

CamHOSP2

Camfil Farr

Product brochure

CamHOSP2

Camfil Farr – clean air solutions



Complies with high hygienic grades areas

Effective protection for patients

Camfil Farr has been designing and manufacturing air filtration solutions for hospitals for more than 40 years. Protecting patients from the risk of infection is one of its main concerns.

Compliance with high quality requirements

Standards currently give doctors the ability to manage the quality of the hospital environment on the basis of the care being provided and the condition of the patient. Camfil Farr is involved in developing and manufacturing solutions for hospitals which are fully compliant with high grade requirements.

Design

The design involves the use of air flow techniques and a simple implementation.

Unidirectional flow

The system is designed to ensure a unidirectional flow, according to EN ISO 14644 with a regular speed and flows of air, which are almost in parallel, within the range speeds between 0.25 and 0.35 m/s and above. Our solution combines the effective protection required in high and very high hygienic grades areas and a comfortable working environment. Large filters are used to reduce the number of supporting members and give the largest possible air delivery surface. CamHOSP2 complies with the ISO 5 to ISO 6 classes by providing a decontamination rate below the flow of less than CP10.

Terminal HEPA filters

Our solution provides air delivery through terminal filters. This allows risks to be managed more easily and reliably, because the air travels a minimum distance from the highly efficient filters to the operating table.

Materials

The materials comply with the requirements of the European clean room EN ISO 14644-3 standard. The plenum area and the structural elements are made of electro-galvanised steel with an oven-baked epoxy coating, which is highly abrasion resistant, perfectly smooth and can easily be decontaminated. The materials are also resistant to the standard disinfectants used in hospitals.

Guaranteed airtight in the long term

The plenum is assembled using a system of bolts and complies with class B of the EN 1886 standard (completely airtight casing). The passage for surgical lighting or technical arms meets the hygienic requirements as a result of their "airtight cavity" design. The air delivery system is designed, welded and supplied in one piece. This is a considerably more reliable solution than T bar grid systems, which are assembled on site. The maximum leakage rate from the gasket seat is guaranteed to be below 10^{-4} (0.01%) in accordance with EN ISO 14644-3. This, together with the HEPA terminal filters result in high protection for the patient.

Easy, safe and quick filter assembly

As a result of Camfil Farr's proprietary clamping system, which has a compression limiter with captive stops that ensures excessive compression of the gasket is prevented, this allows for a quick filter assembly. The carefully designed layout of the system also provides a maximum effective air delivery surface, whilst adhering to the recommended size restrictions, which ensure that the system can be handled and installed without the risk of damage or injury.

The clamping system can be operated from room side, which allows for a quick and easily replacement of faulty filters, without the need to remove an entire row of filters.

Testing and monitoring of filters in accordance with European EN ISO 14644-3

CamHOSP2 includes as a standard, a sampling port to monitor pressure drop across the HEPA filters and for periodic integrity tests.

Direct access to the HEPA filters allows the integrity of the filters and the absence of any assembly leaks to be accurately monitored in compliance with the EN ISO 14644-3 standard.



Long-term reliability and a long service life

New modular design
Safer and more reliable assembly process
Immediate and lasting airtight joints

1 Factory-made modules ready for assembly
Welded structure made of 2 mm steel. Factory made airtight steel plenum with an oven baked, RAL 9010 epoxy coating

2 Airtight surgical lighting cavity
Allows the surgical lighting system to be maintained without affecting the integrity of the plenum area



3 Assembly at ground level
Easy and safe process for the installation team. Bolting the exterior flanges in place assembles the system

4 Casing guaranteed to be airtight to 450 Pa
Class B of NF EN 1886:1998
Class L1 (M) of PR EN 1886:2003
Class C of PR EN 12237:2003

In addition to complying with all the relevant standards, Camfil Farr's CamHOSP2 filtration ceiling for operating theatres is especially designed to provide ease of installation, maintenance and day-to-day use.

A modular design for easy, quick and reliable installation

The CamHOSP2 system is made up of modules that consist of a continuously welded one-piece filter framework and a plenum area, both of which are pre-assembled and airtight. These simply need to be assembled on site to produce a complete plenum area and an airtight platform for the HEPA filters.

The CamHOSP2 system can be delivered directly to the building site and its modular design makes installation simple.

The small size of the modules (1.20 m x 1.80 m x 0.50 m and 40 kg maximum for the largest ceilings) and the small number of components (4 or 6 modules depending on the type of ceiling) make delivery easy, keeps handling and movement of the system to a minimum and allow for fast and straightforward installation.

The modules are assembled and bolted together on the ground. All the clamping points are accessible from the outside, which allows the installation team to work easily and safely.

The entire ceiling is mounted on hangers. None of the hangers passes through plenum

area. Once the modules are assembled, the base of the modules forms a rigid, high-inertia, self-supporting platform (2 mm steel), with welded rigid suspension plates (2 mm steel) at the edges to which the hangers are firmly fixed.

A surrounding corner structure supports the protruding elements of the false ceiling.

The side air inlets are factory installed to ensure that the plenum area can be connected to the ventilation circuit as easily as possible.

Guarantee of immediate and long-lasting air tightness

It is essential that the ceiling of the operating theatre is airtight in order to provide effective protection for patients. The majority of filtration ceilings installed in operating theatres are sealed at the end of the assembly process, by applying flexible RTV sealant to the ceiling on site in conditions where application of the RTV sealant and access to the ceiling is often difficult. As a result, these ceilings rarely prove to be airtight immediately when the qualification test is carried out on site. Additional measures are then needed which often involve the removal and refitting of the HEPA filters and, therefore, additional charges for the re-running the tests and delays in putting the theatre into operation.

With its CamHOSP2 ceiling, Camfil Farr

has produced a definitive solution to this problem. RTV sealant does not need to be applied on site to ensure that the ceiling is airtight. The joints on clean side are guaranteed to be airtight as a result of the continuous welds.

The connections between the modules are made airtight by the use of a mechanical clamping of a pre-cut specially designed gasket. The clamping device has a compression limiter with stops to ensure that the joints are correctly clamped together. The CamHOSP2 is guaranteed to be airtight when it has been assembled and will remain airtight over time.

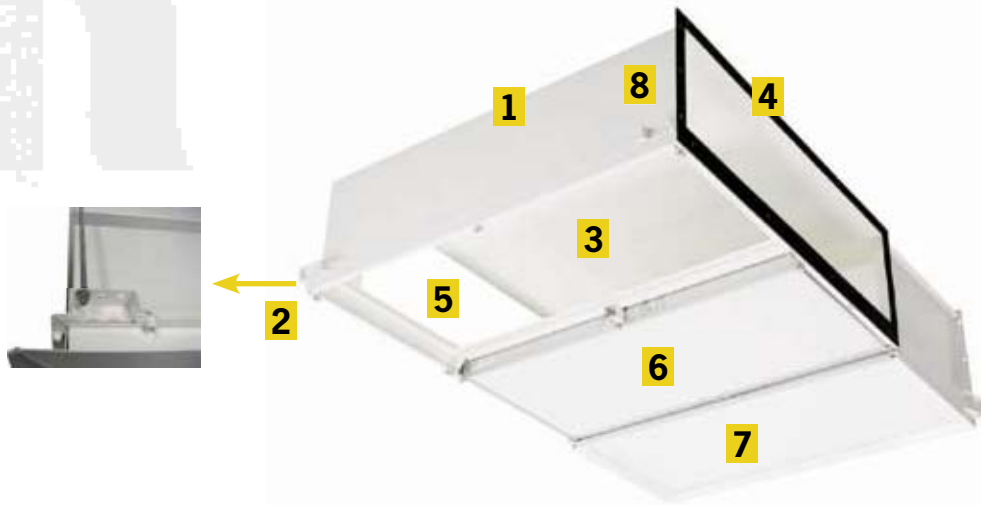
Easy HEPA filter maintenance results in shorter downtimes

With the CamHOSP2 system, filter maintenance is simple and keeps downtimes to a minimum. The filters can be safely and securely refitted.

The HEPA filters are accessed from the operating theatre. The final frames can be removed individually to allow instant access to and replacement of the filters.

The Camfil Farr captive clamping tabs, which have a compression limiter with stops, ensure that the HEPA filters are correctly clamped in place.

Reliability and reduced downtimes



1 Reliable design

Each module is assembled and sealed in the factory. The airtight framework is made of welded 2 mm steel.

2 Permanently airtight

No structures pass through the plenum area. The hangers and accessories are fixed to external welded mounting plates.

3 Easily cleaned and decontaminated

In order to allow the ceiling to be cleaned easily and effectively, it has been designed specifically with a completely separate plenum area. The finishing cover has an oven-baked, white, RAL 9010 epoxy coating with the necessary chemical and mechanical resistance to the cleaning products and disinfectants used in hospitals.

4 Secure assembly

The joints between the modules are pre-cut and clamped together to ensure that they are airtight. The clamping mechanism has a compression limiter with stops.

5 No risk of leakage into the operating theatre

The framework consists of a continuously welded one-piece structure. No components pass through the joints. Permanently airtight structure. The system is guaranteed to be airtight. The leakage rate is $<0.01\%$ at 450 Pa in accordance with ISO EN 14644-3.

8 Accessories

Option of fitting an airflow guide



6 Rapid and totally secure assembly of the HEPA filters

Captive, pre-positioned, pivoting tabs. The Camfil Farr clamping mechanism with a compression limiter ensures that the joints are correctly compressed.



7 Hygienic

The HEPA filters are effectively protected by removable Screenetek screens in individual clip-on frames (see above).

Protective Screenetek screen to ensure maximum usage of the theatre

The CamHOSP 2 ceiling helps to ensure that the operating theatre is used to the maximum extent by keeping maintenance times to a minimum and reducing the downtimes needed to bring the system back into compliance with the standards.

One factor, which has been specifically taken into account is the accidental contamination of the HEPA filters during operations. If a filter is contaminated with blood or other biological substances, it must be replaced before the next operation. Decontaminating the filter by spraying and then wiping it is not

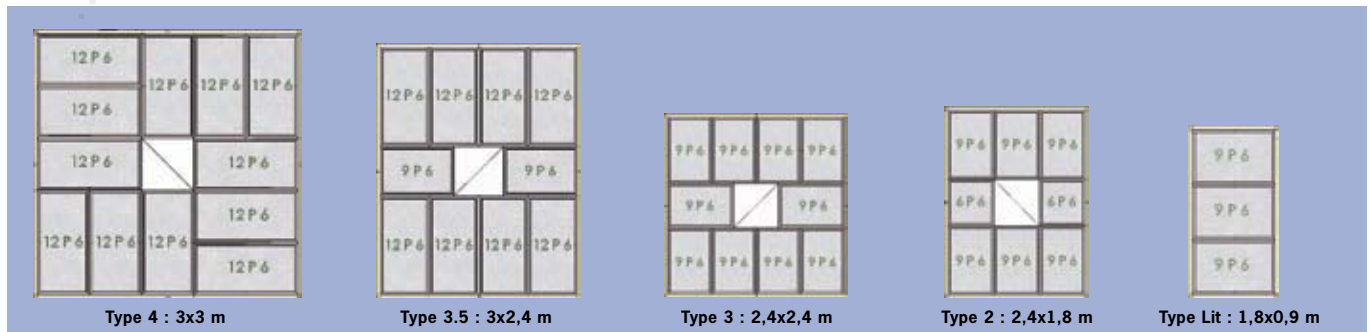
recommended, as this can cause damage to the filter. The use of protective grilles does not resolve the problem. Because this type of grille has relatively large holes, the contamination can reach the upper surface of the grille and therefore the HEPA filter, which is positioned relatively close to the grille.

The Screenetek screens on the CamHOSP2 ceiling solve this problem by providing individual protection for the HEPA filters. These are protective screens made of monofilament polyester fabric on a clip-on frame a few centimetres away from the HEPA filter. If a Screenetek screen becomes contaminated during the course of an operation, the individual screen can easily be replaced

by a clean one in only a few minutes. This ensures that the ceiling is hygienic and that the next operation can take place.

The major benefit of this protective system is that the HEPA filters do not need to be replaced, which would require the operating theatre to be closed down for maintenance, cleaning and re-testing.

Practical design: A range of standard sizes designed to meet your needs



The type 4 CamHOSP2 modular ceiling with an operational surface of around 9 m² for class ISO 5 to ISO 7 is ideally suited for major operations (for example, orthopaedic or cardiac surgery). It also provides a comfortable working environment for the surgical team.

At a speed of 0.25 m/s to 0.30 m/s, this model produces an air change rate of 60 to 70 per/h for a 45 m² operating theatre suite. The type 2, 3 and 3.5 CamHOSP2 ceilings with air delivery surfaces of 4, 6 and 7 m² respectively are suitable for more minor operations.

For extremely sensitive areas (for example, major burns, immune deficient patients), CamHOSP2 has a model designed to provide individual protection for one bed.

Type	Int. size LxWxH mm	Int. surface m ²	Airflow in m ³ /h			No. of module(s)
			at 0,25 m/s	at 0,3 m/s	at 0,45 m/s	
Type Bed	1815x905x400	1.7	1300	1560	2350	1
Type 2	1815x2419x400	4.4	3170	3800	5700	2+2
Type 3	2422x2419x450	5.9	4350	5200	7800	4+2
Type 3.5	3029x2422x450	7.3	5560	6780	10000	4+2
Type 4	3027x3027x450	9.2	7050	8460	12700	4

Features:

Type:	Modular filtration ceiling with a unidirectional flow for operating theatres Design
Construction:	Modular, with each module assembled and sealed in the factory and consisting of: <ul style="list-style-type: none"> 1 plenum part made of mild steel 1 airtight, continuously welded platform with a thickness of 2 mm 1 fastening kit
Assembly:	The modules are simply bolted together on site. Airtight joints are created mechanically between the modules
Protection:	Oven-baked, RAL 9010 epoxy coating both inside and out
Test connector:	1 test connector accessible from the operating theatre to measure the loss of pressure and to take Test Aerosol samples
Fitting the filters:	From the operating theatre the filters can be quickly clamped in place with a compression limiter using captive, pre-positioned tabs
Casing airtight at 450 Pa:	Class B of EN 1886:1998 Class L1 (M) of PR EN 1886:2003 Class C of PR EN 12237:2003
Joints airtight at 450 Pa:	Maximum local penetration < 10 ⁻⁴ (0.01%) in accordance with ISO EN 14644-3
Surgical lighting:	Airtight
Finish:	3 types of finish: <ul style="list-style-type: none"> – Screentek: set of clip-on frame units with removable screens made of monofilament polyester fabric – Protek: set of clip-on frame units with the frame and grill welded and with a white, RAL 9010 epoxy coating – Teknik: set of clip-on frame units with a white, RAL 9010 epoxy coating
Options:	Rigid air flow guides

On world standards...

...Camfil Farr is the leader in clean air technology and air filter production.

Camfil Farr has its own product development, R&D and world wide local representation.

Our overall quality goal is to develop, produce and market products and services of such a quality that we aim to exceed our customers expectations.

We see our activities and products as an expression of our quality.

To reach a level of total quality it is necessary to establish an internal work environment where all Camfil Farr employees can succeed together.

This means an environment characterised by openness, confidence and good business understanding.

www.camfilfarr.com

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Camfil Farr
is a Eurovent certified company