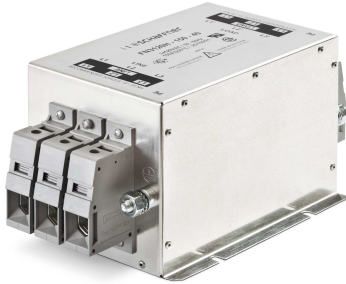


# High-Performance EMC/RFI Filter for Drives



- High performance filter for extremely noisy applications
- Significantly improves the reliability and immunity of installations
- Enables compliance with Class B limits even with very long cables



### Performance indicators

Attenuation performance



## Technical specifications

|                                                  |                                                                                  |
|--------------------------------------------------|----------------------------------------------------------------------------------|
| <b>Maximum continuous operating voltage</b>      | 3x 520/300 VAC (480 VAC +10% possible)                                           |
| <b>Operating frequency</b>                       | DC to 60 Hz                                                                      |
| <b>Rated currents</b>                            | 25 to 230 A @ 50°C                                                               |
| <b>High potential test voltage</b>               | P → E 2750 VDC for 2 sec<br>P → P 2250 VDC for 2 sec                             |
| <b>Protection category</b>                       | IP 20                                                                            |
| <b>Overload capability</b>                       | 4x rated current at switch on,<br>1.5x rated current for 1 minute, once per hour |
| <b>Temperature range (operation and storage)</b> | -25°C to +100°C (25/100/21)                                                      |
| <b>Flammability corresponding to</b>             | UL 94 V-2 or better                                                              |
| <b>Design corresponding to</b>                   | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939                                       |
| <b>MTBF @ 50°C/400 V (Mil-HB-217F)</b>           | >300,000 hours                                                                   |

### Approvals



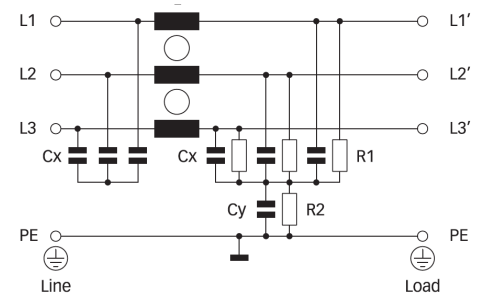
### Features and benefits

- High-performance filter for mainly industrial motor drive applications with extremely high noise levels, providing sufficient interference suppression to achieve Class B even with very long motor cables (e.g. machine tools with up to 12 axes with ~10 to 20 m cables each)
- Broadband attenuation performance and exceptional saturating resistance ensure reliable interference suppression
- FN 3120 operated on the mains input of machines or equipment contributes significantly to the reliability and immunity by offering protection against conducted interference phenomena coming from the environment
- Solid, touch-safe terminal blocks offer sufficient contacting cross section according to the EN 60204-1 installation standard, which is very common for industrial equipment like machine tools
- Compact dimensions and light weight design with good accessibility for automatic and hand tools guarantee a simple time and space-saving installation


### Typical applications

Mainly industrial equipment, machinery and machine tools such as printing machines, packaging machines, extruders, wood working machines, milling and drilling machines, laser cutting machines, welding machines, robotics, conveyors, assembly lines, pumps, oil production, chemical and mining industry, etc. The filters are ideal for most motor drive applications and particularly for regenerative drives.

### Typical electrical schematic



### Filter selection table

| Filter           | Rated current<br>@ 50°C (40°C) | Typical drive<br>power rating* | Leakage current**<br>@ 480 VAC/50 Hz | Power loss<br>@ 25°C/50 Hz | Input/Output<br>connections<br> | Weight<br>[kg] |
|------------------|--------------------------------|--------------------------------|--------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------|----------------|
|                  | [A]                            | [kW]                           | [mA]                                 | [W]                        |                                                                                                                    |                |
| FN 3120 H-25-33  | 25 (27)                        | 15                             | 97.9                                 | 17.1                       | -33                                                                                                                | 2.4            |
| FN 3120 H-50-53  | 50 (54)                        | 30                             | 97.9                                 | 17.5                       | -53                                                                                                                | 2.7            |
| FN 3120 H-80-35  | 80 (87)                        | 45                             | 97.9                                 | 25.9                       | -35                                                                                                                | 5.0            |
| FN 3120 H-110-35 | 110 (120)                      | 55                             | 97.9                                 | 25.4                       | -35                                                                                                                | 6.1            |
| FN 3120 H-150-40 | 150 (164)                      | 75                             | 97.9                                 | 40.5                       | -40                                                                                                                | 6.3            |
| FN 3120 H-230-40 | 230 (230)                      | 132                            | 97.9                                 | 33.5                       | -40                                                                                                                | 13.3           |

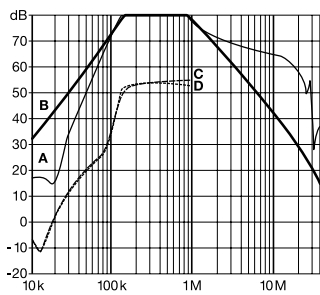
\* Calculated at rated current, 480 VAC and cos phi=0.8. The exact value depends upon the efficiency of the drive, the motor and the entire application.

\*\* Maximum leakage under normal operating conditions. Note: if two phases are interrupted, worst case leakage could reach 5.4 times higher levels.

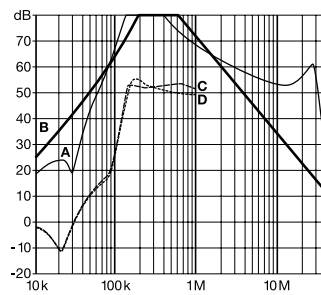
### Typical filter attenuation

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

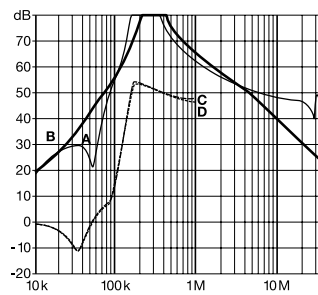
25 A types



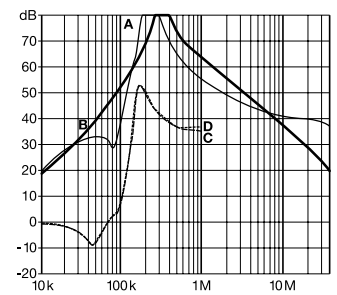
50 to 110 A types



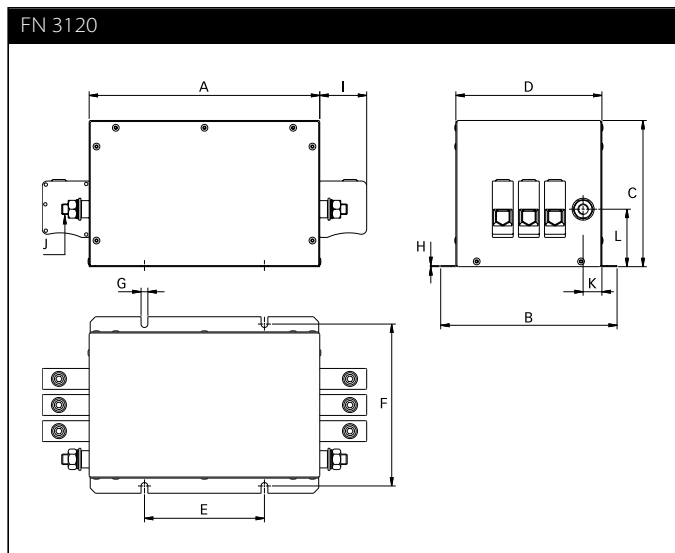
150 A types



230 A types



### Mechanical data







## Dimensions

|          | 25 A | 50 A  | 80 A | 110 A | 150 A | 230 A            |
|----------|------|-------|------|-------|-------|------------------|
| <b>A</b> | 214  | 214   | 221  | 221   | 221   | 300              |
| <b>B</b> | 159  | 159   | 169  | 169   | 169   | 168              |
| <b>C</b> | 64   | 64    | 140  | 140   | 140   | 140              |
| <b>D</b> | 129  | 129   | 140  | 140   | 140   | 140              |
| <b>E</b> | 115  | 115   | 115  | 115   | 115   | 165 (82.5/82.5)* |
| <b>F</b> | 145  | 145   | 155  | 155   | 155   | 155              |
| <b>G</b> | 6.5  | 6.5   | 6.5  | 6.5   | 6.5   | 6.5              |
| <b>H</b> | 1    | 1     | 1    | 1     | 1     | 1                |
| <b>I</b> | 25   | 29.45 | 45   | 45    | 51    | 51               |
| <b>J</b> | M5   | M6    | M10  | M10   | M10   | M10              |
| <b>K</b> | 21.5 | 24.5  | 18   | 18    | 13    | 13               |
| <b>L</b> | 26   | 35    | 55   | 55    | 62    | 62               |

\* 230 A filters provide 2 additional mounting slots, to do justice to the additional product weight. They are located right in the center of those mounting slots shown in the drawing above (82.5/82.5 → 165 mm).

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

## Filter input/output connector cross sections

|                           | -33                                                                                | -35                                                                                 | -40                                                                                  | -53                                                                                  |
|---------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                           |  |  |  |  |
| <b>Solid wire</b>         | 16 mm <sup>2</sup>                                                                 | 50 mm <sup>2</sup>                                                                  | 95 mm <sup>2</sup>                                                                   | 25 mm <sup>2</sup>                                                                   |
| <b>Flex wire</b>          | 10 mm <sup>2</sup>                                                                 | 50 mm <sup>2</sup>                                                                  | 95 mm <sup>2</sup>                                                                   | 16 mm <sup>2</sup>                                                                   |
| <b>AWG type wire</b>      | AWG 6                                                                              | AWG 1/0                                                                             | AWG 4/0                                                                              | AWG 4                                                                                |
| <b>Recommended torque</b> | 1.5-1.8 Nm                                                                         | 7-8 Nm                                                                              | 17-20 Nm                                                                             | 2.0-2.3 Nm                                                                           |

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](mailto:info@schaffner.com)  
<http://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](mailto:cschina@schaffner.com)  
<http://www.schaffner.com.cn>

### Finland

#### Schaffner Oy

Sauvonrinne 19 H  
08500 Lohja  
T +358 50 468 7284  
[finlandsales@schaffner.com](mailto: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](mailto:francesales@schaffner.com)

### Germany

#### Schaffner Deutschland GmbH

Schoemperlenstrasse 12B  
76185 Karlsruhe  
T +49 721 56910  
F +49 721 569110  
[germanysales@schaffner.com](mailto:germanysales@schaffner.com)

### India

#### Schaffner India Pvt. Ltd

Unit 59, Level, Mfar Greenheart 7  
Manyata Tech Park, Hebbal Outer Ring Road  
560045 Bangalore  
T +91 80 6781 9805  
F +91 80 6781 9998  
[indiasales@schaffner.com](mailto:indiasales@schaffner.com)

### Italy

#### Schaffner EMC S.r.l.

Via Ticino, 30  
20900 Monza (MB)  
T +39 039 21 41 070  
[italysales@schaffner.com](mailto:italysales@schaffner.com)

### Japan

#### Schaffner EMC K.K.

1-32-12, Kamiyama, Setagaya-ku  
7F Mitsui-seimei Sengenjaya Bldg.  
154-0011 Tokyo  
T +81 3 5712 3650  
F +81 3 5712 3651  
[japansales@schaffner.com](mailto:japansales@schaffner.com)  
<http://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](mailto:singaporesales@schaffner.com)

### Spain

#### Schaffner EMC España

Calle Caléndula 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](mailto:spainsales@schaffner.com)

### Sweden

#### Schaffner EMC AB

Tegeluddsvägen 76, 2tr  
115 28 Stockholm  
T +46 8 5050 2425  
[swedensales@schaffner.com](mailto:swedensales@schaffner.com)  
<http://www.schaffner.com>

### Switzerland

#### Schaffner EMV AG

Nordstrasse 11  
4542 Luterbach  
T +41 32 681 66 26  
[switzerlandsales@schaffner.com](mailto: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](mailto:taiwansales@schaffner.com)  
<http://www.schaffner.com.tw>

### Thailand

#### Schaffner EMC Co. Ltd.

Northern Region Industrial Estate  
67 Moo 4 Tambon Ban Klang  
Amphur Muangng P.O. Box 14  
51000 Lamphun  
T +66 53 58 11 04  
F +66 53 58 10 19  
[thailandsales@schaffner.com](mailto:thailandsales@schaffner.com)

### United Kingdom

#### Schaffner Ltd.

5 Ashville Way, Molly Millars Lane  
Wokingham  
RG41 2PL Berkshire  
T +44 118 9770070  
F +44 118 9792969  
[uksales@schaffner.com](mailto:uksales@schaffner.com)

### USA

#### Schaffner EMC Inc.

52 Mayfield Avenue  
08837 Edison, New Jersey  
T +1 800 367 5566  
T +1 732 225 9533  
F +1 732 225 4789  
[usasales@schaffner.com](mailto:usasales@schaffner.com)  
<http://www.schaffnerusa.com>

#### Schaffner North America

6722 Thirlane Road  
24019 Roanoke, Virginia  
T +1 276 228 7943  
F +1 276 228 7953

#### 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](http://www.schaffner.com)

© 2017 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.