

# IEC Inlet Filters FN 280

## Compact Filtered Power Entry Module

**SCHAFNER**  
energy efficiency and reliability



- Rated currents up to 10A
- Single or dual-fuse holder
- Fuses Ø5 x 20mm
- 2-pole rocker switch
- General purpose application
- Optional earth line choke (E type)
- Optional medical version (B type)

### Approvals



**RoHS**

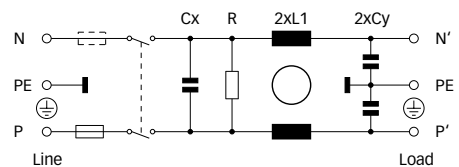
### Technical specifications

|                                            |                                                                                                                        |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Maximum continuous operating voltage:      | 250VAC, 50/60Hz                                                                                                        |
| Operating frequency:                       | 50 to 400Hz                                                                                                            |
| Rated currents:                            | 1 to 10A @ 40°C max.                                                                                                   |
| High potential test voltage:               | P → PE 2000VAC for 2 sec (standard types)<br>P → PE 2500VAC for 2 sec (B types)                                        |
|                                            | P → N 760VAC for 2 sec                                                                                                 |
| Protection category:                       | IP40 according to IEC 60529                                                                                            |
| Temperature range (operation and storage): | -25°C to +85°C (25/85/21)                                                                                              |
| Design corresponding to:                   | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939                                                                             |
| Flammability corresponding to:             | UL 94V-2 or better                                                                                                     |
| MTBF @ 40°C/230V (Mil-HB-217F):            | 1,500,000 hours                                                                                                        |
| Fuse holder:                               | 1 or 2 fuses (Ø5 x 20mm)                                                                                               |
| Marking:                                   | — max. 250V ~ (text is print. below fuse symbol)                                                                       |
| Rocker switch description:                 |                                                                                                                        |
| Function:                                  | 2-pole, dark not illuminated<br>Marking I - 0                                                                          |
| Electrical specifications:                 | Inrush current 82A<br>6,000 on-off operations according to UL 1054, TV 5<br>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*                                                                                                      |

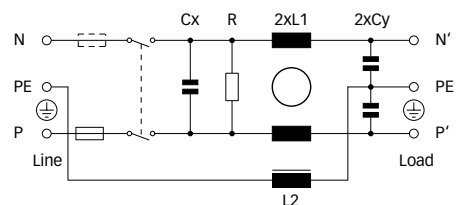
\* Value in () relates to the inductive current charge:  $\cos \varphi = 0.65$

### Typical electrical schematic

#### Standard types



#### E types



### Features and benefits

- High conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior.
- Rear/front or snap-in mounting.
- Single or dual-fuse holder.
- 2-pole rocker switch.
- Custom-specific versions are available on request.

### 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 equipment

The FN 280 power entry module combines an IEC inlet, a mains filter with single or dual-fuse holder and a 2-pole rocker switch in a small form factor. Choosing FN 280 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, fuse options, mounting possibilities and filters for medical applications are designed to offer you the desired solution.

Filter selection table

| Filter        | Rated current<br>@ 40°C (25°C) | Leakage current*<br>@ 230VAC/50Hz | Inductance<br>L1 L2 |      | Capacitance<br>Cx Cy |      | Resistance<br>R | Output<br>connections                                                               | Fuses** | Weight |
|---------------|--------------------------------|-----------------------------------|---------------------|------|----------------------|------|-----------------|-------------------------------------------------------------------------------------|---------|--------|
|               | [A]                            | [µA]                              | [mH]                | [mH] | [nF]                 | [nF] | [kΩ]            |  | [Qty]   | [g]    |
| FN 281-1-06   | 1 (1.2)                        | 373                               | 7.5                 |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 281-2-06   | 2 (2.4)                        | 373                               | 2                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 281-4-06   | 4 (4.8)                        | 373                               | 1                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 281-6-06   | 6 (7.2)                        | 373                               | 0.45                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 281-10-06  | 10 (11.6)                      | 373                               | 0.34                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 282-1-06   | 1 (1.2)                        | 373                               | 7.5                 |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 282-2-06   | 2 (2.4)                        | 373                               | 2                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 282-4-06   | 4 (4.8)                        | 373                               | 1                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 282-6-06   | 6 (7.2)                        | 373                               | 0.45                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 282-10-06  | 10 (11.6)                      | 373                               | 0.34                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 283-1-06   | 1 (1.2)                        | 373                               | 7.5                 |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 283-2-06   | 2 (2.4)                        | 373                               | 2                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 283-4-06   | 4 (4.8)                        | 373                               | 1                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 283-6-06   | 6 (7.2)                        | 373                               | 0.45                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 283-10-06  | 10 (11.6)                      | 373                               | 0.34                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 284-1-06   | 1 (1.2)                        | 373                               | 7.5                 |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 284-2-06   | 2 (2.4)                        | 373                               | 2                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 284-4-06   | 4 (4.8)                        | 373                               | 1                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 284-6-06   | 6 (7.2)                        | 373                               | 0.45                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 284-10-06  | 10 (11.6)                      | 373                               | 0.34                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 285-1-06   | 1 (1.2)                        | 373                               | 7.5                 |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 285-2-06   | 2 (2.4)                        | 373                               | 2                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 285-4-06   | 4 (4.8)                        | 373                               | 1                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 285-6-06   | 6 (7.2)                        | 373                               | 0.45                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 285-10-06  | 10 (11.6)                      | 373                               | 0.34                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 90     |
| FN 286-1-06   | 1 (1.2)                        | 373                               | 7.5                 |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 286-2-06   | 2 (2.4)                        | 373                               | 2                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 286-4-06   | 4 (4.8)                        | 373                               | 1                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 286-6-06   | 6 (7.2)                        | 373                               | 0.45                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 286-10-06  | 10 (11.6)                      | 373                               | 0.34                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 283E-1-06  | 1 (1.2)                        | 373                               | 7.5                 | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 100    |
| FN 283E-2-06  | 2 (2.4)                        | 373                               | 2                   | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 100    |
| FN 283E-4-06  | 4 (4.8)                        | 373                               | 1                   | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 100    |
| FN 283E-6-06  | 6 (7.2)                        | 373                               | 0.45                | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 100    |
| FN 284E-1-06  | 1 (1.2)                        | 373                               | 7.5                 | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 100    |
| FN 284E-2-06  | 2 (2.4)                        | 373                               | 2                   | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 100    |
| FN 284E-4-06  | 4 (4.8)                        | 373                               | 1                   | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 100    |
| FN 284E-6-06  | 6 (7.2)                        | 373                               | 0.45                | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 100    |
| FN 282B-1-06  | 1 (1.2)                        | 2                                 | 7.5                 |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 282B-2-06  | 2 (2.4)                        | 2                                 | 2                   |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 282B-4-06  | 4 (4.8)                        | 2                                 | 1                   |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 282B-6-06  | 6 (7.2)                        | 2                                 | 0.45                |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 282B-10-06 | 10 (11.6)                      | 2                                 | 0.34                |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 284B-1-06  | 1 (1.2)                        | 2                                 | 7.5                 |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 284B-2-06  | 2 (2.4)                        | 2                                 | 2                   |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 284B-4-06  | 4 (4.8)                        | 2                                 | 1                   |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 284B-6-06  | 6 (7.2)                        | 2                                 | 0.45                |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 284B-10-06 | 10 (11.6)                      | 2                                 | 0.34                |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 286B-1-06  | 1 (1.2)                        | 2                                 | 7.5                 |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 286B-2-06  | 2 (2.4)                        | 2                                 | 2                   |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 286B-4-06  | 4 (4.8)                        | 2                                 | 1                   |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 286B-6-06  | 6 (7.2)                        | 2                                 | 0.45                |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |
| FN 286B-10-06 | 10 (11.6)                      | 2                                 | 0.34                |      | 220                  |      | 1000            | -06                                                                                 | 2       | 90     |

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

\*\* Filters are delivered without fuse.

Product selector

FN 28xx-yy-zz

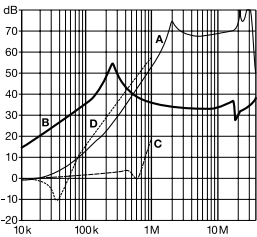
|  |                                                                                      |                                                                |
|--|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
|  | 06:                                                                                  | Faston 6.3 x 0.8mm (spade/soldering)                           |
|  | 1 to 10:                                                                             | Rated current                                                  |
|  | Blank:                                                                               | Standard version                                               |
|  | E:                                                                                   | Optional earth line choke                                      |
|  | B:                                                                                   | Medical version (with bleed resistor and without Y2-capacitor) |
|  |  1: | Flange mounting version top/bottom, single-fuse                |
|  |  2: | Flange mounting version top/bottom, dual-fuse                  |
|  |  3: | Flange mounting version left/right, single-fuse                |
|  |  4: | Flange mounting version left/right, dual-fuse                  |
|  |  5: | Snap-in version, single-fuse                                   |
|  |  6: | Snap-in version, dual-fuse                                     |

For example: FN 281-6-06, FN 283B-04-06, FN 283E-1-06

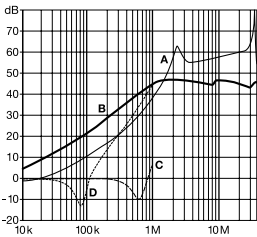
Typical filter attenuation

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

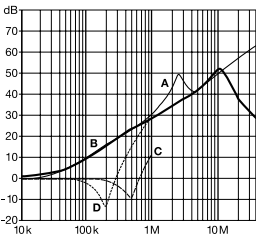
1A types



2 to 6A types

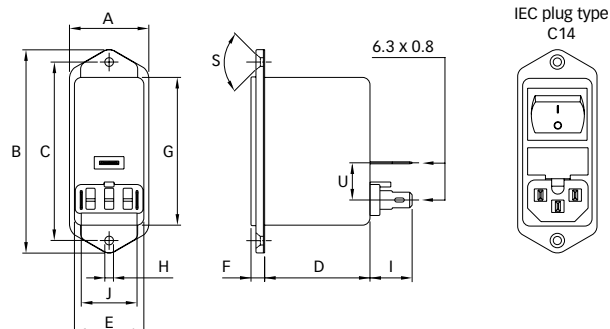


10A types

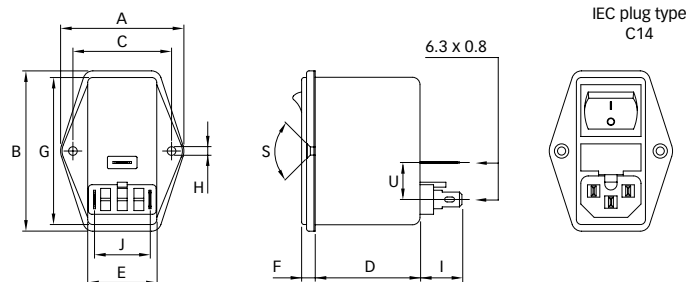


# Mechanical data

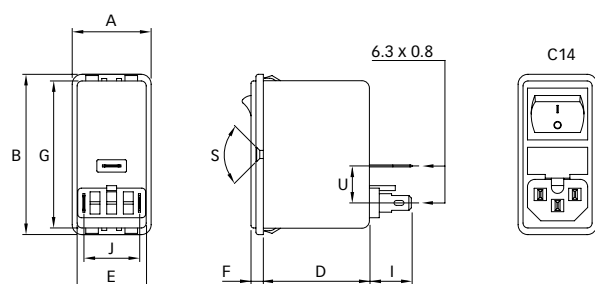
FN 281 / FN 282



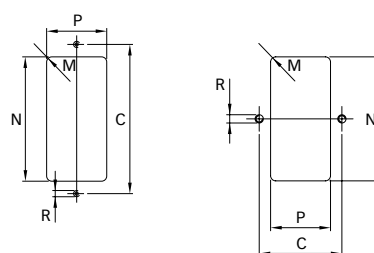
FN 283 / FN 284



FN 285 / FN 286



Panel cut out



# Dimensions

|          | FN 281     | FN 282     | FN 283     | FN 284     | FN 285        | FN 286        | Tolerances |
|----------|------------|------------|------------|------------|---------------|---------------|------------|
| <b>A</b> | 32         | 32         | 50         | 50         | 32            | 32            | ±0.3       |
| <b>B</b> | 82         | 82         | 65         | 65         | 65            | 65            | ±0.3       |
| <b>C</b> | 72         | 72         | 40         | 40         |               |               | ±0.1       |
| <b>D</b> | 43.1       | 43.1       | 43.1       | 43.1       | 43.6          | 43.6          | ±0.3       |
| <b>E</b> | 28.5       | 28.5       | 28.5       | 28.5       | 28.5          | 28.5          | ±0.25      |
| <b>F</b> | 5.5        | 5.5        | 5.5        | 5.5        | 5             | 5             | ±0.3       |
| <b>G</b> | 59.95 max. | 59.95 max. | 59.95 max. | 59.95 max. | 59.95 max.    | 59.95 max.    |            |
| <b>H</b> | Ø3.5       | Ø3.5       | Ø3.3       | Ø3.3       |               |               |            |
| <b>I</b> | 13.4       | 16.2       | 13.4       | 16.2       | 13.9          | 16.7          | ±0.3       |
| <b>J</b> | 22.5       | 22.5       | 22.5       | 22.5       | 22.5          | 22.5          |            |
| <b>M</b> | R ≤ 2.5    | R ≤ 2.5    | R ≤ 2.5    | R ≤ 2.5    | R ≤ 2.5       | R ≤ 2.5       |            |
| <b>N</b> | 60         | 60         | 60         | 60         | 61.5 +0.2/-0* | 61.5 +0.2/-0* | +0.5/-0    |
| <b>P</b> | 29         | 29         | 29         | 29         | 29            | 29            | +0.5/-0    |
| <b>R</b> | M3         | M3         | M3         | M3         |               |               |            |
| <b>S</b> | 90°        | 90°        | 90°        | 90°        |               |               |            |

\* For a panel thickness between 0.8 and 3mm

All dimensions in mm; 1 inch = 25.4mm

Tolerances according: ISO 2768-m / EN 22768-m

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