

## Multi-stage Performance EMI Filter



- Rated currents from 1 to 36 A
- High differential and common-mode attenuation
- High frequency attenuation
- Optional medical versions (B type)
- Optional safety versions (A type)



### Performance indicators

Attenuation performance



### Technical specifications

|                                           |                                                                                              |
|-------------------------------------------|----------------------------------------------------------------------------------------------|
| Operating voltage                         | 110/250 VAC, 50/60 Hz                                                                        |
| Operating frequency                       | dc to 400 Hz                                                                                 |
| Rated currents                            | 1 to 36 A @ 40 °C max.                                                                       |
| High potential test voltage               | P → PE 2000 VAC for 2 sec<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)                                                                |
| Flammability corresponding to             | UL 94 V-2 or better                                                                          |
| Design corresponding to                   | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939                                                   |
| MTBF @ 40°C/230V (Mil-HB-217F)            | 1,550,000 hours<br>1,600,000 hours (B types)                                                 |

### Approvals



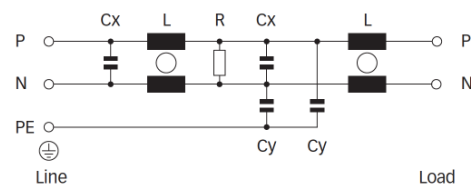
### Features and benefits

- FN 2070 two-stage filters are designed for easy and fast chassis mounting
- FN 2070 filters are also available as B versions without Y-capacitors for medical applications as well as A version with low capacitance for safety critical applications with necessity for low leakage currents
- All filters provide a high conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- FN 2070 two-stage filters are designed for high frequency attenuation
- FN 2070 filters are also available as single-stage filters (FN 2020 series)
- Various terminal options allow you to select the desired connection style

### Typical applications

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

### Typical electrical schematic



Filter selection table

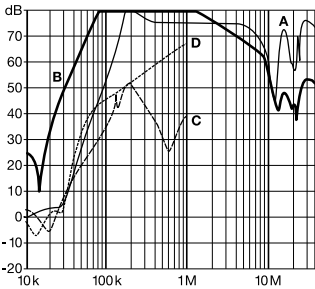
| Filter*        | Rated current<br>@ 40 °C (25 °C) | Leakage current**<br>@ 230 VAC/50 Hz | Inductance<br>L | Capacitance |            | Resistance<br>R | Input/Output<br>connections                                                         |                                                                                     |                                                                                     | Weight |
|----------------|----------------------------------|--------------------------------------|-----------------|-------------|------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------|
|                | [A]                              | [mA]                                 | [mH]            | Cx<br>[μF]  | Cy<br>[nF] | [kΩ]            |  |  |  | [g]    |
| FN 2070-1-..   | 1 (1.2)                          | 0.734                                | 22              | 0.33        | 4.7        | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 190    |
| FN 2070-3-..   | 3 (3.5)                          | 0.734                                | 9.8             | 0.47        | 4.7        | 470             | -06                                                                                 | -07                                                                                 |                                                                                     | 250    |
| FN 2070-6-..   | 6 (6.9)                          | 0.734                                | 7.8             | 1           | 4.7        | 220             | -06                                                                                 | -07                                                                                 |                                                                                     | 450    |
| FN 2070-10-..  | 10 (11.5)                        | 0.734                                | 4.5             | 1           | 4.7        | 220             | -06                                                                                 | -07                                                                                 |                                                                                     | 670    |
| FN 2070-12-..  | 12 (13.8)                        | 0.734                                | 3.25            | 1           | 4.7        | 220             | -06                                                                                 | -07                                                                                 |                                                                                     | 670    |
| FN 2070-16-..  | 16 (18.4)                        | 0.734                                | 2.8             | 1           | 4.7        | 220             | -06                                                                                 | -07                                                                                 | -08                                                                                 | 1000   |
| FN 2070-25-08  | 25 (28.8)                        | 0.734                                | 2               | 2.2         | 4.7        | 220             |                                                                                     |                                                                                     | -08                                                                                 | 760    |
| FN 2070-36-08  | 36 (41.4)                        | 0.867                                | 1.23            | 2.2         | 4.7        | 220             |                                                                                     |                                                                                     | -08                                                                                 | 790    |
| FN 2070A-1-..  | 1 (1.2)                          | 0.074                                | 22              | 0.33        | 0.47       | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 190    |
| FN 2070A-3-..  | 3 (3.5)                          | 0.074                                | 9.8             | 0.47        | 0.47       | 470             | -06                                                                                 | -07                                                                                 |                                                                                     | 250    |
| FN 2070A-6-..  | 6 (6.9)                          | 0.074                                | 7.8             | 1           | 0.47       | 220             | -06                                                                                 | -07                                                                                 |                                                                                     | 450    |
| FN 2070A-10-.. | 10 (11.5)                        | 0.074                                | 4.5             | 1           | 0.47       | 220             | -06                                                                                 | -07                                                                                 |                                                                                     | 670    |
| FN 2070A-12-.. | 12 (13.8)                        | 0.074                                | 3.25            | 1           | 0.47       | 220             | -06                                                                                 | -07                                                                                 |                                                                                     | 670    |
| FN 2070A-16-.. | 16 (18.4)                        | 0.074                                | 2.8             | 1           | 0.47       | 220             | -06                                                                                 | -07                                                                                 | -08                                                                                 | 1000   |
| FN 2070A-25-08 | 25 (28.8)                        | 0.074                                | 2               | 2.2         | 0.47       | 220             |                                                                                     |                                                                                     | -08                                                                                 | 760    |
| FN 2070A-36-08 | 36 (41.4)                        | 0.074                                | 1.23            | 2.2         | 0.47       | 220             |                                                                                     |                                                                                     | -08                                                                                 | 790    |
| FN 2070B-1-..  | 1 (1.2)                          | 0.002                                | 22              | 0.33        |            | 1000            | -06                                                                                 | -07                                                                                 |                                                                                     | 190    |
| FN 2070B-3-..  | 3 (3.5)                          | 0.002                                | 9.8             | 0.47        |            | 470             | -06                                                                                 | -07                                                                                 |                                                                                     | 250    |
| FN 2070B-6-..  | 6 (6.9)                          | 0.002                                | 7.8             | 1           |            | 220             | -06                                                                                 | -07                                                                                 |                                                                                     | 450    |
| FN 2070B-10-.. | 10 (11.5)                        | 0.002                                | 4.5             | 1           |            | 220             | -06                                                                                 | -07                                                                                 |                                                                                     | 670    |
| FN 2070B-12-.. | 12 (13.8)                        | 0.002                                | 3.25            | 1           |            | 220             | -06                                                                                 | -07                                                                                 |                                                                                     | 670    |
| FN 2070B-16-.. | 16 (18.4)                        | 0.002                                | 2.8             | 1           |            | 220             | -06                                                                                 | -07                                                                                 | -08                                                                                 | 1000   |
| FN 2070B-25-08 | 25 (28.8)                        | 0.002                                | 2               | 2.2         |            | 220             |                                                                                     |                                                                                     | -08                                                                                 | 760    |
| FN 2070B-36-08 | 36 (41.4)                        | 0.002                                | 1.23            | 2.2         |            | 220             |                                                                                     |                                                                                     | -08                                                                                 | 790    |

\* To compile a complete part number, please replace the -.. with the required I/O connection style (e.g. FN 2070-25-08, FN 2070B-10-06).  
\*\* Maximum leakage under normal operating conditions. Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

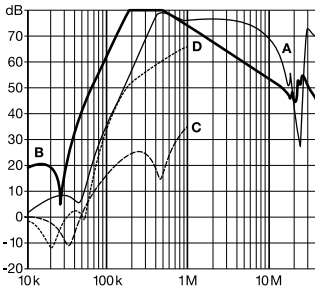
Typical filter attenuation

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

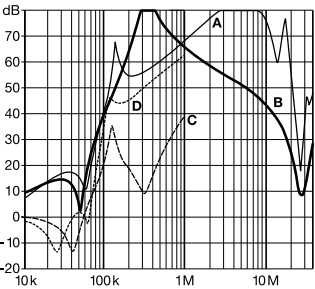
1 A types



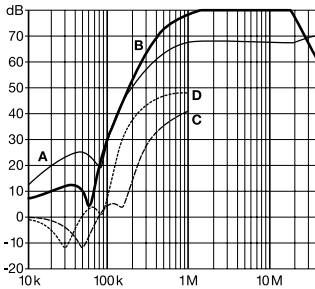
3 to 12 A types



16 A types

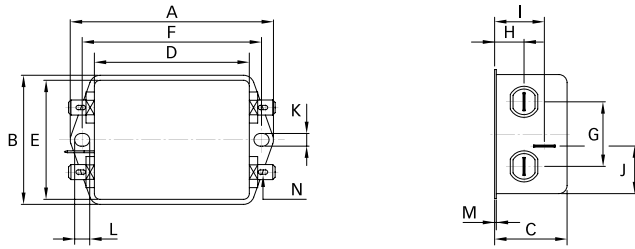


25 and 36 A types

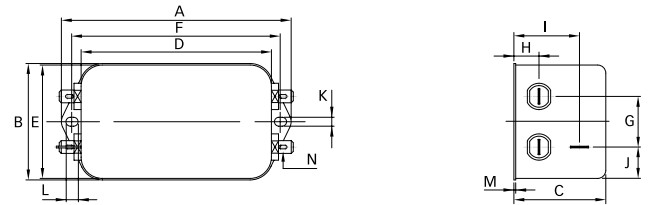


## Mechanical data

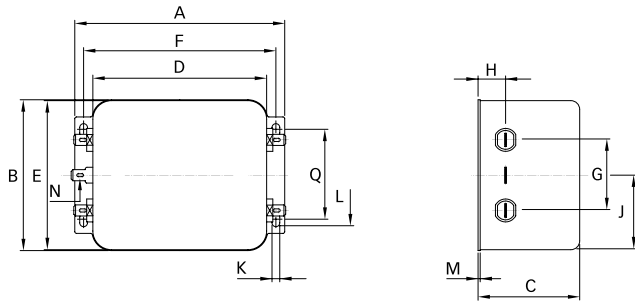
Connection style -06, 1 and 3 A types



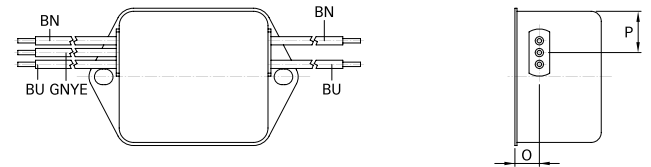
Connection style -06, 6 to 12 A types



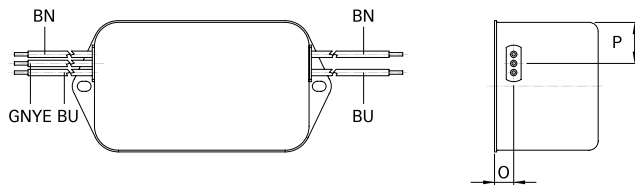
Connection style -06, 16 A types



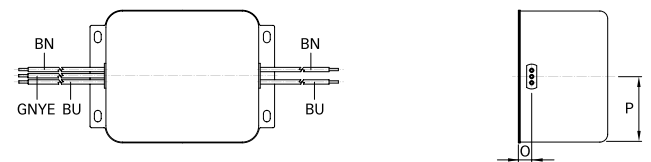
Connection style -07, 1 and 3 A types (same dimensions as style -06)



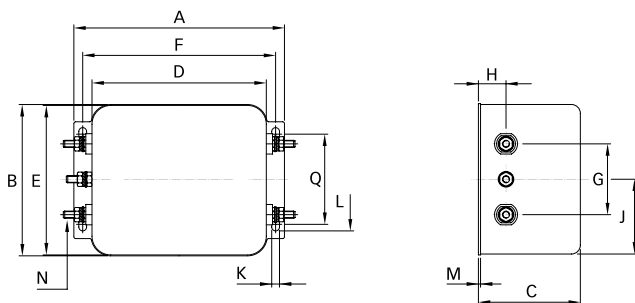
Connection style -07, 6 to 12 A types (same dimensions as style -06)



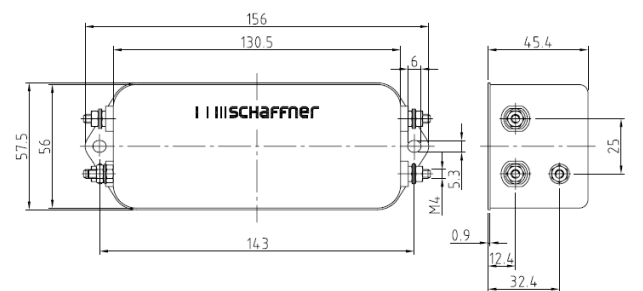
Connection style -07, 16 A types (same dimensions as style -06)



Connection style -08, 16 A types



Connection style -08, 25 and 36 A types



## Dimensions

|                             | 1 A       | 3 A       | 6 A       | 10 A      | 12 A      | 16 A      | 25 A  | 36 A  | Tolerances |
|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-------|-------|------------|
| <b>A</b>                    | 85 ±0.5   | 85 ±0.5   | 113.5     | 156       | 156       | 119       | 156   | 156   | ±1         |
| <b>B</b>                    | 54 ±0.5   | 54 ±0.5   | 57.5      | 57.5      | 57.5      | 85.5      | 57.5  | 57.5  | ±1         |
| <b>C</b>                    | 30.3 ±0.5 | 40.3 ±0.5 | 45.4      | 45.4      | 45.4      | 57.6      | 45.4  | 45.4  | ±1         |
| <b>D</b>                    | 64.8 ±0.5 | 64.8 ±0.5 | 94        | 130.5     | 130.5     | 98.5      | 130.5 | 130.5 | ±1         |
| <b>E</b>                    | 49.8      | 49.8      | 56        | 56        | 56        | 84.5      | 56    | 56    | ±0.5       |
| <b>F</b>                    | 75        | 75        | 103       | 143       | 143       | 109       | 143   | 143   | ±0.3       |
| <b>G</b>                    | 27        | 27        | 25        | 25        | 25        | 40        | 25    | 25    | ±0.2       |
| <b>H</b>                    | 12.3      | 12.3      | 12.4      | 12.4      | 12.4      | 15.6      | 12.4  | 12.4  | ±0.5       |
| <b>I</b>                    | 20.8      | 29.8      | 32.4      | 32.5      | 32.5      |           | 32.5  | 32.5  | ±0.5       |
| <b>J</b>                    | 19.9      | 11.4      | 15.5      | 15.5      | 15.5      | 42.25     | 15.5  | 15.5  | ±0.5       |
| <b>K</b>                    | 5.3       | 5.3       | 4.4       | 5.3       | 5.3       | 4.4       | 5.3   | 5.3   |            |
| <b>L</b>                    | 6.3       | 6.3       | 6         | 6         | 6         | 7.4       | 6     | 6     |            |
| <b>M</b>                    | 0.7       | 0.7       | 0.9       | 1         | 1         | 1.2       | 1     | 1     |            |
|                             |           |           |           |           |           |           |       |       |            |
| <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 |       |       |            |
| <b>Connection style -07</b> |           |           |           |           |           |           |       |       |            |
| <b>O</b>                    | 8.3       | 8.3       | 8.4       | 8.4       | 8.4       | 8.6       |       |       | ±0.5       |
| <b>P</b>                    | 14.9      | 14.9      | 18        | 18        | 18        | 42.25     |       |       | ±0.5       |
| <b>AWG type wire</b>        | AWG 20    | AWG 20    | AWG 18    | AWG 18    | AWG 16    | AWG 16    |       |       |            |
| <b>Wire length</b>          | 140       | 140       | 140       | 140       | 140       | 140       |       |       | +5         |
| <b>Connection style -08</b> |           |           |           |           |           |           |       |       |            |
| <b>N</b>                    |           |           |           |           |           | M4        | M4    | M4    |            |
| <b>Q</b>                    |           |           |           |           |           | 51        |       |       | ±0.2       |

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

Please visit [www.schaffner.com](http://www.schaffner.com) to find more details on filter connectors.



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