

## General Performance IEC Inlet Filter



- Rated currents up to 20 A
- Excellent performance/size ratio
- Optional medical versions (B type) according to IEC/EN 60601-1
- Snap-in versions (S and S1 type)
- Hot inlet versions (HI type)
- Optional overvoltage protection (Z type)



### Performance indicators

Attenuation performance



Rated current [A]



### Technical specifications

|                                                  |                                                                                                                                                                                                                                                    |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Maximum continuous operating voltage</b>      | 250 VAC, 50/60 Hz                                                                                                                                                                                                                                  |
| <b>Operating frequency</b>                       | dc to 400 Hz                                                                                                                                                                                                                                       |
| <b>Rated currents</b>                            | 1 to 20 A @ 50°C                                                                                                                                                                                                                                   |
| <b>Approvals by rated current</b>                | 1 to 10 A (ENEC, CQC)<br>16 A (ENEC, CQC) for 16 and 20 A types<br>1 to 20 A (UL, CSA)                                                                                                                                                             |
| <b>High potential test voltage</b>               | P → PE 2000 VAC for 2 sec (standard types)<br>P → N 250 VAC for 2 sec (all Z types)<br>P → N 1000 VAC for 2 sec (1 to 10 A types, not Z types)<br>P → PE 2500 VAC for 2 sec (B types)<br>P → N 1100 VDC for 2 sec (16 and 20 A types, not Z types) |
| <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 (X to XX A, not Z types)                                                                                                                                                                                |
| <b>Flammability corresponding to</b>             | UL 94 V-2 or better                                                                                                                                                                                                                                |
| <b>Surge pulse protection (optional)</b>         | 2 kV, IEC 61000-4-5                                                                                                                                                                                                                                |
| <b>MTBF @ 40°C/230 V (Mil-HB-217F)</b>           | ≤15 A: 3,040,000 hours<br>≥16 A: 2,256,000 hours                                                                                                                                                                                                   |

### Approvals



(CQC except HI-types)

The FN 9222 IEC inlet filter combines an IEC inlet and mains filter with excellent filter attenuation in a small form factor. Choosing the FN 9222 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
- Wide mounting flanges available
- Optional medical versions (B type) comply with the requirements of IEC/EN 60601-1 for creepage and clearance, leakage current and high potential testing
- 12 and 15 A types with hot inlet available
- Optional surge pulse protection
- 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

## Filter selection table

| Filter             | Rated current<br>@ 50°C (25°C) | Leakage current*<br>@ 250 VAC/50 Hz | Inductance<br>L | Capacitance |            | Resistance<br>R | Output connections                                                                  |                                                                                     | Weight |
|--------------------|--------------------------------|-------------------------------------|-----------------|-------------|------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------|
|                    | [A]                            | [µA]                                | [mH]            | Cx<br>[µF]  | Cy<br>[nF] | [kΩ]            |  |  | [g]    |
| FN 9222 x-1-..     | 1 (1.2)                        | 373                                 | 12              | 0.1         | 2.2        |                 | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 x-3-..     | 3 (3.5)                        | 373                                 | 2.5             | 0.1         | 2.2        |                 | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 x-6-..     | 6 (7.2)                        | 373                                 | 0.78            | 0.1         | 2.2        |                 | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 x-8-..     | 8 (10.6)                       | 373                                 | 0.5             | 0.1         | 2.2        |                 | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 x-10-..    | 10 (11.6)                      | 373                                 | 0.225           | 0.1         | 2.2        |                 | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 x-12-..    | 12 (12)                        | 373                                 | 0.11            | 0.1         | 2.2        |                 | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 x-15-..    | 15 (15)                        | 373                                 | 0.075           | 0.1         | 2.2        |                 | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 x-12-..HI  | 12 (12)                        | 373                                 | 0.11            | 0.1         | 2.2        |                 | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 x-15-..HI  | 15 (15)                        | 373                                 | 0.075           | 0.1         | 2.2        |                 | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xR-1-..    | 1 (1.2)                        | 373                                 | 12              | 0.1         | 2.2        | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xR-3-..    | 3 (3.5)                        | 373                                 | 2.5             | 0.1         | 2.2        | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xR-6-..    | 6 (7.2)                        | 373                                 | 0.78            | 0.1         | 2.2        | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xR-8-..    | 8 (10.6)                       | 373                                 | 0.5             | 0.1         | 2.2        | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xR-10-..   | 10 (11.6)                      | 373                                 | 0.225           | 0.1         | 2.2        | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xR-12-..   | 12 (12)                        | 373                                 | 0.11            | 0.1         | 2.2        | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xR-15-..   | 15 (15)                        | 373                                 | 0.075           | 0.1         | 2.2        | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 R-16-06    | 16 (18.5)                      | 373                                 | 0.54            | 0.33        | 2.2        | 1000            | -06                                                                                 |                                                                                     | 100    |
| FN 9222 R-20-06    | 20 (23)                        | 373                                 | 0.4             | 0.33        | 2.2        | 1000            | -06                                                                                 |                                                                                     | 100    |
| FN 9222 xR-12-..HI | 12 (12)                        | 373                                 | 0.11            | 0.1         | 2.2        | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xR-15-..HI | 15 (15)                        | 373                                 | 0.075           | 0.1         | 2.2        | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xB-1-..    | 1 (1.2)                        | 2                                   | 12              | 0.1         |            | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xB-3-..    | 3 (3.5)                        | 2                                   | 2.5             | 0.1         |            | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xB-6-..    | 6 (7.2)                        | 2                                   | 0.78            | 0.1         |            | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xB-8-..    | 8 (10.6)                       | 2                                   | 0.5             | 0.1         |            | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xB-10-..   | 10 (11.6)                      | 2                                   | 0.225           | 0.1         |            | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xB-12-..   | 12 (12)                        | 2                                   | 0.11            | 0.1         |            | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xB-15-..   | 15 (15)                        | 2                                   | 0.075           | 0.1         |            | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 RB-16-06   | 16 (18.5)                      | 2                                   | 0.54            | 0.33        |            | 1000            | -06                                                                                 |                                                                                     | 100    |
| FN 9222 RB-20-06   | 20 (23)                        | 2                                   | 0.4             | 0.33        |            | 1000            | -06                                                                                 |                                                                                     | 100    |
| FN 9222 xB-12-..HI | 12 (12)                        | 2                                   | 0.11            | 0.1         |            | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 xB-15-..HI | 15 (15)                        | 2                                   | 0.075           | 0.1         |            | 1000            | -06                                                                                 | -07                                                                                 | 40     |
| FN 9222 UZ-1-06    | 1 (1.2)                        | 373                                 | 12              | 0.1         | 2.2        |                 | -06                                                                                 |                                                                                     | 43     |
| FN 9222 UZ-3-06    | 3 (3.5)                        | 373                                 | 2.5             | 0.1         | 2.2        |                 | -06                                                                                 |                                                                                     | 43     |
| FN 9222 UZ-6-06    | 6 (7.2)                        | 373                                 | 0.78            | 0.1         | 2.2        |                 | -06                                                                                 |                                                                                     | 43     |
| FN 9222 UZ-8-06    | 8 (10.6)                       | 373                                 | 0.5             | 0.1         | 2.2        |                 | -06                                                                                 |                                                                                     | 43     |
| FN 9222 UZ-10-06   | 10 (11.6)                      | 373                                 | 0.225           | 0.1         | 2.2        |                 | -06                                                                                 |                                                                                     | 43     |
| FN 9222 UZ-12-06   | 12 (12)                        | 373                                 | 0.11            | 0.1         | 2.2        |                 | -06                                                                                 |                                                                                     | 43     |
| FN 9222 UZ-15-06   | 15 (15)                        | 373                                 | 0.075           | 0.1         | 2.2        |                 | -06                                                                                 |                                                                                     | 43     |

\* Maximum leakage under normal operating conditions. Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

## Product selector

FN 9222xx-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 (1 to 15A types), C20 (16 and 20A types)

HI: Hot IEC inlet type C16 (12 and 15A types only)

06: Faston 6.3 x 0.8mm (spade/soldering)

07: Wire leads

1 to 20: Rated current

Blank: Standard version

R: Bleed resistor

B: Medical version (with bleed resistor and without Y2-capacitor)

Z: Optional surge pulse protection with additional varistor (MOV)

(Z types have longer housings, only available for FN 9222UZ-yy-06)

 Blank: Standard housing with mounting flanges

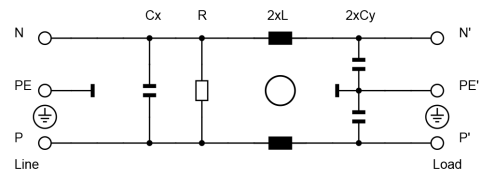
 U: Housing with wider mounting flanges

 S: Snap-in version, snapper on vertical side (1 to 15A types only)

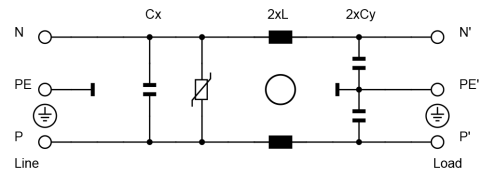
 S1: Snap-in version, snapper on horizontal side (1 to 15A types only)

## Typical electrical schematic

Standard, R and B types



Z types

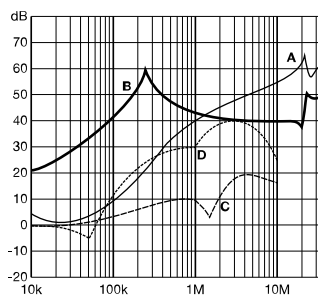


For example: FN 9222 E-15-06, FN 9222 ES1B-10-06-20, FN 9222 ER-12-06HI, FN 9222 EUB-8-06-20

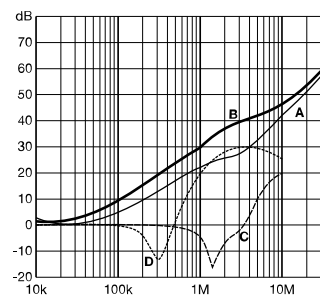
## Typical filter attenuation

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

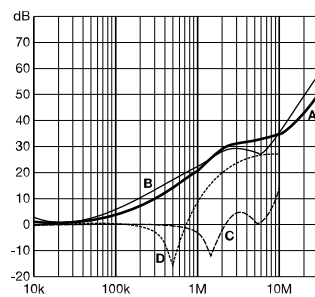
1 and 3 A types



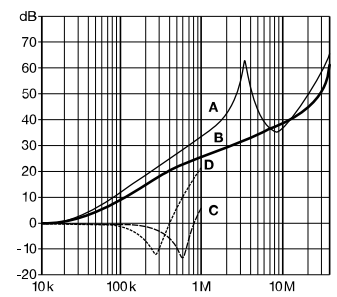
6 to 10 A types



12 and 15 A types

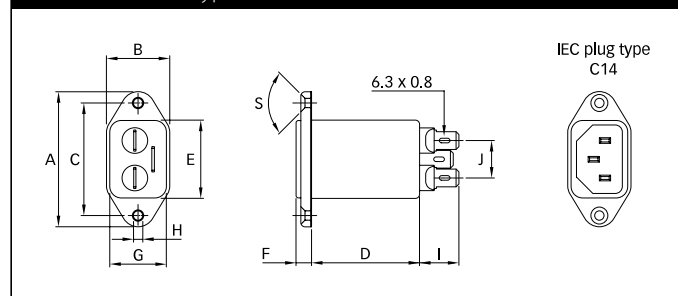


16 and 20 A types

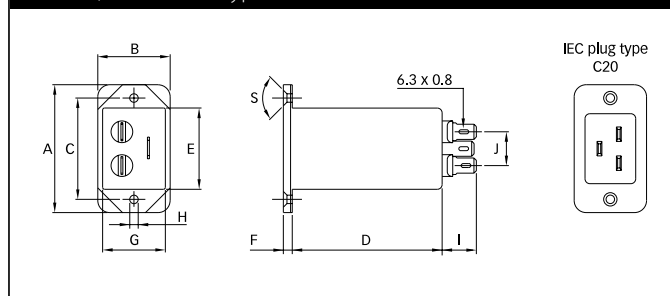


## Mechanical data

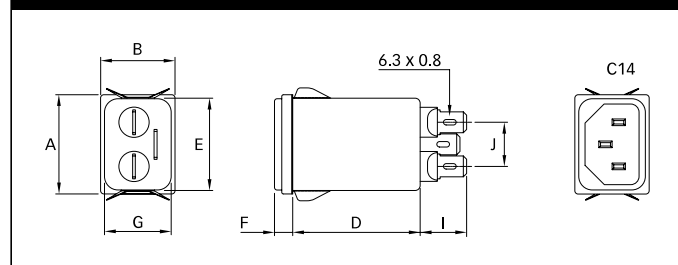
FN 9222 1 to 15 A types



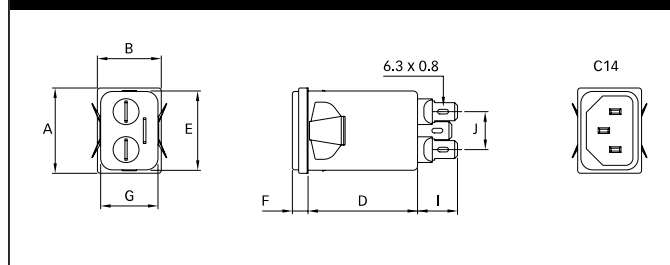
FN 9222, 16 and 20 A types



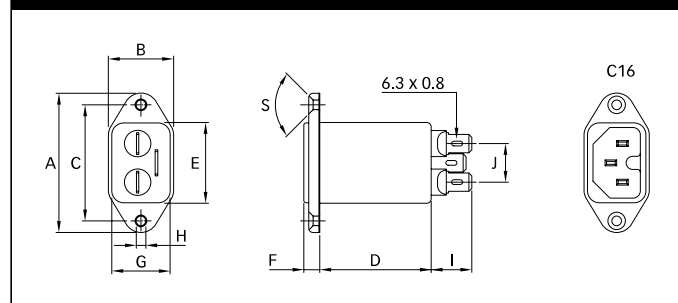
FN 9222 S



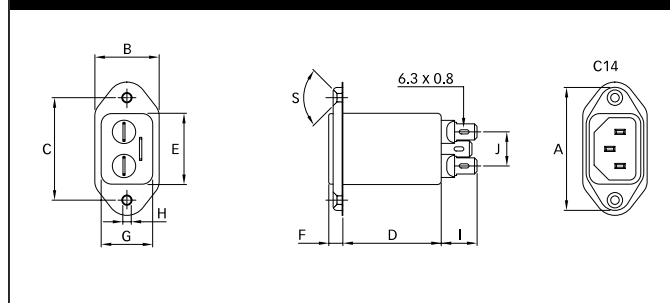
FN 9222 S1



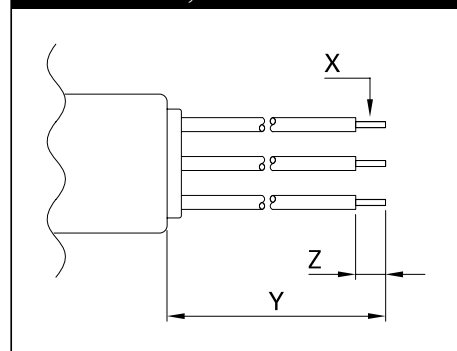
FN 9222-HI



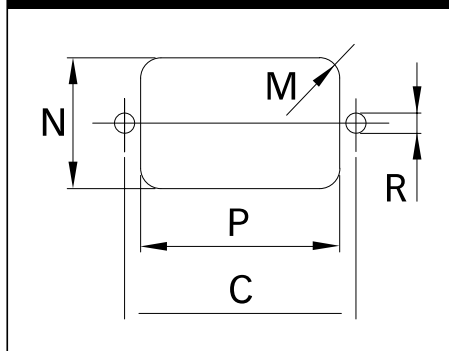
FN 9222 U



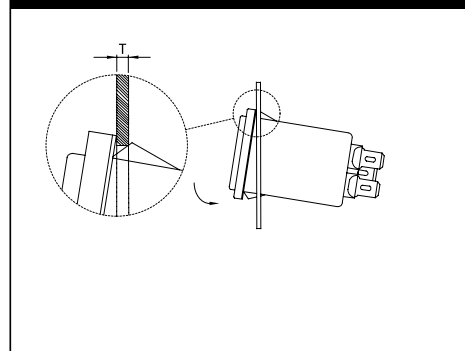
-07 connection style



Panel cut out



Installation



## Dimensions

|           | FN 9222<br>1 to 8 A | 10 to 15 A | 16 and 20 A | FN 9222 U | FN 9222 UZ | FN 9222 S<br>1 to 8 A | 10 to 15 A | FN 9222 S1<br>1 to 8 A | 10 to 15 A | FN 9222-HI<br>12 and 15 A |
|-----------|---------------------|------------|-------------|-----------|------------|-----------------------|------------|------------------------|------------|---------------------------|
| <b>A</b>  | 48                  | 48         | 53          | 51.85     | 51.85      | 29.9                  | 29.9       | 29.9                   | 29.9       | 48                        |
| <b>B</b>  | 22.4                | 22.4       | 30          | 25        | 25         | 22.4                  | 22.4       | 22.4                   | 22.4       | 22.4                      |
| <b>C</b>  | 40 ±0.2             | 40 ±0.2    | 42 ±0.2     | 40 ±0.2   | 40 ±0.2    |                       |            |                        |            | 40 ±0.2                   |
| <b>D</b>  | 38.25               | 38.25      | 62          | 38.25     | 46.7       | 38.25                 | 38.25      | 38.25                  | 38.25      | 38.25                     |
| <b>E</b>  | 27.8                | 27.8       | 34.5        | 27.8      | 27.8       | 27.9                  | 27.8       | 27.8                   | 27.8       | 27.8                      |
| <b>F</b>  | 5.7                 | 5.7        | 3.8         | 5.7       | 5.7        | 5.7                   | 5.7        | 5.7                    | 5.7        | 5.7                       |
| <b>G</b>  | 20.1                | 20.1       | 26.5        | 20.1      | 20.5       | 20.1                  | 20.1       | 20.1                   | 20.1       | 20.1                      |
| <b>H</b>  | Ø3.3                | Ø3.3       | Ø3.5        | Ø3.3      | Ø3.3       |                       |            |                        |            | Ø3.3                      |
| <b>I</b>  | 14                  | 14         | 14          | 14        | 14         | 14                    | 14         | 14                     | 14         | 14                        |
| <b>J</b>  | 13.3                | 13.3       | 13.3        | 13.3      | 13.3       | 13.3                  | 13.3       | 13.3                   | 13.3       | 13.3                      |
| <b>M</b>  | R 3                 | R ≤3       | R ≤3        | R ≤3      | R ≤3       | R ≤1.5                | R ≤ 1.5    | R ≤1.5                 | R ≤1.5     | R ≤3                      |
| <b>N</b>  | 21.5                | 21.5       | 27          | 21.5      | 21.5       | 20.8                  | 20.8       | 21.9                   | 21.9       | 21.5                      |
| <b>P</b>  | 28.5                | 28.5       | 34.7        | 28.5      | 28.5       | 29.4                  | 29.4       | 28.5                   | 28.5       | 28.5                      |
| <b>R</b>  | M3                  | M3         | M3          | M3        | M3         |                       |            |                        |            | M3                        |
| <b>S</b>  | 90°                 | 90°        | 90°         | 90°       | 90°        |                       |            |                        |            | 90°                       |
| <b>T*</b> |                     |            |             |           |            | 0.7-1.5               | 0.7-1.5    | 0.7-1.5                | 0.7-1.5    |                           |
| <b>T*</b> |                     |            |             |           |            | 1.5-2.2               | 1.5-2.2    | 1.5-2.2                | 1.5-2.2    |                           |
| <b>X</b>  | AWG 18              | AWG 16     |             |           |            | AWG 18                | AWG 16     | AWG 18                 | AWG 16     | AWG 16                    |
| <b>Y</b>  | 160                 | 160        |             |           |            | 160                   | 160        | 160                    | 160        | 160                       |
| <b>Z</b>  | 6                   | 6          |             |           |            | 6                     | 6          | 6                      | 6          | 6                         |

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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