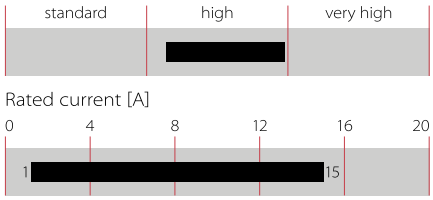
schaffner
shaping electrical power

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)

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 –> PE 2500 VAC for 2 sec (B types) P –> N 1000 VAC for 2 sec
Protection category	IP 40 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/230 V (Mil-HB-217F)	1,710,000 hours

Approvals

(CQC except HI-types)

The FN 9233 E IEC inlet filter combines an IEC inlet and mains filter with excellent filter attenuation in a small form factor. The FN 9233 E high performance power entry module offers additional EMI suppression on the earth line. Choosing the FN 9233 E 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.

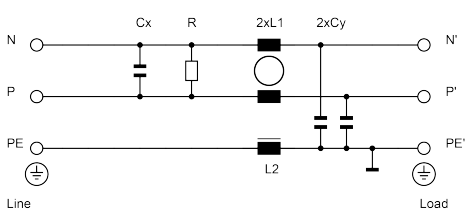
Features and benefits

- 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

Typical electrical schematic



Filter selection table

Filter	Rated current @ 50°C(25 °C)	Leakage current* @ 250 VAC/50 Hz (@ 120 VAC/60 Hz)	Inductance		Capacitance		Resistance	Output connections	Weight
			L1	L2	Cx	Cy	R		
	[A]	[mA]	[mH]	[mH]	[µF]	[nF]	[kΩ]		[g]
FN 9233 Ex-1-06	1 (1.2)	0.31 (0.18)	22.5	0.4	0.1	2.2		-06	46
FN 9233 Ex-3-06	3 (3.5)	0.31 (0.18)	4.6	0.4	0.1	2.2		-06	46
FN 9233 Ex-6-06	6 (7.2)	0.31 (0.18)	1.6	0.4	0.1	2.2		-06	46
FN 9233 Ex-8-06	8 (10.6)	0.31 (0.18)	0.9	0.4	0.1	2.2		-06	46
FN 9233 Ex-10-06	10 (11.6)	0.31 (0.18)	0.45	0.4	0.1	2.2		-06	46
FN 9233 Ex-12-06	12 (12)	0.31 (0.18)	0.27	0.1	0.1	2.2		-06	46
FN 9233 Ex-15-06	15 (15)	0.31 (0.18)	0.2	0.1	0.1	2.2		-06	46
FN 9233 Ex-12-06HI	12 (12)	0.31 (0.18)	0.27	0.1	0.1	2.2		-06	46
FN 9233 Ex-15-06HI	15 (15)	0.31 (0.18)	0.2	0.1	0.1	2.2		-06	46
FN 9233 ExR-1-06	1 (1.2)	0.31 (0.18)	22.5	0.4	0.1	2.2	1000	-06	46
FN 9233 ExR-3-06	3 (3.5)	0.31 (0.18)	4.6	0.4	0.1	2.2	1000	-06	46
FN 9233 ExR-6-06	6 (7.2)	0.31 (0.18)	1.6	0.4	0.1	2.2	1000	-06	46
FN 9233 ExR-8-06	8 (10.6)	0.31 (0.18)	0.9	0.4	0.1	2.2	1000	-06	46
FN 9233 ExR-10-06	10 (11.6)	0.31 (0.18)	0.45	0.4	0.1	2.2	1000	-06	46
FN 9233 ExR-12-06	12 (12)	0.31 (0.18)	0.27	0.1	0.1	2.2	1000	-06	46
FN 9233 ExR-15-06	15 (15)	0.31 (0.18)	0.2	0.1	0.1	2.2	1000	-06	46
FN 9233 ExR-12-06HI	12 (12)	0.31 (0.18)	0.27	0.1	0.1	2.2	1000	-06	46
FN 9233 ExR-15-06HI	15 (15)	0.31 (0.18)	0.2	0.1	0.1	2.2	1000	-06	46
FN 9233 ExB-1-06	1 (1.2)	0.00	22.5	0.4	0.1		1000	-06	46
FN 9233 ExB-3-06	3 (3.5)	0.00	4.6	0.4	0.1		1000	-06	46
FN 9233 ExB-6-06	6 (7.2)	0.00	1.6	0.4	0.1		1000	-06	46
FN 9233 ExB-8-06	8 (10.6)	0.00	0.9	0.4	0.1		1000	-06	46
FN 9233 ExB-10-06	10 (11.6)	0.00	0.45	0.4	0.1		1000	-06	46
FN 9233 ExB-12-06	12 (12)	0.00	0.27	0.1	0.1		1000	-06	46
FN 9233 ExB-15-06	15 (15)	0.00	0.2	0.1	0.1		1000	-06	46
FN 9233 ExB-12-06HI	12 (12)	0.00	0.27	0.1	0.1		1000	-06	46
FN 9233 ExB-15-06HI	15 (15)	0.00	0.2	0.1	0.1		1000	-06	46

* Maximum leakage under normal operating conditions (acc. to IEC60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

Product selector

FN 9233Exx-yy-..HI-zz

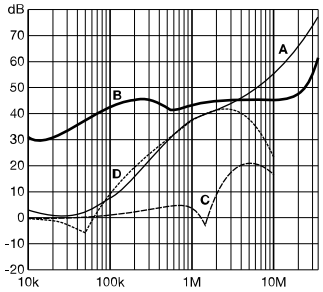
		Snap-in range for S version only
	Blank:	Snap-in range 0.7 to 1.5mm
	20:	Snap-in range 1.5 to 2.2mm
	Blank:	Standard IEC inlet type C14
	HI:	Hot IEC inlet type C16 (12 and 15A types only)
	06:	Faston 6.3 x 0.8mm (spade/soldering)
	1 to 15:	Rated current
	Blank:	Standard version
	R:	Bleed resistor
	B:	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

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

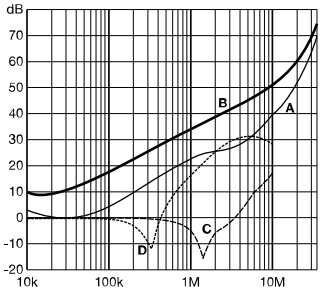
Typical filter attenuation

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

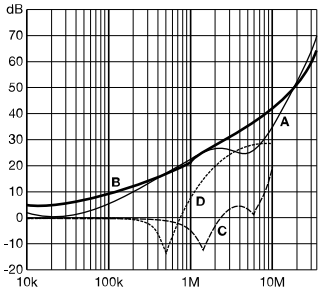
1 and 3 A types



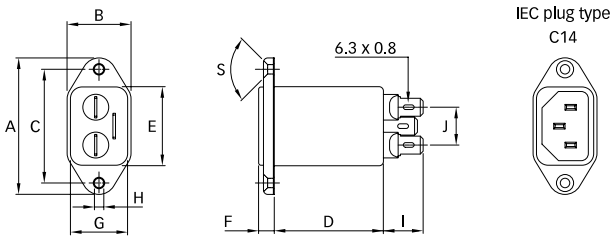
6 to 10 A types



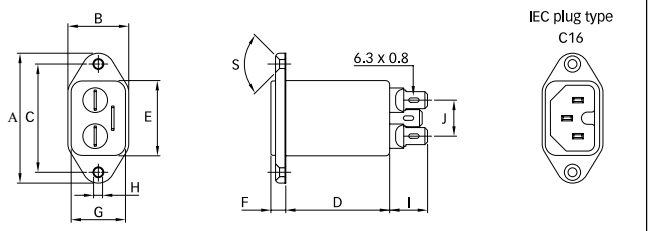
12 and 15 A types



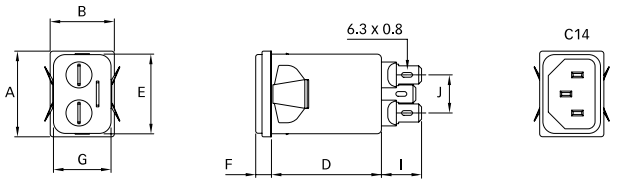
FN 9233 E



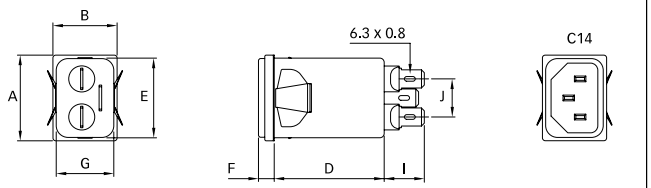
FN 9233 E-HI



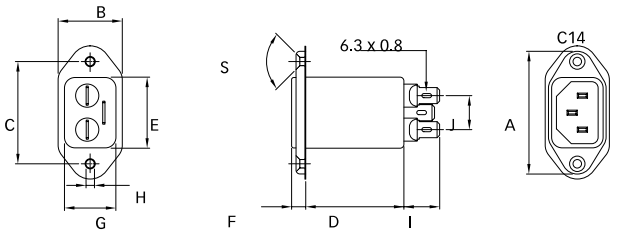
FN 9233 ES



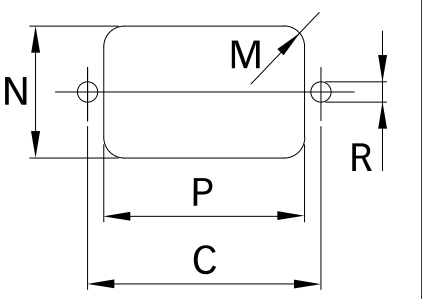
FN 9233 ES1



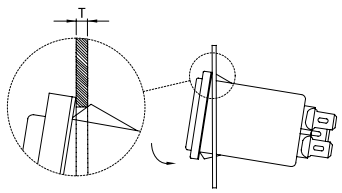
FN 9233 EU



Panel cut out



Installation



Dimensions

	FN 9233 E	FN 9233 EU	FN 9233 ES	FN 9233 ES1	FN 9233 E-HI	Tol.
A	48	48	29.9	29.9	48	
B	22.4	25	22.4	22.4	22.4	
C	40	40			40	0.2
D	46.8	46.7	46.8	46.8	46.8	
E	27.8	27.7	27.8	27.8	27.8	+0.6/-0
F	5.7	5.7	5.7	5.7	5.7	
G	20.1	20.1	20.1	20.1	20.1	+0.6/-0
H	Ø3.3	Ø3.3			Ø3.3	
I	14	14	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		

* Recommended torque for M3 (90° countersunk flat head) is 0.5 Nm

** 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.

Accessories for IEC Inlet Filters and Power Entry Modules

The accessories displayed are a selection of available accessories for IEC Inlet filters and IEC Power entry modules. As they are displayed in a general way there might be variants of the filters where the accessories are not available.
For further information please ask your local Schaffner Sales Partner and visit our homepage https://www.schaffner.com/.

Power Cord with Locking System for Inlet Filters IL 13, IL 13 P, IL 19

Link to Datasheet: Datasheet IEC C13/ C19 locking cable

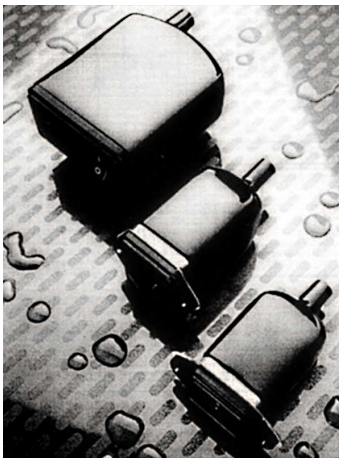
The locking system has a tensile force of typical 200N.
It is recommended to use it with flange mount filters.
Lock Power Cords with IEC Inlets and Filters"
Schaffner power cords with IEC lock guard against
accidental disconnection of all electrical appliances
with an IEC inlet. No exchange or modification of the
IEC inlet or IEC inlet filter system is needed. Easy
retrofit for all electronic equipments and devices.

IEC C13 Rewireable Connector for individual Power Cord with Locking System

Link to Datasheet: Datasheet IEC C13 rewireable

The locking system has a tensile force of typical 300N. It is recommended to use it with flange mount filters. For details refer to our Application Note "Using IEC Lock Power Cords with IEC Inlets and Filters" Schaffner power connector with IEC lock guard against accidental disconnection of all electrical appliances with an IEC inlet. No exchange or modification of the IEC inlet or IEC inlet filter system is needed. Easy retrofit for all electronic equipments and devices.

IB - Insulating Boots



There is a full range of insulating boots available from Schaffner that provide a physical cover for the exposed terminals on the back of IEC Inlet Filters.
These boots fit the simplest non-fused and unswitched style up to the fully fused and switched IEC filtered inlet. The boots are made from a durable black PVC material that conforms to UL94-V0 flammability requirements. The boots slip easily over the back of the filter and reduce the risk of electrical shock to maintenance personnel whilst protecting the filter from environmental hazard such as the ingress of dust and moisture.

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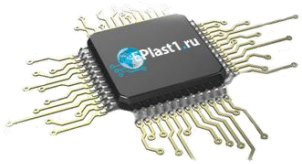
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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