

# 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



### 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

### 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 (Z type)</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   |

### 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<br>(@ 120 VAC/60 Hz) | Inductance<br>L | Capacitance |      | Resistance<br>R | Output connections  |   | Weight |
|--------------------|--------------------------------|--|-----------------|-------------|------|-----------------|---|---|--------|
|                    |                                |  |                 | Cx          | Cy   |                 |   |   |        |
|                    | [A]                            | [mA]   | [mH]            | [μF]        | [nF] | [kΩ]            |  |  | [g]    |
| FN 9222 x-1-..     | 1 (1.2)                        | 0.31 (0.18)  | 12              | 0.1         | 2.2  |                 | -06   | -07   | 40     |
| FN 9222 x-3-..     | 3 (3.5)                        | 0.31 (0.18)  | 2.5             | 0.1         | 2.2  |                 | -06   | -07   | 40     |
| FN 9222 x-6-..     | 6 (7.2)                        | 0.31 (0.18)  | 0.78            | 0.1         | 2.2  |                 | -06   | -07   | 40     |
| FN 9222 x-8-..     | 8 (10.6)                       | 0.31 (0.18)  | 0.5             | 0.1         | 2.2  |                 | -06   | -07   | 40     |
| FN 9222 x-10-..    | 10 (11.6)                      | 0.31 (0.18)  | 0.225           | 0.1         | 2.2  |                 | -06   | -07   | 40     |
| FN 9222 x-12-..    | 12 (12)                        | 0.31 (0.18)  | 0.11            | 0.1         | 2.2  |                 | -06   | -07   | 40     |
| FN 9222 x-15-..    | 15 (15)                        | 0.31 (0.18)  | 0.075           | 0.1         | 2.2  |                 | -06   | -07   | 40     |
| FN 9222 x-12-..HI  | 12 (12)                        | 0.31 (0.18)  | 0.11            | 0.1         | 2.2  |                 | -06   | -07   | 40     |
| FN 9222 x-15-..HI  | 15 (15)                        | 0.31 (0.18)  | 0.075           | 0.1         | 2.2  |                 | -06   | -07   | 40     |
| FN 9222 xR-1-..    | 1 (1.2)                        | 0.31 (0.18)  | 12              | 0.1         | 2.2  | 1000            | -06   | -07   | 40     |
| FN 9222 xR-3-..    | 3 (3.5)                        | 0.31 (0.18)  | 2.5             | 0.1         | 2.2  | 1000            | -06   | -07   | 40     |
| FN 9222 xR-6-..    | 6 (7.2)                        | 0.31 (0.18)  | 0.78            | 0.1         | 2.2  | 1000            | -06   | -07   | 40     |
| FN 9222 xR-8-..    | 8 (10.6)                       | 0.31 (0.18)  | 0.5             | 0.1         | 2.2  | 1000            | -06   | -07   | 40     |
| FN 9222 xR-10-..   | 10 (11.6)                      | 0.31 (0.18)  | 0.225           | 0.1         | 2.2  | 1000            | -06   | -07   | 40     |
| FN 9222 xR-12-..   | 12 (12)                        | 0.31 (0.18)  | 0.11            | 0.1         | 2.2  | 1000            | -06   | -07   | 40     |
| FN 9222 xR-15-..   | 15 (15)                        | 0.31 (0.18)  | 0.075           | 0.1         | 2.2  | 1000            | -06   | -07   | 40     |
| FN 9222 R-16-06    | 16 (18.5)                      | 0.31 (0.18)  | 0.54            | 0.33        | 2.2  | 1000            | -06   |   | 100    |
| FN 9222 R-20-06    | 20 (23)                        | 0.31 (0.18)  | 0.4             | 0.33        | 2.2  | 1000            | -06   |   | 100    |
| FN 9222 xR-12-..HI | 12 (12)                        | 0.31 (0.18)  | 0.11            | 0.1         | 2.2  | 1000            | -06   | -07   | 40     |
| FN 9222 xR-15-..HI | 15 (15)                        | 0.31 (0.18)  | 0.075           | 0.1         | 2.2  | 1000            | -06   | -07   | 40     |
| FN 9222 xB-1-..    | 1 (1.2)                        | 0.00   | 12              | 0.1         |      | 1000            | -06   | -07   | 40     |
| FN 9222 xB-3-..    | 3 (3.5)                        | 0.00   | 2.5             | 0.1         |      | 1000            | -06   | -07   | 40     |
| FN 9222 xB-6-..    | 6 (7.2)                        | 0.00   | 0.78            | 0.1         |      | 1000            | -06   | -07   | 40     |
| FN 9222 xB-8-..    | 8 (10.6)                       | 0.00   | 0.5             | 0.1         |      | 1000            | -06   | -07   | 40     |
| FN 9222 xB-10-..   | 10 (11.6)                      | 0.00   | 0.225           | 0.1         |      | 1000            | -06   | -07   | 40     |
| FN 9222 xB-12-..   | 12 (12)                        | 0.00   | 0.11            | 0.1         |      | 1000            | -06   | -07   | 40     |
| FN 9222 xB-15-..   | 15 (15)                        | 0.00   | 0.075           | 0.1         |      | 1000            | -06   | -07   | 40     |
| FN 9222 RB-16-06   | 16 (18.5)                      | 0.00   | 0.54            | 0.33        |      | 1000            | -06   |   | 100    |
| FN 9222 RB-20-06   | 20 (23)                        | 0.00   | 0.4             | 0.33        |      | 1000            | -06   |   | 100    |
| FN 9222 xB-12-..HI | 12 (12)                        | 0.00   | 0.11            | 0.1         |      | 1000            | -06   | -07   | 40     |
| FN 9222 xB-15-..HI | 15 (15)                        | 0.00   | 0.075           | 0.1         |      | 1000            | -06   | -07   | 40     |
| FN 9222 UZ-1-06    | 1 (1.2)                        | 0.31 (0.18)  | 12              | 0.1         | 2.2  |                 | -06   |   | 43     |
| FN 9222 UZ-3-06    | 3 (3.5)                        | 0.31 (0.18)  | 2.5             | 0.1         | 2.2  |                 | -06   |   | 43     |
| FN 9222 UZ-6-06    | 6 (7.2)                        | 0.31 (0.18)  | 0.78            | 0.1         | 2.2  |                 | -06   |   | 43     |
| FN 9222 UZ-8-06    | 8 (10.6)                       | 0.31 (0.18)  | 0.5             | 0.1         | 2.2  |                 | -06   |   | 43     |
| FN 9222 UZ-10-06   | 10 (11.6)                      | 0.31 (0.18)  | 0.225           | 0.1         | 2.2  |                 | -06   |   | 43     |
| FN 9222 UZ-12-06   | 12 (12)                        | 0.31 (0.18)  | 0.11            | 0.1         | 2.2  |                 | -06   |   | 43     |
| FN 9222 UZ-15-06   | 15 (15)                        | 0.31 (0.18)  | 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

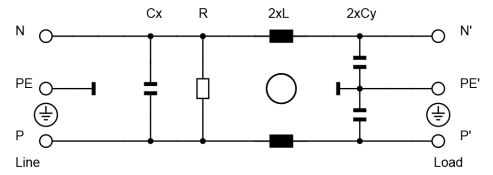
 U: Housing with wider mounting flanges

 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

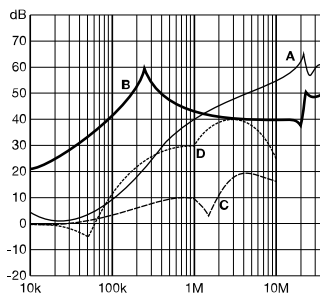


For example: FN 9222 E-15-06, FN 9222 ES1B-10-06-20, FN 9222 ER-12-06HI, FN 9222 EUB-8-06-20

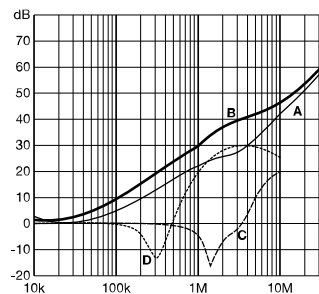
Typical filter attenuation

Per CISPR 17; A=50 Ω/50 Ω sym; B=50 Ω/50 Ω asym; C=0.1 Ω/100 Ω sym; D=100 Ω/0.1 Ω sym

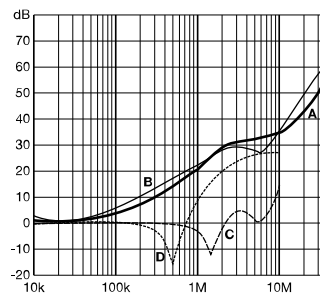
1 and 3 A types



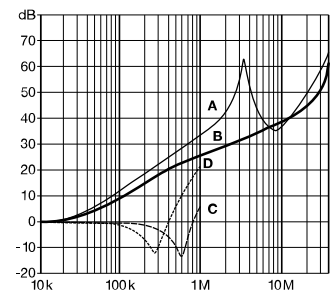
6 to 10 A types



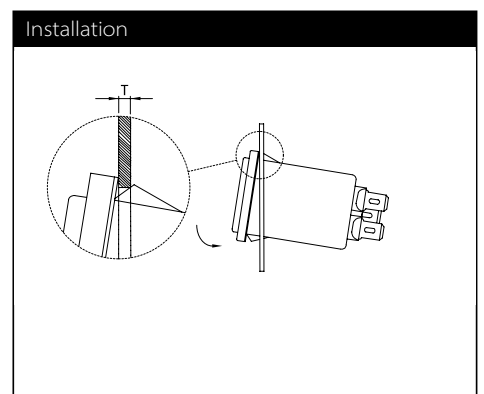
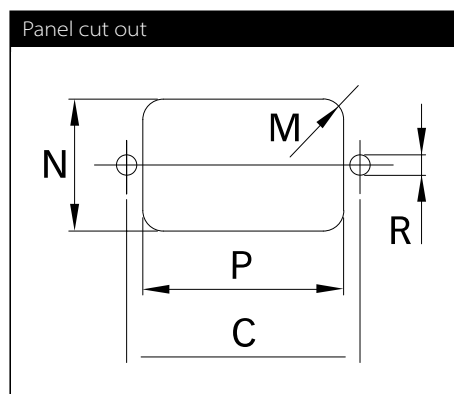
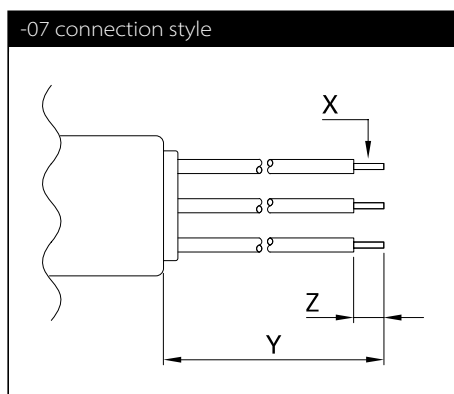
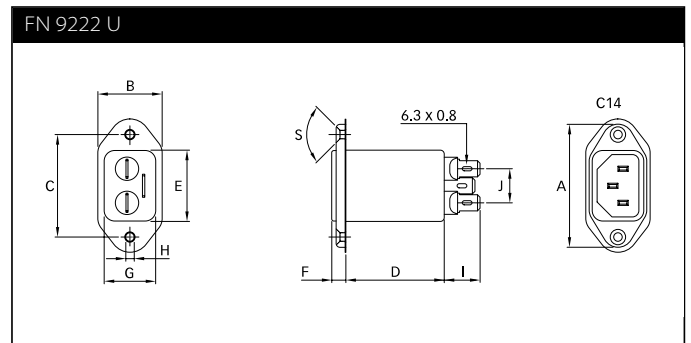
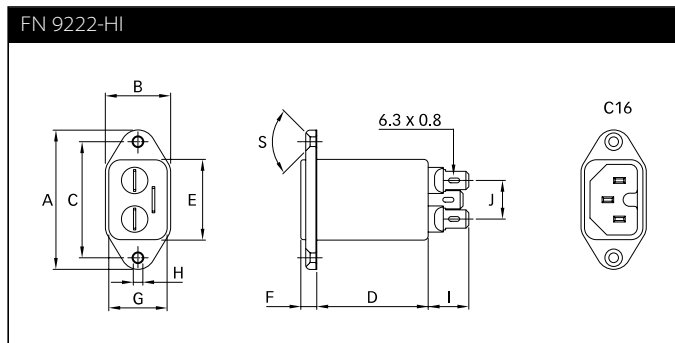
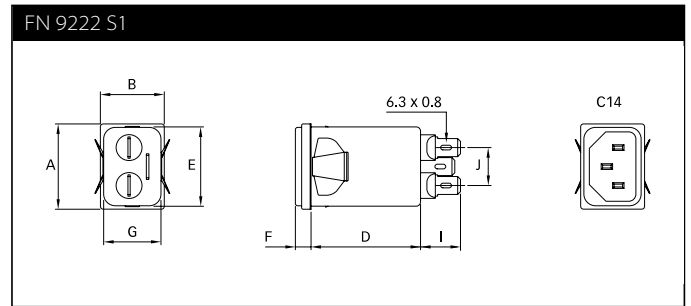
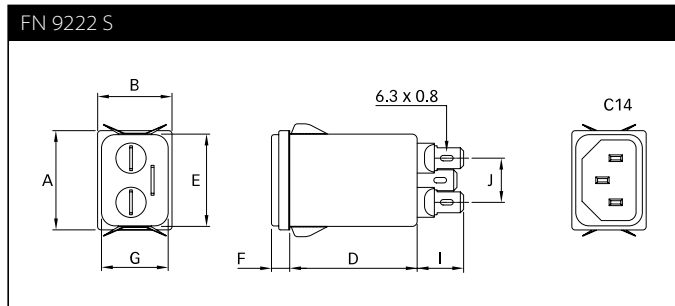
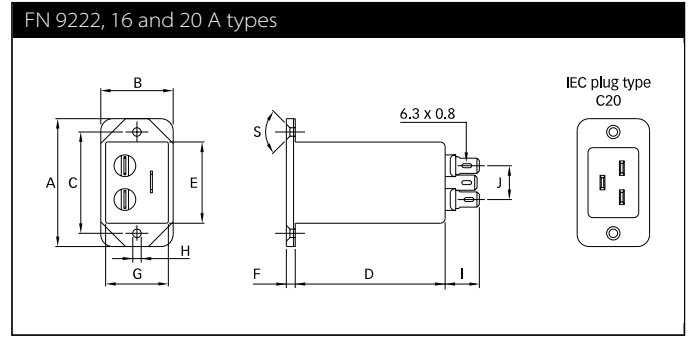
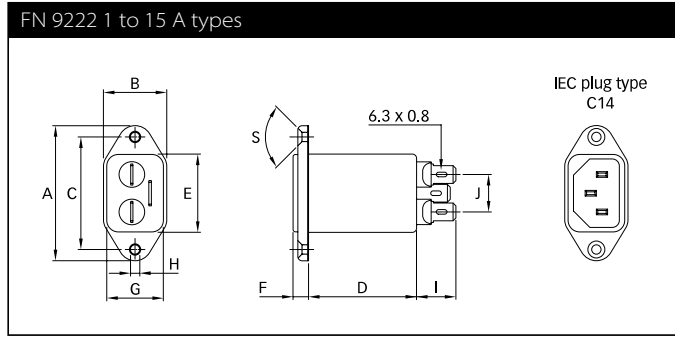
12 and 15 A types



16 and 20 A types



**Mechanical data**



## Dimensions

|            | FN 9222  |            |             | FN 9222 U | FN 9222 UZ | FN 9222 S |            | FN 9222 S1 |            | FN 9222-HI  | Tol.    |
|------------|----------|------------|-------------|-----------|------------|-----------|------------|------------|------------|-------------|---------|
|            | 1 to 8 A | 10 to 15 A | 16 and 20 A |           |            | 1 to 8 A  | 10 to 15 A | 1 to 8 A   | 10 to 15 A | 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       | 40         | 42          | 40        | 40         |           |            |            |            | 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        | 27.7      | 27.7       | 27.8      | 27.8       | 27.8       | 27.8       | 27.8        | +0.6/-0 |
| <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      | 20.1       | 20.1      | 20.1       | 20.1       | 20.1       | 20.1        | +0.6/-0 |
| <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           |         |

\* Recommended torque for M3 (90° countersunk flat head) is 0.5 Nm

\*\* 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.

## Accessories for IEC Inlet Filters and Power Entry Modules

The accessories displayed are a selection of available accessories for IEC Inlet filters and IEC Power entry modules. As they are displayed in a general way there might be variants of the filters where the accessories are not available.

For further information please ask your local Schaffner Sales Partner and visit our homepage <http://www.schaffner.com/>.

### Power Cord with Locking System for Inlet Filters IL 13, IL 13 P, IL 19



Link to Datasheet: [Datasheet IEC C13/C19 locking cable](#)

The locking system has a tensile force of typical 200N.

It is recommended to use it with flange mount filters.

Lock Power Cords with IEC Inlets and Filters"

Schaffner power cords with IEC lock guard against

accidental disconnection of all electrical appliances

with an IEC inlet. No exchange or modification of the

IEC inlet or IEC inlet filter system is needed. Easy

retrofit for all electronic equipments and devices.

### IEC C13 Rewireable Connector for individual Power Cord with Locking System



Link to Datasheet: [Datasheet IEC C13 rewireable](#)

The locking system has a tensile force of typical 300N. It is recommended to

use it with flange mount filters. For details refer to our Application Note

"Using IEC Lock Power Cords with IEC Inlets and Filters"

Schaffner power connector with IEC lock guard against

accidental disconnection of all electrical appliances with an IEC inlet.

No exchange or modification of the IEC inlet or IEC inlet filter system is

needed. Easy retrofit for all electronic equipments and devices.

### IB - Insulating Boots



There is a full range of insulating boots available from Schaffner that provide a

physical cover for the exposed terminals on the back of IEC Inlet

Filters.

These boots fit the simplest non-fused and unswitched style up to the fully

fused and switched IEC filtered inlet.

The boots are made from a durable black PVC material that conforms to

UL94-V0 flammability requirements.

The boots slip easily over the back of the filter and reduce the risk of

electrical shock to maintenance

personnel whilst protecting the filter from environmental hazard such as

the ingress of dust and moisture.



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