

General Purpose AC/DC EMC/RFI Filter



- Rated currents from 1 to 60 A
- High differential-mode attenuation
- Optional medical version (B type)
- Optional safety version (A type)



Performance indicators

Attenuation performance



Rated current [A]



Technical Specifications

| | |
|--|---|
| Maximum continuous operating voltage | 250 VAC, 50/60 Hz 250 VDC |
| Nominal operating voltage | 230 VAC |
| Rated currents | 1 to 60 A @ 40°C |
| Operating frequency | DC to 400 Hz |
| High potential test voltage | P → N 1100 VDC for 2 sec (30 and 60 A types) P → PE 2000 VAC for 2 sec P → PE 2500 VAC for 2 sec (B types) P → N 760 VAC for 2 sec (1 to 20 A types) |
| Overvoltage 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) | >1,250,000 h @ 40°C/230 V 1,750,000 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

Approvals & Compliances



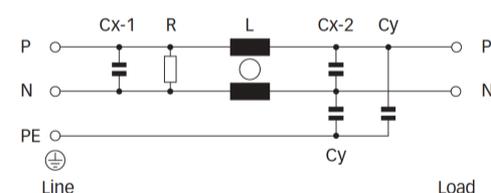
Features and Benefits

- FN 2020 filters are designed for easy and fast chassis mounting
- FN 2020 B versions without capacitors to earth comply to 1MOP for ME (medical equipment) acc. IEC 60601-1
- FN 2020 A versions with low capacitance to earth for safety critical applications with necessity for low leakage currents
- All filters provide a general purpose conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior
- FN 2020 filters can be used to cover a broad range of usage and they offer a good size/ amperage ratio
- FN 2020 filters are also available as two- stage filters (FN 2060, FN 2070 series) for more noisy environment
- 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] |  |  |  | |
| FN2020-1-.. |  | 1 (1.15) | 0.66 (0.38) | 0.8 | 12 | 0.15 | 4.7 | 1000 | -06 | -07 | | 80 |
| FN2020-3-.. |  | 3 (3.45) | 0.66 (0.38) | 1.2 | 2.5 | 0.15 | 4.7 | 1000 | -06 | -07 | | 80 |
| FN2020-6-.. |  | 6 (6.9) | 0.66 (0.38) | 1.5 | 1 | 0.15 | 4.7 | 1000 | -06 | -07 | | 80 |
| FN2020-10-.. |  | 10 (11.5) | 0.66 (0.38) | 2.9 | 0.8 | 0.15 | 4.7 | 1000 | -06 | -07 | | 85 |
| FN2020-12-.. |  | 12 (13.8) | 0.66 (0.38) | 3.6 | 0.7 | 0.15 | 4.7 | 1000 | -06 | -07 | | 85 |
| FN2020-16-.. |  | 16 (18.4) | 0.66 (0.38) | 2.5 | 0.65 | 0.15 | 4.7 | 1000 | -06 | -07 | -08 | 140 |
| FN2020-20-.. |  | 20 (23) | 0.66 (0.38) | 3.8 | 0.6 | 0.15 | 4.7 | 1000 | -06 | | -08 | 210 |
| FN2020-30-08 |  | 30 (34.5) | 0.79 (0.45) | 6.3 | 0.67 | 0.47 | 10 | 470 | | | -08 | 470 |
| FN2020-60-24 |  | 60 (69) | 0.79 (0.45) | 14.7 | 1 | 1.5 | 10 | 220 | | | -24 | 1100 |
| FN2020A-1-.. |  | 1 (1.15) | 0.07 (0.04) | 0.8 | 12 | 0.15 | 0.47 | 1000 | -06 | -07 | | 80 |
| FN2020A-3-.. |  | 3 (3.45) | 0.07 (0.04) | 1.2 | 2.5 | 0.15 | 0.47 | 1000 | -06 | -07 | | 80 |
| FN2020A-6-.. |  | 6 (6.9) | 0.07 (0.04) | 1.5 | 1 | 0.15 | 0.47 | 1000 | -06 | -07 | | 80 |
| FN2020A-10-.. |  | 10 (11.5) | 0.07 (0.04) | 2.9 | 0.8 | 0.15 | 0.47 | 1000 | -06 | -07 | | 85 |
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| FN2020A-16-.. |  | 16 (18.4) | 0.07 (0.04) | 2.5 | 0.65 | 0.15 | 0.47 | 1000 | -06 | -07 | -08 | 140 |
| FN2020A-20-.. |  | 20 (23) | 0.07 (0.04) | 3.8 | 0.6 | 0.15 | 0.47 | 1000 | -06 | | -08 | 210 |
| FN2020A-30-08 |  | 30 (34.5) | 0.07 (0.04) | 6.3 | 0.67 | 0.47 | 0.47 | 470 | | | -08 | 470 |
| FN2020A-60-24 |  | 60 (69) | 0.07 (0.04) | 14.7 | 1 | 1.5 | 0.47 | 220 | | | -24 | 1100 |
| FN2020B-1-.. |  | 1 (1.15) | 0.00 | 0.8 | 12 | 0.15 | | 1000 | -06 | -07 | | 80 |
| FN2020B-3-.. |  | 3 (3.45) | 0.00 | 1.2 | 2.5 | 0.15 | | 1000 | -06 | -07 | | 80 |
| FN2020B-6-.. |  | 6 (6.9) | 0.00 | 1.5 | 1 | 0.15 | | 1000 | -06 | -07 | | 80 |
| FN2020B-10-.. |  | 10 (11.5) | 0.00 | 2.9 | 0.8 | 0.15 | | 1000 | -06 | -07 | | 85 |
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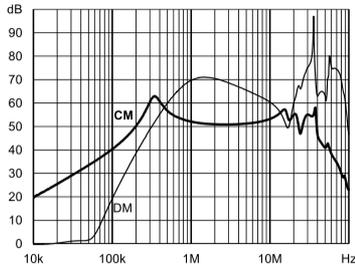
* To compile a complete part number, please replace the -.. with the required I/O connection style (e.g. FN 2020-30-08, FN 2020B-10-06).

** 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.

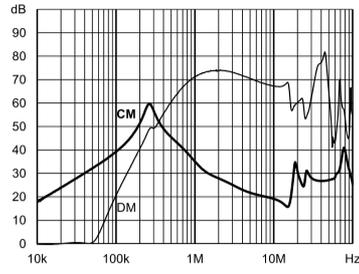
*** Tolerances apply: Inductance: -30/+50%, Capacitance: ±20%, Resistance: ±10%

Typical Filter Attenuation

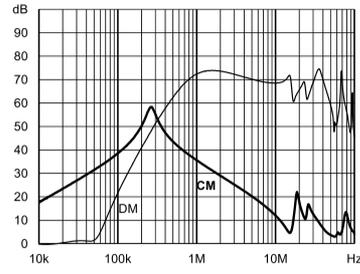
Per CISPR 17: symmetrical 50 Ω/50 Ω -> Differential Mode (DM); asymmetrical 50 Ω/50 Ω -> Common Mode (CM)



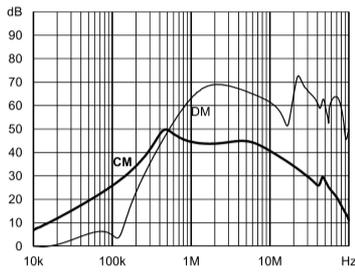
1 A: Standard type



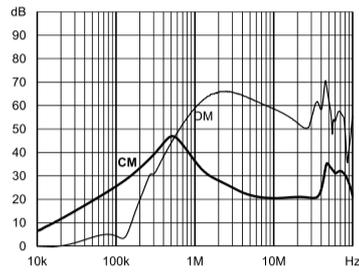
A type



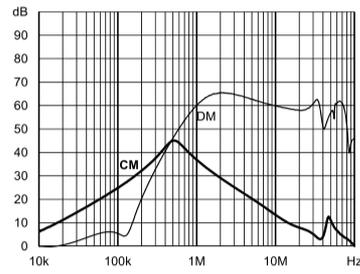
B type



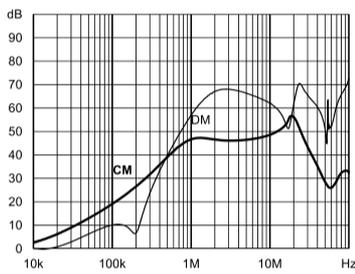
3 A: Standard type



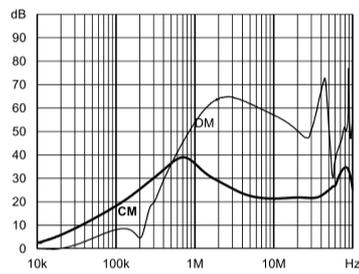
A type



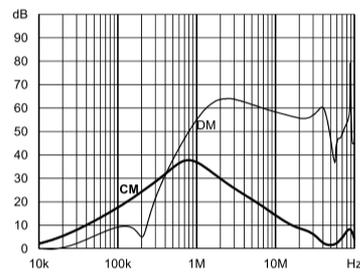
B type



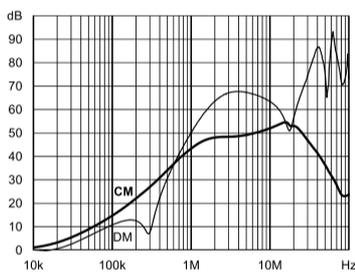
6 A: Standard type



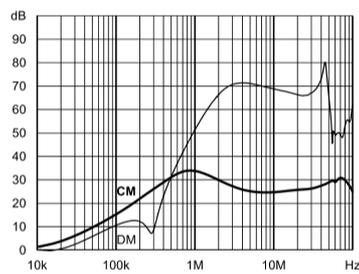
A type



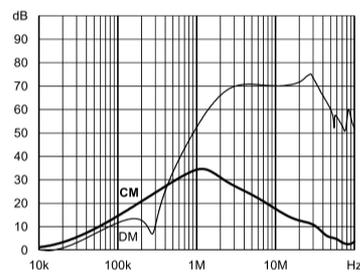
B type



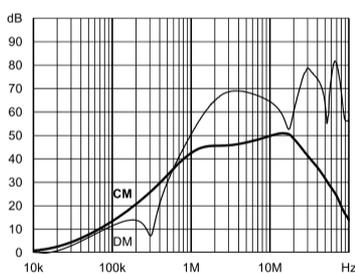
10 A: Standard type



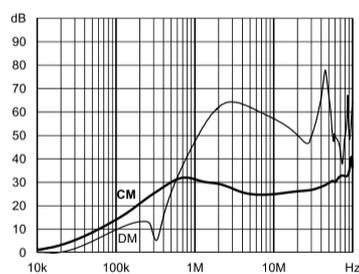
A type



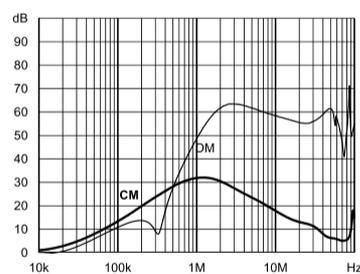
B type



12 A: Standard type



A type



B type

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 | 29.3 | 29.3 | 29.3 | 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 | | | |
| Connection style -07 | | | | | | | | | | |
| O | 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 | | | | ±0.5 |
| 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 | | |
| 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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