

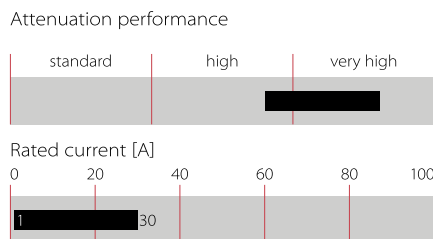
Multi-stage AC/DC EMI Filter with Excellent Attenuation Performance



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



Performance indicators



Approvals & Compliances



Features and benefits

- FN 2090 two-stage filters are designed for easy and fast chassis mounting.
- 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

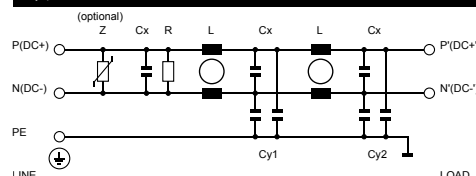
Rated voltage*	250 VAC, 50/60 Hz; 250 VDC
Operating frequency	DC to 400 Hz
Rated currents	1 to 30 A @ 40°C max.
High potential test voltage	P → PE 2000 VAC for 2 sec (equiv. cap <88 nF) P → PE 2550 VDC for 2 sec (equiv. cap >88 nF) P → PE 2500 VAC for 2 sec (B types) P → N 1100 VDC for 2 sec
Temperature range (operation and storage)	-25°C to +100°C (25/100/21)**
Certified to	UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939 (applies to AC and DC applications)
Flammability corresponding to	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
Surge pulse protection (Z type)	Helps compliance to IEC61000-4-5 (Differential Mode only)
Overvoltage category	II acc. IEC 60664-1
Pollution degree	2 acc. IEC 60664-1
Altitude	2000m (above derating applies)**
MTBF @ 40°C/230 V (Mil-HB-217F)	1,300,000 hours (1 to 10 A types) 1,100,000 hours (12 A types) 517,000 hours (16 and 30 A 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

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)	Leakage current** @ 250V AC/50 Hz (@ 120V AC/60 Hz)	Power Loss @ 25°C/DC	Inductance***		Capacitance***			Resistance*** R	Input/Output connections			Weight [g]
					L	Cx	Cy1	Cy2						
		[A]	[mA]	[W]	[mH]	[μF]	[nF]	[nF]	[kΩ]					
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	
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	
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	
Enhanced performance														
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.

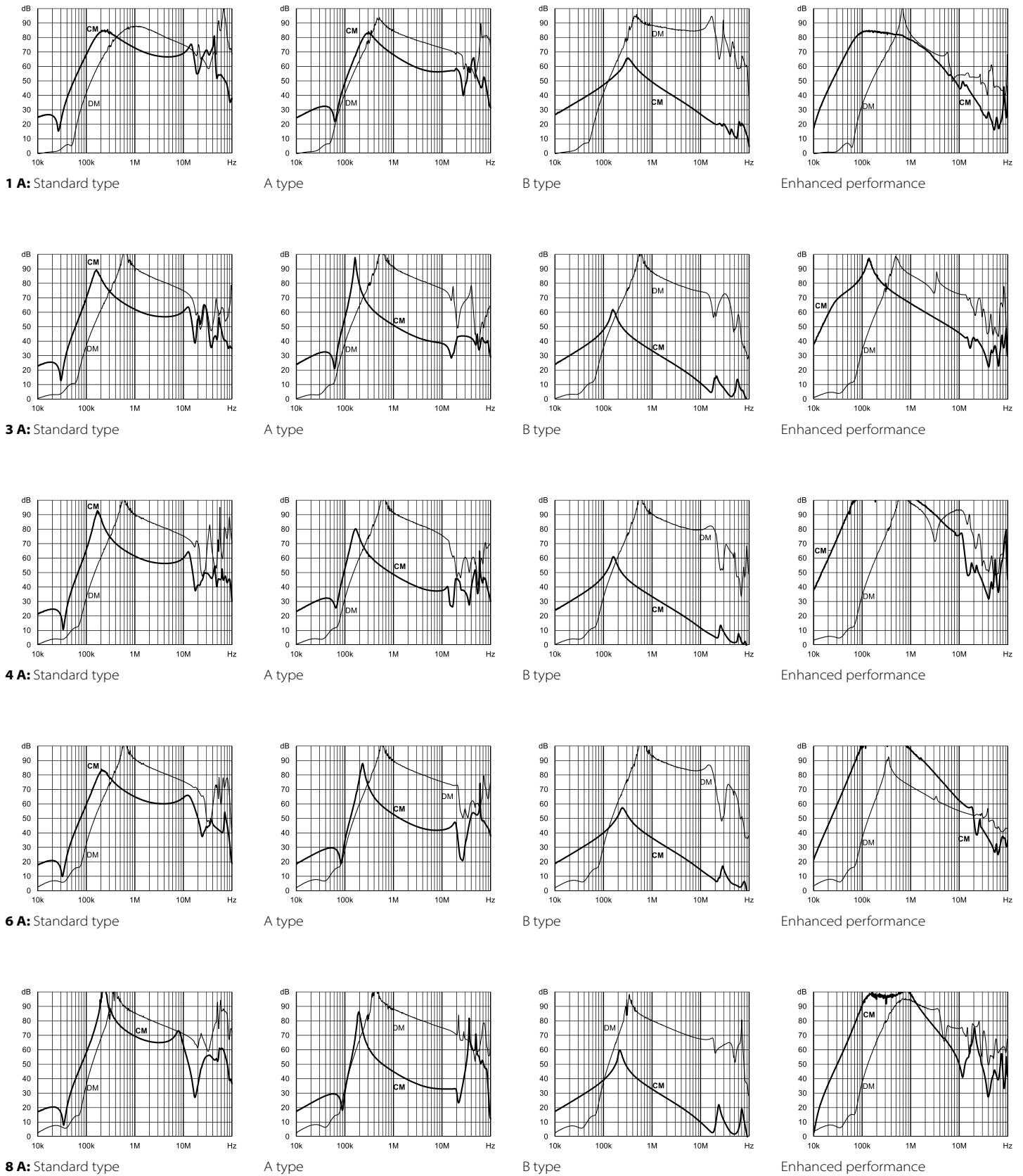
For surge pulse protection, please add Z (e.g. FN2090Z-10-06, FN2090BZ-20-08). The different letters code the used Cy values in the filter type (A = 0.47nF; K = 22nF; L = 33nF; N = 100nF; as the FN2090 is a dual stage filter each letter stands for one stage of Cy)

** 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%

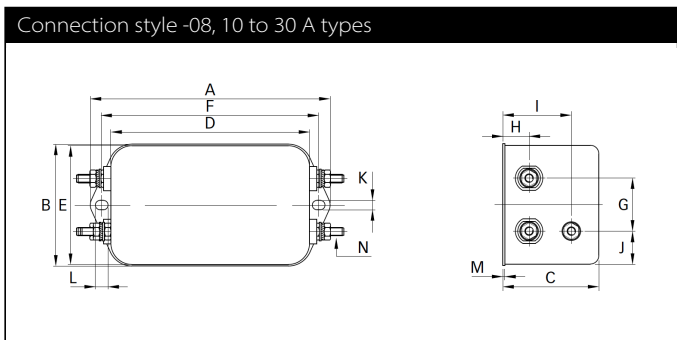
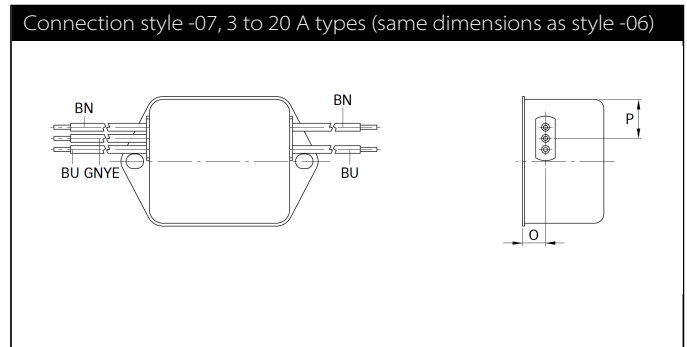
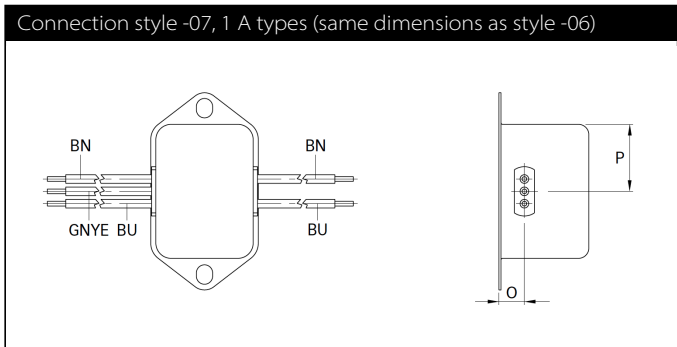
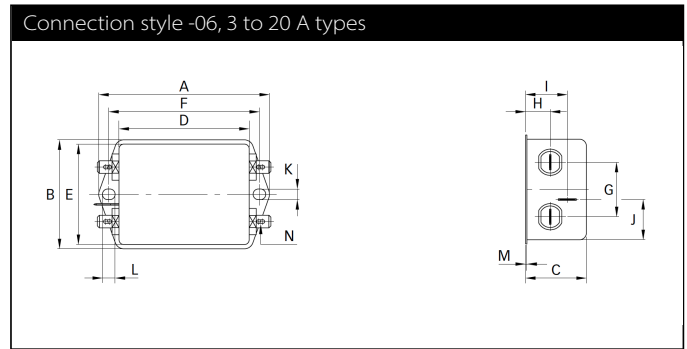
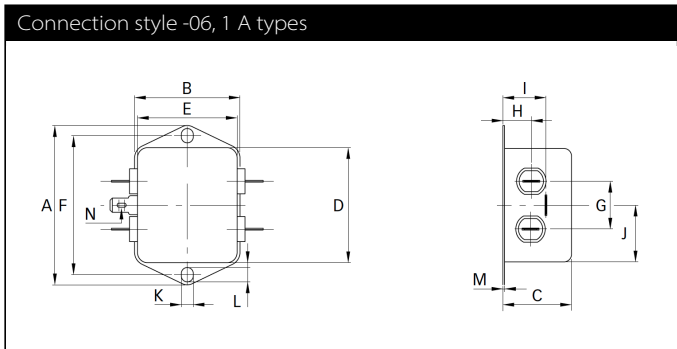
Typical filter attenuation

Per CISPR 17; CM=50 Ω/50 Ω sym; DM=50 Ω/50 Ω asym



Product selector		
<p>FN 2090 xy-xx-yy</p>	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
A	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	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
C	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
D	50.5	64.8	64.8	64.8	94 ±1	94 ±1	94 ±1	94 ±1	94 ±1	94 ±1	±0.5
E	44.5	49.8	49.8	49.8	56	56	56	56	56	56	±0.5
F	61	75	75	75	103	103	103	103	103	103	±0.3
G	21	27	27	27	25	25	25	25	25	25	±0.2
H	10.8	12.3	12.3	12.3	12.4	12.4	12.4	12.4	12.4	12.4	±0.5
I	16.8	20.8	20.8	20.8	32.4	32.4	32.4	32.4	32.4	32.4	±0.5
J	25.25	19.9	19.9	19.9	15.5	15.5	15.5	15.5	15.5	15.5	±0.5
K	5.3	5.3	5.3	5.3	4.4	4.4	4.4	4.4	4.4	4.4	
L	6.3	6.3	6.3	6.3	6	6	6	6	6	6	
M	0.7	0.7	0.7	0.7	1	1	1	1	1	1	±0.3
Connection style -06											
N	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	
Connection style -07											
O	8.3	8.3	8.3	8.3	8.4	8.4	8.4	8.4			±0.5
P	14	14.9	14.9	14.9	18	18	18	18			±0.5
AWG type wire	AWG 20	AWG 20	AWG 20	AWG 18	AWG 18	AWG 18	AWG 16	AWG 16			
Wire length	140	140	140	140	140	140	140	140			+5
Connection style -08											
N						M4	M4	M4	M4	M4	
Recommended torque (Nm)						1.2 - 1.3	1.2 - 1.3	1.2 - 1.3	1.2 - 1.3	1.2 - 1.3	
Earth terminal						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 to find more details on filter connectors.



Headquarters, global innovation and development

Switzerland

Schaffner Group

Industrie Nord
Nordstrasse 11e
4542 Luterbach
T +41 32 681 66 26
info@schaffner.com



Sales and application centers

China

Schaffner EMC Ltd. Shanghai

T20-3 C, No 565 Chuangye Road,
Pudong district
201201 Shanghai
T +86 21 3813 9500
cschina@schaffner.com
www.schaffner.com.cn

Finland

Schaffner Oy

Sauvonrinne 19 H
08500 Lohja
T +358 50 468 7284
finlandsales@schaffner.com

France

Schaffner EMC S.A.S.

16-20 Rue Louis Rameau
95875 Bezons
T +33 1 34 34 30 60
F +33 1 39 47 02 28
francesales@schaffner.com

Germany

Schaffner Deutschland GmbH

Schoemperlenstrasse 12B
76185 Karlsruhe
T +49 721 56910
germanysales@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
T +91 80 67935355
indiasales@schaffner.com

Italy

Schaffner EMC S.r.l.

Via Ticino, 30
20900 Monza (MB)
T +39 039 21 41 070
italysales@schaffner.com

Japan

Schaffner EMC K.K.

Taiju-Seimei Sangenjaya Bldg.
1-32-12, Kamiyama, Setagaya-ku
154-0011 Tokyo
T +81 3 5712 3650
F +81 3 5712 3651
japansales@schaffner.com
www.schaffner.jp

Singapore

Schaffner EMC Pte Ltd.

#05-09, Kg Ubi Ind. Estate
408705 Singapore
T +65 6377 3283
F +65 6377 3281
singaporesales@schaffner.com

Spain

Schaffner EMC España

Calle Caléndula 93, Miniparc III, Edificio E
El Soto de Moraleja, Alcobendas
28109 Madrid
T +34 917 912 900
F +34 917 912 901
spainsales@schaffner.com

Sweden

Schaffner EMC AB

Östermalmstorg 1
114 42 Stockholm
T +46 8 5050 2425
swedensales@schaffner.com
www.schaffner.com

Switzerland

Schaffner EMV AG

Industrie Nord
Nordstrasse 11e
4542 Luterbach
T +41 32 681 66 88
T +41 32 681 66 26
switzerlandsales@schaffner.com

Taiwan

Schaffner EMV Ltd.

20 Floor-2, No 97, Section 1, XinTai 5th Road
22175 XiZhi District New Taipei City 22175
T +886 2 2697 5500
F +886 2 2697 5533
taiwansales@schaffner.com
www.schaffner.com.tw

Thailand

Schaffner EMC Co. Ltd.

Northern Region Industrial Estate
67 Moo 4 Tambon Ban Klang
Amphur Muangng P.O. Box 14
51000 Lamphun
T +66 53 58 11 04
F +66 53 58 10 19
thailandsales@schaffner.com

United Kingdom

Schaffner Ltd.

1, Oakmede Place
Binfield
RG42 4JF Berkshire
T +44 118 9770070
F +44 118 9792969
uksales@schaffner.com

USA

Schaffner EMC Inc.

52 Mayfield Avenue
Edison, New Jersey
T +1 732 225 9533
F +1 732 225 4789
usasales@schaffner.com
www.schaffnerusa.com

To find your local partner within Schaffner's global network: www.schaffner.com

© 2021 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.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [Power Line Filters](#) category:

Click to view products by [Schaffner](#) manufacturer:

Other Similar products are found below :

[6609019-3](#) [6609026-5](#) [6609030-6](#) [6609973-2](#) [D30A](#) [7-1609090-5](#) [F2810](#) [F4456A](#) [F7140A](#) [F7382Z](#) [F7863Z](#) [FAHAV3100ZC000](#) [806276](#)
[FN2020B-1-06](#) [FN2080B-10-06](#) [FN2090A-1-06](#) [FN2410H-32-33](#) [FN2410H-80-34](#) [FP144](#) [FS4153-20-06](#) [FS4353-500-99](#) [12-MMB-030-11-](#)
[D](#) [DB4-393](#) [15811T200](#) [20B1](#) [LC630](#) [2B1](#) [1609080-2](#) [1609993-8](#) [1-6609070-1](#) [F1100AA02](#) [F1150CC10](#) [F1500CA10](#) [F1500CA15](#)
[F4041Z](#) [F7585E](#) [1B1](#) [FN2070A-16-06](#) [FN2090A-20-06](#) [FN2090B-12-06](#) [FN2090Z-1-06](#) [FN2410H-25-33](#) [FN2410H-60-34](#) [FN2410H-8-44](#)
[FN2412H-8-44](#) [FN323B-6-01](#) [FN610R-3-06](#) [20EHQ7](#) [20EHZ7](#) [20K1](#)