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# General Performance EMC/EMI Filter with Earth Line Choke



- Rated currents up to 15 A
- Excellent performance/size ratio
- Integrated earth line choke
- Complies with IEC/EN 60601-1
- Snap-in versions (S and S1 type)
- Optional wide mounting flanges



### Performance indicators

Attenuation performance



Rated current [A]



### Approvals



(CQC except HI-types)

The FN 9222 E IEC inlet filter combines an IEC inlet and mains filter with excellent filter attenuation in a small form factor and integrated earth line choke. Choosing the FN 9222 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.

## Technical specifications

|  |   |
|--|---|
| <b>Maximum continuous operating voltage</b>      | 250 VAC, 50/60 Hz   |
| <b>Operating frequency</b>                       | DC to 400 Hz<br>dc to 400 Hz  |
| <b>Rated currents</b>                            | 1 to 15 A @ 50°C max.   |
| <b>Approvals by rated current</b>                | 1 to 10 A (ENEC, CQC)<br>1 to 15 A (UL, CSA)  |
| <b>High potential test voltage</b>               | P → PE 2000 VAC for 2 sec (standard types)<br>P → PE 2500 VAC for 2 sec (B types)<br>P → N 1000 VAC for 2 sec |
| <b>Protection category</b>                       | IP 40 according to IEC 60529  |
| <b>Temperature range (operation and storage)</b> | -25°C to +85°C (25/85/21)   |
| <b>Design corresponding to</b>                   | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939  |
| <b>Flammability corresponding to</b>             | UL 94 V-2 or better   |
| <b>MTBF @ 40°C/230 V (Mil-HB-217F)</b>           | 1,610,000 hours   |

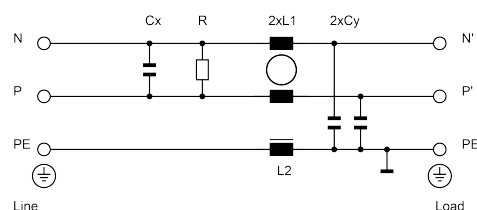
## Features and benefits

- Exceptional conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- Rear/front or snap-in mounting
- 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
- Without earth line choke see FN 9222 data sheet
- Custom-specific versions are available on request


## Typical electrical schematic

- 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<br>@ 50°C (5 °C) | Leakage current*<br>@ 250 VAC/50 Hz<br>(@ 120 VAC/60 Hz) | Inductance |      | Capacitance |      | Resistance<br>R | Output connections  | Weight |
|---------------------|--------------------------------|--|------------|------|-------------|------|-----------------|---|--------|
|                     |                                |  | L1         | L2   | Cx          | Cy   |                 |   |        |
|                     | [A]                            | [mA]   | [mH]       | [mH] | [µF]        | [nF] | [kΩ]            |  | [g]    |
| FN 9222 Ex-1-06     | 1 (1.2)                        | 0.31 (0.18)  | 12         | 0.4  | 0.1         | 2.2  |                 | -06   | 46     |
| FN 9222 Ex-3-06     | 3 (3.5)                        | 0.31 (0.18)  | 2.5        | 0.4  | 0.1         | 2.2  |                 | -06   | 46     |
| FN 9222 Ex-6-06     | 6 (7.2)                        | 0.31 (0.18)  | 0.78       | 0.4  | 0.1         | 2.2  |                 | -06   | 46     |
| FN 9222 Ex-8-06     | 8 (10.6)                       | 0.31 (0.18)  | 0.5        | 0.4  | 0.1         | 2.2  |                 | -06   | 46     |
| FN 9222 Ex-10-06    | 10 (11.6)                      | 0.31 (0.18)  | 0.225      | 0.1  | 0.1         | 2.2  |                 | -06   | 46     |
| FN 9222 Ex-12-06    | 12 (12)                        | 0.31 (0.18)  | 0.11       | 0.1  | 0.1         | 2.2  |                 | -06   | 46     |
| FN 9222 Ex-15-06    | 15 (15)                        | 0.31 (0.18)  | 0.075      | 0.1  | 0.1         | 2.2  |                 | -06   | 46     |
| FN 9222 Ex-12-06HI  | 12 (12)                        | 0.31 (0.18)  | 0.11       | 0.1  | 0.1         | 2.2  |                 | -06   | 46     |
| FN 9222 Ex-15-06HI  | 15 (15)                        | 0.31 (0.18)  | 0.075      | 0.1  | 0.1         | 2.2  |                 | -06   | 46     |
| FN 9222 ExR-1-06    | 1 (1.2)                        | 0.31 (0.18)  | 12         | 0.4  | 0.1         | 2.2  | 1000            | -06   | 46     |
| FN 9222 ExR-3-06    | 3 (3.5)                        | 0.31 (0.18)  | 2.5        | 0.4  | 0.1         | 2.2  | 1000            | -06   | 46     |
| FN 9222 ExR-6-06    | 6 (7.2)                        | 0.31 (0.18)  | 0.78       | 0.4  | 0.1         | 2.2  | 1000            | -06   | 46     |
| FN 9222 ExR-8-06    | 8 (10.6)                       | 0.31 (0.18)  | 0.5        | 0.4  | 0.1         | 2.2  | 1000            | -06   | 46     |
| FN 9222 ExR-10-06   | 10 (11.6)                      | 0.31 (0.18)  | 0.225      | 0.1  | 0.1         | 2.2  | 1000            | -06   | 46     |
| FN 9222 ExR-12-06   | 12 (12)                        | 0.31 (0.18)  | 0.11       | 0.1  | 0.1         | 2.2  | 1000            | -06   | 46     |
| FN 9222 ExR-15-06   | 15 (15)                        | 0.31 (0.18)  | 0.075      | 0.1  | 0.1         | 2.2  | 1000            | -06   | 46     |
| FN 9222 ExR-12-06HI | 12 (12)                        | 0.31 (0.18)  | 0.11       | 0.1  | 0.1         | 2.2  | 1000            | -06   | 46     |
| FN 9222 ExR-15-06HI | 15 (15)                        | 0.31 (0.18)  | 0.075      | 0.1  | 0.1         | 2.2  | 1000            | -06   | 46     |
| FN 9222 ExB-1-06    | 1 (1.2)                        | 0.00   | 12         | 0.4  | 0.1         |      | 1000            | -06   | 46     |
| FN 9222 ExB-3-06    | 3 (3.5)                        | 0.00   | 2.5        | 0.4  | 0.1         |      | 1000            | -06   | 46     |
| FN 9222 ExB-6-06    | 6 (7.2)                        | 0.00   | 0.78       | 0.4  | 0.1         |      | 1000            | -06   | 46     |
| FN 9222 ExB-8-06    | 8 (10.6)                       | 0.00   | 0.5        | 0.4  | 0.1         |      | 1000            | -06   | 46     |
| FN 9222 ExB-10-06   | 10 (11.6)                      | 0.00   | 0.225      | 0.1  | 0.1         |      | 1000            | -06   | 46     |
| FN 9222 ExB-12-06   | 12 (12)                        | 0.00   | 0.11       | 0.1  | 0.1         |      | 1000            | -06   | 46     |
| FN 9222 ExB-15-06   | 15 (15)                        | 0.00   | 0.075      | 0.1  | 0.1         |      | 1000            | -06   | 46     |
| FN 9222 ExB-12-06HI | 12 (12)                        | 0.00   | 0.11       | 0.1  | 0.1         |      | 1000            | -06   | 46     |
| FN 9222 ExB-15-06HI | 15 (15)                        | 0.00   | 0.075      | 0.1  | 0.1         |      | 1000            | -06   | 46     |

\* Leakage current 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 9222Exx-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)

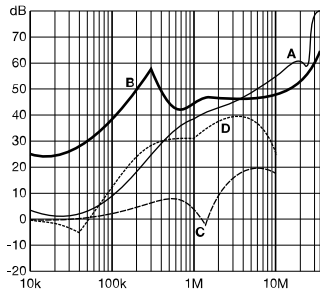
 Blank: Standard housing with mounting flanges U: Housing with wider mounting flanges S: Snap-in version, snapper on vertical side S1: Snap-in version, snapper on horizontal side

For example: FN 9222 E-15-06, FN 9222 ES1B-10-06-20, FN 9222 EUB-8-06-20

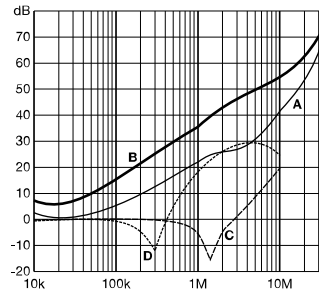
### Typical filter attenuation

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

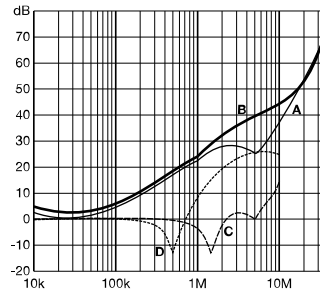
1 and 3 A types



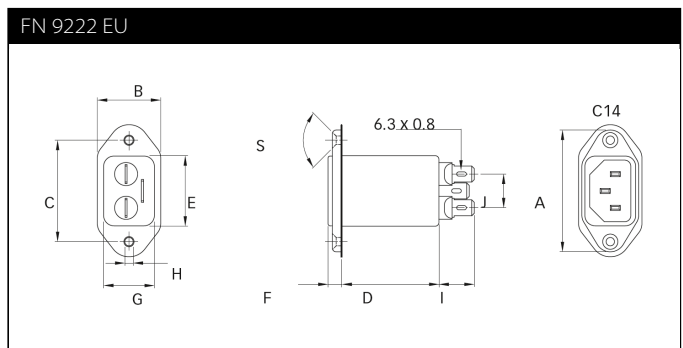
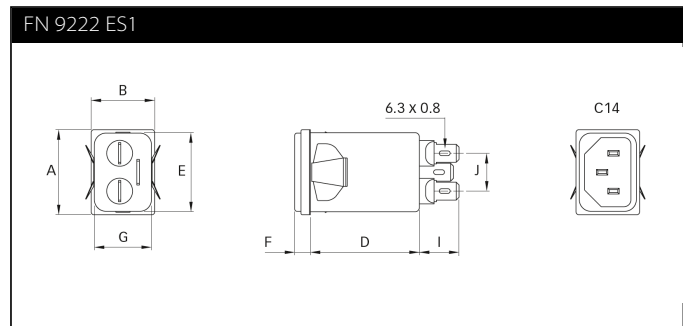
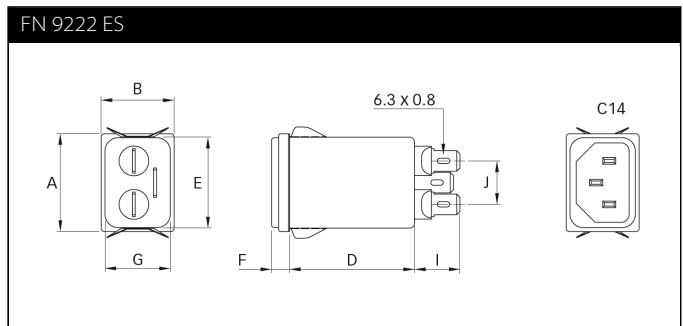
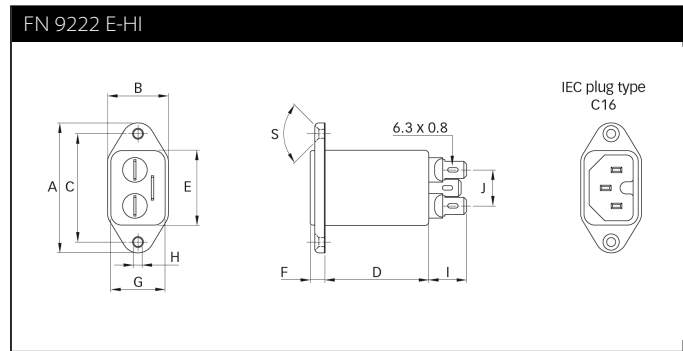
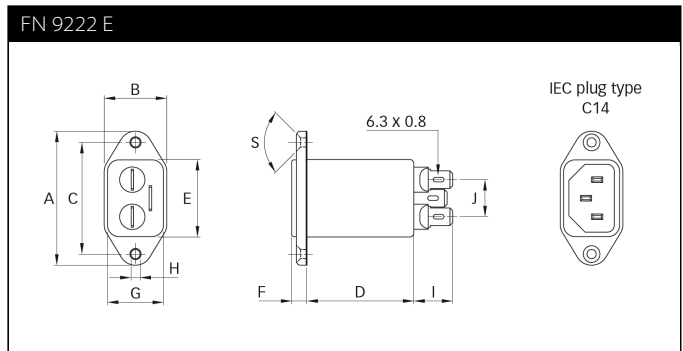
6 to 10 A types



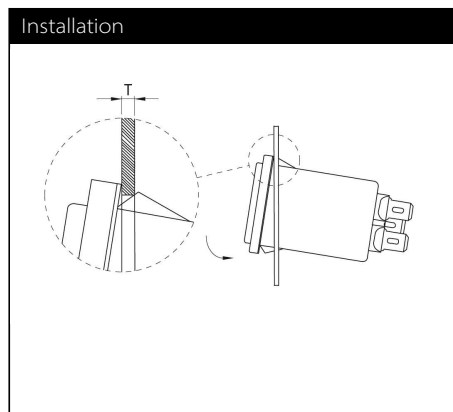
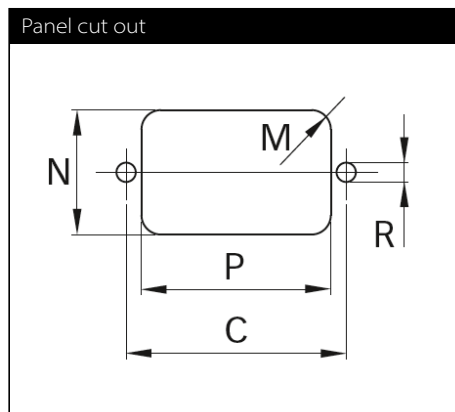
12 and 15 A types



### Mechanical data







## Dimensions

|           | FN 9222 E | FN 9222 EU | FN 9222 ES | FN 9222 ES1 | FN 9222 E-HI |
|-----------|-----------|------------|------------|-------------|--------------|
| <b>A</b>  | 48        | 48         | 29.9       | 29.9        | 48           |
| <b>B</b>  | 22.4      | 25         | 22.4       | 22.4        | 22.4         |
| <b>C</b>  | 40 ±0.2   | 40 ±0.2    |            |             | 40 ±0.2      |
| <b>D</b>  | 46.8      | 46.7       | 46.8       | 46.8        | 46.8         |
| <b>E</b>  | 27.8      | 27.9       | 27.9       | 27.9        | 27.8         |
| <b>F</b>  | 5.7       | 5.7        | 5.7        | 5.7         | 5.7          |
| <b>G</b>  | 20.5      | 20.5       | 20.5       | 20.5        | 20.5         |
| <b>H</b>  | Ø3.3      | Ø3.3       |            |             | Ø3.3         |
| <b>I</b>  | 14        | 14         | 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 = 25.4 mm  
Tolerances according: ISO 2768-m/EN 22768-m

Please visit [www.schaffner.com](http://www.schaffner.com) to find more details on filter connectors.



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