

# General Purpose AC/DC EMI Filter



- Rated currents from 1 to 60 A
- High differential-mode attenuation
- Optional medical version (B type)
- Optional safety version (A type)



### 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 P → PE 2500 VAC for 2 sec (B types) P → N 760 VAC for 2 sec (1 to 20 A types) P → N 1100 VDC for 2 sec (30 and 60 A types)
<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>	Terminal plastic for -06/-08 version: UL 94 V-0 Laces for -07 version: UL 94 VW-1 Grommet for -07 version: UL 94 V-0
<b>Design corresponding to</b>	UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939
<b>Overvoltage category</b>	II acc. IEC 60664-1
<b>Pollution degree</b>	2 acc. IEC 60664-1
<b>Altitude</b>	2000m (above derating applies)**
<b>MTBF @ 40°C/230 V (Mil-HB-217F)</b>	1,250,000 hours 1,750,000 hours (B types)

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

\*\* for dedicated requests exceeding this specification (e.g. -40 °C or higher altitude) please contact your local Schaffner Sales office

### Approvals



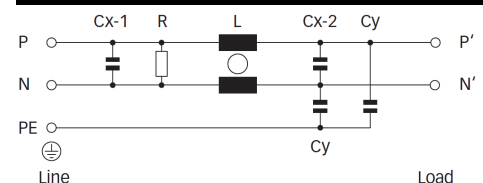
## Features and benefits

- FN 2020 filters are designed for easy and fast chassis mounting
- FN 2020 B versions without capacitors to earth comply to 1MOP for ME (medical equipment) acc. IEC 60601-1
- FN 2020 A versions with low capacitance to earth for safety critical applications with necessity for low leakage currents
- All filters provide a general purpose conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- FN 2020 filters can be used to cover a broad range of usage and they offer a good size/ampereage ratio
- FN 2020 filters are also available as two-stage filters (FN 2060, FN 2070 series) for more noisy environment
- 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)  [A]	Leakage current** @ 250 VAC/50 Hz (@ 120 VAC/60 Hz)  [mA]	Inductance***  L  [mH]	Capacitance***		Resistance***  R  [kΩ]	Input/Output connections			Weight  [g]
				Cx  [μF]	Cy  [nF]					
<b>FN 2020-1-..</b>	1 (1.15)	0.66 (0.38)	12	0.15	4.7	1000	-06	-07		80
<b>FN 2020-3-..</b>	3 (3.45)	0.66 (0.38)	2.5	0.15	4.7	1000	-06	-07		80
<b>FN 2020-6-..</b>	6 (6.9)	0.66 (0.38)	1	0.15	4.7	1000	-06	-07		80
<b>FN 2020-10-..</b>	10 (11.5)	0.66 (0.38)	0.8	0.15	4.7	1000	-06	-07		85
<b>FN 2020-12-..</b>	12 (13.8)	0.66 (0.38)	0.7	0.15	4.7	1000	-06	-07		85
<b>FN 2020-16-..</b>	16 (18.4)	0.66 (0.38)	0.65	0.15	4.7	1000	-06	-07	-08	140
<b>FN 2020-20-..</b>	20 (23)	0.66 (0.38)	0.6	0.15	4.7	1000	-06		-08	210
<b>FN 2020-30-08</b>	30 (34.5)	0.79 (0.45)	0.67	0.47	10	470			-08	470
<b>FN 2020-60-24</b>	60 (69)	0.79 (0.45)	1	1.5	10	220			-24	1100
<b>FN 2020A-1-..</b>	1 (1.15)	0.07 (0.04)	12	0.15	0.47	1000	-06	-07		80
<b>FN 2020A-3-..</b>	3 (3.45)	0.07 (0.04)	2.5	0.15	0.47	1000	-06	-07		80
<b>FN 2020A-6-..</b>	6 (6.9)	0.07 (0.04)	1	0.15	0.47	1000	-06	-07		80
<b>FN 2020A-10-..</b>	10 (11.5)	0.07 (0.04)	0.8	0.15	0.47	1000	-06	-07		85
<b>FN 2020A-12-..</b>	12 (13.8)	0.07 (0.04)	0.7	0.15	0.47	1000	-06	-07		85
<b>FN 2020A-16-..</b>	16 (18.4)	0.07 (0.04)	0.65	0.15	0.47	1000	-06	-07	-08	140
<b>FN 2020A-20-..</b>	20 (23)	0.07 (0.04)	0.6	0.15	0.47	1000	-06		-08	210
<b>FN 2020A-30-08</b>	30 (34.5)	0.07 (0.04)	0.67	0.47	0.47	470			-08	470
<b>FN 2020A-60-24</b>	60 (69)	0.07 (0.04)	1	1.5	0.47	220			-24	1100
<b>FN 2020B-1-..</b>	1 (1.15)	0.00	12	0.15		1000	-06	-07		80
<b>FN 2020B-3-..</b>	3 (3.45)	0.00	2.5	0.15		1000	-06	-07		80
<b>FN 2020B-6-..</b>	6 (6.9)	0.00	1	0.15		1000	-06	-07		80
<b>FN 2020B-10-..</b>	10 (11.5)	0.00	0.8	0.15		1000	-06	-07		85
<b>FN 2020B-12-..</b>	12 (13.8)	0.00	0.7	0.15		1000	-06	-07		85
<b>FN 2020B-16-..</b>	16 (18.4)	0.00	0.65	0.15		1000	-06	-07	-08	140
<b>FN 2020B-20-..</b>	20 (23)	0.00	0.6	0.15		1000	-06		-08	210
<b>FN 2020B-30-08</b>	30 (34.5)	0.00	0.67	0.47		470			-08	470
<b>FN 2020B-60-24</b>	60 (69)	0.00	1	1.5		220			-24	1100

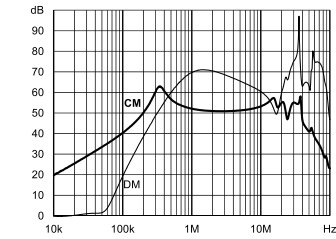
\* To compile a complete part number, please replace the -.. with the required I/O connection style (e.g. FN 2020-30-08, FN 2020B-10-06).

\*\* 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.

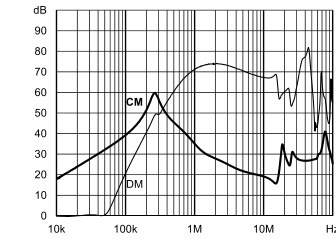
\*\*\* Tolerances apply: Inductance: -30/+50%, Capacitance: ±20%, Resistance: ±10%

### Typical filter attenuation

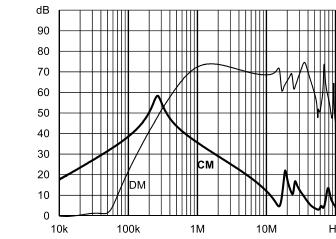
Per CISPR 17; A=50 Ω/50 Ω sym; B=50 Ω/50 Ω asym; C=0.1 Ω/100 Ω sym; D=100 Ω/0.1 Ω sym



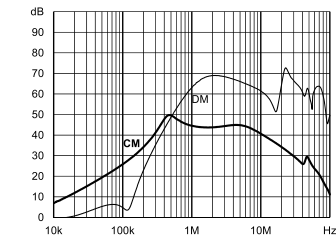
1 A: Standard type



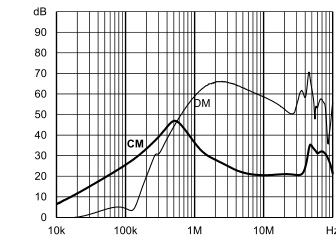
A type



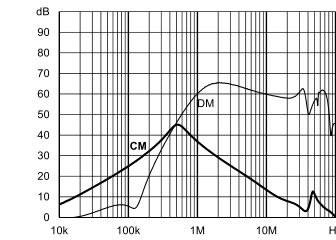
B type



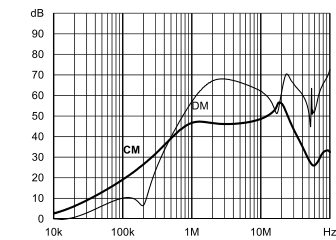
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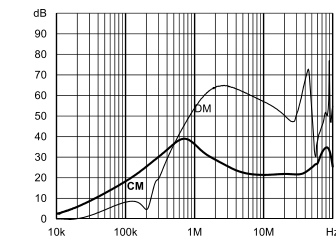
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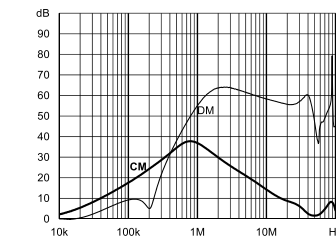
B types



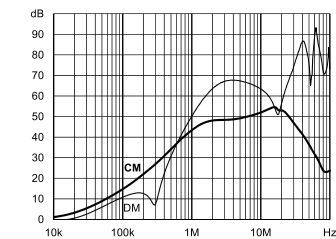
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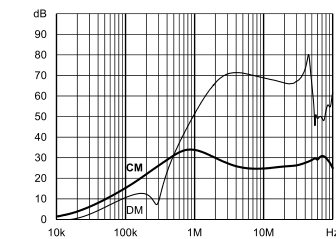
A type



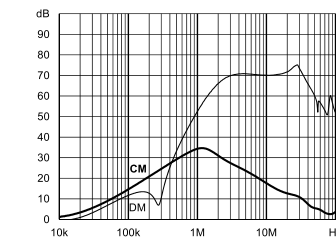
B types



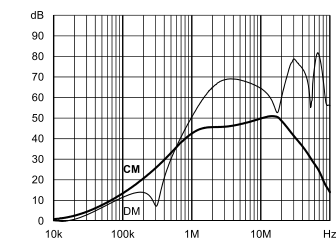
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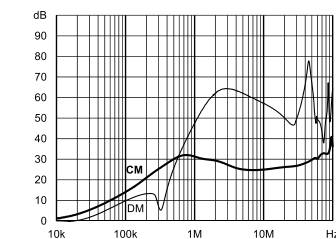
A type



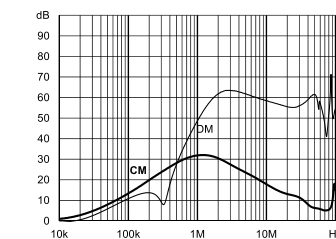
B types



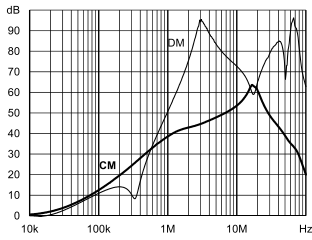
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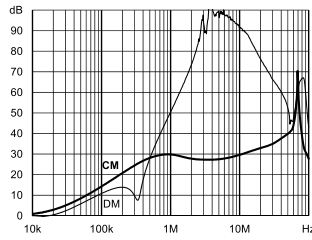
A type



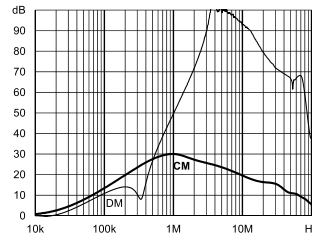
B types



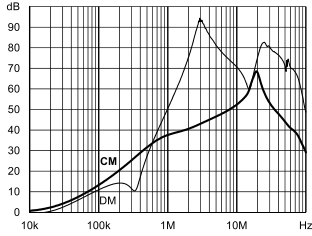
16 A: Standard type



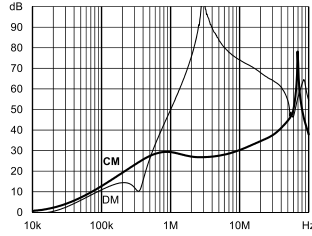
A type



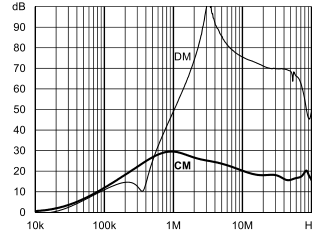
B types



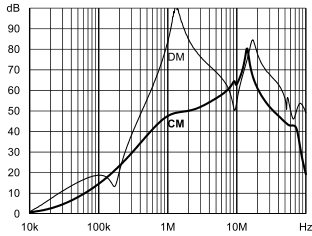
20 A: Standard type



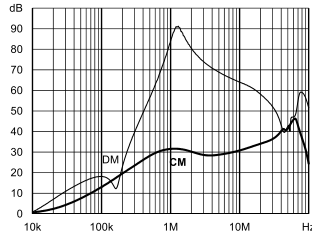
A type



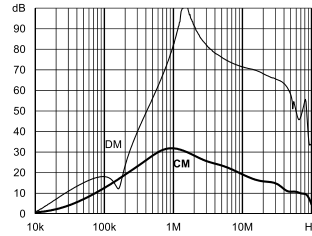
B types



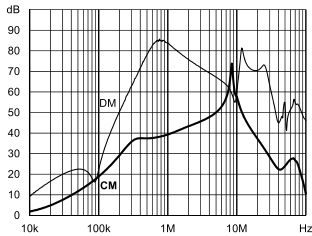
30 A: Standard type



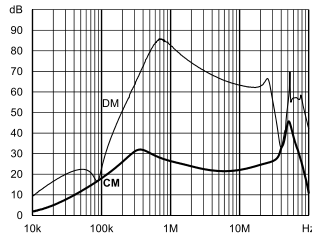
A type



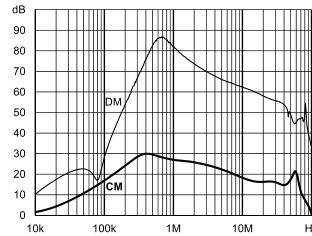
B types



60 A: Standard type



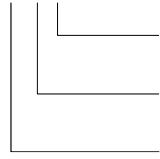
A type



B types

### Product selector

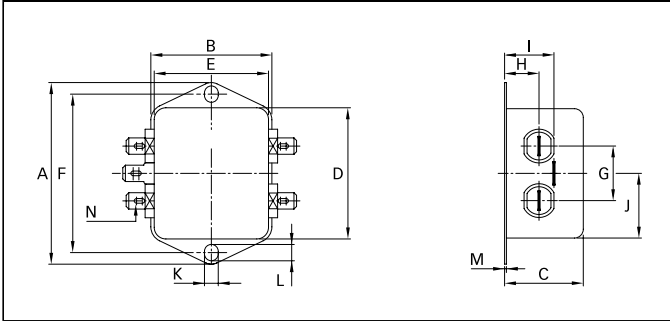
FN 2020 x -xx-yy



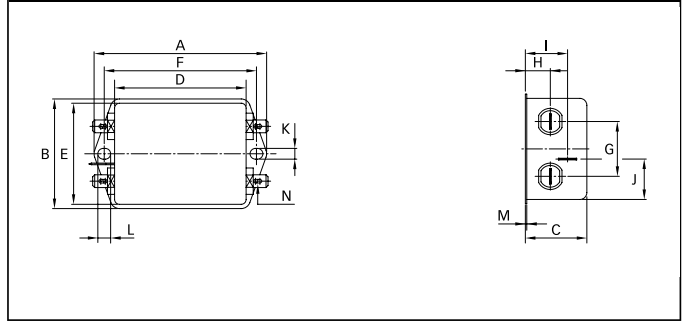
- 06 Faston 6.3 × 0.8 mm (spade/soldering)
- 07 Wire leads
- 08 Studs (M4 screws)
- 24 Studs (M6 screws)
- 1 to 60 Rated current
- Blank Standard version
- A Safety version
- B Medical version

### Mechanical data

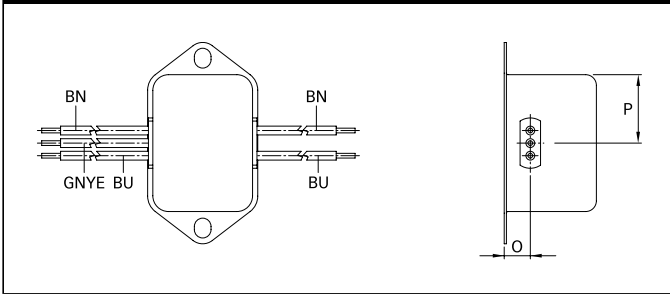
#### Connection style -06, 1 to 12 A types



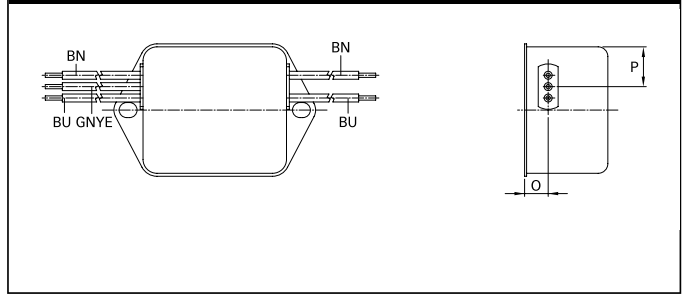
#### Connection style -06, 16 and 20 A types



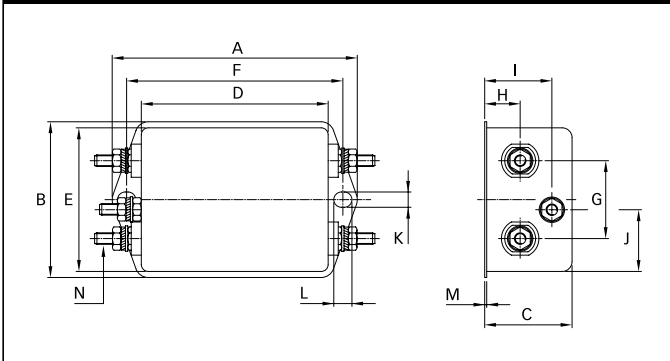
#### Connection style -07, 1 to 12 A types (same dimensions as style -06)



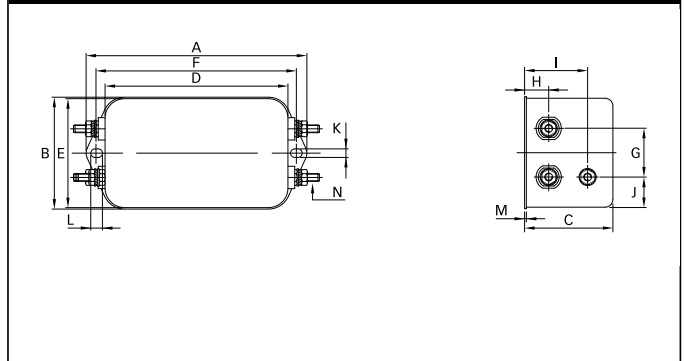
#### Connection style -07, 16 A types (same dimensions as style -06)



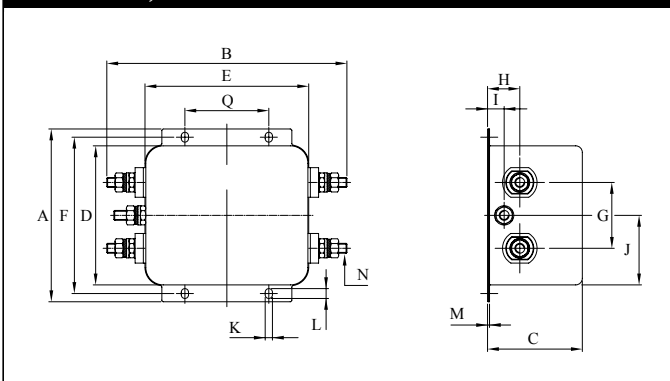
#### Connection style -08, 16 and 20 A types



#### Connection style -08, 30 A types



#### Connection style -24



## 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>	29.3	29.3	29.3	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	1	1.2	±0.3
<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				±0.5
<b>P</b>	21.8	21.8	21.8	21.8	21.8	14				±0.5
<b>AWG type wire</b>	AWG 20	AWG 20	AWG 18	AWG 18	AWG 16	AWG 16				
<b>Wire length</b>	140	140	140	140	140	140				+5
<b>Connection style -08</b>										
<b>N</b>						M4	M4	M4		
<b>Recommended torque (Nm)</b>						1.2 - 1.3	1.2 - 1.3	1.2 - 1.3		
<b>Earth Terminal</b>						1.5 - 1.7	1.5 - 1.7	1.5 - 1.7		
<b>Connection style -24</b>										
<b>N</b>									M6	
<b>Q</b>									51	±0.2
<b>Recommended torque (Nm)</b>									3.5 - 4	
<b>Earth Terminal</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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