

# Multi-stage general purpose AC/DC EMC/RFI Filter



- Rated currents from 1 to 30 A
- High differential and common-mode attenuation
- Optional medical versions (B type)
- Optional safety versions (A type)



### Performance indicators

Attenuation performance



Rated current [A]



### Approvals & Compliances



### Features and Benefits

- FN 2060 two-stage filters are designed for easy and fast chassis mounting
- FN 2060 B versions without capacitors to earth comply to 1MOP for ME (medical equipment) acc. IEC 60601-1
- FN 2060 A version with low capacitance to earth for safety critical applications with necessity for low leakage currents
- All filters provide a high conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- FN 2060 two-stage filters are designed for noisy applications requiring good differential and common-mode attenuation
- FN 2060 filters are also available as single-stage filters (FN 2010 series)
- Various terminal options allow you to select the desired connection style

## Technical Specifications

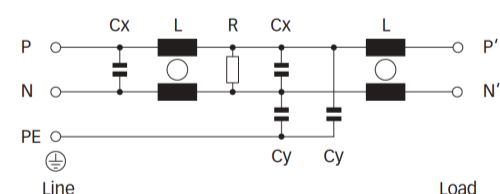
<b>Maximum continuous operating voltage</b>	250 VAC, 50/60 Hz 250 VDC
<b>Nominal operating voltage</b>	230 VAC
<b>Rated currents</b>	1 to 30 A @ 40°C
<b>Operating frequency</b>	DC to 400 Hz
<b>High potential test voltage</b>	P → PE 2000 VAC for 2 sec P → PE 2500 VAC for 2 sec (B types) P → N 1100 VDC for 2 sec
<b>Overtoltage category</b>	II acc. IEC 60664-1
<b>Pollution degree</b>	2 acc. IEC 60664-1
<b>Temperature range (operation and storage)</b>	-25°C to +100°C (25/100/21)**
<b>Altitude</b>	2000m (above derating applies)**
<b>Flammability corresponding to</b>	Laces for -07 version: UL 94 VW-1 Terminal plastic for -06/-08 version: UL 94 V-0 Grommet for -07 version: UL 94 V-0
<b>Certified to</b>	UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939 (applies to AC and DC applications)
<b>Design corresponding to</b>	UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939
<b>MTBF (Mil-HB-217F)</b>	>950,000 h @ 40°C/230 V 1,650,000 h (B types) @ 40°C/230 V

\* 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




























## Typical Applications

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

### Typical electrical schematic



## Filter Selection Table

Filter*	Buy	Rated current @ 40°C (25°C)	Leakage current** @ 250 VAC/50 Hz (@ 120 VAC/60 Hz)	Power Loss @25°C/DC	Inductance*** L	Capacitance***		Resistance*** R	Input/Output connections			Weight [g]
						Cx	Cy					
		[A]	[mA]	[W]	[mH]	[µF]	[nF]	[kΩ]				
<b>FN2060-1-..</b>		1 (1.2)	0.66 (0.38)	1.6	12	0.22	4.7	1000	-06	-07		120
<b>FN2060-3-..</b>		3 (3.5)	0.66 (0.38)	2.2	2.5	0.22	4.7	1000	-06	-07		120
<b>FN2060-6-..</b>		6 (6.9)	0.66 (0.38)	3.2	0.97	0.22	4.7	1000	-06	-07		120
<b>FN2060-10-..</b>		10 (11.5)	0.66 (0.38)	4.3	0.8	0.47	4.7	470	-06	-07	-08	190
<b>FN2060-12-..</b>		12 (13.8)	0.66 (0.38)	6.2	0.58	0.47	4.7	470	-06	-07	-08	190
<b>FN2060-16-..</b>		16 (18.4)	0.66 (0.38)	4.4	0.65	0.33	4.7	1000	-06	-07	-08	260
<b>FN2060-20-..</b>		20 (23)	0.66 (0.38)	5.3	0.6	1	4.7	220	-06		-08	480
<b>FN2060-30-08</b>		30 (34.5)	0.79 (0.45)	9.1	0.6	1	10	220			-08	950
<b>FN2060A-1-..</b>		1 (1.2)	0.07 (0.04)	1.6	12	0.22	0.47	1000	-06	-07		120
<b>FN2060A-3-..</b>		3 (3.5)	0.07 (0.04)	2.2	2.5	0.22	0.47	1000	-06	-07		120
<b>FN2060A-6-..</b>		6 (6.9)	0.07 (0.04)	3.2	0.97	0.22	0.47	1000	-06	-07		120
<b>FN2060A-10-..</b>		10 (11.5)	0.07 (0.04)	4.3	0.8	0.47	0.47	470	-06	-07	-08	190
<b>FN2060A-12-..</b>		12 (13.8)	0.07 (0.04)	6.2	0.58	0.47	0.47	470	-06	-07	-08	190
<b>FN2060A-16-..</b>		16 (18.4)	0.07 (0.04)	4.4	0.65	0.33	0.47	1000	-06	-07	-08	260
<b>FN2060A-20-..</b>		20 (23)	0.07 (0.04)	5.3	0.6	1	0.47	220	-06		-08	480
<b>FN2060A-30-08</b>		30 (34.5)	0.07 (0.04)	9.1	0.6	1	0.47	220			-08	950
<b>FN2060B-1-..</b>		1 (1.2)	0.00	1.6	12	0.22		1000	-06	-07		120
<b>FN2060B-3-..</b>		3 (3.5)	0.00	2.2	2.5	0.22		1000	-06	-07		120
<b>FN2060B-6-..</b>		6 (6.9)	0.00	3.2	0.97	0.22		1000	-06	-07		120
<b>FN2060B-10-..</b>		10 (11.5)	0.00	4.3	0.8	0.47		470	-06	-07	-08	190
<b>FN2060B-12-..</b>		12 (13.8)	0.00	6.2	0.58	0.47		470	-06	-07	-08	190
<b>FN2060B-16-..</b>		16 (18.4)	0.00	4.4	0.65	0.33		1000	-06	-07	-08	260
<b>FN2060B-20-..</b>		20 (23)	0.00	5.3	0.6	1		220	-06		-08	480
<b>FN2060B-30-08</b>		30 (34.5)	0.00	9.1	0.6	1		220			-08	950

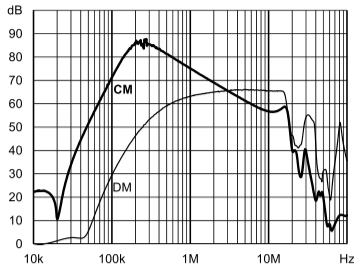
\* To compile a complete part number, please replace the -.. with the required I/O connection style (e.g. FN 2070-25-08, FN 2070B-10-06).

\*\* 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.

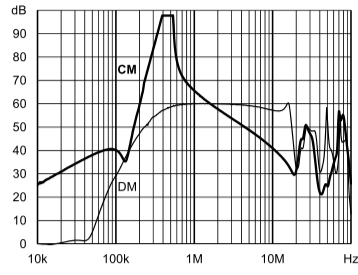
\*\*\* Tolerances apply: Inductance: -30/+50%, Capacitance: ±20%, Resistance: ±10%

## Typical Filter Attenuation

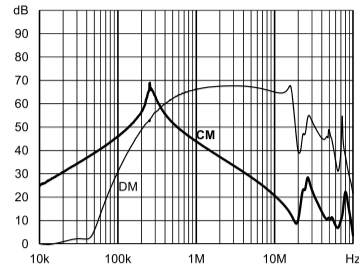
Per CISPR 17: symmetrical 50 Ω/50 Ω -> Differential Mode (DM); asymmetrical 50 Ω/50 Ω -> Common Mode (CM)



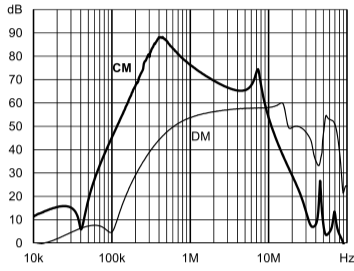
1 A: Standard type



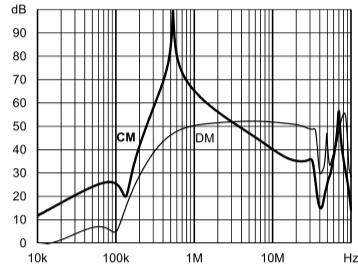
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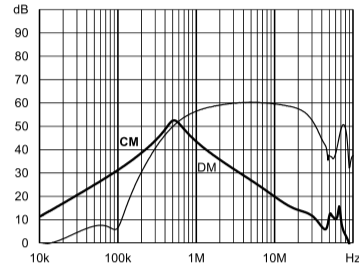
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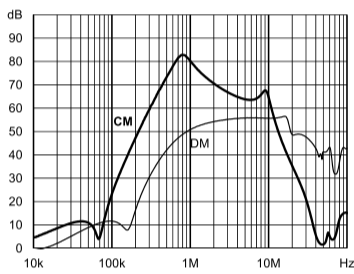
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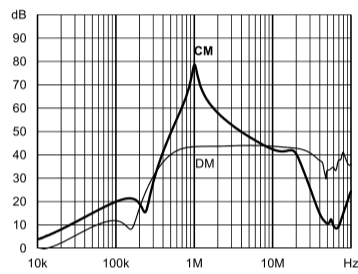
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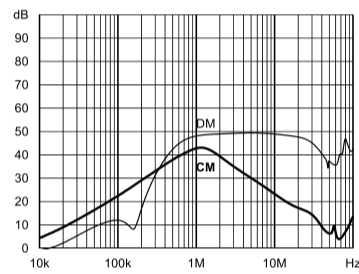
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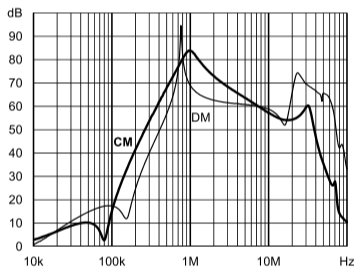
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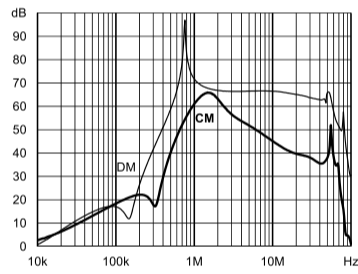
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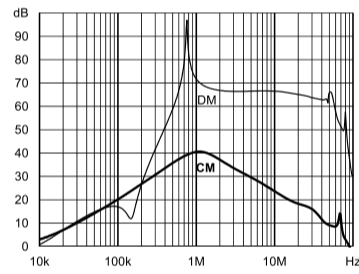
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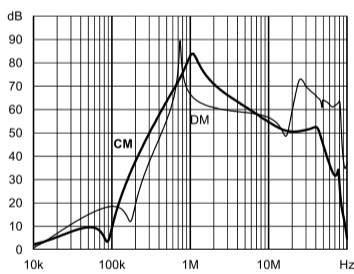
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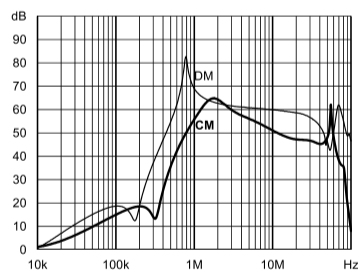
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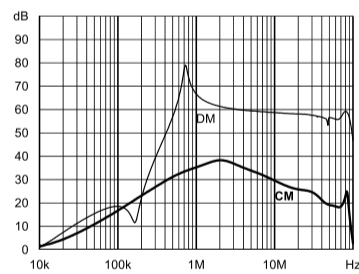
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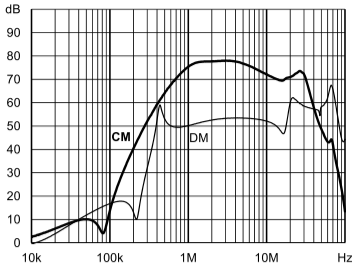
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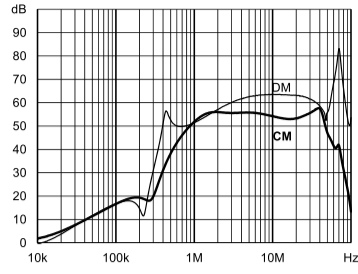
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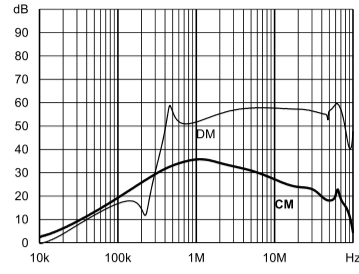
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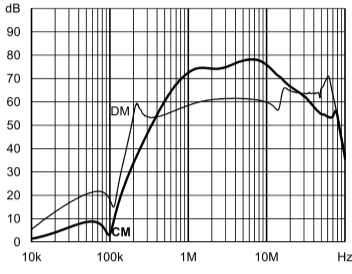
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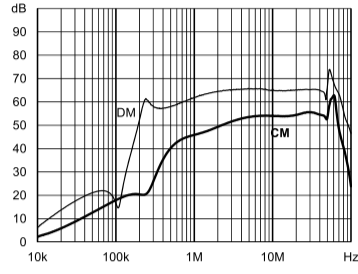
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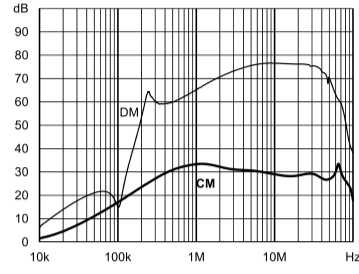
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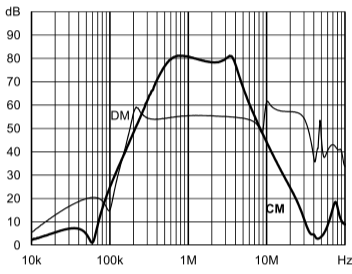
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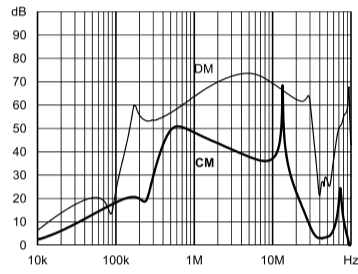
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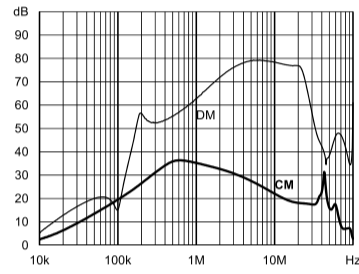
B type



30 A: Standard type



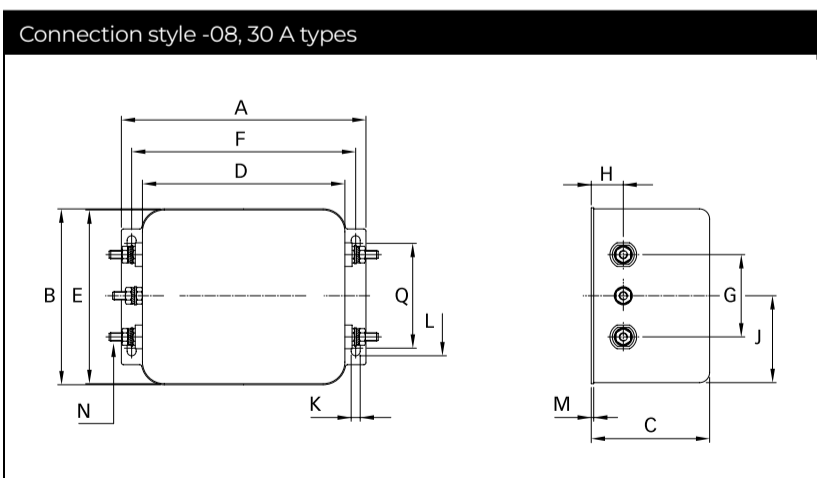
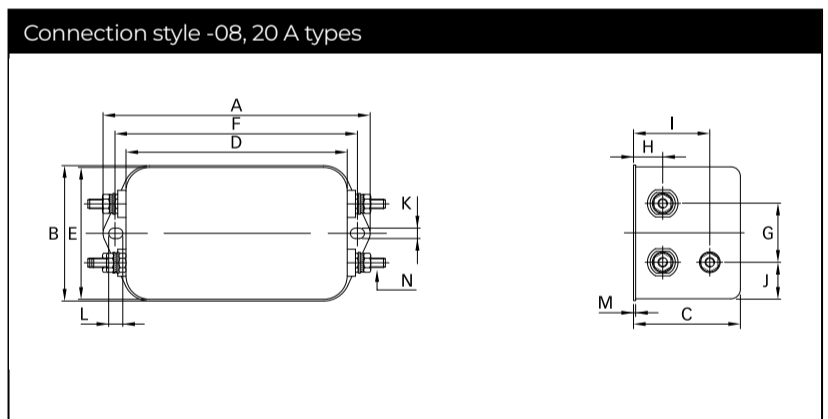
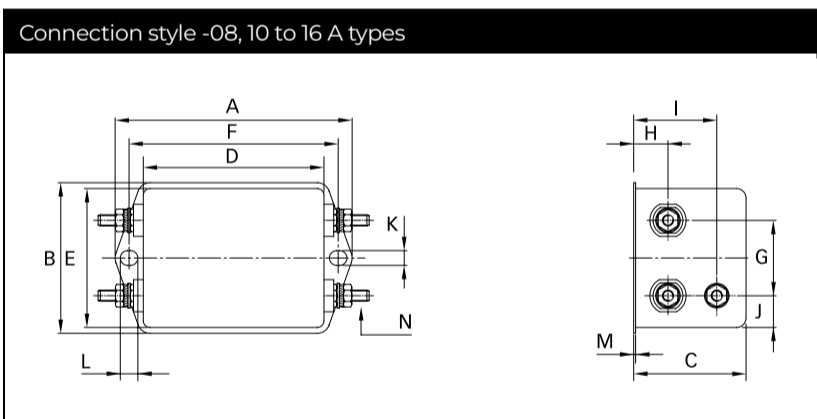
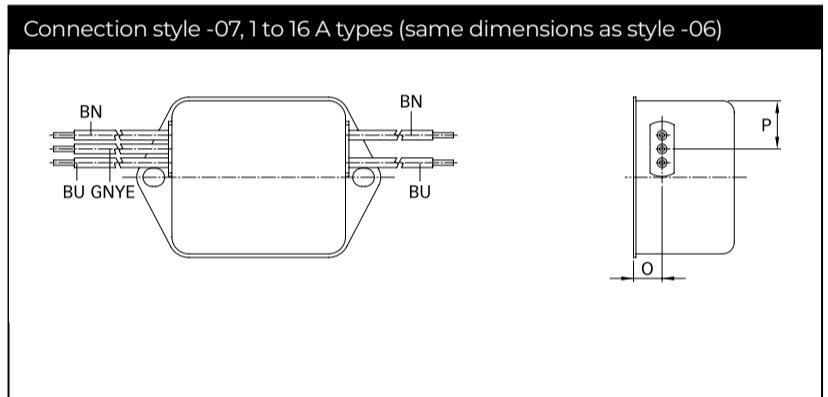
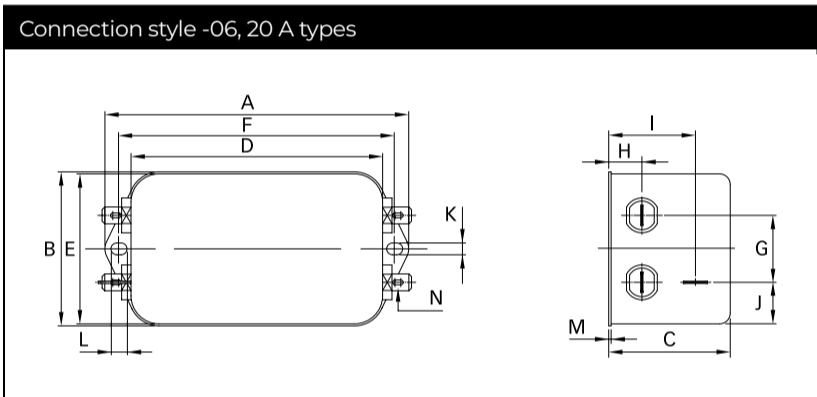
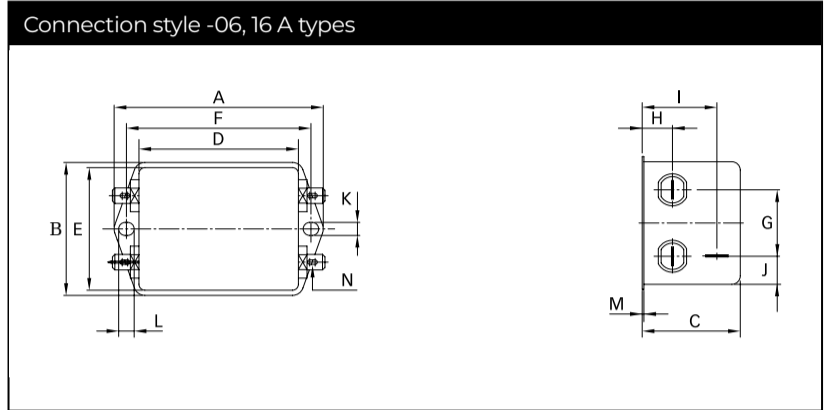
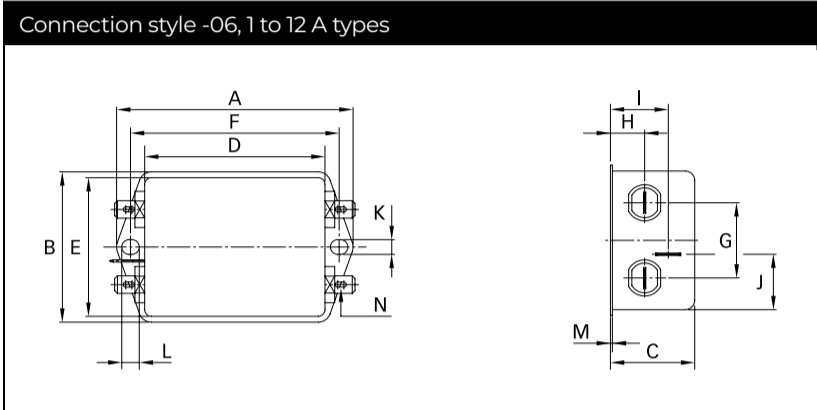
A type



B type

Product selector		
	06	Faston 6,3 × 0.8 mm (spade/soldering)
	07	Wire leads
	08	Studs (M4 screws)
	1 to 30	Rated current
	Blank	Standard version
	A	Safety version
	B	Medical version

### Mechanical Data



## Dimensions

	1 A	3 A	6 A	10 A	12 A	16 A	20 A	30 A	Tolerances
<b>A</b>	71	71	71	85	85	85	113.5 ±1	119 ±1	±0.5
<b>B</b>	46.6	46.6	46.6	54	54	54	57.5 ±1	85.5 ±1	±0.5
<b>C</b>	29.3	29.3	29.3	30.3	30.3	40.3	45.4 ±1	57.6 ±1	±0.5
<b>D</b>	50.5	50.5	50.5	64.8	64.8	64.8	94 ±1	98.5 ±1	±0.5
<b>E</b>	44.5	44.5	44.5	49.8	49.8	49.8	56	84.5	±0.5
<b>F</b>	61	61	61	75	75	75	103	109	±0.3
<b>G</b>	21	21	21	27	27	27	25	40	±0.2
<b>H</b>	10.8	10.8	10.8	12.3	12.3	12.3	12.4	15.6	±0.5
<b>I</b>	19.3	19.3	19.3	20.8	20.8	29.8	32.4		±0.5
<b>J</b>	20.1	20.1	20.1	19.9	19.9	11.4	15.5	42.25	±0.5
<b>K</b>	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	7.4	
<b>M</b>	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	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>	14	14	14	14.9	14.9	14.9			
<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	M4	M4	
<b>Q</b>								51	±0.2
<b>Recommended torque (Nm)</b>				1.2 - 1.3	1.2 - 1.3	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	1.5 - 1.7		

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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