Multi-stage General Purpose AC/DC EMI Filter

<table>
<thead>
<tr>
<th>Performance indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated currents</strong></td>
</tr>
<tr>
<td><strong>High differential and common-mode attenuation</strong></td>
</tr>
<tr>
<td><strong>Optional medical versions (B type)</strong></td>
</tr>
<tr>
<td><strong>Optional safety versions (A type)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated voltage</strong></td>
</tr>
<tr>
<td><strong>Operating frequency</strong></td>
</tr>
<tr>
<td><strong>Rated currents</strong></td>
</tr>
<tr>
<td><strong>High potential test voltage</strong></td>
</tr>
<tr>
<td>P –&gt; PE 2000 VAC for 2 sec</td>
</tr>
<tr>
<td>P –&gt; PE 2500 VAC for 2 sec (B types)</td>
</tr>
<tr>
<td>P –&gt; N 1100 VDC for 2 sec</td>
</tr>
<tr>
<td><strong>Temperature range (operation and storage)</strong></td>
</tr>
<tr>
<td><strong>Certified to</strong></td>
</tr>
<tr>
<td><strong>Flammability corresponding to</strong></td>
</tr>
<tr>
<td><strong>Design corresponding to</strong></td>
</tr>
<tr>
<td><strong>MTBF @ 40°C/230 V (Mil-HB-217F)</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

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

**Features and benefits**
- FN 2060 two-stage filters are designed for easy and fast chassis mounting
- FN 2060 filters are also 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
- 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**

---

[Diagram of typical electrical schematic]

---

**Approvals**
- UL
- CSA
- IEC/EN 60939
- CE
- ROHS
## Filter selection table

<table>
<thead>
<tr>
<th>Filter*</th>
<th>Rated current @ 40°C (25°C)</th>
<th>Leakage current** @ 250 VAC/50 Hz (at 120 VAC/60 Hz)</th>
<th>Inductance L</th>
<th>Capacitance Cx</th>
<th>Capacitance Cy</th>
<th>Resistance R</th>
<th>Input/Output connections</th>
<th>Weight [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FN 2060-1-..</td>
<td>1 (1.2)</td>
<td>0.66 (0.38)</td>
<td>12</td>
<td>0.22</td>
<td>4.7</td>
<td>1000</td>
<td>-06 -07</td>
<td>120</td>
</tr>
<tr>
<td>FN 2060-3-..</td>
<td>3 (3.5)</td>
<td>0.66 (0.38)</td>
<td>2.5</td>
<td>0.22</td>
<td>4.7</td>
<td>1000</td>
<td>-06 -07</td>
<td>120</td>
</tr>
<tr>
<td>FN 2060-6-..</td>
<td>6 (6.9)</td>
<td>0.66 (0.38)</td>
<td>0.97</td>
<td>0.22</td>
<td>4.7</td>
<td>1000</td>
<td>-06 -07</td>
<td>120</td>
</tr>
<tr>
<td>FN 2060-10-..</td>
<td>10 (11.5)</td>
<td>0.66 (0.38)</td>
<td>0.8</td>
<td>0.47</td>
<td>4.7</td>
<td>470</td>
<td>-06 -07 -08</td>
<td>190</td>
</tr>
<tr>
<td>FN 2060-12-..</td>
<td>12 (13.8)</td>
<td>0.66 (0.38)</td>
<td>0.58</td>
<td>0.47</td>
<td>4.7</td>
<td>470</td>
<td>-06 -07 -08</td>
<td>190</td>
</tr>
<tr>
<td>FN 2060-16-..</td>
<td>16 (18.4)</td>
<td>0.66 (0.38)</td>
<td>0.65</td>
<td>0.33</td>
<td>4.7</td>
<td>1000</td>
<td>-06 -07 -08</td>
<td>260</td>
</tr>
<tr>
<td>FN 2060-20-..</td>
<td>20 (23)</td>
<td>0.66 (0.38)</td>
<td>0.6</td>
<td>1</td>
<td>4.7</td>
<td>220</td>
<td>-06 -08</td>
<td>480</td>
</tr>
<tr>
<td>FN 2060-30-08</td>
<td>30 (34.5)</td>
<td>0.79 (0.45)</td>
<td>0.6</td>
<td>1</td>
<td>10</td>
<td>220</td>
<td>-06 -08</td>
<td>480</td>
</tr>
<tr>
<td>FN 2060A-1-..</td>
<td>1 (1.2)</td>
<td>0.07 (0.04)</td>
<td>12</td>
<td>0.22</td>
<td>0.47</td>
<td>1000</td>
<td>-06 -07</td>
<td>120</td>
</tr>
<tr>
<td>FN 2060A-3-..</td>
<td>3 (3.5)</td>
<td>0.07 (0.04)</td>
<td>2.5</td>
<td>0.22</td>
<td>0.47</td>
<td>1000</td>
<td>-06 -07</td>
<td>120</td>
</tr>
<tr>
<td>FN 2060A-6-..</td>
<td>6 (6.9)</td>
<td>0.07 (0.04)</td>
<td>0.97</td>
<td>0.22</td>
<td>0.47</td>
<td>1000</td>
<td>-06 -07</td>
<td>120</td>
</tr>
<tr>
<td>FN 2060A-10-..</td>
<td>10 (11.5)</td>
<td>0.07 (0.04)</td>
<td>0.8</td>
<td>0.47</td>
<td>0.47</td>
<td>470</td>
<td>-06 -07 -08</td>
<td>190</td>
</tr>
<tr>
<td>FN 2060A-12-..</td>
<td>12 (13.8)</td>
<td>0.07 (0.04)</td>
<td>0.58</td>
<td>0.47</td>
<td>0.47</td>
<td>470</td>
<td>-06 -07 -08</td>
<td>190</td>
</tr>
<tr>
<td>FN 2060A-16-..</td>
<td>16 (18.4)</td>
<td>0.07 (0.04)</td>
<td>0.65</td>
<td>0.33</td>
<td>0.47</td>
<td>1000</td>
<td>-06 -07 -08</td>
<td>260</td>
</tr>
<tr>
<td>FN 2060A-20-..</td>
<td>20 (23)</td>
<td>0.07 (0.04)</td>
<td>0.6</td>
<td>1</td>
<td>0.47</td>
<td>220</td>
<td>-06 -08</td>
<td>480</td>
</tr>
<tr>
<td>FN 2060A-30-08</td>
<td>30 (34.5)</td>
<td>0.07 (0.04)</td>
<td>0.6</td>
<td>1</td>
<td>0.47</td>
<td>220</td>
<td>-06 -08</td>
<td>480</td>
</tr>
</tbody>
</table>

* To compile a complete part number, please replace the -.. with the required I/O connection style (e.g. FN 2060-30-08, FN 2060B-10-06).

** 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. Leakage current for DC application is 0 mA;
Typical filter attenuation

dPer 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
## Mechanical data

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

![Connection style -06, 1 to 12 A types](image1)

### Connection style -06, 16 A types

![Connection style -06, 16 A types](image2)

### Connection style -06, 20 A types

![Connection style -06, 20 A types](image3)

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

![Connection style -07, 1 to 16 A types](image4)

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

![Connection style -08, 10 to 16 A types](image5)

### Connection style -08, 20 A types

![Connection style -08, 20 A types](image6)

### Connection style -08, 30 A types

![Connection style -08, 30 A types](image7)
<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>Tolerances</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>85</td>
<td>85</td>
<td>85</td>
<td>113.5±1</td>
<td>119±1</td>
<td>±0.5</td>
</tr>
<tr>
<td>B</td>
<td>46.6</td>
<td>46.6</td>
<td>46.6</td>
<td>54</td>
<td>54</td>
<td>54</td>
<td>57.5±1</td>
<td>85.5±1</td>
<td>±0.5</td>
</tr>
<tr>
<td>C</td>
<td>29.3</td>
<td>29.3</td>
<td>29.3</td>
<td>30.3</td>
<td>30.3</td>
<td>40.3</td>
<td>45.4±1</td>
<td>57.6±1</td>
<td>±0.5</td>
</tr>
<tr>
<td>D</td>
<td>50.5</td>
<td>50.5</td>
<td>50.5</td>
<td>64.8</td>
<td>64.8</td>
<td>64.8</td>
<td>94±1</td>
<td>98.5±1</td>
<td>±0.5</td>
</tr>
<tr>
<td>E</td>
<td>44.5</td>
<td>44.5</td>
<td>44.5</td>
<td>49.8</td>
<td>49.8</td>
<td>49.8</td>
<td>56</td>
<td>84.5</td>
<td>±0.5</td>
</tr>
<tr>
<td>F</td>
<td>61</td>
<td>61</td>
<td>61</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>103</td>
<td>109</td>
<td>±0.3</td>
</tr>
<tr>
<td>G</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>27</td>
<td>27</td>
<td>27</td>
<td>27</td>
<td>25</td>
<td>±0.2</td>
</tr>
<tr>
<td>H</td>
<td>10.8</td>
<td>10.8</td>
<td>10.8</td>
<td>12.3</td>
<td>12.3</td>
<td>12.3</td>
<td>12.3</td>
<td>15.6</td>
<td>±0.5</td>
</tr>
<tr>
<td>I</td>
<td>19.3</td>
<td>19.3</td>
<td>19.3</td>
<td>20.8</td>
<td>20.8</td>
<td>29.8</td>
<td>32.4</td>
<td></td>
<td>±0.5</td>
</tr>
<tr>
<td>J</td>
<td>20.1</td>
<td>20.1</td>
<td>20.1</td>
<td>19.9</td>
<td>19.9</td>
<td>11.4</td>
<td>15.5</td>
<td>42.25</td>
<td>±0.5</td>
</tr>
<tr>
<td>K</td>
<td>5.3</td>
<td>5.3</td>
<td>5.3</td>
<td>5.3</td>
<td>5.3</td>
<td>5.3</td>
<td>4.4</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6.3</td>
<td>6</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>1</td>
<td>1.2</td>
<td>±0.3</td>
</tr>
</tbody>
</table>

**Connection style -06**

<table>
<thead>
<tr>
<th>N</th>
<th>6.3 x 0.8</th>
<th>6.3 x 0.8</th>
<th>6.3 x 0.8</th>
<th>6.3 x 0.8</th>
<th>6.3 x 0.8</th>
<th>6.3 x 0.8</th>
<th>6.3 x 0.8</th>
<th>6.3 x 0.8</th>
<th>6.3 x 0.8</th>
</tr>
</thead>
</table>

**Connection style -07**

<table>
<thead>
<tr>
<th>O</th>
<th>8.3</th>
<th>8.3</th>
<th>8.3</th>
<th>8.3</th>
<th>8.3</th>
<th>8.3</th>
<th>8.3</th>
<th>±0.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14.9</td>
<td>14.9</td>
<td>14.9</td>
<td>14.9</td>
<td>±5</td>
</tr>
</tbody>
</table>

**AWG type wire**

<table>
<thead>
<tr>
<th>AWG type wire</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>
</tr>
</thead>
<tbody>
<tr>
<td>Wire length</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
</tr>
</tbody>
</table>

**Connection style -08**

<table>
<thead>
<tr>
<th>N</th>
<th>M4</th>
<th>M4</th>
<th>M4</th>
<th>M4</th>
<th>M4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q</td>
<td>51</td>
<td>±0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Recommended torque (Nm)**

| 1.2 - 1.3 | 1.2 - 1.3 | 1.2 - 1.3 | 1.2 - 1.3 | 1.2 - 1.3 |

**Earth terminal**

| 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.
Headquarters, global innovation and development

Schaffner Group
Industrie Nord
Nordstrasse 11e
4542 Luterbach
T +41 32 681 66 26
info@schaffner.com

Sales and application centers

China
Schaffner EMC Ltd. Shanghai
T20-3 C, No 565 Chuangye Road, Pudong district
201201 Shanghai
T +86 21 3813 9500
csschina@schaffner.com
www.schaffner.com.cn

Finland
Schaffner Oy
Sauvonrinne 19 H
08500 Lohja
T +358 10 567 2855
finlandsales@schaffner.com

France
Schaffner EMC S.A.S.
16-20 Rue Louis Rameau
95875 Bezons
T +33 1 34 34 30 60
F +33 1 39 47 02 28
francesales@schaffner.com

Germany
Schaffner Deutschland GmbH
Schoemperlenstrasse 128
76185 Karlsruhe
T +49 721 56910
F +49 721 569110
germanysales@schaffner.com

India
Schaffner India Pvt. Ltd
REGUS WORLD TRADE CENTRE
WTC, 22nd Floor Unit No 223B, Brigade Gateway Campus, 26/1, Dr. R. Rajkumar Road
Mallahewar Road (W)
560055 Bangalore
T +91 80 67935355
indiasales@schaffner.com

Italy
Schaffner EMC S.r.l.
Via Ticino, 30
20900 Monza (MB)
T +39 039 21 41 070
italysales@schaffner.com

Japan
Schaffner EMC K.K.
Taijo-Seimei Sangenjaya Bldg.
1-32-12, Kasauma, Setagaya-ku
154-0011 Tokyo
T +81 3 5712 3650
F +81 3 5712 3651
japansales@schaffner.com
www.schaffner.jp

Singapore
Schaffner EMC Pte Ltd.
#05-09, Kg UbI Ind. Estate
408705 Singapore
T +65 6377 3283
F +65 6377 3281
singaporesales@schaffner.com

Spain
Schaffner EMC España
Calle Calendula 93, Miniparc III, Edificio E
El Soto de Moraleja, Alcobendas
28109 Madrid
T +34 917 912 900
F +34 917 912 901
spainsales@schaffner.com

Taiwan R.O.C.
Schaffner EMV Ltd.
20 Floor-2, No 97, Section 1, XinTai 5th Road
22175 XZhi District New Taipei City 22175
T +886 2 2697 5500
F +886 2 2697 5513
taiwansales@schaffner.com
www.schaffner.com.tw

Thailand
Schaffner EMC Co. Ltd.
Northern Region Industrial Estate
67 Moo 4 Tambon Ban Klang
Amphur Muang PO. Box 14
51000 Lampun
T +66 53 58 11 04
F +66 53 58 10 19
thailandsales@schaffner.com

UK
Schaffner Ltd.
5 Ashville Way, Molly Millars Lane
Wokingham
RG41 2PL Berkshire
T +44 118 9770070
F +44 118 9792969
uksales@schaffner.com

USA
Schaffner EMC Inc.
52 Mayfield Avenue
Edison, New Jersey
08817 24789
T +1 732 225 9533
F +1 732 225 4789
usasales@schaffner.com
www.schaffnerusa.com

Schaffner North America
6722 Thirlane Road
24019 Roanoke, Virginia
T +1 276 228 7943
F +1 276 228 7983

Schaffner North America
823 Fairview Road
24382 Wytheville, Virginia
T +1 276 228 7943
F +1 276 228 7258

To find your local partner within Schaffner’s global network: www.schaffner.com

© 2018 Schaffner Group

The content of this document has been carefully checked and understood. However, neither Schaffner nor its subsidiaries assume any liability whatsoever for any errors or inaccuracies of this document and the consequences thereof. Published specifications are subject to change without notice. Product suitability for any area of application must ultimately be determined by the customer. In all cases, products must never be operated outside their published specifications. Schaffner does not guarantee the availability of all published products. This disclaimer shall be governed by substantive Swiss law and resulting disputes shall be settled by the courts at the place of business of Schaffner Holding AG. Latest publications and a complete disclaimer can be downloaded from the Schaffner website. All trademarks recognized.