

Multi-stage general purpose AC/DC EMC/RFI Filter



- Rated currents from 1 to 30 A
- High differential and common-mode attenuation
- Optional medical versions (B type)
- Optional safety versions (A type)



Performance indicators

Attenuation performance



Rated current [A]



Approvals & Compliances



Features and Benefits

- FN 2060 two-stage filters are designed for easy and fast chassis mounting
- FN 2060 B versions without capacitors to earth comply to 1MOP for ME (medical equipment) acc. IEC 60601-1
- FN 2060 A version with low capacitance to earth 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 2060 two-stage filters are designed for noisy applications requiring good differential and common-mode attenuation
- FN 2060 filters are also available as single-stage filters (FN 2010 series)
- Various terminal options allow you to select the desired connection style

Technical Specifications

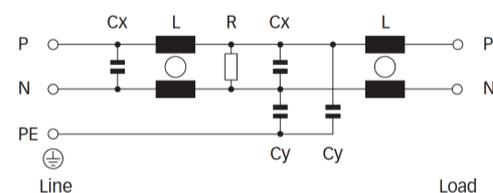
| | |
|--|--|
| Maximum continuous operating voltage | 250 VAC, 50/60 Hz 250 VDC |
| Nominal operating voltage | 230 VAC |
| Rated currents | 1 to 30 A @ 40°C |
| Operating frequency | DC to 400 Hz |
| High potential test voltage | P → PE 2000 VAC for 2 sec P → PE 2500 VAC for 2 sec (B types) P → N 1100 VDC for 2 sec |
| Overtoltage category | II acc. IEC 60664-1 |
| Pollution degree | 2 acc. IEC 60664-1 |
| Temperature range (operation and storage) | -25°C to +100°C (25/100/21)** |
| Altitude | 2000m (above derating applies)** |
| Flammability corresponding to | Laces for -07 version: UL 94 VW-1 Terminal plastic for -06/-08 version: UL 94 V-0 Grommet for -07 version: UL 94 V-0 |
| Certified to | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939 (applies to AC and DC applications) |
| Design corresponding to | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939 |
| MTBF (Mil-HB-217F) | >950,000 h @ 40°C/230 V 1,650,000 h (B types) @ 40°C/230 V |

* 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

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* | 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] | | | | |
| FN2060-1-.. |  | 1 (1.2) | 0.66 (0.38) | 1.6 | 12 | 0.22 | 4.7 | 1000 | -06 | -07 | | 120 |
| FN2060-3-.. |  | 3 (3.5) | 0.66 (0.38) | 2.2 | 2.5 | 0.22 | 4.7 | 1000 | -06 | -07 | | 120 |
| FN2060-6-.. |  | 6 (6.9) | 0.66 (0.38) | 3.2 | 0.97 | 0.22 | 4.7 | 1000 | -06 | -07 | | 120 |
| FN2060-10-.. |  | 10 (11.5) | 0.66 (0.38) | 4.3 | 0.8 | 0.47 | 4.7 | 470 | -06 | -07 | -08 | 190 |
| FN2060-12-.. |  | 12 (13.8) | 0.66 (0.38) | 6.2 | 0.58 | 0.47 | 4.7 | 470 | -06 | -07 | -08 | 190 |
| FN2060-16-.. |  | 16 (18.4) | 0.66 (0.38) | 4.4 | 0.65 | 0.33 | 4.7 | 1000 | -06 | -07 | -08 | 260 |
| FN2060-20-.. |  | 20 (23) | 0.66 (0.38) | 5.3 | 0.6 | 1 | 4.7 | 220 | -06 | | -08 | 480 |
| FN2060-30-08 |  | 30 (34.5) | 0.79 (0.45) | 9.1 | 0.6 | 1 | 10 | 220 | | | -08 | 950 |
| FN2060A-1-.. |  | 1 (1.2) | 0.07 (0.04) | 1.6 | 12 | 0.22 | 0.47 | 1000 | -06 | -07 | | 120 |
| FN2060A-3-.. |  | 3 (3.5) | 0.07 (0.04) | 2.2 | 2.5 | 0.22 | 0.47 | 1000 | -06 | -07 | | 120 |
| FN2060A-6-.. |  | 6 (6.9) | 0.07 (0.04) | 3.2 | 0.97 | 0.22 | 0.47 | 1000 | -06 | -07 | | 120 |
| FN2060A-10-.. |  | 10 (11.5) | 0.07 (0.04) | 4.3 | 0.8 | 0.47 | 0.47 | 470 | -06 | -07 | -08 | 190 |
| FN2060A-12-.. |  | 12 (13.8) | 0.07 (0.04) | 6.2 | 0.58 | 0.47 | 0.47 | 470 | -06 | -07 | -08 | 190 |
| FN2060A-16-.. |  | 16 (18.4) | 0.07 (0.04) | 4.4 | 0.65 | 0.33 | 0.47 | 1000 | -06 | -07 | -08 | 260 |
| FN2060A-20-.. |  | 20 (23) | 0.07 (0.04) | 5.3 | 0.6 | 1 | 0.47 | 220 | -06 | | -08 | 480 |
| FN2060A-30-08 |  | 30 (34.5) | 0.07 (0.04) | 9.1 | 0.6 | 1 | 0.47 | 220 | | | -08 | 950 |
| FN2060B-1-.. |  | 1 (1.2) | 0.00 | 1.6 | 12 | 0.22 | | 1000 | -06 | -07 | | 120 |
| FN2060B-3-.. |  | 3 (3.5) | 0.00 | 2.2 | 2.5 | 0.22 | | 1000 | -06 | -07 | | 120 |
| FN2060B-6-.. |  | 6 (6.9) | 0.00 | 3.2 | 0.97 | 0.22 | | 1000 | -06 | -07 | | 120 |
| FN2060B-10-.. |  | 10 (11.5) | 0.00 | 4.3 | 0.8 | 0.47 | | 470 | -06 | -07 | -08 | 190 |
| FN2060B-12-.. |  | 12 (13.8) | 0.00 | 6.2 | 0.58 | 0.47 | | 470 | -06 | -07 | -08 | 190 |
| FN2060B-16-.. |  | 16 (18.4) | 0.00 | 4.4 | 0.65 | 0.33 | | 1000 | -06 | -07 | -08 | 260 |
| FN2060B-20-.. |  | 20 (23) | 0.00 | 5.3 | 0.6 | 1 | | 220 | -06 | | -08 | 480 |
| FN2060B-30-08 |  | 30 (34.5) | 0.00 | 9.1 | 0.6 | 1 | | 220 | | | -08 | 950 |

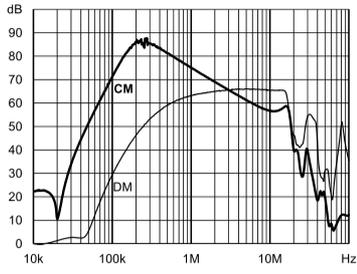
* To compile a complete part number, please replace the -.. with the required I/O connection style (e.g. FN 2070-25-08, FN 2070B-10-06).

** 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.

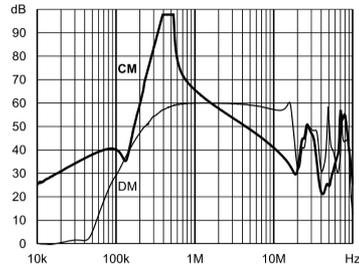
*** Tolerances apply: Inductance: -30/+50%, Capacitance: ±20%, Resistance: ±10%

Typical Filter Attenuation

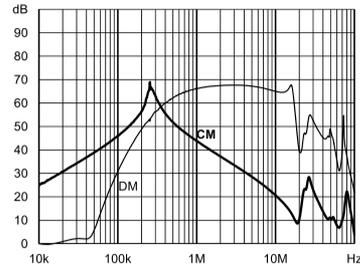
Per CISPR 17: symmetrical 50 Ω/50 Ω -> Differential Mode (DM); asymmetrical 50 Ω/50 Ω -> Common Mode (CM)



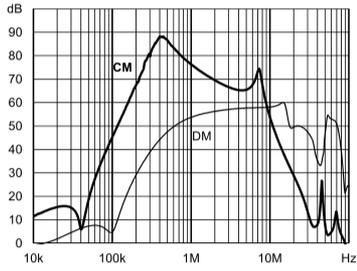
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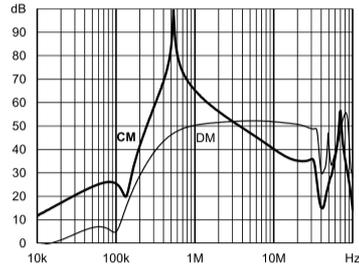
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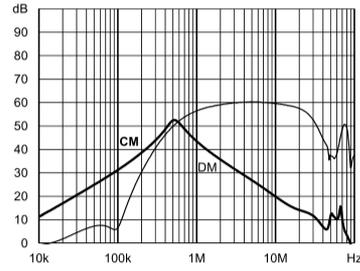
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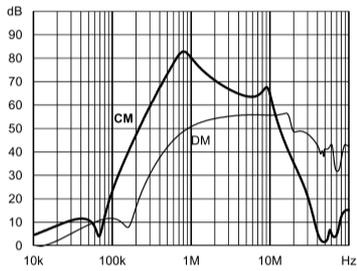
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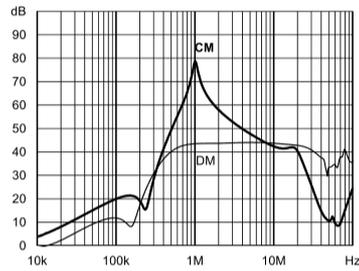
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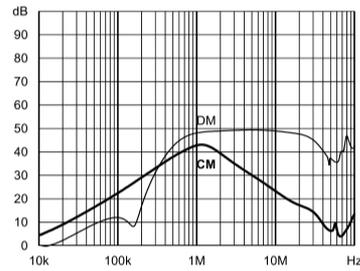
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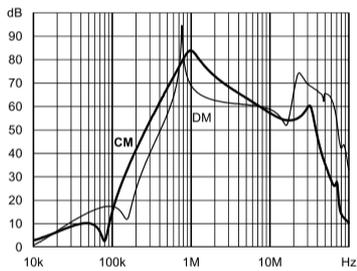
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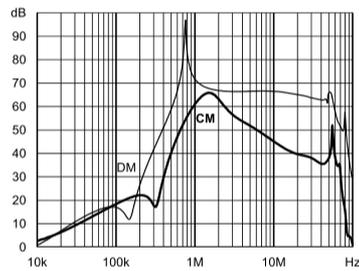
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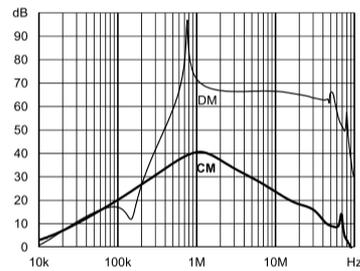
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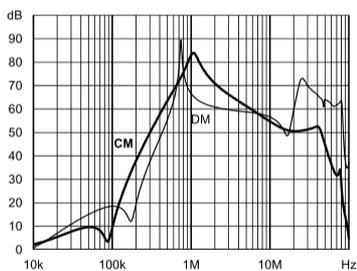
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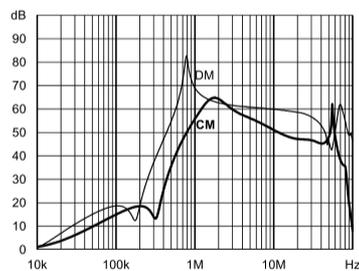
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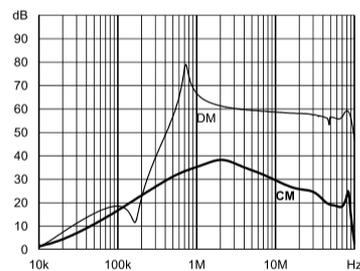
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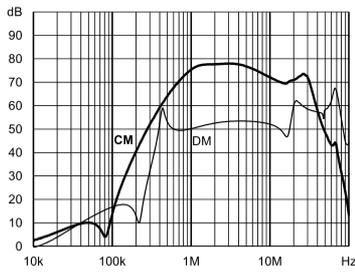
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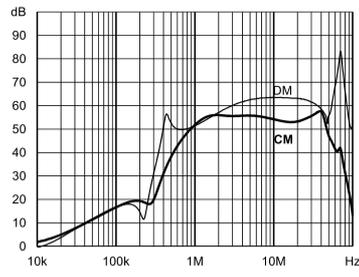
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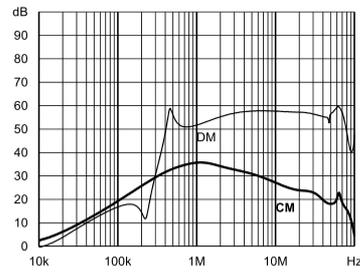
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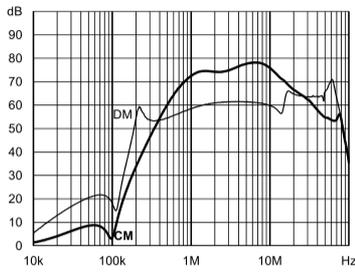
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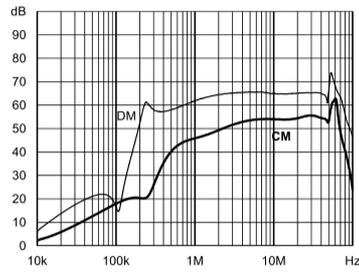
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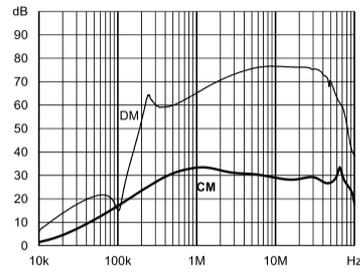
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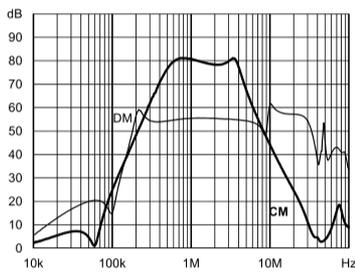
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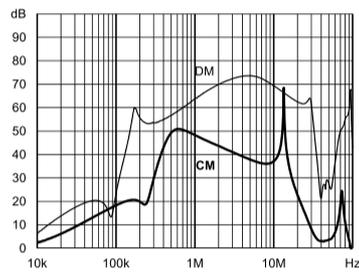
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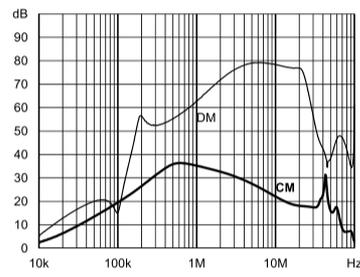
B type



30 A: Standard type



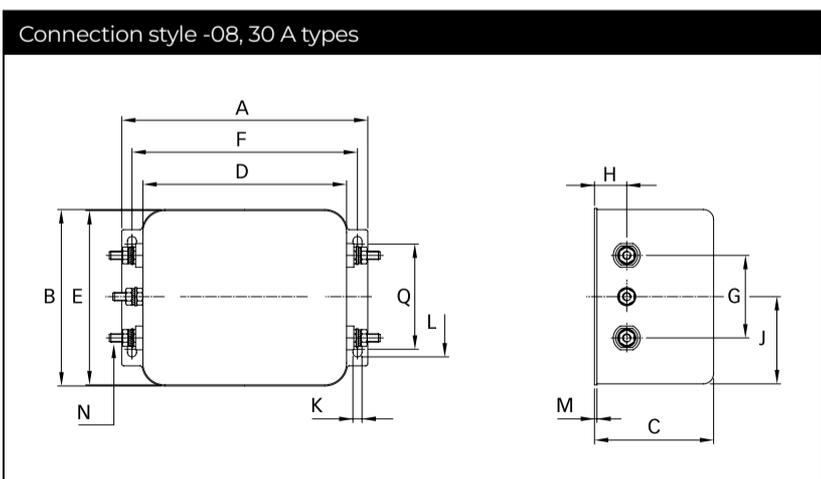
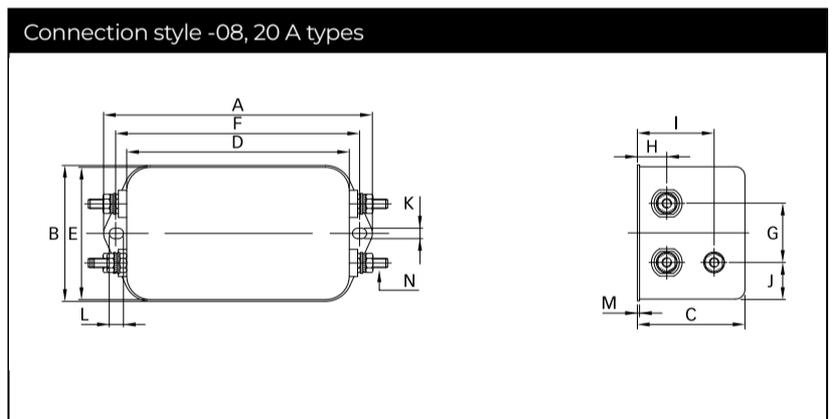
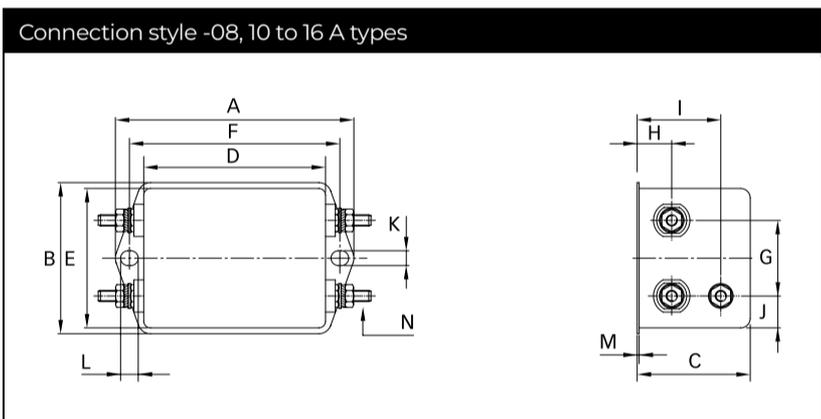
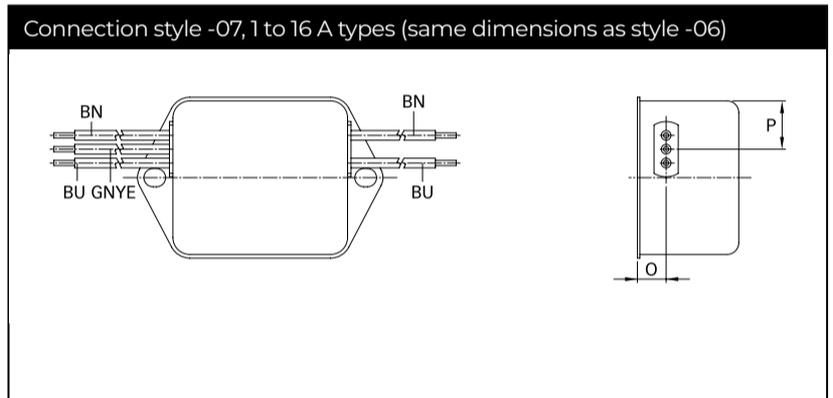
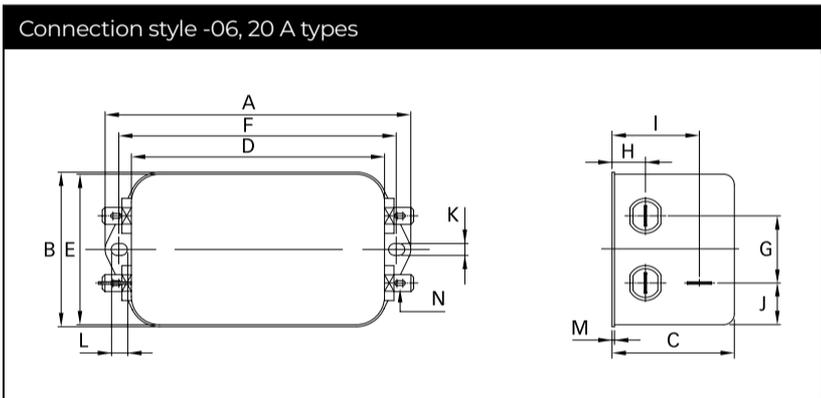
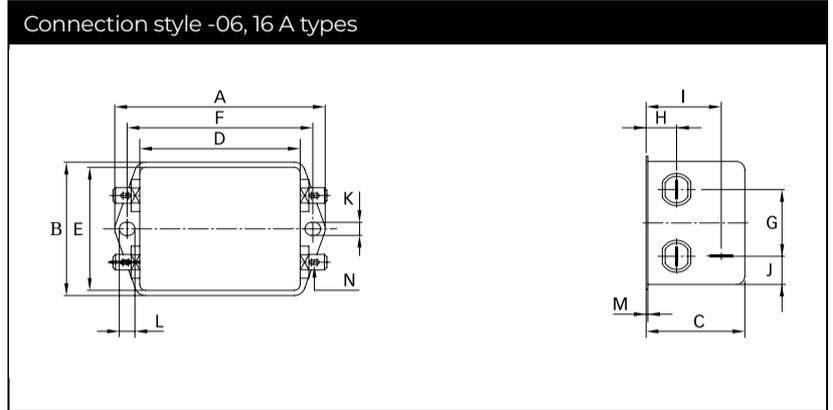
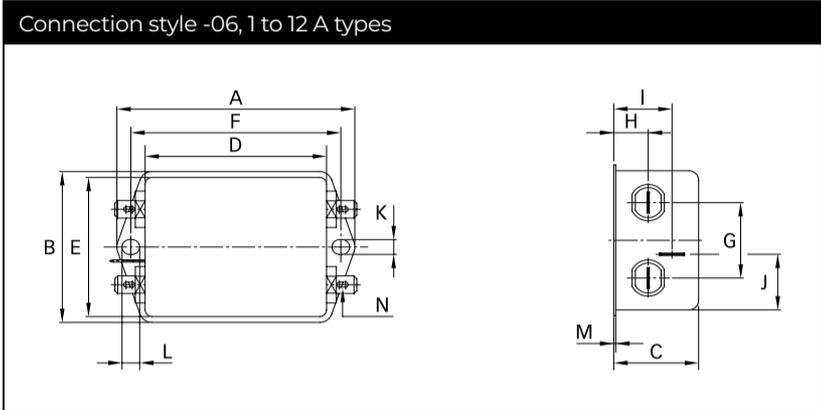
A type



B type

| Product selector | | |
|------------------|-----------------|---------------------------------------|
| | 06 | Faston 6,3 × 0.8 mm (spade/soldering) |
| | 07 | Wire leads |
| | 08 | Studs (M4 screws) |
| | 1 to 30 | Rated current |
| | Blank | Standard version |
| A | Safety version | |
| B | Medical version | |

Mechanical Data



Dimensions

| | 1 A | 3 A | 6 A | 10 A | 12 A | 16 A | 20 A | 30 A | Tolerances |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| A | 71 | 71 | 71 | 85 | 85 | 85 | 113.5 ±1 | 119 ±1 | ±0.5 |
| B | 46.6 | 46.6 | 46.6 | 54 | 54 | 54 | 57.5 ±1 | 85.5 ±1 | ±0.5 |
| C | 29.3 | 29.3 | 29.3 | 30.3 | 30.3 | 40.3 | 45.4 ±1 | 57.6 ±1 | ±0.5 |
| D | 50.5 | 50.5 | 50.5 | 64.8 | 64.8 | 64.8 | 94 ±1 | 98.5 ±1 | ±0.5 |
| E | 44.5 | 44.5 | 44.5 | 49.8 | 49.8 | 49.8 | 56 | 84.5 | ±0.5 |
| F | 61 | 61 | 61 | 75 | 75 | 75 | 103 | 109 | ±0.3 |
| G | 21 | 21 | 21 | 27 | 27 | 27 | 25 | 40 | ±0.2 |
| H | 10.8 | 10.8 | 10.8 | 12.3 | 12.3 | 12.3 | 12.4 | 15.6 | ±0.5 |
| I | 19.3 | 19.3 | 19.3 | 20.8 | 20.8 | 29.8 | 32.4 | | ±0.5 |
| J | 20.1 | 20.1 | 20.1 | 19.9 | 19.9 | 11.4 | 15.5 | 42.25 | ±0.5 |
| K | 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 | 7.4 | |
| M | 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 | |
| Connection style -07 | | | | | | | | | |
| O | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | 8.3 | | | ±0.5 |
| P | 14 | 14 | 14 | 14.9 | 14.9 | 14.9 | | | |
| AWG type wire | AWG 20 | AWG 20 | AWG 18 | AWG 18 | AWG 16 | AWG 16 | | | |
| Wire length | 140 | 140 | 140 | 140 | 140 | 140 | | | +5 |
| Connection style -08 | | | | | | | | | |
| N | | | | M4 | M4 | M4 | M4 | M4 | |
| Q | | | | | | | | 51 | ±0.2 |
| Recommended torque (Nm) | | | | 1.2 - 1.3 | 1.2 - 1.3 | 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 | 1.5 - 1.7 | | |

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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