

# General Purpose AC/DC 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 enhanced performance versions
- Optional overvoltage protection (Z type)

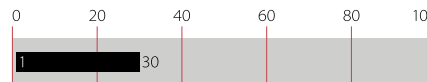


### Performance indicators

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
- FN 2030 filters offer an optimized filter range for high performance AC and DC applications, in same compact size (M, N1 types)
- 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 (Z type).
- Various terminal options allow you to select the desired connection style

### Technical specifications

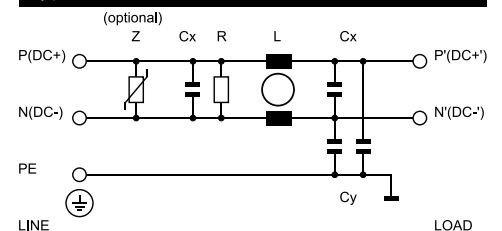
|  |   |
|--|---|
| <b>Rated voltage*</b>                            | 250 VAC, 50/60 Hz; 250 VDC  |
| <b>Operating frequency</b>                       | DC to 400 Hz  |
| <b>Rated currents</b>                            | 1 to 30 A @ 40°C max.   |
| <b>High potential test voltage</b>               | P → PE 2000 VAC for 2 sec (equiv. cap <88 nF)<br>P → PE 2550 VDC for 2 sec (equiv. cap >88 nF)<br>P → PE 2500 VAC for 2 sec (B types)<br>P → N 1100 VDC for 2 sec |
| <b>Temperature range (operation and storage)</b> | -25°C to +100°C (25/100/21)   |
| <b>Certified to</b>                              | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939 (applies to AC and DC applications)  |
| <b>Flammability corresponding to</b>             | UL 94 V-2 or better   |
| <b>Surge pulse protection (Z type)</b>           | Helps compliance to IEC61000-4-5 (Differential Mode only)   |
| <b>MTBF @ 40°C/230 V (Mil-HB-217F)</b>           | 2,200,000 hours (1 to 10 A types)<br>1,200,000 hours (12 to 30 A types)   |

\*maximum RMS operating voltage at rated frequency or the maximum DC operating voltage




### 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>@ 250 VAC/50 Hz<br>(@ 120 VAC/60 Hz) | Inductance<br>L | Capacitance |      | Resistance<br>R | Input/Output<br>connections   |   |   | Weight |
|-----------------------------|--------------------------------|---|-----------------|-------------|------|-----------------|---|---|---|--------|
|                             |                                |   |                 | Cx          | Cy   |                 |  |  |  |        |
|                             | [A]                            | [mA]  | [mH]            | [µF]        | [nF] | [kΩ]            |   |   |   | [g]    |
| <b>FN 2030-1-..</b>         | 1 (1.1)                        | 0.31 (0.18)   | 20              | 0.22        | 2.2  | 1000            | -06   | -07   |   | 58     |
| <b>FN 2030-3-..</b>         | 3 (3.4)                        | 0.47 (0.27)   | 14              | 0.33        | 3.3  | 1000            | -06   | -07   |   | 87     |
| <b>FN 2030-4-..</b>         | 4 (4.5)                        | 0.47 (0.27)   | 14              | 0.33        | 3.3  | 1000            | -06   | -07   |   | 92     |
| <b>FN 2030-6-..</b>         | 6 (6.7)                        | 0.66 (0.38)   | 8               | 0.47        | 4.7  | 680             | -06   | -07   |   | 100    |
| <b>FN 2030-8-..</b>         | 8 (8.9)                        | 0.66 (0.38)   | 8               | 0.47        | 4.7  | 680             | -06   | -07   |   | 170    |
| <b>FN 2030-10-..</b>        | 10 (11.2)                      | 0.66 (0.38)   | 8               | 0.47        | 4.7  | 680             | -06   | -07   |   | 196    |
| <b>FN 2030-12-..</b>        | 12 (13.4)                      | 0.79 (0.45)   | 4               | 1.0         | 10   | 330             | -06   | -07   |   | 185    |
| <b>FN 2030-16-..</b>        | 16 (17.9)                      | 0.79 (0.45)   | 4               | 1.0         | 10   | 330             | -06   | -07   |   | 225    |
| <b>FN 2030-20-..</b>        | 20 (22.4)                      | 0.79 (0.45)   | 4               | 1.0         | 10   | 330             | -06   |   | -08   | 285    |
| <b>FN 2030-30-08</b>        | 30 (33.5)                      | 0.79 (0.45)   | 2               | 1.0         | 10   | 330             |   |   | -08   | 326    |
| <b>FN 2030 A-1-..</b>       | 1 (1.1)                        | 0.07 (0.04)   | 20              | 0.22        | 0.47 | 1000            | -06   | -07   |   | 58     |
| <b>FN 2030 A-3-..</b>       | 3 (3.4)                        | 0.07 (0.04)   | 14              | 0.33        | 0.47 | 1000            | -06   | -07   |   | 87     |
| <b>FN 2030 A-4-..</b>       | 4 (4.5)                        | 0.07 (0.04)   | 14              | 0.33        | 0.47 | 1000            | -06   | -07   |   | 92     |
| <b>FN 2030 A-6-..</b>       | 6 (6.7)                        | 0.07 (0.04)   | 8               | 0.47        | 0.47 | 680             | -06   | -07   |   | 100    |
| <b>FN 2030 A-8-..</b>       | 8 (8.9)                        | 0.07 (0.04)   | 8               | 0.47        | 0.47 | 680             | -06   | -07   |   | 170    |
| <b>FN 2030 A-10-..</b>      | 10 (11.2)                      | 0.07 (0.04)   | 8               | 0.47        | 0.47 | 680             | -06   | -07   |   | 196    |
| <b>FN 2030 A-12-..</b>      | 12 (13.4)                      | 0.07 (0.04)   | 4               | 1.0         | 0.47 | 330             | -06   | -07   |   | 185    |
| <b>FN 2030 A-16-..</b>      | 16 (17.9)                      | 0.07 (0.04)   | 4               | 1.0         | 0.47 | 330             | -06   | -07   |   | 225    |
| <b>FN 2030 A-20-..</b>      | 20 (22.4)                      | 0.07 (0.04)   | 4               | 1.0         | 0.47 | 330             | -06   |   | -08   | 285    |
| <b>FN 2030 A-30-08</b>      | 30 (33.5)                      | 0.07 (0.04)   | 2               | 1.0         | 0.47 | 330             |   |   | -08   | 326    |
| <b>FN 2030 B-1-..</b>       | 1 (1.1)                        | 0.00  | 20              | 0.22        |      | 1000            | -06   | -07   |   | 58     |
| <b>FN 2030 B-3-..</b>       | 3 (3.4)                        | 0.00  | 14              | 0.33        |      | 1000            | -06   | -07   |   | 87     |
| <b>FN 2030 B-4-..</b>       | 4 (4.5)                        | 0.00  | 14              | 0.33        |      | 1000            | -06   | -07   |   | 92     |
| <b>FN 2030 B-6-..</b>       | 6 (6.7)                        | 0.00  | 8               | 0.47        |      | 680             | -06   | -07   |   | 100    |
| <b>FN 2030 B-8-..</b>       | 8 (8.9)                        | 0.00  | 8               | 0.47        |      | 680             | -06   | -07   |   | 170    |
| <b>FN 2030 B-10-..</b>      | 10 (11.2)                      | 0.00  | 8.45            | 0.47        |      | 680             | -06   | -07   |   | 196    |
| <b>FN 2030 B-12-..</b>      | 12 (13.4)                      | 0.00  | 4               | 1.0         |      | 330             | -06   | -07   |   | 185    |
| <b>FN 2030 B-16-..</b>      | 16 (17.9)                      | 0.00  | 4               | 1.0         |      | 330             | -06   | -07   |   | 225    |
| <b>FN 2030 B-20-..</b>      | 20 (22.4)                      | 0.00  | 4               | 1.0         |      | 330             | -06   |   | -08   | 285    |
| <b>FN 2030 B-30-08</b>      | 30 (33.5)                      | 0.00  | 2               | 1.0         |      | 330             |   |   | -08   | 326    |
| <b>Enhanced performance</b> |                                |   |                 |             |      |                 |   |   |   |        |
| <b>FN 2030 N1-1-06</b>      | 1 (1.1)                        | 5.34 (3.08)   | 20              | 0.22        | 68   | 1000            | -06   |   |   | 65     |
| <b>FN 2030 M-3-06</b>       | 3 (3.4)                        | 3.69 (2.28)   | 14              | 0.33        | 47   | 1000            | -06   |   |   | 110    |
| <b>FN 2030 M-4-06</b>       | 4 (4.5)                        | 3.69 (2.28)   | 14              | 0.33        | 47   | 1000            | -06   |   |   | 110    |
| <b>FN 2030 M-6-06</b>       | 6 (6.7)                        | 3.69 (2.28)   | 8               | 0.47        | 47   | 680             | -06   |   |   | 120    |
| <b>FN 2030 N1-8-06</b>      | 8 (8.9)                        | 5.34 (3.08)   | 8               | 0.47        | 68   | 3680            | -06   |   |   | 200    |
| <b>FN 2030 N1-10-06</b>     | 10 (11.2)                      | 5.34 (3.08)   | 8               | 0.47        | 68   | 680             | -06   |   |   | 200    |
| <b>FN 2030 N1-12-06</b>     | 12 (13.4)                      | 5.34 (3.08)   | 4               | 1.0         | 68   | 330             | -06   |   |   | 210    |
| <b>FN 2030 M-16-06</b>      | 16 (17.9)                      | 3.69 (2.28)   | 4               | 1.0         | 47   | 330             | -06   |   |   | 265    |
| <b>FN 2030 M-20-..</b>      | 20 (22.4)                      | 3.69 (2.28)   | 4               | 1.0         | 47   | 330             | -06   |   | -08   | 326    |
| <b>FN 2030 M-30-08</b>      | 30 (33.5)                      | 3.69 (2.28)   | 2               | 1.0         | 47   | 330             |   |   | -08   | 346    |

\* 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). The different letters code the used Cy values in the filter type (A = 0.47nF; M = 47nF; N1 = 47nF)

\*\* Maximum leakage under usual AC operating conditions (acc. IEC60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level. Leakage current for DC application is 0 mA

## Typical filter attenuation

Per CISPR 17; A=50 Ω/50 Ω sym; B=50 Ω/50 Ω asym

### Standard Types

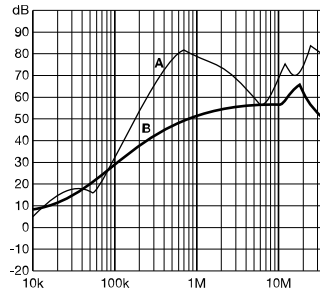
1 to 4 A types



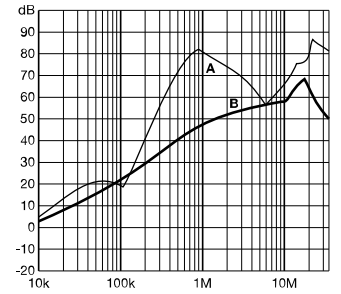
6 to 10 A types



12 to 20 A types



30 A types



### Enhanced Performance Types

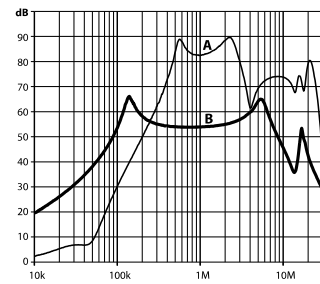
1 A types



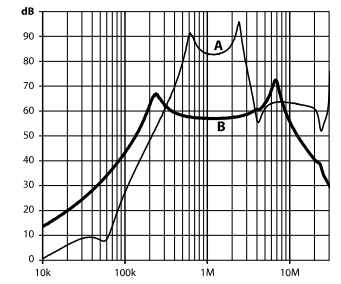
3 A types



4 A types



6 A types



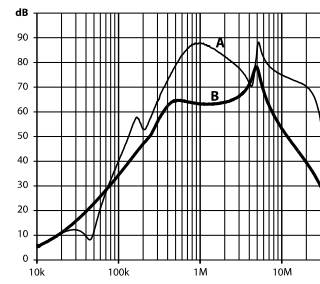
8 A types



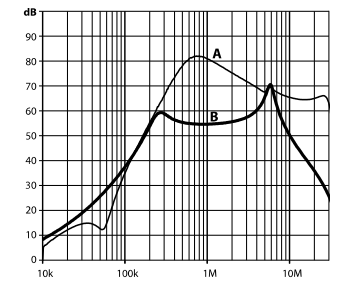
10 A types



12 A types



16 A types



20 A types

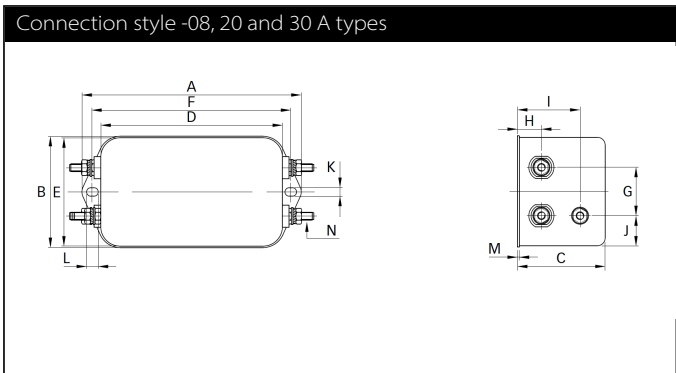
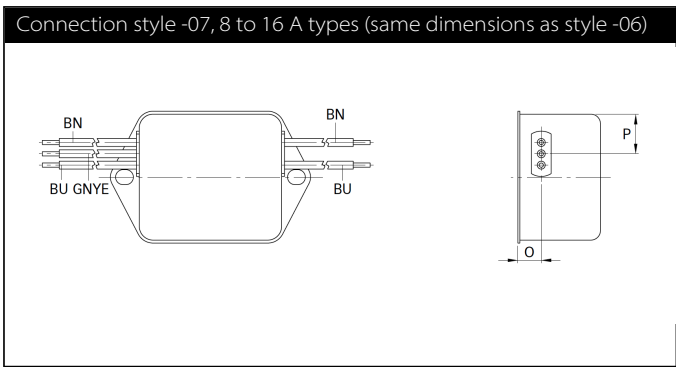
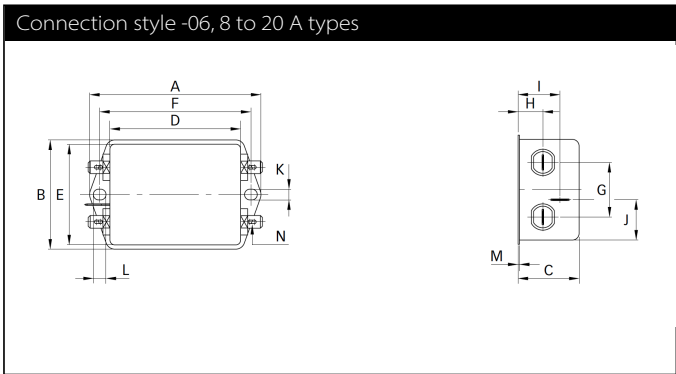


30 A types



| Product selector |         |                                       |
|------------------|---------|---------------------------------------|
| FN 2030-xy-xx-yy |         |                                       |
|                  | 06      | Faston 6.3 x 0.8 mm (spade/soldering) |
|                  | 07      | Wire leads                            |
|                  | 08      | Studs (M4 screws)                     |
|                  | 1 to 60 | Rated current                         |
|                  | Blank   | Standard version                      |
|                  | Z       | With surge protection                 |
|                  | Blank   | Standard version                      |
|                  | A       | Safety version                        |
|                  | B       | Medical version                       |
|                  | N1/M    | High performance version              |

**Mechanical data**



## 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 | 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       | 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       |           |           | +5         |
| <b>Connection style -08</b>    |           |           |           |           |           |           |           |           |           |           |            |
| <b>N</b>                       |           |           |           |           |           |           |           |           | M4        | M4        |            |
| <b>Recommended torque (Nm)</b> |           |           |           |           |           |           |           |           | 1.2 - 1.3 | 1.2 - 1.3 |            |

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



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Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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