

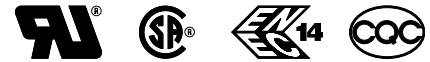
## High Performance IEC Inlet Filter with Earth Line Choke

**SCHAFFNER**  
energy efficiency and reliability



- Rated currents up to 15A
- Excellent attenuation performance
- Integrated earth line choke
- Optional medical versions (B type) according to IEC/EN 60601-1
- Snap-in versions (S and S1 type)
- Hot inlet versions (HI type)

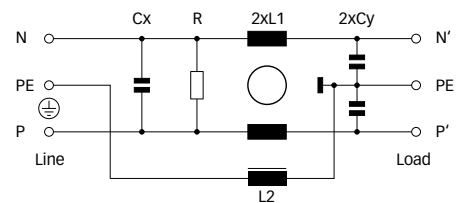
### Approvals



### Technical specifications

Maximum continuous operating voltage:	250VAC, 50/60Hz
Operating frequency:	dc to 400Hz
Rated currents:	1 to 15A @ 50°C
Approvals by rated current:	1 to 10A (ENEC, CQC) 1 to 15A (UL, CSA)
High potential test voltage:	P → PE 2000VAC for 2 sec (standard types) P → PE 2500VAC for 2 sec (B types) P → N 1000VAC for 2 sec
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 94V-2 or better
MTBF @ 40°C/230V (Mil-HB-217F):	1,710,000 hours

### Typical electrical schematic



The FN 9233E IEC inlet filter combines an IEC inlet and mains filter with excellent filter attenuation in a small form factor. The FN 9233E high performance power entry module offers additional EMI suppression on the earth line. Choosing the FN 9233E 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 without additional earth line choke please consult the FN 9233 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.
- Without earth line choke see FN 9233 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

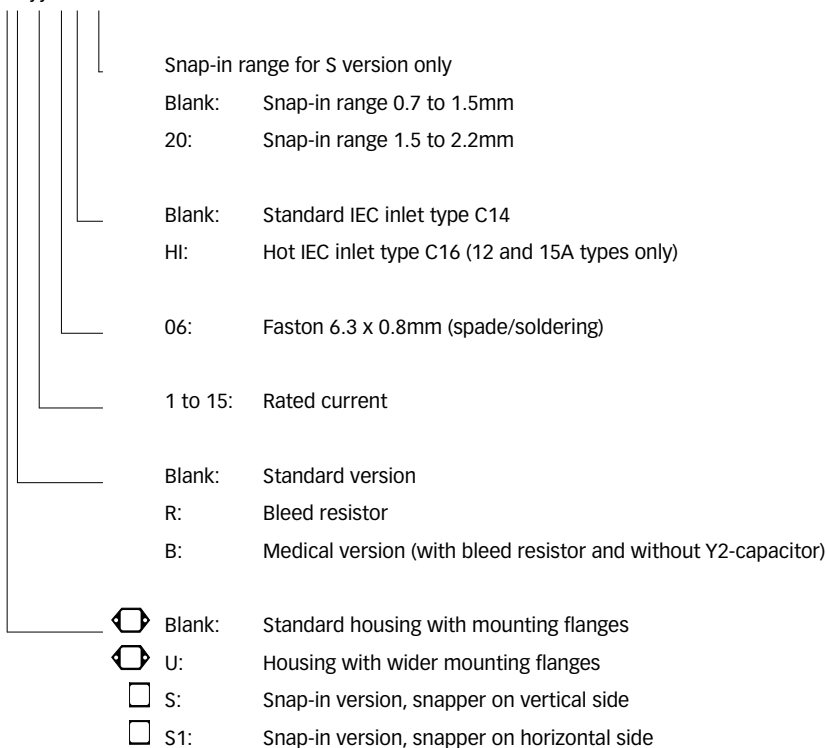
Filter selection table

Filter	Rated current @ 50°C (25°C)	Leakage current* @ 250VAC/50Hz	Inductance		Capacitance		Resistance R	Output connections	Weight
			L1	L2	Cx	Cy			
	[A]	[µA]	[mH]	[mH]	[µF]	[nF]	[kΩ]		[g]
FN 9233Ex-1-06	1 (1.2)	373	22.5	0.4	0.1	2.2		-06	46
FN 9233Ex-3-06	3 (3.5)	373	4.6	0.4	0.1	2.2		-06	46
FN 9233Ex-6-06	6 (7.2)	373	1.6	0.4	0.1	2.2		-06	46
FN 9233Ex-8-06	8 (10.6)	373	0.9	0.4	0.1	2.2		-06	46
FN 9233Ex-10-06	10 (11.6)	373	0.45	0.4	0.1	2.2		-06	46
FN 9233Ex-12-06	12 (12)	373	0.27	0.1	0.1	2.2		-06	46
FN 9233Ex-15-06	15 (15)	373	0.2	0.1	0.1	2.2		-06	46
FN 9233Ex-12-06HI	12 (12)	373	0.27	0.1	0.1	2.2		-06	46
FN 9233Ex-15-06HI	15 (15)	373	0.2	0.1	0.1	2.2		-06	46
FN 9233ExR-1-06	1 (1.2)	373	22.5	0.4	0.1	2.2	1000	-06	46
FN 9233ExR-3-06	3 (3.5)	373	4.6	0.4	0.1	2.2	1000	-06	46
FN 9233ExR-6-06	6 (7.2)	373	1.6	0.4	0.1	2.2	1000	-06	46
FN 9233ExR-8-06	8 (10.6)	373	0.9	0.4	0.1	2.2	1000	-06	46
FN 9233ExR-10-06	10 (11.6)	373	0.45	0.4	0.1	2.2	1000	-06	46
FN 9233ExR-12-06	12 (12)	373	0.27	0.1	0.1	2.2	1000	-06	46
FN 9233ExR-15-06	15 (15)	373	0.2	0.1	0.1	2.2	1000	-06	46
FN 9233ExR-12-06HI	12 (12)	373	0.27	0.1	0.1	2.2	1000	-06	46
FN 9233ExR-15-06HI	15 (15)	373	0.2	0.1	0.1	2.2	1000	-06	46
FN 9233ExB-1-06	1 (1.2)	2	22.5	0.4	0.1		1000	-06	46
FN 9233ExB-3-06	3 (3.5)	2	4.6	0.4	0.1		1000	-06	46
FN 9233ExB-6-06	6 (7.2)	2	1.6	0.4	0.1		1000	-06	46
FN 9233ExB-8-06	8 (10.6)	2	0.9	0.4	0.1		1000	-06	46
FN 9233ExB-10-06	10 (11.6)	2	0.45	0.4	0.1		1000	-06	46
FN 9233ExB-12-06	12 (12)	2	0.27	0.1	0.1		1000	-06	46
FN 9233ExB-15-06	15 (15)	2	0.2	0.1	0.1		1000	-06	46
FN 9233ExB-12-06HI	12 (12)	2	0.27	0.1	0.1		1000	-06	46
FN 9233ExB-15-06HI	15 (15)	2	0.2	0.1	0.1		1000	-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 9233Exx-yy-...HI-zz

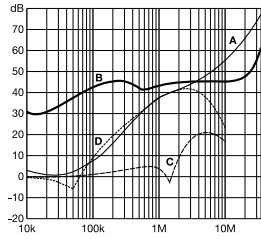


For example: FN 9233E-15-06, FN 9233ES1B-10-06-20, FN 9233ER-12-06HI, FN 9233EUB-8-06-20

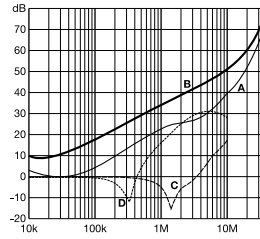
**Typical filter attenuation**

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

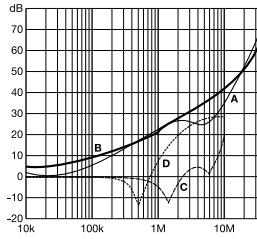
1 and 3A types



6 to 10A types

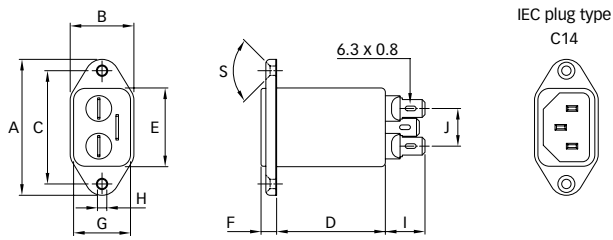


12 and 15A types

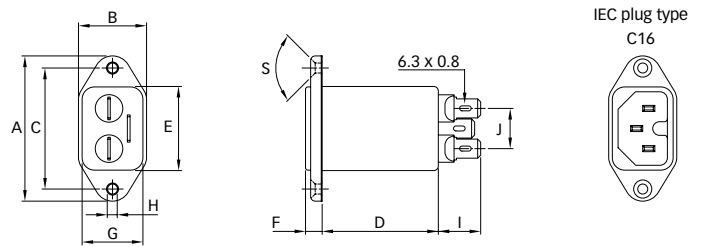


**Mechanical data**

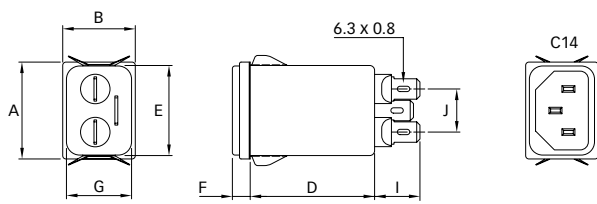
FN 9233E



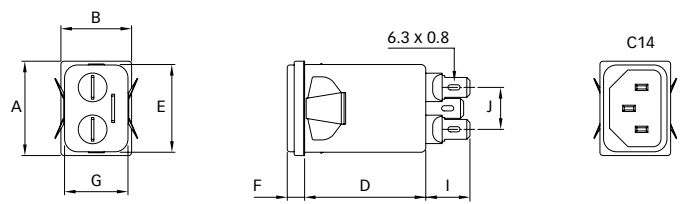
FN 9233E-HI



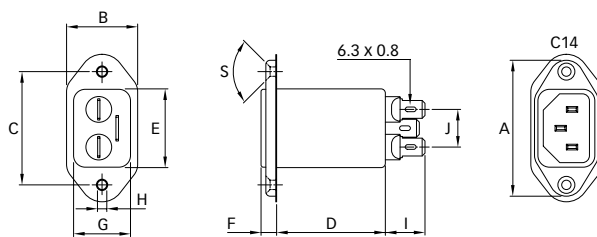
FN 9233ES



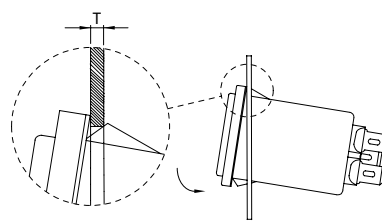
FN 9233ES1



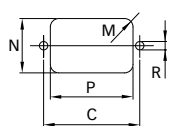
FN 9233EU



Installation



Panel cut out



**Dimensions**

	FN 9233E	FN 9233EU	FN 9233ES	FN 9233ES1	FN 9233E-HI
<b>A</b>	48	51.85	29.9	29.9	48
<b>B</b>	22.5	25	22.4	22.4	22.5
<b>C</b>	40 ±0.2	40 ±0.2			40 ±0.2
<b>D</b>	46.8	46.8	46.8	46.8	46.8
<b>E</b>	27.8	27.8	27.8	27.8	27.8
<b>F</b>	5.5	5.5	5.5	5.5	5.5
<b>G</b>	20.1	20.1	20.1	20.1	20.1
<b>H</b>	Ø3.3	Ø3.3			Ø3.3
<b>I</b>	14	14.1	14	14	14
<b>J</b>	13.3	13.3	13.3	13.3	13.3
<b>M</b>	R ≤ 3	R ≤ 3	R ≤ 1.5	R ≤ 1.5	R ≤ 3
<b>N</b>	21.5	21.5	20.8	21.9	21.5
<b>P</b>	28.5	28.5	29.4	28.5	28.5
<b>R</b>	M3	M3			M3
<b>S</b>	90°	90°			90°
<b>T*</b>			0.7 - 1.5	0.7 - 1.5	
<b>T*</b>			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 = 25.4mm

Tolerances according: ISO 2768-m / EN 22768-m

**Headquarters and  
global innovation and  
development center**

**Schaffner Group**  
Nordstrasse 11  
4542 Luterbach  
Switzerland  
T +41 32 681 66 26  
F +41 32 681 66 30  
info@schaffner.ch  
[www.schaffner.com](http://www.schaffner.com)

**Sales and application centers**

**China**  
**Schaffner EMC Ltd. Shanghai**  
Building 11, Lane 1365  
East Kangqiao Road  
Shanghai 201319  
T +86 21 6813 9855  
F +86 21 6813 9811  
cschina@schaffner.com  
[www.schaffner.com](http://www.schaffner.com)

**Germany**  
**Schaffner Deutschland GmbH**  
Schoemperlenstrasse 12B  
76185 Karlsruhe  
T +49 721 56910  
F +49 721 569110  
germanysales@schaffner.com

**Finland**  
**Schaffner Oy**  
Tynninkuja 7  
08700 Lohja  
T +358 19 35 72 71  
F +358 19 32 66 10  
finlandsales@schaffner.com

**France**  
**Schaffner EMC S.A.S.**  
112, Quai de Bezons  
95103 Argenteuil  
T +33 1 34 34 30 60  
F +33 1 39 47 02 28  
francesales@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.**  
Mitsui-Seimei Sangenjaya Bldg. 7F  
1-32-12, Kamiyama, Setagaya-ku  
Tokyo 154-0011  
T +81 3 5712 3650  
F +81 3 5712 3651  
japansales@schaffner.com  
[www.schaffner.jp](http://www.schaffner.jp)

**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 32 681 66 26  
F +41 32 681 66 41  
sales@schaffner.ch

**Singapore**  
**Schaffner EMC Pte Ltd.**  
Blk 3015A Ubi Road 1  
05-09 Kampong Ubi Industrial  
Estate  
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

**Taiwan**  
**Schaffner EMV Ltd.**  
6th Floor, No 413  
Rui Guang Road  
Neihu District  
Taipei City 114  
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  
Lamphun 51000  
T +66 53 58 11 04  
F +66 53 58 10 19  
thailsales@schaffner.com

**UK**  
**Schaffner Ltd.**  
5 Ashville Way  
Molly Millars Lane  
Wokingham  
Berkshire RG41 2PL  
T +44 118 9770070  
F +44 118 9792969  
uksales@schaffner.com  
[www.schaffner.uk.com](http://www.schaffner.uk.com)

**USA**  
**Schaffner EMC Inc.**  
52 Mayfield Avenue  
Edison, New Jersey 08837  
T +1 732 225 9533  
F +1 732 225 4789  
usasales@schaffner.com  
[www.schaffner.com/us](http://www.schaffner.com/us)

To find your local partner within  
Schaffner's global network, please go to

[www.schaffner.com](http://www.schaffner.com)

May 2011

© 2011 Schaffner EMC.  
Specifications subject to change without  
notice. All trademarks recognized.

Schaffner is an ISO-registered company.  
Its products are designed and manufac-  
tured under the strict quality and environ-  
mental requirements of the ISO 9001 and  
ISO 14001 standards.

This document has been carefully  
checked. However, Schaffner does not  
assume any liability for errors or inac-  
curacies.