

Bookstyle EMC/EMI Filter for Motor Drives



- Exceptional broadband attenuation performance from 10 kHz up to 30 MHz
- Slim and user-friendly book-style design with touch-safe terminal blocks for minimum space and maximum safety
- Enables compliance with Class B limits

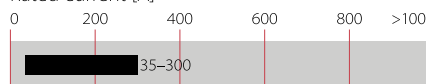


Performance indicators

Attenuation performance



Rated current [A]



Approvals



(FN 3100 up to 150 A)

Features and benefits

- High performance filter for mainly industrial motor drive applications with significant interference levels
- Attenuation performance for Class B compliance in applications comprising multiple motor drives (e.g. machine tool with up to 8 driving axes with ~10 to 20 m motor cable each)
- Broadband filter performance with low frequency attenuation down to 10 kHz for reliable suppression of conducted interference
- Slim book-style shape requiring minimum cabinet space and allowing convenient installation right beside the motor drive
- Touch-safe terminal blocks provide unsurpassed electrical safety and contacting cross section according to EN 60204-1 installation standard
- For even better filter specifications, please consider FN 3120 H series from Schaffner

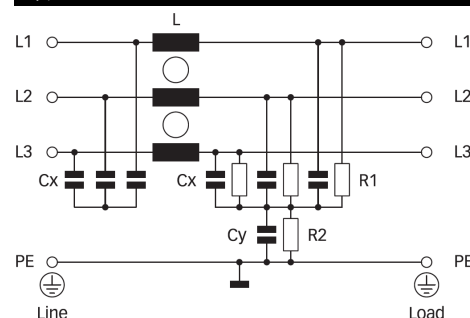
Technical specifications

| | |
|--|--|
| Maximum continuous operating voltage | 3x 520/300 VAC |
| Operating frequency | dc to 60 Hz |
| Rated currents | 35 to 300 A @ 50°C |
| High potential test voltage | P → E 2750 VDC for 2 sec P → P 2250 VDC for 2 sec |
| Protection category | IP 20 |
| Overload capability | 4x rated current at switch on, 1.5x rated current for 1 minute, once per hour |
| 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 @ 50°C/400 V (Mil-HB-217F) | >400,000 hours |



Typical applications

- Conventional motor drives with long motor cables and high interference levels
- Four quadrant motor drives and servo drives with energy regeneration mode (in combination with a suitable line reactor)
- Industrial applications comprising power conversion devices, such as machinery, machine tools and process automation equipment
- Uninterruptible power supplies (UPS)
- Converters for renewable energy generation
- Thyristor drives
- Elevators and cranes

Typical electrical schematic



Filter selection table

| Filter | Rated current @ 50°C (40°C) | Typical drive power rating* | Leakage current** @ 400 VAC/50 Hz | Power loss @ 25°C/50 Hz | Input/Output connections | | Weight |
|-----------------------|--------------------------------|--------------------------------|--------------------------------------|----------------------------|---|---|--------|
| | [A] | [kW] | [mA] | [W] |  |  | [kg] |
| FN 3100-35-33 | 35 (38.4) | 22 | 48.9 | 11.8 | -33 | | 2.3 |
| FN 3100-50-34 | 50 (54.8) | 30 | 66.1 | 18.0 | -34 | | 3.4 |
| FN 3100-80-35 | 80 (87.6) | 45 | 71.5 | 25.9 | -35 | | 5.3 |
| FN 3100-110-35 | 110 (120.5) | 55 | 71.5 | 32.7 | -35 | | 5.4 |
| FN 3100-150-40 | 150 (164.3) | 75 | 71.5 | 50.6 | -40 | | 8.5 |
| FN 3100-200-40 | 200 (219) | 110 | 71.5 | 67.2 | -40 | | 9.1 |
| FN 3100-230-40 | 230 (230) | 132 | 71.5 | 36.5 | -40 | | 9.2 |
| FN 3100-300-99 | 300 (329) | 160 | 71.5 | 54.0 | | -99 | 11.8 |

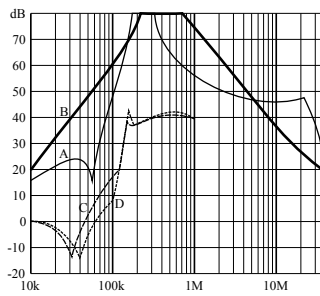
* Calculated at rated current, 480 VAC and cos phi=0.8. The exact value depends upon the efficiency of the drive, the motor and the entire application.

** Maximum leakage under normal operating conditions. Note: if two phases are interrupted, worst case leakage could reach 5.3 times higher levels.

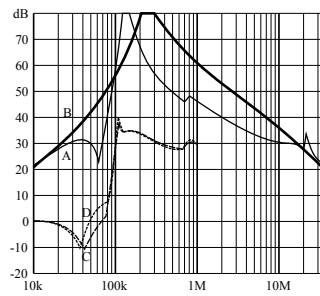
Typical filter attenuation

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

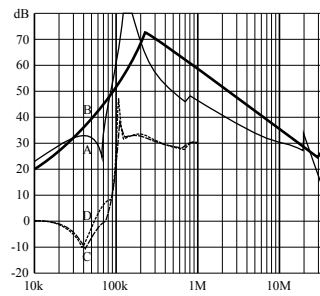
35 to 80 A types



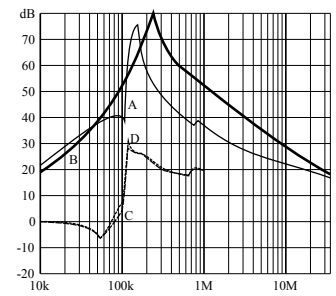
110 and 150 A types



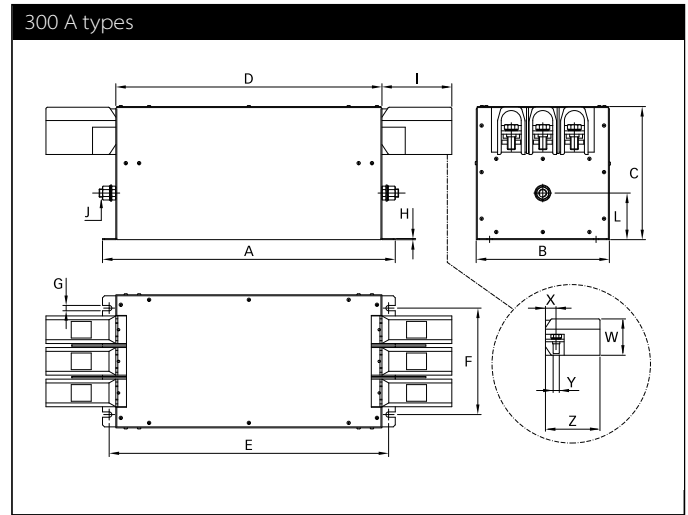
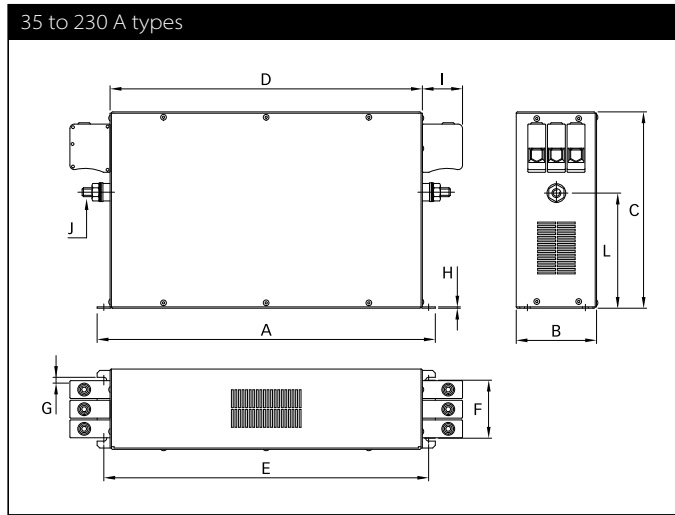
200 A types



230 and 300 A types



Mechanical data



Dimensions

| | 35 A | 50 A | 80 A | 110 A | 150 A | 200 A | 230 A | 300 A |
|----------|------|------|------|-------|-------|-------|-------|-------|
| A | 335 | 329 | 379 | 379 | 438 | 438 | 438 | 440 |
| B | 60 | 80 | 90 | 90 | 110 | 110 | 110 | 200 |
| C | 150 | 185 | 220 | 220 | 240 | 240 | 240 | 200 |
| D | 305 | 300 | 350 | 350 | 400 | 400 | 400 | 400 |
| E | 320 | 314 | 364 | 364 | 413 | 413 | 413 | 420 |
| F | 35 | 55 | 65 | 65 | 80 | 80 | 80 | 160 |
| G | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 8 |
| H | 1 | 1.5 | 1.5 | 1.5 | 4 | 4 | 4 | 1.5 |
| I | 25 | 39 | 45 | 45 | 51 | 51 | 51 | 105 |
| J | M5 | M6 | M10 | M10 | M10 | M10 | M10 | M12 |
| L | 93.5 | 107 | 129 | 129 | 108 | 108 | 108 | 70 |
| W | | | | | | | | 71.5 |
| X | | | | | | | | ~22 |
| Y | | | | | | | | M12 |
| Y | | | | | | | | ~105 |

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

Filter input/output connector cross sections

| | -33 | -34 | -35 | -40 | -99 |
|---------------------------|--------------------|--------------------|--------------------|--------------------|---------------------|
| Solid wire | 16 mm ² | 35 mm ² | 50 mm ² | 95 mm ² | - |
| Flex wire | 10 mm ² | 25 mm ² | 50 mm ² | 95 mm ² | 150 mm ² |
| AWG type wire | AWG 6 | AWG 2 | AWG 1/0 | AWG 4/0 | AWG 6/0 |
| Recommended torque | 1.5 - 1.8 Nm | 4.0 - 4.5 Nm | 7 - 8 Nm | 17 - 20 Nm | 27 - 30 Nm |

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



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