

# EMC/RFI Filters for Industrial Electronics

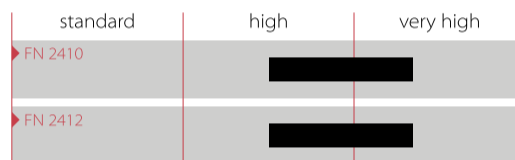


- Excellent filter performance for applications with high interference levels
- Filters for two-phase supply up to 2x 520 VAC (P-P) available
- Fast and comfortable snap-in installation on popular TS 35 DIN-rails up to 45 A
- Industrial grade terminal blocks for unsurpassed electrical safety

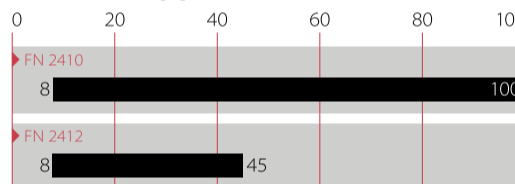


### Performance indicators

Attenuation performance



Rated current [A]



## Technical Specifications

<b>Maximum continuous operating voltage</b>	2x 520/300 VAC (FN 2410 H/FN 2412 H) 1x 250 VAC (FN 2410/FN 2412)
<b>Operating frequency</b>	DC to 400 Hz
<b>Rated currents</b>	8 to 45 A @ 50°C (FN 2412) 8 to 100 A @ 50°C (FN 2410)
<b>High potential test voltage</b>	P → P 2250 VDC for 2 sec (H types) P → E 2000 VAC for 2 sec P → N 1100 VDC for 2 sec P → E 2700 VDC for 2 sec (H types)
<b>Protection category</b>	IP 20
<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/250 V (Mil-HB-217F)</b>	1,200,000 hours 250,000 hours (H types)

### Approvals & Compliances



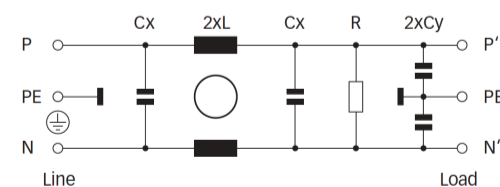
### Features and Benefits

- FN 2410 filters up to 100 A are designed for traditional chassis mounting
- For extra fast installation, FN 2412 filters up to 45 A can comfortably be snapped-in on popular TS 35 DIN-rails which are common in most electrical cabinets
- Both FN 2410 and FN 2412 are also available as „H versions“. These are ideally suitable for an operation on two phases in a three-phase power network, handling voltages up to 520 VAC
- All filters provide an exceptional conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior. Thus, all filters retain the expected filter performance even in very noisy applications and under full load conditions
- Touch-safe industrial grade terminal blocks provide maximum electrical safety and protect humans from undeliberate contact with life conductors. They help to fulfill the most demanding installation standards


### Typical Applications

- Small to medium-sized machines and industrial equipment
- High-end single-phase power supplies
- Single-phase variable speed motor drives, inverters and converters
- DIN-rail filter versions are ideal for panel building and electrical cabinets
- Various noisy applications with higher power single-phase or two-phase supply

### Typical electrical schematic



### Filter Selection Table

Filter	Rated current	Leakage current*	Power loss	Input/Output connections	Weight
	@ 50°C (40°C)	@ 250 VAC /50 Hz (@ 120 VAC /60 Hz)	@ 25°C/50 Hz		
	[A]	[mA]	[W]		[kg]
<b>FN 2410-8-44</b>	8 (8.8)	2.60 (1.49)	2.6	-44	0.4
<b>FN 2410-16-44</b>	16 (17.5)	2.60 (1.49)	3.5	-44	0.5
<b>FN 2410-25-33</b>	25 (27.4)	2.60 (1.49)	5.5	-33	0.6
<b>FN 2410-32-33</b>	32 (35.0)	2.60 (1.49)	5.6	-33	0.7
<b>FN 2410-45-33</b>	45 (49.3)	2.60 (1.49)	7.4	-33	0.7
<b>FN 2410-60-34</b>	60 (65.7)	2.60 (1.49)	5.5	-34	1.8
<b>FN 2410-80-34</b>	80 (87.6)	2.60 (1.49)	9.9	-34	1.8
<b>FN 2410-100-34</b>	100 (109.5)	2.60 (1.49)	15.4	-34	1.8
<b>FN 2410 H-8-44</b>	8 (8.8)	2.60 (1.49)	2.6	-44	0.5
<b>FN 2410 H-16-44</b>	16 (17.5)	2.60 (1.49)	3.5	-44	0.6
<b>FN 2410 H-25-33</b>	25 (27.4)	2.60 (1.49)	5.5	-33	0.7
<b>FN 2410 H-32-33</b>	32 (35.0)	2.60 (1.49)	5.6	-33	0.8
<b>FN 2410 H-60-34</b>	60 (65.7)	2.60 (1.49)	5.5	-34	1.9
<b>FN 2410 H-80-34</b>	80 (87.6)	2.60 (1.49)	9.9	-34	1.9
<b>FN 2410 H-100-34</b>	100 (109.5)	2.60 (1.49)	15.4	-34	1.9
<b>FN 2412-8-44</b>	8 (8.8)	2.60 (1.49)	2.6	-44	0.4
<b>FN 2412-16-44</b>	16 (17.5)	2.60 (1.49)	3.5	-44	0.6
<b>FN 2412-25-33</b>	25 (27.4)	2.60 (1.49)	5.5	-33	0.7
<b>FN 2412-32-33</b>	32 (35.0)	2.60 (1.49)	5.6	-33	0.8
<b>FN 2412-45-33</b>	45 (49.3)	2.60 (1.49)	7.4	-33	0.8
<b>FN 2412 H-8-44</b>	8 (8.8)	2.60 (1.49)	2.6	-44	0.5
<b>FN 2412 H-16-44</b>	16 (17.5)	2.60 (1.49)	3.5	-44	0.7
<b>FN 2412 H-25-33</b>	25 (27.4)	2.60 (1.49)	5.5	-33	0.8
<b>FN 2412 H-32-33</b>	32 (35.0)	2.60 (1.49)	5.6	-33	0.9

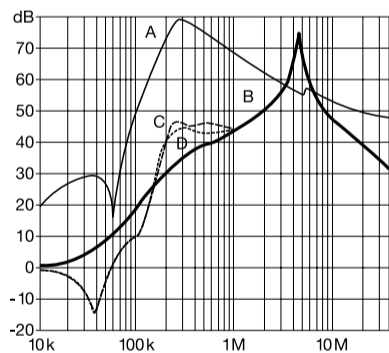
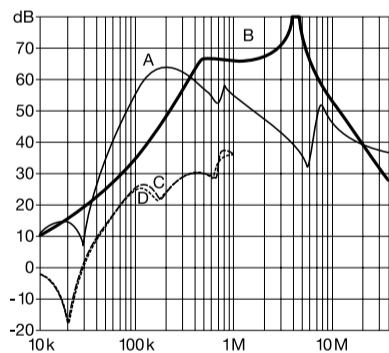
\* Maximum leakage under normal operating conditions (acc. to IEC60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

### Typical Filter Attenuation

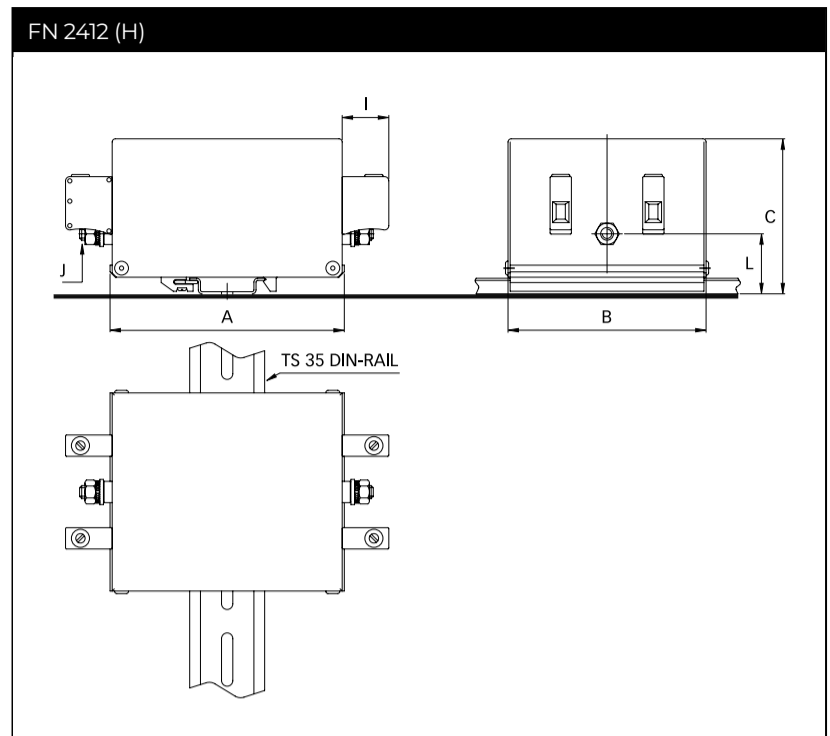
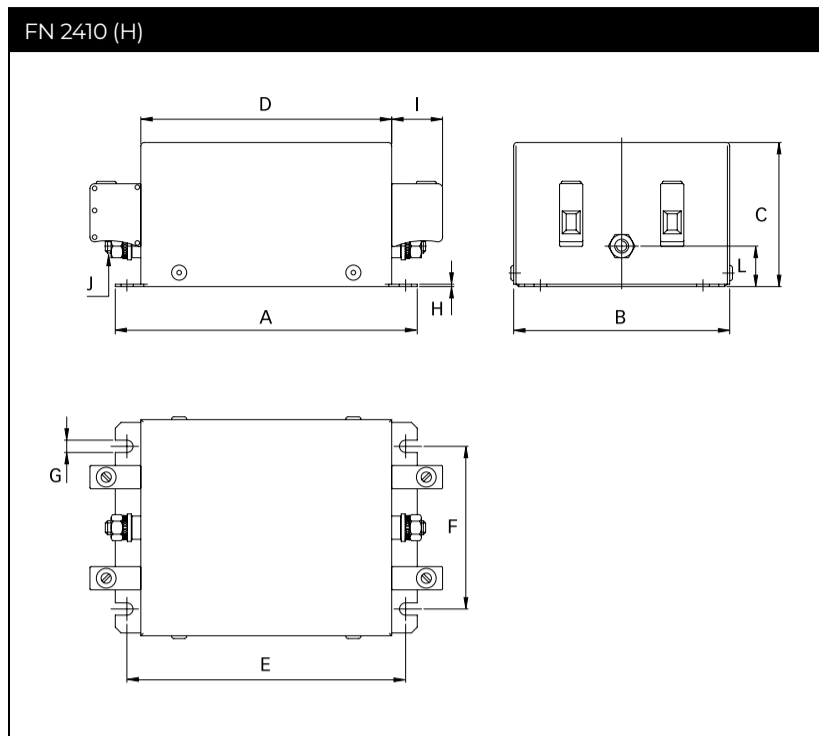
Per CISPR 17; A=50 Ω/50 Ω sym; B=50 Ω/50 Ω asym; C=0.1 Ω/100 Ω sym; D=100 Ω/0.1 Ω sym

8 to 45 A types

60 to 100 A types



### Mechanical Data



### Dimensions

	FN 2410					FN 2412							
	8 A	16 A	25 A	32 A	45 A	60 A	80 A	100 A	8 A	16 A	25 A	32 A	45 A
<b>A</b>	130	130	130	130	130	165	165	165	110	110	110	110	110
<b>B</b>	93	93	93	93	93	115	115	115	93	93	93	93	93
<b>C</b>	62	62	76	76	76	100	100	100	73	73	87	87	87
<b>D</b>	108	108	108	108	108	140	140	140					
<b>E</b>	120	120	120	120	120	155	155	155					
<b>F</b>	70	70	70	70	70	90	90	90					
<b>G</b>	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3					
<b>H</b>	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2					
<b>I</b>	22	22	25	25	25	39	39	39	22	22	25	25	25
<b>J</b>	M6	M6	M6	M6	M6	M8	M8	M8	M6	M6	M6	M6	M6
<b>Rec. torque (Nm)</b>	3.5 - 4.0	3.5 - 4.0	3.5 - 4.0	3.5 - 4.0	3.5 - 4.0	8.0 - 9.0	8.0 - 9.0	8.0 - 9.0	3.5 - 4.0	3.5 - 4.0	3.5 - 4.0	3.5 - 4.0	3.5 - 4.0
<b>L</b>	17.5	17.5	31.5	31.5	31.5	39.2	39.2	39.2	28.5	28.5	42.5	42.5	42.5

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

### Filter Input/Output Connector Cross Sections

	-33	-34	-44
<b>Solid wire</b>	16 mm <sup>2</sup>	35 mm <sup>2</sup>	10 mm <sup>2</sup>
<b>Flex wire</b>	10 mm <sup>2</sup>	25 mm <sup>2</sup>	6 mm <sup>2</sup>
<b>AWG type wire</b>	AWG 6	AWG 2	AWG 8
<b>Recommended torque</b>	1.5-1.8 Nm	4.0-4.5 Nm	1.0-1.2 Nm

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

## Headquarters, Global Innovation and Development

### Switzerland

#### Schaffner Holding AG

Industrie Nord  
Nordstrasse 11e  
4542  
Luterbach  
+41 32 681 66 26  
[info@schaffner.com](mailto:info@schaffner.com)

## Sales and Application Centers

### China

#### Schaffner EMC Ltd. Shanghai

T20-3 C, No 565 Chuangye Road, Pudong district  
201201  
Shanghai  
+86 2138139500  
[cschina@schaffner.com](mailto:cschina@schaffner.com)

### Finland

#### Schaffner Oy

Sauvonrinne 19 H  
8500  
Lohja  
+358 50 468 7284  
[finlandsales@schaffner.com](mailto:finlandsales@schaffner.com)

### France

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

16-20 Rue Louis Rameau  
95875  
Bezons  
+33 1 34 34 30 60  
[francesales@schaffner.com](mailto:francesales@schaffner.com)

### Germany

#### Schaffner Deutschland GmbH

Schoemperlenstrasse 12B  
76185  
Karlsruhe  
+49 721 56910  
[germanysales@schaffner.com](mailto: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  
+91 8067935355  
[indiasales@schaffner.com](mailto:indiasales@schaffner.com)

### Italy

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

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

### Japan

#### Schaffner EMC K.K.

ISM Sangenjaya 7F  
1-32-12 Kamiuma, Setagaya-ku  
154-0011  
Tokyo  
+81 3 5712 3650  
[japansales@schaffner.com](mailto:japansales@schaffner.com)

### Singapore

#### Schaffner EMC Pte Ltd.

Blk 3015A Ubi Road 1, #05-09, Kampong Ubi Industrial Estate  
408705  
Singapore  
+65 63773283  
[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  
+34 917 912 900  
[spainsales@schaffner.com](mailto:spainsales@schaffner.com)

### Sweden

#### Schaffner EMC AB

Östermalmstrorg 1  
114 42  
Stockholm  
+46 8 5050 2425  
[swedensales@schaffner.com](mailto:swedensales@schaffner.com)

### Switzerland

#### Schaffner EMV AG

Industrie Nord  
Nordstrasse 11e  
4542  
Luterbach  
+41 32 681 66 26  
[switzerlandsales@schaffner.com](mailto:switzerlandsales@schaffner.com)

### Taiwan

#### Schaffner EMV Ltd.

U-Town  
20 Floor-2, No 97, Section 1, XinTai 5th Road, XiZhi District  
22175  
New Taipei City  
+886 226975500  
[taiwansales@schaffner.com](mailto:taiwansales@schaffner.com)

### Thailand

#### Schaffner EMC Co. Ltd.

Sathorn Square Tower  
Room 3780, 37FL, 98 North-Sathorn Rd, Silom, Bangrak  
10500  
Bangkok  
+66 621056397  
[thailandsales@schaffner.com](mailto:thailandsales@schaffner.com)

### United Kingdom

#### Schaffner Ltd.

1, Oakmede Place  
Terrace Road  
RG42 4JF  
Binfield  
+44 118 9770070  
[uksales@schaffner.com](mailto:uksales@schaffner.com)

### United States

#### Schaffner EMC Inc.

52 Mayfield Avenue  
Edison, New Jersey  
+1 732 225 9533  
[usasales@schaffner.com](mailto:usasales@schaffner.com)

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

© 2022 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.