

# Multi-stage AC/DC EMC/RFI Filter with Excellent Attenuation Performance



- Rated currents from 1 to 30 A
- Two-stage filter
- Very high differential and common-mode attenuation
- Optional low power loss version (R type)
- Optional medical versions (B type)
- Optional safety versions (A type)
- Optional enhanced performance versions
- Optional overvoltage protection (Z type)

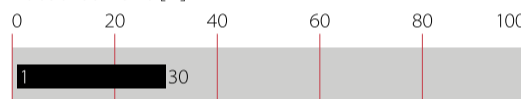


### Performance indicators

Attenuation performance



Rated current [A]



### Approvals & Compliances



### Features and Benefits

- FN 2090 two-stage filters are designed for easy and fast chassis mounting.
- FN 2090 R versions without discharge capacitors, reducing standby current
- FN 2090 B versions without capacitors to earth comply to 1MOP for ME (medical equipment) acc. IEC 60601-1
- FN 2090 A versions with low capacitance to earth for safety critical applications with a requirement for low leakage currents.
- FN 2090 filters offers an optimized filter range for enhanced performance AC and DC applications, in same compact size (KK, LL, NN types)
- All filters provide an exceptional conducted attenuation performance, based on chokes with high permeable core material.
- FN 2090 two-stage filters are designed for noisy applications requiring excellent filter performance.
- The higher inductivity offers increased attenuation performance with the same form factor as FN 2060 and FN 2080 series.
- All FN 2090 filters can be delivered with optional surge pulse protection (Z type).
- FN 2090 filters are also available as singlestage filters (FN 2030 series).
- Various terminal options allow you to select the desired connection style.

## Technical Specifications

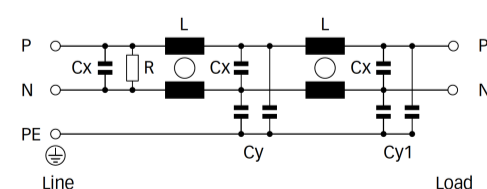
<b>Maximum continuous operating voltage</b>	250 VAC, 50/60 Hz 250 VDC
<b>Nominal operating voltage</b>	230 VAC
<b>Rated currents</b>	1 to 30 A @ 40°C
<b>Operating frequency</b>	DC to 400 Hz
<b>High potential test voltage</b>	P → N 1100 VDC for 2 sec P → PE 2000 VAC for 2 sec (equiv. cap <88 nF) P → PE 2550 VDC for 2 sec (equiv. cap >88 nF) P → PE 2500 VAC for 2 sec (B types)
<b>Overvoltage category</b>	II acc. IEC 60664-1
<b>Pollution degree</b>	2 acc. IEC 60664-1
<b>Surge pulse protection (Z type)</b>	Helps compliance to IEC61000-4-5 (Differential Mode only)
<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>MTBF (Mil-HB-217F)</b>	≤10 A: >1,300,000 h @ 40°C/230 V ≥12 A: >1,100,000 h @ 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 high filter performance

### Typical electrical schematic



## Filter Selection Table

Filter*	Buy	Rated current @ 40°C (25°C) [A]	Leakage current** @ 250V AC/50 Hz (@ 120V AC/60 Hz) [mA]	Power Loss @ 25°C/DC [W]	Inductance*** L [mH]	Capacitance***			Resistance*** R [kΩ]	Input/Output connections			Weight [g]
						Cx [μF]	Cy1 [nF]	Cy2 [nF]					
FN2090-1-..		1 (1.1)	0.45 (0.26)	1.8	20	0.22	2.2	1.0	680	-06	-07		73
FN2090-3-..		3 (3.4)	0.45 (0.26)	3.7	14	0.33	2.2	1.0	470	-06	-07		158
FN2090-4-..		4 (4.5)	0.45 (0.26)	6.4	14	0.33	2.2	1.0	470	-06	-07		176
FN2090-6-..		6 (6.7)	0.61 (0.35)	7.1	8	0.47	3.3	1.0	330	-06	-07	-08	191
FN2090-8-..		8 (8.9)	0.61 (0.35)	7.7	8	0.47	3.3	1.0	330	-06	-07		330
FN2090-10-..		10 (11.2)	0.61 (0.35)	8.4	8	0.47	3.3	1.0	330	-06	-07	-08	369
FN2090-12-..		12 (13.4)	0.93 (0.54)	12.1	4	1	10	1.0	220	-06	-07	-08	391
FN2090-16-..		16 (17.9)	0.93 (0.54)	10.7	4	1	10	1.0	220	-06	-07		425
FN2090-20-..		20 (22.4)	0.93 (0.54)	8.2	2.7	1	10	1.0	220	-06		-08	530
FN2090-30-08		30 (33.5)	0.93 (0.54)	10.1	1.5	1	10	1.0	220			-08	548
<b>Reduced Power loss ****</b>													
FN2090R-4-06		4 (4.5)	0.45 (0.26)	6.4	14	0.33	2.2	1.0		-06			172
FN2090R-6-06		6 (6.7)	0.61 (0.35)	7.1	8	0.47	3.3	1.0		-06			326
FN2090R-10-06		10 (11.2)	0.61 (0.35)	8.4	8	0.47	3.3	1.0		-06			365
FN2090R-16-06		16 (17.9)	0.93 (0.54)	10.7	4	1	10	1.0		-06			421
FN2090R-20-06		20 (22.4)	0.93 (0.54)	8.2	2.7	1	10	1.0		-06			526
FN2090R-30-08		30 (33.5)	0.93 (0.54)	10.1	1.5	1	10	1.0				-08	544
<b>Safety (0.07mA IIC)</b>													
FN2090A-1-..		1 (1.1)	0.13 (0.07)	1.8	20	0.22	0.47	0.47	680	-06	-07		73
FN2090A-3-..		3 (3.4)	0.13 (0.07)	3.7	14	0.33	0.47	0.47	470	-06	-07		158
FN2090A-4-..		4 (4.5)	0.13 (0.07)	6.4	14	0.33	0.47	0.47	470	-06	-07		176
FN2090A-6-..		6 (6.7)	0.13 (0.07)	7.1	8	0.47	0.47	0.47	330	-06	-07	-08	191
FN2090A-8-..		8 (8.9)	0.13 (0.07)	7.7	8	0.47	0.47	0.47	330	-06	-07		330
FN2090A-10-..		10 (11.2)	0.13 (0.07)	8.4	8	0.47	0.47	0.47	330	-06	-07	-08	369
FN2090A-12-..		12 (13.4)	0.13 (0.07)	12.1	4	1	0.47	0.47	220	-06	-07	-08	391
FN2090A-16-..		16 (17.9)	0.13 (0.07)	10.7	4	1	0.47	0.47	220	-06	-07		425
FN2090A-20-..		20 (22.4)	0.13 (0.07)	8.2	2.7	1	0.47	0.47	220	-06		-08	530
FN2090A-30-08		30 (33.5)	0.13 (0.07)	10.1	1.5	1	10	10	220			-08	548
<b>Medical (0mA IIC)</b>													
FN2090B-1-..		1 (1.1)	0.00	1.8	20	0.22			680	-06	-07		73
FN2090B-3-..		3 (3.4)	0.00	3.7	14	0.33			470	-06	-07		158
FN2090B-4-..		4 (4.5)	0.00	6.4	14	0.33			470	-06	-07		176
FN2090B-6-..		6 (6.7)	0.00	7.1	8	0.47			330	-06	-07	-08	191
FN2090B-8-..		8 (8.9)	0.00	7.7	8	0.47			330	-06	-07		330
FN2090B-10-..		10 (11.2)	0.00	8.4	8	0.47			330	-06	-07	-08	369
FN2090B-12-..		12 (13.4)	0.00	12.1	4	1			220	-06	-07	-08	391
FN2090B-16-..		16 (17.9)	0.00	10.7	4	1			220	-06	-07		425
FN2090B-20-..		20 (22.4)	0.00	8.2	2.7	1			220	-06		-08	530
FN2090B-30-08		30 (33.5)	0.00	10.1	1.5	1			220			-08	548
<b>Enhanced performance</b>													
FN2090KK-1-06		1 (1.15)	3.46 (1.99)	1.8	20	0.22	22	22	680	-06	-07		95
FN2090NN-3-06		3 (3.4)	15.71 (9.05)	3.7	14	0.33	100	100	470	-06			200
FN2090NN-4-06		4 (4.5)	15.71 (9.05)	6.4	14	0.33	100	100	470	-06			210
FN2090NN-6-06		6 (6.7)	15.71 (9.05)	7.1	8	0.47	100	100	330	-06			220
FN2090NN-8-06		8 (8.9)	15.71 (9.05)	7.7	8	0.47	100	100	330	-06			340
FN2090LL-10-..		10 (11.2)	5.18 (2.98)	8.4	8	0.47	33	33	330	-06		-08	470
FN2090LL-12-..		12 (13.4)	5.18 (2.98)	12.1	4	1	33	33	220	-06		-08	500
FN2090LL-16-06		16 (17.9)	5.18 (2.98)	10.7	4	1	33	33	220	-06			530
FN2090LL-20-..		20 (23)	5.18 (2.98)	8.2	2.7	1	33	33	220	-06		-08	580
FN2090LL-30-08		30 (33.5)	5.18 (2.98)	10.1	1.5	1	33	33	220			-08	600

\* 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.

FN2090Z-10-06, FN2090BZ-20-08). The different letters code the used Cy values in the filter type (A = 0.47nF; K = 22nF; L = 33nF; N = 100nF; as the FN2090 is a dual stage filter each letter stands for one stage of Cy)

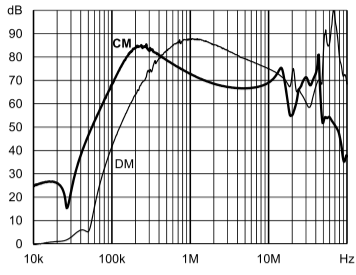
\*\* Maximum leakage under usual AC operating conditions (acc. IEC 60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level. Leakage current for DC application is 0mA

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

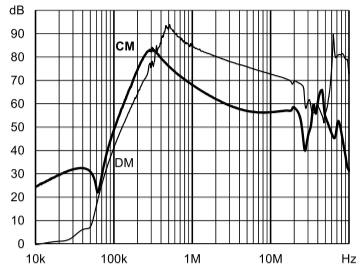
\*\*\*\* Reduced power loss in operation due to removed discharge resistors on capacitors

## Typical Filter Attenuation

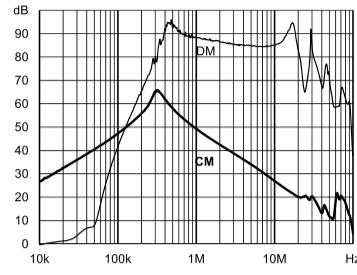
Per CISPR 17: symmetrical 50 Ω/50 Ω -> Differential Mode (DM); asymmetrical 50 Ω/50 Ω -> Common Mode (CM)



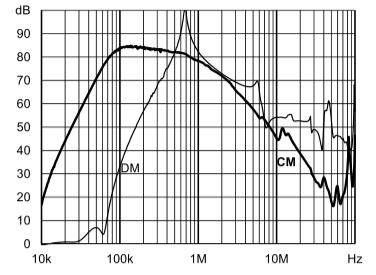
1 A: Standard type



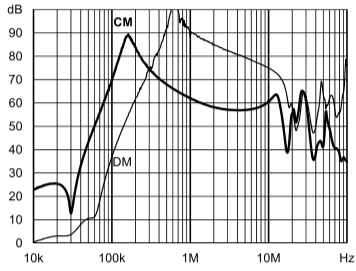
A type



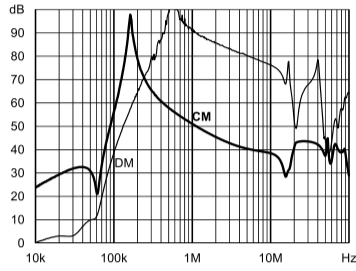
B type



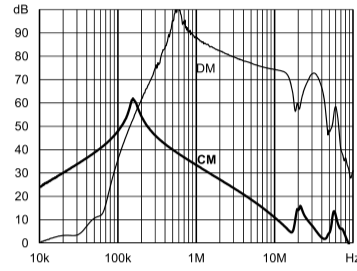
Enhanced performance



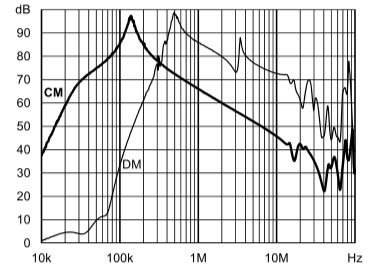
3 A: Standard type



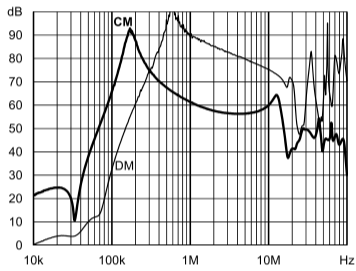
A type



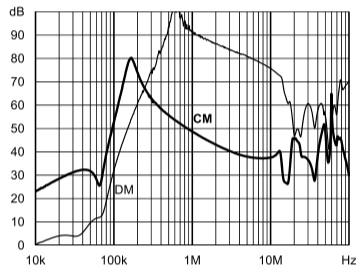
B type



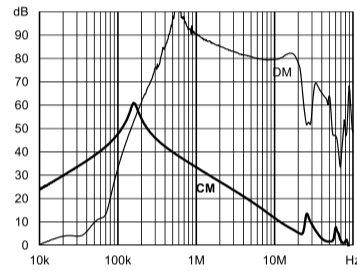
Enhanced performance



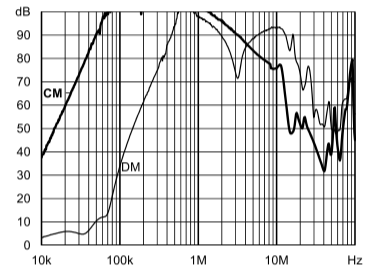
4 A: Standard type



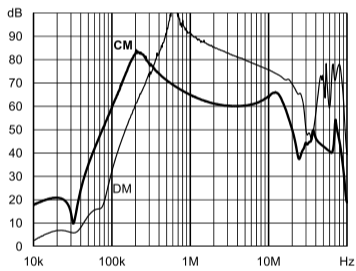
A type



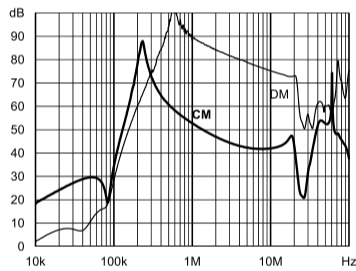
B type



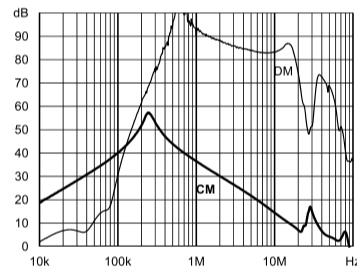
Enhanced performance



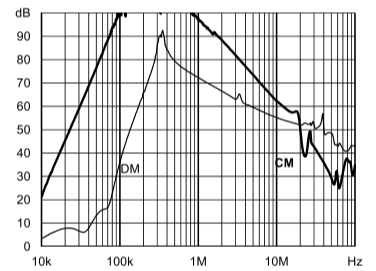
6 A: Standard type



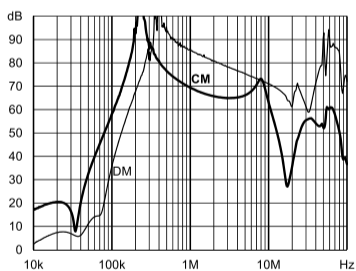
A type



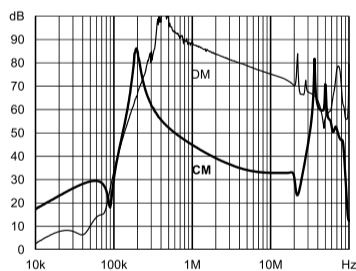
B type



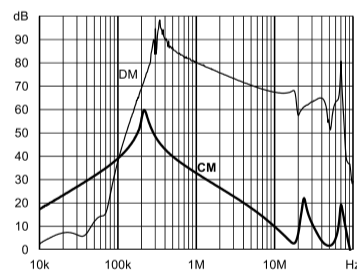
Enhanced performance



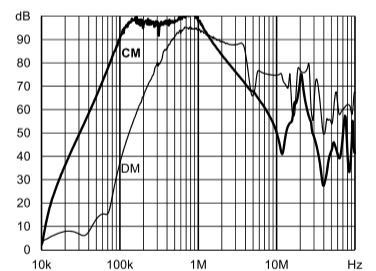
8 A: Standard type



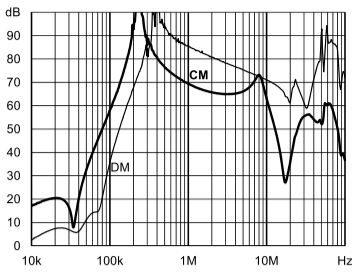
A type



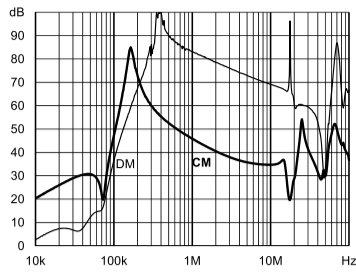
B type



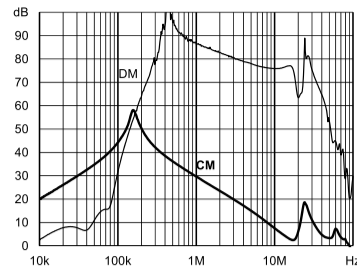
Enhanced performance



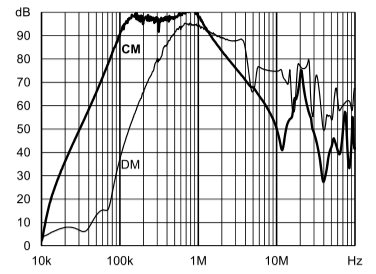
10 A: Standard type



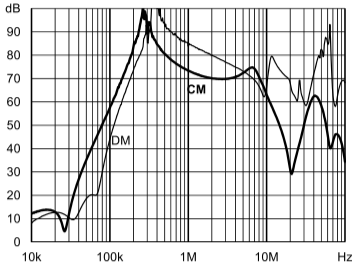
A type



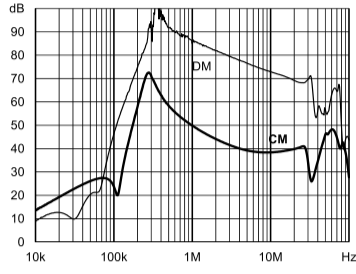
B type



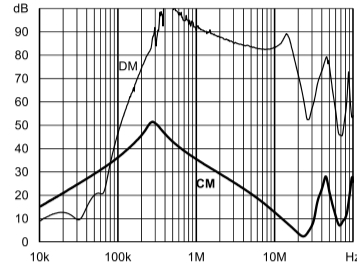
Enhanced performance



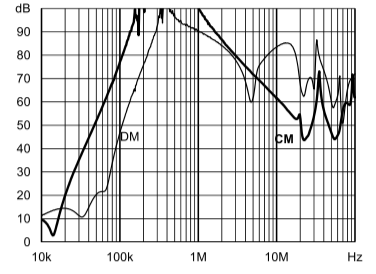
12 A: Standard type



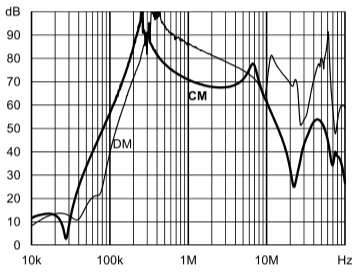
A type



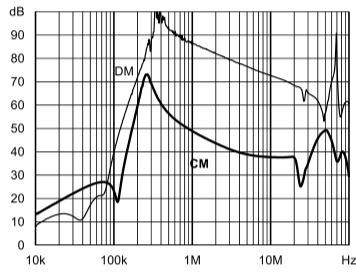
B type



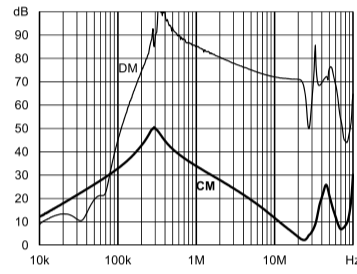
Enhanced performance



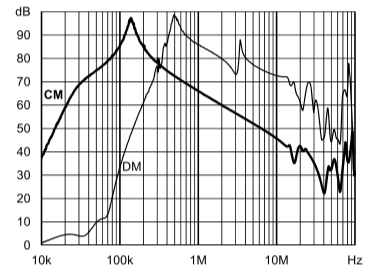
16 A: Standard type



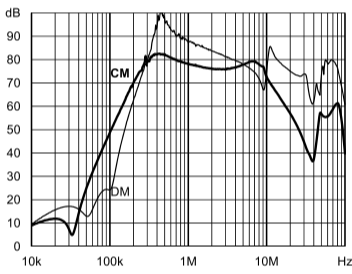
A type



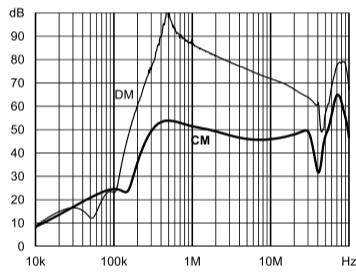
B type



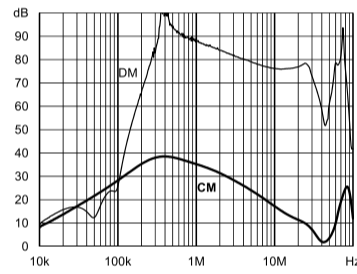
Enhanced performance



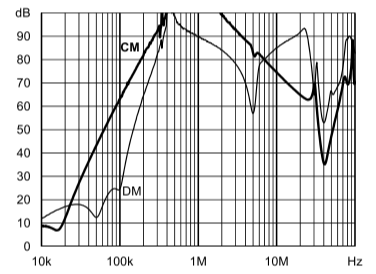
20 A: Standard type



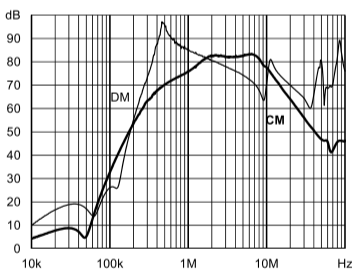
A type



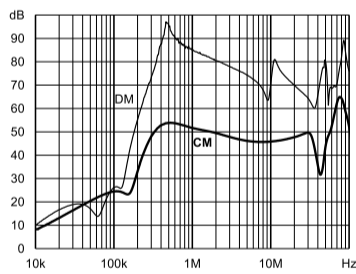
B type



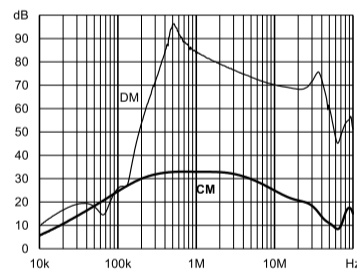
Enhanced performance



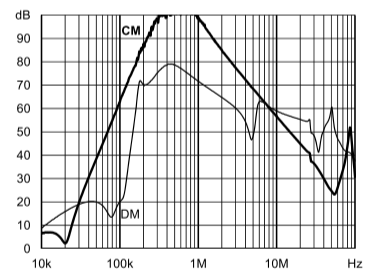
30 A: Standard type



A type



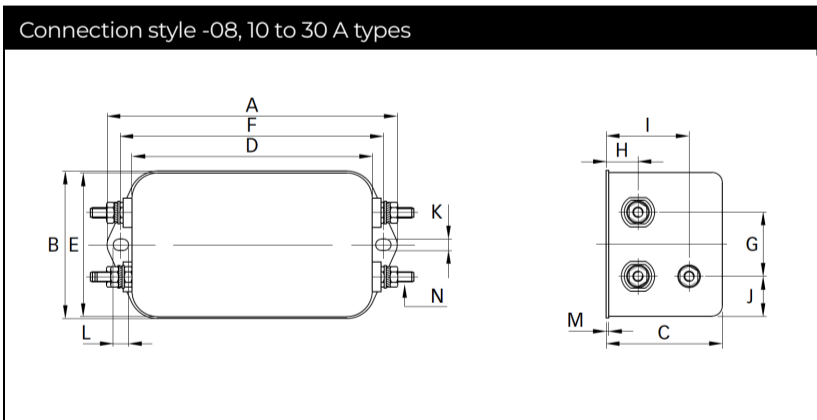
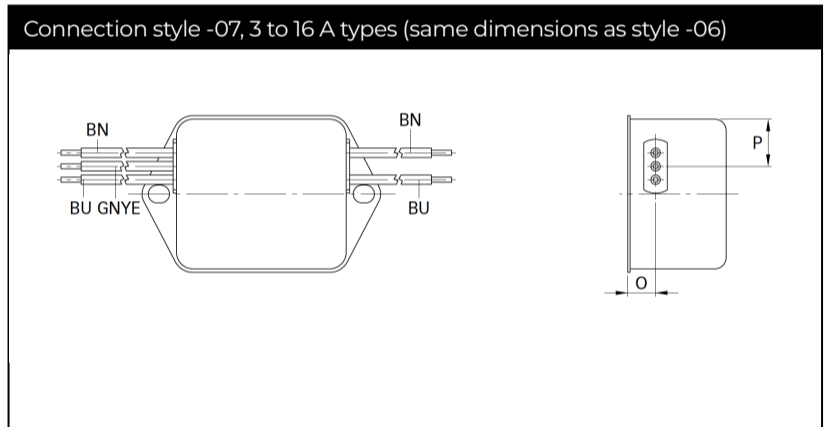
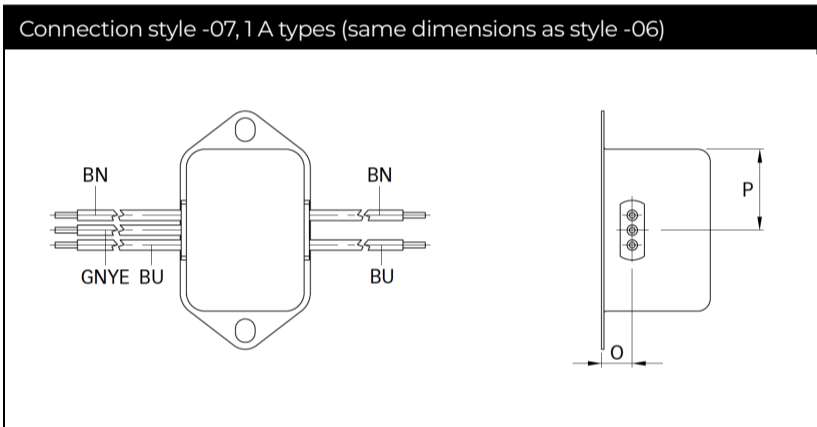
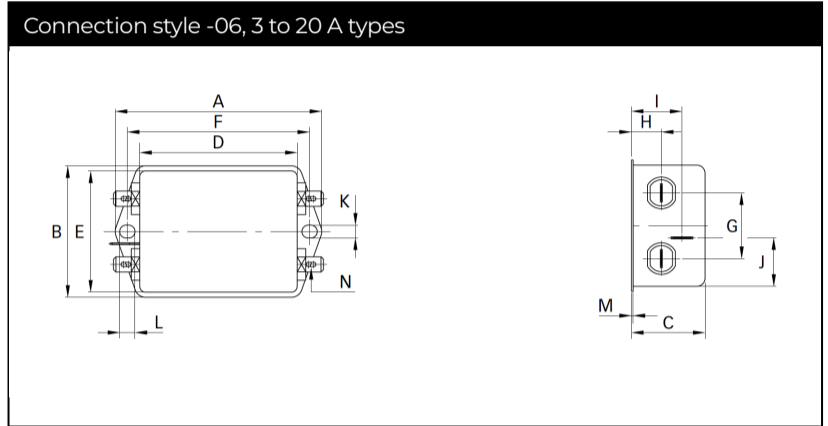
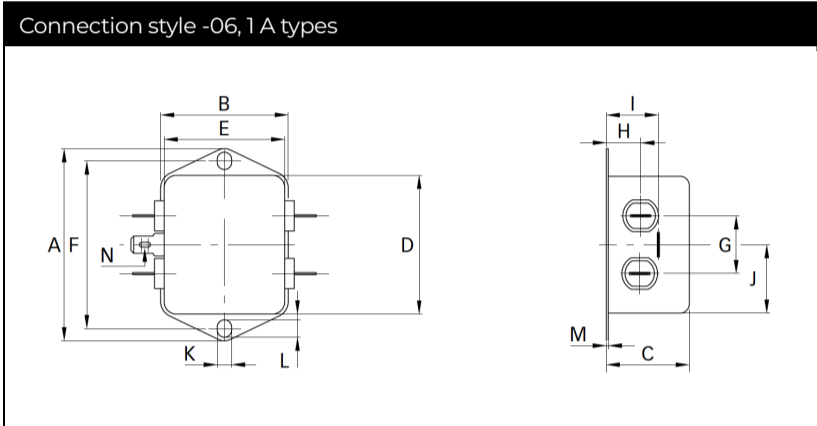
B type



Enhanced performance

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
	Z	With surge protection
	Blank	Standard version
	A	Safety version
	B	Medical version
	KK/LL/NN	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>	71	85	85	85	113.5 ±1	113.5 ±1	113.5 ±1	113.5 ±1	113.5 ±1	113.5 ±1	±0.5
<b>B</b>	46.6	54	54	54	57.5 ±1	57.5 ±1	57.5 ±1	57.5 ±1	57.5 ±1	57.5 ±1	±0.5
<b>C</b>	22.3	30.3	30.3	30.3	45.4 ±1	45.4 ±1	45.4 ±1	45.4 ±1	45.4 ±1	45.4 ±1	±0.5
<b>D</b>	50.5	64.8	64.8	64.8	94 ±1	94 ±1	94 ±1	94 ±1	94 ±1	94 ±1	±0.5
<b>E</b>	44.5	49.8	49.8	49.8	56	56	56	56	56	56	±0.5
<b>F</b>	61	75	75	75	103	103	103	103	103	103	±0.3
<b>G</b>	21	27	27	27	25	25	25	25	25	25	±0.2
<b>H</b>	10.8	12.3	12.3	12.3	12.4	12.4	12.4	12.4	12.4	12.4	±0.5
<b>I</b>	16.8	20.8	20.8	20.8	32.4	32.4	32.4	32.4	32.4	32.4	±0.5
<b>J</b>	25.25	19.9	19.9	19.9	15.5	15.5	15.5	15.5	15.5	15.5	±0.5
<b>K</b>	5.3	5.3	5.3	5.3	4.4	4.4	4.4	4.4	4.4	4.4	
<b>L</b>	6.3	6.3	6.3	6.3	6	6	6	6	6	6	
<b>M</b>	0.7	0.7	0.7	0.7	1	1	1	1	1	1	±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	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	8.4	8.4	8.4	8.4			±0.5
<b>P</b>	14	14.9	14.9	14.9	18	18	18	18			±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	M4	M4	M4	
<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	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 connectors.

## Headquarters, Global Innovation and Development

### Switzerland

#### Schaffner Group

Industrie Nord  
Nordstrasse 5  
4542  
Luterbach  
+41 32 681 66 26  
[info@schaffner.com](mailto:info@schaffner.com)

## Sales and Application Centers

### Finland

#### Schaffner Oy

Lohjanharjuntie 1109  
08500  
Lohja  
+ 358 50 468 72 84  
[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

Ohiostr. 8  
76149  
Karlsruhe  
+49 721 56910  
[germanysales@schaffner.com](mailto:germanysales@schaffner.com)

### Italy

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

Via Ticino, 30  
20900  
Monza (MB)  
+39 335 120 44 32  
[italysales@schaffner.com](mailto:italysales@schaffner.com)

### Japan

#### Schaffner EMC K.K.

ISM Sangenjaya 7F  
1-32-12 Kamiyama 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)

### Sweden

#### Schaffner EMC AB

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

### Switzerland

#### Schaffner EMV AG

Industrie Nord  
Nordstrasse 5  
4542  
Luterbach  
+41 32 681 66 26  
[switzerlandsales@schaffner.com](mailto:switzerlandsales@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)

### United Kingdom

#### Schaffner Ltd.

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

© 2025 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.

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

[View FN2090B-10-06 on WIN SOURCE](#)

[TE Connectivity Information](#)

## Optimize Your Supply Chain with WIN SOURCE Solutions

- ✓ Global Sourcing Solution
- ✓ Obsolete Management
- ✓ Cost Control Management
- ✓ Shortage Management
- ✓ Alternative Solution
- ✓ Excess Inventory Management