General Purpose AC/DC EMI Filter

- Rated currents from 1 to 60 A
- General purpose filtering performance
- Optional medical versions (B type)
- Optional safety versions (A type)
- Optional enhanced performance versions
- Optional DC optimized versions

<table>
<thead>
<tr>
<th>Performance indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attenuation performance</strong></td>
</tr>
<tr>
<td>standard</td>
</tr>
<tr>
<td>Rated current [A]</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

**Technical specifications**

- **Rated voltage**
  - 250 VAC, 50/60 Hz; 250 VDC
- **Operating frequency**
  - DC to 400 Hz
- **Rated currents**
  - 1 to 60 A @ 40°C max.
- **High potential test voltage**
  - P -> PE 2000 VAC for 2 sec (equiv. cap <88 nF)
  - P -> PE 2550 VDC for 2 sec (equiv. cap >88 nF)
  - P -> PE 2500 VAC for 2 sec (B types)
  - P -> N 1100 VDC for 2 sec
- **Temperature range (operation and storage)**
  - -25 °C to +100 °C (25/100/21)
- **Certified to**
  - UL 1283, CSA 22.2 No. 8, 1986, IEC/EN 60939 (applies to AC and DC applications)
- **Flammability corresponding to**
  - UL 94 V-2 or better
- **MTBF @ 40°C/230 V (MIL-HB-217F)**
  - 1,250,000 hours
  - 3,200,000 hours (B types)

*maximum RMS operating voltage at rated frequency or the maximum DC operating voltage

**Features and benefits**

- FN 2010 filters are designed for easy and fast chassis mounting
- FN 2010 filters are available as B versions without Y-capacitors for medical applications as well as A version with low capacitance for safety critical applications with necessity for low leakage currents
- FN 2010 filters are also available as enhanced performance and DC optimized versions. With higher attenuation in very compact housing (M, N1, N types)
- All filters provide a general purpose conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- FN 2010 filters can be used to cover a broad range of usage and they offer a good size/amperage ratio
- Various terminal options allow you to select the desired connection style

**Typical applications**

- Electrical and electronic equipment
- Consumer goods
- Household equipment
- Medical equipment
- Office automation equipment
- Datacom equipment

**Typical electrical schematic**

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*maximum RMS operating voltage at rated frequency or the maximum DC operating voltage*
## Filter selection table

<table>
<thead>
<tr>
<th>Filter*</th>
<th>Rated current @ 40°C (25°C)</th>
<th>Leakage current** @ 250 VAC/50 Hz (@ 120 VAC/60 Hz)</th>
<th>Inductance L</th>
<th>Capacitance Cx</th>
<th>Cy</th>
<th>Resistance R</th>
<th>Input/Output connections</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[A]</td>
<td>[mA]</td>
<td>[mH]</td>
<td>[μF]</td>
<td>[nF]</td>
<td>[kΩ]</td>
<td></td>
<td></td>
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<tr>
<td>FN 2010-1-..</td>
<td>1(1.15)</td>
<td>0.66 (0.38)</td>
<td>12</td>
<td>0.1</td>
<td>4.7</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
</tr>
<tr>
<td>FN 2010-3-..</td>
<td>3(3.45)</td>
<td>0.66 (0.38)</td>
<td>2.5</td>
<td>0.1</td>
<td>4.7</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
</tr>
<tr>
<td>FN 2010-6-..</td>
<td>6(6.9)</td>
<td>0.66 (0.38)</td>
<td>1</td>
<td>0.1</td>
<td>4.7</td>
<td>1000</td>
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<td>-07</td>
</tr>
<tr>
<td>FN 2010-10-..</td>
<td>10(11.5)</td>
<td>0.66 (0.38)</td>
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<td>0.1</td>
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<tr>
<td>FN 2010-12-..</td>
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<td>0.1</td>
<td>4.7</td>
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</tr>
<tr>
<td>FN 2010-16-..</td>
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<td>0.1</td>
<td>4.7</td>
<td>1000</td>
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<td>-07</td>
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<tr>
<td>FN 2010-30-08</td>
<td>30(34.5)</td>
<td>0.79 (0.46)</td>
<td>0.7</td>
<td>0.47</td>
<td>10</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
</tr>
<tr>
<td>FN 2010-60-24</td>
<td>60(69)</td>
<td>0.79 (0.46)</td>
<td>1</td>
<td>1.5</td>
<td>10</td>
<td>330</td>
<td>-24</td>
<td>1100</td>
</tr>
<tr>
<td>FN 2010 A-1-..</td>
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<td>0.07 (0.04)</td>
<td>12</td>
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<td>0.47</td>
<td>1000</td>
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<tr>
<td>FN 2010 A-3-..</td>
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<td>0.47</td>
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<td>0.1</td>
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<td>-07</td>
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<td>1.5</td>
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<td>-24</td>
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</tr>
<tr>
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<td>1(1.15)</td>
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<td>0.1</td>
<td>1000</td>
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<td>0.8</td>
<td>0.1</td>
<td>1000</td>
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<td>0.7</td>
<td>0.1</td>
<td>1000</td>
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<td>-07</td>
<td>65</td>
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<tr>
<td>FN 2010 B-20-..</td>
<td>20(23)</td>
<td>0.00</td>
<td>0.6</td>
<td>0.1</td>
<td>1000</td>
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<tr>
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<td>1000</td>
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<td>-07</td>
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<td>FN 2010 B-60-24</td>
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<td>1</td>
<td>1.5</td>
<td>0.47</td>
<td>330</td>
<td>-24</td>
<td>1100</td>
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</tbody>
</table>

** Enhanced performance

| FN 2010 N1-1-06 | 1(1.15) | 5.34 (3.08) | 12 | 0.1 | 68 | 1000 | -06 | -07 | 70 |
| FN 2010 N1-3-06 | 3(3.45) | 5.34 (3.08) | 2.5 | 0.1 | 68 | 1000 | -06 | -07 | 70 |
| FN 2010 N1-6-06 | 6(6.9) | 5.34 (3.08) | 1 | 0.1 | 68 | 1000 | -06 | -07 | 70 |
| FN 2010 N1-10-06 | 10(11.5) | 5.34 (3.08) | 0.8 | 0.1 | 68 | 1000 | -06 | -07 | 70 |
| FN 2010 N1-12-06 | 12(13.8) | 3.69 (2.13) | 0.7 | 0.1 | 47 | 1000 | -06 | -07 | 70 |
| FN 2010 N1-16-06 | 16(18.4) | 3.69 (2.13) | 0.7 | 0.1 | 47 | 1000 | -06 | -07 | 70 |
| FN 2010 M-20-.. | 20(23) | 3.69 (2.13) | 0.6 | 0.1 | 47 | 1000 | -06 | -07 | 70 |
| FN 2010 N3-08 | 30(34.5) | 7.85 (4.52) | 0.7 | 0.47 | 100 | 1000 | -06 | -07 | 70 |
| FN 2010 N6-20-4 | 60(69) | 7.85 (4.52) | 1 | 1.5 | 10 | 330 | -24 | 1100 | 65 |

* To compile a complete part number, please replace the -.. with the required I/O connection style (e.g. FN 2010-30-08, FN 2010B-10-06). The different letters code the used Cy values in the filter type (A = 0.47nF; M = 47nF; N1 = 47nF; N = 100nF)

** Maximum leakage under usual AC operating conditions (acc. IEC 60939-3). 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

Standard types
1 and 3 A types

6 to 12 A types

16 and 20 A types

30 and 60 A types

Enhanced performance types
1 A types

3 A types

6 A types

10 and 12 A types

16 A types

20 A types

30 A types

60 A types

Product Selector

- 06: Factor 6.3 x 0.8 mm (pin/screw/soldering)
- 07: Wire leads
- 08: Studs (M6 screws)
- 24: Studs (M6 screws)
- 1 to 69: Rated current
- Blank: Standard version
- Z: With surge protection
- Blank: Standard version
- A: Safety version
- B: Medical version
- N1/N/M: High performance version
Mechanical data

Connection style -06, 1 to 12 A types

Connection style -07, 1 to 12 A types (same dimensions as style -06)

Connection style -08, 20 A types

Connection style -24

Connection style -06, 16 and 20 A types

Connection style -07, 16 and 20 A types (same dimensions as style -06)

Connection style -08, 30 A types
## Dimensions

<table>
<thead>
<tr>
<th></th>
<th>1 A</th>
<th>3 A</th>
<th>6 A</th>
<th>10 A</th>
<th>12 A</th>
<th>16 A</th>
<th>20 A</th>
<th>30 A</th>
<th>60 A</th>
<th>Tolerances</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>64</td>
<td>64</td>
<td>64</td>
<td>64</td>
<td>71</td>
<td>85</td>
<td>113.5±1</td>
<td>105±1</td>
<td>±0.5</td>
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<tr>
<td>B</td>
<td>35</td>
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<td>35</td>
<td>35</td>
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<td>46.6</td>
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<td>24.3</td>
<td>29.3</td>
<td>29.3</td>
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<td>57.6±1</td>
<td>±0.5</td>
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<td>±35</td>
<td>±35</td>
<td>±35</td>
<td>±35</td>
<td>±35</td>
<td>±35</td>
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<td>54</td>
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<td>15.3</td>
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<td>M</td>
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<td>0.7</td>
<td>1</td>
<td>±0.3</td>
</tr>
</tbody>
</table>

**Connection style -06**

| N  | 6.3 x 0.8| 6.3 x 0.8| 6.3 x 0.8| 6.3 x 0.8| 6.3 x 0.8| 6.3 x 0.8| 6.3 x 0.8| 6.3 x 0.8| 6.3 x 0.8|±0.5 |

**Connection style -07**

| O  | 8.3  | 8.3  | 8.3  | 8.3  | 8.3  | 8.3  | 8.3  | 8.3  | ±0.5 |

**AWG type wire**

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<tr>
<th>Wire length</th>
<th>AWG 20</th>
<th>AWG 20</th>
<th>AWG 18</th>
<th>AWG 18</th>
<th>AWG 16</th>
<th>AWG 16</th>
<th>AWG 14</th>
</tr>
</thead>
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<tr>
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**Connection style -08**

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<tr>
<th>N</th>
<th>M4</th>
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<tbody>
<tr>
<td>Recommended torque (Nm)</td>
<td>1.2 - 1.3</td>
<td>1.2 - 1.3</td>
</tr>
<tr>
<td>Earth terminal</td>
<td>1.5 - 1.7</td>
<td>1.5 - 1.7</td>
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**Connection style -24**

<table>
<thead>
<tr>
<th>N</th>
<th>M6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended torque (Nm)</td>
<td>3.5 - 4</td>
</tr>
<tr>
<td>Earth Terminal</td>
<td>3.5 - 4</td>
</tr>
</tbody>
</table>

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

Please visit www.schaffner.com to find more details on filter connections.
To find your local partner within Schaffner’s global network: www.schaffner.com

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