

Ultra Compact and Versatile Filtered Power Entry Module



- Dual stage filter
- Ultra compact design
- Rated currents up to 10 A
- Dual fuse holder
- 2-pole rocker switch
- Good attenuation performance
- Faston or spring cage terminals



Performance indicators

Attenuation performance



Rated current [A]



Approvals



(CQC except HI-types; Patent US20110227692 / US8766761)

Choosing FN 9280/90 product line brings you the rapid availability of a standard filter associated with the necessary safety acceptances and a high attenuation performance. For higher attenuation performance the FN 9290 family with a dual stage filter and identical panel cut-out can be used.

Standard IEC connector filters are a practical solution to pass EMI system approval in a short time. A wide selection of amperage ratings, mounting possibilities and also filters for medical applications are designed to offer you the best solution.

Features and benefits

- Good conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- Deep-drawn iron-sheet housing for best possible shielding against magnetic fields
- Rear/front flange mounting or snap-in versions
- Dual fuse holder
- 2-pole rocker switch
- Faston or spring cage terminals for more flexible assembly
- Medical version (B Type) according IEC / EN60601-1
- Spare fuse holder

Typical applications

- Portable electrical and electronic equipment
- Consumer goods
- EDP and office equipment
- Single-phase power supplies, switch-mode power supplies
- Test and measurement equipment
- Medical electrical devices (MD) and *In-Vitro*-Diagnostics (IVD) equipment

Technical specifications

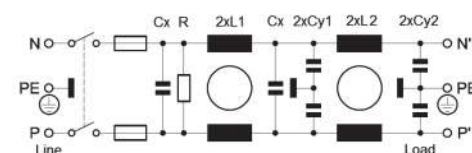
Design corresponding to	UL 1283, CSA 22.2 No. 8 1986, EN60939, EN60950, EN60601-1, UL544, EN60320
Electrical specifications	Inrush current 82 A 6,000 on-off operations according to UL 1054 10,000 on-off operations according to ENEC
Flammability corresponding to	UL 94 V-2 or better
Fuse holder	2fuses (Ø5 x 20 mm) max. 250 V
High potential test voltage	P → PE 2000 VAC for 2 sec (standard types) P → N 760 VAC for 2 sec P → PE 2500 VAC for 2 sec (B types)
Leakage current	Standard: <500uA at 250 VAC/50 Hz Medical: <5uA at 250 VAC/50 Hz
Maximum continuous operating voltage	250 VAC, 50/60 Hz
Mechanical life	50,000 cycles
MTBF @ 40°C/230V (Mil-HB-217F)	> 1,000,000 hours
Operating frequency	50 to 400 Hz
Protection category	IP40 according to IEC 60529 (front side)
Rated currents	1 to 10 A* @ 40°C max.
Rocker switch	2-pole, dark not illuminated, Marking I - 0
Spring cage wire range	0.2 – 1.5 mm ² / 24 – 16 AWG single or flexible wire
Switch ratings	
USA (UL) and Canada (C-UL)	10 A, 125 VAC; 10A, 250 VAC; 1/3HP
Europe (ENEC)	10 A (4 A), 250 VAC**
Temperature range (operation and storage)	– 25 °C to +85 °C (25/85/21)
Terminals	IP20 spring cage safe against finger touch

* 10 A version is 8 A UL and CSA approved

** Value in () relates to the inductive current charge: cos γ = 0.65

Typical electrical schematic

FN 9290 Standard types (B types without Cy)



Filter selection table

Filter*	Rated current	Leakage current**	Inductance		Capacitance			Resistance	Output connections		Weight
	@ 40 °C	@ 250 V ~/50 Hz	L1	L2	Cx	Cy1	Cy2	R			
	[A]	[uA]	[mH]				[nF]	[kOhm]			[g]
FN 9290-1-..	1	311	10.9	10.9	220	1.5	0.47	1000	-06	-100	147
FN 9290-2-..	2	311	4.4	4.4	220	1.5	0.47	1000	-06	-100	148
FN 9290-4-..	4	311	1.7	1.7	220	1.5	0.47	1000	-06	-100	148
FN 9290-6-..	6	311	0.78	0.78	220	1.5	0.47	1000	-06	-100	153
FN 9290-10-..	10	311	0.32	0.32	220	1.5	0.47	1000	-06	-100	154
FN 9290B-1-..	1	2	10.9	10.9	220	0	0	1000	-06	-100	147
FN 9290B-2-..	2	2	4.4	4.4	220	0	0	1000	-06	-100	148
FN 9290B-4-..	4	2	1.7	1.7	220	0	0	1000	-06	-100	148
FN 9290B-6-..	6	2	0.78	0.78	220	0	0	1000	-06	-100	153
FN 9290B-10-..	10	2	0.32	0.32	220	0	0	1000	-06	-100	154
FN 9299-1-..	1	311	10.9	10.9	220	1.5	0.47	1000	-06	-100	147
FN 9299-2-..	2	311	4.4	4.4	220	1.5	0.47	1000	-06	-100	148
FN 9299-4-..	4	311	1.7	1.7	220	1.5	0.47	1000	-06	-100	148
FN 9299-6-..	6	311	0.78	0.78	220	1.5	0.47	1000	-06	-100	153
FN 9299-10-..	10	311	0.32	0.32	220	1.5	0.47	1000	-06	-100	154
FN 9299B-1-..	1	2	10.9	10.9	220	0	0	1000	-06	-100	147
FN 9299B-2-..	2	2	4.4	4.4	220	0	0	1000	-06	-100	148
FN 9299B-4-..	4	2	1.7	1.7	220	0	0	1000	-06	-100	148
FN 9299B-6-..	6	2	0.78	0.78	220	0	0	1000	-06	-100	153
FN 9299B-10-..	10	2	0.32	0.32	220	0	0	1000	-06	-100	154

* To compile a complete part number, please replace the .. with the required output connection style (e.g. FN 9289-1-06, FN 9282-4-100)

** Maximum leakage current under normal conditions according to IEC 60939-1 Ed. 3 at 250 V AC.

Product selector:

FN 92www-xx-yy-zz

Blank: Snap in range 1.0 to 2.5 mm
Optional: 30: Snap in range >2.5 to 3.5 mm

06: Fast-On 6.3 x 0.8 mm (spade/soldering)
100: Spring cage

1 to 10: Rated current [A]

Blank: Standard version
B: Medical version (without Y2-capacitor)
Optional: E: Earth line choke
EB: Medical version (without YZ-capacitor) with earth line choke

0: Flange version vertical/horizontal/front/rear mounting set
9: Snap-in version, snapper on horizontal side (top / bottom)
Optional: 1: Rear Flange mounting (top / bottom)
2: Front Flange mounting (top / bottom)
3: Rear Flange mounting (left / right)
4: Front Flange mounting (left / right)
8: Snap-in version, snapper on vertical side (left / right)

8: Single stage filter
9: Dual stage filter

All FN 9280/FN 9290 are equipped with a dual fuse holder with a spare fuse holder.

Note: All FN 9280/FN 9280B/FN 9289/FN 9289B/FN 9290/FN 9290B/FN 9299/FN 9299B are stock types from our distribution partners.

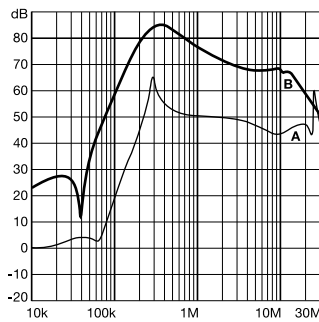
Order Examples:

FN 9280B-6-100: Medical version of single stage, dual fuse EMC/EMI filter, flange set for vertical/horizontal/front/rear mounting, 6 A, spring cage terminals, from stock available.

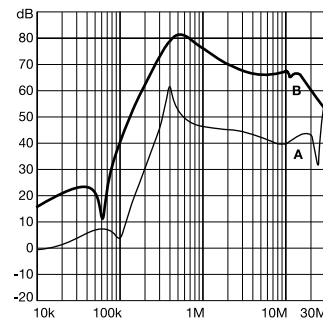
FN 9298-6-06-30: Dual stage, dual fuse EMC/EMI filter, snap-in version, snappers for snap-in panel thickness range >2.5 to 3.5 mm, snapper on vertical side, 6 A, fast-on terminals, non-stock order type

FN 9290 Series | Typical filter attenuation | Per CISPR 17; A = 50 Ω /50 Ω sym; B = 50 Ω /50 Ω asym

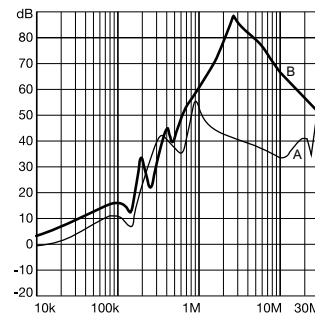
1 A types



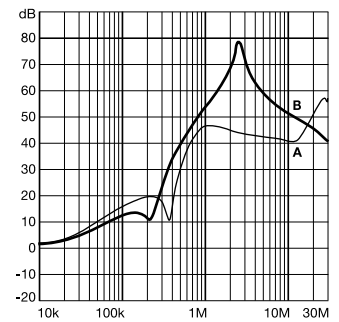
2 A types



4 – 6 A types

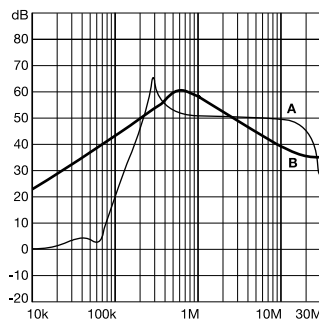


10 A types

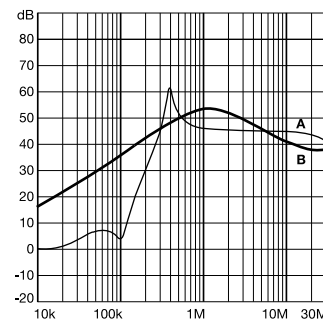


FN 9290B Series | Typical filter attenuation | Per CISPR 17; A = 50 Ω /50 Ω sym; B = 50 Ω /50 Ω asym

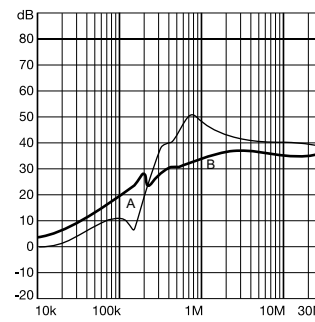
1 A types



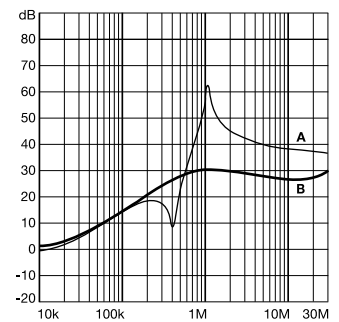
2 A types



4 – 6 A types

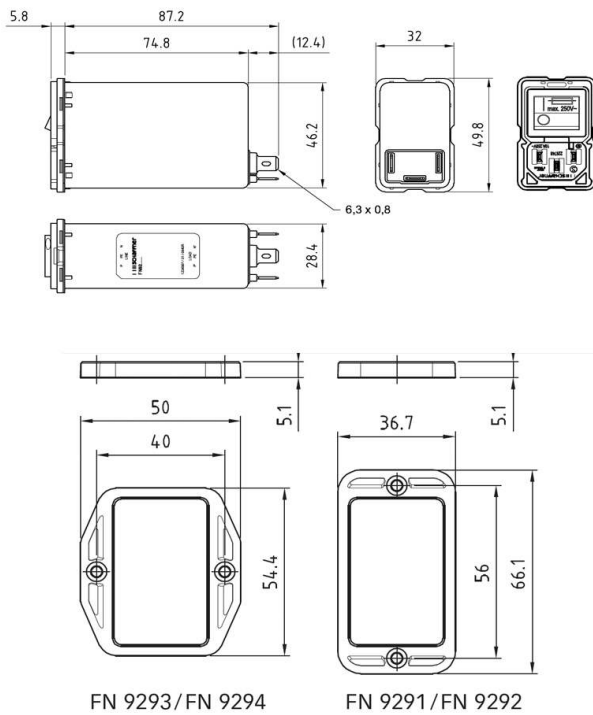


10 A types

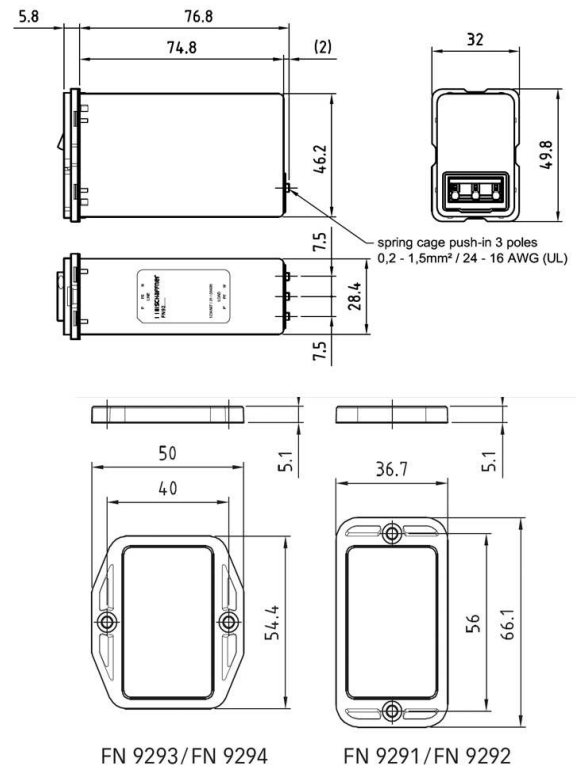


Mechanical Data:

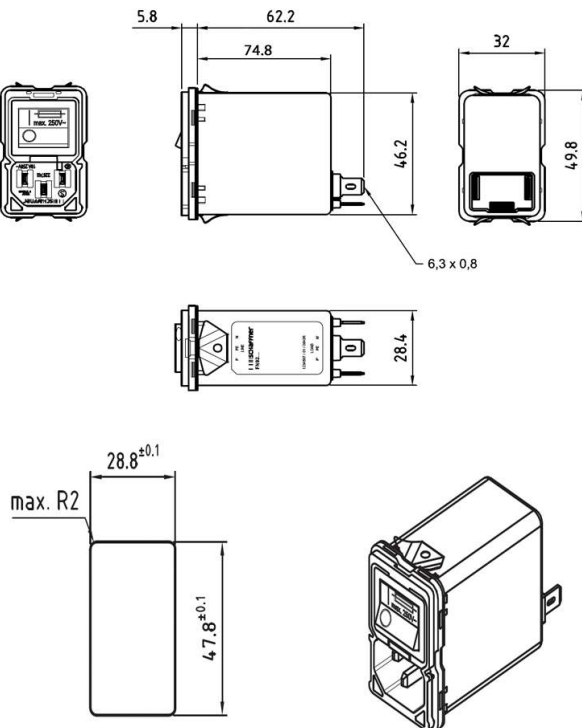
FN 9290-x-06 / FN 9290B-x-06 / FN 9280E-x-06 / FN 9280EB-x-06



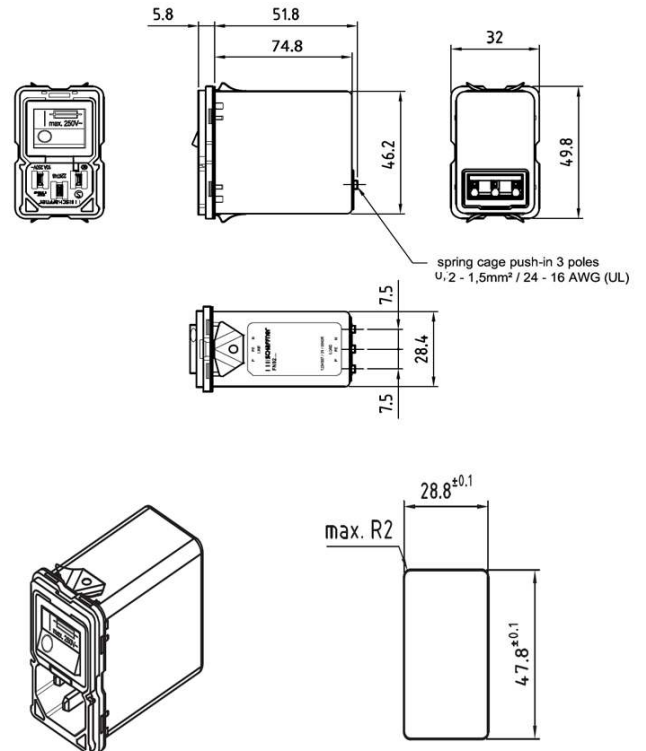
FN 9290-x-100/FN 9290B-x-100/FN 9280E-x-100/FN 9280EB-x-100



FN 9299-x-06 / FN 9299B-x-06 / FN 9289E-x-06 / FN 9889EB-x-06



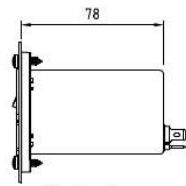
FN 9299-x-100/FN 9299B-x-100/FN 9289E-x-100/FN 9289EB-x-100



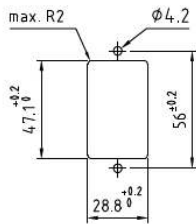
Assembly Instructions

REAR MOUNTING

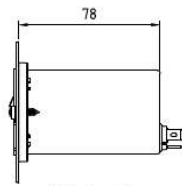
vertical:



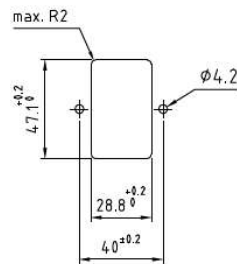
Cutout:



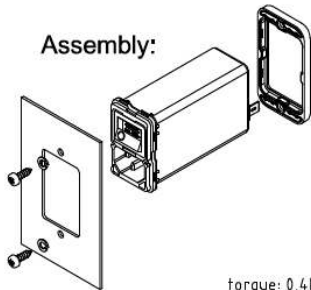
horizontal:



Cutout:



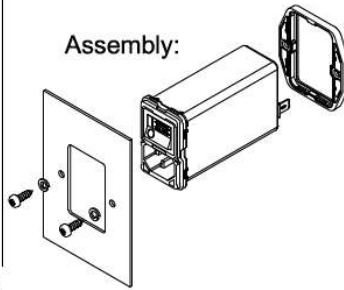
Assembly:



torque: 0,4 Nm

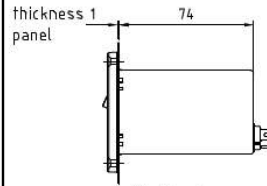
Recommended screw:
Panhead tapping screw d x l 3,9 x 9,5 mm

Assembly:

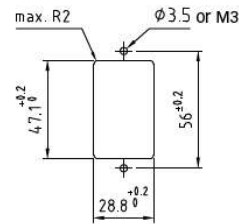


FRONT MOUNTING

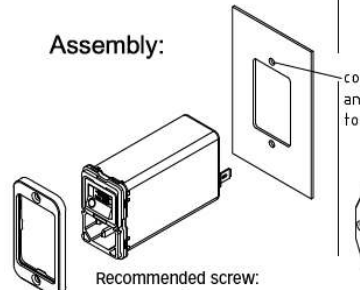
vertical:



Cutout:

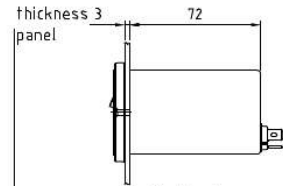


Assembly:

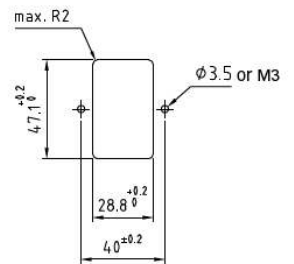


Recommended screw:
Countersunk screw M3X14 DIN963A

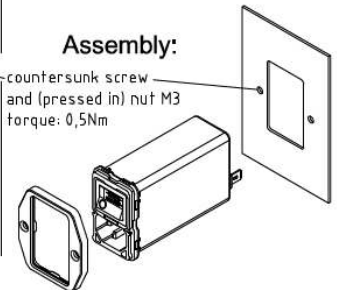
horizontal:



Cutout:



Assembly:



countersunk screw
and (pressed in) nut M3
torque: 0,5 Nm

Terminal -100

clamping range, solid wire / flex wire

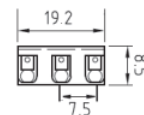
0,20 mm² – 1,5 mm², AWG24 – AWG16

operating force of slider

max. 40 N

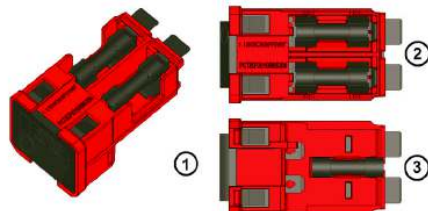
recommended stripped length

8 mm



Push the knob above the
terminal to insert the wire.

Removal of the combined switch / fuse holder unit



Fuses are not in the scope of delivery.

An additional fuse mark on the switch indicates the fuses holders behind the switch. The red frame shows the outline of the removable unit.

With a simple tool like a Swiss Army knife or a screwdriver No 1 or smaller the unit (1) can be removed from the filter. On the topside (2) behind the switch there are two fuse holders for each live connection. On the bottom side (3) is a clip to carry an additional spare fuse.



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