Filter Fan Unit Systems

Cleanroom Products
Experience matters ...
… with Filter Fan Units from M+W Products

M+W Products has been a pioneer in filter fan unit systems since 1990. During that period more than half a million M+W Products filter fan units have been installed worldwide. M+W Products is developing, manufacturing and qualifying filter fan units. Our extensive experience in this field has given us in-depth understanding of our customers’ processes and needs. Specialized products such as FFU-RA (return air) and PIFF (plenum integrated filter fan) units are the results of our expertise.

Outstanding patents and innovations testify to the performance of our Technology Center in Stuttgart. Several types of filter fan units enable our customers to choose the right system for their individual demands to improve productivity, process reliability and profitability.

All units are available with EC or AC motor versions. Other motor systems are available upon request.

Units are available with ratings according
Filter Fan Units are widely used in clean production environments to ensure particle free air circulation. The effectiveness of contamination control and the operating costs depend strongly on the design of these units.

Our extraordinary engineering expertise in ultra-clean air and ultra-pure atmospheres ensures that your current and future manufacturing processes are clean, safe, productive, cost-efficient – and environmentally friendly.

Our tailor-made OEM accessories include prefilter, AMC-filter, cooling/heating coils and testing equipment. Whether in stainless steel, aluminum or powder-coated, Filter Fan Units from M+W Products are the right choice for your application.

### Products and Industries for Filter Fan Units

<table>
<thead>
<tr>
<th>FFU Types</th>
<th>Semiconductor</th>
<th>Flat Panel Display</th>
<th>Photovoltaics</th>
<th>Battery Cells</th>
<th>Pharma &amp; Biotech</th>
<th>Food &amp; Nutrition</th>
<th>Science &amp; Research</th>
<th>Automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td>SILENT</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>ECO</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>LIGHT</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>o</td>
<td>+</td>
<td>o</td>
<td>+</td>
</tr>
<tr>
<td>COMPACT</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>o</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>RETURN AIR *)</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>–</td>
<td>–</td>
<td>+</td>
<td>o</td>
</tr>
<tr>
<td>PIFF *)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>o</td>
</tr>
<tr>
<td>CWIC</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
</tbody>
</table>

*) only turbulent airflow

++ well suited
+ suited
o restricted-use
– not applicable
... for precisely controlled Environments

Filter Fan Unit Types and Cleanroom Classes

<table>
<thead>
<tr>
<th>FFU Types</th>
<th>ISO 14644</th>
<th>Uni-directional airflow</th>
<th>Turbulent airflow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fed. Std.209/E</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>SILENT</td>
<td>ISO 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECO</td>
<td>ISO 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIGHT</td>
<td>ISO 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RETURN AIR</td>
<td>ISO 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMPACT</td>
<td>ISO 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIFF</td>
<td>ISO 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CWIC</td>
<td>ISO 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ISO 8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Individual dimensions are available upon request

<table>
<thead>
<tr>
<th>Metric</th>
<th>Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200 mm x 1200 mm</td>
<td>4’ x 4’</td>
</tr>
<tr>
<td>1200 mm x 900 mm</td>
<td>4’ x 3’</td>
</tr>
<tr>
<td>1200 mm x 600 mm</td>
<td>4’ x 2’</td>
</tr>
</tbody>
</table>

Motor Types and Control Systems

<table>
<thead>
<tr>
<th>Standard fan motors</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC</td>
</tr>
<tr>
<td>Control terminal CT3</td>
</tr>
<tr>
<td>Ultra display</td>
</tr>
<tr>
<td>CRiS²</td>
</tr>
</tbody>
</table>
Filter Fan Units SILENT / ECO / LIGHT

Filter Fan Unit SILENT *

FFU-S-EC (AC)-1212-T-AU

FFU optimized regarding sound power level and air flow. Particularly suited for
1. uni-directional airflow (laminar) cleanroom areas
2. advanced requirements on the uniformity of the uni-directional air flow
3. advanced sound pressure level requirements in the room
4. cleanroom classes 1–8 according to ISO 14644-1

Applications
Electronics, Microelectronics
Life Sciences
High Tech Industries
New Technologies
Food Industry
Laboratories

Filter Fan Unit ECO *

FFU-E-EC (AC)-1212-T-AU

Effective construction – excellent compromise in terms of power consumption, uniformity of the unidirectional air flow, sound power and price. Particularly suited for
1. non-unidirectional airflow (turbulent) cleanroom areas
2. cleanroom classes 3–8 according to ISO 14644-1

Applications
Electronics, Microelectronics
Life Sciences
High Tech Industries
New Technologies
Food Industry

Filter Fan Unit LIGHT

FFU-L-EC (AC)-1212-T-AU

Practicable solution for a low budget. Especially suited for cleanroom areas
1. with high background sound level due to production noises
2. in which sound levels are of secondary importance
3. with a less dense filter coverage
4. cleanroom classes 5–8 according to ISO 14644-1

Applications
Electronics, Microelectronics
High Tech Industries
New Technologies
Food Industry
Filter Fan Units RETURN AIR/ COMPACT

Filter Fan Unit RETURN AIR *
FFU-RA-EC (AC)-1212-T-AU

Exclusively suitable for the application in turbulent cleanrooms. Return-flow areas (raised floor, return-air ducts) in the building can be significantly reduced through the integrated return-air ducts. Local hot-spots can be avoided by closing of individual integrated return-air ducts. Particularly suited for
• turbulent cleanrooms with a maximum of 50% filter coverage
• cleanroom areas with large scale dimensions
• cleanroom classes 5–8 according to ISO 14644-1

Applications
Electronics, Microelectronics
High Tech Industries
New Technologies

Filter Fan Unit COMPACT
FFU-C-EC (AC)-1206-T-AU

Filter Fan Unit for the equipment of individual workstations or entire cleanroom ceilings. Especially suited for
• cleanroom areas with a low installation room clearance
• cleanroom areas with moderate sound pressure level requirements
• cleanroom classes 1–8 according to ISO 14644-1

Applications
Electronics, Microelectronics
Life Sciences
High Tech Industries
New Technologies
Food Industry
Laboratories

* These products are protected by patents
PIFF Plenum Integrated Filter Fan/ CWIC® Systems

Plenum Integrated Filter Fan *
PIFF3 - EC (AC)-H14

Designed as self-sustaining return air unit with integrated filter fan, H14 filter, cooling coil and air grill. No raised floors and return air shafts are needed. Connectable to make-up air or exhaust air in order to pressurize the cleanroom. Especially suited for pharmaceutical laboratories with turbulent airflow.

- cleanroom classes 5–8 according to ISO 14644-1/
class B, C and D according EC Guide (GMP)

Applications
Pharma & Biotech labs
Food & Nutrition

CWIC® Systems *
CWIC – 1010 / 1020 / 1030 / 1040

The CWIC® System is a versatile system: Individual Filter Fan Units (CWIC® modules) can be connected to form different size cleanroom ceilings, e.g. for machine enclosures, clean benches or clean work cabins. The modular design enables fast and low-cost cleanroom construction that can be suspended from the ceiling or supported from the floor by pedestals. Depending on the load of additional components, a range of 4,800 mm without support pedestals or suspensions is possible.

- cleanroom classes 1–8 according to ISO14644-1/
class: A, B, C or D according EC Guide (GMP)

Applications
Pharma & Biotech
Food & Nutrition
Science & Research

* These products are protected by patents
Control Systems

Our Filter Fan Units can be operated as a simple power on / off system at a pre-configured speed or air volume. Equipment layouts, process requirements and work shift models often result in the need for a more sophisticated control of the FFU system to ensure energy efficient and process aligned operation. M+W Products offers a wide range of control systems for AC and EC motor driven FFUs, starting with budget oriented solutions for small scale installations and ending with the high-end control software CRis².

Control System AC (CSA)

The system includes the complete cabling, speed control for the fan unit systems, the visual alarm indicator as well as the illumination control. The fan units can be compiled in groups from 1 to 10 units (depending on the control unit).

The CSA is delivered with a plug-and-play cable-system, allowing a fast and low-cost installation. All components are designed for a 230 V power-supply and a frequency of 50 Hz. Depending on the project size, a Control System AC contains the following components:
- Supply line with distribution box and dummy-plug (if used without speed controller)
- Speed-controller with connection cable (5A/8A/10A)
- Motor monitoring via a pressure cell and indicator light
- Illumination equipment with switch and connection cable

Control System DC (CSD)

The control electronics is plug-and-play integrated into the Fan Unit. The individual speed control of each Fan Unit allows the adjustment of the air-speed to the local requirements. Automatic monitoring and fast notification of any deviations guarantee a safe operation. The network is clearly structured and completely pre-assembled. Depending on project size, a Control System DC contains the following components:
- Control Terminal
- UltraDisplay
- CRis² – Software with PC-workstation.

DC control systems can be operated with through a standard interface (LON, M+W Bus). Auto-installation, an interface to Auto-CAD for visualization in actual cleanroom layouts and the ability to handle up to 75,000 units make CRis² an unique software solution for uncompromised FFU administration.
Customized Filter Fan Units
– the right Solution for every Challenge

Areas of Application

Manufacturing processes in the semiconductor industry, in nanotechnology and in the production of optical storage media demand a highly purified environment across all areas of the production process. Particle-free air ensures quality and reduces the rejection rate during production. Due to the need for air purity, we develop customized filter fan units in close collaboration with the client.

Some outstanding features of these systems are the high level of flexibility in terms of geometric shapes, external dimensions, materials used, desired filter classes, required air flow rates, drive concepts that can be individually implemented and the multitude of options that can be integrated.

Special Features

- Devices that are ready to hook up and use, can be used independently of the power line frequency and supply voltage
- Sound attenuation and vibration isolation for the highest production demands
- Available in stainless steel, aluminum or powder-coated casing in a variety of sizes
- High reserve capacity in a compact design
- Wide range of control and regulation concepts, possibility of integration into client systems
- Pressure regulation, integrated temperature control, AMC filters, LED illumination, ionization are optionally available
- UL and SEMI certification and approval upon customer request
- HEPA/ULPA filter in various efficiencies and materials available

Photos: © SÜSS MicroTec AG
Customized Filter Fan Units
– Applications (Examples)

Customized FFU
Application: Nanotechnology
- Stainless steel casing
- Integrated five-stage speed controller
- Modular system in a choice of three standard sizes
- Integrated lighting and process air ionization on the air purification side
- Slot for AMC filter
- CE verified
- In line with SEMI and UL standards

Customized FFU
Application: Optical Industry
- Natural aluminum casing
- Smooth, integrated speed controller
- Extremely high reserve capacity with the smallest possible footprint
- Air purification side laminating unit for optimum flow distribution
- Client interface to allow total monitoring of the filter fan unit
- Wide-range power supply motors of 110–230 V and 50–60 Hz
- CE verified
- In line with SEMI and UL standards

Customized FFU
Application: Semiconductor Industry
- Natural aluminum casing
- Smooth, integrated speed controller featuring LON bus operation
- Special design (L-shape)
- Integrated lighting and process air ionization on the air purification side
- Air purification side laminating unit for optimum flow distribution
- Slot for AMC filter
- Wide-range power supply motors of 100–230 V and 50–60 Hz
- CE verified
- In line with SEMI and UL standards
M+W Products GmbH (Headquarters)
A Company of the M+W Group
Lotterbergstr. 30
70499 Stuttgart, Germany
Phone +49 711 8804-1742
Fax +49 711 8804-1668
products@mwgroup.net
www.products.mwgroup.net

M+W Products (Shanghai) Co., Ltd.
A Company of the M+W Group
No. 139 Beimin Road, Che dun, Songjiang Area
Shanghai, 201611, P.R. China
Phone +86 21 3783-8360
Fax +86 21 3783-7681

M+W U.S., Inc.
A Company of the M+W Group
4710 East Elwood, Suite#9
Phoenix, AZ 85040, USA
Phone +1 480 303-6600
Fax +1 480 303-9300