AAF INTERNATIONAL
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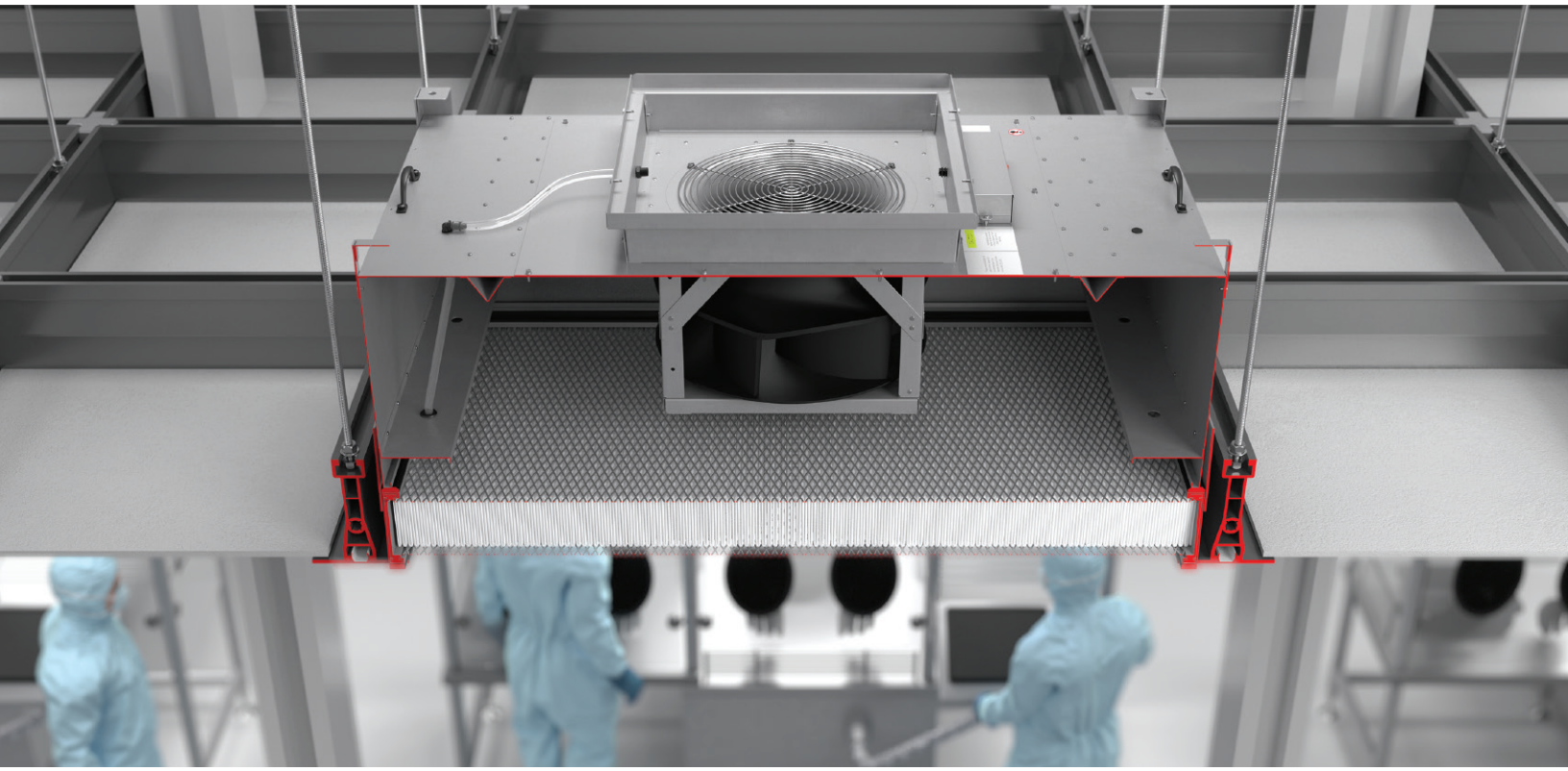
High Purity Filtration Solutions

Fan Filter Units & Controls



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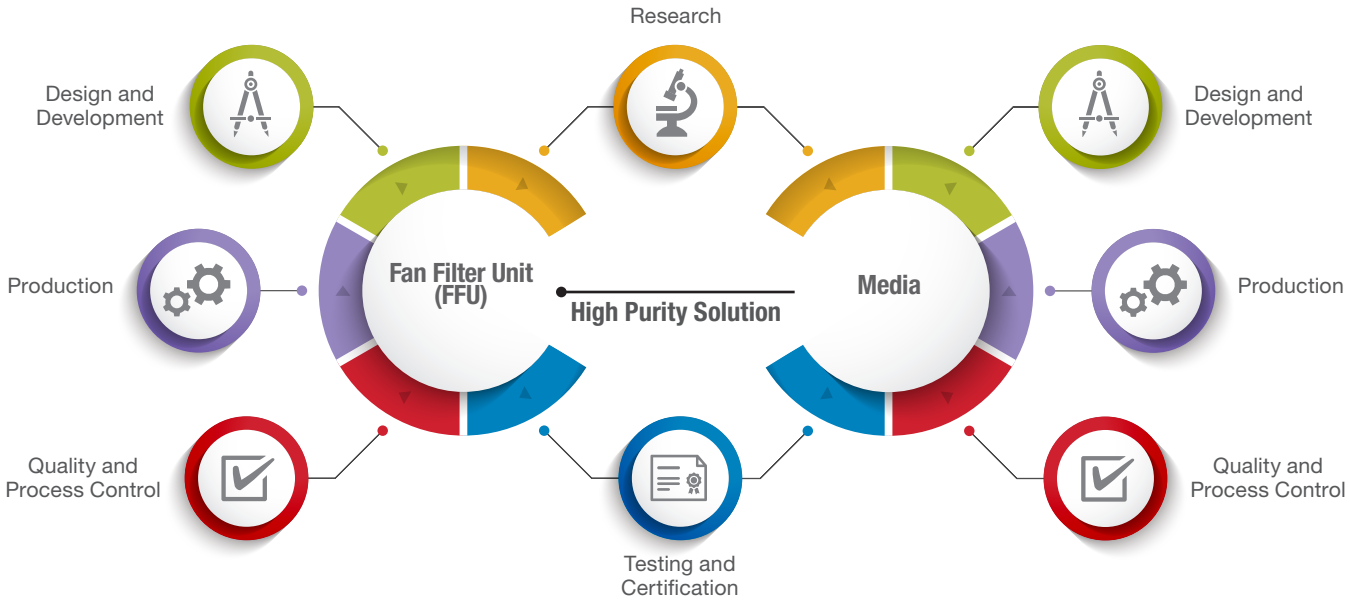
AstroFan™ FFUs and AstroDrive™ Controls

AAF has designed and manufactured
cleanroom products since the inception of the industry.
In fact, AAF pioneered many of the techniques
and products used in cleanroom filtration today.
Around the world, leading manufacturers rely on our
cleanroom equipment and air filtration technologies
in the microelectronics, pharmaceutical,
and biotechnology industries.

AAF FFU + Air Filter = A Single Manufacturer

AAF offers the most comprehensive manufacturing capabilities in the industry. We are the only manufacturer of FFUs that also manufactures the air filters used in the units. Our product development and technical leadership in both filtration and equipment manufacturing gives us a unique advantage to understanding and delivering on the challenges and opportunities for cleanroom environments.

We perform all aspects of the production process from the research, design, and development of the equipment and filters to the fabrication, assembly, and testing, entirely in-house. Our cleanroom production environments, located worldwide, are in accordance with the most advanced testing standards resulting in unparalleled product performance. At AAF, our seamless integration ensures exceptionally high product quality and operational excellence to minimize your risk.



Every day, more than

1.5 million FFUs produced by AAF

are used to protect processes and products throughout the world.

State-of-the-Art Testing

AAF has established a testing methodology that is among the most comprehensive and accurate in the industry. Testing is essential in documenting filter efficiency within the FFU, diagnosing problems, and assisting in research and development. Our testing facilities meet the highest standards for quality control. We perform routine, specialized testing for HEPA and ULPA filters to ensure the cleanroom filtration products you receive meet your performance requirements.

Quality and Process Control

Meticulous scrutiny during every phase of the production process enables AAF to trace a filter or FFU back through the manufacturing process. Each unit and filter are identified by serial and order numbers and labeled with performance criteria, size information, operator number, and part number. This elaborate quality process control ensures that you receive only the highest quality cleanroom products that meet your most stringent requirements.

Exceptional Quality Design

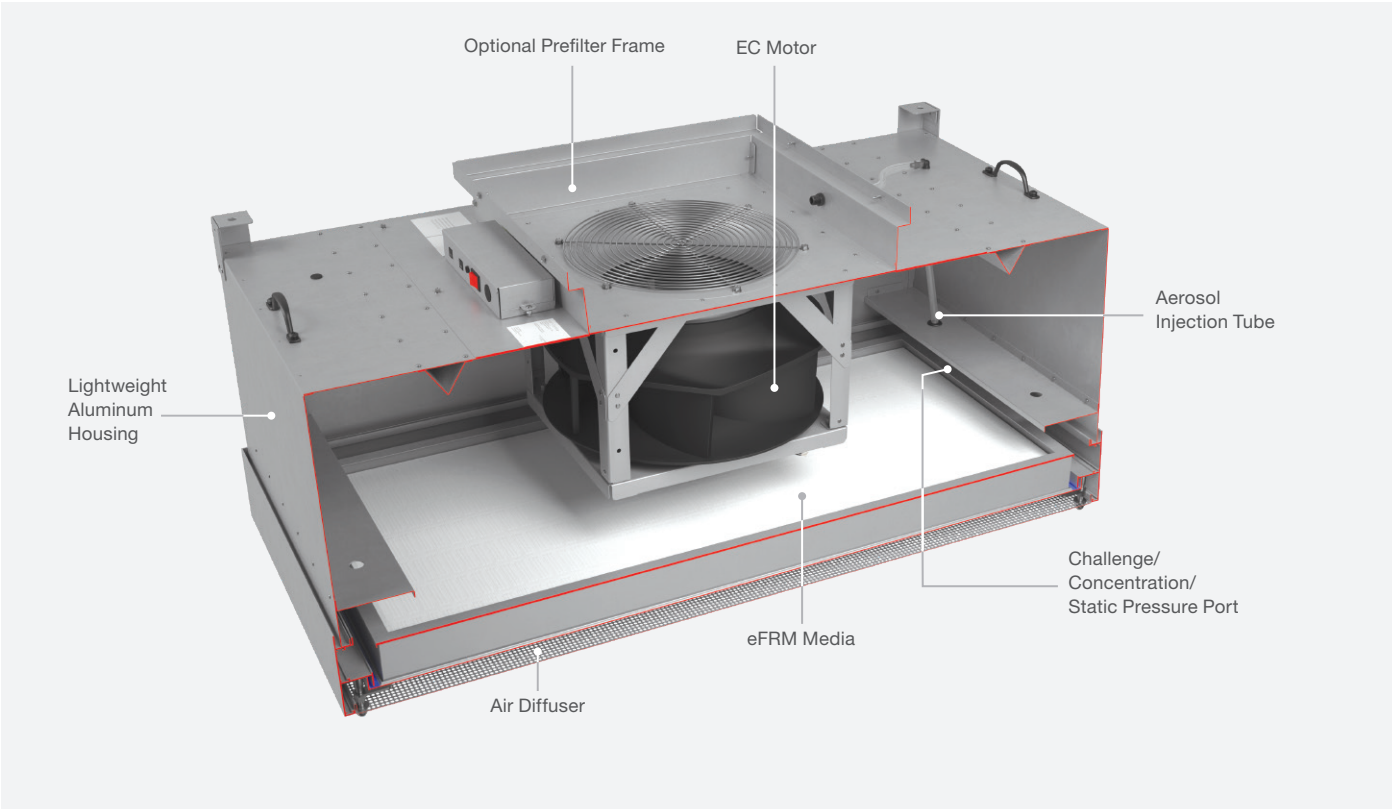
AstroFan™ EC Fan Filter Units are ideal for use in applications requiring controlled clean air, particularly cleanrooms supporting: microelectronic fabrication, semiconductor manufacturing, medical device manufacturing and assembly, pharmaceutical processing, sterile compounding pharmacies, hazardous drug or material handling, and all other controlled and regulated applications.

Ensure System Integrity

The AstroFan EC FFU is suitable for open plenum as well as ducted arrangements and controlled via handheld or wall-mounted options. Using filter fan units in an open negative pressure plenum design reduces the contamination risk of leakage or by-pass contaminants into the room. When paired with MEGAcel® II eFRM or ePTFE filters and AstroDrive™ control systems, the AstroFan helps to ensure the integrity of production processes in critical environments.

Maximize System Economy

Reduction of energy consumption by optimizing construction and media types is increasingly important as the industry's need for lower operating costs and increased yields continues to grow. The AstroFan EC FFU provides outstanding energy savings and efficiency. Coupled with MEGAcel II eFRM or ePTFE filters, the AstroFan EC FFU units are the quietest and most energy efficient option available.



Precise Control and Monitoring

AAF AstroDrive controls offer a handheld and wall-mounted option to ensure aligned operation and energy efficiency. Automatic monitoring lowers operating costs, and fast notification of any deviations maintains full system integrity.

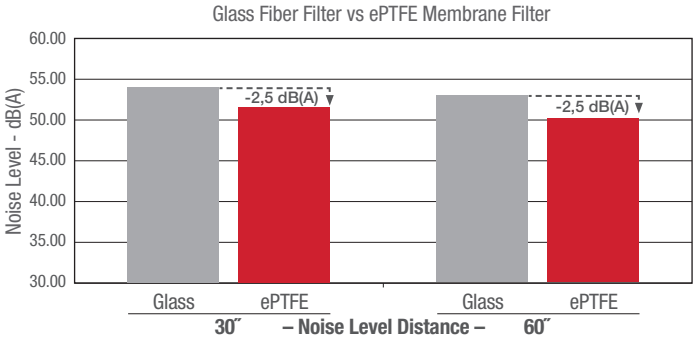
- Simple, reliable, and widely-recognized interfaces
- Individual controls for up to 100 FFUs
- Stand-alone monitoring and control unit for up to 200 EC-fans

Engineered for Operational Excellence

Among the Quietest and Most Energy Efficient

The quietly efficient AstroFan™ electronically commutated (EC) motor combines low watts and low sound. AAF whisper-quiet technology ensures uniform airflow across the filter face and reduces noise for one of the quietest fan filter units in the industry. The unit uses 30% - 40% less energy compared to AC alternatives, resulting in significantly lower operating costs.

Noise Level Reduction

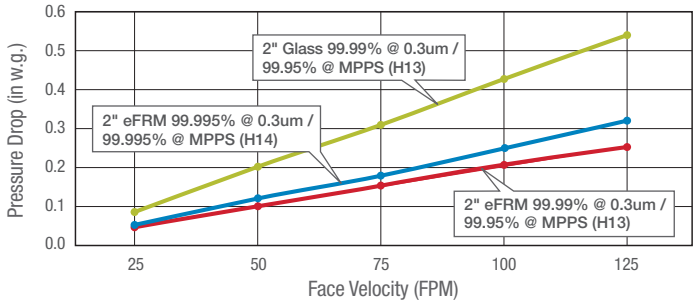


Enhance Energy Savings

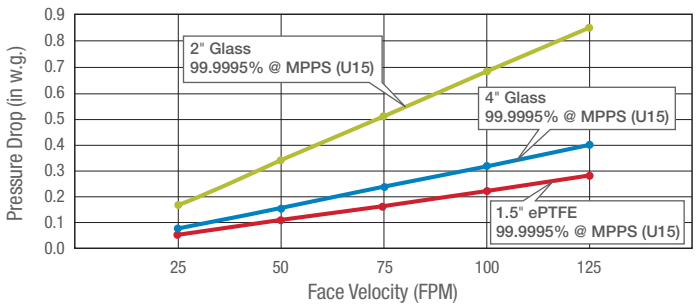
The energy-saving AstroFan EC FFU has the highest efficiency airflow rates when coupled with AAF's membrane media technology, delivering significant benefits in energy consumption and performance. Membrane media, whether ePTFE or eFRM, is proven to be more reliable due to its high level of mechanical strength for resistance to damage. An alternative to ePTFE membrane media, eFRM media is the industry's first and highest-performing membrane media to be compatible with polyalphaolefin (PAO). eFRM media has the lowest available pressure drop, reducing operating costs while improving production yield.

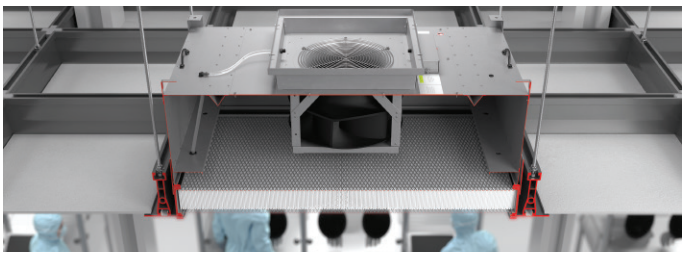
Energy Efficiency of AstroFan Paired with Membrane Filters

Life Science Applications: eFRM vs Glass



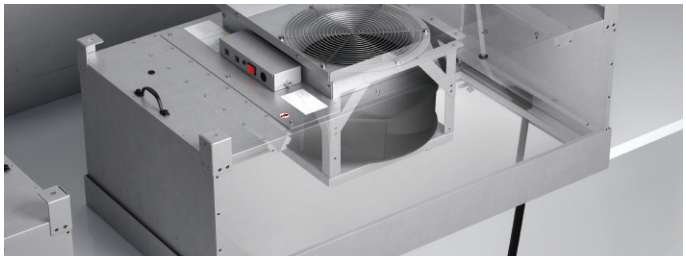
Microelectronic Applications: ePTFE vs Glass





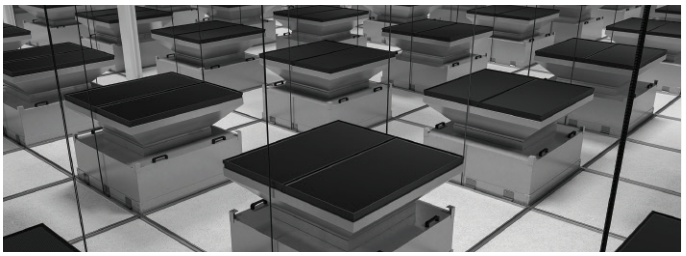
Easy Access to All Working Components

Monitoring and maintaining system integrity is critical to ensuring each system provides the clean air required. The electronically commutated (EC) motor offers continuous speed monitoring and self-compensating fan speed. The top-side and room-side serviceable fan and blower assembly provide easy access to minimize cleanroom service and downtime.



Reliable and Consistent Certification

The AstroFan EC FFU is designed and tested to meet the Life Science industry certification factory and field aerosol testing requirements. With the room-side configuration, filter replacement is quick and simple. Integrated knife-edge and gel track filters allow for tool-free installation and replacement. Room-side aerosol injection port permits easy injection of aerosol challenge, simplifying leak testing.



Control Risk from Airborne Molecular Contamination (AMC)

In controlled environments, the presence of molecular levels of contamination in the air is damaging to the process being performed. The elimination of corrosive contaminants is essential in maintaining equipment and product reliability. AstroFan EC FFUs are designed to accommodate single and multiple layers of standard or larger AMC pre-filters. Along with boron-free HEPA and ULPA filters, gas-phase filtration controls AMCs in manufacturing facilities.

High Purity Cleanroom Solutions

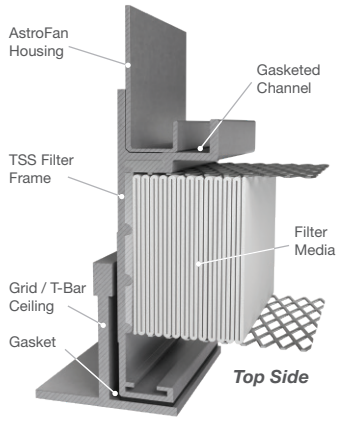
Certain applications require unit-specific control of the speed and consistency of airflow into large-scale production spaces. Fan Filter Units, especially when paired with eFRM media and AstroDrive™ controls, help to ensure the integrity of production processes within these applications and serve to maximize the overall system economy.

AstroFan™ EC FFU

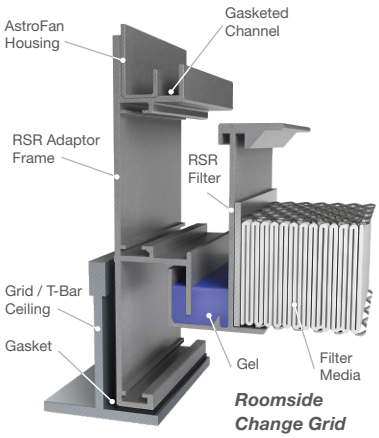
Selecting the right FFU depends on several factors, including the degree of airflow control required, the desired level of energy efficiency, filter testing requirements for the space, and accessibility to the filter itself for testing and replacement.

AstroFan EC Key Features:

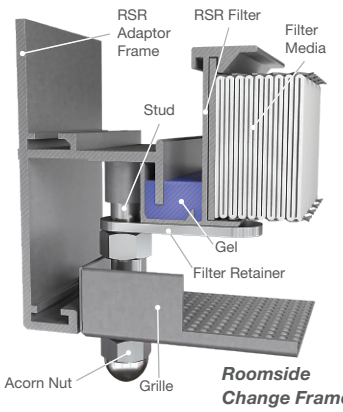
- Servicable from either the room side or top side which minimizes downtime. Filters are replaceable from the room side
- Energy-efficient EC motor (brushless, DC) provides 30-40% savings in energy use compared to AC alternatives, resulting in significantly lower operating costs
- Whisper-quiet technology meets stringent noise suppression requirements
- Multiple control options allow for large-scale integrated operation
- Highest efficiency airflow rates, when coupled with MEGAcel® II eFRM or ePTFE filters, minimize energy consumption
- Five standard sizes: 2'x2', 2'x3', 2'x4', 3'x4', and 4'x4' (custom sizes available upon request)



Top Side



Roomside Change Grid



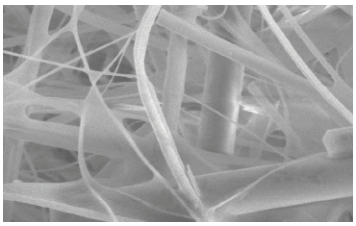
Roomside Change Frame

MEGAcel® II HEPA and ULPA Filtration

The strength of the filter material is critical to the success of a cleanroom environment. Depending on the carrier substrate, the strength of MEGAcel II eFRM and ePTFE filters is up to 100 times stronger than microglass. eFRM and ePTFE membrane media do not fail under standard operating procedures, cleaning, installing, or testing, and provide durability to mitigate almost all risks of contamination from airflow. MEGAcel II HEPA/ULPA filters utilizing Daikin's ultra-fine fiber membrane media technology are the product of choice in the most demanding environments.

MEGAcel II eFRM Media:

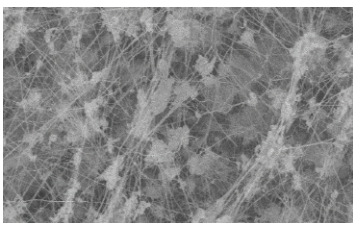
Dual layers of expanded fluororesin membrane supported by a layer of spun-bonded synthetic media on the upstream and downstream side


(10,000x)

- Available efficiencies:
  99.99% @ 0.3um/99.95% @ MPPS (H13)
  99.995% @ 0.3um/99.995% @ MPPS (H14)
- Designed for ultra-high particulate loading, including oil-based test aerosols for Life Science applications
- Compatible with photometric test methods

MEGAcel II ePTFE Media:

Single layer of expanded PTFE supported by a layer of spun-bonded synthetic media on the upstream and downstream side


(10,000x)

- Available efficiencies:
  99.9995% @ MPPS (U15)
  99.99995% @ MPPS (U16)
  99.999995% @ MPPS (U17)
- Standard for Microelectronic and Tool Market applications
- Compatible with discrete particle counters (DPC) testing

Specification

AstroFan™ EC FFU – Imperial (Metric)			
Certifications: cUL listed with UL 900 filter, file number E508161 (UL507)			
Dimension	2' x 2' (600 x 600)	2' x 4' (600 x 1200)	4' x 4' (1200 x 1200)
Housing			
Actual Dimension	Refer to drawing		
Unit Height	13.75" (350)		
Weight (Based on Aluminum)	29 - 38 lbs. (13 - 17 Kg)	38 - 57 lbs. (17 - 26 Kg)	71 - 77 lbs. (32 - 35 Kg)
Material	Aluminum / Stainless Steel		
Motor Information			
Power Supply	Single-phase : 100 - 130 VAC / 200-277 VAC - 50/60Hz		
Performance Data			
Noise Level	< 50 dB(A)		< 55 dB(A)
Airflow @ 90 FPM	306 CFM (520 m³/h)	636 CFM (1080 m³/h)	1307 CFM (2220 m³/h)
Fan Static Pressure	1.4 in. w.g. (350 Pa)	1.4 in. w.g. (350 Pa)	1.3 in. w.g. (320 Pa)
Filter			
Filter Type	Membrane / Glassfiber		
Seal Type	Gel / Gasket		
Efficiency	HEPA / ULPA		
Installation Options	Top Side Serviceable / Roomside Serviceable		
Accessories	Prefilter / AMC Filter / Test Port / Challenge Port / Duct Connections		
Controls Platform	MODBUS RTU /BACNET Gateway Compatible / Handheld / Wall-Mount		

AstroFan EC Fan Filter Unit
Roomside Replaceable/Serviceable Filter/Fan
Top Side Serviceable Filter/Fan
MEGAcel® II ePTFE Membrane
MEGAcel® II eFRM Membrane
AstroCel® II Glass Media
Prefilter Frame / Prefilter
AMC Filter Frame / Adaptor / AMC Filter
Aerosol Injection Ports (For RSR Option)
Static Pressure Ports (For RSR Option)
2" Foilback Insulation
Direct Duct Connection
FFU Size: 2'x2', 2'x3', 2'x4', 3'x4', 4'x4'
Custom Sizes Available (Upon request)

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AstroDrive™ FFU Controls

For precise control over the speed of the motor and the resultant airflow, our fan filter units can be operated with the AstroDrive handheld or wall-mount control options.

AstroDrive 100 – Handheld Control

- Portable control unit
- Clear and simple menu-guided interface
- Individual controls or up to 100 FFUs in a line
- ebmBUS or MODBUS interface
- Battery-powered with Mini-USB - battery charge

AstroDrive 200 – Wall-Mount Control

- Stand-alone monitoring and control unit
- Up to 200 EC-fans
- ebmBUS or MODBUS interface
- Clear and simple menu guide
- IP65-wall-mounted
- Includes digital inputs/outputs
- Includes dry contact points

AAF International Plant Locations

AAF, the world's largest manufacturer of air filtration solutions, operates production, warehousing and distribution facilities in 22 countries across four continents. With its global headquarters in Louisville, Kentucky, AAF is committed to protecting people, processes and systems through the development and manufacturing of the highest quality air filters, filtration equipment, and associated housing and hardware available today.

Contact your local AAF representative for a complete list of AAF Air Filtration Product Solutions.

Americas

Louisville, KY
Atlanta, GA
Ardmore, OK
Bartow, FL
Columbia, MO
Fayetteville, AR
Hudson, NY
Momence, IL
Smithfield, NC
Tijuana, Mexico
Votorantim, Brazil
Washington, NC

Europe

Cramlington, UK
Gasny, France
Vitoria, Spain
Ecoparc, France
Trencin, Slovakia
Olaine, Latvia
Horndal, Sweden
Vantas, Finland

Asia & Middle East

Riyadh, Saudi Arabia
Shah Alam, Malaysia
Suzhou, China
Shenzhen, China
Miaoli, Taiwan
Bangalore, India
Noida, India
Yuki, Japan (Nippon Muki)

AAF INTERNATIONAL
a member of DAIKIN group

9920 Corporate Campus Drive, Suite 2200, Louisville, KY 40223-5690
888.223.2003 Fax 888.223.6500 I aafintl.com

AAF has a policy of continuous product research and improvement. We reserve the right to change design and specifications without notice.

ISO Certified Firm

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