Multi-stage general purpose AC/DC EMI Filter

- Rated currents from 1 to 30 A
- High differential and common-mode attenuation
- Optional medical versions (B type)
- Optional safety versions (A type)

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>60</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 30 A @ 40°C max.
- **High potential test voltage**
  - P -> PE 2000 VAC for 2 sec
  - 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**
  - Terminal plastic for -06/08 version: UL 94 V-0
  - Laces for -07 version: UL 94 VW-1
  - Grommet for -07 version: UL 94 V-0
- **Design corresponding to**
  - UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939
- **Overvoltage category**
  - II acc. IEC 60664-1
- **Pollution degree**
  - 2 acc. IEC 60664-1
- **Altitude**
  - 2000m (above derating applies)**
- **MTBF @ 40°C/230 V (Mil-HB-217F)**
  - 1,650,000 hours (B types)
  - 950,000 hours

* maximum RMS operating voltage at rated frequency or the maximum DC operating voltage
** for dedicated requests exceeding this specification (e.g. -40°C or higher altitude) please contact your local Schaffner Sales office

Features and benefits

- FN 2060 two-stage filters are designed for easy and fast chassis mounting
- FN 2060 B versions without capacitors to earth comply to 1MOP for ME (medical equipment) acc. IEC 60601-1
- FN 2060 A version with low capacitance to earth for safety critical applications with necessity for low leakage currents
- All filters provide a high conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- FN 2060 two-stage filters are designed for noisy applications requiring good differential and common-mode attenuation
- FN 2060 filters are also available as single-stage filters (FN 2010 series)
- Various terminal options allow you to select the desired connection style

Typical applications

- Electrical and electronic equipment
- Consumer goods
- Household equipment
- Building automation
- Industrial applications
- Machinery
- Medical equipment
- Electronic data processing equipment
- Office automation and datacom equipment
- Various noisy applications requiring good filter performance

Typical electrical schematic
## Filter Selection Table

<table>
<thead>
<tr>
<th>Filter*</th>
<th>Buy</th>
<th>Rated current at 40°C (25°C)</th>
<th>Leakage current** at 250 VAC/50 Hz (120 VAC/60 Hz)</th>
<th>Power Loss @25°C/DC</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>FN2060-1-..</td>
<td>1 (1.2)</td>
<td>0.66 (0.38)</td>
<td>1.6</td>
<td>12</td>
<td>0.22</td>
<td>4.7</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
<td>120</td>
</tr>
<tr>
<td>FN2060-3-..</td>
<td>3 (3.5)</td>
<td>0.66 (0.38)</td>
<td>2.2</td>
<td>2.5</td>
<td>0.22</td>
<td>4.7</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
<td>120</td>
</tr>
<tr>
<td>FN2060-6-..</td>
<td>6 (6.9)</td>
<td>0.66 (0.38)</td>
<td>3.2</td>
<td>0.97</td>
<td>0.22</td>
<td>4.7</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
<td>120</td>
</tr>
<tr>
<td>FN2060-10-..</td>
<td>10 (11.5)</td>
<td>0.66 (0.38)</td>
<td>4.3</td>
<td>0.8</td>
<td>0.47</td>
<td>4.7</td>
<td>470</td>
<td>-06</td>
<td>-07</td>
<td>190</td>
</tr>
<tr>
<td>FN2060-12-..</td>
<td>12 (13.8)</td>
<td>0.66 (0.38)</td>
<td>6.2</td>
<td>0.58</td>
<td>0.47</td>
<td>4.7</td>
<td>470</td>
<td>-06</td>
<td>-07</td>
<td>190</td>
</tr>
<tr>
<td>FN2060-16-..</td>
<td>16 (18.4)</td>
<td>0.66 (0.38)</td>
<td>4.4</td>
<td>0.65</td>
<td>0.33</td>
<td>4.7</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
<td>260</td>
</tr>
<tr>
<td>FN2060-20-..</td>
<td>20 (23)</td>
<td>0.66 (0.38)</td>
<td>5.3</td>
<td>0.6</td>
<td>1</td>
<td>4.7</td>
<td>220</td>
<td>-06</td>
<td>-08</td>
<td>480</td>
</tr>
<tr>
<td>FN2060-30-08</td>
<td>30 (34.5)</td>
<td>0.79 (0.45)</td>
<td>9.1</td>
<td>0.6</td>
<td>1</td>
<td>10</td>
<td>220</td>
<td>-08</td>
<td>-08</td>
<td>950</td>
</tr>
<tr>
<td>FN2060A-1-..</td>
<td>1 (1.2)</td>
<td>0.07 (0.04)</td>
<td>1.6</td>
<td>12</td>
<td>0.22</td>
<td>0.47</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
<td>120</td>
</tr>
<tr>
<td>FN2060A-3-..</td>
<td>3 (3.5)</td>
<td>0.07 (0.04)</td>
<td>2.2</td>
<td>2.5</td>
<td>0.22</td>
<td>0.47</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
<td>120</td>
</tr>
<tr>
<td>FN2060A-6-..</td>
<td>6 (6.9)</td>
<td>0.07 (0.04)</td>
<td>3.2</td>
<td>0.97</td>
<td>0.22</td>
<td>0.47</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
<td>120</td>
</tr>
<tr>
<td>FN2060A-10-..</td>
<td>10 (11.5)</td>
<td>0.07 (0.04)</td>
<td>4.3</td>
<td>0.8</td>
<td>0.47</td>
<td>0.47</td>
<td>470</td>
<td>-06</td>
<td>-07</td>
<td>260</td>
</tr>
<tr>
<td>FN2060A-12-..</td>
<td>12 (13.8)</td>
<td>0.07 (0.04)</td>
<td>6.2</td>
<td>0.58</td>
<td>0.33</td>
<td>0.47</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
<td>260</td>
</tr>
<tr>
<td>FN2060A-16-..</td>
<td>16 (18.4)</td>
<td>0.07 (0.04)</td>
<td>4.4</td>
<td>0.65</td>
<td>0.33</td>
<td>0.47</td>
<td>1000</td>
<td>-06</td>
<td>-07</td>
<td>260</td>
</tr>
<tr>
<td>FN2060A-20-..</td>
<td>20 (23)</td>
<td>0.07 (0.04)</td>
<td>5.3</td>
<td>0.6</td>
<td>1</td>
<td>0.47</td>
<td>220</td>
<td>-06</td>
<td>-08</td>
<td>480</td>
</tr>
<tr>
<td>FN2060A-30-08</td>
<td>30 (34.5)</td>
<td>0.07 (0.04)</td>
<td>9.1</td>
<td>0.6</td>
<td>1</td>
<td>0.47</td>
<td>220</td>
<td>-08</td>
<td>-08</td>
<td>950</td>
</tr>
</tbody>
</table>

* To compile a complete part number, please replace the -.. with the required I/O connection style (e.g. FN 2070-25-08, FN 2070B-10-06).

** Maximum leakage under usual AC operating conditions (acc. IEC60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

*** Tolerances apply: Inductance: -30%+50%, Capacitance: ±20%, Resistance: ±10%
Typical filter attenuation

Per CISPR 17; CM=50 Ω/50 Ω sym; DM=50 Ω/50 Ω asym;
<table>
<thead>
<tr>
<th>Amp</th>
<th>Standard type</th>
<th>A type</th>
<th>B type</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 A</td>
<td><img src="image1" alt="Graph" /></td>
<td><img src="image2" alt="Graph" /></td>
<td><img src="image3" alt="Graph" /></td>
</tr>
<tr>
<td>20 A</td>
<td><img src="image4" alt="Graph" /></td>
<td><img src="image5" alt="Graph" /></td>
<td><img src="image6" alt="Graph" /></td>
</tr>
<tr>
<td>30 A</td>
<td><img src="image7" alt="Graph" /></td>
<td><img src="image8" alt="Graph" /></td>
<td><img src="image9" alt="Graph" /></td>
</tr>
</tbody>
</table>
### Mechanical data

**Connection style -06, 1 to 12 A types**

- An example diagram showing the mechanical data for connection style -06, 1 to 12 A types.

**Connection style -06, 16 A types**

- Another example diagram showing the mechanical data for connection style -06, 16 A types.

**Connection style -06, 20 A types**

- A diagram illustrating the mechanical details for connection style -06, 20 A types.

**Connection style -07, 1 to 16 A types (same dimensions as style -06)**

- Diagram depicting the mechanical features of connection style -07, 1 to 16 A types, noting they share dimensions with style -06.

**Connection style -08, 10 to 16 A types**

- A diagram showing the mechanical aspects of connection style -08, 10 to 16 A types.

**Connection style -08, 20 A types**

- Diagram illustrating the mechanical data for connection style -08, 20 A types.

**Connection style -08, 30 A types**

- A diagram displaying the mechanical details of connection style -08, 30 A types.
### Connection style -06

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| A | 71 | 71 | 71 | 85 | 85 | 85 | 113.5 ±1 | 119 ±1 | ±0.5
| B | 46.6 | 46.6 | 46.6 | 54 | 54 | 54 | 57.5 ±1 | 85.5 ±1 | ±0.5
| C | 29.3 | 29.3 | 29.3 | 30.3 | 30.3 | 40.3 | 45.4 ±1 | 576 ±1 | ±0.5
| D | 50.5 | 50.5 | 50.5 | 64.8 | 64.8 | 64.8 | 94 ±1 | 98.5 ±1 | ±0.5
| E | 44.5 | 44.5 | 44.5 | 49.8 | 49.8 | 49.8 | 56 | 84.5 | ±0.5
| F | 61 | 61 | 61 | 75 | 75 | 75 | 103 | 109 | ±0.3
| G | 21 | 21 | 21 | 27 | 27 | 27 | 25 | 40 | ±0.2
| H | 10.8 | 10.8 | 10.8 | 12.3 | 12.3 | 12.3 | 12.4 | 15.6 | ±0.5
| I | 19.3 | 19.3 | 19.3 | 20.8 | 20.8 | 29.8 | 32.4 | ±0.5
| J | 20.1 | 20.1 | 20.1 | 19.9 | 19.9 | 11.4 | 15.5 | 42.25 | ±0.5
| K | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 4.4 | 4.4
| L | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6 | 7.4
| M | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 1 | 1.2 | ±0.3

### Connection style -07

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>6.3 x 0.8</td>
<td>6.3 x 0.8</td>
<td>6.3 x 0.8</td>
<td>6.3 x 0.8</td>
<td>6.3 x 0.8</td>
<td>6.3 x 0.8</td>
<td>6.3 x 0.8</td>
</tr>
</tbody>
</table>

### Connection style -08

|   |   |   |   |   |
|---|---|---|---|
| N | AWG 20 | AWG 20 | AWG 18 | AWG 18 |
| P | 14 | 14 | 14 | 14.9 |

### AWG type wire

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire length</td>
<td>140</td>
</tr>
</tbody>
</table>

### Recommended torque (Nm)

|   |   |   |   |   |
|---|---|---|---|
| N | 1.2 - 1.3 | 1.2 - 1.3 | 1.2 - 1.3 | 1.2 - 1.3 |
| Q | 51 | ±0.2 |

### Earth terminal

|   |   |   |   |   |
|---|---|---|---|
| N | 1.5 - 1.7 | 1.5 - 1.7 | 1.5 - 1.7 | 1.5 - 1.7 |

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

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