

# 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**

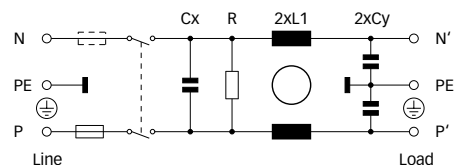
### Technical specifications

|                                            |                                                                                                                        |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 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*                                                                                                      |

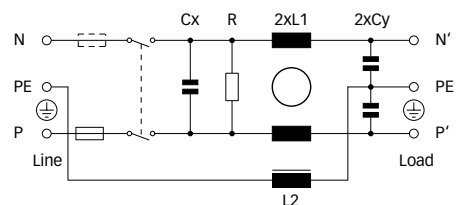
\* Value in () relates to the inductive current charge:  $\cos \varphi = 0.65$

### 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       | 140    |
| FN 281-2-06   | 2 (2.4)                        | 373                               | 2                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 281-4-06   | 4 (4.8)                        | 373                               | 1                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 281-6-06   | 6 (7.2)                        | 373                               | 0.45                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 281-10-06  | 10 (11.6)                      | 373                               | 0.34                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| 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       | 140    |
| FN 283-1-06   | 1 (1.2)                        | 373                               | 7.5                 |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 283-2-06   | 2 (2.4)                        | 373                               | 2                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 283-4-06   | 4 (4.8)                        | 373                               | 1                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 283-6-06   | 6 (7.2)                        | 373                               | 0.45                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 283-10-06  | 10 (11.6)                      | 373                               | 0.34                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| 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       | 140    |
| FN 285-1-06   | 1 (1.2)                        | 373                               | 7.5                 |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 285-2-06   | 2 (2.4)                        | 373                               | 2                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 285-4-06   | 4 (4.8)                        | 373                               | 1                   |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 285-6-06   | 6 (7.2)                        | 373                               | 0.45                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 285-10-06  | 10 (11.6)                      | 373                               | 0.34                |      | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| 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       | 140    |
| FN 283E-1-06  | 1 (1.2)                        | 373                               | 7.5                 | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 283E-2-06  | 2 (2.4)                        | 373                               | 2                   | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 283E-4-06  | 4 (4.8)                        | 373                               | 1                   | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 283E-6-06  | 6 (7.2)                        | 373                               | 0.45                | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 1       | 140    |
| FN 284E-1-06  | 1 (1.2)                        | 373                               | 7.5                 | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 284E-2-06  | 2 (2.4)                        | 373                               | 2                   | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 284E-4-06  | 4 (4.8)                        | 373                               | 1                   | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| FN 284E-6-06  | 6 (7.2)                        | 373                               | 0.45                | 0.4  | 220                  | 2.2  | 1000            | -06                                                                                 | 2       | 90     |
| 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       | 140    |
| 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       | 140    |
| 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       | 140    |

\* 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

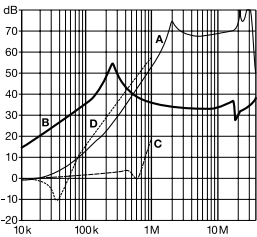
|                                                                                      |                                                                |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| 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

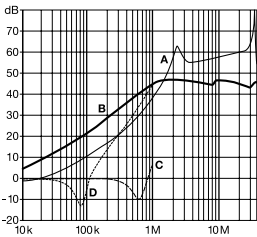
Typical filter attenuation

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

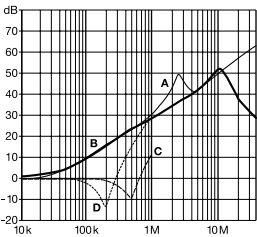
1A types



2 to 6A types

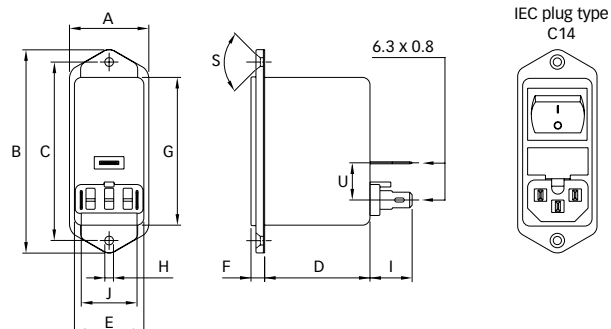


10A types

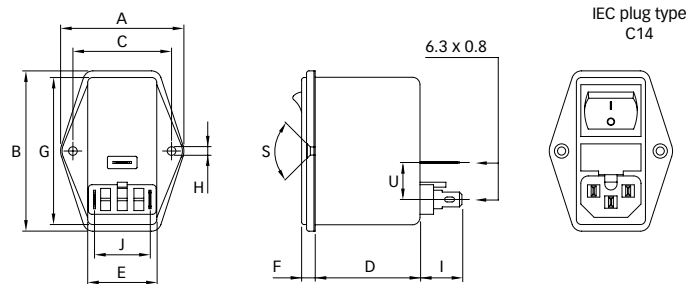


## Mechanical data

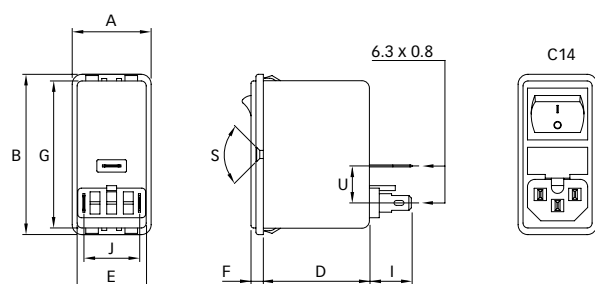
FN 281 / FN 282



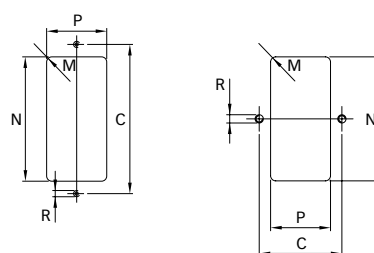
FN 283 / FN 284



FN 285 / FN 286



Panel cut out



## Dimensions

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

**Headquarters, global innovation  
and development center**

**Schaffner Group**  
Nordstrasse 11  
4542 Luterbach  
Schweiz  
T +41 32 681 66 26  
F +41 32 681 66 30  
info@schaffner.com  
www.schaffner.com

**Sales and application centers**

**China**  
**Schaffner EMC Ltd. Shanghai**  
T20-3, No 565 Chuangye Road  
Pudong New Area  
Shanghai 201201  
T +86 21 3813 9500  
F +86 21 3813 9501 / 02  
cschina@schaffner.com  
www.schaffner.com

**Finland**  
**Schaffner Oy**  
Sauvonrinne 19 H  
08500 Lohja  
T +358 19 35 72 71  
F +358 19 32 66 10  
finlandsales@schaffner.com

**France**  
**Schaffner EMC S.A.S.**  
112, Quai de Bezons  
95103 Argenteuil  
T +33 1 34 34 30 60  
F +33 1 39 47 02 28  
francesales@schaffner.com

**Germany**  
**Schaffner Deutschland GmbH**  
Schoemperlenstrasse 12B  
76185 Karlsruhe  
T +49 721 56910  
F +49 721 569110  
germanysales@schaffner.com

**Italy**  
**Schaffner EMC S.r.l.**  
Via Galileo Galilei, 47  
20092 Cinisello Balsamo (MI)  
T +39 02 66 04 30 45/47  
F +39 02 61 23 943  
italysales@schaffner.com

**Japan**  
**Schaffner EMC K.K.**  
Mitsui-Seimei Sangenjaya Bldg. 7F  
1-32-12, Kamiuma, Setagaya-ku  
Tokyo 154-0011  
T +81 3 5712 3650  
F +81 3 5712 3651  
japansales@schaffner.com  
www.schaffner.jp

**Singapore**  
**Schaffner EMC Pte Ltd.**  
Blk 3015A Ubi Road 1  
05-09 Kampong Ubi Industrial Estate  
T +65 6377 3283  
F +65 6377 3281  
singaporesales@schaffner.com

**Spain**  
**Schaffner EMC España**  
Calle Caléndula 93  
Miniparc III, Edificio E  
El Soto de la Moraleja  
Alcobendas  
28109 Madrid  
T +34 618 176 133  
spainsales@schaffner.com

**Sweden**  
**Schaffner EMC AB**  
Turebergstorg 1, 6  
19147 Sollentuna  
T +46 8 5792 1121 / 22  
F +46 8 92 96 90  
swedensales@schaffner.com

**Switzerland**  
**Schaffner EMV AG**  
Nordstrasse 11  
4542 Luterbach  
T +41 32 681 66 26  
F +41 32 681 66 41  
sales@schaffner.ch

**Taiwan**  
**Schaffner EMV Ltd.**  
6th Floor, No 413  
Rui Guang Road  
Neihu District  
Taipei City 114  
T +886 2 87525050  
F +886 2 87518086  
taiwansales@schaffner.com

**Thailand**  
**Schaffner EMC Co. Ltd.**  
Northern Region Industrial Estate  
67 Moo 4 Tambon Ban Klang  
Amphur Muang P.O. Box 14  
Lamphun 51000  
T +66 53 58 11 04  
F +66 53 58 10 19  
thailandsales@schaffner.com

**UK**  
**Schaffner Ltd.**  
5 Ashville Way  
Molly Millars Lane  
Wokingham  
Berkshire RG41 2PL  
T +44 118 9770070  
F +44 118 9792969  
uksales@schaffner.com  
www.schaffner.uk.com

**USA**  
**Schaffner EMC Inc.**  
52 Mayfield Avenue  
Edison, New Jersey 08837  
T +1 732 225 9533  
F +1 732 225 4789  
usasales@schaffner.com  
www.schaffner.com/us

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