

# General Purpose AC/DC EMI Filter with High Attenuation Performance



- Rated currents from 1 to 30 A
- High performance filter attenuation
- High differential-mode attenuation
- Optional medical versions (B type)
- Optional safety versions (A type)
- Optional enhanced performance versions
- Optional overvoltage protection (Z type)



### Performance indicators

Attenuation performance



Rated current [A]



### Approvals



### Features and benefits

- FN 2030 filters are designed for easy and fast chassis mounting
- The FN 2030 filters are also available as B versions with no Y-capacitors for medical applications as well as A versions with low capacitance for safety critical applications with a requirement for low leakage currents
- FN 2030 filters offer an optimized filter range for high performance AC and DC applications, in same compact size (M, N1 types)
- All filters provide an exceptional conducted attenuation performance, based on chokes with high permeable core material and excellent thermal behavior
- The higher inductivity versus amperage offers increased attenuation performance with same form factor compared to FN 2010 and FN 2020 filter series
- All FN 2030 filters can be delivered with optional surge pulse protection (Z type).
- Various terminal options allow you to select the desired connection style

### 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 30 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</b>	UL 94 V-2 or better
<b>Surge pulse protection (Z type)</b>	Helps compliance to IEC61000-4-5 (Differential Mode only)
<b>MTBF @ 40°C/230 V (Mil-HB-217F)</b>	2,200,000 hours (1 to 10 A types) 1,200,000 hours (12 to 30 A types)

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

### Typical application

- Electrical and electronic equipment
- Consumer goods
- Household equipment
- Medical equipment
- Electronic data processing equipment
- Office automation and datacom equipment
- Various noisy applications requiring high filter performance

### 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 2030-1-..</b>	1 (1.1)	0.31 (0.18)	20	0.22	2.2	1000	-06	-07		58
<b>FN 2030-3-..</b>	3 (3.4)	0.47 (0.27)	14	0.33	3.3	1000	-06	-07		87
<b>FN 2030-4-..</b>	4 (4.5)	0.47 (0.27)	14	0.33	3.3	1000	-06	-07		92
<b>FN 2030-6-..</b>	6 (6.7)	0.66 (0.38)	8	0.47	4.7	680	-06	-07		100
<b>FN 2030-8-..</b>	8 (8.9)	0.66 (0.38)	8	0.47	4.7	680	-06	-07		170
<b>FN 2030-10-..</b>	10 (11.2)	0.66 (0.38)	8	0.47	4.7	680	-06	-07		196
<b>FN 2030-12-..</b>	12 (13.4)	0.79 (0.45)	4	1.0	10	330	-06	-07		185
<b>FN 2030-16-..</b>	16 (17.9)	0.79 (0.45)	4	1.0	10	330	-06	-07		225
<b>FN 2030-20-..</b>	20 (22.4)	0.79 (0.45)	4	1.0	10	330	-06		-08	285
<b>FN 2030-30-08</b>	30 (33.5)	0.79 (0.45)	2	1.0	10	330			-08	326
<b>FN 2030 A-1-..</b>	1 (1.1)	0.07 (0.04)	20	0.22	0.47	1000	-06	-07		58
<b>FN 2030 A-3-..</b>	3 (3.4)	0.07 (0.04)	14	0.33	0.47	1000	-06	-07		87
<b>FN 2030 A-4-..</b>	4 (4.5)	0.07 (0.04)	14	0.33	0.47	1000	-06	-07		92
<b>FN 2030 A-6-..</b>	6 (6.7)	0.07 (0.04)	8	0.47	0.47	680	-06	-07		100
<b>FN 2030 A-8-..</b>	8 (8.9)	0.07 (0.04)	8	0.47	0.47	680	-06	-07		170
<b>FN 2030 A-10-..</b>	10 (11.2)	0.07 (0.04)	8	0.47	0.47	680	-06	-07		196
<b>FN 2030 A-12-..</b>	12 (13.4)	0.07 (0.04)	4	1.0	0.47	330	-06	-07		185
<b>FN 2030 A-16-..</b>	16 (17.9)	0.07 (0.04)	4	1.0	0.47	330	-06	-07		225
<b>FN 2030 A-20-..</b>	20 (22.4)	0.07 (0.04)	4	1.0	0.47	330	-06		-08	285
<b>FN 2030 A-30-08</b>	30 (33.5)	0.07 (0.04)	2	1.0	0.47	330			-08	326
<b>FN 2030 B-1-..</b>	1 (1.1)	0.00	20	0.22		1000	-06	-07		58
<b>FN 2030 B-3-..</b>	3 (3.4)	0.00	14	0.33		1000	-06	-07		87
<b>FN 2030 B-4-..</b>	4 (4.5)	0.00	14	0.33		1000	-06	-07		92
<b>FN 2030 B-6-..</b>	6 (6.7)	0.00	8	0.47		680	-06	-07		100
<b>FN 2030 B-8-..</b>	8 (8.9)	0.00	8	0.47		680	-06	-07		170
<b>FN 2030 B-10-..</b>	10 (11.2)	0.00	8.45	0.47		680	-06	-07		196
<b>FN 2030 B-12-..</b>	12 (13.4)	0.00	4	1.0		330	-06	-07		185
<b>FN 2030 B-16-..</b>	16 (17.9)	0.00	4	1.0		330	-06	-07		225
<b>FN 2030 B-20-..</b>	20 (22.4)	0.00	4	1.0		330	-06		-08	285
<b>FN 2030 B-30-08</b>	30 (33.5)	0.00	2	1.0		330			-08	326
<b>Enhanced performance</b>										
<b>FN 2030 N1-1-06</b>	1 (1.1)	5.34 (3.08)	20	0.22	68	1000	-06			65
<b>FN 2030 M-3-06</b>	3 (3.4)	3.69 (2.28)	14	0.33	47	1000	-06			110
<b>FN 2030 M-4-06</b>	4 (4.5)	3.69 (2.28)	14	0.33	47	1000	-06			110
<b>FN 2030 M-6-06</b>	6 (6.7)	3.69 (2.28)	8	0.47	47	680	-06			120
<b>FN 2030 N1-8-06</b>	8 (8.9)	5.34 (3.08)	8	0.47	68	3680	-06			200
<b>FN 2030 N1-10-06</b>	10 (11.2)	5.34 (3.08)	8	0.47	68	680	-06			200
<b>FN 2030 N1-12-06</b>	12 (13.4)	5.34 (3.08)	4	1.0	68	330	-06			210
<b>FN 2030 M-16-06</b>	16 (17.9)	3.69 (2.28)	4	1.0	47	330	-06			265
<b>FN 2030 M-20-..</b>	20 (22.4)	3.69 (2.28)	4	1.0	47	330	-06		-08	326
<b>FN 2030 M-30-08</b>	30 (33.5)	3.69 (2.28)	2	1.0	47	330			-08	346

\* To compile a complete part number, please replace the -.. with the required I/O connection style. For surge pulse protection, please add Z (e.g. FN 2030Z-10-06, FN 2030BZ-20-08). The different letters code the used Cy values in the filter type (A = 0.47nF; M = 47nF; N1 = 47nF)

\*\* Maximum leakage under usual AC operating conditions (acc. IEC60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level. Leakage current for DC application is 0 mA

## Typical filter attenuation

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

### Standard Types

1 to 4 A types



6 to 10 A types



12 to 20 A types



30 A types



### Enhanced Performance Types

1 A types



3 A types



4 A types



6 A types



8 A types



10 A types



12 A types



16 A types



20 A types

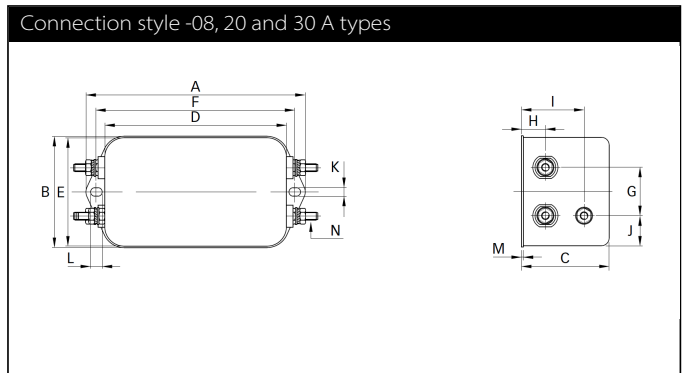
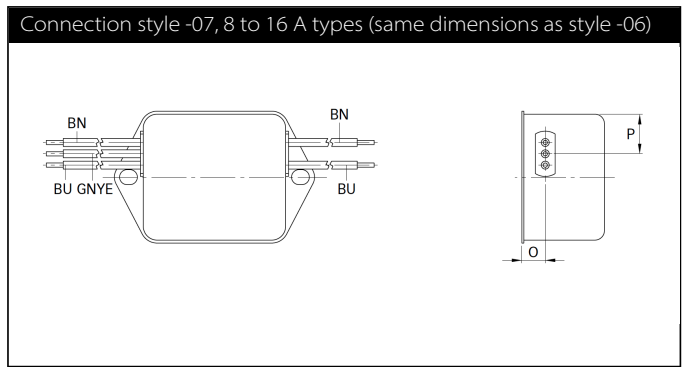
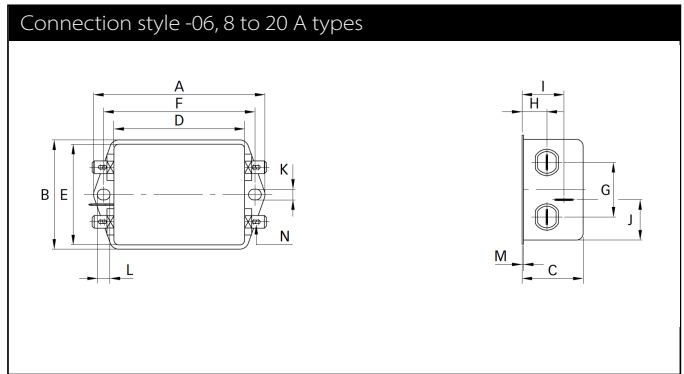


30 A types



Product selector		
FN 2030-xy-xx-yy		
	06	Faston 6.3 x 0.8 mm (spade/soldering)
	07	Wire leads
	08	Studs (M4 screws)
	1 to 60	Rated current
	Blank	Standard version
	Z	With surge protection
	Blank	Standard version
	A	Safety version
	B	Medical version
	N1/M	High performance version

**Mechanical data**



## Dimensions

	1 A	3 A	4 A	6 A	8 A	10 A	12 A	16 A	20 A	30 A	Tolerances
<b>A</b>	64	71	71	71	85	85	85	85	85	85	±0.5
<b>B</b>	35	46.6	46.6	46.6	54	54	54	54	54	54	±0.5
<b>C</b>	24.3	22.3	22.3	22.3	30.3	30.3	30.3	40.3	40.3	40.3	±0.5
<b>D</b>	43.5	50.5	50.5	50.5	64.8	64.8	64.8	64.8	64.8	64.8	±0.5
<b>E</b>	32.5	44.5	44.5	44.5	49.8	49.8	49.8	49.8	49.8	49.8	±0.5
<b>F</b>	54	61	61	61	75	75	75	75	75	75	±0.3
<b>G</b>	21	21	21	21	27	27	27	27	27	27	±0.2
<b>H</b>	9.3	10.8	10.8	10.8	12.3	12.3	12.3	12.3	12.3	12.3	±0.5
<b>I</b>	15.3	16.8	16.8	16.8	20.8	20.8	20.8	29.8	29.8	29.8	±0.5
<b>J</b>	21.8	25.25	25.25	25.25	19.9	19.9	19.9	11.4	11.4	11.4	±0.5
<b>K</b>	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	
<b>L</b>	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	
<b>M</b>	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
<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	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	8.3	8.3		±0.5
<b>P</b>	21.8	14	14	14	14.9	14.9	14.9	14.9			±0.5
<b>AWG type wire</b>	AWG 20	AWG 20	AWG 20	AWG 18	AWG 18	AWG 18	AWG 16	AWG 16			
<b>Wire length</b>	140	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	

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



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