Multi-stage Performance AC/DC EMI Filter

Technical specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage*</td>
<td>250 VAC, 50/60 Hz; 250 VDC</td>
</tr>
<tr>
<td>Operating frequency</td>
<td>DC to 400 Hz</td>
</tr>
<tr>
<td>Rated currents</td>
<td>1 to 36 A @ 40°C max</td>
</tr>
<tr>
<td>High potential test voltage</td>
<td>P -&gt; PE 2000 VAC for 2 sec</td>
</tr>
<tr>
<td></td>
<td>P -&gt; PE 2500 VAC for 2 sec (B types)</td>
</tr>
<tr>
<td></td>
<td>P -&gt; N 1100 VDC for 2 sec</td>
</tr>
<tr>
<td>Temperature range (operation and storage)</td>
<td>-25°C to +100°C (25/100/23)**</td>
</tr>
<tr>
<td>Certified to</td>
<td>UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939 (applies to AC and DC applications)</td>
</tr>
<tr>
<td>Flammability corresponding to</td>
<td>UL 94 V-2 or better</td>
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<tr>
<td>Design corresponding to</td>
<td>UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939</td>
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<tr>
<td>Overvoltage category</td>
<td>II acc. IEC 60664-1</td>
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<tr>
<td>Pollution degree</td>
<td>2 acc. IEC 60664-1</td>
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<tr>
<td>Altitude</td>
<td>2000m (above derating applies)</td>
</tr>
<tr>
<td>MTBF @ 40°C/230 V (MIL-HB-217F)</td>
<td>1,550,000 hours</td>
</tr>
<tr>
<td></td>
<td>1,600,000 hours (B types)</td>
</tr>
</tbody>
</table>

* 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 2070 two-stage filters are designed for easy and fast chassis mounting
- FN 2070 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 2070 two-stage filters are designed for high frequency attenuation
- FN 2070 filters are also available as single-stage filters (FN 2030 series)
- FN 2070 filters are also available with differential mode choke (FN 2080 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
- Single Phase Motor Drives

Typical electrical schematic

```
  P  CK  L  R  CK  L  P'  
  N  0   Cy  Cy  0   N'  
  PE Line
```

Approved by:

- UL
- CSA
- ROHS
- CE
## 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>Capacitance*** Cy</th>
<th>Resistance*** R</th>
<th>Input/Output connections</th>
<th>Weight</th>
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<tbody>
<tr>
<td>FN 2070-1-..</td>
<td>1 (1.2)</td>
<td>0.66 (0.38)</td>
<td>0.02</td>
<td>0.03</td>
<td>4.7</td>
<td>1000</td>
<td>-06 -07</td>
<td>190</td>
</tr>
<tr>
<td>FN 2070-3-..</td>
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<td>470</td>
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<td>-06 -07</td>
<td>450</td>
</tr>
<tr>
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<td>0.66 (0.38)</td>
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<td>220</td>
<td>-06 -07 -08</td>
<td>670</td>
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<tr>
<td>FN 2070-12-..</td>
<td>12 (13.8)</td>
<td>0.66 (0.38)</td>
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<td>2.2</td>
<td>4.7</td>
<td>220</td>
<td>-06 -07 -08</td>
<td>790</td>
</tr>
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<td>2.2</td>
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<td>790</td>
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<td>0.47</td>
<td>1000</td>
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<td>0.09</td>
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<td>470</td>
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<td>250</td>
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<td>0.07</td>
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<td>0.47</td>
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<td>0.47</td>
<td>220</td>
<td>-06 -07 -08</td>
<td>670</td>
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<td>FN 2070 B-16-..</td>
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<td>2.2</td>
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<td>** Enhanced performance**</td>
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<td>FN 2070 M-1-06</td>
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<td>-06 -08</td>
<td>670</td>
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<td>3.25</td>
<td>1</td>
<td>47</td>
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<td>-06 -08</td>
<td>670</td>
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<td>47</td>
<td>220</td>
<td>-06 -08</td>
<td>1000</td>
</tr>
<tr>
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<td>33</td>
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<td>-06 -08</td>
<td>790</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; 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

1 A: Standard type
   A type
   B type
   Enhanced performance

3 A: Standard type
   A type
   B type
   Enhanced performance

6 A: Standard type
   A type
   B type
   Enhanced performance

10 A: Standard type
   A type
   B type
   Enhanced performance

12 A: Standard type
   A type
   B type
   Enhanced performance
Product selector

FN 2070 x -<x-yy

<p>| | | |</p>
<table>
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<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>Factor 6.3 x 0.8 mm (solder/soldering)</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Wire leads</td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Stud (M4 screw)</td>
<td></td>
</tr>
<tr>
<td>1 to M</td>
<td>Rated current</td>
<td></td>
</tr>
<tr>
<td>Blank</td>
<td>Standard version</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Safety version</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Medical version</td>
<td></td>
</tr>
<tr>
<td>L/M</td>
<td>High-performance version</td>
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</table>

Mechanical data

Connection style -06, 1 and 3 A types

Connection style -06, 6 to 12 A types

Connection style -07, 1 and 3 A types (same dimensions as style -06)

Connection style -07, 6 to 12 A types (same dimensions as style -06)

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

Connection style -08, 10 to 16 A types

Connection style -08, 25 and 36 A types
### Dimensions

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<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>25 A</th>
<th>36 A</th>
<th>Tolerances</th>
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<td>113.5</td>
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<td>156</td>
<td>119</td>
<td>156</td>
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<td>B</td>
<td>54 ±0.5</td>
<td>54 ±0.5</td>
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<td>1</td>
<td>1</td>
<td>1.2</td>
<td>1</td>
<td>1</td>
<td>±0.3</td>
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</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 |

**Connection style -07**

| O | 8.3 | 8.3 | 8.4 | 8.4 | 8.4 | 8.6 | ±0.5 |
| P | 14.9 | 14.9 | 18 | 18 | 18 | 42.25 | ±0.5 |
| AWG type wire | AWG 20 | AWG 20 | AWG 18 | AWG 18 | AWG 16 | AWG 16 | |
| Wire length | 140 | 140 | 140 | 140 | 140 | 140 | ±5 |

**Connection style -08**

| N | M4 | M4 | M4 | M4 | M4 |
| Q | 51 | ±0.2 |
| 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 | 1.5 - 1.7 |

All dimensions in mm; 1 inch = 25.4 mm

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