

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

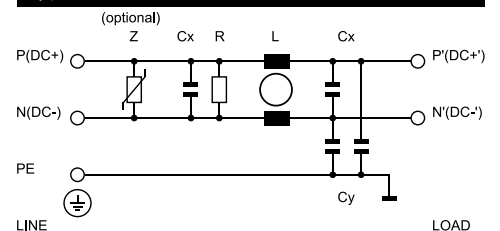
| | |
|--|---|
| Rated voltage* | 250 VAC, 50/60 Hz; 250 VDC |
| Operating frequency | DC to 400 Hz |
| Rated currents | 1 to 30 A @ 40°C max. |
| High potential test voltage | P → PE 2000 VAC for 2 sec (equiv. cap <88 nF) P → PE 2550 VDC for 2 sec (equiv. cap >88 nF) P → PE 2500 VAC for 2 sec (B types) P → N 1100 VDC for 2 sec |
| Temperature range (operation and storage) | -25°C to +100°C (25/100/21) |
| Certified to | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939 (applies to AC and DC applications) |
| Flammability corresponding to | UL 94 V-2 or better |
| Surge pulse protection (Z type) | Helps compliance to IEC61000-4-5 (Differential Mode only) |
| MTBF @ 40°C/230 V (Mil-HB-217F) | 2,200,000 hours (1 to 10 A types) 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 @ 40°C (25°C) | Leakage current** @ 250 VAC/50 Hz (@ 120 VAC/60 Hz) | Inductance L | Capacitance | | Resistance R | Input/Output connections | | | Weight |
|-----------------------------|--------------------------------|---|-----------------|-------------|------|-----------------|---|---|---|--------|
| | | | | Cx | Cy | |  |  |  | |
| | [A] | [mA] | [mH] | [µF] | [nF] | [kΩ] | | | | [g] |
| FN 2030-1-.. | 1 (1.1) | 0.31 (0.18) | 20 | 0.22 | 2.2 | 1000 | -06 | -07 | | 58 |
| FN 2030-3-.. | 3 (3.4) | 0.47 (0.27) | 14 | 0.33 | 3.3 | 1000 | -06 | -07 | | 87 |
| FN 2030-4-.. | 4 (4.5) | 0.47 (0.27) | 14 | 0.33 | 3.3 | 1000 | -06 | -07 | | 92 |
| FN 2030-6-.. | 6 (6.7) | 0.66 (0.38) | 8 | 0.47 | 4.7 | 680 | -06 | -07 | | 100 |
| FN 2030-8-.. | 8 (8.9) | 0.66 (0.38) | 8 | 0.47 | 4.7 | 680 | -06 | -07 | | 170 |
| FN 2030-10-.. | 10 (11.2) | 0.66 (0.38) | 8 | 0.47 | 4.7 | 680 | -06 | -07 | | 196 |
| FN 2030-12-.. | 12 (13.4) | 0.79 (0.45) | 4 | 1.0 | 10 | 330 | -06 | -07 | | 185 |
| FN 2030-16-.. | 16 (17.9) | 0.79 (0.45) | 4 | 1.0 | 10 | 330 | -06 | -07 | | 225 |
| FN 2030-20-.. | 20 (22.4) | 0.79 (0.45) | 4 | 1.0 | 10 | 330 | -06 | | -08 | 285 |
| FN 2030-30-08 | 30 (33.5) | 0.79 (0.45) | 2 | 1.0 | 10 | 330 | | | -08 | 326 |
| FN 2030 A-1-.. | 1 (1.1) | 0.07 (0.04) | 20 | 0.22 | 0.47 | 1000 | -06 | -07 | | 58 |
| FN 2030 A-3-.. | 3 (3.4) | 0.07 (0.04) | 14 | 0.33 | 0.47 | 1000 | -06 | -07 | | 87 |
| FN 2030 A-4-.. | 4 (4.5) | 0.07 (0.04) | 14 | 0.33 | 0.47 | 1000 | -06 | -07 | | 92 |
| FN 2030 A-6-.. | 6 (6.7) | 0.07 (0.04) | 8 | 0.47 | 0.47 | 680 | -06 | -07 | | 100 |
| FN 2030 A-8-.. | 8 (8.9) | 0.07 (0.04) | 8 | 0.47 | 0.47 | 680 | -06 | -07 | | 170 |
| FN 2030 A-10-.. | 10 (11.2) | 0.07 (0.04) | 8 | 0.47 | 0.47 | 680 | -06 | -07 | | 196 |
| FN 2030 A-12-.. | 12 (13.4) | 0.07 (0.04) | 4 | 1.0 | 0.47 | 330 | -06 | -07 | | 185 |
| FN 2030 A-16-.. | 16 (17.9) | 0.07 (0.04) | 4 | 1.0 | 0.47 | 330 | -06 | -07 | | 225 |
| FN 2030 A-20-.. | 20 (22.4) | 0.07 (0.04) | 4 | 1.0 | 0.47 | 330 | -06 | | -08 | 285 |
| FN 2030 A-30-08 | 30 (33.5) | 0.07 (0.04) | 2 | 1.0 | 0.47 | 330 | | | -08 | 326 |
| FN 2030 B-1-.. | 1 (1.1) | 0.00 | 20 | 0.22 | | 1000 | -06 | -07 | | 58 |
| FN 2030 B-3-.. | 3 (3.4) | 0.00 | 14 | 0.33 | | 1000 | -06 | -07 | | 87 |
| FN 2030 B-4-.. | 4 (4.5) | 0.00 | 14 | 0.33 | | 1000 | -06 | -07 | | 92 |
| FN 2030 B-6-.. | 6 (6.7) | 0.00 | 8 | 0.47 | | 680 | -06 | -07 | | 100 |
| FN 2030 B-8-.. | 8 (8.9) | 0.00 | 8 | 0.47 | | 680 | -06 | -07 | | 170 |
| FN 2030 B-10-.. | 10 (11.2) | 0.00 | 8.45 | 0.47 | | 680 | -06 | -07 | | 196 |
| FN 2030 B-12-.. | 12 (13.4) | 0.00 | 4 | 1.0 | | 330 | -06 | -07 | | 185 |
| FN 2030 B-16-.. | 16 (17.9) | 0.00 | 4 | 1.0 | | 330 | -06 | -07 | | 225 |
| FN 2030 B-20-.. | 20 (22.4) | 0.00 | 4 | 1.0 | | 330 | -06 | | -08 | 285 |
| FN 2030 B-30-08 | 30 (33.5) | 0.00 | 2 | 1.0 | | 330 | | | -08 | 326 |
| Enhanced performance | | | | | | | | | | |
| FN 2030 N1-1-06 | 1 (1.1) | 5.34 (3.08) | 20 | 0.22 | 68 | 1000 | -06 | | | 65 |
| FN 2030 M-3-06 | 3 (3.4) | 3.69 (2.28) | 14 | 0.33 | 47 | 1000 | -06 | | | 110 |
| FN 2030 M-4-06 | 4 (4.5) | 3.69 (2.28) | 14 | 0.33 | 47 | 1000 | -06 | | | 110 |
| FN 2030 M-6-06 | 6 (6.7) | 3.69 (2.28) | 8 | 0.47 | 47 | 680 | -06 | | | 120 |
| FN 2030 N1-8-06 | 8 (8.9) | 5.34 (3.08) | 8 | 0.47 | 68 | 3680 | -06 | | | 200 |
| FN 2030 N1-10-06 | 10 (11.2) | 5.34 (3.08) | 8 | 0.47 | 68 | 680 | -06 | | | 200 |
| FN 2030 N1-12-06 | 12 (13.4) | 5.34 (3.08) | 4 | 1.0 | 68 | 330 | -06 | | | 210 |
| FN 2030 M-16-06 | 16 (17.9) | 3.69 (2.28) | 4 | 1.0 | 47 | 330 | -06 | | | 265 |
| FN 2030 M-20-.. | 20 (22.4) | 3.69 (2.28) | 4 | 1.0 | 47 | 330 | -06 | | -08 | 326 |
| FN 2030 M-30-08 | 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



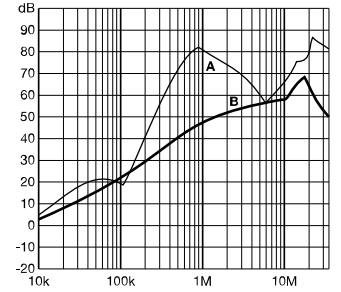
6 to 10 A types



12 to 20 A types



30 A types



Enhanced Performance Types

1 A types



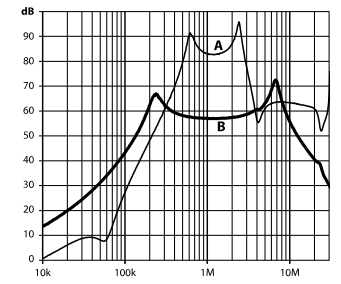
3 A types



4 A types



6 A types



8 A types



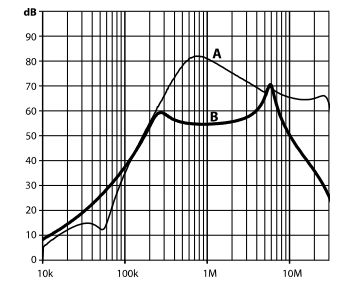
10 A types



12 A types



16 A types



20 A types

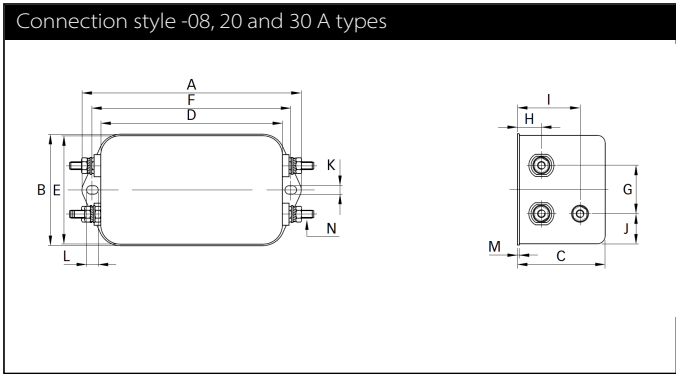
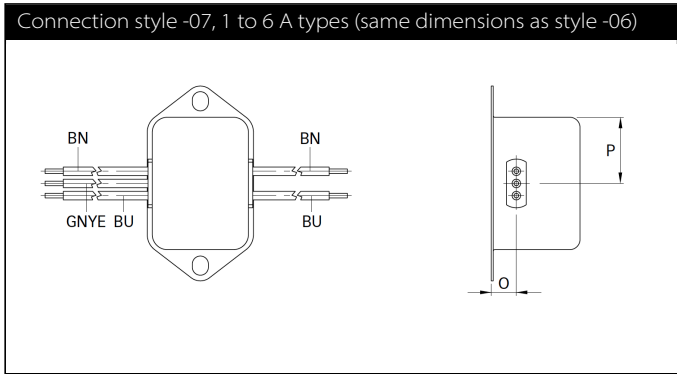
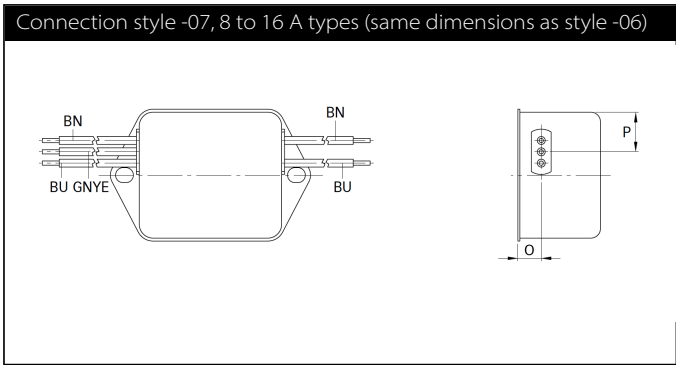
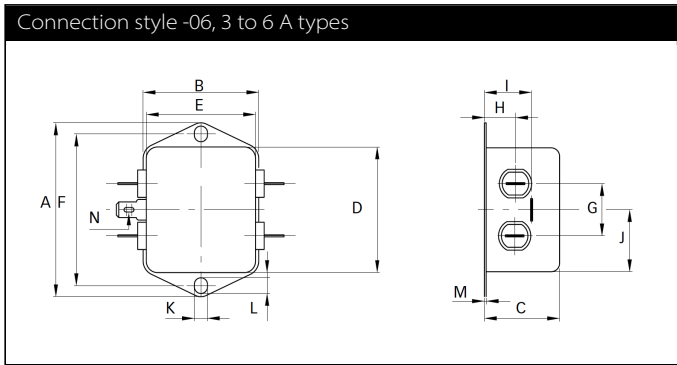
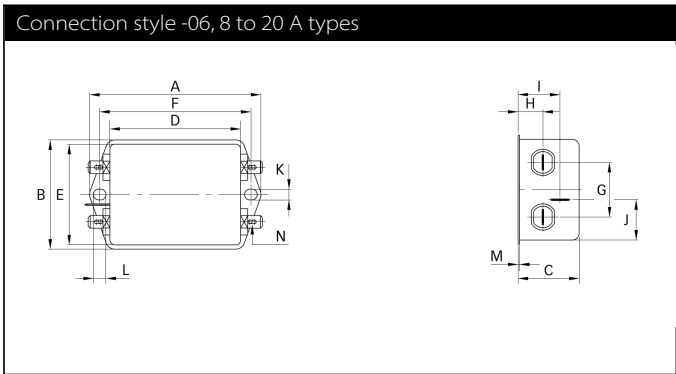


30 A types



| 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 |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| A | 64 | 71 | 71 | 71 | 85 | 85 | 85 | 85 | 85 | 85 | ±0.5 |
| B | 35 | 46.6 | 46.6 | 46.6 | 54 | 54 | 54 | 54 | 54 | 54 | ±0.5 |
| C | 24.3 | 22.3 | 22.3 | 22.3 | 30.3 | 30.3 | 30.3 | 40.3 | 40.3 | 40.3 | ±0.5 |
| D | 43.5 | 50.5 | 50.5 | 50.5 | 64.8 | 64.8 | 64.8 | 64.8 | 64.8 | 64.8 | ±0.5 |
| E | 32.5 | 44.5 | 44.5 | 44.5 | 49.8 | 49.8 | 49.8 | 49.8 | 49.8 | 49.8 | ±0.5 |
| F | 54 | 61 | 61 | 61 | 75 | 75 | 75 | 75 | 75 | 75 | ±0.3 |
| G | 21 | 21 | 21 | 21 | 27 | 27 | 27 | 27 | 27 | 27 | ±0.2 |
| H | 9.3 | 10.8 | 10.8 | 10.8 | 12.3 | 12.3 | 12.3 | 12.3 | 12.3 | 12.3 | ±0.5 |
| I | 15.3 | 16.8 | 16.8 | 16.8 | 20.8 | 20.8 | 20.8 | 29.8 | 29.8 | 29.8 | ±0.5 |
| J | 21.8 | 25.25 | 25.25 | 25.25 | 19.9 | 19.9 | 19.9 | 11.4 | 11.4 | 11.4 | ±0.5 |
| K | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | |
| L | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | |
| M | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | |
| Connection style -06 | | | | | | | | | | | |
| N | 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 | |
| Connection style -07 | | | | | | | | | | | |
| O | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | | ±0.5 |
| P | 21.8 | 14 | 14 | 14 | 14.9 | 14.9 | 14.9 | 14.9 | | | ±0.5 |
| AWG type wire | AWG 20 | AWG 20 | AWG 20 | AWG 18 | AWG 18 | AWG 18 | AWG 16 | AWG 16 | | | |
| Wire length | 140 | 140 | 140 | 140 | 140 | 140 | 140 | 140 | | | +5 |
| Connection style -08 | | | | | | | | | | | |
| N | | | | | | | | | M4 | M4 | |
| Recommended torque (Nm) | | | | | | | | | 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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