

General Purpose AC/DC EMI Filter



Images are for reference only. Please see product specifications

- Rated currents from 1 to 60 A
- General purpose filtering performance
- Optional medical versions (B type)
- Optional safety versions (A type)
- Optional enhanced performance versions
- Optional DC optimized versions



Performance indicators

Attenuation performance



Rated current [A]



Technical specifications

| | |
|--|---|
| Rated voltage* | 250 VAC, 50/60 Hz; 250 VDC |
| Operating frequency | DC to 400 Hz |
| Rated currents | 1 to 60 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 | Terminal plastic for -06/-08 version: UL 94 V-0 Laces for -07 version: UL 94 VW-1 Grommet for -07 version: UL 94 V-0 |
| Overvoltage category | II acc. IEC 60664-1 |
| Pollution degree | 2 acc. IEC 60664-1 |
| Altitude | 2000m (above derating applies)** |
| MTBF @ 40°C/230 V (Mil-HB-217F) | 1,250,000 hours 3,200,000 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 & Compliances



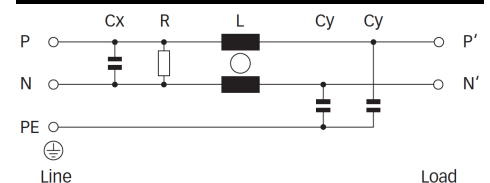
Features and benefits

- FN 2010 filters are designed for easy and fast chassis mounting
- FN 2010 B versions without capacitors to earth comply to 1MOP for ME (medical equipment) acc. IEC 60601-1
- FN 2010 A versions with low capacitance to earth for safety critical applications with necessity for low leakage currents
- FN 2010 filters are also available as enhanced performance and DC optimized versions. With higher attenuation in very compact housing (M, N1,N types)
- All filters provide a general purpose conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- FN 2010 filters can be used to cover a broad range of usage and they offer a good size/ampere ratio
- Various terminal options allow you to select the desired connection style








































Typical applications

- Electrical and electronic equipment
- Consumer goods
- Household equipment
- Medical equipment
- Office automation equipment
- Datacom equipment

Typical electrical schematic



Filter selection table

| Filter* | Buy | Rated current @ 40°C (25°C) | Leakage current** @ 250 VAC/50 Hz (@ 120 VAC/60 Hz) | Power loss @25°C/DC | Inductance*** L | Capacitance*** | | Resistance*** R | Input/Output connections | | | Weight [g] |
|-----------------------------|---|--------------------------------|---|------------------------|--------------------|----------------|------|--------------------|---|---|---|---------------|
| | | | | | | Cx | Cy | |  |  |  | |
| | | [A] | [mA] | [W] | [mH] | [µF] | [nF] | [kΩ] | | | | |
| FN2010-1-.. |  | 1 (1.15) | 0.66 (0.38) | 0.8 | 12 | 0.1 | 4.7 | 1000 | -06 | -07 | | 65 |
| FN2010-3-.. |  | 3 (3.45) | 0.66 (0.38) | 1.1 | 2.5 | 0.1 | 4.7 | 1000 | -06 | -07 | | 65 |
| FN2010-6-.. |  | 6 (6.9) | 0.66 (0.38) | 1.7 | 1 | 0.1 | 4.7 | 1000 | -06 | -07 | | 65 |
| FN2010-10-.. |  | 10 (11.5) | 0.66 (0.38) | 2.5 | 0.8 | 0.1 | 4.7 | 1000 | -06 | -07 | | 85 |
| FN2010-12-.. |  | 12 (13.8) | 0.66 (0.38) | 3.6 | 0.7 | 0.1 | 4.7 | 1000 | -06 | -07 | | 85 |
| FN2010-16-.. |  | 16 (18.4) | 0.66 (0.38) | 2.5 | 0.7 | 0.1 | 4.7 | 1000 | -06 | -07 | -08 | 140 |
| FN2010-20-.. |  | 20 (23) | 0.66 (0.38) | 3.8 | 0.6 | 0.1 | 4.7 | 1000 | -06 | -07 | -08 | 210 |
| FN2010-30-08 |  | 30 (34.5) | 0.79 (0.46) | 6.3 | 0.7 | 0.47 | 10 | 1000 | | | -08 | 470 |
| FN2010-60-24 |  | 60 (69) | 0.79 (0.46) | 14.7 | 1 | 1.5 | 10 | 330 | | | -24 | 1100 |
| Enhanced performance | | | | | | | | | | | | |
| FN2010A-1-.. |  | 1 (1.15) | 0.07 (0.04) | 0.8 | 12 | 0.1 | 0.47 | 1000 | -06 | -07 | | 65 |
| FN2010A-3-.. |  | 3 (3.45) | 0.07 (0.04) | 1.1 | 2.5 | 0.1 | 0.47 | 1000 | -06 | -07 | | 65 |
| FN2010A-6-.. |  | 6 (6.9) | 0.07 (0.04) | 1.7 | 1 | 0.1 | 0.47 | 1000 | -06 | -07 | | 65 |
| FN2010A-10-.. |  | 10 (11.5) | 0.07 (0.04) | 2.5 | 0.8 | 0.1 | 0.47 | 1000 | -06 | -07 | | 85 |
| FN2010A-12-.. |  | 12 (13.8) | 0.07 (0.04) | 3.6 | 0.7 | 0.1 | 0.47 | 1000 | -06 | -07 | | 85 |
| FN2010A-16-.. |  | 16 (18.4) | 0.07 (0.04) | 2.5 | 0.7 | 0.1 | 0.47 | 1000 | -06 | -07 | -08 | 140 |
| FN2010A-20-.. |  | 20 (23) | 0.07 (0.04) | 3.8 | 0.6 | 0.1 | 0.47 | 1000 | -06 | -07 | -08 | 210 |
| FN2010A-30-08 |  | 30 (34.5) | 0.07 (0.04) | 6.3 | 0.7 | 0.47 | 0.47 | 1000 | | | -08 | 470 |
| FN2010A-60-24 |  | 60 (69) | 0.07 (0.04) | 14.7 | 1 | 1.5 | 0.47 | 330 | | | -24 | 1100 |
| FN2010B-1-.. |  | 1 (1.15) | 0.00 | 0.8 | 12 | 0.1 | | 1000 | -06 | -07 | | 65 |
| FN2010B-3-.. |  | 3 (3.45) | 0.00 | 1.1 | 2.5 | 0.1 | | 1000 | -06 | -07 | | 65 |
| FN2010B-6-.. |  | 6 (6.9) | 0.00 | 1.7 | 1 | 0.1 | | 1000 | -06 | -07 | | 65 |
| FN2010B-10-.. |  | 10 (11.5) | 0.00 | 2.5 | 0.8 | 0.1 | | 1000 | -06 | -07 | | 85 |
| FN2010B-12-.. |  | 12 (13.8) | 0.00 | 3.6 | 0.7 | 0.1 | | 1000 | -06 | -07 | | 85 |
| FN2010B-16-.. |  | 16 (18.4) | 0.00 | 2.5 | 0.7 | 0.1 | | 1000 | -06 | -07 | -08 | 140 |
| FN2010B-20-.. |  | 20 (23) | 0.00 | 3.8 | 0.6 | 0.1 | | 1000 | -06 | -07 | -08 | 210 |
| FN2010B-30-08 |  | 30 (34.5) | 0.00 | 6.3 | 0.7 | 0.47 | | 1000 | | | -08 | 470 |
| FN2010B-60-24 |  | 60 (69) | 0.00 | 14.7 | 1 | 1.5 | | 330 | | | -24 | 1100 |
| FN2010N1-1-06 |  | 1 (1.15) | 5.34 (3.08) | 0.8 | 12 | 0.1 | 68 | 1000 | -06 | | | 70 |
| FN2010N1-3-06 |  | 3 (3.45) | 5.34 (3.08) | 1.1 | 2.5 | 0.1 | 68 | 1000 | -06 | | | 70 |
| FN2010N1-6-06 |  | 6 (6.9) | 5.34 (3.08) | 1.7 | 1 | 0.1 | 68 | 1000 | -06 | | | 70 |
| FN2010N1-10-06 |  | 10 (11.5) | 5.34 (3.08) | 2.5 | 0.8 | 0.1 | 68 | 1000 | -06 | | | 85 |
| FN2010N1-12-06 |  | 12 (13.8) | 3.69 (2.13) | 3.6 | 0.7 | 0.1 | 47 | 1000 | -06 | | | 85 |
| FN2010M-16-.. |  | 16 (18.4) | 3.69 (2.13) | 2.5 | 0.7 | 0.1 | 47 | 1000 | -06 | | -08 | 140 |
| FN2010M-20-.. |  | 20 (23) | 3.69 (2.13) | 3.8 | 0.6 | 0.1 | 47 | 1000 | -06 | | -08 | 220 |
| FN2010N-30-08 |  | 30 (34.5) | 7.85 (4.52) | 6.3 | 0.7 | 0.47 | 100 | 1000 | | | -08 | 400 |
| FN2010N-60-24 |  | 60 (69) | 7.85 (4.52) | 14.7 | 1 | 1.5 | 100 | 330 | | | -24 | 1120 |

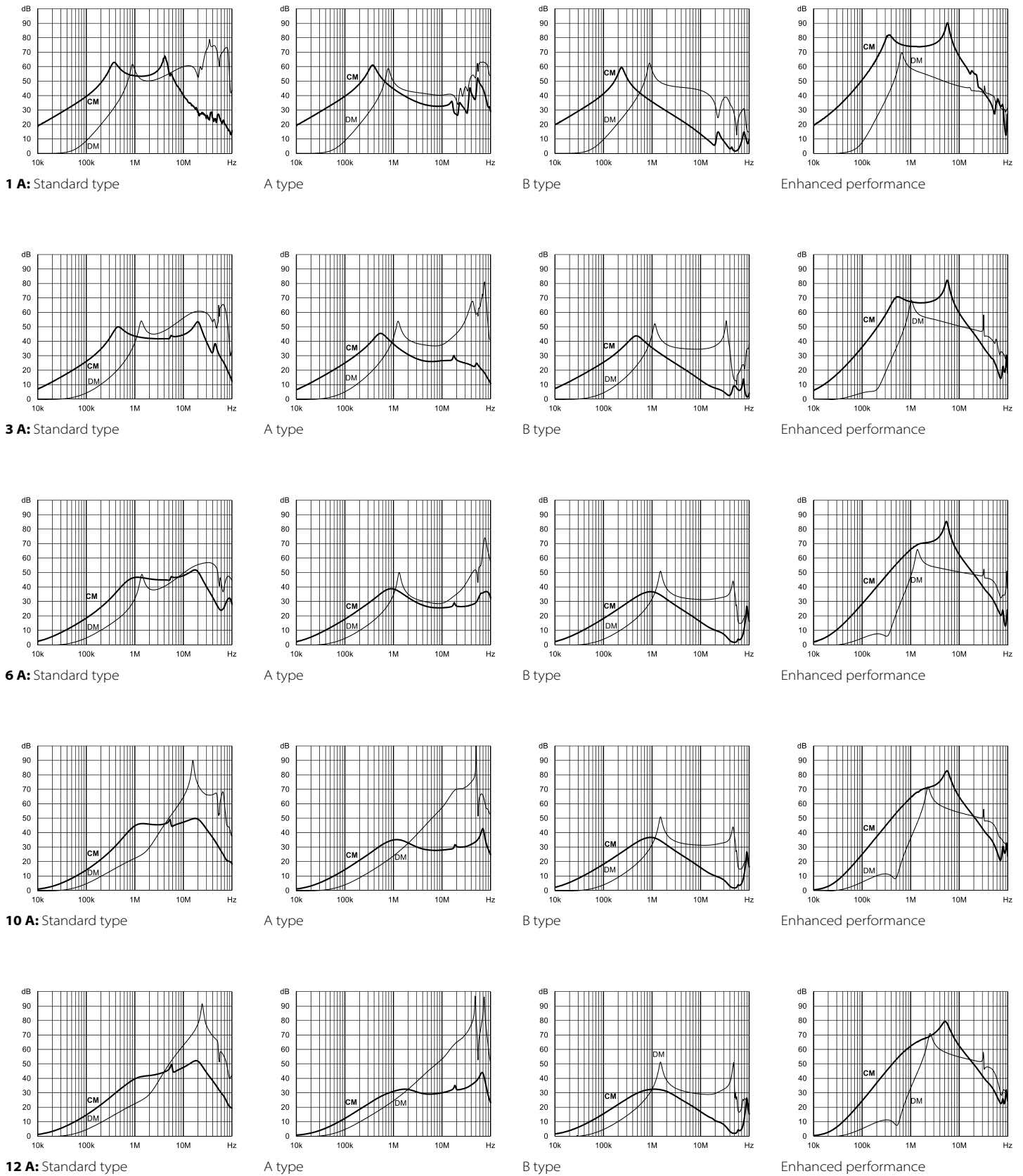
* To compile a complete part number, please replace the .. with the required I/O connection style (e.g. FN 2010-30-08, FN 2010B-10-06). The different letters code the used Cy values in the filter type (A = 0.47nF; M = 47nF; N1 = 47nF; N = 100nF)

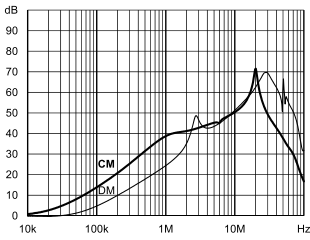
** Maximum leakage under usual AC operating conditions (acc. IEC 60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

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

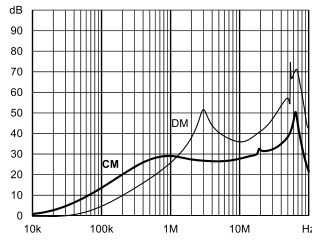
Typical filter attenuation

Per CISPR 17; CM=50 Ω/50 Ω sym; DM=50 Ω/50 Ω asym

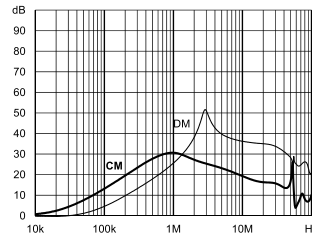




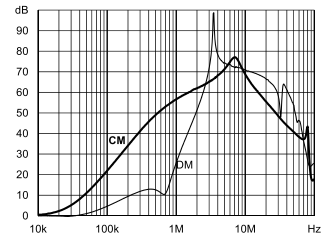
16 A: Standard type



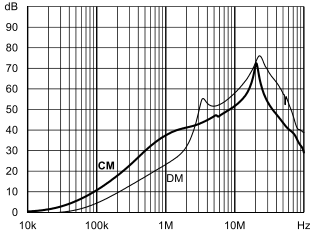
A type



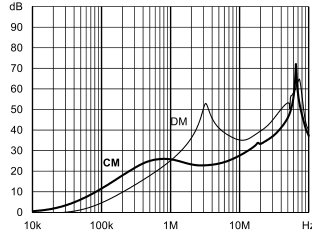
B type



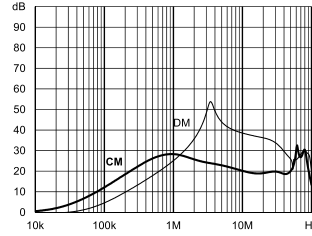
Enhanced performance



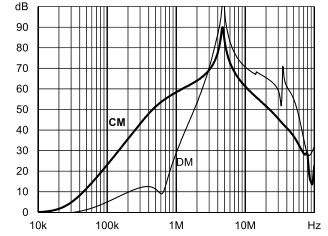
20 A: Standard type



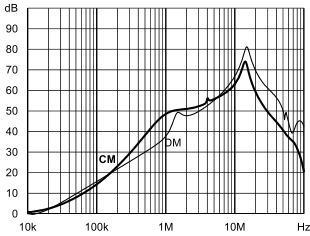
A type



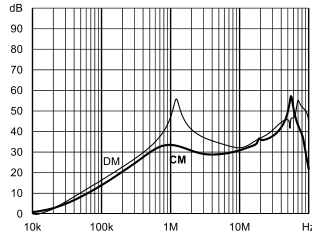
B type



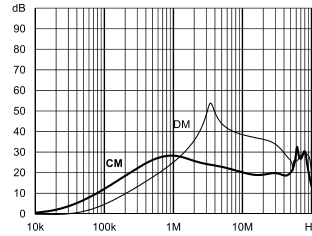
Enhanced performance



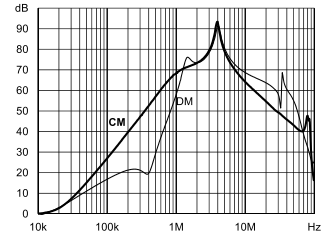
30 A: Standard type



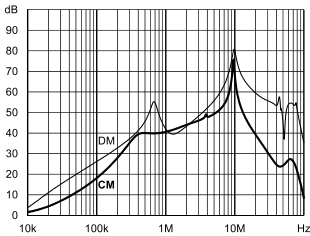
A type



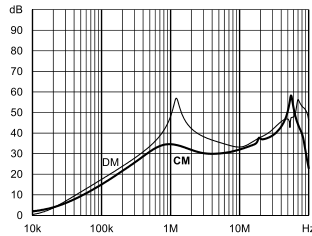
B type



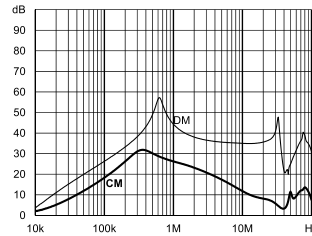
Enhanced performance



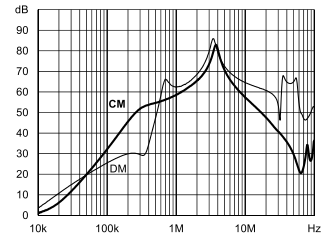
60 A: Standard type



A type



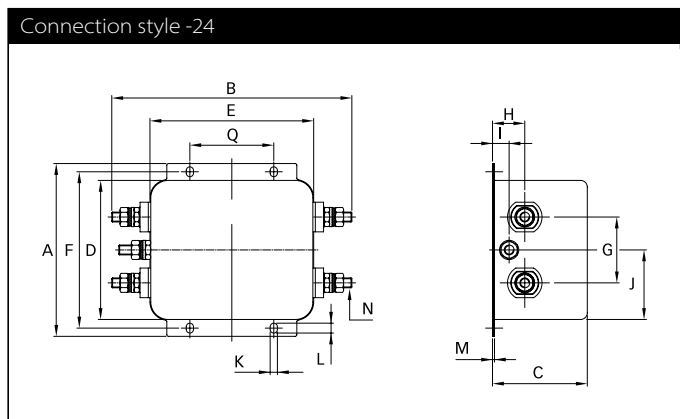
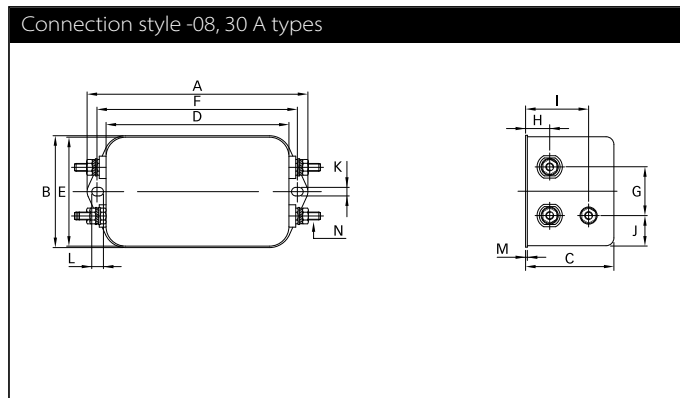
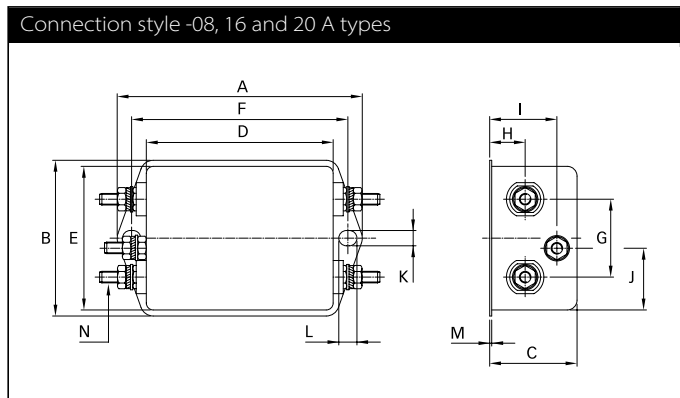
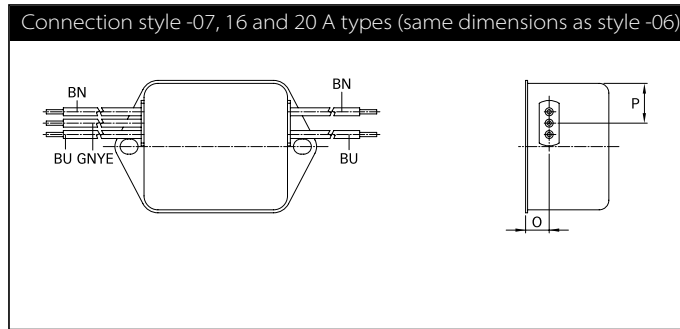
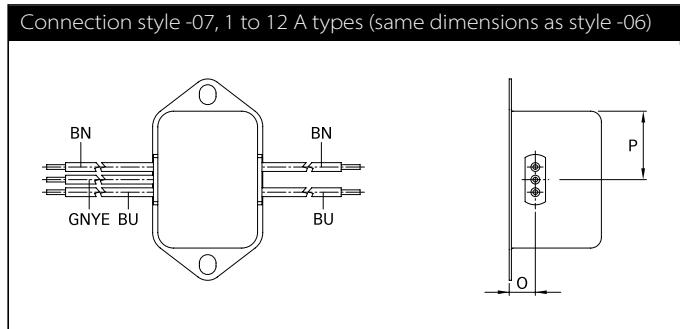
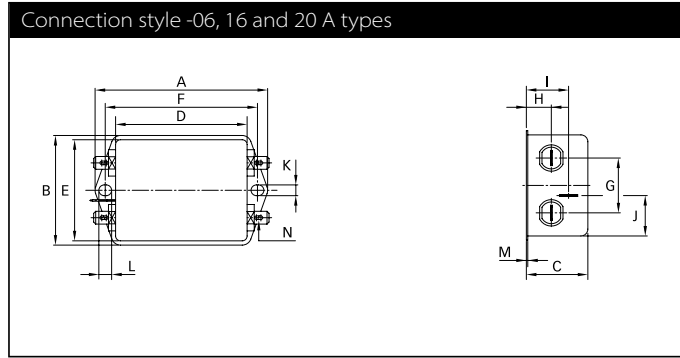
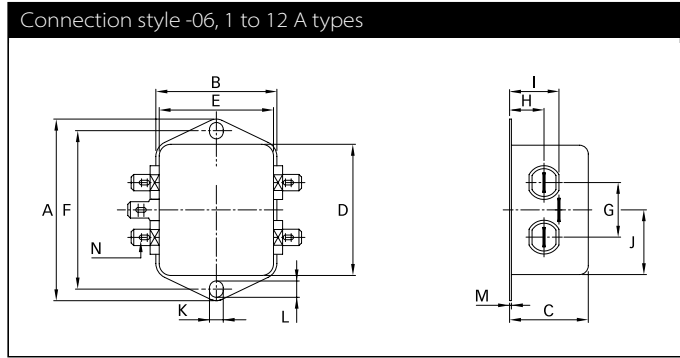
B type



Enhanced performance

| Product Selector | | |
|------------------|---------|---------------------------------------|
| FN 2010-xy-xx-yy | | |
| | 06 | Faston 6.3 x 0.8 mm (spade/soldering) |
| | 07 | Wire leads |
| | 08 | Studs (M4 screws) |
| | 24 | Studs (M6 screws) |
| | 1 to 60 | Rated current |
| | Blank | Standard version |
| | Z | With surge protection |
| | Blank | Standard version |
| | A | Safety version |
| | B | Medical version |
| | N1/N/M | High performance version |

Mechanical data



Dimensions

| | 1 A | 3 A | 6 A | 10 A | 12 A | 16 A | 20 A | 30 A | 60 A | Tolerances |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|------------|
| A | 64 | 64 | 64 | 64 | 64 | 71 | 85 | 113.5 ±1 | 105 ±1 | ±0.5 |
| B | 35 | 35 | 35 | 35 | 35 | 46.6 | 54 | 57.5 ±1 | 145.9 ±1 | ±0.5 |
| C | 24.3 | 24.3 | 24.3 | 29.3 | 29.3 | 29.3 | 30.3 | 45.4 ±1 | 57.6 ±1 | ±0.5 |
| D | 43.5 | 43.5 | 43.5 | 43.5 | 43.5 | 50.5 | 64.8 | 94 ±1 | 84.5 ±1 | ±0.5 |
| E | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | 44.5 | 49.8 | 56 | 99.5 | ±0.5 |
| F | 54 | 54 | 54 | 54 | 54 | 61 | 75 | 103 | 95 | ±0.3 |
| G | 21 | 21 | 21 | 21 | 21 | 21 | 27 | 25 | 40 | ±0.2 |
| H | 9.3 | 9.3 | 9.3 | 9.3 | 9.3 | 10.8 | 12.3 | 12.4 | 19.6 | ±0.5 |
| I | 15.3 | 15.3 | 15.3 | 15.3 | 15.3 | 19.3 | 20.8 | 32.4 | 10.1 | ±0.5 |
| J | 21.8 | 21.8 | 21.8 | 21.8 | 21.8 | 20.1 | 19.9 | 15.5 | 42.25 | ±0.5 |
| K | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 4.4 | 4.4 | |
| L | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6 | 6 | |
| M | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 1 | 1.2 | ±0.3 |
| 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 | | | |
| Connection style -07 | | | | | | | | | | |
| O | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | | | ±0.5 |
| P | 21.8 | 21.8 | 21.8 | 21.8 | 21.8 | 14 | 14.9 | | | ±0.5 |
| AWG type wire | AWG 20 | AWG 20 | AWG 18 | AWG 18 | AWG 16 | AWG 16 | AWG 14 | | | |
| Wire length | 140 | 140 | 140 | 140 | 140 | 140 | 140 | | | +5 |
| Connection style -08 | | | | | | | | | | |
| N | | | | | | M4 | M4 | M4 | | |
| Recommended torque (Nm) | | | | | | 1.2 - 1.3 | 1.2 - 1.3 | 1.2 - 1.3 | | |
| Earth terminal | | | | | | 1.5 - 1.7 | 1.5 - 1.7 | 1.5 - 1.7 | | |
| Connection style -24 | | | | | | | | | | |
| N | | | | | | | | | M6 | |
| Q | | | | | | | | | 51 | ±0.2 |
| Recommended torque (Nm) | | | | | | | | | 3.5 - 4 | |
| Earth Terminal | | | | | | | | | 3.5 - 4 | |

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

Please visit www.schaffner.com to find more details on filter connections.



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