Single-phase EMC Filter for Control Equipment

- Filter for the control line of complex equipment and machinery
- To ensure interference-free operation of control equipment (PLC, Motion-, Robot Control etc.)
- To improve operational reliability and system stability
- Compact EMC filter design with minimum space requirement

### Performance indicators

#### Attenuation performance

<table>
<thead>
<tr>
<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>
</tr>
</tbody>
</table>

#### Technical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum continuous operating voltage</td>
<td>250 VAC</td>
</tr>
<tr>
<td>Operating frequency</td>
<td>DC to 400 Hz</td>
</tr>
<tr>
<td>Rated currents</td>
<td>6 to 16 A @ 50°C</td>
</tr>
<tr>
<td>High potential test voltage</td>
<td>P/N -&gt; E 2250VDC for 2 sec  \ P -&gt; N 1100VDC for 2 sec</td>
</tr>
<tr>
<td>Protection category</td>
<td>IP 20</td>
</tr>
<tr>
<td>Overload capability</td>
<td>4x rated current at switch on, 1.5x rated current for 1 minute, once per hour</td>
</tr>
<tr>
<td>Temperature range (operation and storage)</td>
<td>-25°C to +100°C (25/100/21)</td>
</tr>
<tr>
<td>Flammability corresponding to</td>
<td>UL 94 V-2 or better</td>
</tr>
<tr>
<td>Design corresponding to</td>
<td>UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939</td>
</tr>
<tr>
<td>MTBF @ 50°C/250 V (Mil-HB-217F)</td>
<td>1,300,000 hours</td>
</tr>
</tbody>
</table>

### Approvals & Compliances

- UL, CE, RoHS

### Features and benefits

- An additional filter for the supply cables of controls of rather large and complex systems, to ensure a reliable operation of the control unit.
- To achieve significant system stability improvement by reducing the risk of internal interference propagation and coupling.
- FN 2415 B version without leakage current (0 mA)
- FN 2415 L version with leakage current of less than 3.5 mA.
- Simple and time-saving installation with good accessibility for automatic and hand tools.
- Solid, touch-safe terminal blocks offering sufficient contacting cross section according to the EN 60204-1 installation standard.
- By providing a very decent attenuation performance, FN 2415 contributes significantly to the achievement of electromagnetic compliance, e.g. EN50370-1 standards for machine tools.

### Typical applications

Ideal for industrial equipment, machinery and diverse process automation systems, which involve any kind of control units (NC, CNC, Motion- and Robot Control(s)).

Large and complex machine tools with multiple driving axes and very long motor cables can be subjected to major reliability problems, provoked and by internal coupling of interferences from the drive system to the control wires.

This can cause drop outs and interrupts of the control unit and consequently lead to unnecessary downtimes of the entire machine. FN 2415 can also be used for most diverse single-phase applications, e.g. motor drives and power supplies.

### Typical electrical schematic
**Filter selection table**

<table>
<thead>
<tr>
<th>Filter</th>
<th>Buy</th>
<th>Rated current @40°C (25°C)</th>
<th>Leakage current* 250VAC/50Hz (120VAC/60Hz)</th>
<th>Power loss</th>
<th>Inductance** L</th>
<th>Capacitance** Cx</th>
<th>Resistance** R</th>
<th>Input/Output</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>FN2415-6-29</td>
<td></td>
<td>6 (6.6)</td>
<td>7.85 (4.52)</td>
<td>2.2</td>
<td>8</td>
<td>3.3</td>
<td>100</td>
<td>220</td>
<td>-29</td>
</tr>
<tr>
<td>FN2415-10-29</td>
<td></td>
<td>10 (11)</td>
<td>7.85 (4.52)</td>
<td>2.4</td>
<td>4.2</td>
<td>3.3</td>
<td>100</td>
<td>220</td>
<td>-29</td>
</tr>
<tr>
<td>FN2415-16-29</td>
<td></td>
<td>16 (17.5)</td>
<td>7.85 (4.52)</td>
<td>4.3</td>
<td>3</td>
<td>3.3</td>
<td>100</td>
<td>220</td>
<td>-29</td>
</tr>
<tr>
<td>FN2415B-6-29</td>
<td></td>
<td>6 (6.6)</td>
<td>0.00 (0.00)</td>
<td>2.2</td>
<td>8</td>
<td>3.3</td>
<td>220</td>
<td>-29</td>
<td>0.4</td>
</tr>
<tr>
<td>FN2415B-10-29</td>
<td></td>
<td>10 (11)</td>
<td>0.00 (0.00)</td>
<td>2.4</td>
<td>4.2</td>
<td>3.3</td>
<td>220</td>
<td>-29</td>
<td>0.4</td>
</tr>
<tr>
<td>FN2415B-16-29</td>
<td></td>
<td>16 (17.5)</td>
<td>0.00 (0.00)</td>
<td>4.3</td>
<td>3</td>
<td>3.3</td>
<td>220</td>
<td>-29</td>
<td>0.4</td>
</tr>
<tr>
<td>FN2415L-6-29</td>
<td></td>
<td>6 (6.6)</td>
<td>2.59 (1.49)</td>
<td>2.2</td>
<td>8</td>
<td>3.3</td>
<td>33</td>
<td>220</td>
<td>-29</td>
</tr>
<tr>
<td>FN2415L-10-29</td>
<td></td>
<td>10 (11)</td>
<td>2.59 (1.49)</td>
<td>2.4</td>
<td>4.2</td>
<td>3.3</td>
<td>33</td>
<td>220</td>
<td>-29</td>
</tr>
<tr>
<td>FN2415L-16-29</td>
<td></td>
<td>16 (17.5)</td>
<td>2.59 (1.49)</td>
<td>4.3</td>
<td>3</td>
<td>3.3</td>
<td>33</td>
<td>220</td>
<td>-29</td>
</tr>
</tbody>
</table>

* Maximum leakage under normal operating conditions (acc. to 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%

*** Value of both inductors in the same

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**Typical filter attenuation**

Per CISPR 17; DM (differential mode) =50 Ω/50 Ω sym; CM (common mode) =50 Ω/50 Ω asym

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![Graphs for 6 A]  
6 A: Standard type  
L type  
B type

![Graphs for 10 A]  
10 A: Standard type  
L type  
B type

![Graphs for 16 A]  
16 A: Standard type  
L type  
B type
**Mechanical Data**

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

**Filter input/output connector cross sections**

| Solid wire | 6 mm² |
| Flex wire  | 4 mm² |
| AWG type wire | AWG 10 |
| Recommended torque | 0.6-0.8 Nm |

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

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To our local sales and application centers

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

Headquarters, global innovation and development

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 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
F +33 1 39 47 02 28
francesales@schaffner.com

Germany
Schaffner Deutschland GmbH
Schoeplerlenstrasse 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
Malleshwararam (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.
Taigai-Seimei Sangenjaya Bldg.
1-32-12, Kusunuma, 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

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

Schaffner EMC AB
Ostermalmsgt 1
114 42 Stockholm
T +46 8 5050 2425
swedensales@schaffner.com
www.schaffner.com

Schaffner EMC 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

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

Schaffner Ltd.
1, Oakmede Place
Binfield
RG42 4JF Berkshire
T +44 118 9770070
F +44 118 9792969
uksales@schaffner.com

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

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