Compact EMC/RFI Filter for Motor Drives

Compact filter solution for single-phase motor drive applications
- Industrial grade safety terminal blocks
- Designed to meet EN 55011/14/22
- Compliant with IEC 60950

Performance indicators

<table>
<thead>
<tr>
<th>Attenuation performance</th>
<th>Standard</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated current (A)</td>
<td>0</td>
<td>20</td>
<td>40</td>
</tr>
</tbody>
</table>

Features and benefits
- High component values optimized for common and differential-mode attenuation in the lower frequency range makes this filter ideal for a large variety of single-phase motor drive applications
- Supplied in a relatively small housing design with safety terminal blocks for fast and easy installation in primarily industrial environments
- FN 350 also meets IEC 60950 requirements, thus providing additional application flexibility

Technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum continuous operating voltage</td>
<td>1x 250 VAC</td>
</tr>
<tr>
<td>Operating frequency</td>
<td>DC to 400 Hz</td>
</tr>
<tr>
<td>Rated currents</td>
<td>8 to 55 A @ 40°C max</td>
</tr>
<tr>
<td>High potential test voltage</td>
<td>P -&gt; E 2000 VAC for 2 sec, P -&gt; N 1100 VDC for 2 sec</td>
</tr>
<tr>
<td>Protection category</td>
<td>IP 20</td>
</tr>
<tr>
<td>Overload capability</td>
<td>4x rated current at switch on, 1.5x rated current for 1 minute, once per hour</td>
</tr>
<tr>
<td>Temperature range (operation and storage)</td>
<td>-25°C to +100°C (25/100/21)</td>
</tr>
<tr>
<td>Flammability corresponding to</td>
<td>UL 94 V-2 or better</td>
</tr>
<tr>
<td>Design corresponding to</td>
<td>UL 1283, CSA 22.2 No. B 1986, IEC/EN 60939</td>
</tr>
<tr>
<td>MTBF @ 40°C/230 V (Mil-HB-217F)</td>
<td>420,000 hours</td>
</tr>
</tbody>
</table>

Approvals & Compliances

- UL, CSA, CE, UK CA, ROHS

Typical applications

- Single-phase motor drives
- Automation equipment
- Power supplies, SMPS
- Office equipment
- Testing and measurements equipment

Typical electrical schematic
### Filter selection table

<table>
<thead>
<tr>
<th>Filter</th>
<th>Rated current @ 40°C (25°C) [A]</th>
<th>Leakage current* @ 230 VAC/50 Hz [mA]</th>
<th>Power loss @ 25°C/50 Hz [W]</th>
<th>Input/Output connections</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FN 350-8-29</td>
<td>8 (9.0)</td>
<td>49</td>
<td>5.2</td>
<td>-29</td>
<td>0.7</td>
</tr>
<tr>
<td>FN 350-12-29</td>
<td>12 (13.5)</td>
<td>49</td>
<td>5.7</td>
<td>-29</td>
<td>0.7</td>
</tr>
<tr>
<td>FN 350-20-29</td>
<td>20 (22.4)</td>
<td>49</td>
<td>6.1</td>
<td>-29</td>
<td>0.7</td>
</tr>
<tr>
<td>FN 350-30-33</td>
<td>30 (33.6)</td>
<td>5.6</td>
<td>6.1</td>
<td>-33</td>
<td>0.7</td>
</tr>
<tr>
<td>FN 350-55-..</td>
<td>55 (61.5)</td>
<td>11.0</td>
<td>9.9</td>
<td>-33/-24</td>
<td>1.2</td>
</tr>
</tbody>
</table>

* Maximum leakage under normal operating conditions. Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

### Typical filter attenuation

Per CISPR 17: A = 50 Ω/50 Ω sym; B = 50 Ω/50 Ω asym; C = 0.1 Ω/100 Ω sym; D = 100 Ω/0.1 Ω sym

8 A types

![8 A types graph](image)

12 A types

![12 A types graph](image)

20 and 30 A types

![20 and 30 A types graph](image)

55 A types

![55 A types graph](image)
Mechanical data

### 8 to 30 A types

- **Dimensions**
  - **B**: 8 A - 105, 12 A - 105, 20 A - 105, 30 A - 105, 55 A (-33) - 115, 55 A (-24) - 115
  - **C**: 8 A - 57, 12 A - 57, 20 A - 57, 30 A - 57.6, 55 A (-33) - 60, 55 A (-24) - 60
  - **D**: 8 A - 84.4, 12 A - 84.4, 20 A - 84.4, 30 A - 84.4, 55 A (-33) - 85, 55 A (-24) - 85
  - **E**: 8 A - 51, 12 A - 51, 20 A - 51, 30 A - 51, 55 A (-33) - 115, 55 A (-24) - 115
  - **F**: 8 A - 95, 12 A - 95, 20 A - 95, 30 A - 95, 55 A (-33) - 100, 55 A (-24) - 100
  - **G**: 8 A - 6 x 4.4, 12 A - 6 x 4.4, 20 A - 6 x 4.4, 30 A - 6 x 4.4, 55 A (-33) - 6.5, 55 A (-24) - 6.5
  - **H**: 8 A - 0.6, 12 A - 0.6, 20 A - 0.6, 30 A - 1.2, 55 A (-33) - 1, 55 A (-24) - 1
  - **J**: 8 A - M6, 12 A - M6, 20 A - M6, 30 A - M6, 55 A (-33) - M6, 55 A (-24) - M6
  - **K**: 8 A - 18, 12 A - 18, 20 A - 18, 30 A - 16, 55 A (-33) - 12.9, 55 A (-24) - 12.9
  - **L**: 8 A - 16, 12 A - 16, 20 A - 16, 30 A - 19, 55 A (-33) - 18.3, 55 A (-24) - 17

  *All dimensions in mm; 1 inch = 25.4 mm
  *Tolerances according: ISO 2768-m/EN 22768-m*

### Filter input/output connector cross sections

- **Solid wire**
  - **-29**: 6 mm²
  - **-33**: 16 mm²
- **Flex wire**
  - **-29**: 4 mm²
  - **-33**: 10 mm²
- **AWG type wire**
  - **-29**: AWG 10
  - **-33**: AWG 6

*Please visit [www.schaffner.com](http://www.schaffner.com) to find more details on filter connectors.*
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