

# Multi-stage Performance AC/DC 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

|  |   |
|--|---|
| <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 36 A @ 40°C max.   |
| <b>High potential test voltage</b>               | P → PE 2000 VAC for 2 sec<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>             | Terminal plastic for -06/-08 version: UL 94 V-0<br>Laces for -07 version: UL 94 VW-1<br>Grommet for -07 version: UL 94V-0 |
| <b>Design corresponding to</b>                   | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939  |
| <b>Overvoltage category</b>                      | II acc. IEC 60664-1   |
| <b>Pollution degree</b>                          | 2 acc. IEC 60664-1  |
| <b>Altitude</b>                                  | 2000m (above derating applies)**  |
| <b>MTBF @ 40°C/230 V (Mil-HB-217F)</b>           | 1,550,000 hours<br>1,600,000 hours (B types)  |

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

\*\* for dedicated requests exceeding this specification (e.g. -40 °C or higher altitude) please contact your local Schaffner Sales office

### Approvals



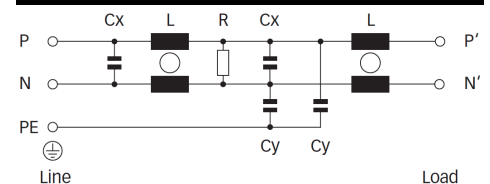
## Features and benefits

- 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 2030 series)
- FN 2070 filters are also available with differential mode choke (FN 2080 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
- Single Phase Motor Drives

### 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<br>[g] |
|-----------------------------|--------------------------------|---|--------------------|----------------|------|--------------------|---|---|---|---------------|
|                             |                                |   |                    | Cx             | Cy   |                    |  |  |  |               |
|                             | [A]                            | [mA]  | [mH]               | [μF]           | [nF] | [kΩ]               |   |   |   |               |
| <b>FN 2070-1-..</b>         | 1 (1.2)                        | 0.66 (0.38)   | 22                 | 0.33           | 4.7  | 1000               | -06   | -07   |   | 190           |
| <b>FN 2070-3-..</b>         | 3 (3.5)                        | 0.66 (0.38)   | 9.8                | 0.47           | 4.7  | 470                | -06   | -07   |   | 250           |
| <b>FN 2070-6-..</b>         | 6 (6.9)                        | 0.66 (0.38)   | 7.8                | 1              | 4.7  | 220                | -06   | -07   |   | 450           |
| <b>FN 2070-10-..</b>        | 10 (11.5)                      | 0.66 (0.38)   | 4.5                | 1              | 4.7  | 220                | -06   | -07   | -08   | 670           |
| <b>FN 2070-12-..</b>        | 12 (13.8)                      | 0.66 (0.38)   | 3.25               | 1              | 4.7  | 220                | -06   | -07   | -08   | 670           |
| <b>FN 2070-16-..</b>        | 16 (18.4)                      | 0.66 (0.38)   | 2.8                | 1              | 4.7  | 220                | -06   | -07   | -08   | 1000          |
| <b>FN 2070-25-08</b>        | 25 (28.8)                      | 0.66 (0.38)   | 2                  | 2.2            | 4.7  | 220                |   |   | -08   | 760           |
| <b>FN 2070-36-08</b>        | 36 (41.4)                      | 0.66 (0.38)   | 1.23               | 2.2            | 4.7  | 220                |   |   | -08   | 790           |
| <b>FN 2070 A-1-..</b>       | 1 (1.2)                        | 0.07 (0.04)   | 22                 | 0.33           | 0.47 | 1000               | -06   | -07   |   | 190           |
| <b>FN 2070 A-3-..</b>       | 3 (3.5)                        | 0.07 (0.04)   | 9.8                | 0.47           | 0.47 | 470                | -06   | -07   |   | 250           |
| <b>FN 2070 A-6-..</b>       | 6 (6.9)                        | 0.07 (0.04)   | 7.8                | 1              | 0.47 | 220                | -06   | -07   |   | 450           |
| <b>FN 2070 A-10-..</b>      | 10 (11.5)                      | 0.07 (0.04)   | 4.5                | 1              | 0.47 | 220                | -06   | -07   | -08   | 670           |
| <b>FN 2070 A-12-..</b>      | 12 (13.8)                      | 0.07 (0.04)   | 3.25               | 1              | 0.47 | 220                | -06   | -07   | -08   | 670           |
| <b>FN 2070 A-16-..</b>      | 16 (18.4)                      | 0.07 (0.04)   | 2.8                | 1              | 0.47 | 220                | -06   | -07   | -08   | 1000          |
| <b>FN 2070 A-25-08</b>      | 25 (28.8)                      | 0.07 (0.04)   | 2                  | 2.2            | 0.47 | 220                |   |   | -08   | 760           |
| <b>FN 2070 A-36-08</b>      | 36 (41.4)                      | 0.07 (0.04)   | 1.23               | 2.2            | 0.47 | 220                |   |   | -08   | 790           |
| <b>FN 2070 B-1-..</b>       | 1 (1.2)                        | 0.00  | 22                 | 0.33           |      | 1000               | -06   | -07   |   | 190           |
| <b>FN 2070 B-3-..</b>       | 3 (3.5)                        | 0.00  | 9.8                | 0.47           |      | 470                | -06   | -07   |   | 250           |
| <b>FN 2070 B-6-..</b>       | 6 (6.9)                        | 0.00  | 7.8                | 1              |      | 220                | -06   | -07   |   | 450           |
| <b>FN 2070 B-10-..</b>      | 10 (11.5)                      | 0.00  | 4.5                | 1              |      | 220                | -06   | -07   | -08   | 670           |
| <b>FN 2070 B-12-..</b>      | 12 (13.8)                      | 0.00  | 3.25               | 1              |      | 220                | -06   | -07   | -08   | 670           |
| <b>FN 2070 B-16-..</b>      | 16 (18.4)                      | 0.00  | 2.8                | 1              |      | 220                | -06   | -07   | -08   | 1000          |
| <b>FN 2070 B-25-08</b>      | 25 (28.8)                      | 0.00  | 2                  | 2.2            |      | 220                |   |   | -08   | 760           |
| <b>FN 2070 B-36-08</b>      | 36 (41.4)                      | 0.00  | 1.23               | 2.2            |      | 220                |   |   | -08   | 790           |
| <b>Enhanced performance</b> |                                |   |                    |                |      |                    |   |   |   |               |
| <b>FN 2070 M-1-06</b>       | 1 (1.2)                        | 3.69 (2.13)   | 22                 | 0.33           | 47   | 1000               | -06   |   |   | 170           |
| <b>FN 2070 M-3-06</b>       | 3 (3.5)                        | 3.69 (2.13)   | 9.8                | 0.47           | 47   | 470                | -06   |   |   | 250           |
| <b>FN 2070 M-6-06</b>       | 6 (6.9)                        | 3.69 (2.13)   | 7.8                | 1              | 47   | 220                | -06   |   |   | 450           |
| <b>FN 2070 M-10-06</b>      | 10 (11.5)                      | 3.69 (2.13)   | 4.5                | 1              | 47   | 220                | -06   |   | -08   | 670           |
| <b>FN 2070 M-12-06</b>      | 12 (13.8)                      | 3.69 (2.13)   | 3.25               | 1              | 47   | 220                | -06   |   | -08   | 670           |
| <b>FN 2070 M-16-..</b>      | 16 (18.4)                      | 3.69 (2.13)   | 2.8                | 1              | 47   | 220                | -06   |   | -08   | 1000          |
| <b>FN 2070 M-25-08</b>      | 25 (28.8)                      | 3.69 (2.13)   | 2                  | 2.2            | 47   | 220                |   |   | -08   | 750           |
| <b>FN 2070 L-36-08</b>      | 36 (41.4)                      | 2.59 (1.49)   | 1.23               | 2.2            | 33   | 220                |   |   | -08   | 790           |

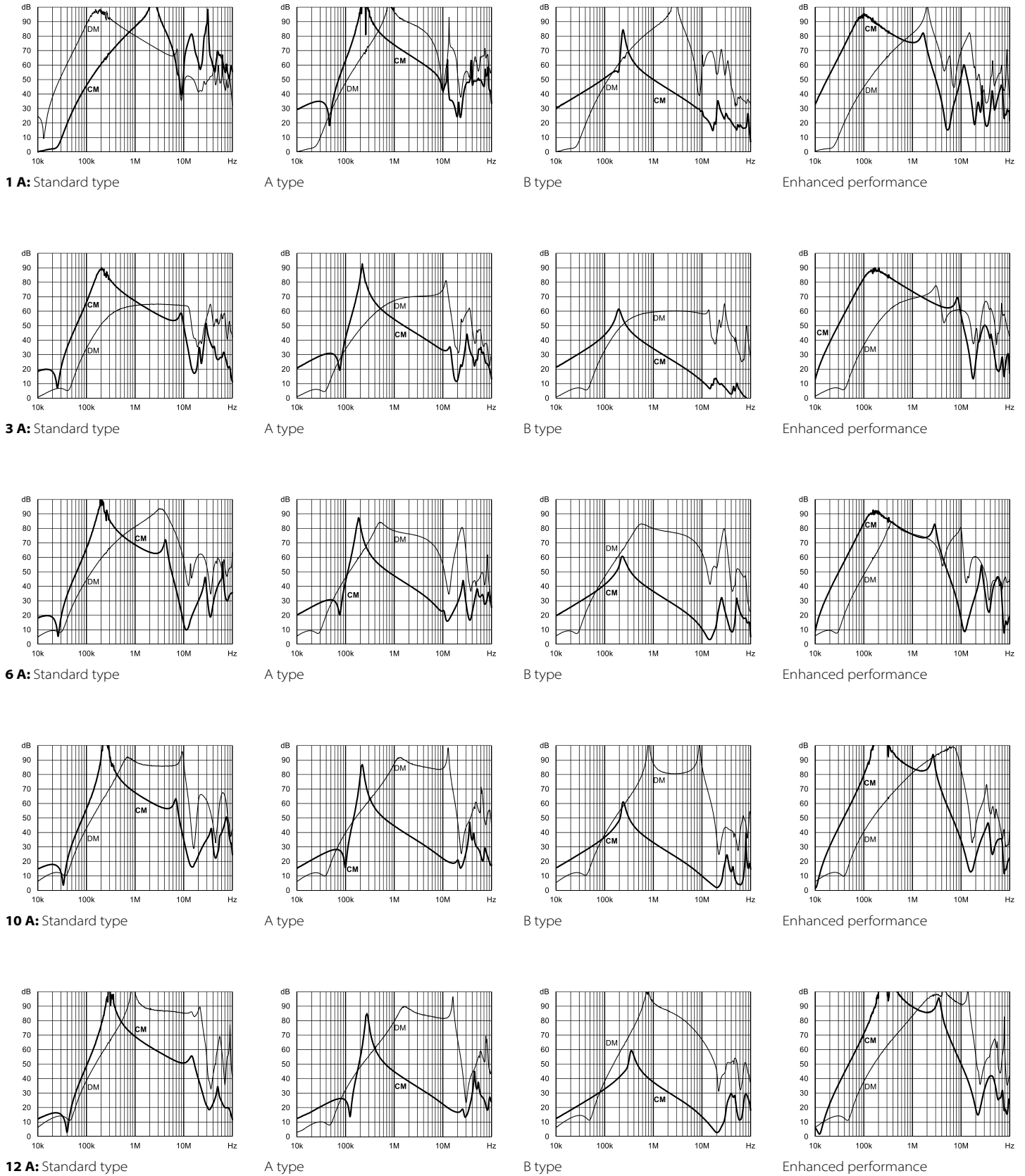
\* To compile a complete part number, please replace the -.. with the required I/O connection style (e.g. FN 2070-25-08, FN 2070B-10-06).

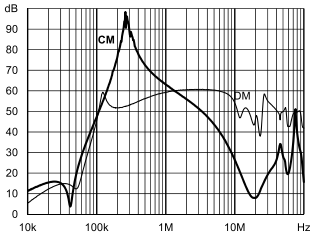
\*\* Maximum leakage under usual AC operating conditions (acc. IEC60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

\*\*\* Tolerances apply: Inductance: -30/+50%, Capacitance: ±20%, Resistance: ±10%

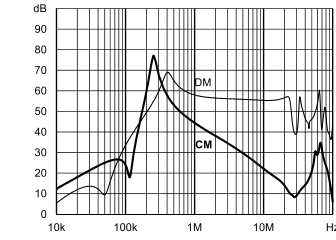
### Typical filter attenuation

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

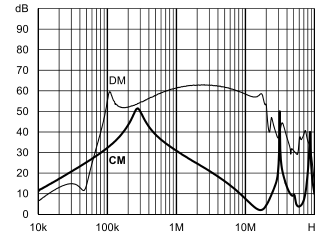




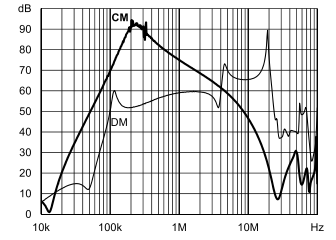
16 A: Standard type



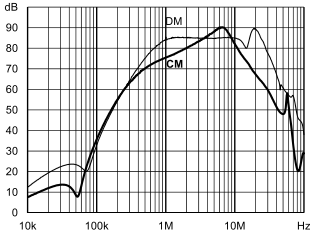
A type



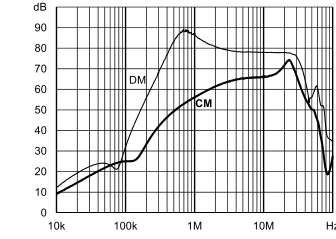
B type



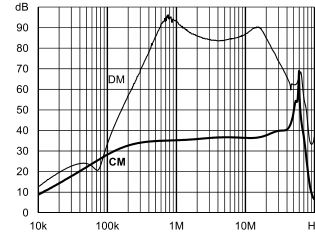
Enhanced performance



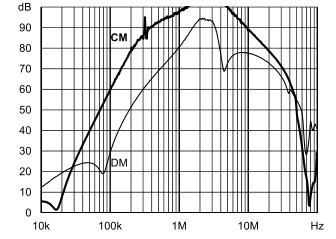
25 A: Standard type



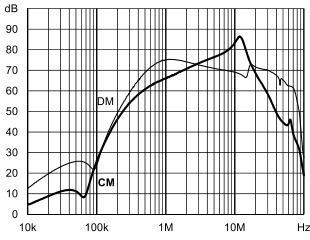
A type



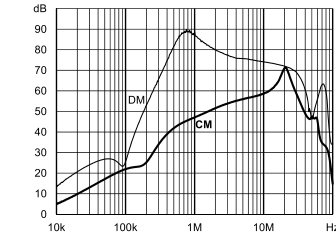
B type



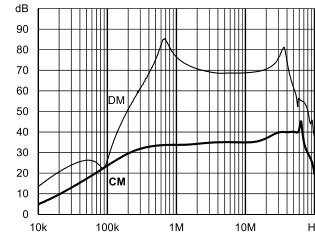
Enhanced performance



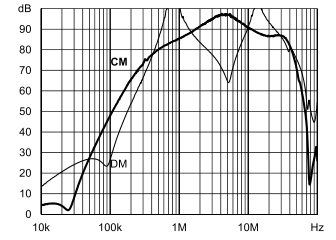
36 A: Standard type



A type



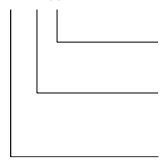
B type



Enhanced performance

Product selector

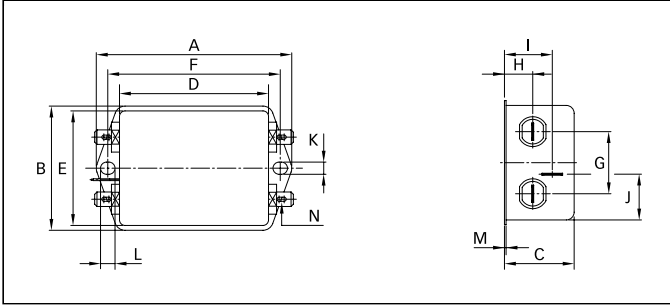
FN 2070 x -xx-yy



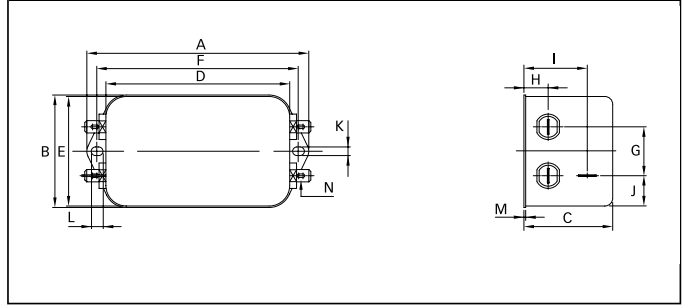
- 06 Faston 6.3 x 0.8 mm (spade/soldering)
- 07 Wire leads
- 08 Studs (M4 screws)
- 1 to 36 Rated current
- Blank Standard version
- A Safety version
- B Medical version
- L/M High performance version

Mechanical data

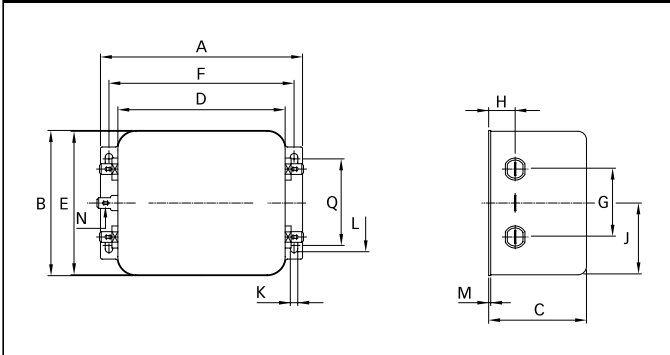
Connection style -06, 1 and 3 A types



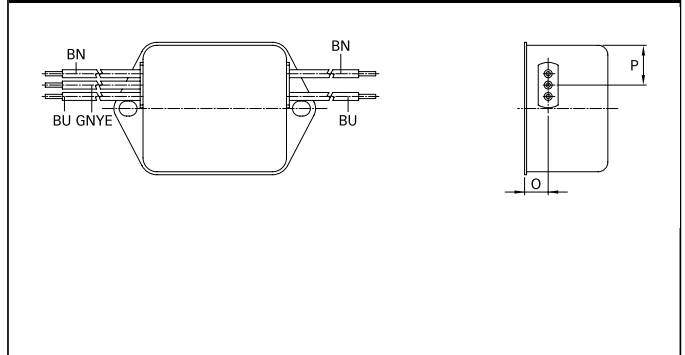
Connection style -06, 6 to 12 A types



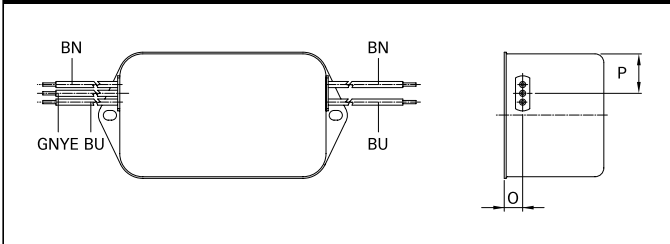
Connection style -06, 16 A types



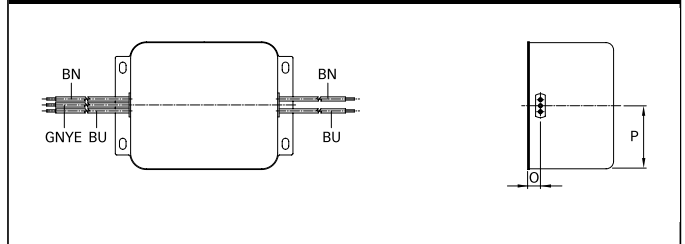
Connection style -07, 1 and 3 A types (same dimensions as style -06)



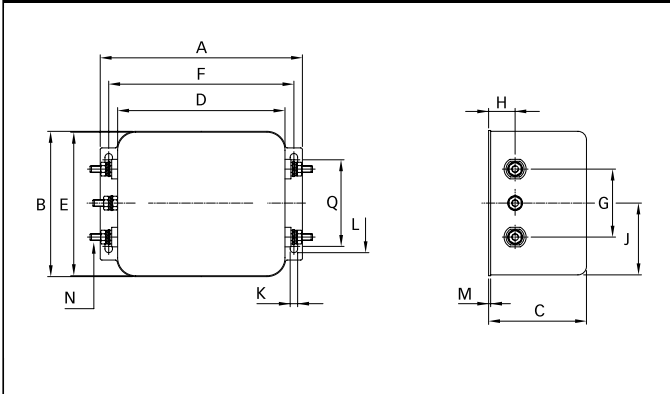
Connection style -07, 6 to 12 A types (same dimensions as style -06)



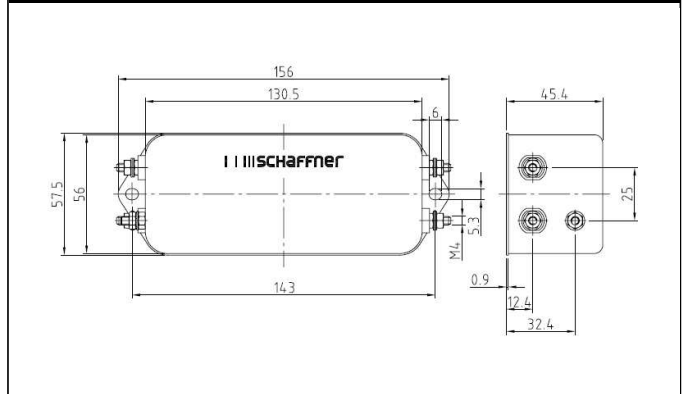
Connection style -07, 16 A types (same dimensions as style -06)



Connection style -08, 10 to 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       | 1         | 1         | 1         | 1.2       | 1         | 1         | ±0.3       |
| <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        | M4        | M4        |            |
| <b>Q</b>                       |           |           |           |           |           | 51        |           |           | ±0.2       |
| <b>Recommended torque (Nm)</b> |           |           |           | 1.2 - 1.3 | 1.2 - 1.3 | 1.2 - 1.3 | 1.2 - 1.3 | 1.2 - 1.3 |            |
| <b>Earth terminal</b>          |           |           |           | 1.5 - 1.7 | 1.5 - 1.7 | 1.5 - 1.7 | 1.5 - 1.7 | 1.5 - 1.7 |            |

All dimensions in mm; 1 inch = 25.4 mm

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



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