

Book-style EMC/RFI Filter for Inverters and Power Drive Systems



- Industry standard EMC solution for three-phase PDS filtering
- Slim space-saving book-style housing
- Solid safety connector blocks or optional wire output connections
- Excellent attenuation performance
- HV versions for up to 690 VAC
- HVIT versions for IT distribution networks
- P/L versions with low leakage current



Performance indicators

Attenuation performance



Rated current [A]



Technical specifications

| | |
|--|--|
| Maximum continuous operating voltage | 3x 520/300 VAC (FN 258, FN 258 L, FN 258 P) 3x 760/440 VAC (FN 258 HV, FN 258 HVIT) |
| Rated currents | 7 to 250 A @50°C (480 V filters) |
| Operating frequency | DC to 60 Hz |
| High potential test voltage | P → E 2650 VDC for 2 sec (FN 258) P → P 2100 VDC for 2 sec (FN 258) P → E 2000 VAC for 2 sec (FN 258L) P → P 2100 VDC for 2 sec (FN 258L) P → E 3000 VDC for 2 sec (FN 258P) P → P 2100 VDC for 2 sec (FN 258P) P → E 3200 VDC for 2 sec (FN 258HV and FN 258HVIT) P → P 3270 VDC for 2 sec (FN 258HV and FN 258HVIT) |
| 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) | 220,000 hours |

Approvals



UL/CSA: FN 258 up to 180 A (ex. -180-07)

Features and benefits

- FN 258 range of filters provides state-of-the-art EMI attenuation based on an innovative multi-stage filter topology. They help to ensure compliance with Class A or even Class B limits
- The slim book-style shape allows a convenient and space-saving installation next to inverters and motor drives
- With 480 VAC rating and filter modules from 7 to 250 A, FN 258 are ready for the most diverse applications worldwide
- FN 258 HV filters up to 130 A are designed for 690 VAC distribution networks
- FN 258 HVIT filters up to 130 A meet the special requirements for the application in industrial 690 VAC IT distribution networks
- FN 258 L and FN 258 P filters help to fulfill tough requirements in respect of leakage current limitation and provide an excellent solution to overcome problems with nuisance tripping of sensitive earth leakage detectors

Typical applications

- Three-phase variable speed drives and power drive systems (PDS)
- IT power distribution networks (FN 258 HVIT)
- Applications comprising energy conversion devices (inverters, converters)
- Process automation equipment
- Three-phase power supplies and UPS
- Applications with low-leakage current requirements (FN 258 L and FN 258 P)

Typical electrical schematic



Note: HVIT versions without discharge resistor to ground.

Filter selection table

| Filter* | Rated current | Typical drive | Leakage current*** | Power loss | Input connections | Output connections | | Weight [kg] |
|--------------------|----------------------|------------------------|-----------------------------|---------------------|-------------------|--------------------|-----|-------------|
| | @ 50°C (40°C) [A] | power rating** [kW] | @ 520/760 VAC/50 Hz [mA] | @ 25°C/50 Hz [W] | | | | |
| FN 258-7-.. | 7 (7.7) | 4 | 2.0 | 9 | -29 | -07 | -29 | 1.0 |
| FN 258-16-.. | 16 (17.5) | 7.5 | 2.1 | 20 | -29 | -07 | -29 | 1.4 |
| FN 258-30-.. | 30 (33) | 15 | 2.9 | 21 | -33 | -07 | -33 | 1.7 |
| FN 258-42-.. | 42 (46) | 22 | 3.0 | 30 | -33 | -07 | -33 | 2.5 |
| FN 258-55-.. | 55 (60) | 30 | 3.0 | 30 | -34 | -07 | -34 | 2.9 |
| FN 258-75-34 | 75 (82) | 37 | 3.0 | 24 | -34 | | -34 | 3.9 |
| FN 258-100-35 | 100 (110) | 55 | 3.0 | 51 | -35 | | -35 | 5.5 |
| FN 258-130-35 | 130 (143) | 75 | 3.5 | 50 | -35 | | -35 | 6.9 |
| FN 258-180-.. | 180 (197) | 90 | 3.5 | 73 | -40 | -07 | -40 | 11.0 |
| FN 258-250-.. | 250 (275) | 132 | 3.4 | 79 | -40 | -07 | -40 | 12.0 |
| FN 258 HV-7-29 | 7 (7.7) | 5.5 | 1.6 | 9 | -29 | | -29 | 1.0 |
| FN 258 HV-16-29 | 16 (17.5) | 11 | 2.3 | 20 | -29 | | -29 | 1.5 |
| FN 258 HV-30-33 | 30 (33) | 22 | 2.3 | 21 | -33 | | -33 | 1.8 |
| FN 258 HV-42-33 | 42 (46) | 30 | 2.6 | 30 | -33 | | -33 | 2.6 |
| FN 258 HV-55-34 | 55 (60) | 45 | 2.6 | 30 | -34 | | -34 | 3.0 |
| FN 258 HV-75-34 | 75 (82) | 55 | 2.6 | 24 | -34 | | -34 | 4.3 |
| FN 258 HV-100-35 | 100 (110) | 90 | 2.6 | 51 | -35 | | -35 | 5.6 |
| FN 258 HV-130-35 | 130 (143) | 110 | 2.9 | 50 | -35 | | -35 | 7.1 |
| FN 258 HVIT-7-29 | 7 (7.7) | 5.5 | 0.1 | 9 | -29 | | -29 | 1.0 |
| FN 258 HVIT-16-29 | 16 (17.5) | 11 | 0.1 | 20 | -29 | | -29 | 1.5 |
| FN 258 HVIT-30-33 | 30 (33) | 22 | 0.1 | 21 | -33 | | -33 | 1.8 |
| FN 258 HVIT-42-33 | 42 (46) | 30 | 0.1 | 30 | -33 | | -33 | 2.6 |
| FN 258 HVIT-55-34 | 55 (60) | 45 | 2.6 | 30 | -34 | | -34 | 3.0 |
| FN 258 HVIT-75-34 | 75 (82) | 55 | 2.6 | 24 | -34 | | -34 | 4.3 |
| FN 258 HVIT-100-35 | 100 (110) | 90 | 2.6 | 51 | -35 | | -35 | 5.6 |
| FN 258 HVIT-130-35 | 130 (143) | 110 | 2.9 | 50 | -35 | | -35 | 7.1 |
| FN 258 L-7-.. | 7 (7.7) | 4 | 0.1 | 9 | -29 | -07 | -29 | 1.0 |
| FN 258 L-16-.. | 16 (17.5) | 7.5 | 0.1 | 20 | -29 | -07 | -29 | 1.4 |
| FN 258 L-30-.. | 30 (33) | 15 | 0.1 | 21 | -33 | -07 | -33 | 1.7 |
| FN 258 L-42-.. | 42 (46) | 22 | 0.1 | 30 | -33 | -07 | -33 | 2.5 |
| FN 258 L-55-.. | 55 (60) | 30 | 0.1 | 30 | -34 | -07 | -34 | 2.9 |
| FN 258 L-75-34 | 75 (82) | 37 | 0.1 | 24 | -34 | | -34 | 3.9 |
| FN 258 L-100-35 | 100 (110) | 55 | 0.1 | 51 | -35 | | -35 | 5.5 |
| FN 258 L-130-35 | 130 (143) | 75 | 0.1 | 50 | -35 | | -35 | 6.9 |
| FN 258 L-180-.. | 180 (197) | 90 | 0.1 | 73 | -40 | -07 | -40 | 11.0 |
| FN 258 L-250-07 | 250 (275) | 132 | 0.1 | 79 | -40 | -07 | | 12.0 |
| FN 258 P-7-.. | 7 (7.7) | 4 | 0.4 | 9 | -29 | -07 | -29 | 1.0 |
| FN 258 P-16-.. | 16 (17.5) | 7.5 | 0.4 | 20 | -29 | -07 | -29 | 1.4 |
| FN 258 P-30-.. | 30 (33) | 15 | 0.4 | 21 | -33 | -07 | -33 | 1.7 |
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| FN 258 P-250-07 | 250 (275) | 132 | 0.4 | 79 | -40 | -07 | | 12.0 |

* To compile a complete part number, please replace the -.. with the required output connection style.

** Calculated at rated current, 440 VAC (FN 258)/690 VAC (FN 258 HV) and $\cos \phi = 0.8$. The exact value depends upon the efficiency of the drive, the motor and the entire application.

*** Standardized calculated leakage current acc. IEC60939 under normal operating conditions (FN 258 at 520 VAC and FN 258 HV at 760 VAC).

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

7 to 30 A types

42 to 100 A types

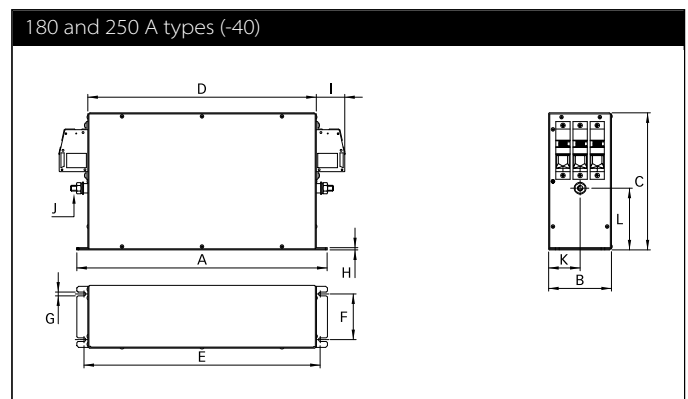
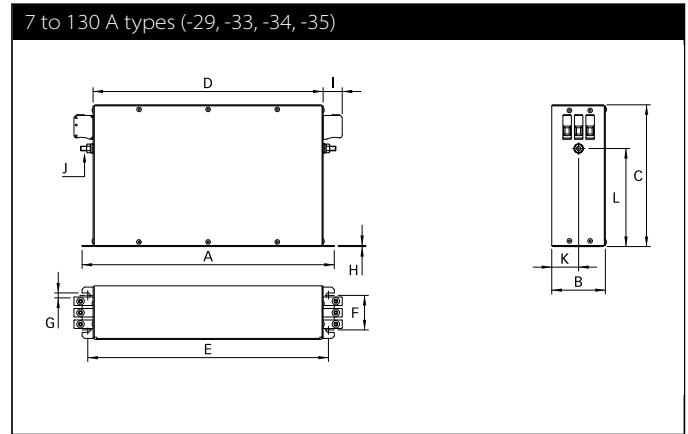
130 A types

180 and 250 A types



Note: typical attenuation performance of FN 258 standard filters. The behavior of FN 258 HV, FN 258 HVT, FN 258 P and FN 258 L may be slightly different.

Mechanical data



Note: in favour of a better readability, connectors and earth studs are not shown in the horizontal projection.

Dimensions

| | 7 A | 16 A | 30 A | 42 A | 55 A | 75 A | 100 A | 130 A | 180 A | 250 A |
|-----------|---------|---------|---------|---------|---------|------|-------|-------|--------------------|--------------------|
| A | 255 | 305 | 335 | 329 | 329 | 329 | 379 | 439 | 438 | 478 |
| B | 50 | 55 | 60 | 70 | 80 | 80 | 90 | 110 | 110 | 110 |
| C | 126 | 142 | 150 | 185 | 185 | 220 | 220 | 240 | 240 | 240 |
| D | 225 | 275 | 305 | 300 | 300 | 300 | 350 | 400 | 400 | 440 |
| E | 240 | 290 | 320 | 314 | 314 | 314 | 364 | 414 | 413 | 453 |
| F | 25 | 30 | 35 | 45 | 55 | 55 | 65 | 80 | 80 | 80 |
| G | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| H | 1 | 1 | 1 | 1.5 | 1.5 | 1.5 | 1.5 | 3 | 4 | 4 |
| I | 10.9 | 10.9 | 25 | 25 | 39 | 39 | 45 | 45 | 51 | 51 |
| J | M5 | M5 | M5 | M6 | M6 | M6 | M10 | M10 | M10 | M10 |
| K | 25 | 27.5 | 30 | 35 | 40 | 40 | 45 | 55 | 55 | 55 |
| L | 85 | 100 | 110 | 130 | 105 | 140 | 130 | 140 | 110 | 110 |
| X* | AWG 16 | AWG 14 | AWG 10 | AWG 8 | AWG 6 | | | | 50 mm ² | 70 mm ² |
| Y* | 300 ±10 | 300 ±10 | 400 ±10 | 500 ±10 | 500 ±10 | | | | 500 ±10 | 500 ±10 |
| Z* | 9 | 9 | 9 | 12 | 12 | | | | 15 | 15 |

* Filters with output wire connections (-07) only.
All dimensions in mm; 1 inch = 25.4 mm
Tolerances according: ISO 2768-m/EN 22768-m

Filter input/output connector cross sections

| | -29 | -33 | -34 | -35 | -40 |
|---------------------------|---|---|---|---|---|
| |  |  |  |  |  |
| Solid wire | 6 mm ² | 16 mm ² | 35 mm ² | 50 mm ² | 95 mm ² |
| Flex wire | 4 mm ² | 10 mm ² | 25 mm ² | 50 mm ² | 95 mm ² |
| AWG type wire | AWG 10 | AWG 6 | AWG 2 | AWG 1/0 | AWG 4/0 |
| Recommended torque | 0.6-0.8 Nm | 1.5-1.8 Nm | 4.0-4.5 Nm | 7-8 Nm | 17-20 Nm |

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



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