General Purpose EMC/EMI Line Filter

Three-phase and neutral line filter for general four-wire filtering tasks
- Choice of connection style
- Low operating leakage current
- Compliant with IEC 60950
- Suitable to meet EN 55011/14/22

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>120</td>
<td>240</td>
</tr>
<tr>
<td></td>
<td>360</td>
<td>480</td>
<td>600</td>
</tr>
</tbody>
</table>

Technical specifications

- Maximum continuous operating voltage: 3x 440/250 VAC
- Rated currents: 16 to 150 A @ 40°C max.
- High potential test voltage:
  - P/N -> E: 2000 VAC for 2 sec
  - P -> P: 1900 VDC for 2 sec
  - P -> N: 1100 VDC for 2 sec
- Protection category:
  - IP 20 (filters with connectors -29, -33, -34)
  - IP 00 (filters with connectors -06, -24, -28)
- Overload capability: 4x rated current at switch on, 1.5x rated current for 1 minute, once per hour
- Temperature range (operation and storage): -25°C to +100°C (25/100/21)
- Flammability: UL 94 V-2 or better
- Design corresponding to: UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939
- MTBF @ 40°C/400 V (MIL-HB-217F): 220,000 hours

Features and benefits

- FN 356 represents the industry standard filter solutions for EMC compliance on three-phases and the neutral conductor, providing high attenuation of both symmetrical and asymmetrical interference
- Choice of connection style is offered for an application-specific filter selection
- Solid touch-safe terminal blocks (-29, -33, -34 versions) offer a generous contacting cross section and contribute to overall safety (IP 20)
- Used as a mains input filter, FN 356 filters increase the conducted immunity and thus contribute to system reliability
- Design compliance with IEC 60950 provides additional application flexibility

Approvals

- UL®
- CSA®
- IEC 14
- ROHS

(FN 356 up to 100 A)

Typical applications

- General purpose four-wire filtering
- Mainframe computer systems
- High power office equipment
- UPS
- Installations comprising automation equipment

Typical electrical schematic
# Filter selection table

<table>
<thead>
<tr>
<th>Filter*</th>
<th>Rated current @ 40°C (25°C)</th>
<th>Leakage current** @ 440 VAC/50 Hz</th>
<th>Power loss @ 25 °C/50Hz</th>
<th>Input/Output connections</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FN 356-16-..</td>
<td>16 (18.4)</td>
<td>0.1</td>
<td>7.0</td>
<td>-06</td>
<td>-29</td>
</tr>
<tr>
<td>FN 356-25-..</td>
<td>25 (28.8)</td>
<td>0.1</td>
<td>10.1</td>
<td>-24</td>
<td>-33</td>
</tr>
<tr>
<td>FN 356-36-..</td>
<td>36 (41.5)</td>
<td>0.1</td>
<td>10.9</td>
<td>-24</td>
<td>-33</td>
</tr>
<tr>
<td>FN 356-50-..</td>
<td>50 (57.7)</td>
<td>0.1</td>
<td>15.8</td>
<td>-24</td>
<td>-33</td>
</tr>
<tr>
<td>FN 356-100-..</td>
<td>100 (115.0)</td>
<td>0.3</td>
<td>24.0</td>
<td>-28</td>
<td>-34</td>
</tr>
<tr>
<td>FN 356-150-28</td>
<td>150 (172.5)</td>
<td>1.7</td>
<td>45.9</td>
<td>-28</td>
<td>-28</td>
</tr>
</tbody>
</table>

* To compile a complete part number, please replace the -.. with the required I/O connection style.
** Standardized calculated leakage current acc. IEC60939 under normal operating conditions.

## 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

<table>
<thead>
<tr>
<th>16 A types</th>
<th>25 to 50 A types</th>
<th>100 A types</th>
<th>150 A types</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="graph1.png" alt="Graph" /></td>
<td><img src="graph2.png" alt="Graph" /></td>
<td><img src="graph3.png" alt="Graph" /></td>
<td><img src="graph4.png" alt="Graph" /></td>
</tr>
</tbody>
</table>

## Mechanical data

<table>
<thead>
<tr>
<th>16 to 50 A types (-06, -24)</th>
<th>16 to 50 A types (-29, -33)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="mech1.png" alt="Mechanical diagram" /></td>
<td><img src="mech2.png" alt="Mechanical diagram" /></td>
</tr>
</tbody>
</table>
**100 and 150 A types (-28)**

Note: in favour of a better readability, connectors and earth studs are not shown in the horizontal projection.

## Dimensions

<table>
<thead>
<tr>
<th></th>
<th>16 A (-06)</th>
<th>16 A (-29)</th>
<th>25 A (-24)</th>
<th>25 A (-33)</th>
<th>36 A (-24)</th>
<th>36 A (-33)</th>
<th>50 A (-24)</th>
<th>50 A (-33)</th>
<th>100 A (-28)</th>
<th>100 A (-34)</th>
<th>150 A</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>149</td>
<td>189.5</td>
<td>140</td>
<td>189.5</td>
<td>140</td>
<td>189.5</td>
<td>192</td>
<td>250</td>
<td>250</td>
<td>340</td>
<td></td>
</tr>
<tr>
<td>B*</td>
<td>104</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>105</td>
<td>102</td>
<td>130</td>
<td>130</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>50</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>102</td>
<td>130</td>
<td>130</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>44 ±0.3</td>
<td>165.5</td>
<td>44 ±0.3</td>
<td>165.5</td>
<td>44 ±0.3</td>
<td>165.5</td>
<td>44 ±0.3</td>
<td>168</td>
<td>230</td>
<td>320</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>75 ±0.3</td>
<td>80</td>
<td>75 ±0.3</td>
<td>50</td>
<td>75 ±0.3</td>
<td>50</td>
<td>75 ±0.3</td>
<td>98</td>
<td>60</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>M5 x 7</td>
<td>13 x 6.5</td>
<td>M5 x 7</td>
<td>13 x 6.5</td>
<td>M5 x 7</td>
<td>13 x 6.5</td>
<td>M5 x 7</td>
<td>13 x 6.5</td>
<td>13 x 6.5</td>
<td>13 x 6.5</td>
<td></td>
</tr>
<tr>
<td>H</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>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>6.3 x 0.8</td>
<td>M6</td>
<td>M6</td>
<td>M6</td>
<td>M6</td>
<td>M6</td>
<td>M6</td>
<td>M6</td>
<td>M6</td>
<td>M6</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>52</td>
<td>82</td>
<td>52.5</td>
<td>52.5</td>
<td>52.5</td>
<td>52.5</td>
<td>52.5</td>
<td>61</td>
<td>80</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>22.5</td>
<td>25</td>
<td>46.5</td>
<td>20</td>
<td>46.5</td>
<td>20</td>
<td>68.5</td>
<td>35</td>
<td>65</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

* Rivets exceed this dimension by max. 1.3mm on each side.
All dimensions in mm; 1 inch = 25.4 mm
Tolerances according: ISO 2768-m/EN 22768-m

## Filter input/output connector cross sections

<table>
<thead>
<tr>
<th>Solid wire</th>
<th>-06 (6.3 x 0.8mm)</th>
<th>-24 (M6)</th>
<th>-28 (M10)</th>
<th>-29</th>
<th>-33</th>
<th>-34</th>
</tr>
</thead>
<tbody>
<tr>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>6 mm²</td>
<td>16 mm²</td>
<td>35 mm²</td>
</tr>
<tr>
<td>Flex wire</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>4 mm²</td>
<td>10 mm²</td>
<td>25 mm²</td>
</tr>
<tr>
<td>AWG type wire</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>AWG 10</td>
<td>AWG 6</td>
<td>AWG 2</td>
</tr>
<tr>
<td>Recommended torque</td>
<td>3.5-4.0 Nm</td>
<td>15-17 Nm</td>
<td>06-0.8 Nm</td>
<td>1.5-1.8 Nm</td>
<td>4.0-4.5 Nm</td>
<td></td>
</tr>
</tbody>
</table>

Please visit [www.schaffner.com](http://www.schaffner.com) to find more details on filter connectors.
Headquarters, global innovation and development

Switzerland
Schaffner Group
Nordstrasse 11
4542 Luterbach
T +41 32 681 66 26
info@schaffner.com
www.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
Sauvonrinne 19 H
08500 Lohja
T +358 50 468 7284
finlandsales@schaffner.com

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

Germany
Schaffner Deutschland GmbH
Schoemperrlenstrasse 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 2238, Brigade Gateway Campus, 26/1, Dr. Rajkumar Road
Malleshwaram (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.
1-32-12, Kamiuina, Setagaya-ku
7F Mitsui-seimei Sangenjaya Bldg.
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 Española
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

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