

## 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 9222E 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 9222E 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.

### 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

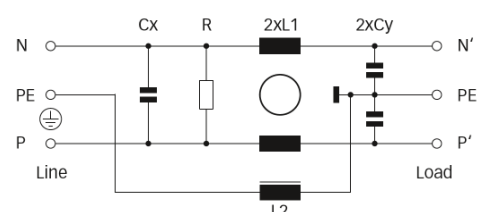
### Technical specifications

|                                                  |                                                                                                               |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Maximum continuous operating voltage</b>      | 250 VAC, 50/60 Hz                                                                                             |
| <b>Operating frequency</b>                       | dc to 400Hz                                                                                                   |
| <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>                       | IP40 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/230V (Mil-HB-217F)</b>            | 1,610,000 hours                                                                                               |

### 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 (25 °C) | Leakage current*<br>@ 250 VAC/50 Hz | Inductance |      | Capacitance |      | Resistance<br>R | Output connections<br> | Weight<br>[g] |
|---------------------------|----------------------------------|-------------------------------------|------------|------|-------------|------|-----------------|-----------------------------------------------------------------------------------------------------------|---------------|
|                           |                                  |                                     | L1         | L2   | Cx          | Cy   |                 |                                                                                                           |               |
|                           | [A]                              | [µA]                                | [mH]       | [mH] | [µF]        | [nF] | [kΩ]            |                                                                                                           |               |
| <b>FN 9222Ex-1-06</b>     | 1 (1.2)                          | 373                                 | 12         | 0.4  | 0.1         | 2.2  |                 | -06                                                                                                       | 46            |
| <b>FN 9222Ex-3-06</b>     | 3 (3.5)                          | 373                                 | 2.5        | 0.4  | 0.1         | 2.2  |                 | -06                                                                                                       | 46            |
| <b>FN 9222Ex-6-06</b>     | 6 (7.2)                          | 373                                 | 0.78       | 0.4  | 0.1         | 2.2  |                 | -06                                                                                                       | 46            |
| <b>FN 9222Ex-8-06</b>     | 8 (10.6)                         | 373                                 | 0.5        | 0.4  | 0.1         | 2.2  |                 | -06                                                                                                       | 46            |
| <b>FN 9222Ex-10-06</b>    | 10 (11.6)                        | 373                                 | 0.225      | 0.1  | 0.1         | 2.2  |                 | -06                                                                                                       | 46            |
| <b>FN 9222Ex-12-06</b>    | 12 (12)                          | 373                                 | 0.11       | 0.1  | 0.1         | 2.2  |                 | -06                                                                                                       | 46            |
| <b>FN 9222Ex-15-06</b>    | 15 (15)                          | 373                                 | 0.075      | 0.1  | 0.1         | 2.2  |                 | -06                                                                                                       | 46            |
| <b>FN 9222Ex-12-06HI</b>  | 12 (12)                          | 373                                 | 0.11       | 0.1  | 0.1         | 2.2  |                 | -06                                                                                                       | 46            |
| <b>FN 9222Ex-15-06HI</b>  | 15 (15)                          | 373                                 | 0.075      | 0.1  | 0.1         | 2.2  |                 | -06                                                                                                       | 46            |
| <b>FN 9222ExR-1-06</b>    | 1 (1.2)                          | 373                                 | 12         | 0.4  | 0.1         | 2.2  | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExR-3-06</b>    | 3 (3.5)                          | 373                                 | 2.5        | 0.4  | 0.1         | 2.2  | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExR-6-06</b>    | 6 (7.2)                          | 373                                 | 0.78       | 0.4  | 0.1         | 2.2  | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExR-8-06</b>    | 8 (10.6)                         | 373                                 | 0.5        | 0.4  | 0.1         | 2.2  | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExR-10-06</b>   | 10 (11.6)                        | 373                                 | 0.225      | 0.1  | 0.1         | 2.2  | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExR-12-06</b>   | 12 (12)                          | 373                                 | 0.11       | 0.1  | 0.1         | 2.2  | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExR-15-06</b>   | 15 (15)                          | 373                                 | 0.075      | 0.1  | 0.1         | 2.2  | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExR-12-06HI</b> | 12 (12)                          | 373                                 | 0.11       | 0.1  | 0.1         | 2.2  | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExR-15-06HI</b> | 15 (15)                          | 373                                 | 0.075      | 0.1  | 0.1         | 2.2  | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExB-1-06</b>    | 1 (1.2)                          | 2                                   | 12         | 0.4  | 0.1         |      | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExB-3-06</b>    | 3 (3.5)                          | 2                                   | 2.5        | 0.4  | 0.1         |      | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExB-6-06</b>    | 6 (7.2)                          | 2                                   | 0.78       | 0.4  | 0.1         |      | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExB-8-06</b>    | 8 (10.6)                         | 2                                   | 0.5        | 0.4  | 0.1         |      | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExB-10-06</b>   | 10 (11.6)                        | 2                                   | 0.225      | 0.1  | 0.1         |      | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExB-12-06</b>   | 12 (12)                          | 2                                   | 0.11       | 0.1  | 0.1         |      | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExB-15-06</b>   | 15 (15)                          | 2                                   | 0.075      | 0.1  | 0.1         |      | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExB-12-06HI</b> | 12 (12)                          | 2                                   | 0.11       | 0.1  | 0.1         |      | 1000            | -06                                                                                                       | 46            |
| <b>FN 9222ExB-15-06HI</b> | 15 (15)                          | 2                                   | 0.075      | 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 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)

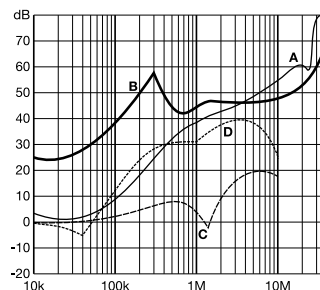
 Blank: Standard housing with mounting flanges U: Housing with wider mounting flanges S: Snap-in version, snapper on vertical side S1: Snap-in version, snapper on horizontal side

For example: FN 9222E-15-06, FN 9222ES1B-10-06-20, FN 9222ER-12-06HI, FN 9222EUB-8-06-20

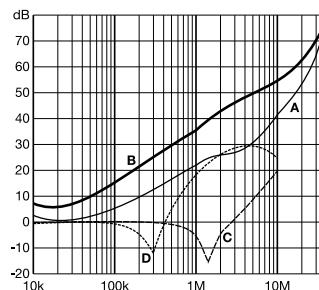
## Typical filter attenuation

Per CISPR 17; A = 50  $\Omega$ /50  $\Omega$  sym; B = 50  $\Omega$ /50  $\Omega$  asym; C = 0.1  $\Omega$ /100  $\Omega$  sym; D = 100  $\Omega$ /0.1  $\Omega$  sym

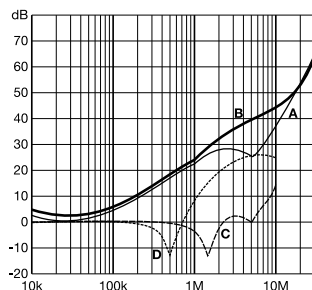
1 and 3 A types



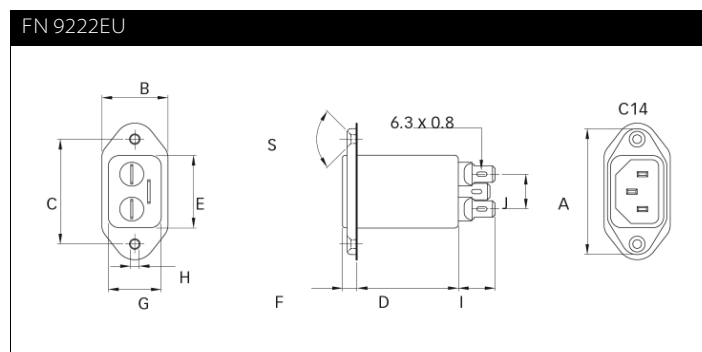
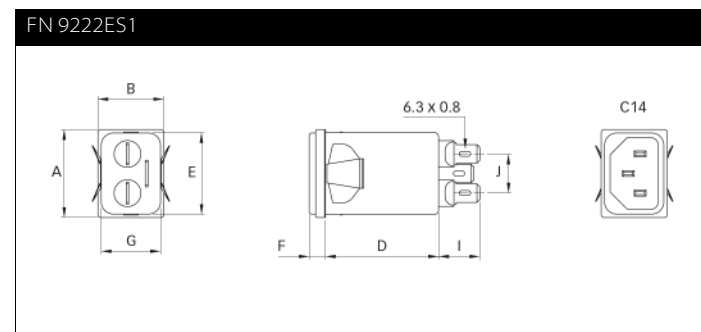
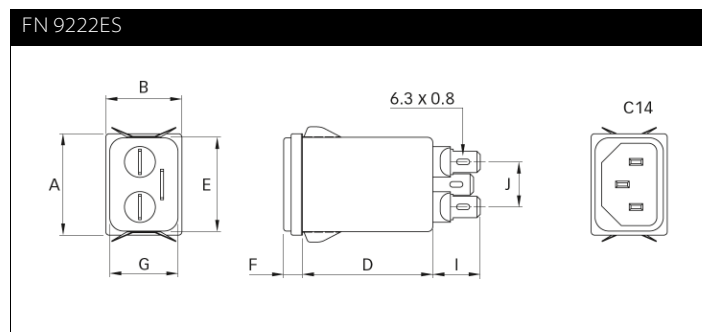
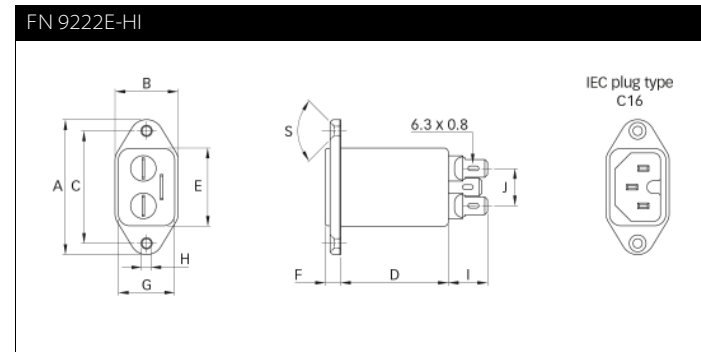
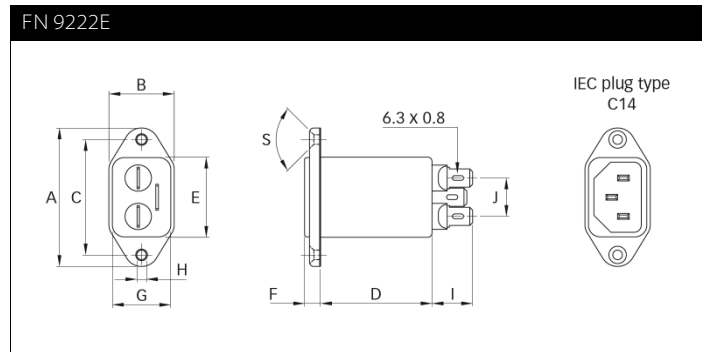
6 to 10 A types



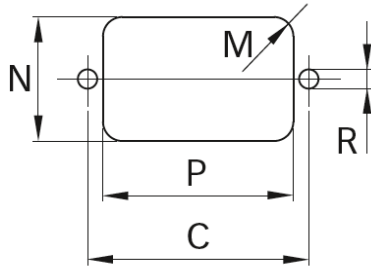
12 and 15 A types



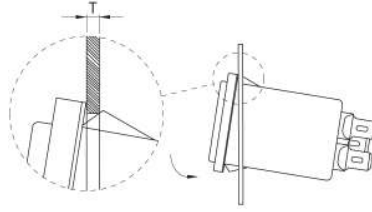
## Mechanical data



Panel cut out



Installation



## Dimensions

|           | FN 9222E | FN 9222EU | FN 9222ES | FN 9222ES1 | FN 9222E-HI |
|-----------|----------|-----------|-----------|------------|-------------|
| <b>A</b>  | 48       | 53        | 29.9      | 29.9       | 48          |
| <b>B</b>  | 22.5     | 25        | 22.4      | 22.4       | 22.5        |
| <b>C</b>  | 40 ±0.2  | 40 ±0.2   |           |            | 40 ±0.2     |
| <b>D</b>  | 46.8     | 46.8      | 46.8      | 46.8       | 46.8        |
| <b>E</b>  | 27.8     | 27.8      | 27.8      | 27.8       | 27.8        |
| <b>F</b>  | 5.5      | 5.5       | 5.5       | 5.5        | 5.5         |
| <b>G</b>  | 20.1     | 20.1      | 20.1      | 20.1       | 20.1        |
| <b>H</b>  | Ø 3.3    | Ø 3.3     |           |            | Ø 3.3       |
| <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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