔP_{st} = Supply static pressure loss

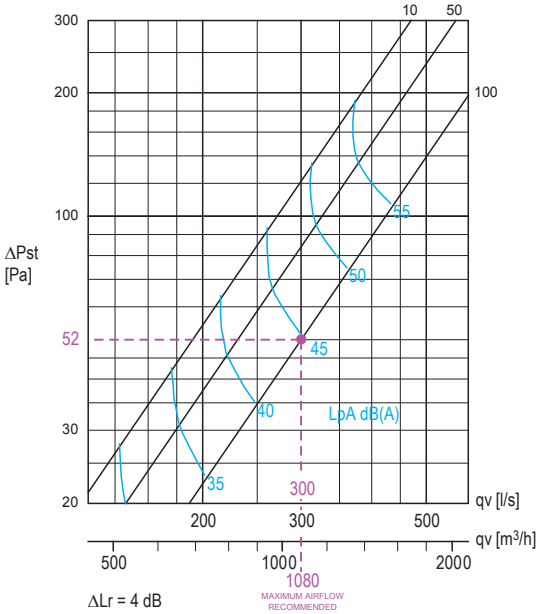
ΔP_{TAB} = T.A.B.™ pressure for airflow rate measurement

10,50,100 = MSM module opening in %

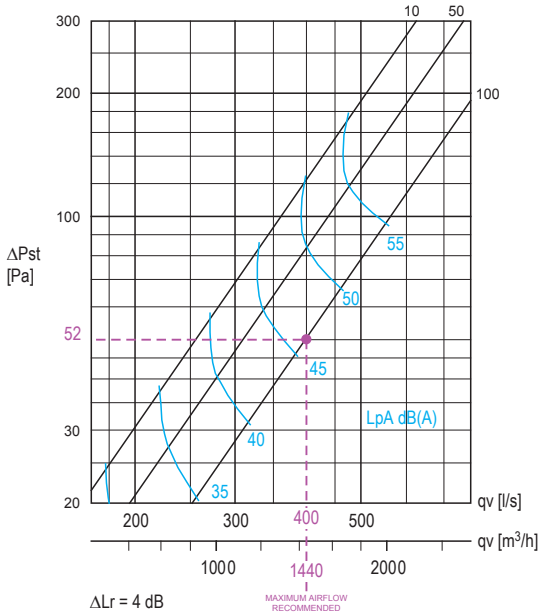
Section 1000 Static pressure loss and sound data



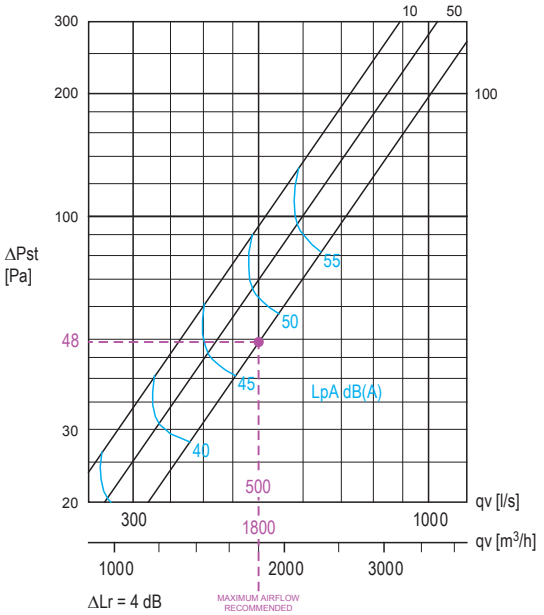
Section 1500 Static pressure loss and sound data

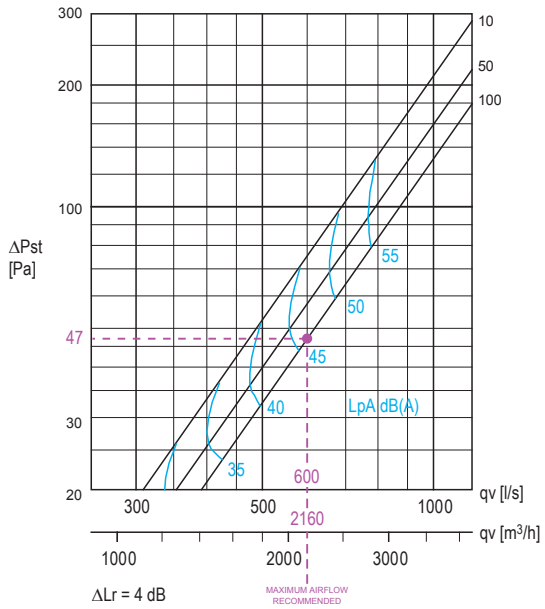


Section 2000 Static pressure loss and sound data



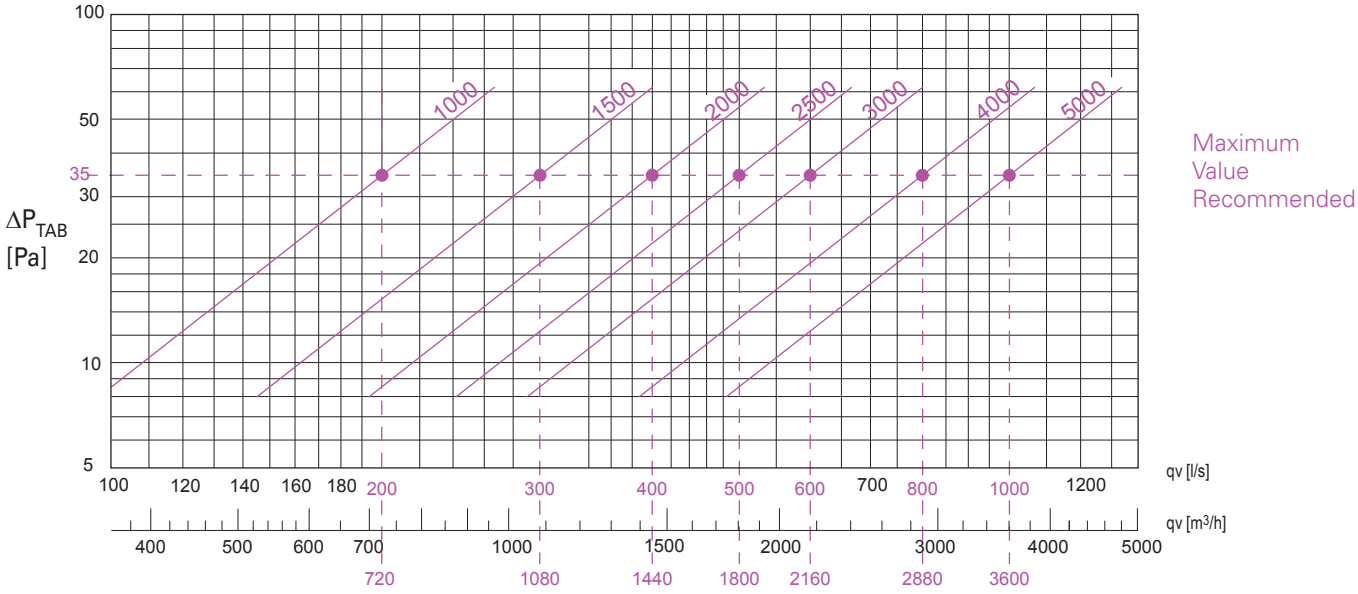
Section 2500 Static pressure loss and sound data





Supply airflow rate measurement with T.A.B.™ ports

Recommended pressure T.A.B.™ 35 Pa



Supply airflow rate measurement using k factors

With the T.A.B.™ pressure measurement, it is also possible to check the supply airflow with the following formula: $q_s = k \times \sqrt{\Delta P_{TAB}}$ [Pa]

L1 (Length of section) mm	k factor [m³/h]	k factor [l/s]
1000	121,7	33,8
1500	182,6	50,7
2000	243,4	67,6
2500	304,2	84,5
3000	365,1	101,4

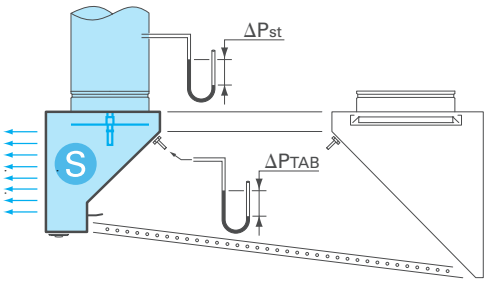
Supply airflow rate measurement using MSM

The supply airflow is balanced with MSM modules installed on each supply connection. Therefore, it is also possible to check the supply airflow by adding up the airflow of each MSM using the following formula.

q_s [l/s] = 51 x $\sqrt{\Delta Pm}$ [Pa]

q_s [m³/h] = 183,6 x $\sqrt{\Delta Pm}$ [Pa]

SUPPLY Pressure drop, sound data and airflow measurement



Supply plenum

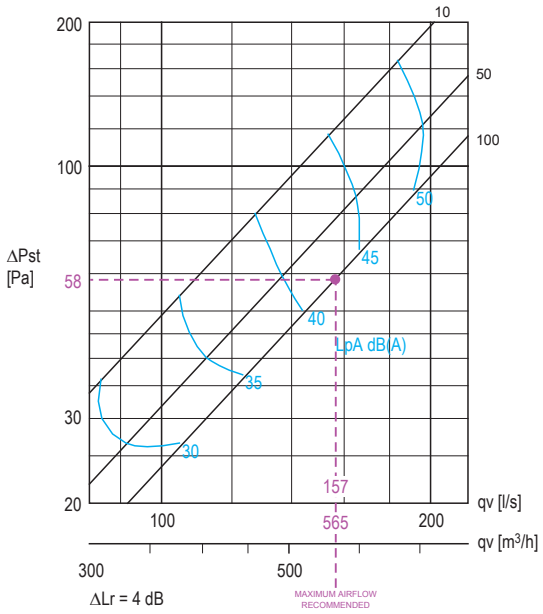
H=400

ΔP_{st} = Supply static pressure loss

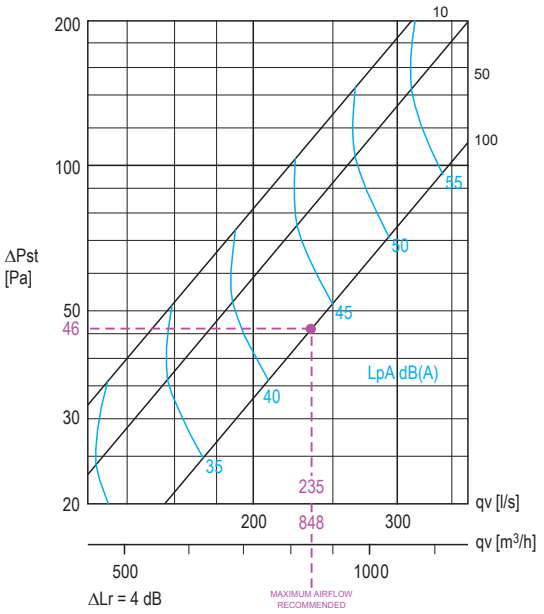
ΔP_{TAB} = T.A.B.™ pressure for airflow rate measurement

10,50,100 = MSM module opening in %

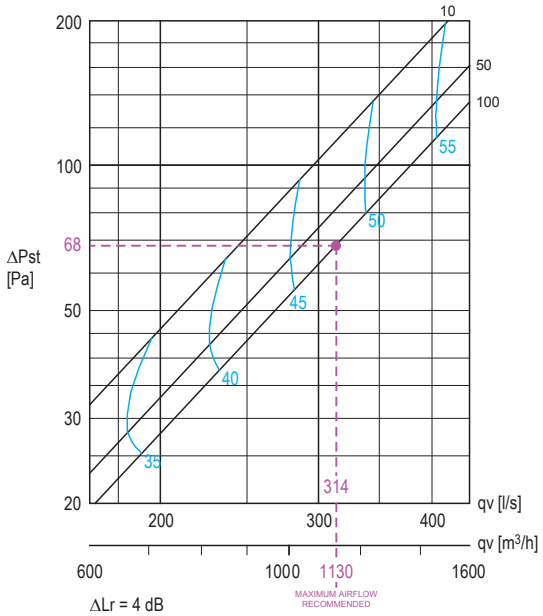
Section 1000 Static pressure loss and sound data



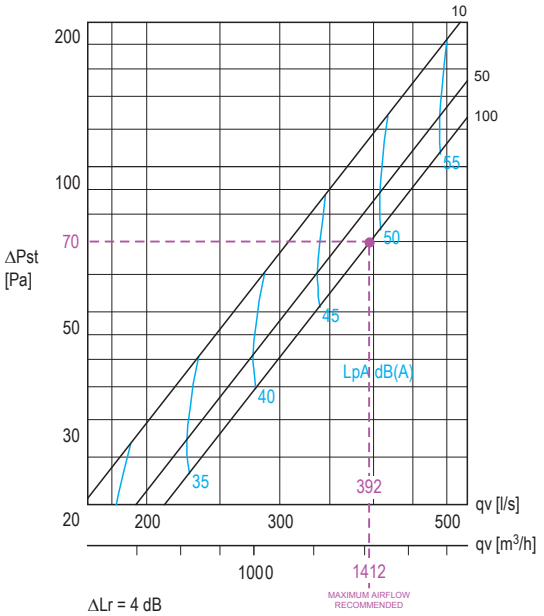
Section 1500 Static pressure loss and sound data

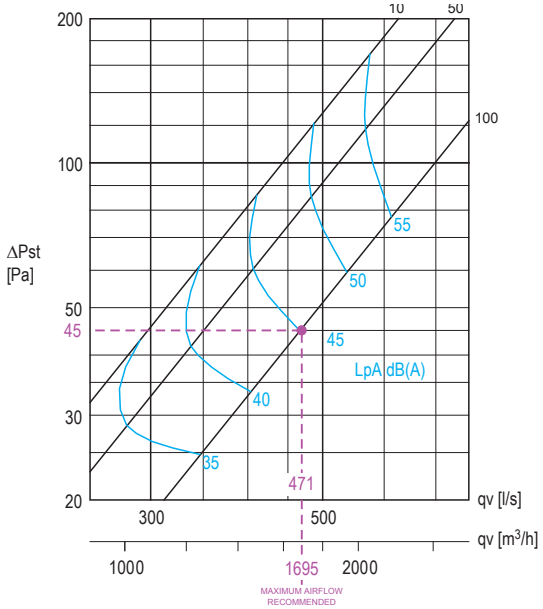


Section 2000 Static pressure loss and sound data



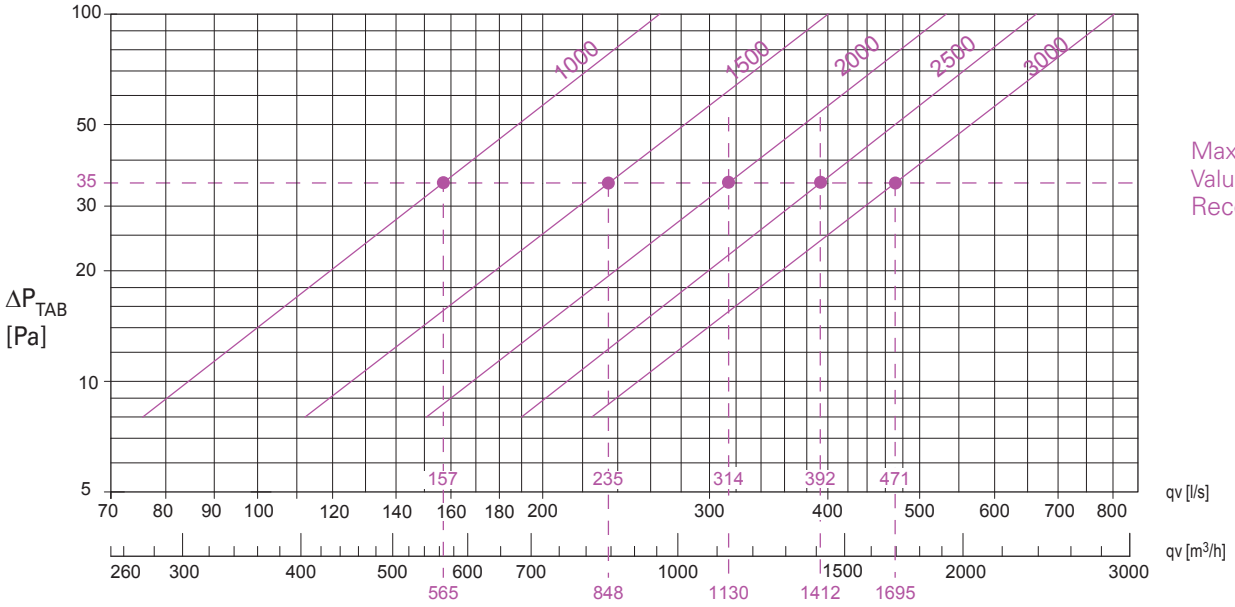
Section 2500 Static pressure loss and sound data





Supply airflow rate measurement with T.A.B.™ ports

Recommended pressure T.A.B.™ 35 Pa



Maximum Value Recommended

Supply airflow rate measurement using k factors

With the T.A.B.™ pressure measurement, it is also possible to check the supply airflow with the following formula: $q_s = k \times \sqrt{\Delta P_{TAB}}$ [Pa]

L1 (Length of section) mm	k factor [m³/h]	k factor [l/s]
1000	95,5	26,5
1500	143,3	39,7
2000	191,0	53,1
2500	238,7	66,3
3000	286,5	79,6

Supply airflow rate measurement using MSM

The supply airflow is balanced with MSM modules installed on each supply connection. Therefore, it is also possible to check the supply airflow by adding up the airflow of each MSM using the following formula.

q_s [l/s] = 51 x $\sqrt{\Delta Pm}$ [Pa]

q_s [m³/h] = 183,6 x $\sqrt{\Delta Pm}$ [Pa]

Suggested specification

UWF / UWI Hood

The hood shall be Halton Brand, UWF/I range. This hood type is equipped with the Capture Jet™, Capture Ray™ and Hot Water Wash technologies. The models shall be according to the projected exhaust devices list, depending on the additional options/features required:
- UWI is the exhaust only type model when the UWF is equipped with an integrated makeup air system on the front.
- When the UV lamps are activated "On Demand" as an option, the models are UWI-OD (exhaust only) or UWF-OD (with integrated makeup air).

The hood shall be supplied completed and ready to be installed with all embedded technologies fully pre-wired from the factory. The following specifications shall be fully observed.

Hood outer casing

• Constructed from 1.0 mm AISI 304 stainless-steel in a brushed satin finish. The joints of the lower edges shall be fully welded for better robustness, cleanability and a better aesthetic. All exposed welds are ground and polished to the metal's original finish.
• Hood sides shall be of double-wall construction to enable the air supply of the side Capture Jets while reducing the condensation risk on the internal face.

Capture Jet™ technology

• The hood shall be equipped with the Capture Jet™ technology. Based on the use of two sets of nozzles on the lower part of both the front fascia and sides, the Capture Jets improve the hood capture and containment efficiency. The exhaust airflow rates are thus reduced by up to 30 to 40% to remove the same heat load compared to the traditional hoods, thus leading to huge energy savings.
• The air used for the Capture Jets shall not represent more than 5% of the calculated exhaust airflow and the airspeed at nozzles outlet shall be a minimum of 8 m/s. Slot- or grille-type discharge shall not be used.
• The hood shall be supplied with an integrated fan to provide the required airflow and static pressure for the Capture Jet™ nozzles operation. A specific duct is thus not required whatever the model, unless contrary specification of a local code.

Exhaust and supply airflow rates

• The exhaust airflow rates shall be determined with an EN 16282-1[(1)] based calculation method. Hence, they shall be calculated based on the convective loads released by the cooking appliances, whether the loads are characterised by the standard, the manufacturer or third parties' tests, and the installation configuration of the hood(s). The method shall, also, in addition, consider the hood capture efficiency according to ASTM 1704-12 standard. Both the exhaust airflow rates and capture efficiency shall be justified by a calculation note.
• Any modification of the hood installation height together with the input power, type and dimensions of the cooking appliances shall be brought to the attention of the manufacturer as they all significantly impact the exhaust airflow rates.
• The makeup air design, especially the diffuser type, size, location and the balance between exhaust and supply, shall be entrusted to the hood manufacturer as it also impacts the exhaust airflow rates and capture efficiency. It is also key to preventing cross-contamination between the kitchen areas.

Exhaust plenum, filters and Hot Water Wash technology

• The exhaust plenum shall be constructed from 1.2 mm AISI 304 stainless steel in a brushed satin finish. The sides shall be closed and fully welded to be liquid-tight. All exposed welds are ground and polished to the metal's original finish. Its bottom edge shall be aerodynamically designed (no flat surface) thus helping the smoke and steam to freely rise toward the exhaust plenum, preventing steam spillage or stagnation leading to harmful dripping of condensation.
• It shall be equipped with a double stage filtration. The first shall be composed of KSA multi-cyclone grease filters, constructed from stainless steel. Their efficiency shall be at least 95% on 10 microns particles or larger, as tested by an independent laboratory. The filters shall also be NSF and UL classified. Baffle or slot type filters shall not be used. The second filtration stage shall be based on MFA mesh filters. This combination is a prerequisite for an efficient action of the UV-C lamps.
• The UV-C lamps shall be fitted in a cassette installed right after the double stage mechanical. Number and length of the UV-C lamps upon manufacturer recommendation. Lamps lifetime shall be at least 13000 hours. Ballasts shall not be integrated in the cassette to prevent a possible overheating and also to make it lightweight and easy to handle. The rack shall be mounted on runners and be equipped with quick electrical connectors to easily remove it without tool.
• The UV-C cassette shall be easily accessible for cleaning and maintenance, without tool and without having to remove the filters, by the mean of an access door equipped with lock handles having an easy grip.

• The exhaust plenum shall be equipped with a full-length stainless-steel spraying ramp supplied with hot water, clear or mixed with detergent, depending on the washing cycles phases. It is installed in front of the filters and shall be equipped with specific brass nozzles, regularly spaced, to efficiently wash them all.
• An additional branch shall be installed behind the filters to clean the UV cassette and the exhaust plenum. It shall be equipped with plastic spraying nozzles, removable without tool.
• The wiring and control way of the solenoid valves installed on the spraying ramps of the hoods shall be based on the manufacturer recommendations.
• The hot wash cycles shall be programmed preferably at the end of every operating day and in any case at least once a week.
• The exhaust plenum is equipped with deflectors to protect the cooking appliances from water projections. They shall be removable to provide complete access to the ramps and filters for routine maintenance and cleaning.
• The wastewater shall be drained from the exhaust plenum with a DN50 stainless steel drain.
• The exhaust connections shall be supplied with sliding balancing dampers. The exhaust plenum shall be equipped with T.A.B.™ pressure tap for quick airflow measurement.

Access safety to the UV-C lamps and lamps control
• The exhaust plenum shall be equipped with maintenance-free magnetic proximity switches in order to individually check the presence of each filter as well as the correct closing of the UV rack's access door. Pressure switches shall not be used for this check. Any access attempt to the UV lamps, whatever the circumstances, shall automatically lead to their automatic shut-off and to trigger an alarm.
• The control system shall include a pressure sensor to automatically switch off the lamps in case of fan shut down or unusual low pressure. A complementary interlock between the exhaust fan and the UV control system shall be set up, preventing in all cases the UV lamps to be on when the fan is off.
• Each hood section is equipped with a UV module composed of the controllers and ballasts. It is installed above the light fitting which shall be removable to enable a wide access for the system maintenance.

[Option] UV on Demand
• To extend the UV-C lamps usage period before replacement, the system shall be equipped with the UV on Demand function.
• To that purpose, each hood section shall be equipped with one or several IRIS Infrared Radiation Index Sensor(s). They are used to scan the cooking appliances' surface and monitor, real time, the variations in cooking activity. Connected to the hood controllers they automatically switch on the UV-C lamps during cooking processes only.

Control cabinet and user interface
• The Hot Wash technology require a control cabinet. It is typically equipped with the user interface which also controls the UV lamps. Both the cabinet and the user interface are also described in these specifications.

[Option] Integrated makeup air (UWF and UWF-OD)
• To improve the staff comfort but also to optimise the capture and containment efficiency of the hoods (thus contributing to the exhaust airflow rates reduction), the makeup air shall be introduced into space from the hood front fascia and at a very low velocity (less than 0.5 m/s).
• The hood shall be equipped with a perforated stainless-steel front panel, combined with a honeycomb structure on the back. This draught free diffusion complex shall be easy to remove for cleaning and maintenance operations. The internal face of the supply plenum shall be insulated to avoid any risk of condensation on the hood containment volume side.
• The supply connections shall be supplied with MSM balancing dampers. The supply plenum shall be equipped with T.A.B.™ pressure tap for quick airflow measurement.

[Option] M.A.R.V.E.L. Demand Controlled Ventilation
• The hood shall be equipped with M.A.R.V.E.L. Demand Controlled Ventilation system to automatically adjust, in real time, the exhaust airflow rates and this, hood section per hood section, in an independent manner and depending on the real cooking activity.
• To that purpose, each hood section shall be equipped with one or several IRIS Infrared Radiation Index Sensor(s). They are used to scan the cooking appliances' surface and monitor real-time variations in cooking activity.
• The reliability and sharpness of the airflow adjustment are reinforced by temperature sensors installed in each hood exhaust plenum. An additional room temperature sensor installed in the kitchen provides the required reference to the plenum temperature sensors.
• Each hood section is also equipped with an ABD damper used for real-time exhaust airflow adjustment.
• All hood section specific components are connected to a hood controller. This controller shall have the ability to make the hood section behave in a totally independent manner while communicating with all the other sections. These communication capabilities are a must for an efficient and required adjustment of the fan(s) speed.
• M.A.R.V.E.L. system shall be controlled by a tactile LCD screen. It shall allow a fast and simple use of the systems, even by non-professional personnel.
• [Option] The LCD screen shall also manage all the other technologies delivered by the manufacturer as part of the kitchen ventilation system. Check the additional requirements specific to these technologies.

• The additional requirements specific to M.A.R.V.E.L., especially concerning the balance between exhaust and supply together with the fan's speed control, will also be observed.

Halton Skyline light fitting

• Each hood shall be equipped with Halton Skyline Culinary Light. Constructed from stainless steel, the light fitting comprises flush-mounted broad beam spots with a diffusion angle of at least 80°. Each spot is composed of a patented mixing chamber and a specific reflector. Both shall provide a good balance between direct and diffuse light components without dazzling the staff. Especially, the shielding angle shall exceed DIN 12464-1 requirement and be at least 30°.
• The illuminance on the working surfaces shall be 750 lx with a CRI Colour Rendering Index of at least 83.
• The LEDs lifetime shall be 50,000 hours. The power supplies shall have at least the same lifetime and be DALI compatible. They shall enable switching on/off or dim the light (0-100%) with one or several switches.
• [Option] The power supplies shall also have a Constant Light Output feature, adjusting the output to keep the 750-lx illuminance required over LEDs lifetime.
• [Option] A specific DALI user interface with a simple scenario and zoning functions shall be used to control the light fittings installed in the hoods and/or ventilated ceilings and – if applicable – in the rest of the kitchen. Check the additional lighting requirements described in the present document.
• [Option] A specific DALI user interfaces with an advanced scenario and zoning functions, equipped with an LCD screen, shall be used to control the light fittings installed both in the hoods and/or ventilated ceilings and in the rest of the kitchens and related areas. Check the additional lighting requirements described in the present document.

[Option] Fire Suppression System

• The fire extinguishing system shall be from Ansul® R-102™ type and be pre-installed from the factory for better integration, at least for the plenum and exhaust connection(s) protection. The detection chain and fusible link(s) shall be fully integrated inside the exhaust plenum to not be visible at all.
• The cooking appliances nozzles shall, as much as possible, drop from the hood roof, without horizontal pipes visible inside the containment volume of the hood.
• The site complementary installation shall be carried out by the hood manufacturer or a certified partner. In all cases, it shall be an authorised representative of Ansul and the installation shall comply with UL 300 requirements and local codes.

(1) The European Standards published by CEN are developed by experts, established by consensus and adopted by the Members of CEN. It is important to note that the use of standards is voluntary, and so there is no legal obligation to apply them (source: CEN).

CCW Control cabinet / suggested specifications

The control cabinet shall be the Halton brand, CCW range. The model(s) shall be according to the project control cabinets list, depending on the additional options/features required.

The following specifications shall be fully observed.

Control cabinet outer casing

Constructed from 1.0 mm AISI 304 stainless steel, it shall segregate the electrical and hydraulic components into two compartments.

Hydraulic compartment / Hot water wash circuit

- The hot water circuit shall be comprised of isolating valves, a backflow preventer, a pressure reducer, the main solenoid valve, and a detergent injection section. It shall be equipped with a temperature sensor. In the case of activation, the water released by the backflow preventer shall be drained outside the compartment.
- A diaphragm metering pump shall dose the detergent according to the hood manufacturer recommendations. The detergent tank shall be equipped with a level probe.
- [Option] The circuit shall be equipped with a booster pump controlled to achieve an operating water pressure of 2,0 to 3,0 bars at nozzles level, during the washing cycles.
- A typical washing cycle shall be made up of 3 steps: the washing phase (hot water mixed with detergent), the soaking time (needed by the detergent to dissolve the grease deposits) and the rinsing phase.
- [Option] Upon receipt of a "fire" or "fire fuse" signal, the hot water distribution valve(s) shall open to prevent the fire spreading the exhaust plenum(s) and the exhaust ductwork.

Electrical /control compartment

- The electrical compartment shall be equipped with the main switch and the user interface. It contains all controllers required for the coordination of the hot water wash cycles.
- [Option] A distant emergency switch shall be installed in the kitchen and connected to the control cabinet to disable all its functions, without cutting its power supply.
- [Option] The distant solenoid valves used for the hot water wash cycles shall be hard wired and connected to the electrical compartment. Under certain conditions and based on the manufacturer's recommendations, they can be also controlled locally, at hood level, without being connected to the control cabinet.

User interface (Halton's Touch Screen)

- A tactile LCD screen shall be used as user interface.
- Typically installed on the cabinet, it can be also installed remotely, inside the kitchen itself, in a specific cabinet or built-in a wall.
- In user mode, it shall allow a fast and simple use of the systems, even by non-professional personnel. In administrator mode, it shall provide detailed information about the systems and technologies statuses, as well as fast access to some of the system settings during the commissioning phase and maintenance operations.

- The tactile screen shall display at least the following information or alarms:
  - System / Communication alarm and – if applicable - emergency stop or fire alarm;
  - Water wash technology / Progression of the washing cycles and, if present, booster pump status, as well as detergent level and water temperature alarm;
  - UV / Activation of the lamps, number of operating hours, as well as low pressure, missing filter, access door opened, ballast fault, UV lamp fault or UV lamps replacement alarms.
- [Option] The tactile screen shall also manage all the other technologies delivered by the manufacturer as part of the kitchen ventilation system and therefore display additional information or alarms. Check the additional requirements specific to these technologies.
- The tactile screen shall be able to interlock with a computer and with the Building Management System (BMS).
- [Option] The tactile screen shall be connected to the building network to enable distant connection features.
- [Option] A dedicated web portal shall be provided and configured to monitor real-time the systems, save all data on a server and provide analytics. The additional specific requirements of this portal shall also be all observed.

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