

# General Purpose EMI Filter with High Attenuation Performance



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

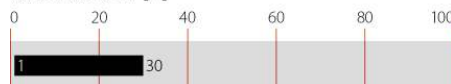


## Performance indicators

Attenuation performance



Rated current [A]



## Approvals



## 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

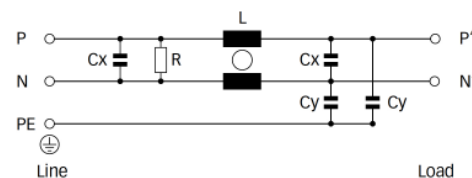
## Technical specifications

|                                                  |                                                                                                               |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Operating voltage</b>                         | 110/250 VAC, 50/60 Hz                                                                                         |
| <b>Operating frequency</b>                       | dc to 400 Hz                                                                                                  |
| <b>Rated currents</b>                            | 1 to 30 A @ 40 °C max.                                                                                        |
| <b>High potential test voltage</b>               | P → PE 2000 VAC for 2 sec (standard types)<br>P → N 1100 VDC for 2 sec<br>P → PE 2500 VAC for 2 sec (B types) |
| <b>Temperature range (operation and storage)</b> | -25 °C to +100 °C (25/100/21)                                                                                 |
| <b>Design corresponding to</b>                   | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939                                                                    |
| <b>Flammability corresponding to</b>             | UL 94 V-2 or better                                                                                           |
| <b>Surge pulse protection (optional)</b>         | 2kV, IEC 61000-4-5                                                                                            |
| <b>MTBF @ 40°C/230V (Mil-HB-217F)</b>            | 2,200,000 hours (1 to 10 A types)<br>1,200,000 hours (12 to 30 A types)                                       |

## Typical application

- 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

## Typical electrical schematic



## Filter selection table

| Filter*        | Rated current<br>@ 40 °C (25 °C) | Leakage current**<br>@ 230 VAC/50 Hz | Inductance<br>L | Capacitance            |                        | Resistance<br>R | Input/Output<br>connections                                                         |                                                                                     |                                                                                     | Weight |
|----------------|----------------------------------|--------------------------------------|-----------------|------------------------|------------------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------|
|                | [A]                              | [mA]                                 | [mH]            | C <sub>x</sub><br>[μF] | C <sub>y</sub><br>[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                                | 8.45            | 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    |

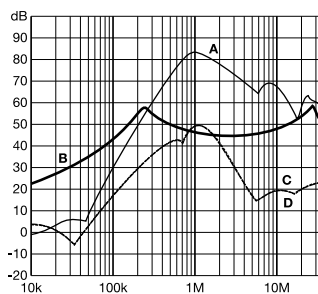
\* To compile a complete part number, please replace the -.. with the required I/O connection style. For surge pulse protection, please add Z (e.g. FN 2030Z-10-06, FN 2030BZ-20-08).

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

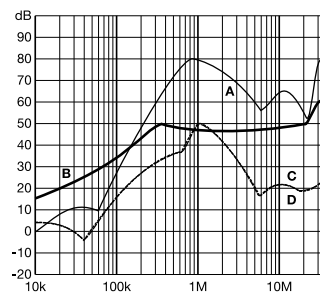
## Typical filter attenuation

Per CISPR 17; A = 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

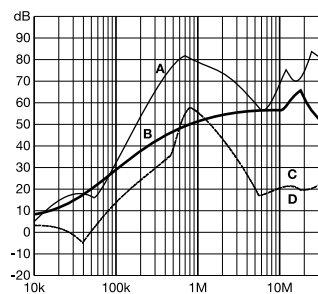
1 to 4 A types



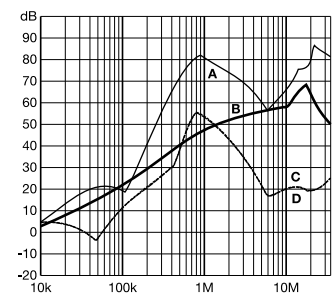
6 to 10 A types



12 to 20 A types

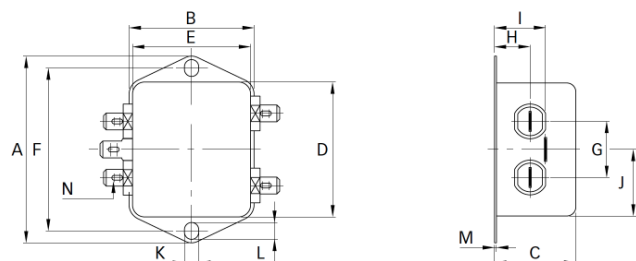


30 A types

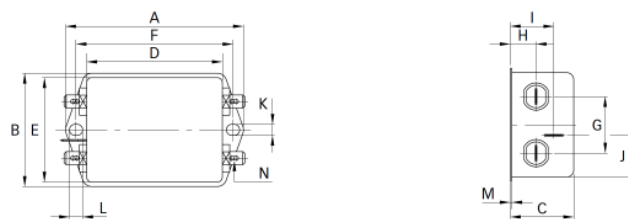


## Mechanical data

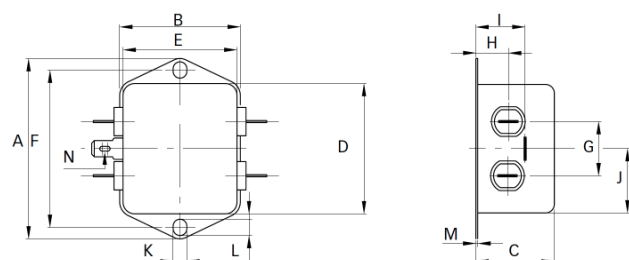
Connection style -06, 1 A types



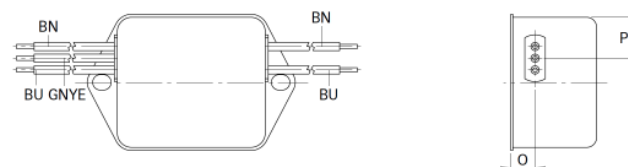
Connection style -06, 8 to 20 A types



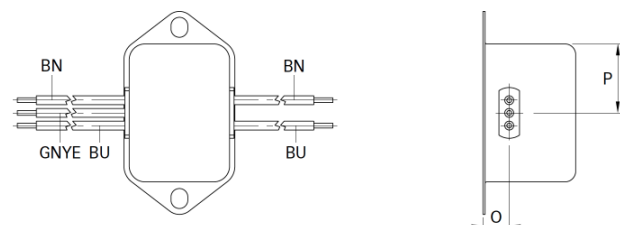
Connection style -06, 3 to 6 A types



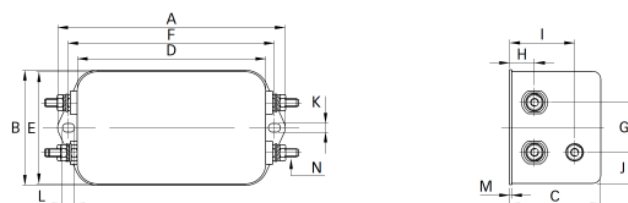
Connection style -07, 8 to 16 A types (same dimensions as style -06)



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



Connection style -08, 20 and 30 A types



## Dimensions

|                             | 1 A       | 3 A       | 4 A       | 6 A       | 8 A       | 10 A      | 12 A      | 16 A      | 20 A      | 30 A | 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  |            |
|                             |           |           |           |           |           |           |           |           |           |      |            |
| <b>Connection style -06</b> |           |           |           |           |           |           |           |           |           |      |            |
| <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 |      |            |
| <b>Connection style -07</b> |           |           |           |           |           |           |           |           |           |      |            |
| <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       |           |      |            |
| <b>Connection style -08</b> |           |           |           |           |           |           |           |           |           |      |            |
| <b>N</b>                    |           |           |           |           |           |           |           |           | M4        | M4   |            |

All dimensions in mm; 1 inch = 25.4 mm  
Tolerances according: ISO 2768-m / EN 22768-m



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