camfil

FOCUS

CLEAN AIR OPERATING THEATRE VENTILATION SYSTEMS

Ultra-clean uni-directional airflow for operating theatres

Australian designed, based on worldwide standards

Incorporates high efficiency air filtration

Simple integration with other ceiling-mounted equipment

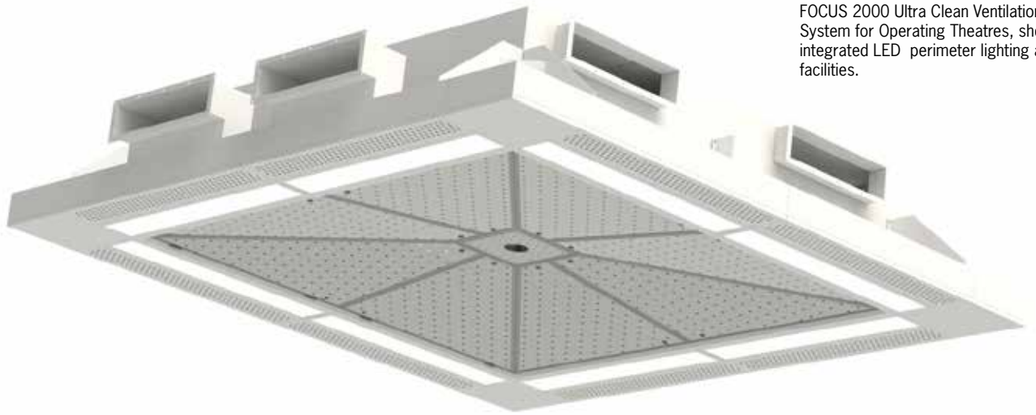
Wide range of fully customisable models

Optional return air and lighting integrated into the units

Low profile / customised options available

Gasket seal option available

Clean air solutions



FOCUS 2000 Ultra Clean Ventilation (UCV) System for Operating Theatres, shown with integrated LED perimeter lighting and return air facilities.

FOCUS

UNI-DIRECTIONAL AND UCV SYSTEMS

In the pursuit of reducing air borne bacteria in operating theatres, FOCUS Clean Air Operating Theatre Ventilation Systems by Camfil Australia provide a controlled distribution of biologically clean sterile air at the operating table, while reducing the risk of contamination from outside the clean zone.

Designed to be constructed in a modular form, FOCUS systems enable installation into existing operating theatre facilites.

Three FOCUS models are available to suit specific applications:

- FOCUS 1000 – Uni-Directional Operating Theatre Ventilation System
- FOCUS 2000 – Ultra Clean Ventilation (UCV) System for Operating Theatres
- FOCUS 3000 – Ultra Clean Ventilation (UCV) System for Operating Theatres

FOCUS Uni-Directional and UVC systems cater to a range of operating theatre requirements; from day surgeries and minor surgical rooms with less demanding airflow requirements through to orthopaedic and neuro operating theatres where deep wound surgery is carried out and there is a high risk of hospital-acquired infection via airborne routes.

Superior Air Quality
FOCUS hospital air filtration systems provide a superior and predictable air quality at the operating theatre table level compared to the conventional arrangement of individual terminal ceiling mounted HEPA filters.

All Camfil FOCUS operating theatre ventilation systems are the result of extensive design research, CFD modelling and refinement from over 20 years of successful installations within Australia.

Our FOCUS Systems comply with the local Australian Council on Health Care Standards (ACHS) guidelines for air flow and velocity at the operating table level and international standards nominated in UK HTM-03.

Cost savings are achieved by reducing onsite labour requirements with the provision of a factory built unit and construction that is quick to install on site, minimising the complex coordination required with traditional theatre ceiling systems.

Custom Engineered
Available with the option for return air facilities and COI (Cyanosis Observation Index) compliant, energy efficient perimeter LED lighting, the unique FOCUS Systems provide operational cost savings in addition to installation cost benefits.

With the extensive experience gained through a great diversity of theatre projects, the Camfil Australia team can assist with the theatre ceiling planning and coordination with the theatre surgical lighting and medical gas and services pendants available from a variety of suppliers.

Each Camfil FOCUS is custom designed to suit the specific requirements of each client, with available options that include gel or gasket seal HEPA filtration, integrated return air and perimeter lighting; and low profile, hybrid or bulkhead style configurations.

FOCUS 2000 installation, shown with integrated LED perimeter lighting and return air.

Hybrid FOCUS installation, shown with joined terminal HEPA modules

FOCUS 2000 installation, shown with integrated flourescent perimeter lighting and return air

FOCUS
ADVANTAGES

Australian designed
FOCUS was engineered to specific design targets that comply with the local Australian Council on Healthcare Standards (ACHS) guidelines for air flow and velocity at the operating table level and the performance requirements of the Health Technical Memorandum (HTM) 03 with respect to supply air velocity below the diffuser.

Air flow at the operating zone is ranged between 0.20 – 0.3 m/s, subject to State codes and guidelines.

- VIC: 0.3 m/s (considered high)
- NSW: 0.20-0.25 m/s
- WA: 0.15-0.2 m/s.
  This lower range is achievable by turning down the airflow, however like all systems trying to achieve this table velocity, they will be more prone to thermal effects and in room disturbances.
- European standards: 0.15 to 0.25 m/s depending on country.

Lighting lux levels are ranged between 600-800 lux to meet the AS1680 Standard nominating the requirements for a specific light spectrum, C.O.I. (Cyanosis Observation Index). DALI dimming is available however some light spectrum changes can occur when lights are dimmed.

These systems are of a proven design where the air distribution profile has been demonstrated by CFD modelling and validated by a full size installation.

Conforms to worldwide standards
FOCUS conforms with international standards for clean workstations and operating theatres, nominated in UK HTM-03.

This includes the range of capacities and sizes available for specific purposes, the provision for on-site testing, and the requirement for increased energy efficiency, including variable or 2 speed turn down.

High efficiency air filtration
FOCUS provides a controlled distribution of biologically clean sterile air at the operating table, while reducing the risk of contamination from outside the clean zone.

This is achieved through high capacity minipleat style HEPA filters (99.99% min efficiency on 0.3µm particles) and a perforated stainless steel diffuser engineered to acheive the required air flow distribution

Constructed for easy cleaning
FOCUS units are constructed from galvanised steel and stainless steel. All theatre-side surfaces are powder coated or constructed from stainless steel to enable easy cleaning and disinfection protocols

Convenient installation
FOCUS units are transported as separate modules which are bolted together on site during installation.

Simple integration with ceiling-mounted equipment
FOCUS systems include a central duct for the inclusion of an operating theatre light stem for the inclusion of surgical lighting and medical gas and services pendants.

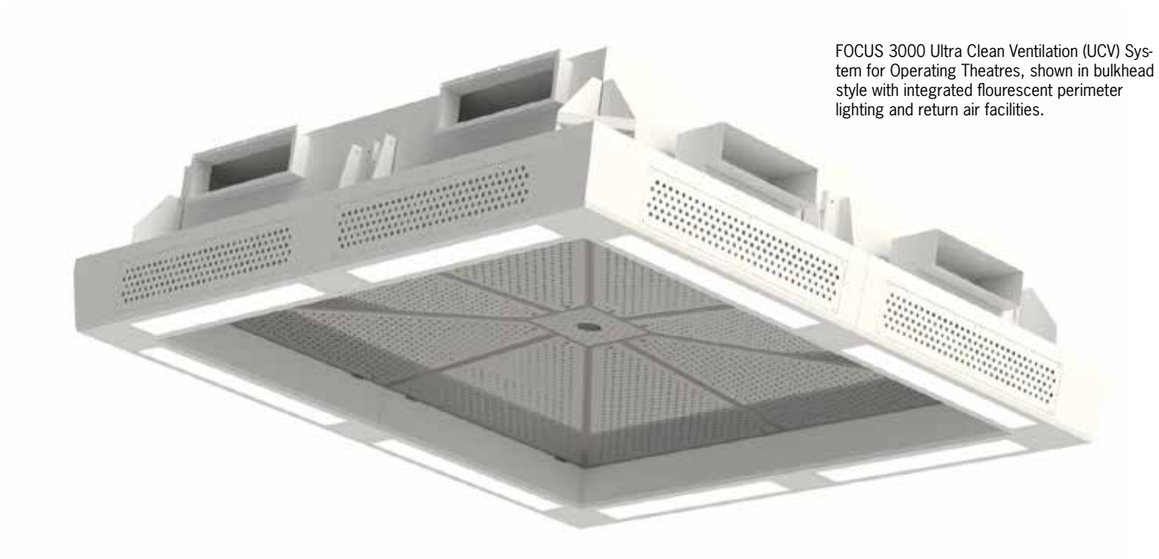
Fully customisable
Each FOCUS is custom designed to suit the specific requirements of each client

Available options include:

- Gel or gasket seal HEPA filtration
- Integrated return air facilities
- Integrated COI compliant, energy efficient perimeter LED lighting
- Operating table light stems attached to the perimeter skirt
- Low profile, hybrid or bulkhead style configurations

Please contact our team for further information and local installation case studies.

FOCUS
SYSTEM CONFIGURATION



FOCUS 3000 Ultra Clean Ventilation (UCV) System for Operating Theatres, shown in bulkhead style with integrated flourescent perimeter lighting and return air facilities.

STANDARD DESIGN

Standard design characteristics for all FOCUS models include:

- Modular construction. Compact size to minimize ventilation plant capacity.
- 65mm depth high capacity, low pressure loss minipleat HEPA filters (99.99% min efficiency on 0.3µm particles).
- Gel filter sealing.
- Perforated stainless steel diffuser engineered to achieve the required air flow distribution.
- Central services duct for operating theatre light stem.

In addition to the above, FOCUS 3000 standard design characteristics also include:

- Bulkhead style return air configuration
- Blanked openings for the option of integrated perimeter lighting and return air grilles.

OPTIONAL DESIGN

Optional design characteristics for all FOCUS models include:

- 120mm depth high capacity, low pressure loss minipleat HEPA filters.
- ULPA filters (99.9995% min efficiency on 0.12µm particles).
- Integrated perimeter lighting, including COI compliant LED (meeting the requirements of AS/NZS 1680.2.5:1997 for examination lighting) and dimmable corner lighting.
- Integrated perimeter return air grilles (max. 50% of supply air) and duct connections.
- Varied pendant locations: centre mounted, side mounted (FOCUS 3000) or structure by others.
- Remote mounted differential pressure gauge for HEPA filter condition monitoring.
- Trimming dampers within the supply duct connections (FOCUS 1000), or in spigot (FOCUS 2000).
- Bulkhead style return configuration in lieu of screens.
- Customised designs can be implemented for specific project work, including low profile or hybrid style configurations.

AIR QUALITY & DISTRIBUTION

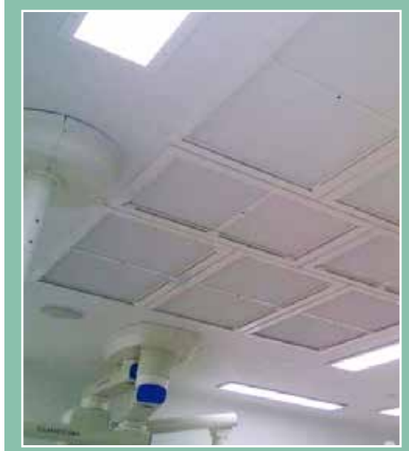
Minimum standards include:

- A maximum of 0.5 bacteria-carrying particles per cubic metre of air issuing from the final filters.
- Less than 10 bacteria-carrying particles per cubic metre of air within 300mm of the wound.
- Less than 20 bacteria-carrying particles per cubic metre of air in the working area* at table height (contamination of instruments and material within the sterile field will lead to wound contamination).
  *FOCUS 1000: 1.9m x 1.9m,
  FOCUS 2000: 2.4m x 2.4m
  FOCUS 3000: 2.8m x 2.8m
- The system provides a controlled distribution of ultra clean air vertically downward and outwards.
- The airflow rate average velocity figures for FOCUS 2000 / 3000 UCV systems are designed to comply with the ACHS and HTM guidelines.

FOCUS 1000 standard installations

FOCUS 2000 installation, shown with integrated LED perimeter lighting, return air and central duct operating theatre light stem.

FOCUS 3000 bulkhead style installation, shown with integrated flourescent perimeter lighting and return air facilities.



Hybrid FOCUS installations co-ordinated with medical imaging equipment gantry

FOCUS
SELECTION GUIDE

Model Configuration [1]	Nominated Clean Zone Dimension (mm)	Overall Dimensions (mm)			Central Duct [2] Restricting Dimension (mm)	Diffuser Area (mm)		Supply Air Volume (L/s)	Conditioned Air Supply* *Rec.Min. (L/s)	Face Velocity at Diffuser (m/s)	HEPA Filter					
		Width (W)	Length (L)	Depth (D)		Width (W)	Length (L)				Qty per unit	Dimensions (mm) Width (W)	Length (L)	Depth (D)	Initial PD 65 D	120 D
FOCUS 1000 STD	1900 x 1900	2200	2200	550	348	1900	1900	1500		0.41	4	552	1118	65/120	248	187
FOCUS 1000 PL[4]	1900 x 1900			550	348	1900	1900	1500		0.41	4	552	1118	65/120	248	187
FOCUS 1000 RA[5]	1900 x 1900	2500	2500	550	348	1900	1900	1500		0.41	4	552	1118	65/120	248	187
FOCUS 1000 PR[6]	1900 x 1900	2500	2500	550	348	1900	1900	1500		0.41	4	552	1118	65/120	248	187
FOCUS 2000 STD	2400 x 2400	2800	2800	650	301	2400	2400	2200	900	0.38	8	552	813	65/120	254	191
FOCUS 2000 PL[4]	2400 x 2400			650	301	2400	2400	2200	900	0.38	8	552	813	65/120	254	191
FOCUS 2000 RA[5]	2400 x 2400	3300	3300	650	301	2400	2400	2200	900	0.38	8	552	813	65/120	254	191
FOCUS 2000 PR[6]	2400 x 2400	3300	3300	650	301	2400	2400	2200	900	0.38	8	552	813	65/120	254	191
FOCUS 3000[7] STD	2800 x 2800	3420	3420	650	141	2800	2800	2980	1200	0.38	8	610	1220	65/120	254	191

Notes:
STD - Standard model
PL - Standard model with Perimeter Lighting
RA - Standard model with Return Air
PR - Standard model with Perimeter Lighting and Return Air

1 Optional perimeter lights or return air will add 300mm to overall dimensions (150mm per side).
Refer FOCUS 1000 and FOCUS 2000 - PL, RA, PR models
2 Restricting dimension in central duct for operating theatre light stem.
3 Check your local State guidelines for minimum operating theatre requirements.
4 FOCUS 1000 PL and FOCUS 2000 PL models include integrated COI compliant LED perimeter lighting .
5 FOCUS 1000 RA and FOCUS 2000 RA models include return air grilles with duct connections.
6 FOCUS 1000 PR and FOCUS 2000 PR models include integrated COI compliant LED perimeter lighting and return air grilles with duct connections.
7 FOCUS 3000 STD bulkhead style includes blanked panels for the optional integrated COI compliant LED perimeter lighting and return air grilles with duct connections.
8 The initial PD is based on the initial clean pressure drop of the HEPA filter at the rated flow and an estimate of the system pressure losses based on the incoming duct connections and plenum effects.
9 Optional ULPA filters (99.999% min efficiency on 0.12µm particles) are available for all FOCUS models.

Performance
The installation of the FOCUS systems should take into consideration the clean zone required (client nominated), the unit mounting height, the ceiling space and height, the diffuser configuration and the quantity of conditioned air, the supply air temperature and the room construction.

Correct installation of the system and the balancing of the supply and return air flow rates is important to ensure optimal performance.

General Filter Information
Due to the critical nature of their end-use, laminar flow grade filters are manufactured and tested in a segregated production area with its own laminar flow grade air supply.

Each filter is individually tested and inspected to ensure that it conforms to industry standards and meets or exceeds the expectations of the customer.

The HEPA filter (or ULPA filter if selected) combined with the FOCUS unique design delivers ultraclean, sterile air over the operating table downwards and outwards enveloping and protecting the patient and theatre personell.

A differential pressure gauge can be interfaced with the BMS to monitor filter performance and provide notification for filter change over.

Optional pressure ports for monitoring filter pressure can be provided for connection by the BMS contractor (subject to co-ordination).

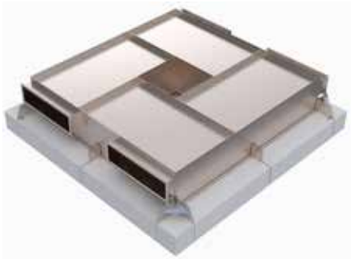
Camfil Australia recommend replacing gel seal HEPA filters when contaminated or the loaded pressure is reached, but no longer than 5 years from manufacture date due to possible degradation of the gel.

Design Considerations
Ample AHU capacity for the required outside air :
- For the clean zone required (client nominated) to meet table velocities
- For the required outside air load
- For the required FOCUS unit airflow

Standard FOCUS unit (alternative to using individual housings)
- Singular hanging arrangement
- Singular ceiling penetration
- CFD Modelled performance
- Improved airflow and clean zone

FOCUS unit with integrated return air and perimeter lighting
- As per above
- Singular penetration for multiple supply, return air and lighting
- Unitary construction
- Co-ordination of services reduced
- Reduced risk of ceilings being compromised (leakage) between differing services

FOCUS 1000 UNI-DIRECTIONAL

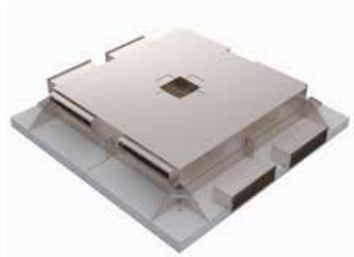


Suitable for small operating theatres and day procedure clinics.

- Diffusion size: 1,900 x 1,900mm
- Overall size: 2,200-2,800 square (subject to options)
- Nominal airflow: 1500 L/s
- Filters: 4 off

Standard design characteristics:
- Modular construction.
- 65mmD minipleat HEPA filters (99.99% min efficiency on 0.3µm particles).
- Gel filter sealing.
- Perforated stainless steel diffuser engineered to achieve the required air flow distribution.
- Central services duct for operating theatre light stem.

FOCUS 2000 UCV

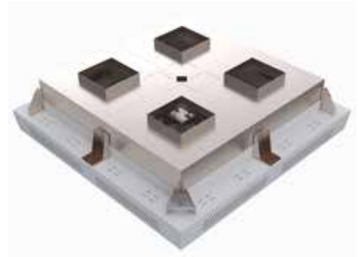


Suitable for general and orthopaedic surgery.

- Diffusion size: 2,400 x 2,400mm
- Overall size: 2,800-3,300 square (subject to options)
- Nominal airflow: 2200 L/s
- Filters: 8 off

Standard design characteristics:
- Modular construction.
- 65mmD minipleat HEPA filters (99.99% min efficiency on 0.3µm particles).
- Gel filter sealing.
- Convex tapered (focus) perforated stainless steel diffuser engineered to achieve the required air flow distribution.
- Central services duct for operating theatre light stem.

FOCUS 3000 UCV



Suitable for orthopaedic and major surgery.

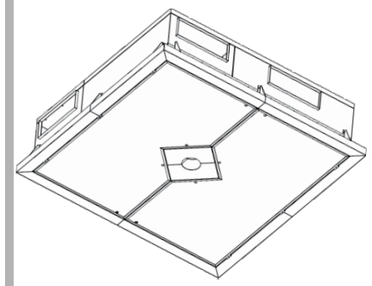
- Diffusion size: 2,800 x 2,800mm
- Overall size: 3,200-3,420 square (subject to options)
- Nominal airflow: 2980 L/s
- Filters: 8 off

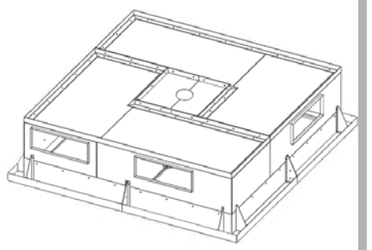
Standard design characteristics include:
- Modular construction.
- Bulkhead style
- 65mmD minipleat HEPA filters (99.99% min efficiency on 0.3µm particles).
- Gel filter sealing.
- Convex tapered (focus) perforated stainless steel diffuser engineered to achieve the required air flow distribution.
- Central services duct for operating theatre light stem.
- Bulkhead style return air configuration
- Bulkhead style includes blanked panels for the optional intergration of COI compliant LED perimeter lighting and perimeter return air grilles (max. 50% of supply air) and duct connections.

FOCUS

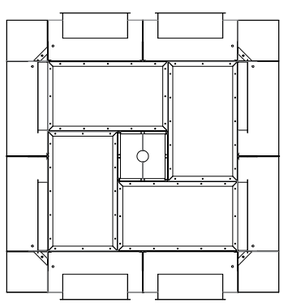
GENERAL ARRANGEMENT

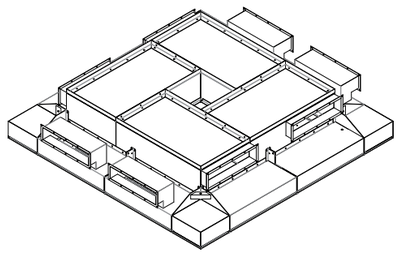
FOCUS 1000 standard model
Diagrams (left and below)

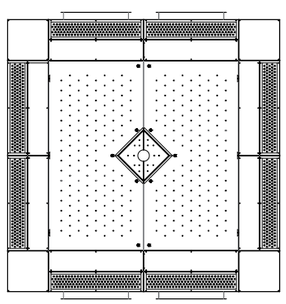


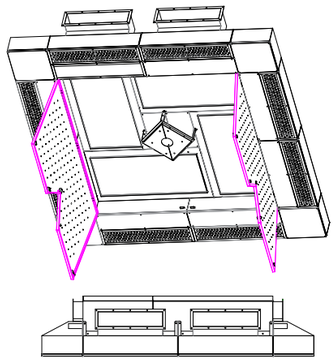


FOCUS 1000 with integrated perimeter lighting and return air grilles.
Diagrams (left and below) .

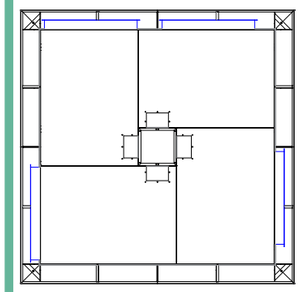


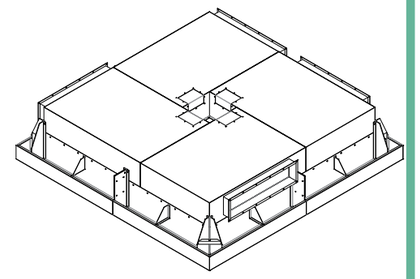


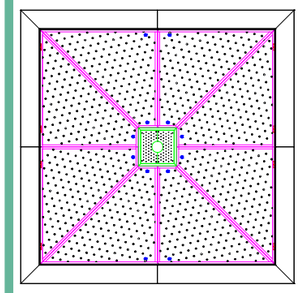


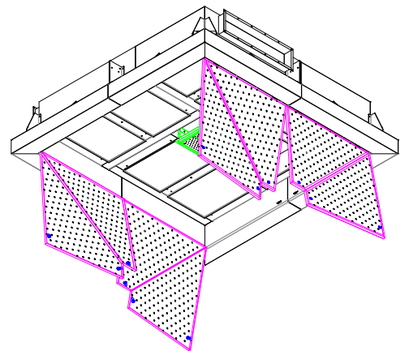


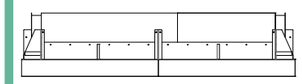
FOCUS 2000 standard model
Diagrams (left and below)



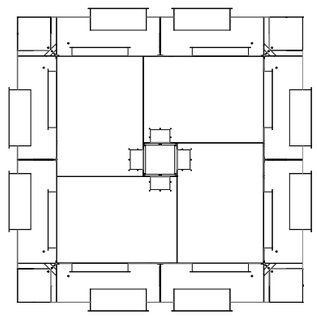


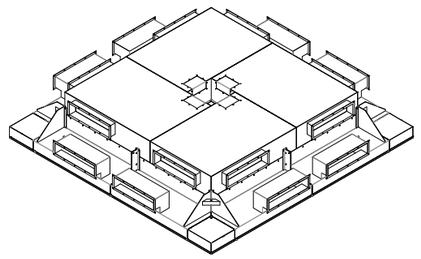


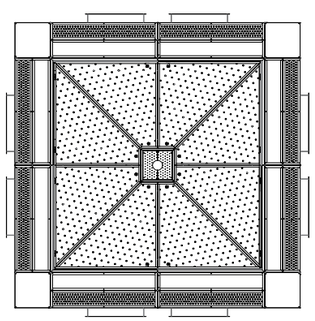


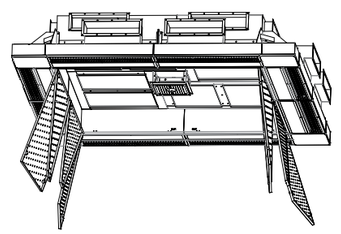


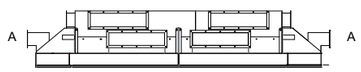
FOCUS 2000 with integrated perimeter lighting and return air grilles.
Diagrams (left and below) .





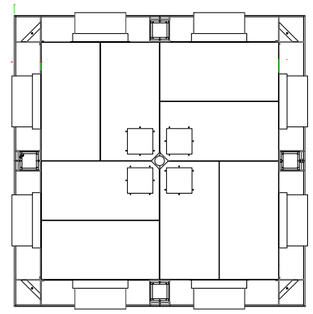


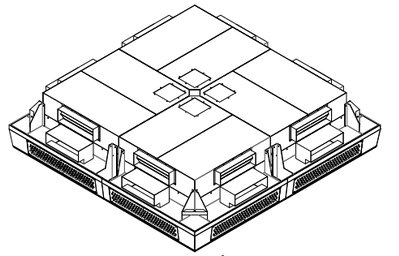


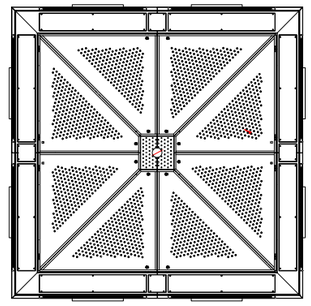


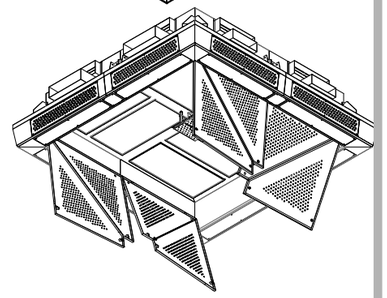
FOCUS 3000 standard bulkhead style model is similar to pictured below, with blanked panels in place of the optional integrated perimeter lighting and return air grilles

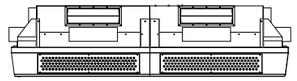
FOCUS 3000 standard bulkhead style model with integrated perimeter lighting and return air grilles.
Diagrams (left and below)











FOCUS

AIR MOVEMENT

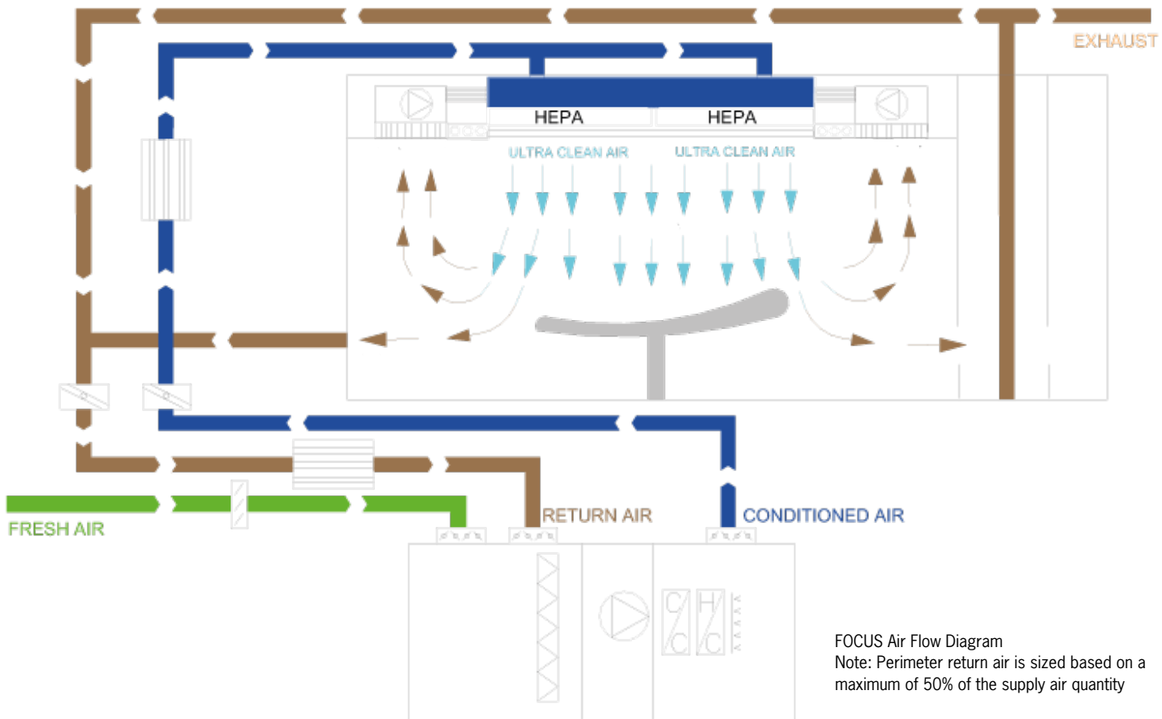
CFD modelling diagrams show the uniform controlled air movement acheived through the FOCUS Clean Air Operating Theatre Ventilation Systems.

The various shading of air flow depicted in the CFD modelling shows the face velocity at the ceiling diffuser with controlled uniform velocity providing a clean air distribution pattern across the designated clean zone, and demonstates the table height as being within the range of the DHS (Department of Health Services) guidelines for the operating theatre ventilation systems.

FOCUS 1000 UNI-DIRECTIONAL
The air distribution moves downward and outwards from the table, providing a clean air zone by moving the air in a controlled and uniform fashion. Any particulates forming in the clean zone under the FOCUS 1000 by the theatre team or a procedure within the theatre are quickly diluted through the controlled air distribution and expelled from the clean zone.

FOCUS 2000/3000 UCV
The FOCUS 2000/3000 arrangement is designed to incorporate high level (ceiling return air) and low level (exhaust air).
The air distribution moves downward and outwards from the table providing an ultra clean air zone directly under the diffuser and surrounding operating table.

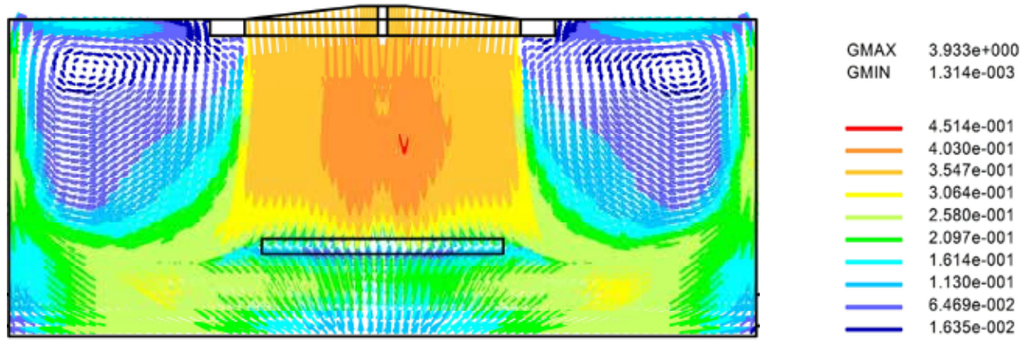
The FOCUS 2000/3000 unit continually purges clean air, diluting any airbourne particles that may have formed around the surgical team away from the theatre clean zone. Temperature controlled fresh air is mixed with return air at the AHU and passed through HEPA filters, delivering ultra clean air to the clean air space under and surrounding the unit. This creates and maintains a particulate free environment.



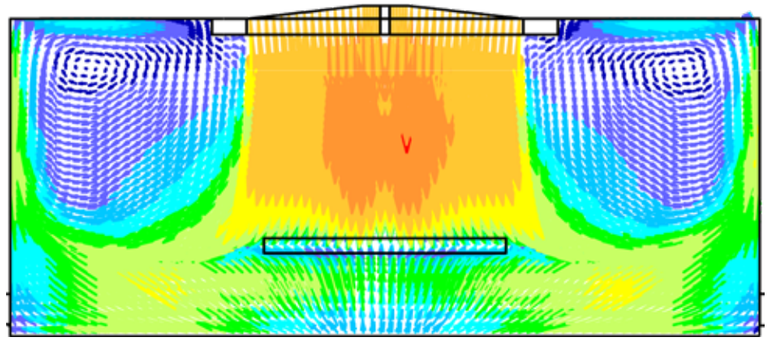
FOCUS Air Flow Diagram
Note: Perimeter return air is sized based on a maximum of 50% of the supply air quantity

FOCUS

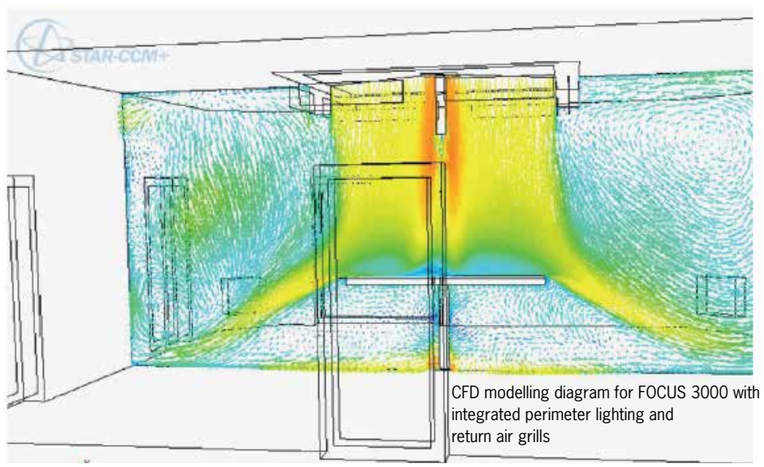
CFD MODELLING



CFD modelling diagram for FOCUS 1000



CFD modelling diagram for FOCUS 2000



CFD modelling diagram for FOCUS 3000 with integrated perimeter lighting and return air grills

FOCUS

ENGINEERING SPECIFICATIONS

1.1 Theatre Ventillation System
Provide operating theatre ventilation systems for installation in operating theatres as indicated on the drawings. The system shall be designed to comply with the Australian Council on Health Care Standards (ACHS) guidelines for the air flow and velocity and at the operating table level and the performance requirements of the Health Technical Memorandum (HTM) 2025/03 with respect to supply air velocity and distribution below the diffuser. The operating theatre ventilation system shall be of a proven design where the air distribution profile has been demonstrated by CFD modelling and validated by a full size installation.

1.2 Design
In the pursuit of reducing airborne bacteria in operating theatres, the operating theatre ventilation system shall provides a controlled distribution of biologically clean air at the operating table, while reducing the risk of contamination from outside the clean zone. The theatre ventilation unit shall be constructed in modular form to enable installation in the existing facility.

FOCUS 1000 Uni-Directional: The operating theatre ventilation system shall serve a theatre where typical applications include, day surgery and minor to intermediate procedures where there is a high risk of hospital acquired infection via air borne routes.

FOCUS 2000/3000 UCV: The operating theatre ventilation system shall serve theatres, where typical applications include orthopaedic and neuro operating theatres, where deep wound surgery is carried out and there is a high risk of hospital acquired infection via air borne routes.

Design Characteristics
- Modular construction.
- Mini pleat high capacity low pressure loss HEPA filters.
- Gel filter sealing.
- Perforated 316 stainless steel diffuser engineered to achieve the required air flow distribution
- *Standard FOCUS 1000 / 2000* Central duct for operating theatre light stem.
- *Standard FOCUS 3000* Central duct for operating theatre light stem and 4 of perimeter services stem locations.
- Integrated perimeter lighting.
- Integrated return air grilles
- *Optional FOCUS 1000 / Standard FOCUS 2000 /3000:* Differential pressure gauge for HEPA filter condition monitoring

Air Quality and Distribution
For the operating theatre ventilation systems the following minimum standards are desirable:
- A maximum of 0.5 bacteria-carrying particles per cubic metre of air issuing from the final filters.
- Less than 10 bacteria-carrying particles per cubic metre of air within 300mm of the wound.
- Less than 20 bacteria-carrying particles per cubic metre of air in the
  FOCUS 1000: 1.9m x 1.9m
  FOCUS 2000: 2.4m x 2.4m
  FOCUS 3000: 2.8m x 2.8m
  working area at table height (contamination of instruments and material within the sterile field may lead to wound contamination and the risk of hospital infection). The system shall provide a controlled distribution of ultra clean air vertically downward and outwards. The airflow rate average velocity figures shall be designed to comply with the ACHS and HTM guidelines.

Construction
High quality zinc seal steel with epoxy paint finish to ensure a hard wearing cleanable finish. The diffuser shall be manufactured from stainless steel sheet perforated and formed to assist with the airflow distribution.

Dimension Clean zone (nom):
FOCUS 1000: 1900 x 1900
FOCUS 2000: 2400 x 2400
FOCUS 3000: 2800 x 2800

Overall Size (nom):
FOCUS 1000: 2200x2200 (2500 x 2500) including the perimeter lighting and return air section)
FOCUS 2000: 2800x2800 (3300 x 3300) including the perimeter lighting and return air section)
FOCUS 3000: 3420x3420

Unit Depth
FOCUS 1000: 600mm
FOCUS 2000: 650mm
FOCUS 3000: 870mm

Supply Air Volume:
FOCUS 1000: 1500l/s
FOCUS 2000: 2200l/s
FOCUS 3000: 2980l/s

FOCUS 2000/3000: Conditioned Air Supply recommended minimum: 900 l/s

Average face velocity at diffuser:
FOCUS 1000: 0.415m/s.
FOCUS 2000/3000: 0.38m/s.

Return air (for return air option) recommended maximum of:
FOCUS 1000: 750 l/s (50% of supply)
FOCUS 2000: 1100 l/s (50% of supply)
FOCUS 3000: 1490 l/s (50% of supply)

Performance
The installation of the operating theatre ventilation system should take into consideration the unit mounting height, the ceiling height, the diffuser configuration and the quantity of conditioned, the supply air temperature and the room construction. Correct installation of the system and the balancing of the supply and aid return air flow rates is important to ensure optimal performance.

1.3 Selection
Quantity: As Scheduled
Make: Camfil Australia or approved equivalent
Model no.:
FOCUS 1000 / 2000 / 3000 STD standard)
FOCUS 1000 / 2000 / 3000 PL with integrated perimeter lighting
FOCUS 1000 / 2000 / 3000 RA with integrated return air
FOCUS 1000 / 2000 / 3000 PR with integrated perimeter lighting and return air grilles

1.4 Filters
FOCUS 1000:
Provide 4 of 552x1118x120mm (media 100mm deep) minipleat HEPA filters:
FOCUS 2000:
Provide 8 of 552x1118x120mm (media 100mm deep) minipleat HEPA filters:
Sealing: Gel Seal
FOCUS 3000:
Provide 8 of 610x1220x120mm (media 100mm deep) minipleat HEPA filters:
Sealing: Gel Seal
Filter Frame: Aluminium
Make: AirePanel CS Filter or approved equal
Model no.:
FOCUS 1000:
AP304046 (rated at 99.99% @ 0.3 micron)
FOCUS 2000:
AP600809 (rated at 99.99% @ 0.3 micron)
FOCUS 3000:
AP305460 (rated at 99.99% @ 0.3 micron)

FOCUS 1000:
All filter modules factory tested in accordance with IES-RP-CC-007.1 by Dual Laser Spectrometer using a polystyrene latex (PSL) test challenge. The Spectrometer samples simultaneously both upstream and downstream of the filter and calculates its efficiency by particle size in 7 size ranges from 0.07um to 3.0um. No DOP or other liquid-based aerosols are used on the filter.

Due to the critical nature of their end-use, Laminar Flow Grade filters are to be manufactured and tested in a segregated production area with its own Laminar Flow Grade air supply. Each filter is individually tested and inspected to ensure that it conforms to industry standards and meets or exceeds the expectations of the customer.

Filter used: HEPA (99.995% minimum efficiency on 0.3um particles) delivers ultraclean air over the operating table downwards and outwards.

FOCUS 2000 / 3000:
All filter modules are factory tested in accordance with EN1822-4 and EN1822-5 in accordance with EN1822-2.

Due to the critical nature of their end-use, Laminar Flow Grade filters are to be manufactured and tested in a segregated production area with its own Laminar Flow Grade air supply. Each filter is individually tested and inspected to ensure that it conforms to industry standards and meets or exceeds the expectations of the customer.

Filter used shall be HEPA H14 (99.995% minimum efficiency on 0.3um particles) and with the FOCUS 2000/3000 unique design delivers ultraclean air over the operating table downwards and outwards.

Provide an optional differential pressure gauge for filter pressure loss indication and option for differential pressure transducer for interfaced with a BMS to monitor filter performance pressure and indicate the need for filter change over.

1.5 Perimeter Lighting (Optional)
Selection: *FOCUS 1000:*
2 of 900 lg LED lights per side
Provide 8 of 46W, 5500LM LED lights integrated into the FOCUS 1000, complete with DELTA LED diffuser, and clear acrylic diffuser lens, 950X210. Colour spectrum to be compliant with Cyanosis Observation Index (COI) requirements of AS1680.2.5-1997, dimmable, with lighting control panel by the installer (DALI).

Selection: *FOCUS 2000:*
8 of 62W, 7300LM LED lights integrated into the FOCUS 2000, IP 65, CRI 92+, glare index <19, COI 1.9, 4000K, Dali dimmable, Zhaga compliance, complete with DELTA LED diffuser, and clear acrylic diffuser lens, 1240X210. Colour spectrum to be compliant with Cyanosis Observation Index (COI) requirements of AS1680.2.5-1997, (DALI).

Selection: *FOCUS 3000:*
Provide 8 of 62W, 7300LM LED lights integrated into the FOCUS 3000, IP 65, CRI 92+, glare index <19, COI 1.9, 4000K, Dali dimmable, Zhaga compliance, complete with DELTA LED diffuser, and clear acrylic diffuser lens, 1240X210. Colour spectrum to be compliant with Cyanosis Observation Index (COI) requirements of AS1680.2.5-1997, (DALI).

CAMFIL – a global leader in air filters and clean air solutions.

For more than half a century, Camfil has been helping people breathe cleaner air. As a leading manufacturer of premium clean air solutions, we provide commercial and industrial systems for air filtration and air pollution control that improve worker and equipment productivity, minimize energy use, and benefit human health and the environment.

We firmly believe that the best solutions for our customers are the best solutions for our planet, too. That's why every step of the way – from design to delivery and across the product life cycle – we consider the impact of what we do on people and on the world around us. Through a fresh approach to problem solving, innovative design, precise process control and a strong customer focus we aim to conserve more, use less and find better ways – so we can all breathe easier.

The Camfil Group is headquartered in Stockholm, Sweden, and has 33 manufacturing sites, six R&D centers, local sales offices in 30 countries, and about 4,800 employees and growing. We proudly serve and support customers in a wide variety of industries and in communities across the world. To discover how Camfil can help you to protect people, processes and the environment, visit us at www.camfil.com

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