

# High-Performance EMC/RFI Filter for Conventional and Regenerative Drives

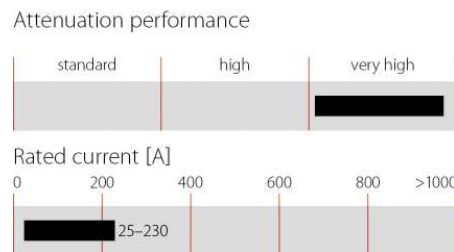
## 3-Phase Filters FN 3120



- High performance filter for extremely noisy applications
- Ideal for the latest regenerative drives (with additional line-impedance)
- Significantly improves the reliability and immunity of installations
- Enables compliance with Class B limits even with very long cables



### Performance indicators



### 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 P → P 2250 VDC for 2 sec
<b>Protection category</b>	IP20
<b>Overload capability</b>	4x rated current at switch on, 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/400V (Mil-HB-217F)</b>	>300,000 hours

### Approvals



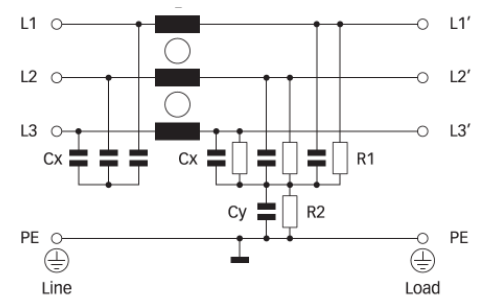
### Features and benefits

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

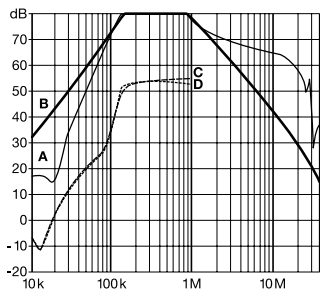
\* Calculated at rated current, 480 VAC and cos phi = 0.8. The exact value depends upon the efficiency of the drive, the motor and the entire application.

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

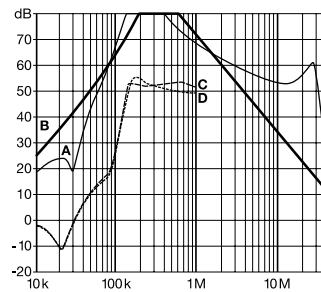
### Typical filter attenuation

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

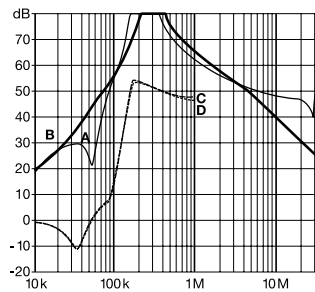
25 A types



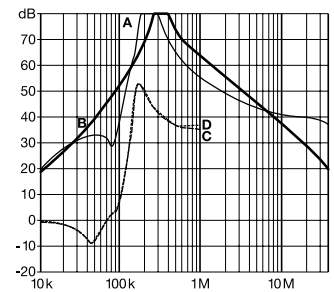
50 to 110 A types



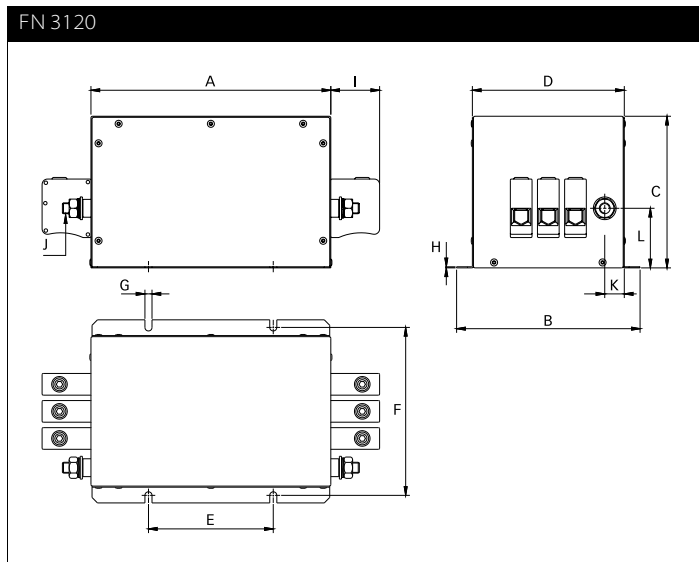
150 A types



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>	1.5-1.8Nm	7-8Nm	17-20Nm	2.0-2.3Nm

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



## Headquarters, global innovation and development center

### Switzerland

#### Schaffner Group

Nordstrasse 11  
4542 Luterbach  
T +41 32 6816 626  
F +41 32 6816 630  
[info@schaffner.com](mailto:info@schaffner.com)  
<http://www.schaffner.com>



## Sales and application centers

### China

#### Schaffner EMC Ltd. Shanghai

T20-3, No 565 Chuangye Road  
Pudong New Area  
201201 Shanghai  
T +86 21 3813 9500  
F F +86 21 3813 9501 / 02  
[cschina@schaffner.com](mailto:cschina@schaffner.com)  
<http://www.schaffner.com.cn/>

### Finland

#### Schaffner Oy

Sauvonrinne 19 H  
08500 Lohja  
T +358 19 35 72 71  
[finlandsales@schaffner.com](mailto:finlandsales@schaffner.com)

### France

#### Schaffner EMC S.A.S.

112, Quai de Bezons  
Boîte postale 133  
95103 Argenteuil  
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)

### Italy

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

Via Galileo Galilei 47  
20092 Cinisello Balsamo (MI)  
T +39 02 66 04 30 45/47  
F +39 02 61 23 943  
[italysales@schaffner.com](mailto:italysales@schaffner.com)

### Japan

#### Schaffner EMC K.K.

1-32-12, Kamiyama, Setagaya-ku  
7F Mitsui-seimei Sangenjaya 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.

Blk 3015A Ubi Road 1  
05-09 Kampong Ubi Industrial Estate  
408705 Singapore  
T +65 6377 3283  
F +65 6377 3281  
[singaporesales@schaffner.com](mailto:singaporesales@schaffner.com)

### Spain

#### Schaffner EMC España

Edificio E, Alcobendas  
El Soto de la Moraleja Alcobendas  
28109 Madrid  
T +34 618 176 133  
[spainsales@schaffner.com](mailto:spainsales@schaffner.com)

### Sweden

#### Schaffner EMC AB

Turebergstorg 1, 6  
19147 Sollentuna  
T +46 8 5792 1121 / 22  
F +46 8 92 96 90  
[swedensales@schaffner.com](mailto:swedensales@schaffner.com)

### Switzerland

#### Schaffner EMV AG

Nordstrasse 11  
4542 Luterbach  
T +41 32 6816 626  
F +41 32 6816 641  
[sales@schaffner.ch](mailto:sales@schaffner.ch)

### Taiwan R.O.C.

#### Schaffner EMV Ltd.

6 Floor, No. 413  
Rui Guang Road  
114 Neihu District Taipei City  
T +886 2 87525050  
F +886 2 87518086  
[taiwansales@schaffner.com](mailto:taiwansales@schaffner.com)

### Thailand

#### Schaffner EMC Co. Ltd.

Northern Region Industrial Estate  
67 Moo 4 Tambon Ban Klang Amphur Muang  
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)

### UK

#### 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)  
<http://www.schaffner.uk.com>

### USA

#### Schaffner EMC Inc.

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

#### Schaffner MTC LLC

6722 Thirlane Road  
24019 Roanoke, Virginia  
T +276 228 7943  
F +276 228 7953  
<http://www.schaffnerusa.com>

#### Schaffner Trencos LLC

2550 Brookpark Road  
44134 Cleveland, Ohio  
T +216 741 5282  
F +216 741 4860  
[www.schaffner-trencos.com](http://www.schaffner-trencos.com)

To find your local partner within Schaffner's global network, please go to:  
[www.schaffner.com](http://www.schaffner.com)

© 2014 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.