

High Performance EMC/EMI Filter

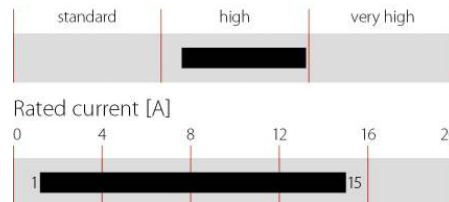


- | Rated currents up to 15 A
- | Excellent attenuation performance
- | Complies with IEC/EN 60601-1
- | Snap-in versions (S and S1 type)
- | Hot inlet versions (HI type)



Performance indicators

Attenuation performance



Technical specifications

Maximum continuous operating voltage	250 VAC, 50/60 Hz
Operating frequency	dc to 400 Hz
Rated currents	1 to 15 A @ 50 °C
Approvals by rated current	1 to 10 A (ENEC, CQC) 1 to 15 A (UL, CSA)
High potential test voltage	P → PE 2000 VAC for 2 sec (standard types) P → N 1000 VAC for 2 sec P → PE 2500 VAC for 2 sec (B types)
Protection category	IP40 according to IEC 60529
Temperature range (operation and storage)	-25 °C to +85 °C (25/85/21)
Design corresponding to	UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939
Flammability corresponding to	UL 94 V-2 or better
MTBF @ 40°C/230V (Mil-HB-217F)	2,540,000 hours

Approvals



RoHS

(CQC except HI-types)

The FN 9233 IEC inlet filter combines an excellent IEC inlet and mains filter with excellent filter attenuation in a small form factor. Choosing the FN 9233 product line brings you the rapid availability of a standard filter associated with the necessary safety acceptances. Standard IEC connector filters are a practical solution helping you to pass EMI system approval in a short time. A wide selection on amperage ratings, output connections, mounting possibilities and filters for medical applications are designed to offer you the desired solution. For types with additional earth line choke please consult the FN 9233E data sheet.

Features and benefits

- | Exceptional conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- | Rear/front or snap-in mounting
- | Optional earth line choke see FN 9233E data sheet
- | Optional medical versions (B type) comply with the requirements of IEC/EN 60601-1 for creepage and clearance, leakage current and high potential testing
- | Wide mounting flanges available
- | Different output connections offering maximum flexibility for assembly
- | Custom-specific versions are available on request

Typical applications

- | Portable electrical and electronic equipment
- | Small to medium-sized machines and household equipment
- | Single-phase power supplies, switch-mode power supplies
- | Test and measurement equipment
- | Medical equipment
- | Rack mounting equipment

Filter selection table

Filter	Rated current @ 50 °C (25 °C)	Leakage current* @ 250 VAC/50 Hz	Inductance L	Capacitance			Resistance Cy	Output connections 	Weight [g]
	[A]	[µA]	[mH]	Cx1 [µF]	Cx2 [µF]	Cy [nF]	[kΩ]		
FN9233x-1-06	1 (1.2)	373	22.5	0.1		2.2		-06	37
FN9233x-3-06	3 (3.5)	373	4.6	0.1		2.2		-06	37
FN9233x-6-06	6 (7.2)	373	1.6	0.1		2.2		-06	37
FN9233x-8-06	8 (10.6)	373	0.9	0.1		2.2		-06	37
FN9233x-10-06	10 (11.6)	373	0.45	0.1		2.2		-06	37
FN9233x-12-06	12 (12)	373	0.27	0.1		2.2		-06	37
FN9233x-15-06	15 (15)	373	0.2	0.1		2.2		-06	37
FN9233x-12-06HI	12 (12)	373	0.27	0.1		2.2		-06	37
FN9233x-15-06HI	15 (15)	373	0.2	0.1		2.2		-06	37
FN9233xR-1-06	1 (1.2)	373	22.5	0.1		2.2	1000	-06	37
FN9233xR-3-06	3 (3.5)	373	4.6	0.1		2.2	1000	-06	37
FN9233xR-6-06	6 (7.2)	373	1.6	0.1		2.2	1000	-06	37
FN9233xR-8-06	8 (10.6)	373	0.9	0.1		2.2	1000	-06	37
FN9233xR-10-06	10 (11.6)	373	0.45	0.1		2.2	1000	-06	37
FN9233xR-12-06	12 (12)	373	0.27	0.1		2.2	1000	-06	37
FN9233xR-15-06	15 (15)	373	0.2	0.1		2.2	1000	-06	37
FN9233xR-12-06HI	12 (12)	373	0.27	0.1		2.2	1000	-06	37
FN9233xR-15-06HI	15 (15)	373	0.2	0.1		2.2	1000	-06	37
FN9233xB-1-06	1 (1.2)	2	22.5	0.1			1000	-06	37
FN9233xB-3-06	3 (3.5)	2	4.6	0.1			1000	-06	37
FN9233xB-6-06	6 (7.2)	2	1.6	0.1			1000	-06	37
FN9233xB-8-06	8 (10.6)	2	0.9	0.1			1000	-06	37
FN9233xB-10-06	10 (11.6)	2	0.45	0.1			1000	-06	37
FN9233xB-12-06	12 (12)	2	0.27	0.1			1000	-06	37
FN9233xB-15-06	15 (15)	2	0.2	0.1			1000	-06	37
FN9233xB-12-06HI	12 (12)	2	0.27	0.1			1000	-06	37
FN9233xB-15-06HI	15 (15)	2	0.2	0.1			1000	-06	37
FN9233UF2-1-06	1 (1.2)	560	22.5	0.047	0.047	3.3		-06	46
FN9233UF2-3-06	3 (3.5)	560	4.6	0.047	0.047	3.3		-06	46
FN9233UF2-6-06	6 (7.2)	560	1.6	0.047	0.047	3.3		-06	46
FN9233UF2-8-06	8 (10.6)	560	0.9	0.047	0.047	3.3		-06	46
FN9233UF2-10-06	10 (11.6)	560	0.45	0.047	0.047	3.3		-06	46
FN9233UF2-12-06	12 (12)	560	0.27	0.047	0.047	3.3		-06	46
FN9233UF2-15-06	15 (15)	560	0.2	0.047	0.047	3.3		-06	46

* Maximum leakage under normal operating conditions. Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

Product selector

FN 9233xx-yy-..HI-zz

Snap-in range for S version only

Blank: Snap-in range 0.7 to 1.5mm

20: Snap-in range 1.5 to 2.2mm

Blank: Standard IEC inlet type C14

HI: Hot IEC inlet type C16 (12 and 15A types only)

06: Faston 6.3 x 0.8mm (spade/soldering)

1 to 15: Rated current

Blank: Standard version

R: Bleed resistor

B: Medical version (with bleed resistor and without Y2-capacitor)

F2: 2 X-capacitors and higher Y-capacitor value

 Blank: Standard housing with mounting flanges

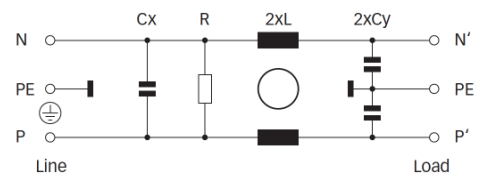
 U: Housing with wider mounting flanges

 S: Snap-in version, snapper on vertical side

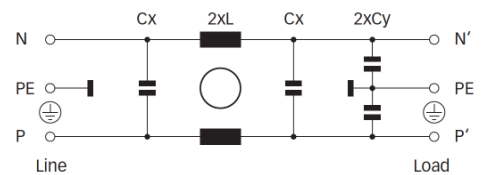
 S1: Snap-in version, snapper on horizontal side

Typical electrical schematic

Standard, R and B types



F2 types

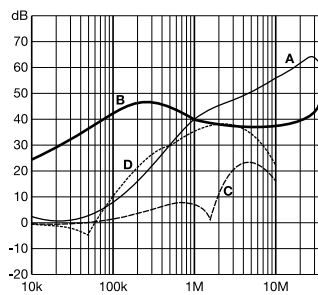


For example: FN 9233-15-06, FN 9233S1B-10-06-20, FN 9233R-12-06HI

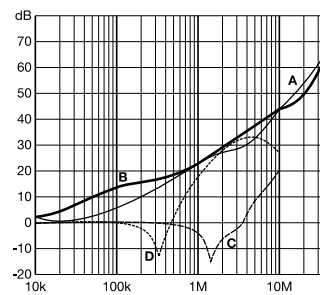
Typical filter attenuation

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

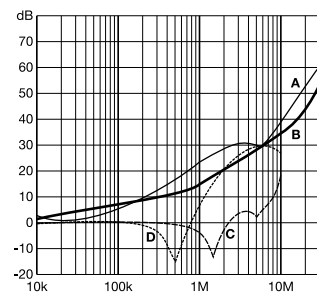
FN 9233: 1 and 3 A types



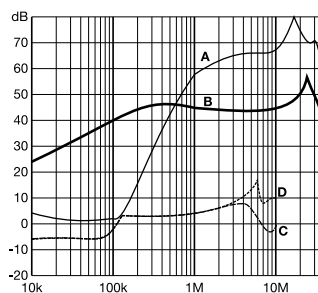
FN 9233: 6 to 10 A types



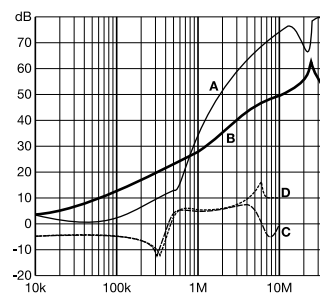
FN 9233: 12 and 15 A types



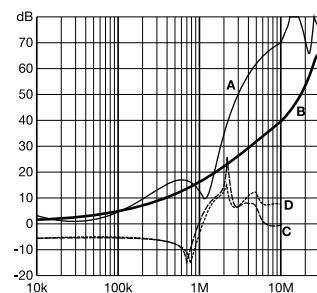
FN 9233UF2: 1 and 3 A types



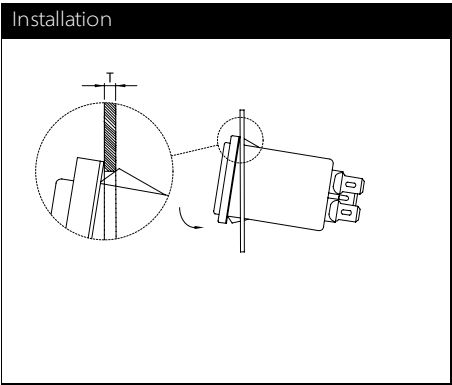
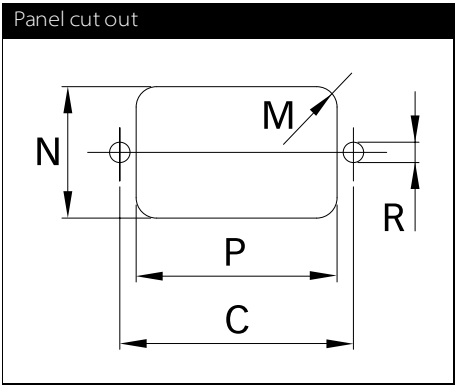
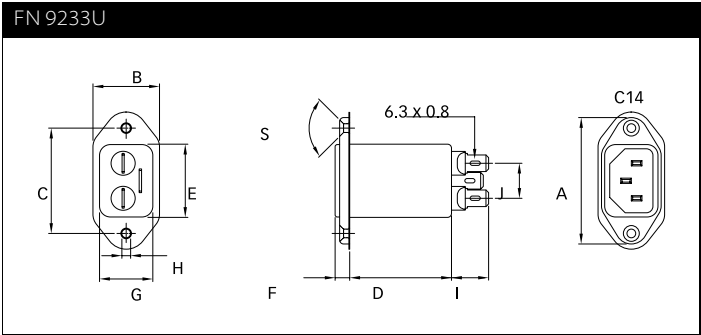
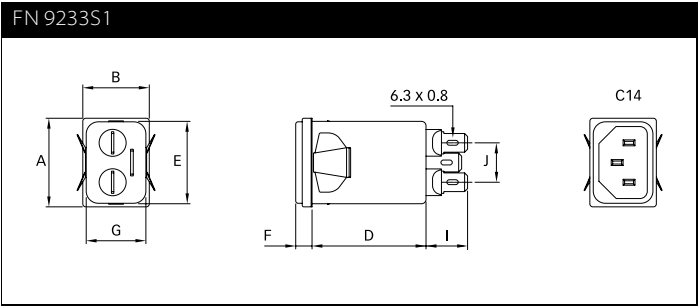
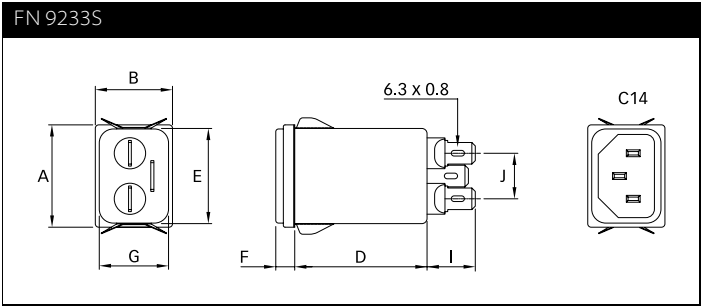
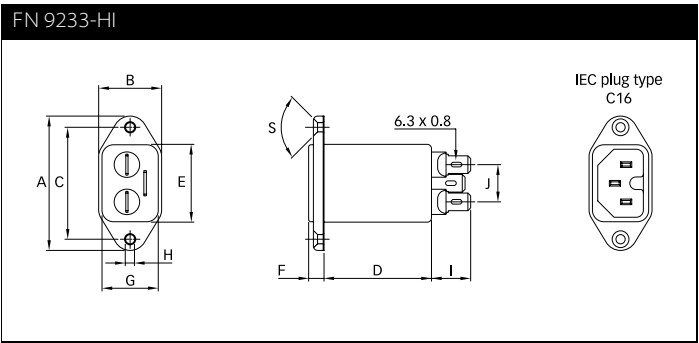
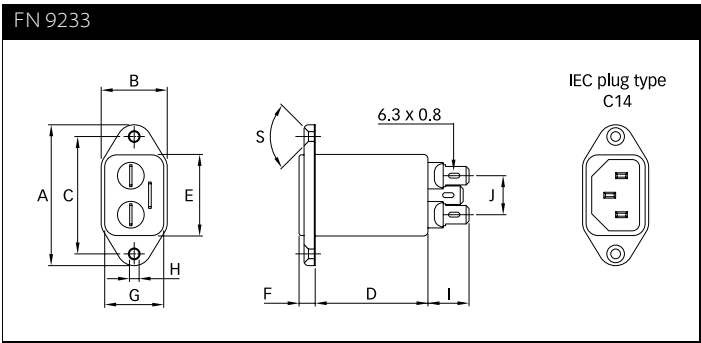
FN 9233UF2: 6 to 10 A types



FN 9233UF2: 12 and 15 A types



Mechanical data



Dimensions

	FN 9233	FN 9233U	FN 9233UF2	FN 9233S	FN 9233S1	FN 9233-HI
A	48	51.85	51.85	29.9	29.9	48
B	22.5	25	25	22.4	22.4	22.5
C	40 ±0.2	40 ±0.2	40 ±0.2			40 ±0.2
D	38.4	38.25	46.8	38.4	38.4	38.4
E	27.8	27.8	27.8	27.8	27.8	27.8
F	5.5	5.5	5.5	5.5	5.5	5.5
G	20.1	20.1	20.1	20.1	20.1	20.1
H	Ø 3.3	Ø 3.3	Ø 3.3			Ø 3.3
I	14	14.1	14	14	14	14
J	13.3	13.3	13.3	13.3	13.3	13.3
M	R ≤ 3	R ≤ 3	R ≤ 3	R ≤ 1.5	R ≤ 1.5	R ≤ 3
N	21.5	21.5	21.5	20.8	21.9	21.5
P	28.5	28.5	28.5	29.4	28.5	28.5
R	M3	M3	M3			M3
S	90°	90°	90°			90°
T*				0.7 - 1.5	0.7 - 1.5	
T*				1.5 - 2.2	1.5 - 2.2	

* For selecting the panel thickness, please refer to the filter selector table.

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 connectors.



Headquarters, global innovation and development center

Switzerland

Schaffner Group

Nordstrasse 11
4542 Luterbach
T +41 32 6816 626
F +41 32 6816 630
info@schaffner.com
<http://www.schaffner.com>



Sales and application centers

China

Schaffner EMC Ltd. Shanghai

T20-3, No 565 Chuangye Road
Pudong New Area
201201 Shanghai
T +86 21 3813 9500
F +86 21 3813 9501 / 02
cschina@schaffner.com
<http://www.schaffner.com.cn/>

Finland

Schaffner Oy

Sauvonrinne 19 H
08500 Lohja
T +358 19 35 72 71
finlandsales@schaffner.com

France

Schaffner EMC S.A.S.

112, Quai de Bezons
Boîte postale 133
95103 Argenteuil
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
F +49 721 569110
germanysales@schaffner.com

Italy

Schaffner EMC S.r.l.

Via Galileo Galilei 47
20092 Cinisello Balsamo (MI)
T +39 02 66 04 30 45/47
F +39 02 61 23 943
italysales@schaffner.com

Japan

Schaffner EMC K.K.

1-32-12, Kamiyama, Setagaya-ku
7F Mitsui-seimei Sangenjaya Bldg.
154-0011 Tokyo
T +81 3 5712 3650
F +81 3 5712 3651
japansales@schaffner.com
<http://www.schaffner.jp>

Singapore

Schaffner EMC Pte Ltd.

Blk 3015A Ubi Road 1
05-09 Kampong Ubi Industrial 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 la Moraleja
Alcobendas
28109 Madrid
T +34 618 176 133
spainsales@schaffner.com

Sweden

Schaffner EMC AB

Turebergstorg 1, 6
19147 Sollentuna
T +46 8 5792 1121 / 22
F +46 8 92 96 90
swedensales@schaffner.com

Switzerland

Schaffner EMV AG

Nordstrasse 11
4542 Luterbach
T +41 32 6816 626
F +41 32 6816 641
sales@schaffner.ch

Taiwan R.O.C.

Schaffner EMV Ltd.

6 Floor, No. 413
Rui Guang Road
114 Neihs District Taipei City
T +886 2 87525050
F +886 2 87518086
taiwansales@schaffner.com

Thailand

Schaffner EMC Co. Ltd.

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

UK

Schaffner Ltd.

5 Ashville Way
Molly Millars Lane
Wokingham
RG41 2PL Berkshire
T +44 118 9770070
F +44 118 9792969
uksales@schaffner.com
<http://www.schaffner.uk.com>

USA

Schaffner EMC Inc.

52 Mayfield Avenue
08837 Edison, New Jersey
T +1 800 367 5566
T +1 732 225 9533
F +1 732 225 4789
usasales@schaffner.com
<http://www.schaffner.com/us>

Schaffner MTC LLC

6722 Thirlane Road
24019 Roanoke, Virginia
T +1 276 228 7943
F +1 276 228 7953
<http://www.schaffner-mtc.com>

Schaffner Trencor LLC

2550 Brookpark Road
44134 Cleveland, Ohio
T +1 216 741 5282
F +1 216 741 4860
www.schaffner-trencor.com

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

© 2014 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.