

High Performance EMC/EMI Filter with Earth Line Choke



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



Approvals



RoHS

(CQC except HI-types)

Performance indicators

Attenuation performance



Rated current [A]



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.

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)	1,710,000 hours

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* @ 250 VAC/50 Hz	Inductance		Capacitance		Resistance R	Output connections 	Weight [g]
			L1 [mH]	L2 [mH]	Cx [μF]	Cy [nF]			
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

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)

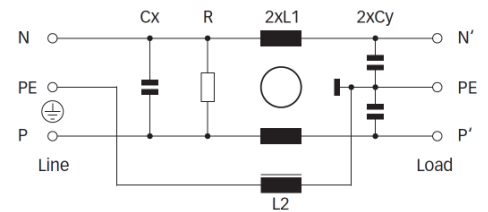
 Blank: Standard housing with mounting flanges

 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

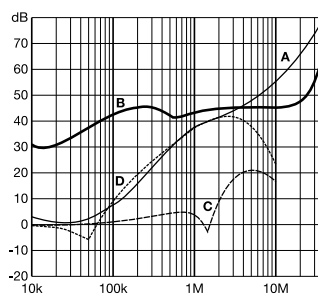


For example: FN 9233E-15-06, FN 9233ES1B-10-06-20, FN 9233ER-12-06HI, FN 9233EUB-8-06-20

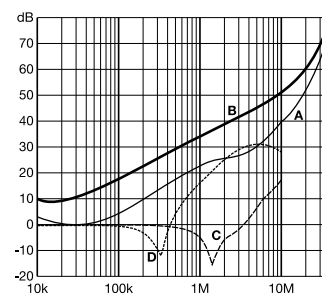
Typical filter attenuation

Per CISPR 17; A = 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

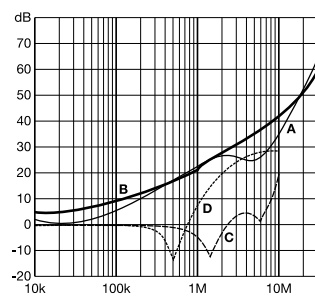
1 and 3 A types



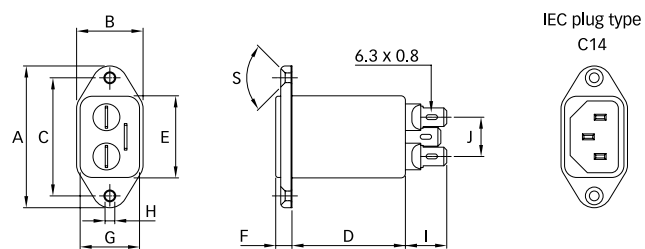
6 to 10 A types



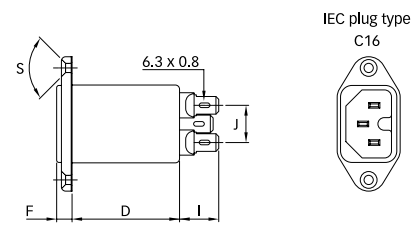
12 and 15 A types



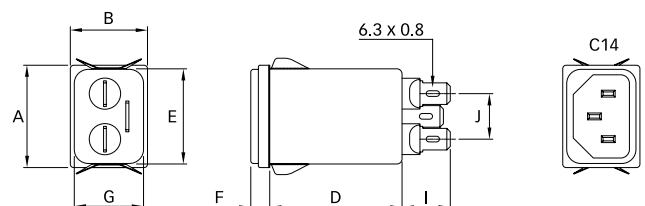
FN 9233E



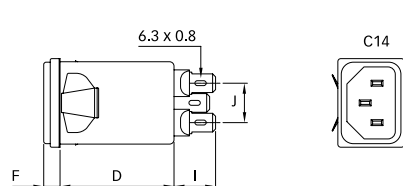
FN 9233E-HI



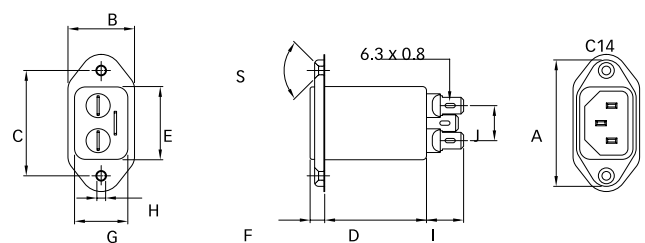
FN 9233ES



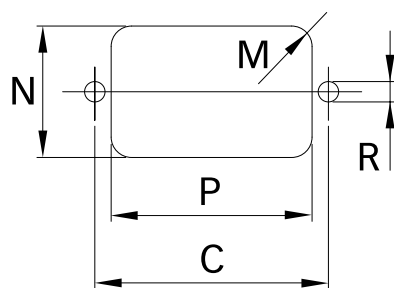
FN 9233ES1



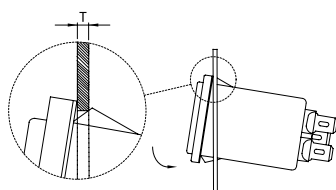
FN 9233EU



Panel cut out



Installation



	FN 9233E	FN 9233EU	FN 9233ES	FN 9233ES1	FN 9233E-HI
A	48	51.85	29.9	29.9	48
B	22.5	25	22.4	22.4	22.5
C	40 ±0.2	40 ±0.2			40 ±0.2
D	46.8	46.8	46.8	46.8	46.8
E	27.8	27.8	27.8	27.8	27.8
F	5.5	5.5	5.5	5.5	5.5
G	20.1	20.1	20.1	20.1	20.1
H	Ø 3.3	Ø 3.3			Ø 3.3
I	14	14.1	14	14	14
J	13.3	13.3	13.3	13.3	13.3
M	R ≤ 3	R ≤ 3	R ≤ 1.5	R ≤ 1.5	R ≤ 3
N	21.5	21.5	20.8	21.9	21.5
P	28.5	28.5	29.4	28.5	28.5
R	M3	M3			M3
S	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.



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