

# General Purpose AC/DC EMI Filter



- Rated currents from 1 to 60 A
- General purpose filtering performance
- Optional medical versions (B type)
- Optional safety versions (A type)
- Optional enhanced performance versions
- Optional DC optimized versions



### Performance indicators

Attenuation performance



Rated current [A]



## Technical specifications

<b>Rated voltage*</b>	250 VAC, 50/60 Hz; 250 VDC
<b>Operating frequency</b>	dc to 400 Hz
<b>Rated currents</b>	1 to 60 A @ 40°C max.
<b>High potential test voltage</b>	P → PE 2000 VAC for 2 sec (equiv. cap <88 nF) P → PE 2550 VDC for 2 sec (equiv. cap >88 nF) P → PE 2500 VAC for 2 sec (B types) P → N 1100 VDC for 2 sec
<b>Temperature range (operation and storage)</b>	-25 °C to +100 °C (25/100/21)
<b>Certified to</b>	UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939 (applies to AC and DC applications)
<b>Flammability corresponding to MTBF @ 40°C/230 V (Mil-HB-217F)</b>	UL 94 V-2 or better 1,250,000 hours 3,200,000 hours (B types)

\*maximum RMS operating voltage at rated frequency or the maximum DC operating voltage

### Approvals



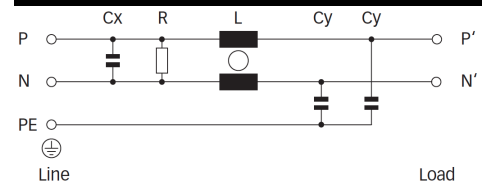
## Features and benefits

- FN 2010 filters are designed for easy and fast chassis mounting
- FN 2010 filters are available as B versions without Y-capacitors for medical applications as well as A version with low capacitance for safety critical applications with necessity for low leakage currents
- FN 2010 filters are also available as enhanced performance and DC optimized versions. With higher attenuation in very compact housing (M, N1,N types)
- All filters provide a general purpose conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- FN 2010 filters can be used to cover a broad range of usage and they offer a good size/ampere ratio
- Various terminal options allow you to select the desired connection style




## Typical applications

- Electrical and electronic equipment
- Consumer goods
- Household equipment
- Medical equipment
- Office automation equipment
- Datacom equipment

### Typical electrical schematic



## Filter selection table

Filter*	Rated current @ 40°C (25°C)	Leakage current** @ 250 VAC/50 Hz (@ 120 VAC/60 Hz)	Inductance L	Capacitance		Resistance R	Input/Output connections			Weight
				Cx	Cy					
	[A]	[mA]	[mH]	[μF]	[nF]	[kΩ]				[g]
<b>FN 2010-1-..</b>	1 (1.15)	0.66 (0.38)	12	0.1	4.7	1000	-06	-07		65
<b>FN 2010-3-..</b>	3 (3.45)	0.66 (0.38)	2.5	0.1	4.7	1000	-06	-07		65
<b>FN 2010-6-..</b>	6 (6.9)	0.66 (0.38)	1	0.1	4.7	1000	-06	-07		65
<b>FN 2010-10-..</b>	10 (11.5)	0.66 (0.38)	0.8	0.1	4.7	1000	-06	-07		85
<b>FN 2010-12-..</b>	12 (13.8)	0.66 (0.38)	0.7	0.1	4.7	1000	-06	-07		85
<b>FN 2010-16-..</b>	16 (18.4)	0.66 (0.38)	0.7	0.1	4.7	1000	-06	-07		140
<b>FN 2010-20-..</b>	20 (23)	0.66 (0.38)	0.6	0.1	4.7	1000	-06	-07	-08	210
<b>FN 2010-30-08</b>	30 (34.5)	0.79 (0.46)	0.7	0.47	10	1000			-08	470
<b>FN 2010-60-24</b>	60 (69)	0.79 (0.46)	1	1.5	10	330			-24	1100
<b>FN 2010 A-1-..</b>	1 (1.15)	0.07 (0.04)	12	0.1	0.47	1000	-06	-07		65
<b>FN 2010 A-3-..</b>	3 (3.45)	0.07 (0.04)	2.5	0.1	0.47	1000	-06	-07		65
<b>FN 2010 A-6-..</b>	6 (6.9)	0.07 (0.04)	1	0.1	0.47	1000	-06	-07		65
<b>FN 2010 A-10-..</b>	10 (11.5)	0.07 (0.04)	0.8	0.1	0.47	1000	-06	-07		85
<b>FN 2010 A-12-..</b>	12 (13.8)	0.07 (0.04)	0.7	0.1	0.47	1000	-06	-07		85
<b>FN 2010 A-16-..</b>	16 (18.4)	0.07 (0.04)	0.7	0.1	0.47	1000	-06	-07		140
<b>FN 2010 A-20-..</b>	20 (23)	0.07 (0.04)	0.6	0.1	0.47	1000	-06	-07	-08	210
<b>FN 2010 A-30-08</b>	30 (34.5)	0.07 (0.04)	0.7	0.47	0.47	1000			-08	470
<b>FN 2010 A-60-24</b>	60 (69)	0.07 (0.04)	1	1.5	0.47	330			-24	1100
<b>FN 2010 B-1-..</b>	1 (1.15)	0.00	12	0.1		1000	-06	-07		65
<b>FN 2010 B-3-..</b>	3 (3.45)	0.00	2.5	0.1		1000	-06	-07		65
<b>FN 2010 B-6-..</b>	6 (6.9)	0.00	1	0.1		1000	-06	-07		65
<b>FN 2010 B-10-..</b>	10 (11.5)	0.00	0.8	0.1		1000	-06	-07		85
<b>FN 2010 B-12-..</b>	12 (13.8)	0.00	0.7	0.1		1000	-06	-07		85
<b>FN 2010 B-16-..</b>	16 (18.4)	0.00	0.7	0.1		1000	-06	-07		140
<b>FN 2010 B-20-..</b>	20 (23)	0.00	0.6	0.1		1000	-06	-07	-08	210
<b>FN 2010 B-30-08</b>	30 (34.5)	0.00	0.7	0.47		1000			-08	470
<b>FN 2010 B-60-24</b>	60 (69)	0.00	1	1.5		330			-24	1100
<b>Enhanced performance</b>										
<b>FN 2010 N1-1-06</b>	1 (1.15)	5.34 (3.08)	12	0.1	68	1000	-06			70
<b>FN 2010 N1-3-06</b>	3 (3.45)	5.34 (3.08)	2.5	0.1	68	1000	-06			70
<b>FN 2010 N1-6-06</b>	6 (6.9)	5.34 (3.08)	1	0.1	68	1000	-06			70
<b>FN 2010 N1-10-06</b>	10 (11.5)	5.34 (3.08)	0.8	0.1	68	1000	-06			85
<b>FN 2010 N1-12-06</b>	12 (13.8)	3.69 (2.13)	0.7	0.1	47	1000	-06			85
<b>FN 2010 M-16-06</b>	16 (18.4)	3.69 (2.13)	0.7	0.1	47	1000	-06			140
<b>FN 2010 M-20-..</b>	20 (23)	3.69 (2.13)	0.6	0.1	47	1000	-06		-08	220
<b>FN 2010 N-30-08</b>	30 (34.5)	7.85 (4.52)	0.7	0.47	100	1000			-08	400
<b>FN 2010 N-60-24</b>	60 (69)	7.85 (4.52)	1	1.5	100	330			-24	1120

\* To compile a complete part number, please replace the .. with the required I/O connection style (e.g. FN 2010-30-08, FN 2010B-10-06). The different letters code the used Cy values in the filter type (A = 0.47nF; M = 47nF; N1 = 47nF; N = 100nF)

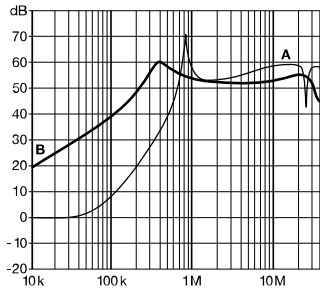
\*\* Maximum leakage under usual AC operating conditions (acc. IEC 60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

## Typical filter attenuation

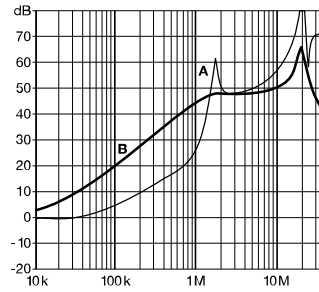
Per CISPR 17; A=50 Ω/50 Ω sym; B=50 Ω/50 Ω asym

### Standard types

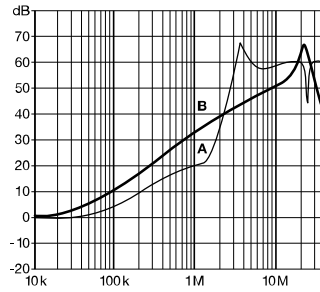
1 and 3 A types



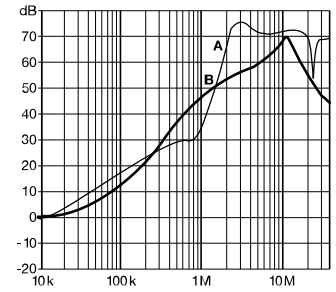
6 to 12 A types



16 and 20 A types

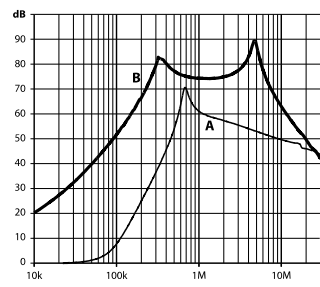


30 and 60 A types

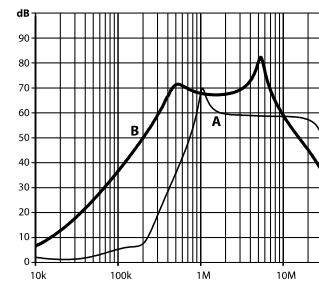


### Enhanced performance types

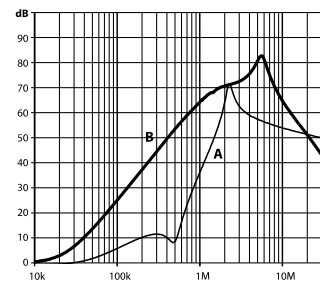
1 A types



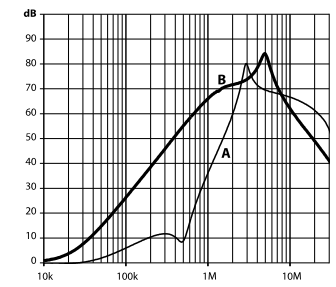
3 A types



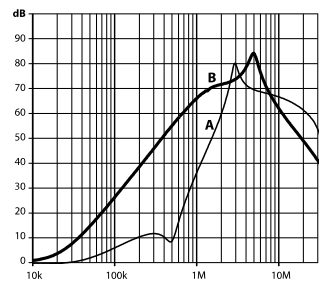
6 A types



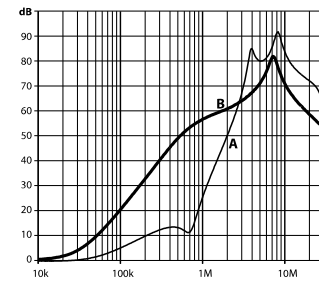
10 and 12 A types



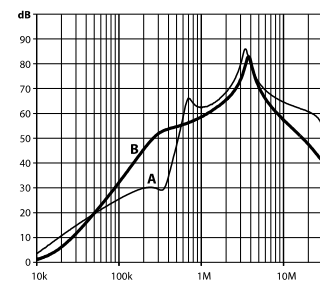
16 A types



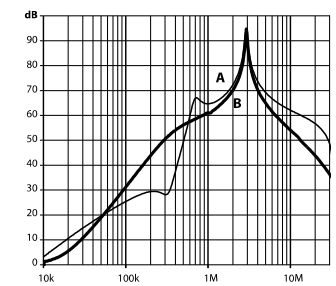
20 A types



30 A types

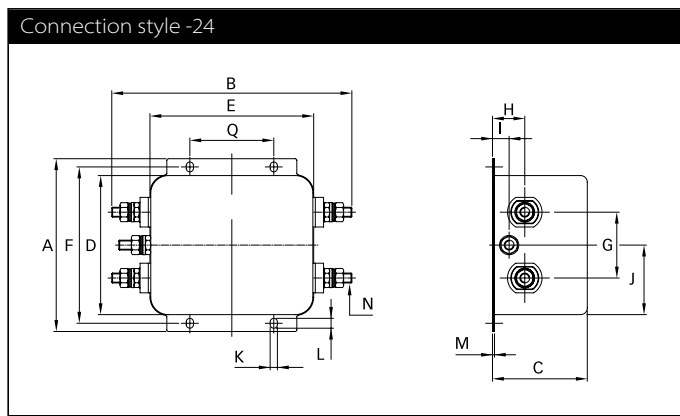
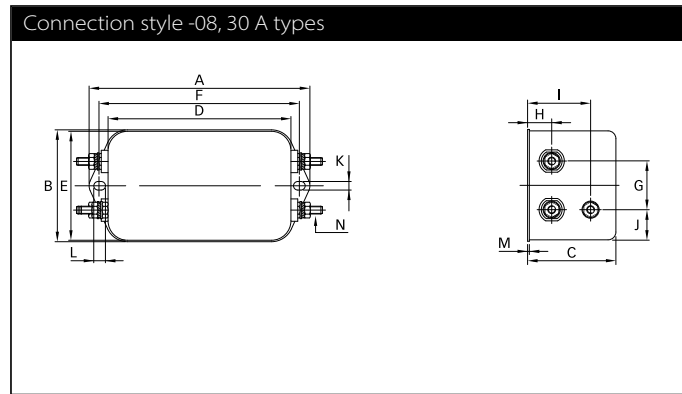
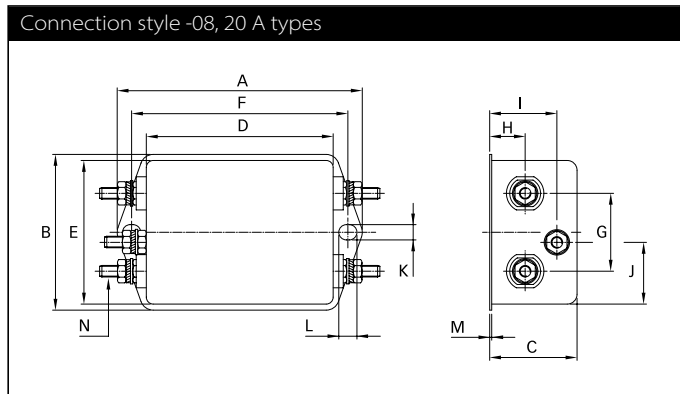
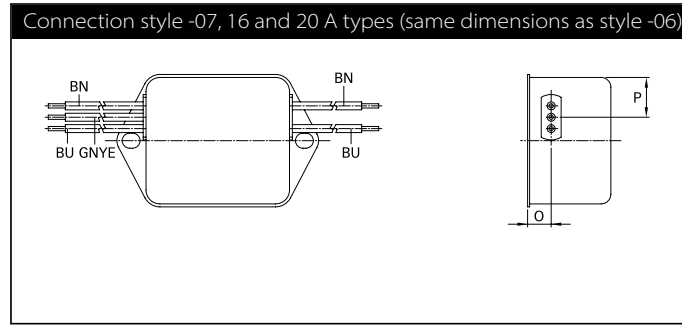
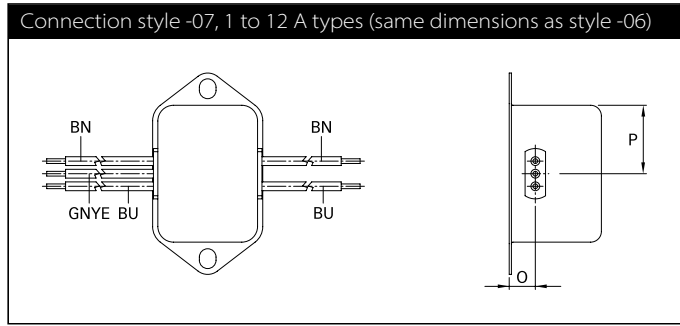
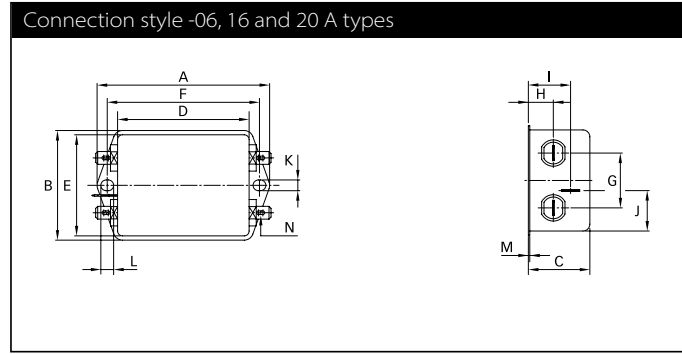
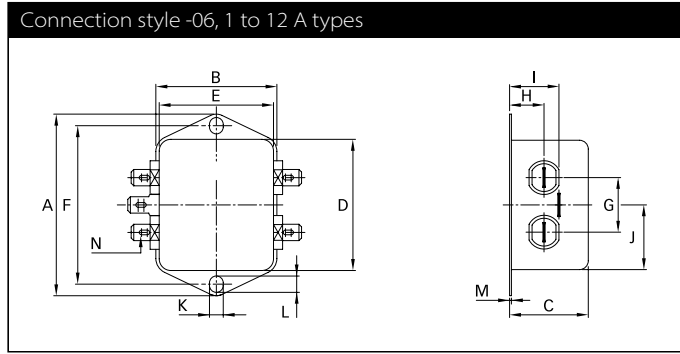


60 A types



Product Selector		
FN 2010-xy-xx-yy		
	06	Faston 6.3 × 0.8 mm (spade/soldering)
	07	Wire leads
	08	Studs (M4 screws)
	24	Studs (M6 screws)
	1 to 60	Rated current
	Blank	Standard version
	Z	With surge protection
	Blank	Standard version
	A	Safety version
	B	Medical version
	N1/N/M	High performance version

**Mechanical data**



## Dimensions

	1 A	3 A	6 A	10 A	12 A	16 A	20 A	30 A	60 A	Tolerances
<b>A</b>	64	64	64	64	64	71	85	113.5 ±1	105 ±1	±0.5
<b>B</b>	35	35	35	35	35	46.6	54	57.5 ±1	145.9 ±1	±0.5
<b>C</b>	24.3	24.3	24.3	29.3	29.3	29.3	30.3	45.4 ±1	57.6 ±1	±0.5
<b>D</b>	43.5	43.5	43.5	43.5	43.5	50.5	64.8	94 ±1	84.5 ±1	±0.5
<b>E</b>	32.5	32.5	32.5	32.5	32.5	44.5	49.8	56	99.5	±0.5
<b>F</b>	54	54	54	54	54	61	75	103	95	±0.3
<b>G</b>	21	21	21	21	21	21	27	25	40	±0.2
<b>H</b>	9.3	9.3	9.3	9.3	9.3	10.8	12.3	12.4	19.6	±0.5
<b>I</b>	15.3	15.3	15.3	15.3	15.3	19.3	20.8	32.4	10.1	±0.5
<b>J</b>	21.8	21.8	21.8	21.8	21.8	20.1	19.9	15.5	42.25	±0.5
<b>K</b>	5.3	5.3	5.3	5.3	5.3	5.3	5.3	4.4	4.4	
<b>L</b>	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6	6	
<b>M</b>	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.9	1.2	
<b>Connection style -06</b>										
<b>N</b>	6.3 x 0.8	6.3 x 0.8	6.3 x 0.8	6.3 x 0.8	6.3 x 0.8	6.3 x 0.8	6.3 x 0.8			
<b>Connection style -07</b>										
<b>O</b>	8.3	8.3	8.3	8.3	8.3	8.3	8.3			±0.5
<b>P</b>	21.8	21.8	21.8	21.8	21.8	14	14.9			±0.5
<b>AWG type wire</b>	AWG 20	AWG 20	AWG 18	AWG 18	AWG 16	AWG 16	AWG 14			
<b>Wire length</b>	140	140	140	140	140	140	140			+5
<b>Connection style -08</b>										
<b>N</b>							M4	M4		
<b>Recommended torque (Nm)</b>							1.2 - 1.3	1.2 - 1.3		
<b>Connection style -24</b>										
<b>N</b>									M6	
<b>Q</b>									51	±0.2
<b>Recommended torque (Nm)</b>									3.5 - 4	

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

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



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