Filter Fan Unit LIGHT

Type LIGHT EC

Technical Concept
Product Description

Filter Fan Units (FFUs) from M+W Products are designed to provide clean air to individual workstations or entire cleanrooms. The FFU LIGHT is a reasonably priced solution and is suited for the use in turbulent airflow cleanroom areas with low requirements regarding the noise level.

Depending on the configuration of the filter coverage and of filter classes, cleanroom classes of ISO 5.0 to ISO 8.0 according DIN EN ISO 14644-1 can be reached.

This brochure provides information about the device design – FFU LIGHT EC - FFU with EC-motor and advanced control and monitoring possibility.

The product FFU LIGHT EC is protected by patent.

Technical Data

<table>
<thead>
<tr>
<th>Grid size 1)</th>
<th>mm</th>
<th>1200×600</th>
<th>1200 ×900</th>
<th>1200×1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing length</td>
<td>mm</td>
<td>1132</td>
<td>1132</td>
<td>1132</td>
</tr>
<tr>
<td>Installation bearing rails</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing width</td>
<td>mm</td>
<td>532</td>
<td>832</td>
<td>1132</td>
</tr>
<tr>
<td>Installation bearing rails</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing height</td>
<td>mm</td>
<td>350</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing material standard</td>
<td></td>
<td>Aluminium untreated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight standard without filter</td>
<td>kg</td>
<td>16</td>
<td>19</td>
<td>21</td>
</tr>
</tbody>
</table>

EC-Motor (IP20)

| Voltage/Phase | V/ ph | 200-277/1 |
| Frequency | Hz | 50/60 |
| Nominal current | A | 1.8–1.3 |
| Nominal power | W | 370 |
| Rotation speed max. | 1/min | 300–1304 |
| Operation temp. min./max. | °C | 0/+40 |
| Air velocity | m/s | 0.30 0.45 | 0.30 0.45 | 0.30 0.45 |
| Air volume flow | m³/h | 778 1166 1166 1750 1555 2330 |
| Differential pressure | Pa | 80 120 80 120 80 120 |
| Power consumption 2) | W | 43 82 61 127 82 186 |
| Sound power level pressure side 2) | dB (A) | 52 58 56 63 60 69 |
| Sound pressure level in the cleanroom 2) | | | | | |
| - 25 % coverage | dB (A) | 54 61 57 64 60 68 |
| - 50 % coverage | dB (A) | 57 64 60 67 63 71 |
| - 100 % coverage | dB (A) | 61 67 63 70 66 75 |
| External differential press. max. 3) | Pa | 390 375 365 310 335 235 |

1) Special size upon request
2) with H14 filter cell without external differential pressure
3) without installed HEPA/ULPA filter
4) measured with phase angle control

Design and Function

The unit consists essentially of the housing 1, the HEPA filter cell 2 and the compact fan unit 3 with impeller and motor 4 with inlet nozzle 5.

The following additional accessories are available:

- Prefilter 9 for coarse particle filtration
- AMC-filter 10 for filtration of gaseous contaminants
- Cooling coil/heating coil 11
- Air diffusor (perforated plate diffuser, swirl outlet) 8

If necessary filter cell classes H13 to U17 can be used.

The FFU fans have sufficient reserve capacity to overcome any additional pressure loss due to e.g. raised floor, return air ducts, prefilter or cooling/heating coils.

The FFU LIGHT EC is driven by an electronically commutated external rotor motor.
### Dimensions

![Fig. 1.1 FFU-LIGHT-1212 Side view](image1)

![Fig. 1.2 FFU-LIGHT-1212 Top view](image2)

![Fig. 1.3 FFU-LIGHT-1212 Bottom view](image3)

### Device Installation

![Fig. 2 FFU installation with HEPA filter and bearing rails into dry ceiling UFR 55/70-T](image4)

![Fig. 3 Installation with air diffuser (perforated plate diffuser)](image5)

### Legend

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FFU housing</td>
</tr>
<tr>
<td>2</td>
<td>HEPA filter</td>
</tr>
<tr>
<td>2a</td>
<td>Filter frame</td>
</tr>
<tr>
<td>2b</td>
<td>Dry seal</td>
</tr>
<tr>
<td>3</td>
<td>Impeller</td>
</tr>
<tr>
<td>4</td>
<td>Motor</td>
</tr>
<tr>
<td>5</td>
<td>Inlet nozzle</td>
</tr>
<tr>
<td>5a</td>
<td>Air grill</td>
</tr>
<tr>
<td>6</td>
<td>Bearing rail</td>
</tr>
<tr>
<td>7</td>
<td>Terminal box</td>
</tr>
<tr>
<td>8</td>
<td>Air diffuser</td>
</tr>
<tr>
<td>9</td>
<td>Prefilter</td>
</tr>
<tr>
<td>10</td>
<td>AMC filter</td>
</tr>
<tr>
<td>11</td>
<td>Cooling coil</td>
</tr>
<tr>
<td>12</td>
<td>Ceiling grid UFR-55/70-T</td>
</tr>
</tbody>
</table>
Device Installation

The installation into the M+W Products ceiling grid system → Ultraflex Grid Ceiling is very simple. The installation can take place from the cleanroom, using the ceiling grid system UFR-55/70-T 12 with bearing rails 6 (Fig. 2) and filter cell are installable from the cleanroom side. The ceiling grid system profiles do not need to be sealed. The sealing between the housing and the filter cell frame is done with a dry gasket 2b (Fig. 2 and 3).

Control

**FFU LIGHT EC**

Based on LON (Local Operating Network) the FFUs are merged to a network system through a special bus-system → Control System DC. This enables a simple and individual speed adjustment and monitoring of each unit, even in complex systems with thousand units.

Power Supply

A plug & play cable system is provided for the power supply. Each unit is connected through the existing terminal box 7, minimizing the installation efforts.

* FFU 1206 Prefilter 500 x 500 mm
* FFU 1212 Prefilter and Cooling coil 750 x 750 mm
Key Features

- Reasonably priced FFU suitable for turbulent airflow cleanroom areas with low requirements regarding the noise level
- FFU sizes fit in ceiling grid size
  1 200 mm × 1200 mm
  1 200 mm × 900 mm
  1 200 mm × 600 mm
- Low power consumption
- Low weight
- Easy operation, low maintenance effort
- Applicable for individual workstations or entire cleanroom facilities
- Aluminium housing (standard)
- Filter cell classes H13 to U17 (standard H14)
- Installed radial fan:
  Motor with internal wired thermal contacts
- FFU LIGHT AC with single-phase external rotor motor, volume flow adjustable through → Control System AC
- FFU LIGHT EC with electronically commutating external rotor motor, volume flow adjustable through → Control System DC
- Minimized power supply installation effort due to plug & play cable system
- Easy device installation from below (cleanroom side) with bearing rails, optionally installation from top (plenum side)
- Optional components: Prefilter, AMC filter, Cooling coil/ heating coil and air diffuser on the cleanroom side
- Flexible installation, if production conditions are changing

Type Designation

| FFU – L – – – – – – – – – |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Filter Fan Unit | Type | Motor | Size | Housing Design | Material/Surface | HEPA/UlPA Filter | Prefilter | AMC Filter | Cooling/heating coil | Air Diffuser |
| Type | Motor | Size | Housing Design | Material/Surface | HEPA/UlPA Filter | Prefilter | AMC Filter | Cooling/heating coil | Air Diffuser |

- **Type**
  - L: LIGHT
- **Motor**
  - EC/LR: EC-Motor with LON RS485-interface
  - EC/LF: EC-Motor with LON FTT10A-interface
- **Size (ceiling grid)**
  - 1212: 1 200 mm × 1 200 mm
  - 1209: 1 200 mm × 900 mm
  - 1206: 1 200 mm × 600 mm
- **Housing Design**
  - T: Installation in dry ceiling with bearing rails
- **Material/Surface**
  - AU: Aluminium untreated (standard)
- **Filter**
  - O: Without
  - H14: Standard filter class
- **Optional**
  - Filter classes H13, U15, U16, U17
- **Prefilter**
  - O: Without
  - A: With AMC filter
- **Optional**
  - Filter class G4
  - Special filter class
- **AMC Filter**
  - O: Without
  - A: With AMC filter
- **Cooling/heating coil**
  - O: Without
- **Optional**
  - LK: With cooling coil
  - LE: With heating coil
- **Air diffusor**
  - O: Without
  - Optional
  - LV: With air diffuser
**Submittal Text**

**FFU LIGHT EC**

___ pcs. of FFU-LIGHT-EC consisting of:

– Housing with fan fixture

– High performance radial fan with backwards curved blades.
   The impeller is directly connected with the driveshaft of the external EC motor. The motor is maintenance free. Fan impeller and motor are statically and dynamically balanced.

### Technical Data

**Component size 1 200 mm × 1 200 mm**

- Air-flow: _______ m³/h
- Length × width: 1 132 mm × 1 132 mm
- Height without filter: 350 mm
- Weight per FFU: 21 kg
- Operating voltage: 200–277 V/1 ph, 50/60 Hz
- Speed min./max.: 300–1304 1/min
- Nominal power: 370 W
- Nominal current: 1,8–1,3 A

**Component size 1 200 mm × 900 mm**

- Air-flow: _______ m³/h
- Length × width: 1 132 mm × 832 mm
- Height without filter: 350 mm
- Weight per FFU: 19 kg
- Operating voltage: 200–277 V/1 ph, 50/60 Hz
- Speed min./max.: 300–1304 1/min
- Nominal power: 370 W
- Nominal current: 1,8–1,3 A

**Baugröße 1 200 mm × 600 mm**

- Air-flow: _______ m³/h
- Length × width: 1 132 mm × 532 mm
- Height without filter: 350 mm
- Weight per FFU: 16 kg
- Operating voltage: 200–277 V/1 ph, 50/60 Hz
- Speed min./max.: 300–1304 1/min
- Nominal power: 370 W
- Nominal current: 1,8–1,3 A

### Operational Data

- Air velocity: _______ m/s
- Power consumption: _______ W
- Allowed sound pressure level: _______ dB (A)

### HEPA Filter

- Class H14
- Class _______
  - Filter height: _______ mm

### Housing Material

- Aluminium untreated (standard)

### Ceiling profile grid-ceiling

- UFR-55/70-T

### Optional

- Prefilter according to DIN EN 779 for coarse particle separation, incl. frame made of aluminium, untreated
  - Filter class: G4
  - _______
- AMC filter for the separation of gaseous and air pollutant substances, Adapter frame standard made of aluminium (the AMC filter must be specified).
- Heating coil
- Cooling coil
  - made of copper tubes, aluminum fins and an aluminum frame
  - Cooling coil for FFU: 1212, 1209, 1206
  - Air-flow: 2300, 1750, 1165 m³/h
  - Air inlet temperature: 23,0 °C
  - Air outlet temperature: 19,5 °C
  - Pressure loss airside: 15, 9, 16 Pa
  - Water inlet temperature: 14,0 °C
  - Water outlet temperature: 18,0 °C
  - Pressure loss waterside: 5,9, 4,1, 2,1 kPa
  - Sensible capacity: 2,7, 2,2, 1,1 kW
  - Water quantity: 600, 500, 300 l/h
- Heating coil
- Cooling coil
- made of copper tubes, aluminum fins and an aluminum frame
- Heating coil
- Cooling coil
- made of copper tubes, aluminum fins and an aluminum frame
- Heating coil
- Cooling coil
- made of copper tubes, aluminum fins and an aluminum frame

### Air diffuser, cleanroom side, includes mounting hardware design:

- Aluminium perforated plate, anodized
- Steel perforated plate, galvanized with powder-coating, RAL ______

### Swirl outlet

### Manufacturer

- M+W Products GmbH
  - Type: FFU–L–EC________
Local Support
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