



## 1-phase Filters FN 2030

### General Purpose EMI Filter with High Attenuation Performance

**SCHAFNER**  
energy efficiency and reliability



- Rated currents from 1 to 30A
- High performance filter attenuation
- High differential-mode attenuation
- Optional medical versions (B type)
- Optional safety versions (A type)
- Optional overvoltage protection (Z type)

#### Approvals

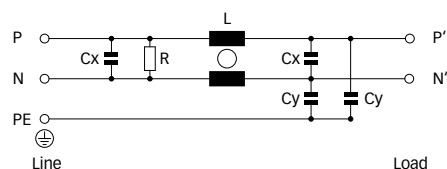


**RoHS**

#### Technical specifications

|                                            |                                                                                 |
|--------------------------------------------|---------------------------------------------------------------------------------|
| Maximum continuous operating voltage:      | 250VAC, 50/60Hz                                                                 |
| Operating frequency:                       | dc to 400Hz                                                                     |
| Rated currents:                            | 1 to 30A @ 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 1100VDC for 2 sec                                                         |
| Temperature range (operation and storage): | -25°C to +100°C (25/100/21)                                                     |
| Design corresponding to:                   | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939                                      |
| Flammability corresponding to:             | UL 94V-2 or better                                                              |
| Surge pulse protection (optional):         | 2kV, IEC 61000-4-5                                                              |
| MTBF @ 40°C/230V (Mil-HB-217F):            | 2,200,000 hours (1 to 10A types)<br>1,200,000 hours (12 to 30A types)           |

#### Typical electrical schematic



#### Features and benefits

- FN 2030 filters are designed for easy and fast chassis mounting.
- The FN 2030 filters are also available as B versions with no Y-capacitors for medical applications as well as A versions with low capacitance for safety critical applications with a requirement for low leakage currents.
- All filters provide an exceptional conducted attenuation performance, based on chokes with high permeable core material and excellent thermal behavior.
- The higher inductivity versus amperage offers increased attenuation performance with same form factor compared to FN 2010 and FN 2020 filter series.
- All FN 2030 filters can be delivered with optional surge pulse protection.
- FN 2030 filters are also available as two-stage filters (FN 2090 series) for very noisy environment.
- Various terminal options allow you to select the desired connection style.

#### Typical applications

- Electrical and electronic equipment
- Consumer goods
- Household equipment
- Medical equipment
- Electronic data processing equipment
- Office automation and datacom equipment
- Various noisy applications requiring high filter performance

Filter selection table

| Filter*        | Rated current<br>@ 40°C (25°C) | Leakage current**<br>@ 230VAC/50Hz | Inductance<br>L | Capacitance<br>Cx Cy |      | Resistance<br>R | Input/Output<br>connections                                                         |                                                                                     |                                                                                     | Weight |
|----------------|--------------------------------|------------------------------------|-----------------|----------------------|------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------|
|                | [A]                            | [mA]                               | [mH]            | [μF]                 | [nF] | [kΩ]            |  |  |  | [g]    |
| FN 2030-1-..   | 1 (1.1)                        | 0.34                               | 20              | 0.22                 | 2.2  | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 58     |
| FN 2030-3-..   | 3 (3.4)                        | 0.52                               | 14              | 0.33                 | 3.3  | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 87     |
| FN 2030-4-..   | 4 (4.5)                        | 0.52                               | 14              | 0.33                 | 3.3  | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 92     |
| FN 2030-6-..   | 6 (6.7)                        | 0.73                               | 8               | 0.47                 | 4.7  | 680             | -06                                                                                 | -07                                                                                 |                                                                                     | 100    |
| FN 2030-8-..   | 8 (8.9)                        | 0.73                               | 8               | 0.47                 | 4.7  | 680             | -06                                                                                 | -07                                                                                 |                                                                                     | 170    |
| FN 2030-10-..  | 10 (11.2)                      | 0.73                               | 8               | 0.47                 | 4.7  | 680             | -06                                                                                 | -07                                                                                 |                                                                                     | 196    |
| FN 2030-12-..  | 12 (13.4)                      | 0.87                               | 4               | 1.0                  | 10   | 330             | -06                                                                                 | -07                                                                                 |                                                                                     | 185    |
| FN 2030-16-..  | 16 (17.9)                      | 0.87                               | 4               | 1.0                  | 10   | 330             | -06                                                                                 | -07                                                                                 |                                                                                     | 225    |
| FN 2030-20-..  | 20 (22.4)                      | 0.87                               | 4               | 1.0                  | 10   | 330             | -06                                                                                 |                                                                                     | -08                                                                                 | 285    |
| FN 2030-30-08  | 30 (33.5)                      | 0.87                               | 2               | 1.0                  | 10   | 330             |                                                                                     |                                                                                     | -08                                                                                 | 326    |
|                |                                |                                    |                 |                      |      |                 |                                                                                     |                                                                                     |                                                                                     |        |
| FN 2030A-1-..  | 1 (1.1)                        | 0.074                              | 20              | 0.22                 | 0.47 | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 58     |
| FN 2030A-3-..  | 3 (3.4)                        | 0.074                              | 14              | 0.33                 | 0.47 | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 87     |
| FN 2030A-4-..  | 4 (4.5)                        | 0.074                              | 14              | 0.33                 | 0.47 | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 92     |
| FN 2030A-6-..  | 6 (6.7)                        | 0.074                              | 8               | 0.47                 | 0.47 | 680             | -06                                                                                 | -07                                                                                 |                                                                                     | 100    |
| FN 2030A-8-..  | 8 (8.9)                        | 0.074                              | 8               | 0.47                 | 0.47 | 680             | -06                                                                                 | -07                                                                                 |                                                                                     | 170    |
| FN 2030A-10-.. | 10 (11.2)                      | 0.074                              | 8               | 0.47                 | 0.47 | 680             | -06                                                                                 | -07                                                                                 |                                                                                     | 196    |
| FN 2030A-12-.. | 12 (13.4)                      | 0.074                              | 4               | 1.0                  | 0.47 | 330             | -06                                                                                 | -07                                                                                 |                                                                                     | 185    |
| FN 2030A-16-.. | 16 (17.9)                      | 0.074                              | 4               | 1.0                  | 0.47 | 330             | -06                                                                                 | -07                                                                                 |                                                                                     | 225    |
| FN 2030A-20-.. | 20 (22.4)                      | 0.074                              | 4               | 1.0                  | 0.47 | 330             | -06                                                                                 |                                                                                     | -08                                                                                 | 285    |
| FN 2030A-30-08 | 30 (33.5)                      | 0.074                              | 2               | 1.0                  | 0.47 | 330             |                                                                                     |                                                                                     | -08                                                                                 | 326    |
|                |                                |                                    |                 |                      |      |                 |                                                                                     |                                                                                     |                                                                                     |        |
| FN 2030B-1-..  | 1 (1.1)                        | 0.002                              | 20              | 0.22                 |      | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 58     |
| FN 2030B-3-..  | 3 (3.4)                        | 0.002                              | 14              | 0.33                 |      | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 87     |
| FN 2030B-4-..  | 4 (4.5)                        | 0.002                              | 14              | 0.33                 |      | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 92     |
| FN 2030B-6-..  | 6 (6.7)                        | 0.002                              | 8               | 0.47                 |      | 680             | -06                                                                                 | -07                                                                                 |                                                                                     | 100    |
| FN 2030B-8-..  | 8 (8.9)                        | 0.002                              | 8               | 0.47                 |      | 680             | -06                                                                                 | -07                                                                                 |                                                                                     | 170    |
| FN 2030B-10-.. | 10 (11.2)                      | 0.002                              | 8               | 0.47                 |      | 680             | -06                                                                                 | -07                                                                                 |                                                                                     | 196    |
| FN 2030B-12-.. | 12 (13.4)                      | 0.002                              | 4               | 1.0                  |      | 330             | -06                                                                                 | -07                                                                                 |                                                                                     | 185    |
| FN 2030B-16-.. | 16 (17.9)                      | 0.002                              | 4               | 1.0                  |      | 330             | -06                                                                                 | -07                                                                                 |                                                                                     | 225    |
| FN 2030B-20-.. | 20 (22.4)                      | 0.002                              | 4               | 1.0                  |      | 330             | -06                                                                                 |                                                                                     | -08                                                                                 | 285    |
| FN 2030B-30-08 | 30 (33.5)                      | 0.002                              | 2               | 1.0                  |      | 330             |                                                                                     |                                                                                     | -08                                                                                 | 326    |

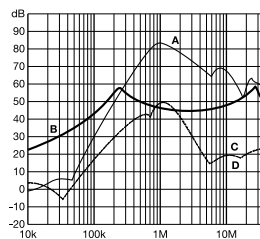
\* To compile a complete part number, please replace the -.. with the required I/O connection style. For surge pulse protection, please add Z (e.g. FN 2030Z-10-06, FN 2030BZ-20-08).

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

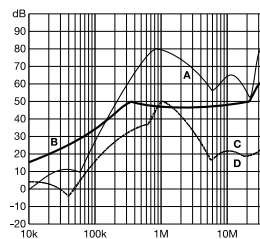
### Typical filter attenuation

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

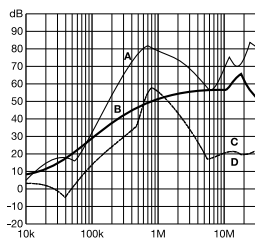
1 to 4A types



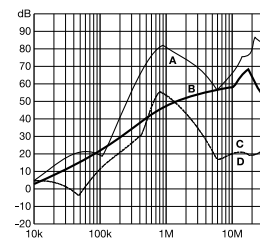
6 to 10A types



12 to 20A types

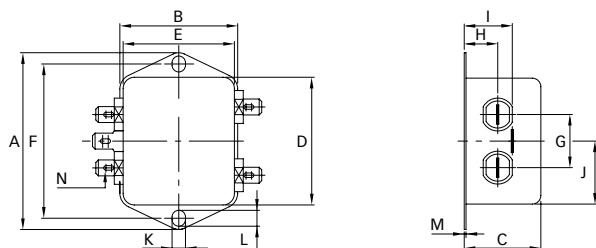


30A types

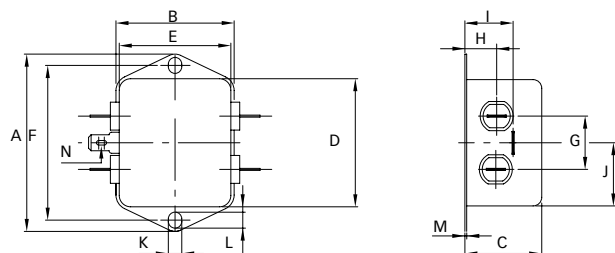


**Mechanical data**

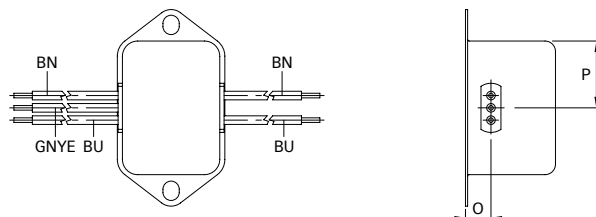
Connection style -06, 1A types



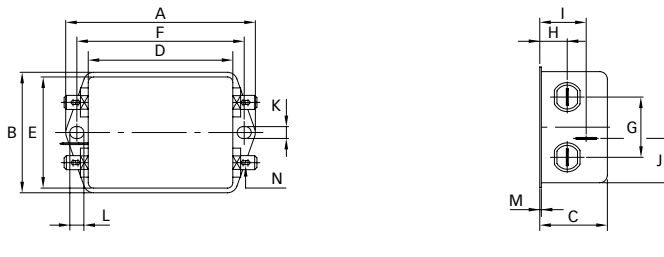
Connection style -06, 3 to 6A types



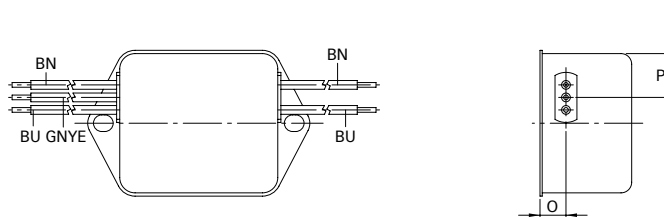
Connection style -07, 1 to 6A types (same dimensions as style -06)



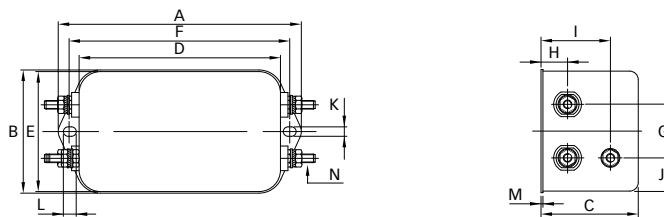
Connection style -06, 8 to 20A types



Connection style -07, 8 to 16A types (same dimensions as style -06)



Connection style -08, 20 and 30A types

**Dimensions**

|          | 1A   | 3A    | 4A    | 6A    | 8A   | 10A  | 12A  | 16A  | 20A  | 30A  | Tolerances |
|----------|------|-------|-------|-------|------|------|------|------|------|------|------------|
| <b>A</b> | 64   | 71    | 71    | 71    | 85   | 85   | 85   | 85   | 85   | 85   | ±0.5       |
| <b>B</b> | 35   | 46.6  | 46.6  | 46.6  | 54   | 54   | 54   | 54   | 54   | 54   | ±0.5       |
| <b>C</b> | 24.3 | 22.3  | 22.3  | 22.3  | 30.3 | 30.3 | 30.3 | 40.3 | 40.3 | 40.3 | ±0.5       |
| <b>D</b> | 43.5 | 50.5  | 50.5  | 50.5  | 64.8 | 64.8 | 64.8 | 64.8 | 64.8 | 64.8 | ±0.5       |
| <b>E</b> | 32.5 | 44.5  | 44.5  | 44.5  | 49.8 | 49.8 | 49.8 | 49.8 | 49.8 | 49.8 | ±0.5       |
| <b>F</b> | 54   | 61    | 61    | 61    | 75   | 75   | 75   | 75   | 75   | 75   | ±0.3       |
| <b>G</b> | 21   | 21    | 21    | 21    | 27   | 27   | 27   | 27   | 27   | 27   | ±0.2       |
| <b>H</b> | 9.3  | 10.8  | 10.8  | 10.8  | 12.3 | 12.3 | 12.3 | 12.3 | 12.3 | 12.3 | ±0.5       |
| <b>I</b> | 15.3 | 16.8  | 16.8  | 16.8  | 20.8 | 20.8 | 20.8 | 29.8 | 29.8 | 29.8 | ±0.5       |
| <b>J</b> | 21.8 | 25.25 | 25.25 | 25.25 | 19.9 | 19.9 | 19.9 | 11.4 | 11.4 | 11.4 | ±0.5       |
| <b>K</b> | 5.3  | 5.3   | 5.3   | 5.3   | 5.3  | 5.3  | 5.3  | 5.3  | 5.3  | 5.3  |            |
| <b>L</b> | 6.3  | 6.3   | 6.3   | 6.3   | 6.3  | 6.3  | 6.3  | 6.3  | 6.3  | 6.3  |            |
| <b>M</b> | 0.7  | 0.7   | 0.7   | 0.7   | 0.7  | 0.7  | 0.7  | 0.7  | 0.7  | 0.7  |            |

**Connection style -06**

|          |           |           |           |           |           |           |           |           |           |  |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|
| <b>N</b> | 6.3 x 0.8 | 6.3 x 0.8 | 6.3 x 0.8 | 6.3 x 0.8 | 6.3 x 0.8 | 6.3 x 0.8 | 6.3 x 0.8 | 6.3 x 0.8 | 6.3 x 0.8 |  |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|

**Connection style -07**

|          |     |     |     |     |     |     |     |     |  |      |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|--|------|
| <b>O</b> | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 |  | ±0.5 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|--|------|

|          |      |    |    |    |      |      |      |      |  |      |
|----------|------|----|----|----|------|------|------|------|--|------|
| <b>P</b> | 21.8 | 14 | 14 | 14 | 14.9 | 14.9 | 14.9 | 14.9 |  | ±0.5 |
|----------|------|----|----|----|------|------|------|------|--|------|

|                      |        |        |        |        |        |        |        |        |  |  |
|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--|--|
| <b>AWG type wire</b> | AWG 20 | AWG 20 | AWG 20 | AWG 18 | AWG 18 | AWG 18 | AWG 16 | AWG 16 |  |  |
|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--|--|

|                    |     |     |     |     |     |     |     |     |  |  |
|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| <b>Wire length</b> | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 |  |  |
|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|--|--|

**Connection style -08**

|          |  |  |  |  |  |  |  |    |    |  |
|----------|--|--|--|--|--|--|--|----|----|--|
| <b>N</b> |  |  |  |  |  |  |  | M4 | M4 |  |
|----------|--|--|--|--|--|--|--|----|----|--|

All dimensions in mm; 1 inch = 25.4mm

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

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**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

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**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, Kamiyuma, 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