DC Feedthrough Filter

Technical specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum continuous operating voltage</td>
<td>130 VDC (UL, ENEC)</td>
</tr>
<tr>
<td></td>
<td>130 VAC, 50/60 Hz (UL, ENEC)</td>
</tr>
<tr>
<td></td>
<td>650 VDC max.</td>
</tr>
<tr>
<td>Rated currents</td>
<td>10 to 200 A @ 60°C max.</td>
</tr>
<tr>
<td>Capacitor class</td>
<td>Y4</td>
</tr>
<tr>
<td>High potential test voltage</td>
<td>1700 VDC for 2 sec</td>
</tr>
<tr>
<td>Insulation resistance (100VDC after 60 sec)</td>
<td>&lt;0.33 μF, t &gt;15,000 s</td>
</tr>
<tr>
<td></td>
<td>&gt;0.33 μF, τ &gt;5000 s</td>
</tr>
<tr>
<td>Temperature range (operation and storage)</td>
<td>-40°C to +100°C (40/100/21)</td>
</tr>
<tr>
<td>Flammability corresponding to</td>
<td>UL 94 V-2 or better</td>
</tr>
<tr>
<td>MTBF @ 60°C/130 V (Mil-HB-217F)</td>
<td>&lt;200 A: 680,000 hours</td>
</tr>
<tr>
<td></td>
<td>≥200 A: 356,000 hours</td>
</tr>
</tbody>
</table>

Features and benefits

- Very low internal series inductance
- Very high self-resonant frequency
- Self-healing dielectric
- High quality and reliability
- Through-bulkhead mounting
- Anti-twist protection
- Custom-specific or dual-versions on request

Typical applications

- Power line filter for 48 VDC battery power
- Increasing system and information security
- Telecom base stations
- Switching and cellular equipment
- Computer servers
- UPS power supplies
- Medical equipment

Typical electrical schematic

Feedthrough filters offer a high insertion loss across a broad band of frequencies from a few tens of kHz up to the GHz region. In general, feedthrough filters offer a higher level of EMI suppression than feedthrough capacitors of the same current rating. This is particularly relevant to applications where source impedance is smaller than 50 Ω. Different versions are available offering a wide selection on operating currents and performance levels. DC feedthrough filters are designed and approved for 130 VDC/130 VAC 50/60 Hz operation.
### Feedthrough selector table

<table>
<thead>
<tr>
<th>Feedthrough</th>
<th>Rated current @ 60°C (A)</th>
<th>Leakage current* @ 130 VAC/50 Hz (mA)</th>
<th>Capacitance** (nF)</th>
<th>Inductance L @ 10 kHz (nH)</th>
<th>DC resistance*** R @ 25°C (mΩ)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FN 7660-10-M3</td>
<td>10</td>
<td>0.98</td>
<td>10</td>
<td>58</td>
<td>1.06</td>
<td>48</td>
</tr>
<tr>
<td>FN 7661-10-M3</td>
<td>10</td>
<td>9.8</td>
<td>100</td>
<td>70</td>
<td>1.2</td>
<td>55</td>
</tr>
<tr>
<td>FN 7661-16-M4</td>
<td>16</td>
<td>9.8</td>
<td>100</td>
<td>70</td>
<td>0.7</td>
<td>58</td>
</tr>
<tr>
<td>FN 7660-32-M4</td>
<td>32</td>
<td>9.8</td>
<td>100</td>
<td>70</td>
<td>0.65</td>
<td>58</td>
</tr>
<tr>
<td>FN 7661-32-M4</td>
<td>32</td>
<td>9.8</td>
<td>100</td>
<td>70</td>
<td>0.7</td>
<td>58</td>
</tr>
<tr>
<td>FN 7660-63-M6</td>
<td>63</td>
<td>9.8</td>
<td>470</td>
<td>186</td>
<td>0.47</td>
<td>250</td>
</tr>
<tr>
<td>FN 7661-63-M6</td>
<td>63</td>
<td>46</td>
<td>470</td>
<td>186</td>
<td>0.25</td>
<td>320</td>
</tr>
<tr>
<td>FN 7660-100-M8</td>
<td>100</td>
<td>46</td>
<td>124</td>
<td>124</td>
<td>0.24</td>
<td>410</td>
</tr>
<tr>
<td>FN 7661-100-M8</td>
<td>100</td>
<td>98</td>
<td>1000</td>
<td>186</td>
<td>0.28</td>
<td>320</td>
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<tr>
<td>FN 7660-200-M10</td>
<td>200</td>
<td>46</td>
<td>470</td>
<td>124</td>
<td>0.24</td>
<td>655</td>
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<tr>
<td>FN 7661-200-M10</td>
<td>200</td>
<td>460.7</td>
<td>4700</td>
<td>124</td>
<td>0.24</td>
<td>655</td>
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</tbody>
</table>

* Tolerance ±20%
** Tolerance ±20%
*** Tolerance ±15%

### Typical filter attenuation

Full load, 50 Ω system

<table>
<thead>
<tr>
<th>10 A types</th>
<th>16 A types</th>
<th>32 A types</th>
<th>63 A types</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Graph 10 A types" /></td>
<td><img src="image2" alt="Graph 16 A types" /></td>
<td><img src="image3" alt="Graph 32 A types" /></td>
<td><img src="image4" alt="Graph 63 A types" /></td>
</tr>
</tbody>
</table>

A = FN 7661-10-M3
B = FN 7660-10-M3
A = FN 7661-16-M4
B = FN 7660-10-M3
A = FN 7661-32-M4
B = FN 7660-32-M4
A = FN 7661-63-M6
B = FN 7660-63-M6

<table>
<thead>
<tr>
<th>100 A types</th>
<th>200 A types</th>
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<tbody>
<tr>
<td><img src="image5" alt="Graph 100 A types" /></td>
<td><img src="image6" alt="Graph 200 A types" /></td>
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A = FN 7661-100-M8
B = FN 7660-100-M8
A = FN 7661-200-M10
B = FN 7660-200-M10
Mechanical data

**FN 766x mechanical**

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>S</th>
<th>T</th>
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<tbody>
<tr>
<td>FN 7660-10-M3</td>
<td>90</td>
<td>12</td>
<td>20</td>
<td>17</td>
<td>16</td>
<td>49</td>
<td>10.3</td>
<td>Ø12.3</td>
<td>M3</td>
<td>M12x1</td>
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<tr>
<td>FN 7661-10-M3</td>
<td>107</td>
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<td>20</td>
<td>17</td>
<td>16</td>
<td>66</td>
<td>10.3</td>
<td>Ø12.3</td>
<td>M3</td>
<td>M12x1</td>
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<td>20</td>
<td>17</td>
<td>18</td>
<td>61</td>
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<td>Ø12.3</td>
<td>M4</td>
<td>M12x1</td>
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<tr>
<td>FN 7660-32-M4</td>
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<td>20</td>
<td>17</td>
<td>18</td>
<td>61</td>
<td>10.3</td>
<td>Ø12.3</td>
<td>M4</td>
<td>M12x1</td>
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<tr>
<td>FN 7660-63-M6</td>
<td>160</td>
<td>14</td>
<td>25</td>
<td>22</td>
<td>26</td>
<td>94</td>
<td>14.3</td>
<td>Ø16.3</td>
<td>M6</td>
<td>M16x1</td>
</tr>
<tr>
<td>FN 7661-63-M6</td>
<td>173</td>
<td>16</td>
<td>32</td>
<td>27</td>
<td>26</td>
<td>105</td>
<td>18.3</td>
<td>Ø20.3</td>
<td>M6</td>
<td>M20x1</td>
</tr>
<tr>
<td>FN 7660-100-M8</td>
<td>184</td>
<td>16</td>
<td>32</td>
<td>27</td>
<td>32</td>
<td>104</td>
<td>18.3</td>
<td>Ø20.3</td>
<td>M8</td>
<td>M20x1</td>
</tr>
<tr>
<td>FN 7661-100-M8</td>
<td>200</td>
<td>16</td>
<td>32</td>
<td>27</td>
<td>32</td>
<td>120</td>
<td>18.3</td>
<td>Ø20.3</td>
<td>M8</td>
<td>M20x1</td>
</tr>
<tr>
<td>FN 7660-200-M10</td>
<td>209</td>
<td>19</td>
<td>54</td>
<td>41</td>
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<td>112</td>
<td>22.3</td>
<td>Ø24.3</td>
<td>M10</td>
<td>M24x1</td>
</tr>
<tr>
<td>FN 7661-200-M10</td>
<td>209</td>
<td>19</td>
<td>54</td>
<td>41</td>
<td>40</td>
<td>112</td>
<td>24.3</td>
<td>Ø27.3</td>
<td>M10</td>
<td>M27x1.5</td>
</tr>
</tbody>
</table>

Tolerances: ±2 ±0.2

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

### Recommended torque

<table>
<thead>
<tr>
<th>Terminal thread</th>
<th>M3</th>
<th>M4</th>
<th>M6</th>
<th>M8</th>
<th>M10</th>
<th>M12x1</th>
<th>M16x1</th>
<th>M20x1</th>
<th>M24x1</th>
<th>M27x1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.5 Nm</td>
<td>1.2 Nm</td>
<td>2.5 Nm</td>
<td>5 Nm</td>
<td>8 Nm</td>
<td>3 Nm</td>
<td>4 Nm</td>
<td>7 Nm</td>
<td>8 Nm</td>
<td>12 Nm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mounting thread</th>
<th>M3</th>
<th>M4</th>
<th>M6</th>
<th>M8</th>
<th>M10</th>
<th>M12x1</th>
<th>M16x1</th>
<th>M20x1</th>
<th>M24x1</th>
<th>M27x1.5</th>
</tr>
</thead>
<tbody>
<tr>
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<td>5 Nm</td>
<td>8 Nm</td>
<td>3 Nm</td>
<td>4 Nm</td>
<td>7 Nm</td>
<td>8 Nm</td>
<td>12 Nm</td>
</tr>
</tbody>
</table>
Headquarters, global innovation and development

Schaffner Group
Nordstrasse 11
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
cschina@schaffner.com
www.schaffner.com.cn

Finland
Schaffner Oy
Savonrinne 19 H
08500 Loiha
T +358 10 567 2865
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. Rajkumar Road Mallerwaram (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.
Taiju-Seimei Sangenjaya Bldg.
1-32-12, Kamsumi, 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, Miniparcm III, Edificio E
El Soto de Moraleja, Alcobendas
28109 Madrid
T +34 917 912 900
F +34 917 912 901
spainsales@schaffner.com

Switzerland
Schaffner EMV AG
Nordstrasse 11
4542 Luterbach
T +41 32 681 66 26
switzerlandsales@schaffner.com

Taiwan R.O.C.
Schaffner EMV Ltd.
20 Floor-2, No 97, Section 1, XinTai 5th Road
22175 Xizhi District New Taipei City 22175
T +886 2 2697 5500
F +886 2 2697 5533
taiwansales@schaffner.com
www.schaffner.com.tw

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