FAN FILTER UNIT
KYODO Fan Filter Unit (FFU) is a self-contained ceiling unit for use in turbulent mixing and laminar flow cleanroom applications. The unit is designed with total flexibility for use with the ceiling grids. It can also be used in many other applications, such as clean booths, clean workbenches, and Clean Room tunnels. When the filter is equipped with a knife-edge interface, the unit can also be utilized in the liquid-sealed ceiling grid. It can be easily upgraded and integrated into any ceiling configuration in accordance with design specification to achieve cleanroom Class 100 (ISO Class 5), Class 10 (ISO Class 4) and Class 1 (ISO Class 3).

KYODO FFU is one of the quietest and cost effective units on the market, delivering high quality air filtration and air movement performance in cleanroom. From simple speed controller for a single standalone FFU to complex controlling and monitoring system for large cleanroom, we offer a vast range of designs and configuration in our standard product range. Kyodo-Allied’s high tech customized computer software system is capable of monitoring and controlling more than 10,000 FFUs through a single central computer monitoring system. Custom-built systems are also available upon request.

KYODO reserves the right to make changes without written notice. The actual product might differ from pictures shown. Drawings are not meant to show exact details of every aspects of the product.
FAN FILTER UNIT

PATENTS

Inline with our mission to enable our customers to enjoy customer-driven R&D and innovation, Kyodo-Allied invest a significant percentage of our effort and resources for Research and Development purposes.

Our Research and Development team works closely with our strategic partners to truly understand our customer requirement and continuously improve our products according with market-driven requirements.

List of Patent:

China : ZL 98106068.4, ZL01104287.7, ZL99813881.9, ZL02122661.X
Indonesia : D 0007780
Singapore : 71388, 100104, 85932, 103888, 115492
Taiwan : 109586, 194851, 128592, 194113, 17756
USA : 6,030,186, 6,444,004 B1, 6,592,451 B2, 6,641,364 B1
UK : GB2354802
Europe : 1364169, 1019659, 1216360
Hong Kong : HK1050563, HK1019629, HK1034302
Japan : 3357377, 3798981
Korea : 453851
Vietnam : 4079, 8513
Thailand : 17756

The Commissions of Patents and Trademarks

This is an application for a patent for a novel article of invention. It is understood that the information contained herein is complete and accurate. The requirements of this application cannot be amended, and it has been determined that no errors on the invention must be granted under the law.

For the 2001 United States Patent

This is the patent application is filed under 35 U.S.C. 119(e), the act of August 19, 1976, and is a division of a prior application. This application has been filed under 35 U.S.C. 119(b), the act of August 19, 1976. The invention is within the scope of the prior application, and no errors have been made in the prior application.

This application has been new filed on October 25, 2000. The information contained herein is true and complete to the best of our knowledge and belief. The information is subject to any change at any time. If any errors have been made in the prior application, they will be corrected in the future.

Signed

[Signature]

[Date]

[Address]
# FAN FILTER UNIT

**SPECIFICATION**

<table>
<thead>
<tr>
<th>Size</th>
<th>600x600; 600x1200; 900x1200; 1200x1200; 750x1500 (mm), etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing</td>
<td>Galvalume Standard</td>
</tr>
<tr>
<td></td>
<td>Aluminum, SUS 430, Powder Coated Steel Optional</td>
</tr>
<tr>
<td>Electrical</td>
<td>Terminal Block Standard</td>
</tr>
<tr>
<td></td>
<td>Male-Female Connector with Pins Optional</td>
</tr>
<tr>
<td></td>
<td>3-Pin Plug for Single Phase Optional</td>
</tr>
<tr>
<td>Power Input</td>
<td>1 Φ: 100<del>110V, 200</del>230V, 277V (50~60Hz)</td>
</tr>
<tr>
<td></td>
<td>3 Φ: 200V, 220V, 380V, 415V, 480V (50~60Hz)</td>
</tr>
<tr>
<td>Mounting</td>
<td>Horizontal Standard</td>
</tr>
<tr>
<td></td>
<td>Vertical (Wall Mounting) Optional</td>
</tr>
<tr>
<td>Filter Access</td>
<td>Top Access Standard</td>
</tr>
<tr>
<td></td>
<td>Room Access Optional</td>
</tr>
<tr>
<td>Step Supporter</td>
<td>Up to 80 kg load Optional</td>
</tr>
<tr>
<td>Control &amp; Monitoring</td>
<td>DC Type</td>
</tr>
<tr>
<td></td>
<td>AIBS Complete with Software Standard</td>
</tr>
<tr>
<td></td>
<td>LonWorks Complete with Software Optional</td>
</tr>
<tr>
<td></td>
<td>1 Φ</td>
</tr>
<tr>
<td></td>
<td>Local Speed Controller Standard</td>
</tr>
<tr>
<td></td>
<td>RS485 Complete with Software Optional</td>
</tr>
<tr>
<td></td>
<td>AC Type</td>
</tr>
<tr>
<td></td>
<td>Motor Circuit Breaker or Relay Optional</td>
</tr>
<tr>
<td></td>
<td>Transformer Optional</td>
</tr>
<tr>
<td></td>
<td>Thermal Contact Optional</td>
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</tbody>
</table>

*Custom-built dimensions & specifications are also acceptable.*
FAN FILTER UNIT

AC TYPE FFU (Single Phase Motor)

- External rotor motor
- Built-in thermal overload contact
- Aluminum backward-curved fan blades
- Dynamically balanced
- Maintenance free ball bearings

AC FFU Control & Monitoring system

- Windows environment, friendly graphical user interface
- Actual FFU layout
- Multi-step individual and group speed control
- Multi-user management system
- Customized error alarm
- Schedule operation
- Easy group operation
- Real-time monitoring
- Audit log
- Error log

![Diagram of AC FFU Control & Monitoring system](image)

<table>
<thead>
<tr>
<th>Technical Information</th>
<th>4x4 AC FFU</th>
<th>2x4 AC FFU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension (Nominal)</td>
<td>1200 x 1200 mm</td>
<td>600 x 1200 mm</td>
</tr>
<tr>
<td>Height</td>
<td>330 mm</td>
<td>275 mm</td>
</tr>
<tr>
<td>Power Supply</td>
<td>1Φ / 230V / 50Hz</td>
<td></td>
</tr>
<tr>
<td>Air Velocity (KYODO FFU control software)</td>
<td>0.45m/s @ TSP=200Pa</td>
<td></td>
</tr>
<tr>
<td>Power Consumption</td>
<td>260 W</td>
<td>170 W</td>
</tr>
<tr>
<td>Noise Level (Measured @ 1.5m below filter surface)</td>
<td>&lt; 52 dB(A)</td>
<td></td>
</tr>
<tr>
<td>Air Velocity Uniformity (150mm below filter surface)</td>
<td>± 15%</td>
<td></td>
</tr>
</tbody>
</table>

Note:
[B] All sound data based upon tests conducted in accordance with NEBB CPT procedural standards: 2009.
FAN FILTER UNIT

FFU CONTROL SYSTEM SOFTWARE SCREEN SHOTS

- System Layout
- FFU Control Panel
- FFU Layout Drawing
- Tree View Structure
- Malfunction FFU List

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FAN FILTER UNIT

AC FFU Control & Monitoring System
(Touch Screen)

- Low cost and simple control system
- Actual FFU layout
- Multi-step individual and group speed control
- Multi-user management system
- Customized error alarm

Suitable for dozens of FFU
- Easy group operation
- Real-time monitoring

![AC FFU Control & Monitoring System](image)

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FAN FILTER UNIT

AC TYPE FFU (Three Phase Motor)
- External rotor motor
- Built-in thermal overload contact
- Aluminum backward-curved fan blades
- Dynamically balanced
- Maintenance free ball bearings

AC FFU Control & Monitoring system
- Windows environment, friendly graphical user interface
- Actual FFU layout
- Group FFU On/Off control
- Multi-user management system
- Customized error alarm
- Schedule operation
- Group FFU status monitoring
- Audit log
- Error log

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Drawings are not meant to show exact details of every aspects of the product.
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