



- **HACCP\* certified (PE-567-HM02I)**
- **Up to 15% energy savings due to the Capture Jets**
- **High-efficiency grease removal KSA multi-cyclone filters (UL and NSF classified)**
- **Alternative: Twin FC filters complying with DIN 18869-5**
- **Maximum thermal and air quality comfort, excellent visual and acoustic comfort leading to pleasant working environment**
- Stylish and perfect finishing
- Easy cleaning and maintenance for optimal hygiene and safety
- Turnkey projects: engineered solution “made in Germany” including installation by Halton specialists
- Full adaptability to developments in the kitchen
- Many customisation opportunities

The KCJ closed ventilated ceiling, with the Capture Jet™ technology, is a flexible and aesthetically pleasing solution that combines several functions: extraction, air supply, lighting, and a suspended ceiling. All components are designed to guarantee optimal hygiene levels and easy maintenance in accordance with HACCP recommendations. The ceiling is suitable for central kitchens but also for all closed cooking areas or show kitchens.

Featuring a closed design and manufactured entirely of stainless steel, the product is equipped with the latest dual Capture Jet™ technology constituting an outer boundary. Combined with a laminar-flow-type make-up air system, it helps to reduce extract air flow rates by at least 15% compared to traditional ventilated ceilings while retaining maximum air quality and comfort for users.

The kitchen space is freed from the canopies volume. The entire kitchen then potentially benefits from the daylight, in addition to the integrated uniform and direct lighting. The visual comfort and the impression of space are incomparable. Also, the kitchen ceiling system provides excellent fire protection, limiting the spreading of fire in the building.

Extraction plenums are equipped with KSA high-efficiency cyclonic filters. They are designed such that their number and location can be adjusted to suit any development of the kitchen space. Depending on the local regulations, they can be replaced by high efficiency twin FC filters which prevent, in case of fire, the flames entering the exhaust plenum (complying with DIN 18869-5).

\* Hazard Analysis Critical Control Point



## Operation

Cooking equipment generates large plumes of hot air, loaded with aerosols: grease solid, grease vapours, water, odours, burned components etc. These plumes or convective flows (1) naturally rise towards the kitchen ceiling.

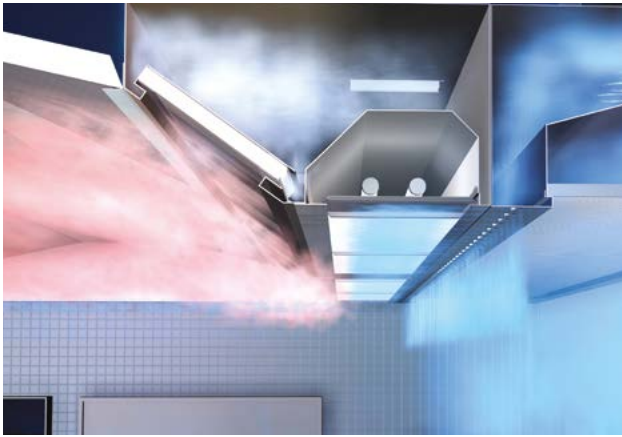
While the absence of containment screens on a kitchen ceiling completely releases the volumes, providing unrivalled working comfort, the convective flows are left to their own life. The combination of the Capture Jets (2) and the laminar-flow air supply (3) allows convective flows to rise freely and be removed by the extraction plenum as quickly as possible, without mixing with the fresh air that is brought into the kitchen.

The KCJ kitchen ceiling system is a closed type. All extraction plenums are connected to the extract

ductwork in order to guarantee absolute hygiene.

There is no contact between the cooking vapours and the building's structure or with services situated above the kitchen ceiling. Through its type of construction, the kitchen ceiling protects building structures against fire. All components in the extraction areas are made from AISI 304 stainless steel with a minimum thickness of 1 mm, for a 30 minutes fire protection by construction (specific requirements of the local regulations still apply).

Extraction plenums and ductwork connections are carefully designed and dimensioned to provide maximum flexibility for future modifications to the layout of the cooking area.

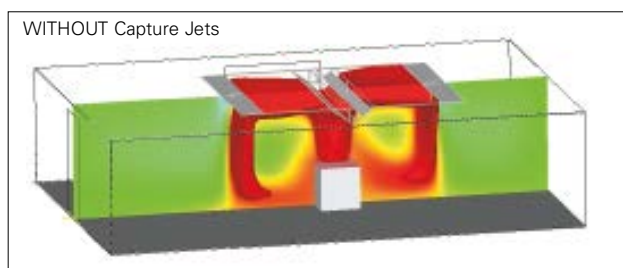
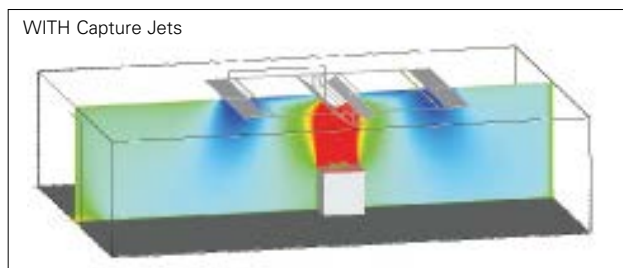


### Double and peripheral Capture Jet™ technology (patented)

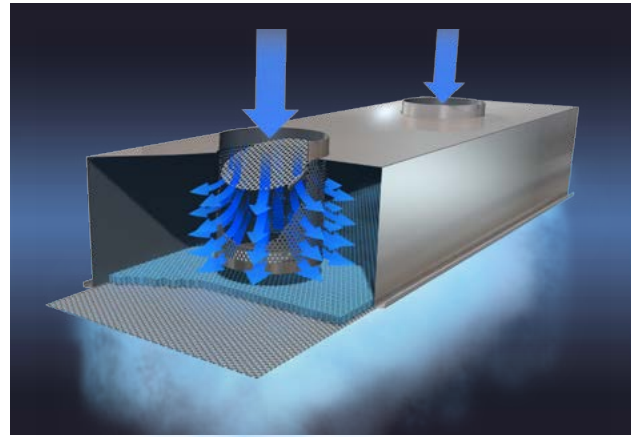
- 15% greater efficiency than traditional ceilings
- Increased capture and containment capacity
- Elimination of the risk of cooking vapour re-circulation
- Energy savings with optimal air quality

The Capture Jet™ technology consists of two sets of nozzles, one vertical and one horizontal.

- The horizontal nozzles push vapours back towards the extraction plenum.
- The vertical nozzles increase the containment volume and prevent vapours escaping from cooking areas and entering re-circulation with the fresh air.



Example of ceiling CFD. WITHOUT the Capture Jets, the thermal plumes are not removed immediately and spread along the ventilated ceiling to finally be re-circulated with the fresh air introduced into the kitchen through the supply units.



KCJ/1303/UK

### Laminar-flow air supply modules

- Completely draught-free makeup air
- A masterpiece for a high comfort level for users

The air supply modules are designed to spread fresh air through the kitchen at extremely low velocity. The absence of draughts not only helps to avoid dispersing convective flows from the cooking equipment but also guarantees user comfort.

The modules comprise of a distribution cylinder, which enables flow velocity to be reduced and fresh air to be uniformly distributed in the plenum. The flow is then streamlined, due to the combination of a honeycomb structure and a perforated front.

The honeycomb structure reduces the induction phenomenon common to all standard supply units. This phenomenon generates a suction effect along the units periphery. It leads to the mixing or recirculation, inside the units, of a small amount of room polluted air with the fresh air blown. Thanks to the honeycomb structure, the air quality is therefore improved and the front faces of the units are kept clean for longer.

The honeycomb structure contributes also to reduce the sound pressure level in the kitchen due to its sound attenuation properties.

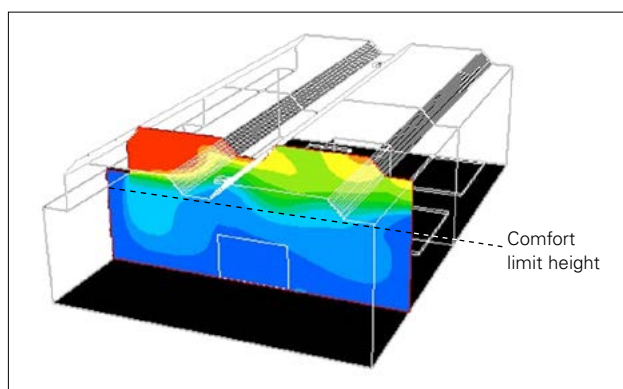




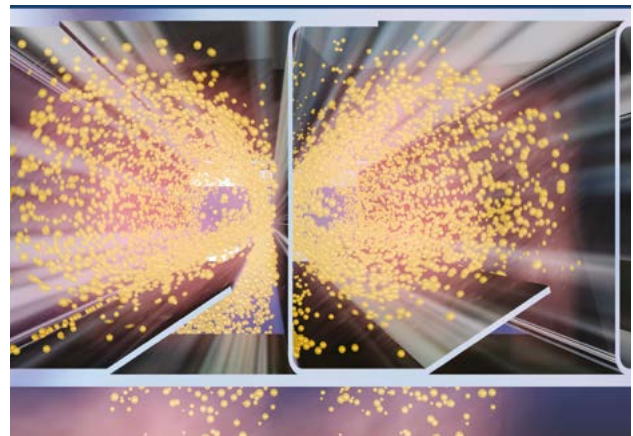
### Comfort limit height

- Total control of air quality in the working area
- Wellbeing and productivity

The laminar-flow air supply modules allow 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. A comfort limit naturally appears in the kitchen's environment through stratification. The Halton ceilings are designed such that this limit point is above head level. Below the limit height, air quality is optimal. The polluted air above is extracted through the kitchen ceiling system.



Example of ceiling CFD with the most efficient combination: Capture Jet™ technology and low displacement units installed in the occupied zone. The capture of the thermal plumes is at its maximum level while the users comfort is ideal.



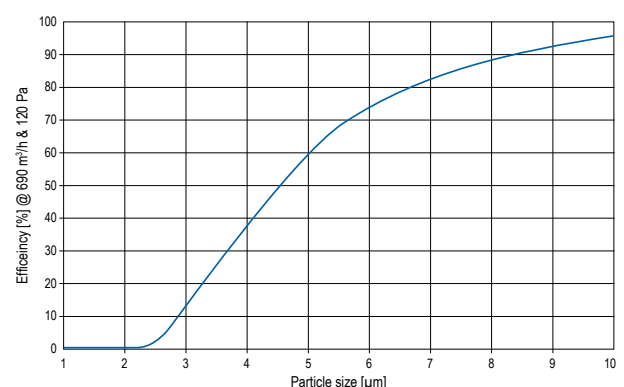
KCJ/1303/UK

### KSA cyclonic filters

- High grease filtration efficiency minimizes grease deposits build up in exhaust ductwork
- Hygiene and safety

The KSA cyclonic filters is made of multiple honeycomb profiles. This special shape forces the air to swirl inside the profiles. The centrifuge effect is significant and, above all, continuous – especially in comparison to the action of traditional filters. Particles are thus pushed against the profiles. The collected condensation flows naturally towards the extraction plenum drains.

The KSA filters are 95% efficient for the removal of 10  $\mu\text{m}$  particles. They are UL-accredited as flame-resistant (Underwriter Laboratories) and have NSF hygiene and safety approval (National Sanitation Foundation, USA).



Efficiency curve of the KSA cyclonic filters based on the VDI 2052 method (part 1) «Ventilation Equipment for kitchens. Determination of Capture Efficiency of Aerosol Separators in Kitchen Exhaust»



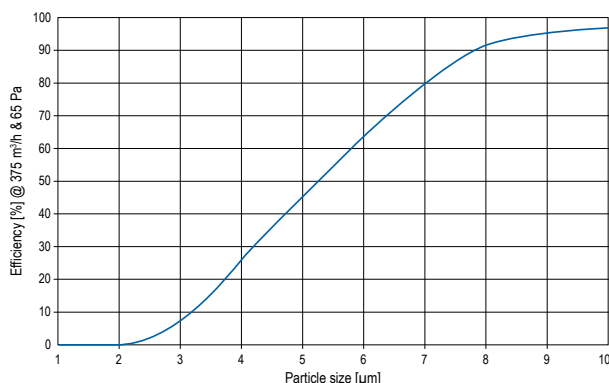
### FC twin filters for specific fire requirements

- Minimisation of grease deposits in the ducts
- Hygiene and total fire safety
- Complies with DIN 18869-5

The twin FC filter is a combination of 2 FC filters. It is therefore composed of 4 layers. This construction generates a high centrifugal effect, allowing a very effective separation of the cooking emissions. The grease deposits inside the ductwork are then significantly reduced.

The Twin FC filter complies also with DIN 18869-5 and, in the event of fire, prevents the flames entering the exhaust plenum and therefore prevents the fire spreading through the kitchen ductwork and, therefore, the building.

The TFC filters are 96% efficient in removal of 10 µm particles. FC twin filters are easy to handle and are dishwasher compatible.



Efficiency curve of the FC twin filters based on the VDI 2052 method (part 1) «Ventilation Equipment for kitchens. Determination of Capture Efficiency of Aerosol Separators in Kitchen Exhaust»



KCJ/1303/UK

### Maintenance

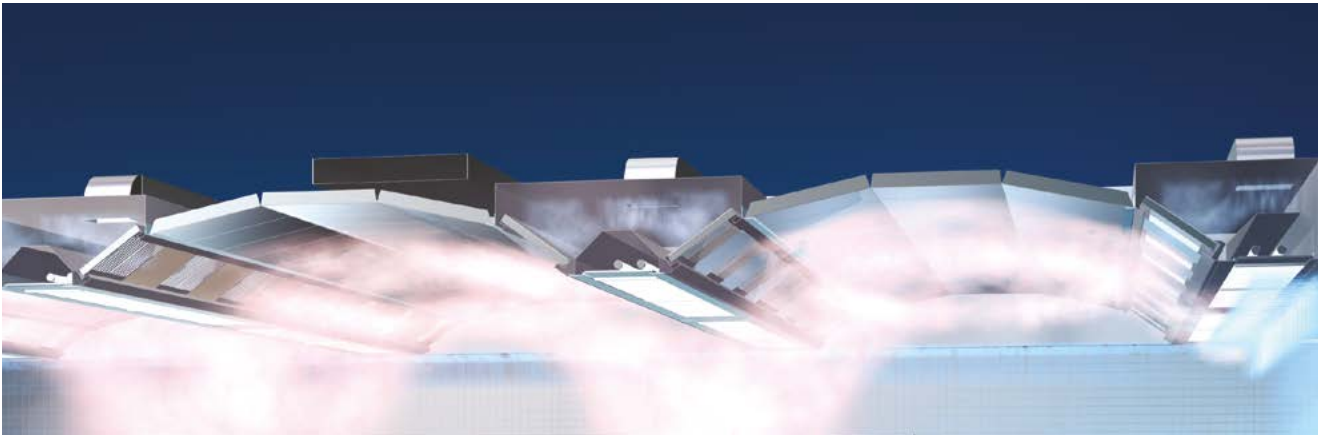
- HACCP certified (PE-567-HM02I)
- Components that are easy to access and clean
- Maximum hygiene and quick maintenance

All Capture Jet™ closed ventilated ceilings are designed to reduce the number of external stainless steel components thus reducing the number of joints to be cleaned for maximum hygiene. The joints of the lower edge are fully welded to be liquid-tight. The arched shape of the panels between extraction plenums is aerodynamically designed to limit the condensation risk. In the panels have been designed to prevent cooking vapours passing into the ceiling and also to facilitate its maintenance.

Testing And Balancing (T.A.B.™) taps allow fast control of the exhaust and supply airflows during the commissioning phase or maintenance operations during the life cycle of the kitchen.

The laminar flow units avoid the re-circulation of polluted air with the make-up air, avoiding the grease deposits on the cooking appliances, the floors (slippery floors lead to high risk of falls) and the building structure.

All these features give to the KCJ ventilated ceiling one of the highest levels of hygiene, safety and ease of maintenance.



### Arched design

- Better containment capacity
- An aesthetically pleasing ceiling
- Easier maintenance and improved hygiene

The arched shape of the panels between extraction plenums increases the containment volume. Peak vapour emissions are held there before being aerodynamically directed towards the extraction plenum.

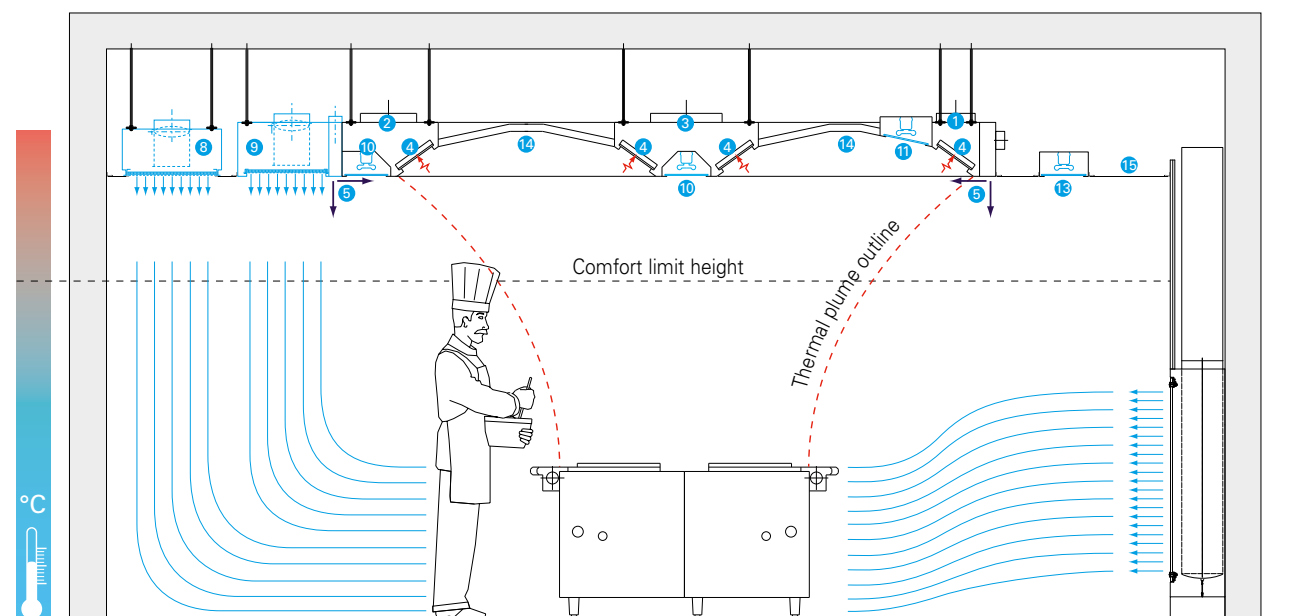
The arches are designed to fit together with an overlap leading to a good airtightness level. The neutral sheets are fixed in place with special L profiles. Arches and sheets remain perfectly in place during cleaning operations, without risk of accidental lifting. These assembly provisions also prevent cooking vapours passing into the ceiling.

All of the components can be disconnected, and the system can be reassembled without tools, for quick and easy maintenance and access to the void above the ceiling.

### Lighting

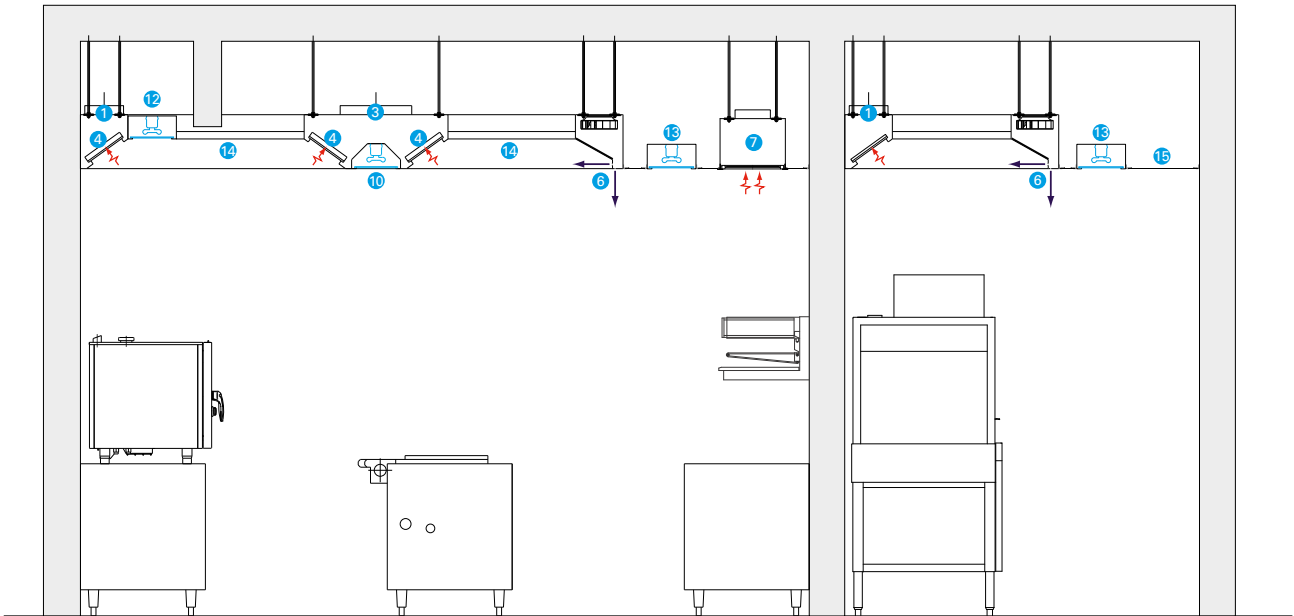
- Uniform lighting
- Great visual comfort for users

With five models to choose from, the lights can be uniformly distributed throughout the kitchen area, whatever the kitchen ceiling configuration. All models are equipped with electronic ballasts and use a Siteco power rail system, enabling the number of lights that are switched on to be adjusted, adding to the energy savings of the system. The lighting is uniform and suited to activity in the kitchen, for improved visual comfort for users.



## General principles

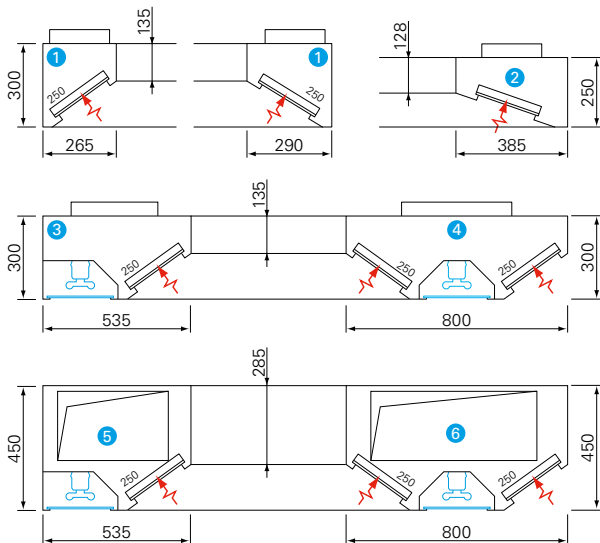
- Extraction plenums constructed from AISI 304 stainless steel, 320 grain, with no visible screws and rivets. T.A.B.™ (Testing And Balancing) ports for pressure testing and air flow rate reading easing proper extract airflow balancing within the area. Flanges with 1.5 mm welded seam and plenum body with 1 mm.
- 1- Single plenum
- 2- Single plenum with integrated light fitting
- 3- Double plenum with integrated light fitting
- High-efficiency KSA cyclonic filters, accredited as flame-resistant, easily dismantled and cleaned by machine. Constructed of AISI 304 stainless steel, constant pressure drop. Twin FC filters as an option.
- 4- KSA cyclonic filters: 500 x 250 x 50 mm
- Ventilated ceilings equipped with double Capture Jet™ technology and peripherals. Modular construction of AISI 304 stainless steel, 320 grain, with no visible screws and rivets.
- 5- Capture Jet™ module
- 6- Arched Capture Jet™ module with integrated Capture Jet™ fan
- Pinpoint extraction plenum constructed from AISI 304 stainless steel, equipped with high efficiency FC filters. T.A.B.™ (Testing and Balancing) ports for pressure testing for direct control of air flow rates.
- 7- Pinpoint extraction plenum
- Laminar-flow supply units. Constructed from AISI 304 stainless steel, 320 grain, with no visible screws and rivets. Stainless steel or aluminium perforated front face, equipped with a honeycomb structure.
- 8- Laminar flow supply unit
- 9- Unit combined with a Capture Jet™ module
- Twin-tube lights, IP54, laminated glass 6 mm thick with plastic divider. Three-phase power rail system.
- 10- Light fitting integrated into the extraction plenums
- 11- Light fitting integrated into the arches between plenums
- 12- Light fitting integrated into the panels between plenums
- 13- Light fitting integrated into neutral zones
- 14- Flat or arched ceiling between plenums: standard construction in AISI 304 stainless steel, 320 grain.
- 15- Passive areas (outside cooking areas): standard construction of aluminium pads or panels supported by aluminium profiles, with lights or integrated spotlights. As an option, aluminium pads or panels can be powder coated (standard white RAL 9010, other colours on request) or constructed from stainless steel.



### Construction and components

The following information and drawings relate to standard construction and components. They can be adapted to suit specific requirements or specific installation conditions.

### Extraction plenums



Constructed from AISI 304 stainless steel, 320 grain, with no visible screws and rivets. Strong side flanges, with a thickness of 1.5 mm. Welded seam for perfect rigidity and waterproofing. T.A.B.™ port for pressure testing for quick and reliable control of air flow rates.

- 1- EP/S – standard single plenum without light fitting
- 2- EP/SF – extra-flat single plenum without light fitting
- 3- EP/SL – standard single plenum with light fitting
- 4- EP/DL – standard double plenum with light fitting
- 5- EP/SLC – single plenum with side duct connection and light fitting
- 6- EP/DLC – double plenum with side duct connection and light fitting

### Installation height (plenum base)

Floor surface area	Minimum	BGN*
< 50 m <sup>2</sup>	2 300 mm	2500 mm
51–100 m <sup>2</sup>	2 500 mm	2750 mm
101–200 m <sup>2</sup>	2 500 mm	3000 mm
> 200 m <sup>2</sup>	2 500 mm	3250 mm

\* Installation heights recommended by BGN (a German-based institution for food processing and restaurant operations)

Maximum plenum length: 3,500 mm

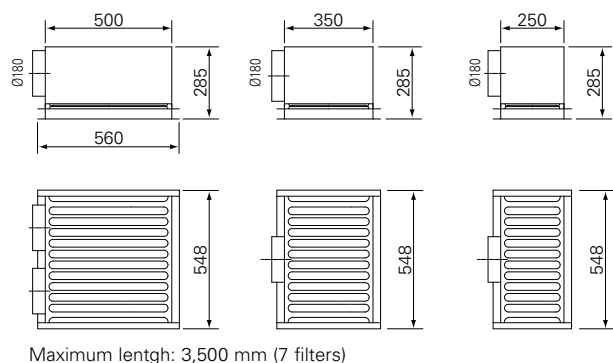
Longer lengths are obtained by on-site joining of plenums together .

Standard filter height: 250 mm

Other heights (and exhaust airflow capacities) available on request.



## Pinpoint exhaust plenum



Maximum length: 3,500 mm (7 filters)

Extraction plenums are intended to handle small-sized cooking equipment with low emission levels and located outside the cooking area covered by the kitchen ceiling (the active area), such as small broilers, small steam ovens, and induction hotplates.

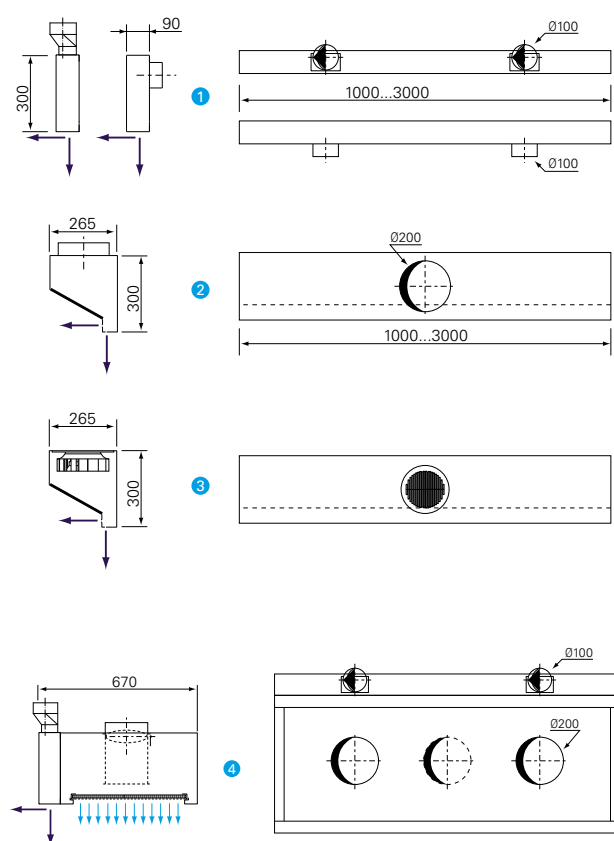
Plenum in galvanised steel. High efficiency FC filters constructed from AISI 304 stainless steel, mirror polished, 1 mm thickness. Closure trim in anodised aluminium. Three sizes available:

- 1- KBO/B50 – FC filter, 500 x 500 mm, 600 m<sup>3</sup>/h max. @ 55 Pa
- 2- KBO/B35 – FC filter, 500 x 350 mm, 450 m<sup>3</sup>/h max. @ 55 Pa
- 3- KBO/B25 – FC filter, 500 x 250 mm, 300 m<sup>3</sup>/h max. @ 55 Pa

Option :

Other diameter connections

## Capture Jet™ system (patent pending)



### Capture Jet™ modules

Constructed from AISI 304 stainless steel, of 1 mm thickness. Two sets of nozzles, one vertical and one horizontal.

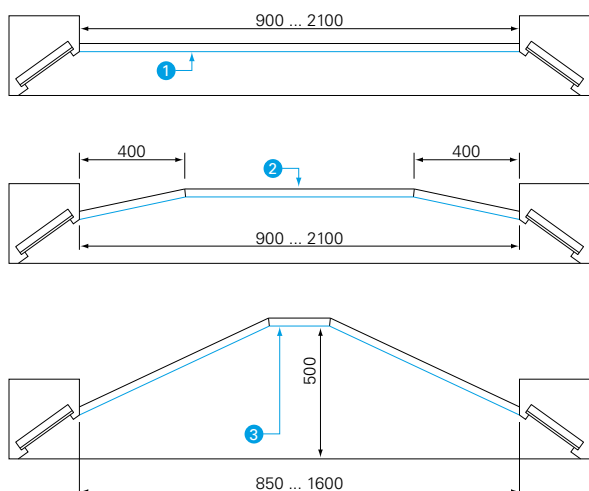
- 1- CJ/B – Capture Jet™ module
- 2- CJ/D – Arched Capture Jet™ module
- 3- CJ/DM – Arched Capture Jet™ module with integrated Capture Jet™ fan

### Capture Jet™ modules combined with a laminar-flow module

Design of the laminar-flow unit similar to the units described hereafter

- 4- CJ/LFU – Laminar-flow supply module combined with Capture Jet™ module

## Active ceilings (extraction areas)



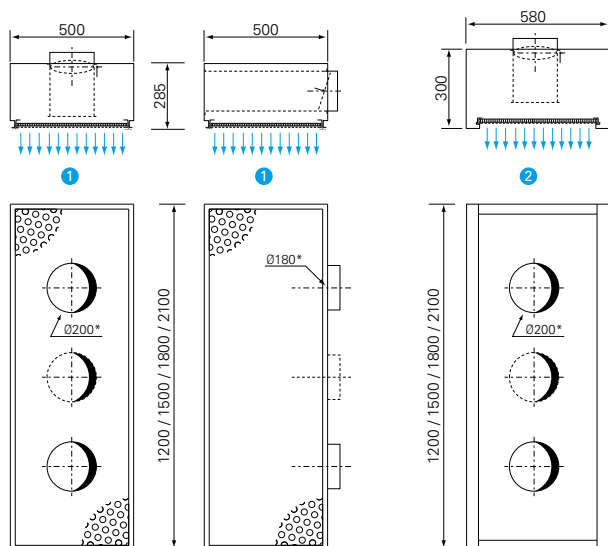
Standard construction in AISI 304 stainless steel, 320 grain, 1 mm thickness. Three panel types available:

- 1- AC/F – stainless steel flat ceiling (aluminium optional)
- 2- AC/D – stainless steel arched ceiling
- 3- AC/HC – arched ceiling with high containment volume (For cooking equipment with high emissions or use in the food-processing industry)

### Options:

Panels powdercoated (standard white RAL 9010, other colours on request) or constructed from stainless steel.

## Laminar-flow air supply modules



\* The number of spigots depends on the supply airflow per unit and can be adjusted to limit the speed through the connections and therefore the sound pressure level.

- 1- LFU/A – Modular laminar-flow module
- 2- LFU/S – Standalone laminar-flow module

### • Modular laminar-flow module:

Designed to be integrated in a neutral ceiling of the panel system type. Plenum in galvanised steel. Tubular flow rate distribution system in perforated galvanised steel. Integrated balancing plate. Anodised aluminium front face with a honeycomb structure. Surrounding frame in anodised aluminium. Anti-vibration fixing brackets.

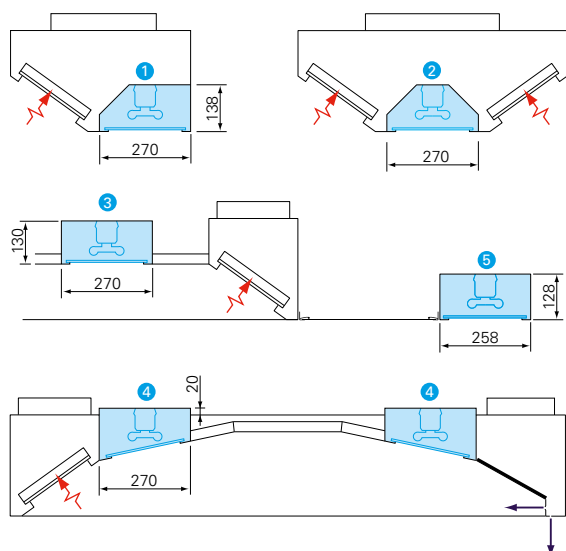
### • Standalone stainless steel laminar flow module:

Design identical to the single air supply module. Plenum in AISI 304 stainless steel, 320 grain.

### Options:

- Ø248 and 313 mm connections
- Facing in powdercoated aluminium (standard white RAL 9010, other colours on request)
- Facing in brushed stainless steel (standalone laminar-flow module) or powdercoated stainless steel (standard white RAL 9010, other colours on request)
- External thermal insulation

## Light fittings



Twin-tube lights, IP54, laminated safety glass 6 mm thick with plastic divider. Electronic ballast and three-phase power rail system.

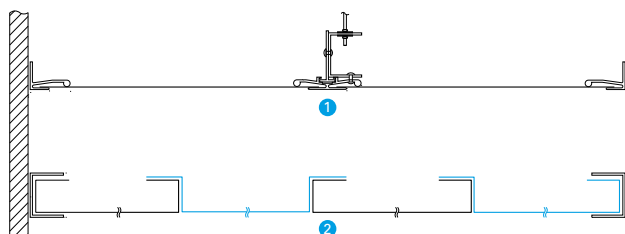
- 1- IL/EP – standard single plenum with light fitting
- 2- IL/EP – double plenum with light fitting
- 3- IL/FC – light fitting flush with the flat ceiling
- 4- IL/DC – light fitting flush with the arched ceiling
- 5- IL/NA – light fitting flush with the neutral ceiling

The Siteco system allows the kitchen lighting to be adjusted by means of a three-phase power rail system, which allows one light in three (walk through lighting for nights), two in three, or all lighting switched on simultaneously.

Options:

IP65 protection, T5 lighting units

## Neutral ceilings



Neutral ceilings in areas without cooking equipment.

- 1- Panel system, with aluminium profile brackets
- 2- Pads system, with aluminium angle brackets

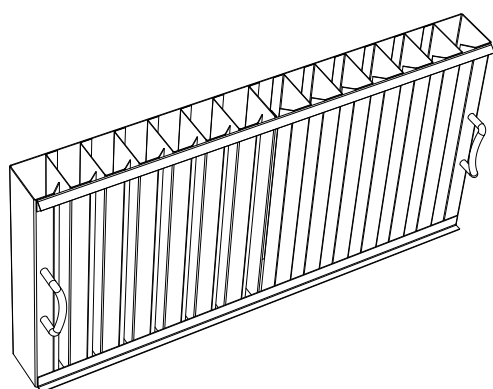
NC/PLA – aluminium pads (1)

NC/PAA – aluminium panels (2)

NC/PAS – stainless steel panels (2)

Options:

- Pads or panels powdercoated (standard white RAL 9010, other colours on request) or constructed from stainless steel.
- Stainless steel angles (panel system)
- Soundabsorbing material (panel system)



Recommended air flow

Rate per filter (250 mm)  $500 < Q_e < 690 \text{ m}^3/\text{h}$

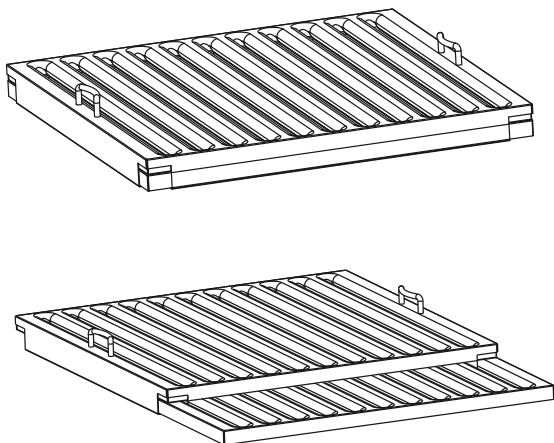
Pressure drop  $65 < \Delta P < 120 \text{ Pa}$

Constructed from AISI 304 (1.4301) polished stainless steel, with constant pressure loss and two handles.

Grease removal efficiency of 95% @120 Pa for particles a diameter of 10 microns or larger.

Flame-resistant filter accredited by the UL laboratory and with NSF hygiene and safety approval. Inclined filters to ensure good condensation removal, reduce the risk of fire, and guarantee perfect hygiene in cooking areas.

## Twin FC filters



Recommended air flow

Rate per filter (250 mm)  $200 < Q_e < 350 \text{ m}^3/\text{h}$

Pressure drop  $30 < \Delta P < 55 \text{ Pa}$

Constructed from AISI 304 (1.4301) mirror-polished stainless steel, with constant pressure loss and two handles. Grease removal efficiency of 96% @65 Pa for particles a diameter of 10 microns or larger.

The twin FC complies with DIN 18869-5, thus preventing, in the event of fire, the flames from entering the exhaust plenum and therefore preventing the fire spreading through the kitchen ductwork and, therefore, the building.

## Quick selection data

Code	Description	Standard length [mm]	Pitch [mm]	Recommended air flow rates*		
					[m <sup>3</sup> /h/ml]	[l/s/ml]
EP/S	Single extraction plenum	1000...3500	500	KSA	1000...1380	278...383
			500	TFC	400...700	111...194
EP/D	Double extraction plenum	1000...3500	500	KSA	2000...2760	556...767
			500	TFC	800...1400	222...389
CJ/C	Combined air supply and Capture Jet™ module	1000	-		750...1000	208...278
CJ/B	Capture Jet™ module	1000...3500	500		20...30	6..8
LF/A	Laminar air supply module	1000	-		400...1000	111...278

\* For 250 mm height filters

Ventilated ceiling weight: CNS 30 kg /m<sup>2</sup>, aluminium 25 kg/m<sup>2</sup>



## Notes



[www.halton.com/foodservice](http://www.halton.com/foodservice)

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