

Ultra Compact and Versatile Filtered Power Entry Module

SCHAFNER
energy efficiency and reliability



Fuse holder
included

- Single stage filter FN 9280
- Dual stage filter FN 9290
- Ultra compact design
- Rated currents up to 10A
- Dual fuse holder
- 2-pole rocker switch
- Good attenuation performance
- Faston or spring cage terminals

Technical specifications

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

* 10A version is 8A UL approved

** Value in () relates to the inductive current charge: $\cos \varphi = 0.65$

The FN 9280 power entry module combines an IEC inlet, a mains filter and a dual fuse holder with a 2-pole rocker switch in an ultra compact housing.

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

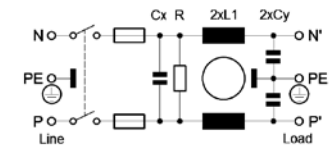
- Good conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- Deep-drawn iron-sheet housing for best possible shielding against magnetic fields
- Rear/front flange mounting or snap-in versions
- Dual fuse holder
- 2-pole rocker switch
- Faston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

Approvals

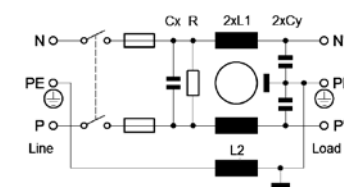


Typical electrical schematic

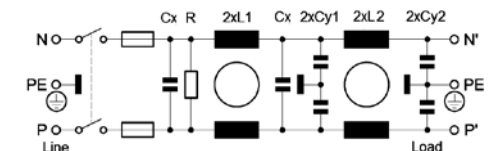
FN 9280 Standard types (B types without Cy)



FN 9280 E types (B types without Cy)



FN 9290 Standard types (B types without Cy)



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

FN 9280 Series

Filter selection table

Filter*	Rated current @ 40°C	Leakage current** @ 250V ~/50Hz	Inductance		Capacitance		Resistance	Output connections		Weight
	[A]	[uA]	L1	L2	Cx	Cy	R			[g]
				[mH]		[nF]	[kOhm]			
FN 9280-1-..	1	311	10.9	0	220	2.2	1000	-06	-100	101
FN 9280-2-..	2	311	4.4	0	220	2.2	1000	-06	-100	102
FN 9280-4-..	4	311	1.7	0	220	2.2	1000	-06	-100	105
FN 9280-6-..	6	311	0.78	0	220	2.2	1000	-06	-100	104
FN 9280-10-..	10	311	0.32	0	220	2.2	1000	-06	-100	106
FN 9280B-1-..	1	2	10.9	0	220	0	1000	-06	-100	101
FN 9280B-2-..	2	2	4.4	0	220	0	1000	-06	-100	102
FN 9280B-4-..	4	2	1.7	0	220	0	1000	-06	-100	105
FN 9280B-6-..	6	2	0.78	0	220	0	1000	-06	-100	104
FN 9280B-10-..	10	2	0.32	0	220	0	1000	-06	-100	106
FN 9289-1-..	1	311	10.9	0	220	2.2	1000	-06	-100	101
FN 9289-2-..	2	311	4.4	0	220	2.2	1000	-06	-100	102
FN 9289-4-..	4	311	1.7	0	220	2.2	1000	-06	-100	105
FN 9289-6-..	6	311	0.78	0	220	2.2	1000	-06	-100	104
FN 9289-10-..	10	311	0.32	0	220	2.2	1000	-06	-100	106
FN 9289B-1-..	1	2	10.9	0	220	0	1000	-06	-100	101
FN 9289B-2-..	2	2	4.4	0	220	0	1000	-06	-100	102
FN 9289B-4-..	4	2	1.7	0	220	0	1000	-06	-100	105
FN 9289B-6-..	6	2	0.78	0	220	0	1000	-06	-100	104
FN 9289B-10-..	10	2	0.32	0	220	0	1000	-06	-100	106
FN 9280E-1-..	1	311	10.9	0.4	220	2.2	1000	-06	-100	135
FN 9280E-2-..	2	311	4.4	0.4	220	2.2	1000	-06	-100	136
FN 9280E-4-..	4	311	1.66	0.4	220	2.2	1000	-06	-100	137
FN 9280E-6-..	6	311	0.78	0.4	220	2.2	1000	-06	-100	138
FN 9280E-10-..	10	311	0.32	0.4	220	2.2	1000	-06	-100	139
FN 9280BE-1-..	1	2	10.9	0.4	220	0	1000	-06	-100	135
FN 9280BE-2-..	2	2	4.4	0.4	220	0	1000	-06	-100	136
FN 9280BE-4-..	4	2	1.66	0.4	220	0	1000	-06	-100	137
FN 9280BE-6-..	6	2	0.78	0.4	220	0	1000	-06	-100	138
FN 9280BE-10-..	10	2	0.32	0.4	220	0	1000	-06	-100	139
FN 9289E-1-..	1	311	10.9	0.4	220	2.2	1000	-06	-100	135
FN 9289E-2-..	2	311	4.4	0.4	220	2.2	1000	-06	-100	136
FN 9289E-4-..	4	311	1.66	0.4	220	2.2	1000	-06	-100	137
FN 9289E-6-..	6	311	0.78	0.4	220	2.2	1000	-06	-100	138
FN 9289E-10-..	10	311	0.32	0.4	220	2.2	1000	-06	-100	139
FN 9289BE-1-..	1	2	10.9	0.4	220	0	1000	-06	-100	135
FN 9289BE-2-..	2	2	4.4	0.4	220	0	1000	-06	-100	136
FN 9289BE-4-..	4	2	1.66	0.4	220	0	1000	-06	-100	137
FN 9289BE-6-..	6	2	0.78	0.4	220	0	1000	-06	-100	138
FN 9289BE-10-..	10	2	0.32	0.4	220	0	1000	-06	-100	139

* 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 250V AC.

FN 9290 Series

Filter selection table

Filter*	Rated current @ 40°C	Leakage current** @ 250V ~/50Hz	Inductance		Cx	Capacitance		Resistance R	Output connections		Weight [g]
	[A]	[uA]	L1	L2		Cy1	Cy2				
				[mH]			[nF]	[kOhm]			
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 250V AC.

Product selector:

FN 92VWW-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
- BE: 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.

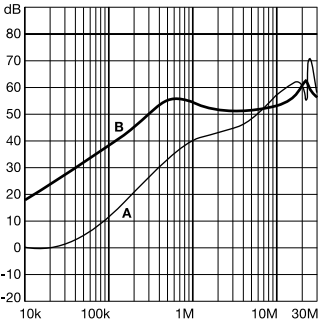
Order Examples:

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

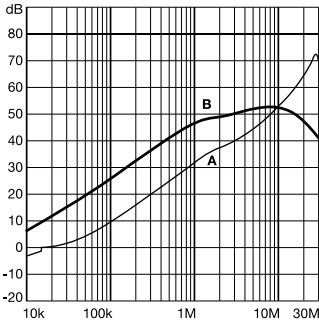
FN 9298-6-06-30: Dual stage, dual fuse EMC/EMI filter, snap-in version, snappers for snap-in panel thickness range >2.5 to 3.5 mm, snapper on vertical side, 6A, fast-on terminals, non-stock order type

FN 9280 Series | Typical filter attenuation | Per CISPR 17; A = 50Ω/50Ω sym; B = 50Ω/50Ω asym

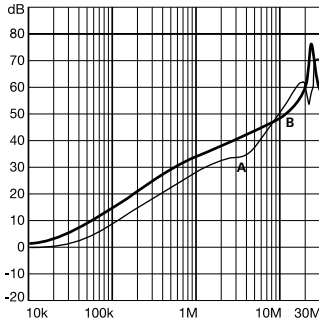
1A types



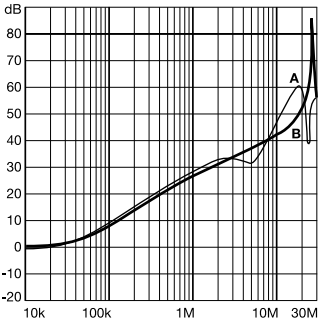
2A types



4–6A types

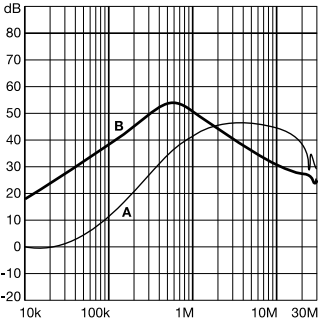


10A types

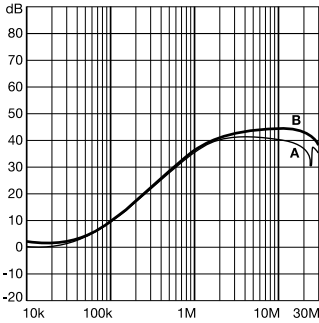


FN 9280B Series | Typical filter attenuation | Per CISPR 17; A = 50Ω/50Ω sym; B = 50Ω/50Ω asym

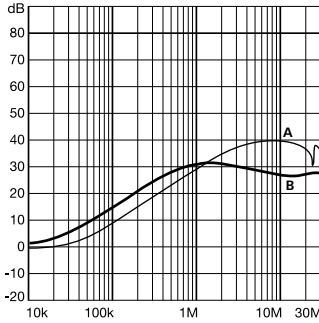
1A types



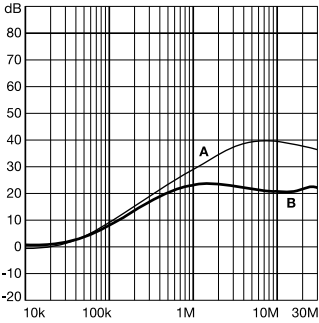
2A types



4–6A types

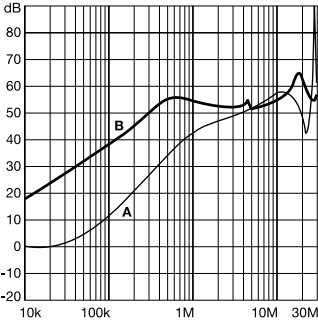


10A types

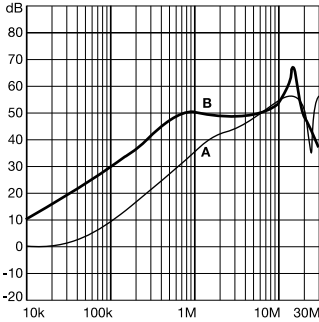


FN 9280E Series | Typical filter attenuation | Per CISPR 17; A = 50Ω/50Ω sym; B = 50Ω/50Ω asym

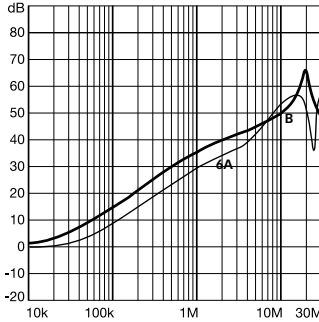
1A types



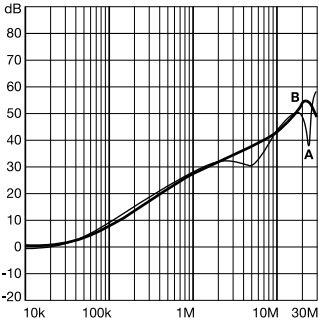
2A types



4–6A types

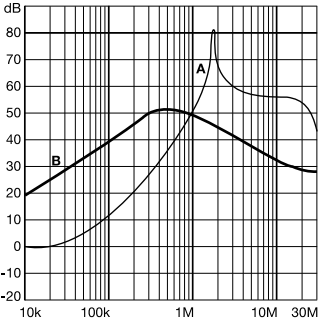


10A types

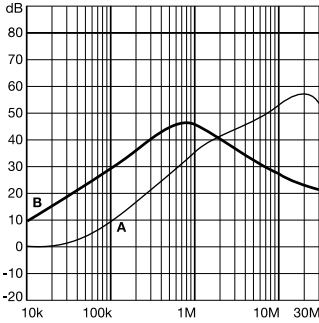


FN 9280BE Series | Typical filter attenuation | Per CISPR 17; A = 50Ω/50Ω sym; B = 50Ω/50Ω asym

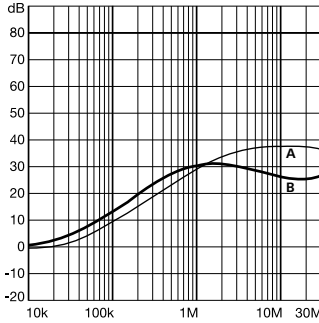
1A types



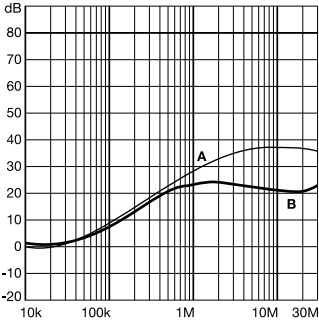
2A types



4–6A types

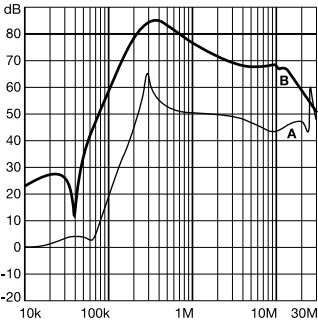


10A types

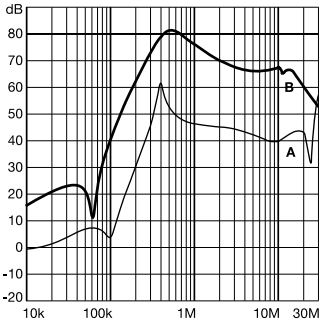


FN 9290 Series | Typical filter attenuation | Per CISPR 17; A = 50Ω/50Ω sym; B = 50Ω/50Ω asym

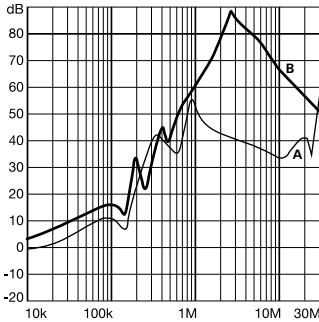
1A types



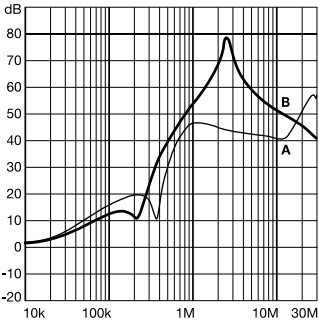
2A types



4–6A types

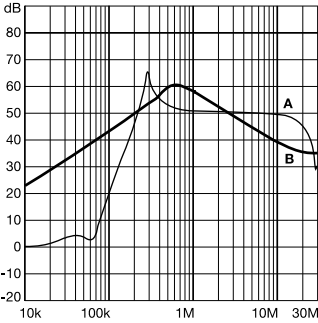


10A types

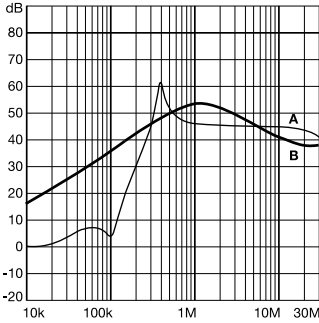


FN 9290B Series | Typical filter attenuation | Per CISPR 17; A = 50Ω/50Ω sym; B = 50Ω/50Ω asym

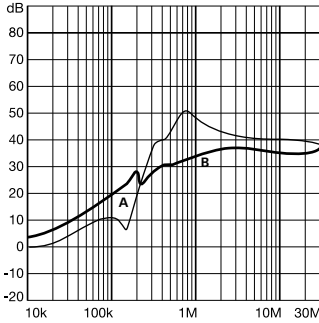
1A types



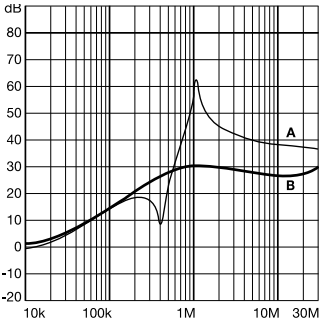
2A types



4–6A types

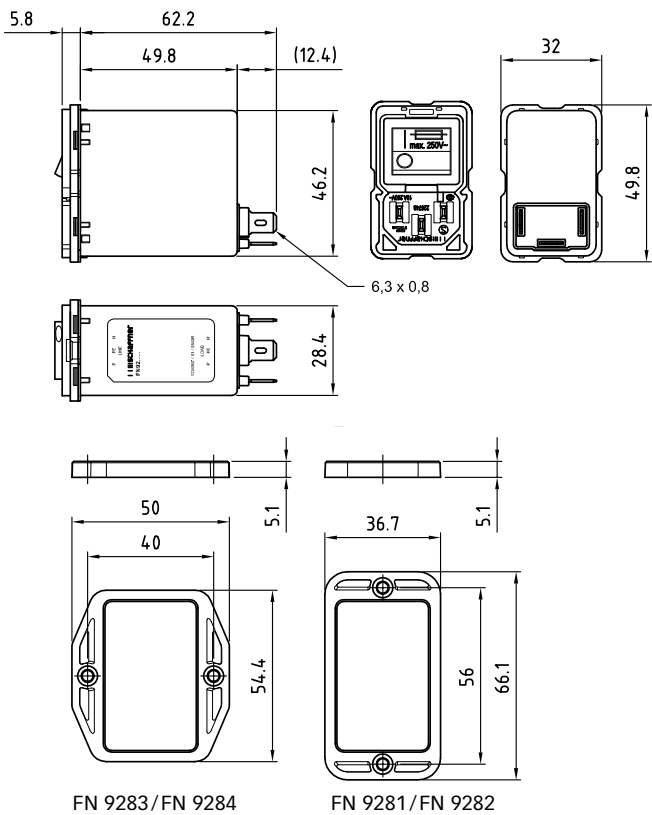


10A types



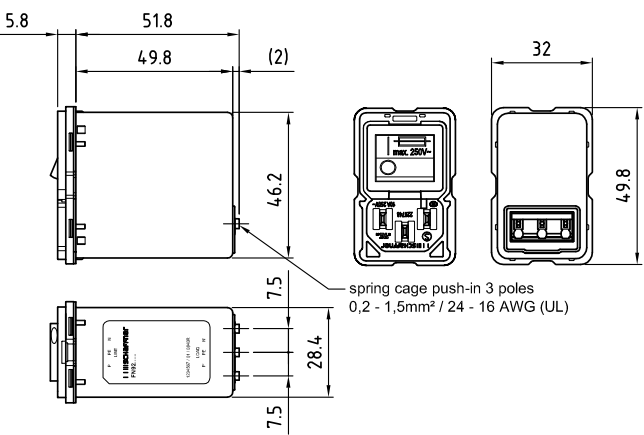
Mechanical Data:

FN 9280-x-06 / FN 9280B-x-06:

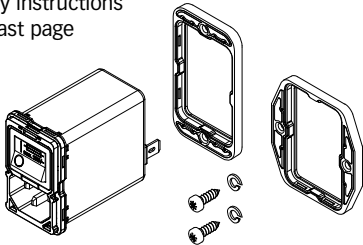


FN 9280-X-100 / FN 9280B-X-100:

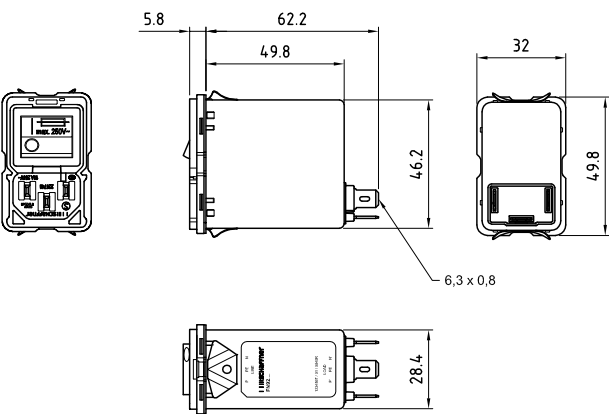
Dimensions (mm)



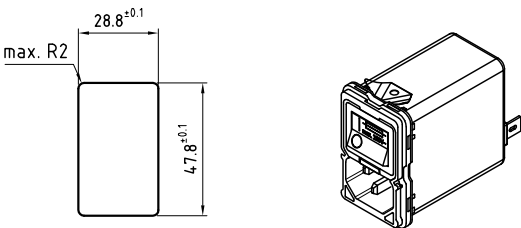
assembly instructions
see on last page



FN 9289-x-06 / FN 9289B-x-06:

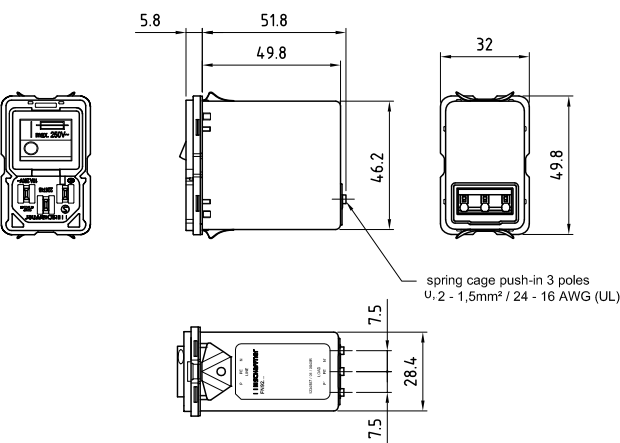


Panel cutout:

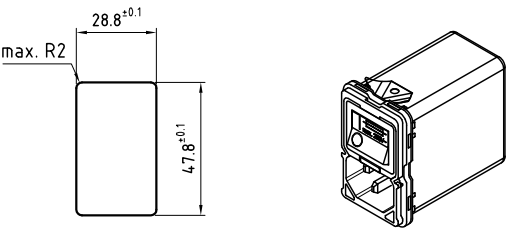


FN 9289-X-100 / FN 9289B-X-100:

Dimensions (mm)

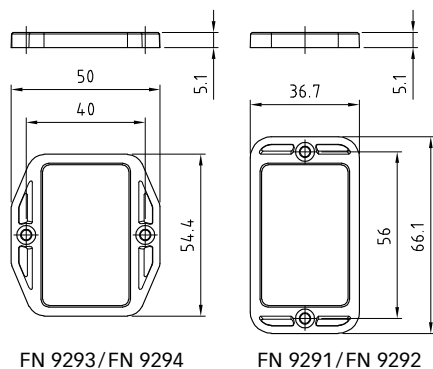
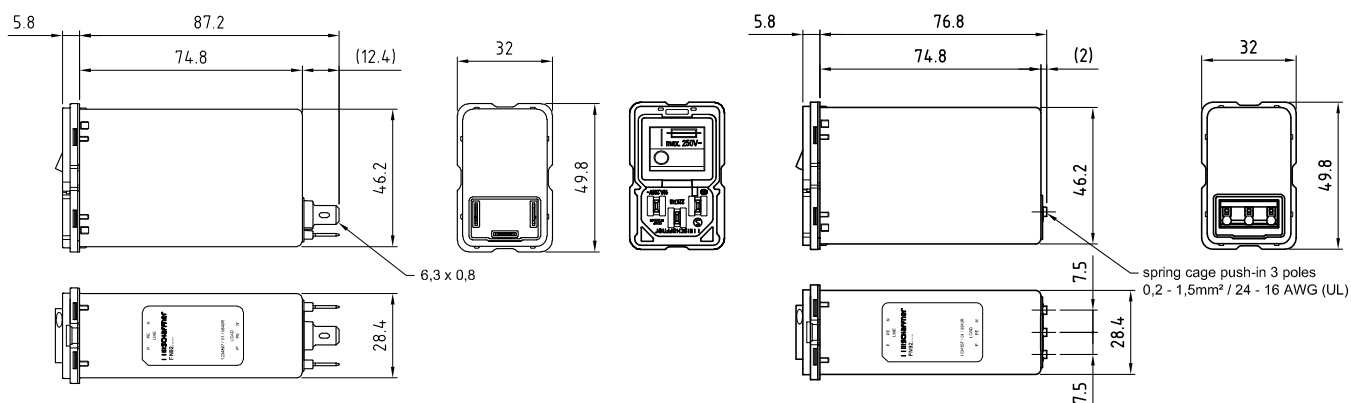
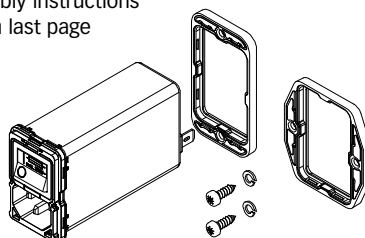


Panel cutout:



FN 9290-x-06/FN 9290B-x-06/FN 9280E-x-06/FN 9280BE-x-06:

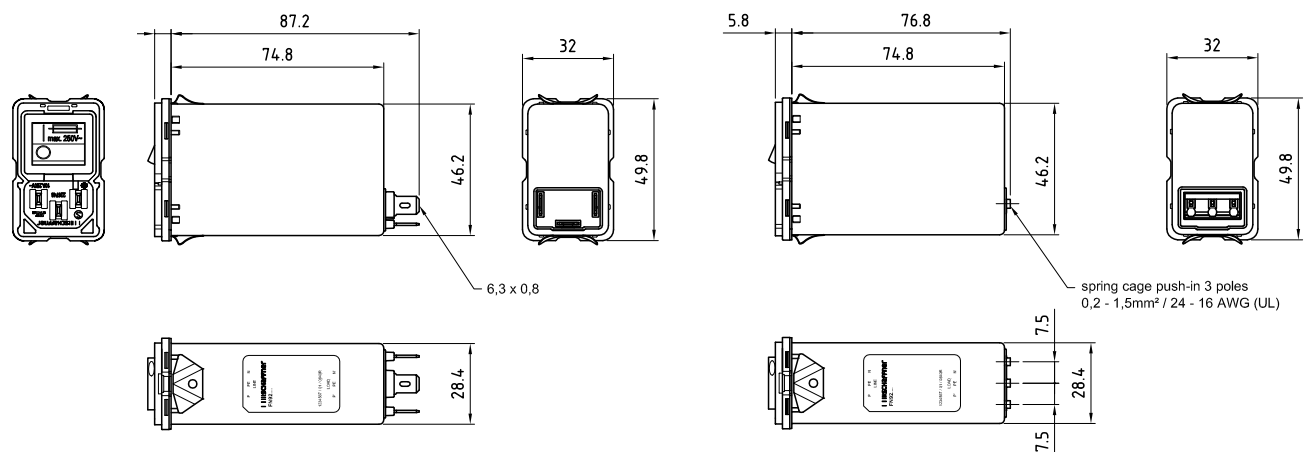
FN 9290-x-100/FN 9290B-x-100/FN 9280E-x-100/FN 9280BE-x-100:

assembly instructions
see on last page

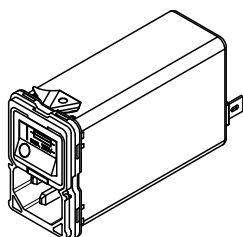
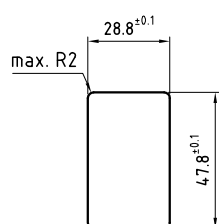
Dimensions (mm)

FN 9299-x-06/FN 9299B-x-06/FN 9289E-x-06/FN 9289BE-x-06:

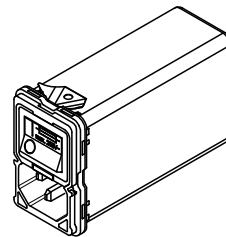
FN 9299-x-100/FN 9299B-x-100/FN 9289E-x-100/FN 9289BE-x-100:



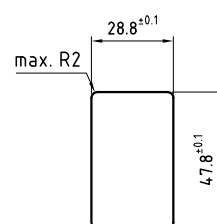
Panel cutout:



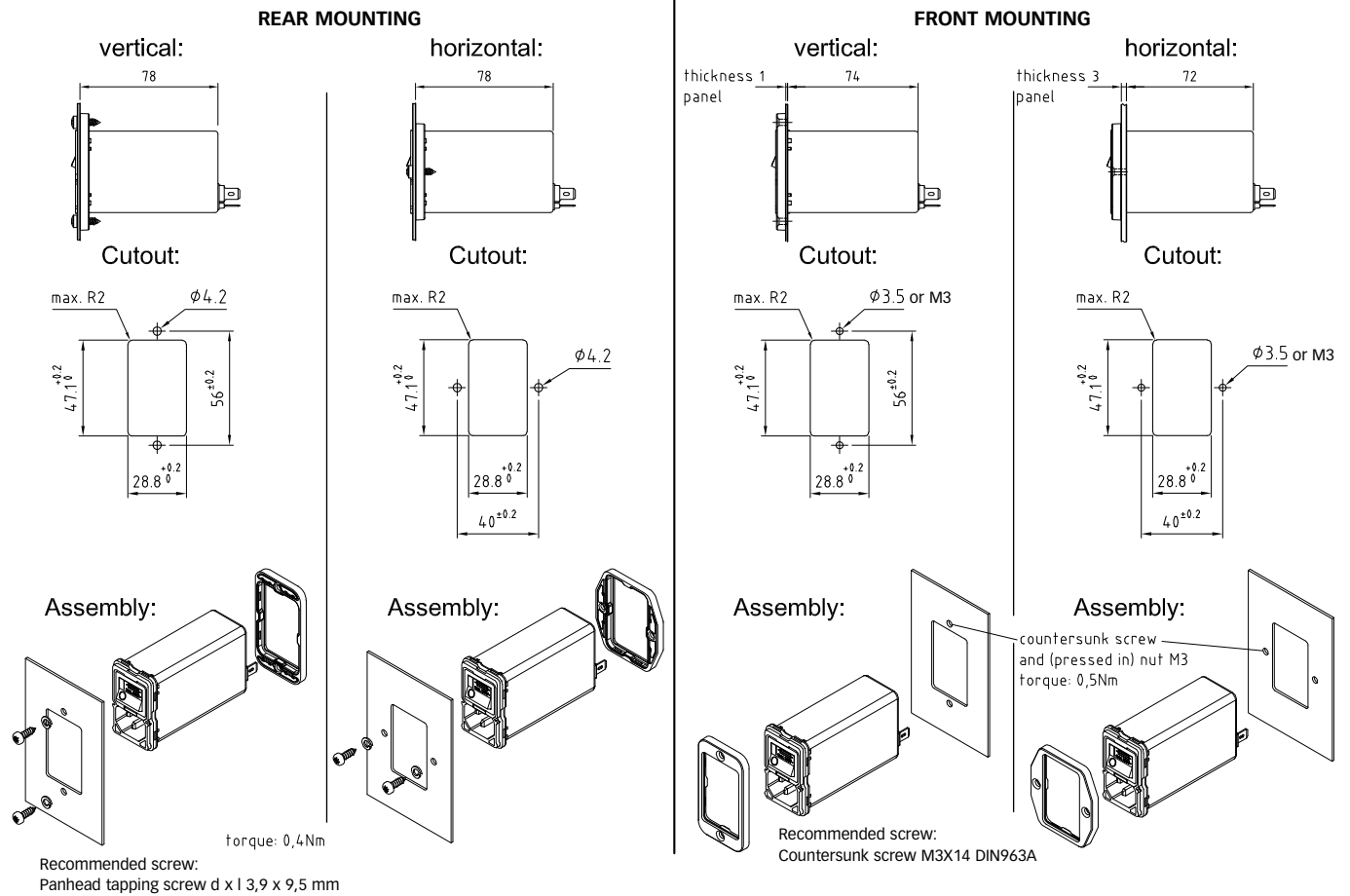
Dimensions (mm)



Panel cutout:

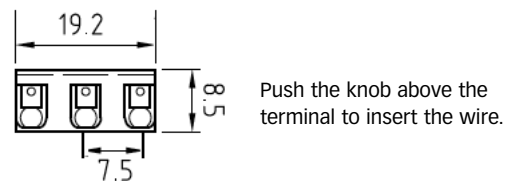


Assembly Instructions:

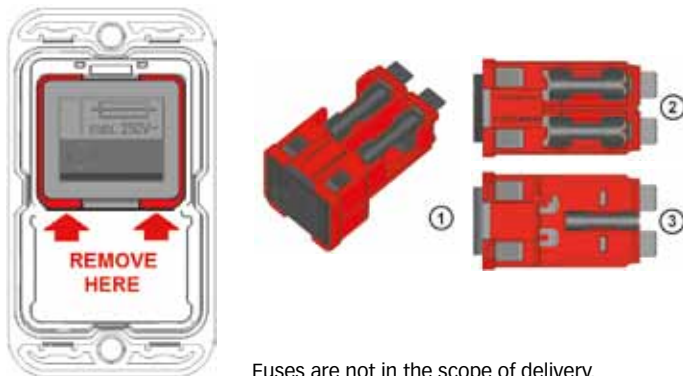


Terminal -100

clamping range, solid wire / flex wire	0,20 mm ² – 1,5 mm ² , AWG24 – AWG16
operating force of slider	max. 40N
recommended stripped length	8mm



Removal of the combined switch / fuse holder unit



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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