

KSR-S / KSR-F

Backshelf (S) or freestanding (F) hood for electric fryers and griddles
With Capture Jet™ technology / M.A.R.V.E.L. compatible



KSR hoods are suitable for LEED⁽¹⁾ projects and can be used in open or closed kitchens, particularly the Quick Service Restaurants. They are designed to capture pollutants generated by electrical fryers and griddles more efficiently as they are located closer to the cooking appliances.

KSR-S and KSR-F are both equipped with the latest and patented Capture Jet™ technology. The inclined front improves the view of the cooking surfaces (negative overhang) for better working comfort.

The free standing model KSR-F is also equipped with side Capture Jets to enable a large opening on the sides for passing of the fries baskets. This model also has a services distribution unit on its back for a perfect integration of the power supplies.

Standard model KSR-S (backshelf)

- HACCP⁽²⁾ certified.
- Minimum space used.
- Considerable energy savings: Up to 50% reduction in exhaust airflow rates due to front Capture Jets.
- Savings on maintenance and enhanced safety: Highly-efficient KSA cyclonic filters (UL, NSF and LPS 1263 certified). Prevents build-up of grease deposits and lowers ductwork cleaning costs.
- Halton Skyline LED culinary light provides the best visual comfort while contributing to further improve the safety and the energy savings.

- Performance tested independently in accordance with the ASTM 1704 standard. Exhaust airflow rates calculated on the basis of this performance and the calculation of cooking appliances' heat loads.
- Quick and easy commissioning. Hoods delivered "ready to install", complete with large access to the light fitting and the Capture Jet fan through a horizontal access hatch.

Model KSR-F (freestanding)

- Same features and benefits as above.
- Integrated self-supporting structure.
- Combination of front Capture Jets and side(s) driving Jets allowing a large opening of one or both sides for the passing of the fries baskets.
- Services distribution on the back of the hood equipped with the electric plugs for the fryers/griddles.

(1) Leadership in Energy and Environmental Design

(2) Hazard Analysis Critical Control Point

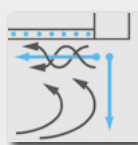
Description of the main technologies



KSR

Backshelf or freestanding hood for electric fryers and griddles
With Capture Jet™ technology / M.A.R.V.E.L. compatible

Halton



Side Jets and Capture Jet™ technology

ENERGY EFFICIENCY

40 to 50% reduction in exhaust airflow rates.

INDOOR ENVIRONMENT QUALITY (IEQ)

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

SAFETY

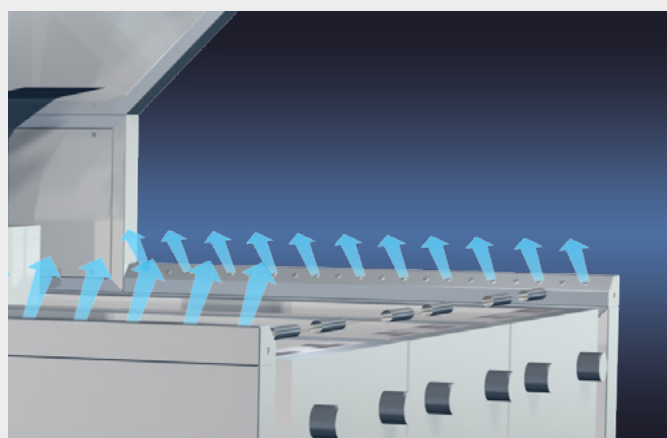
Cooking vapours are not dispersed and food safety is improved.

Capture Jet™ technology

The Capture Jet™ technology consists of one set of vertical nozzles located on the front of the hood. These nozzles form a curtain which increases the containment volume and prevents vapours escaping from cooking areas.

The bottom edge of the exhaust plenum is aerodynamically designed to not disturb the rising up of the thermal plumes, thus further improving the Capture Jets action.

The absence of spillage lead to a better indoor air quality and to minimal heat load transmission to the kitchen. The exhaust airflow rate leads to huge energy savings while limiting the risk of drafts and facilitating the temperature regulation.



Combination with Side Jets (freestanding model only)

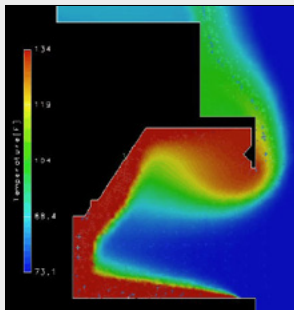
- Enables a large opening of the sides of the hood hence providing a large passing for the fryers baskets
- Better ergonomic and working conditions without compromising the capture efficiency

The Side Capture Jets consist of a set of inclined nozzles, at the level of the cooking surfaces, on both the right and left sides of the cooking appliances block. They allow a large opening of the hood sides hence providing a large passing for the fryers baskets.

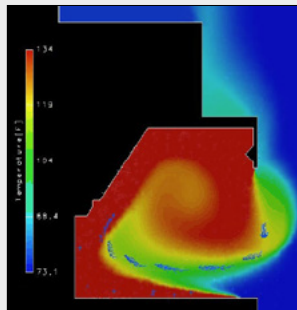
The nozzles have been designed to create an air curtain able to gently push the smoke toward the exhaust plenum without dispersing them.

The Side Jets modules are removable without tool for a total ease of cleaning.

Numeric Simulation (CFD) on a backshelf hood with and without front Capture Jets



WITHOUT Capture Jets, heat
spilling on the front of the hood



WITH Capture Jets, total Capture
& containment of the smoke



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.

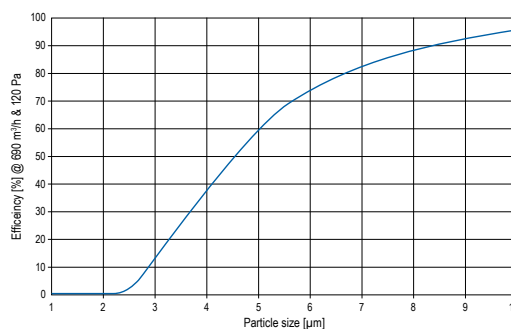
KSA cyclonic filters are composed of vertical honeycomb sections. Opening only at the top and bottom, they are designed to force the air to swirl inside. The centrifugal effect is significant and, above all, continuous – especially in comparison to the action of traditional filters. Particles are thus 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 KCJ 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"



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

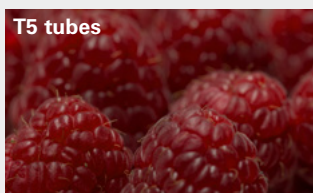
Drastic energy savings leading to reduced payback times.

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.

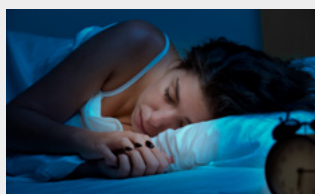
Halton Skyline is the first LED based lighting technology specifically developed for professional kitchens. Everyone agrees the light it provides is simply the closest possible to natural light.



T5 tubes



Halton Skyline



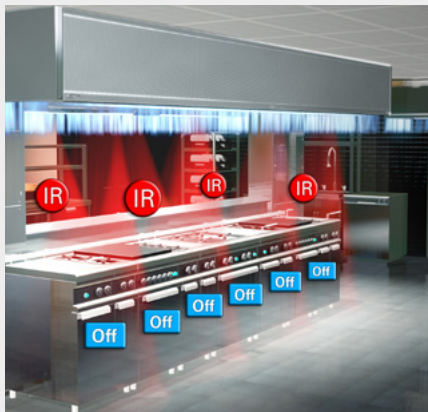
- Halton Skyline remarkably respects the food colour and texture from raw ingredients to plated presentation. The two spot models developed for Halton Skyline have respectively a CRI of 83 (@4000K) and 95 (@2800K).

- 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.

Recommended combinations



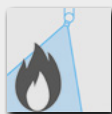
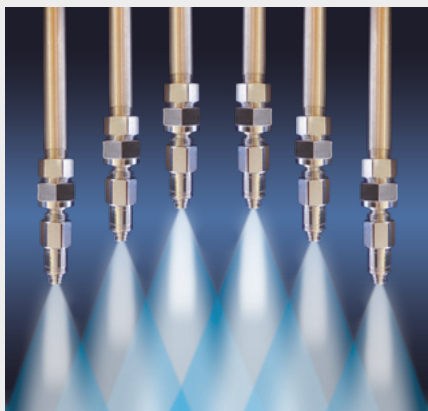
M.A.R.V.E.L. Demand Controlled Ventilation (MRV)

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.



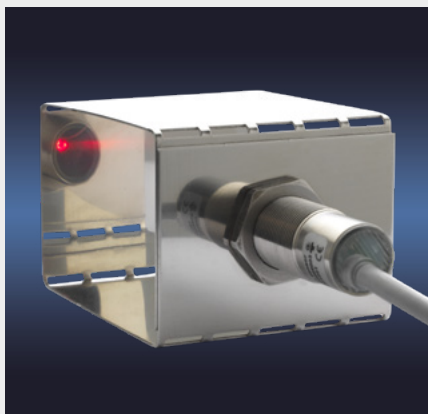
Built-in Fire Suppression System (FSS)

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.

Notes

Technical descriptions

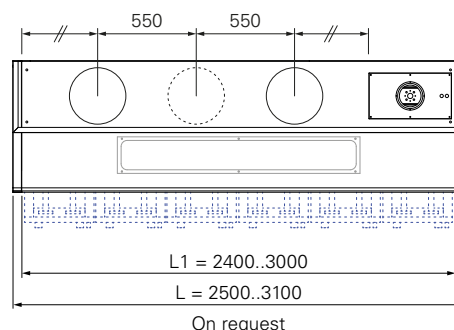
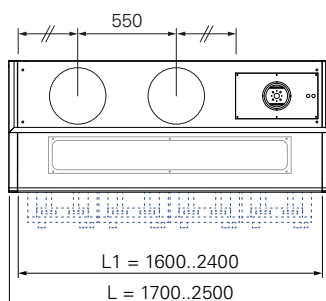
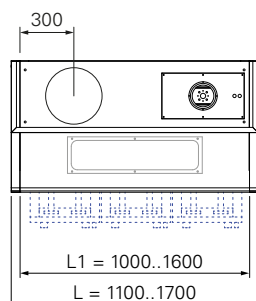
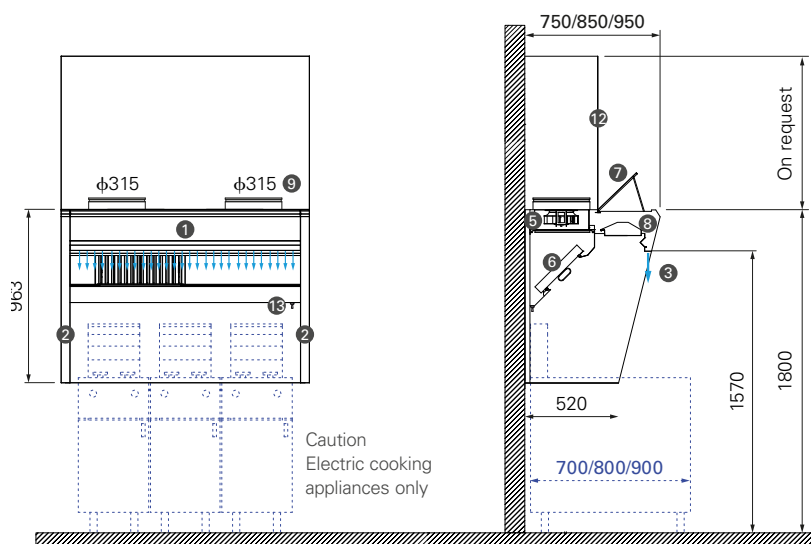
| L | Recommended Exhaust air volume* | |
|------|---------------------------------|---------------|
| | l/s | m³/h |
| 1600 | 420 ... 654 | 1515 ... 2358 |
| 2100 | 560 ... 872 | 2020 ... 3144 |
| 2600 | 700 ... 1090 | 2525 ... 3930 |
| 3100 | 840 ... 1308 | 3030 ... 4716 |

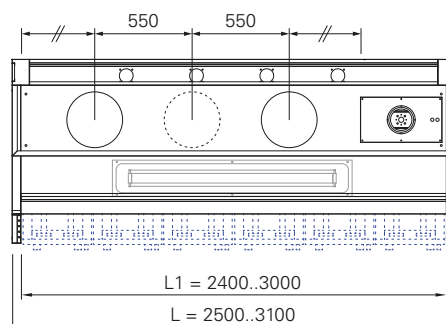
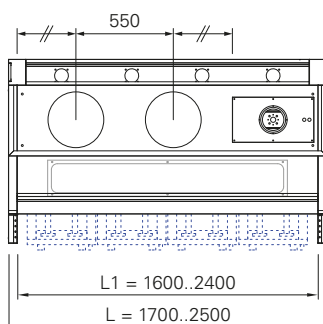
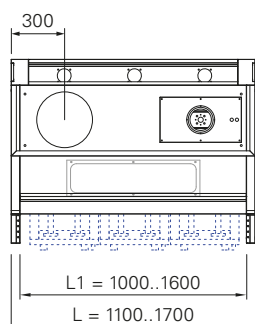
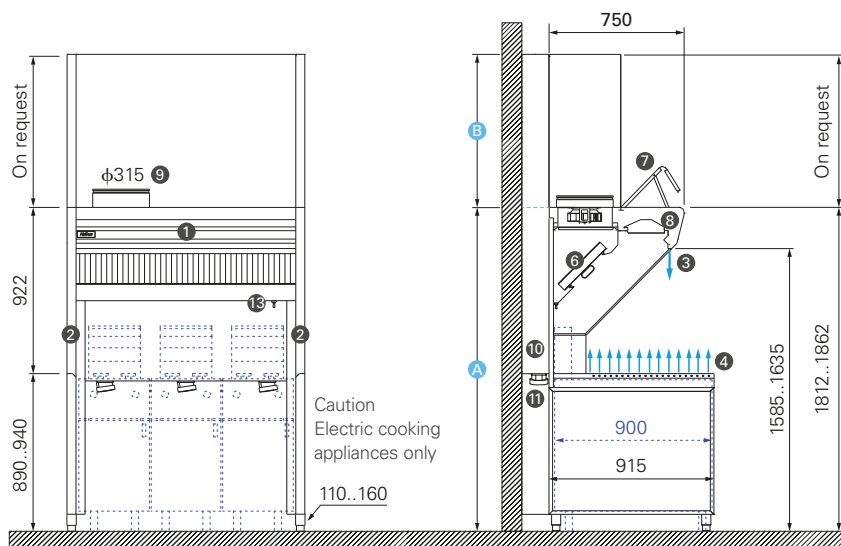
* With the maximum number of filters, minimum values at a T.A.B.™ reading of 50 Pa (505 m³/h or 140 l/s per filter)... maximum values at a T.A.B.™ reading of 120 Pa (786 m³/h or 218 l/s per filter)

DESCRIPTION

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 Outer casing in stainless steel AISI 304 2 Double skin sides 3 Front Capture Jet™ nozzles 4 Side Capture Jet™ nozzles 5 Integrated Capture Jet fan 6 KSA cyclonic grease filters 7 Maintenance access hatch 8 Halton Skyline LED light fitting 9 Exhaust air connection and adjustment damper(s) | <ul style="list-style-type: none"> 10 Services distribution module 11 Electric plugs 12 Option Cover board 13 Drain |
|--|--|

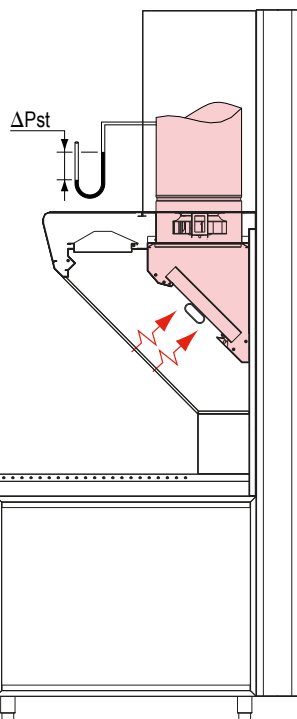
KSR-S



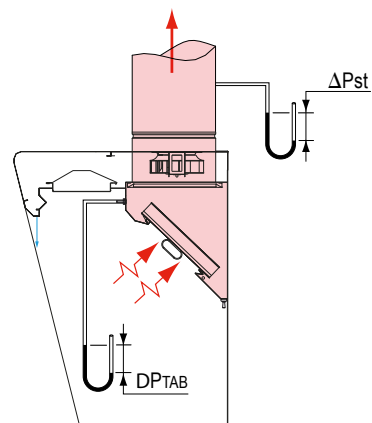


EXHAUST Pressure drop, sound data and airflow measurement

KSR/F
Free standing

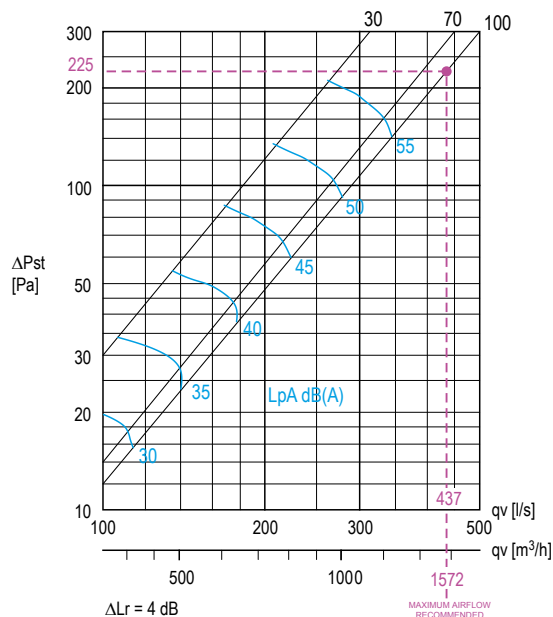


KSR/S
Standard

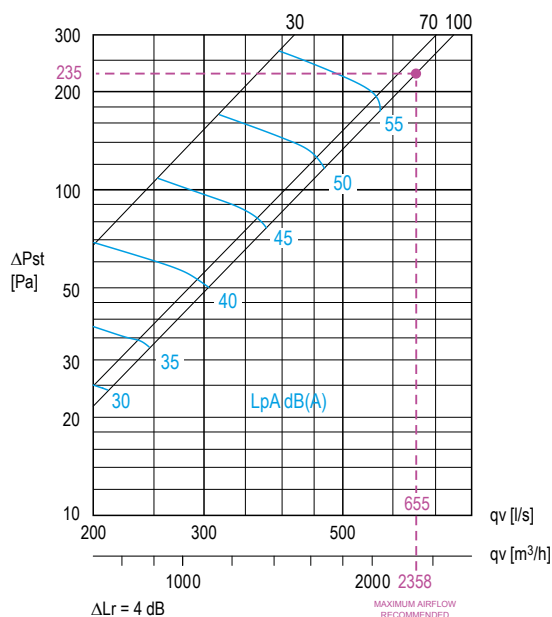


ΔP_{st} = Exhaust static pressure loss
 ΔP_{TAB} = T.A.B.™ pressure for airflow rate measurement
 30, 70, 100 = Damper opening in %

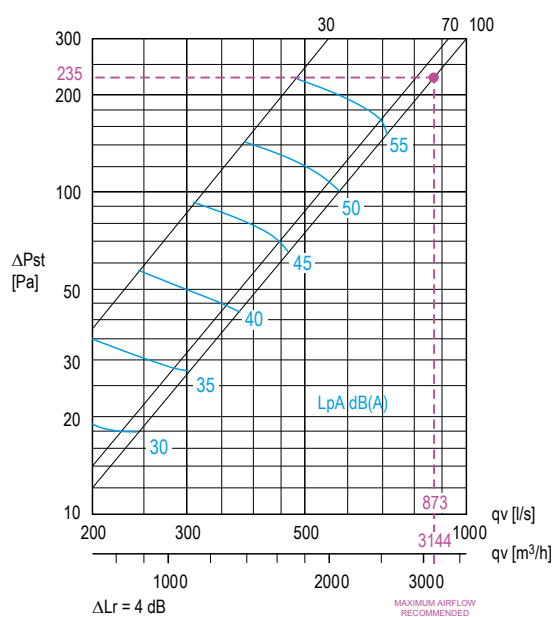
Section 1000 Static pressure loss and sound data



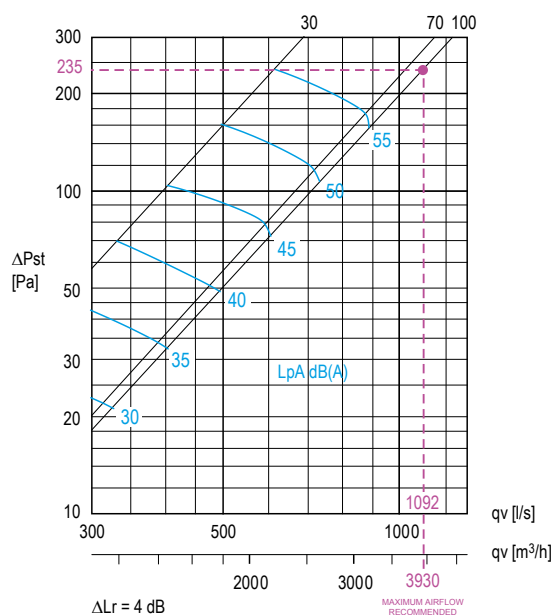
Section 1500 Static pressure loss and sound data



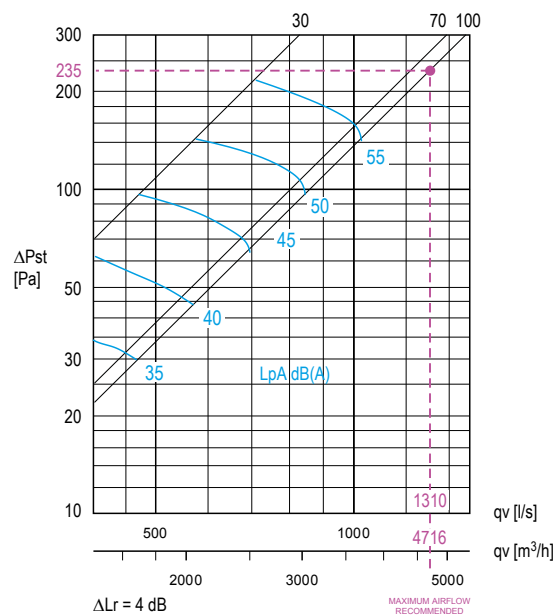
Section 2000 Static pressure loss and sound data



Section 2500 Static pressure loss and sound data

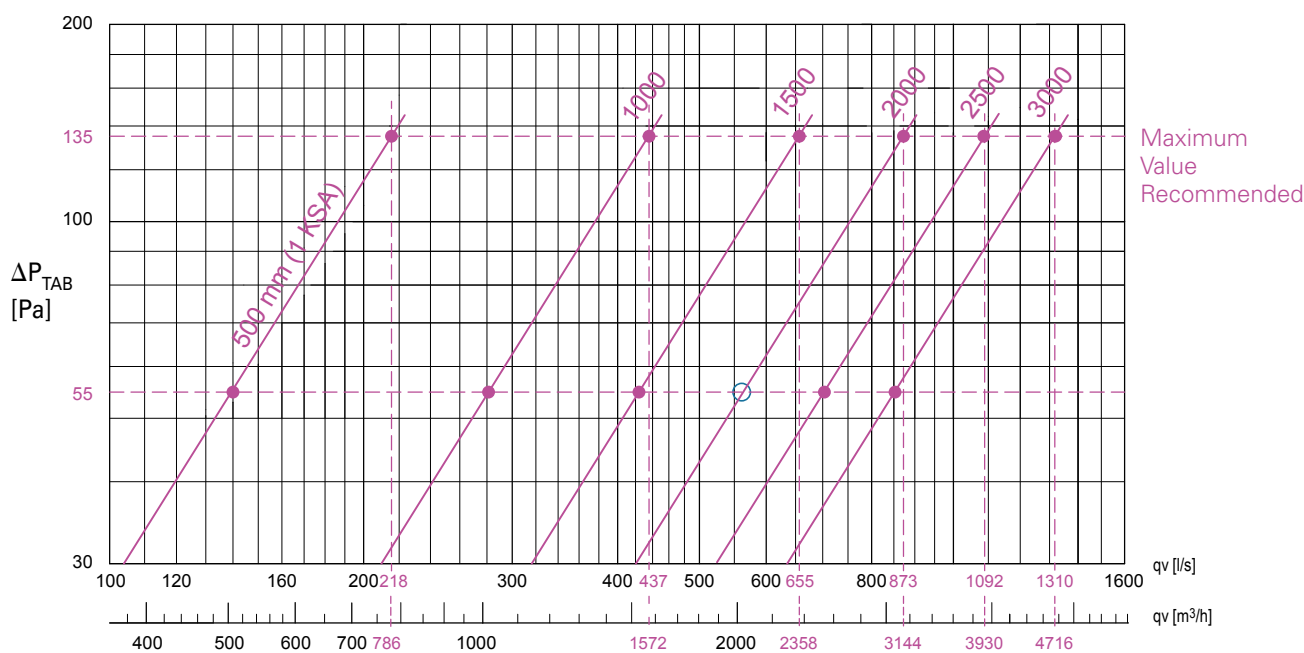


Section 3000 Static pressure loss and sound data



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

Recommended pressure T.A.B.™ 55-135 Pa



Exhaust airflow rate measurement using k factors

| KSA (Number of filters) | k factor [m³/h] | k factor [l/s] |
|-------------------------|-----------------|----------------|
| 1 | 67,6 | 18,8 |
| 2 | 135,2 | 37,6 |
| 3 | 202,8 | 56,3 |
| 4 | 270,4 | 75,1 |
| 5 | 338 | 93,9 |
| 6 | 405,6 | 112,7 |

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

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

Specifications

KSR-S / KSR-F Hood

The hood shall be Halton Brand, KSR range. This low profile with underhang hood type is equipped with the Capture Jet™ technology. The models shall be according to the projected exhaust devices list.

KSR- S is the backshelf/suspended model when the KSR-F is freestanding. This last model is also equipped with side Capture Jets to enable a larger opening on the sides for passing the fries baskets.

The hood shall be supplied completed and ready to be installed. The following specifications shall be fully observed.

Hood outer casing and structure

- 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.
- **[Option]** The hood shall be freestanding with no need to hang it to the ceiling and the wall. To that purpose, a non-visible stainless steel structure shall be integrated on the back and sides of the hood (KSR-F).

Capture Jet™ technology

- The hood shall be equipped with the Capture Jet™ technology. Based on the use of a set of nozzles on the lower part of the front fascia.
- **[Option]** The front Jets shall be combined with side Capture Jets at cooking appliances height to enable a large opening of the sides without risking smoke spillage (KSR-F).
- The exhaust airflow rates are thus reduced by up to 40 to 50% 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 and filters

- The exhaust plenum shall be constructed from 1.0 mm AISI 304 stainless steel in a brushed satin finish. The lower part of the sides shall be welded for a durable tightness against condensates. 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 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 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.

[Option] Integrated services distribution unit (KSR-F)

- The hood shall have an integrated back electricity distribution unit equipped with sockets and corresponding plugs factory pre-set. Cables, wiring and circuit breakers by the electrician.

[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

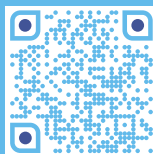
- Each hood shall be equipped with Halton Skyline Culinary Light. Constructed from stainless steel, the light fitting comprises flush-mounted broad beam spots with a diffusion angle of at least 80°. Each spot is composed of a patented mixing chamber and a specific reflector. Both shall provide a good 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).



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