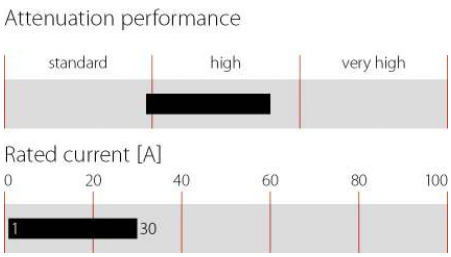
schaffner
energy efficiency and reliability

# 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




## Technical specifications

| | |
|---|---|
| **Operating voltage** | 110/250 VAC, 50/60 Hz |
| **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 (standard types)<br>P –> N 1100 VDC for 2 sec<br>P –> PE 2500 VAC for 2 sec (B types) |
| **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 94 V-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 10 A types)<br>1,200,000 hours (12 to 30 A types) |

## Approvals

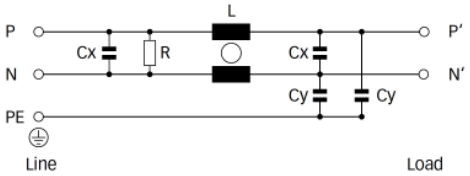
## Features and benefits

- 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

## 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

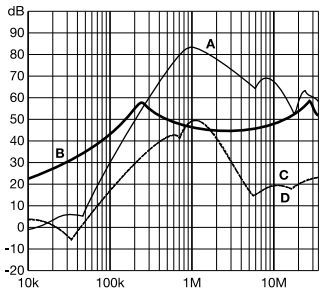
| Filter* | Rated current @ 40 °C (25 °C) | Leakage current** @ 230 VAC/50 Hz | Inductance | Capacitance | | Resistance | Input/Output connections | | | Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | Cx | Cy | R | | | | |
| | [A] | [mA] | [mH] | [µF] | [nF] | [kΩ] | | | | [g] |
| **FN 2030-1-..** | (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.

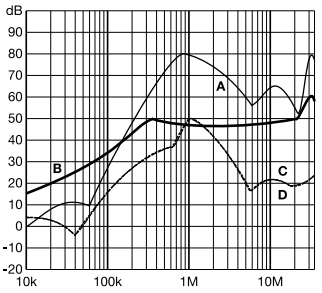
## Typical filter attenuation

Per CISPR 17; A = 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

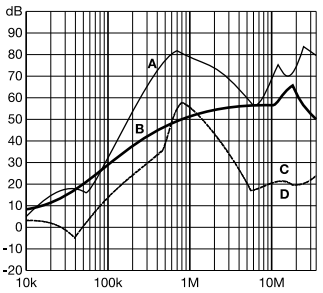
1 to 4 A types



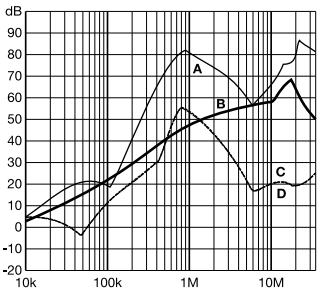

6 to 10 A types




12 to 20 A types

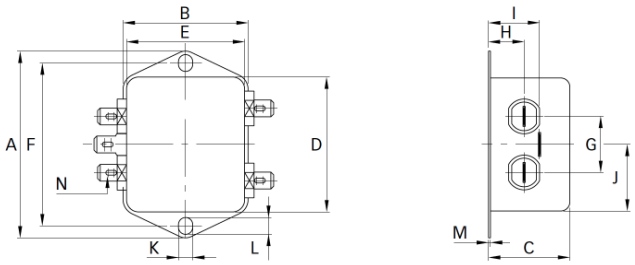



30 A types

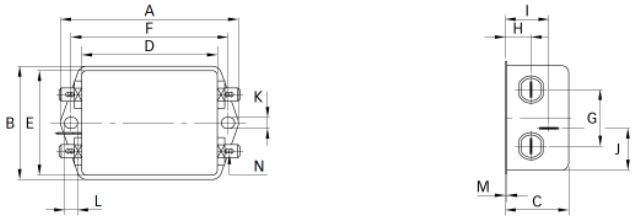


## Mechanical data

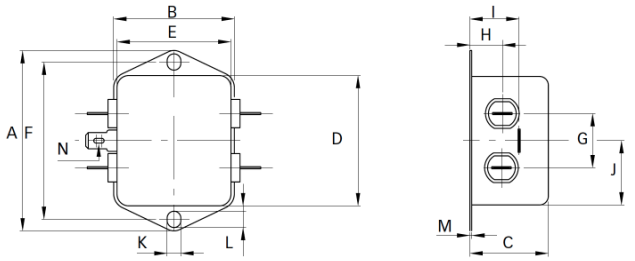
### Connection style -06, 1 A types



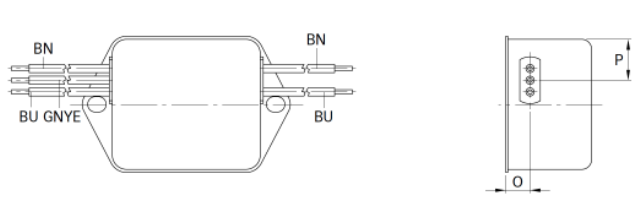

### Connection style -06, 8 to 20 A types



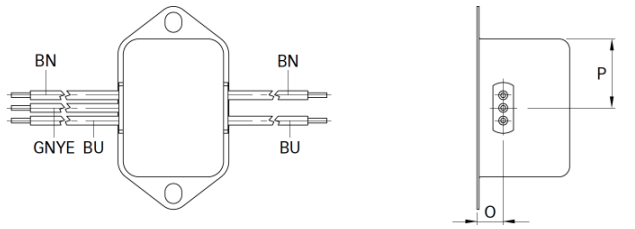

### Connection style -06, 3 to 6 A types



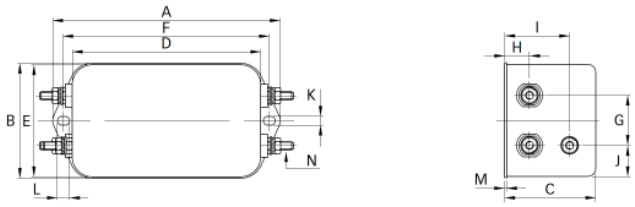

### Connection style -07, 8 to 16 A types (same dimensions as style -06)




### 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **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 | | |
| **Connection style -07** | | | | | | | | | | | |
| **O** | 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 | | | |
| **Connection style -08** | | | | | | | | | | | |
| **N** | | | | | | | | | M4 | M4 | |

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