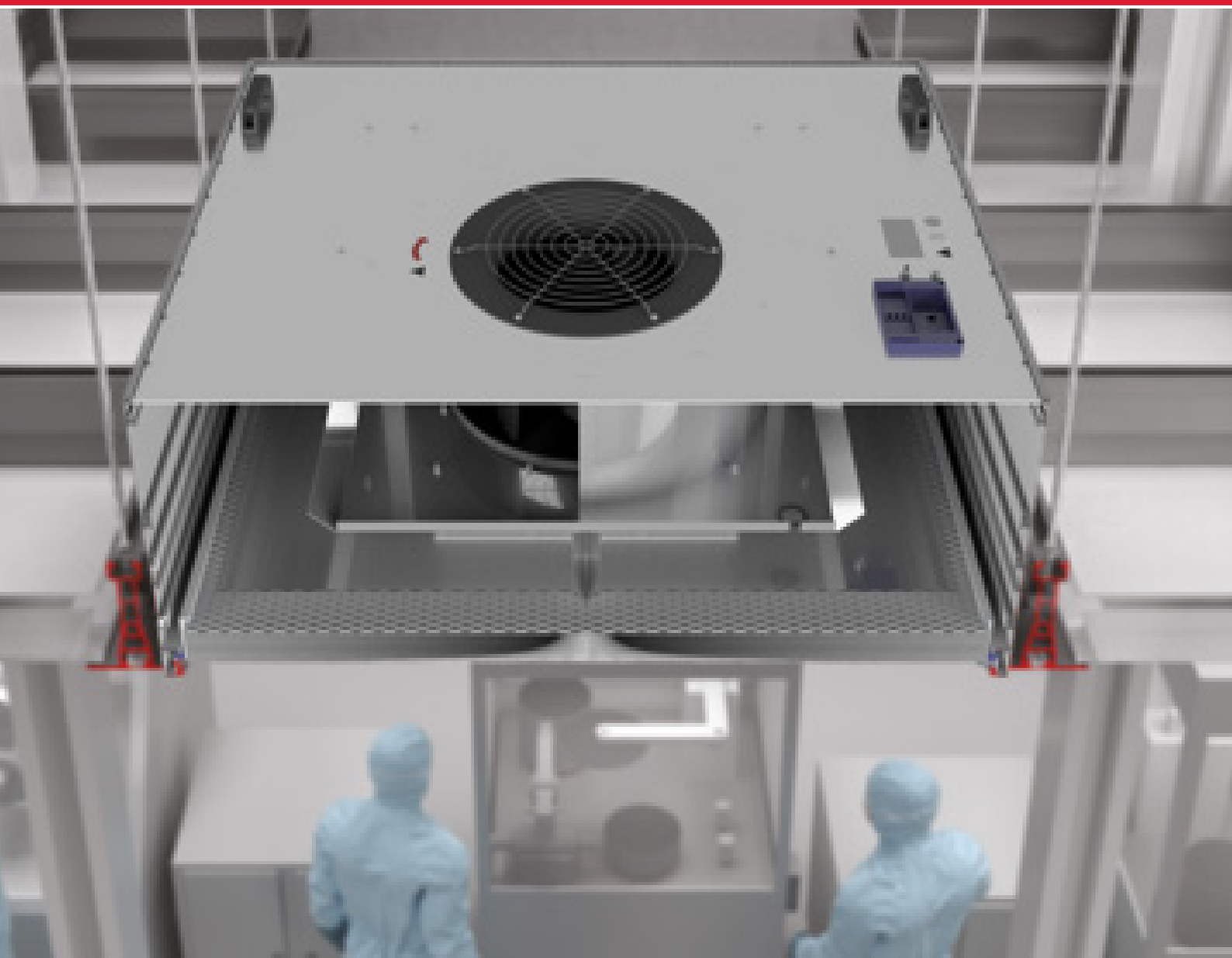
AAF INTERNATIONAL

Bringing clean air to life.™

High Purity Filtration Solutions

Cleanroom Components

AstroFan® FFU
High Efficiency HEPA/ULPA FFU



AstroFan FFU

ASTROFAN FAN FILTER UNIT

Product description

The AstroFan FFU module comprises of an aluminium housing containing a high performance, encapsulated, AAF- Optimized, direct-drive, backward curved EC fan/motor combination and a replaceable AAF HEPA or ULPA filter.
The entire housing is easy to decontaminate and resistant to disinfectants.

Reduced energy consumption and less noise thanks to AAF Optimized fan design

AAF centrifugal fans with backward-curved blades are the new standard in ventilation and air-conditioning. AAF fans include both noise minimization and a further decrease in energy consumption. Backward-curved blades cut the noise level in half and reduces power requirements significantly.

The ideal solution to minimize your planned and unplanned cleanroom downtime costs by offering:

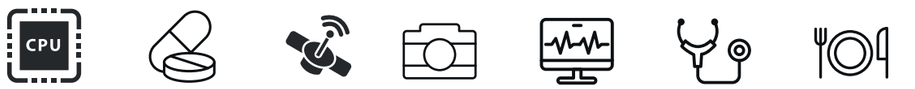
- More Flexibility
- More Safety
- More Convenience
- More Cost Savings
- More Reliability

Features and Benefits

- Available in up to 7 standard sizes
- Lightweight aluminium housing
- Low sound level
- Suitable for all ISO cleanroomclasses
- Suitable for turbulent and laminar flow
- Suitable for a wide range of AAF HEPA and ULPA filters
- Available with EC RS-485, 0-10 Volt and MODBUS RTU control interface

Applications

The AAF AstroFan Filter Unit (FFU) is a self-contained ceiling fan filter module, designed for use in turbulent mixing and laminar airflow cleanroom areas. The unit is designed for utilization in the AAF 50 mm, 55 mm T-Bar ceiling grid, the AstroDry HD ceiling grid and compatible ceiling grids. The lightweight unit is easy to install. Typical applications include cleanrooms ISO.EN 14644-1,Class 5 (Class M 3.5 (100) to US Federal Standard 209E).



AstroFan FFU Modular VS AstroFan FFU Base

One product line, two areas of application where customization and scalability counts.

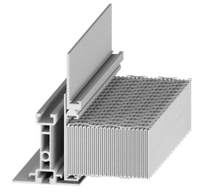
AstroFan Modular

- Customizable sizes
- Fully sealed, airtight construction
- Lowest sound levels in class of as little as 45 dBA
- Excellent air distributions
- Fully integrated room side change filter can allow individual suspension
- Can be fitted with a range of accessories, such as cooling coils, diffusers, etc.

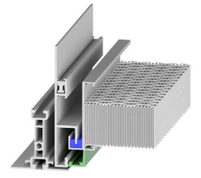
AstroFan Base

- Simplified construction for use in large scale projects
- Available in 6 standard sizes
- Lightweight
- Low sound level

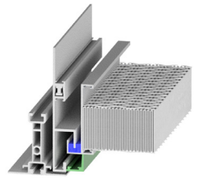
AstroFan Modular



Top Side Change

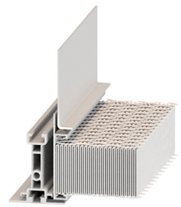


Room Side Change

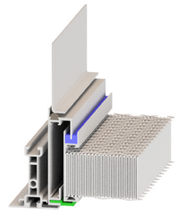


Room Side Replaceable

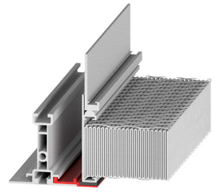
AstroFan Base



Top Side Change



Room Side Change Adapter



Room Side Replaceable

Installation Methods

The AstroFan FFU offers the full range of installation methods from top or room side. A complete range of adapter frames ensures system integrity.

With the room side change (RSC) option the gel seal filter is installed from the cleanroom into an adapter frame (AstroFan Base) or directly into the FFU (AstroFan Modular), which have been installed from above.

The 14 mm flat flange of the adapter frame or FFU then rests on the dry gasket, applied to the ceiling grid. For top side change variants, the HEPA/ULPA filter is simply placed on the grid from above, with the FFU laid on top. Room side replaceable variants allow even greater flexibility with the FFU itself installable and removable frrom the cleanroom.

Optional Features

Depending on the application additional pre-filtration or molecular filtration may be needed.

As an option the AstroFan FFU can be equipped with an adaptor frame to hold
Panel or V-bank prefilters as well as single and multiple layer AMC filters.

Adapter plenum for larger AMC filters

Multiple layer AMC filters

Single layer standard inlet AMC filters

Multiple layer standard inlet AMC filters

Technical data - AstroFan Modular

Modular Fan Filter Unit	FFU 66	FFU 69	FFU 612	FFU 99	FFU 912	FFU 1212	FFU 612 SL
Airflow m^3/h	470	750	1000	1140	1545	1985	1000
Nominal dimensions L x W (mm)	570 x 570	570 x 870	570 x 1170	870 x 870	870 x 1170	1170 x 1170	570 x 1170
Height with integrated filter (RSC) (mm)	442	442	442	442	442	442	277[1]
Power supply	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz
Power consumption ebmBUS	0,41 kW	0,41 kW	0,32 kW	0,32 kW	0,32 kW	0,32 kW	0,29 kW
Power consumption MODBUS RTU	0,50 kW	0,50 kW	0,50 kW	0,50 kW	0,50 kW	0,50 kW	0,47 kW
Weight including filter	23 kg	36 kg	43 kg	45 kg	53 kg	60 kg	35 kg
Total static pressure (Pa)	620	300	380	300	210	260	580
Sound Pressure Level at 0,45 m/s (dB(A))	45	47	45	46	47	53	53
Filter Media Types	Glassfiber / Membrane						
Efficiency	H13 to U17						
Installation Options	Top side / Room side change / Room side change grid						
Accessories	Cooling coils / Prefilter / AMC Filter / Diffuser / Test port						
Control Platform	PC / PLC / IoT / Manual						

Note 1.The AstroFan FFU 612 SL includes for a 2"filter (50 mm pack). All others have a 3" (65 mm media pack).

Technical data - AstroFan Base

Base Fan Top	FFU 66	FFU 69	FFU 612	FFU 99	FFU 912	FFU 1212
Airflow m^3/h	520	800	1080	1225	1640	2220
Actual dimensions L x W (mm)	570 x 570	570 x 870	570 x 1170	870 x 870	870 x 1170	1170 x 1170
Height including filter [2] (mm)	-	-	-	455	-	455
Power supply	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz	220 - 240V 1 Phase 50/60 Hz
Power consumption ebmBUS	0,41 kW	0,41 kW	0,32 kW	0,32 kW	0,32 kW	0,32 kW
Power consumption MODBUS RTU	0,50 kW	0,50 kW	0,50 kW	0,50 kW	0,50 kW	0,50 kW
Weight excluding filter	11 kg	13 kg	17 kg	18 kg	20 kg	23 kg
Fan resistance (Pa)	620	-	380	300	270	260
Sound Pressure Level at 0,45 m/s (dB(A))	49	45	44	46	47	55
Filter Media Types	Glassfiber / Membrane					
Efficiency	H13 to U17					
Installation Options	Top side / Room side change frame / Room side change grid					
Accessories	Cooling coils / Prefilter / AMC Filter / Test port					
Control Platform	PC / PLC / IoT / Manual					

Note [2].Dimensions include a 110 mm HEPA/ULPA filter in TSC execution.

Maximized Filtration Efficiency

ASTROFAN FILTER OPTIONS

Main Filter

The AstroFan FFU is equipped with an AstroCel II HEPA filter in Class H14 as standard. All filters are factory scanned to the European Standard EN1822:2009 to ensure leak free operation.

Additionally the FFUs are suitable for our high performing MEGAcel filters for maximum filter strength, superior chemical resistance and lowest pressure drop.

MEGAcel® II ME

- ePTFE media combines ultra-high efficiency with the lowest possible pressure drop
- High tensile strength and chemically inert ePTFE reduces risk of media damage and degradation
- No boron outgassing
- Compatible with Discrete Particle Counter (DPC) test methods

MEGAcel® II

- Dual-layer eFRM media combines ultra-high efficiency and particulate loading with low pressure drop
- High tensile strength and chemically inert eFRM reduces risk of media damage and degradation
- No boron outgassing
- Compatible with Discrete Particle Counter (DPC) and photometric test methods, including high contration oil-based aerosol testing

AstroCel® II

- Utilizes high performance microglass media to provide high efficiency particulate removal
- Optimally spaced mini-pleat media pack minimizes pressure drop in this cleanroom panel configuration
- Wide range of efficiencies and pack depth options available
- Compatible with Discrete Particle Counter (DPC) and photometric test methods

Maximized System Integrity

ASTROFAN CONTROL AND INSTALLATION OPTIONS

Fully integrated Control Systems down to the single FFU

Certain applications require unit specific control of the speed and consistency of airflow into large-scale production spaces. Fan Filter Units (FFUs), especially when paired with robust electronic control systems, help to ensure the integrity of production processes within these applications and serve to maximize overall system economy.

Selecting the right FFU depends upon a number of factors, including the degree of airflow control required, the desired level of energy efficiency, filter testing requirements for the space, and accessibility to the filter itself for testing and replacement.

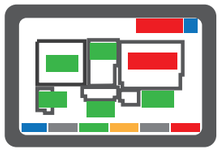
Control System Platform– AstroDrive™

AstroDrive PC, for individual FFU Control software controlled via PC suitable for MODBUS or ebmBUS fans including complete architecture to control and retrieve fan information and status.

AstroDrive PLC, control via PLC suitable for MODBUS or ebmBUS that can include for room pressures, temperatures, interlock, sensor control.

AstroDrive CCU, control via PLC suitable for ebmBUS that can include for sensor control that can control AstroFan units per group or room.

AstroDrive UC, individual unit control built on the unit or used handheld.



PLC Program Logical Control

PC Smart Control System

Fan motor options

AstroFan FFU contains a high performance, encapsulated, direct-drive, backward curved fan/motor combination. Motor options are available either as ebmBUS or MODBUS.

The specialized electronic commutation motor design permits speed control through the built-in electronics, e.g. via AstroDrive Control System Platforms.

AAF Europe / Dinair Sales Offices

Germany and Headquarter Europe
AAF-Lufttechnik GmbH
Odenwaldstrasse 4
64646 Heppenheim
+49 (0)6252 69977-0
Sales.DACH@aafeurope.com
www.aafeurope.de

Denmark
AAF/Dinair APS
Vallensbækvej 63.1
2625 Vallensbæk
Phone: +45 70260166
sales.denmark@aafeurope.com
www.aafeurope.dk

Finland
Dinair Clean Air Oy
Koivuvaarankuja 2
01640 Vantaa
Phone: +358 10 3222610
cleanair@dinair.fi
www.dinair.fi

France
AAF France
9 Avenue de Paris
94300 Vincennes
Phone: +33 1 43 98 42 23
sales.france@aafeurope.com
www.aafeurope.fr

Greece
AAF-Environmental Control Epe
Ifaistou & Kikladon
15354 Glika Nera
Tel.: +30 210 6632015
Greece@aafeurope.com
www.aafeurope.gr

Italy
AAF Srl
Via Friuli, 28/30
21047, Saronno (VA)
Tel: +39 02.9624096
sales.italy@aafeurope.com
www.aafeurope.it

Latvia
Dinair Filton SIA
Rupnicu Street 4
Olaine, Latvia, LV-2114
+371 67069823
Dinair.latvia@dinair.se
www.dinair.lv

The Netherlands
AAF International BV
Hooggoorns 56
7812 AM Emmen
Tel: +31 (0)591 - 701025
aaf.verkoop@aafeurope.com
www.aafeurope.nl

Norway
Dinair AS
Prof Birkelands vei 36
1081 Oslo
Phone: +47 22 90 59 00
post@dinair.no
www.dinair.no

Slovakia
AAF International s.r.o.
Bratislavska 517
91105, Trenčín
Phone: +421 32 746 17 39
aafslovakia@aafeurope.com
www.aafeurope.com/sk

Spain
AAF S.A.
C/ Vidrieros, 10
28830 San Fernando de Henares, Madrid
Tel: +34 916 624 866
Customer.ServiceSP@aafeurope.com
www.aafeurope.es

Sweden
Dinair AB - Head office
Hamngatan 5
SE-592 30 Vadstena
Tel: +46 (0) 143-125 80
info@dinair.se
www.dinair.se

Ånäsvägen 18
511 56 Kinna
+46 (0) 320 20 90 70
order.industries@dinair.se

United Kingdom
Air Filters Ltd (AAF International)
Bassington Lane, Cramlington
Northumberland NE23 8AF
+44 1670 591 790
airfilter@aafeurope.com
www.aafeurope.co.uk/

AAF INTERNATIONAL
a member of DAIKIN group

AAF International
European Headquarters
Odenwaldstrasse 4, 64646 Heppenheim
Tel: +49 (0)6252 69977-0
aafeurope.com

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