

EMC/RFI Filters for Industrial Electronics

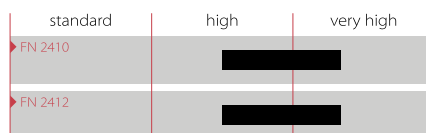


- Excellent filter performance for applications with high interference levels
- Filters for two-phase supply up to 2x 520 VAC (P-P) available
- Fast and comfortable snap-in installation on popular TS 35 DIN-rails up to 45 A
- Industrial grade terminal blocks for unsurpassed electrical safety

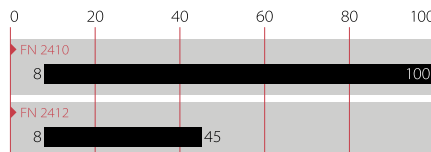


Performance indicators

Attenuation performance



Rated current [A]



Technical specifications

| | |
|--|--|
| Maximum continuous operating voltage | 1x 250 VAC (FN 2410/FN 2412) 2x 520/300 VAC (FN 2410 H/FN 2412 H) |
| Operating frequency | DC to 400 Hz |
| Rated currents | 8 to 100 A @ 50°C (FN 2410) 8 to 45 A @ 50°C (FN 2412) |
| High potential test voltage | P → E 2000 VAC for 2 sec P → N 1100 VDC for 2 sec P → E 2700 VDC for 2 sec (H types) P → P 2250 VDC for 2 sec (H types) |
| 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/250 V (Mil-HB-217F) | 1,200,000 hours 250,000 hours (H types) |

Approvals



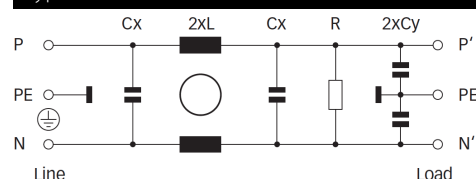
Features and benefits

- FN 2410 filters up to 100 A are designed for traditional chassis mounting
- For extra fast installation, FN 2412 filters up to 45 A can comfortably be snapped-in on popular TS 35 DIN-rails which are common in most electrical cabinets
- Both FN 2410 and FN 2412 are also available as „H versions“. These are ideally suitable for an operation on two phases in a three-phase power network, handling voltages up to 520 VAC
- All filters provide an exceptional conducted attenuation performance, based on chokes with high saturation resistance and excellent thermal behavior. Thus, all filters retain the expected filter performance even in very noisy applications and under full load conditions
- Touch-safe industrial grade terminal blocks provide maximum electrical safety and protect humans from undeliberate contact with live conductors. They help to fulfill the most demanding installation standards


Typical applications

- Small to medium-sized machines and industrial equipment
- High-end single-phase power supplies
- Single-phase variable speed motor drives, inverters and converters
- DIN-rail filter versions are ideal for panel building and electrical cabinets
- Various noisy applications with higher power single-phase or two-phase supply

Typical electrical schematic



Filter selection table

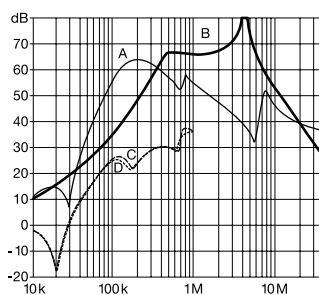
| Filter | Rated current | Leakage current* | Power loss | Input/Output connections | Weight |
|------------------|---------------|--|--------------|---|--------|
| | @ 50°C (40°C) | @ 250 VAC /50 Hz (@ 120 VAC /60 Hz) | @ 25°C/50 Hz | | |
| | [A] | [mA] | [W] |  | [kg] |
| FN 2410-8-44 | 8 (8.8) | 2.60 (1.49) | 2.6 | -44 | 0.4 |
| FN 2410-16-44 | 16 (17.5) | 2.60 (1.49) | 3.5 | -44 | 0.5 |
| FN 2410-25-33 | 25 (27.4) | 2.60 (1.49) | 5.5 | -33 | 0.6 |
| FN 2410-32-33 | 32 (35.0) | 2.60 (1.49) | 5.6 | -33 | 0.7 |
| FN 2410-45-33 | 45 (49.3) | 2.60 (1.49) | 7.4 | -33 | 0.7 |
| FN 2410-60-34 | 60 (65.7) | 2.60 (1.49) | 5.5 | -34 | 1.8 |
| FN 2410-80-34 | 80 (87.6) | 2.60 (1.49) | 9.9 | -34 | 1.8 |
| FN 2410-100-34 | 100 (109.5) | 2.60 (1.49) | 15.4 | -34 | 1.8 |
| FN 2410 H-8-44 | 8 (8.8) | 2.60 (1.49) | 2.6 | -44 | 0.5 |
| FN 2410 H-16-44 | 16 (17.5) | 2.60 (1.49) | 3.5 | -44 | 0.6 |
| FN 2410 H-25-33 | 25 (27.4) | 2.60 (1.49) | 5.5 | -33 | 0.7 |
| FN 2410 H-32-33 | 32 (35.0) | 2.60 (1.49) | 5.6 | -33 | 0.8 |
| FN 2410 H-60-34 | 60 (65.7) | 2.60 (1.49) | 5.5 | -34 | 1.9 |
| FN 2410 H-80-34 | 80 (87.6) | 2.60 (1.49) | 9.9 | -34 | 1.9 |
| FN 2410 H-100-34 | 100 (109.5) | 2.60 (1.49) | 15.4 | -34 | 1.9 |
| FN 2412-8-44 | 8 (8.8) | 2.60 (1.49) | 2.6 | -44 | 0.4 |
| FN 2412-16-44 | 16 (17.5) | 2.60 (1.49) | 3.5 | -44 | 0.6 |
| FN 2412-25-33 | 25 (27.4) | 2.60 (1.49) | 5.5 | -33 | 0.7 |
| FN 2412-32-33 | 32 (35.0) | 2.60 (1.49) | 5.6 | -33 | 0.8 |
| FN 2412-45-33 | 45 (49.3) | 2.60 (1.49) | 7.4 | -33 | 0.8 |
| FN 2412 H-8-44 | 8 (8.8) | 2.60 (1.49) | 2.6 | -44 | 0.5 |
| FN 2412 H-16-44 | 16 (17.5) | 2.60 (1.49) | 3.5 | -44 | 0.7 |
| FN 2412 H-25-33 | 25 (27.4) | 2.60 (1.49) | 5.5 | -33 | 0.8 |
| FN 2412 H-32-33 | 32 (35.0) | 2.60 (1.49) | 5.6 | -33 | 0.9 |

* Maximum leakage under normal operating conditions (acc. to IEC60939-3). Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

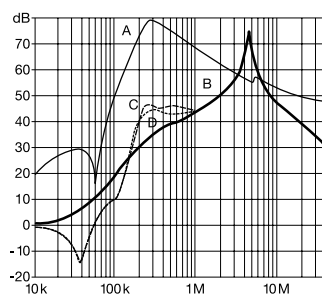
Typical filter attenuation

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

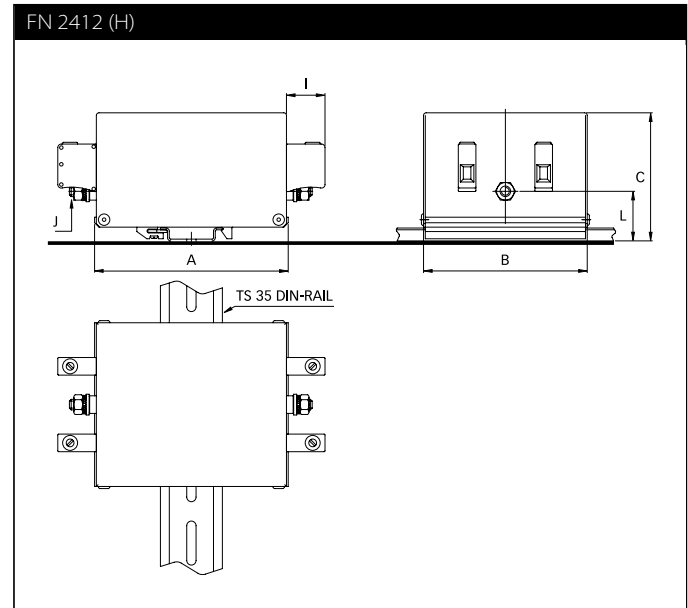
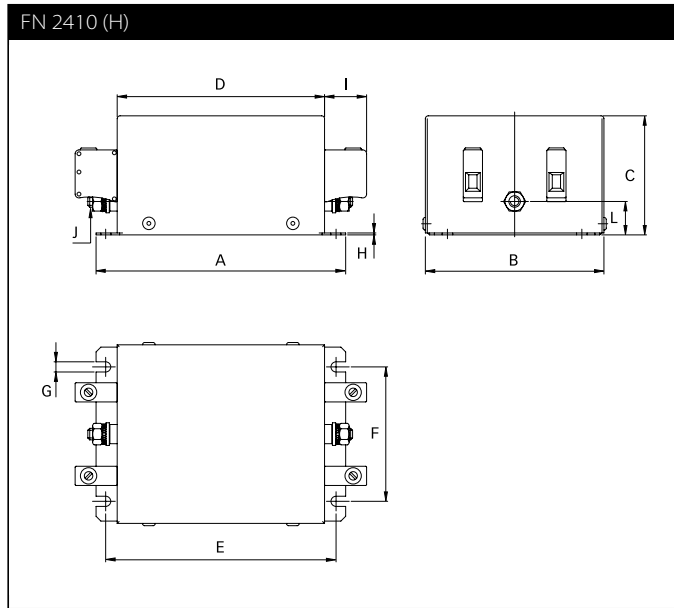
8 to 45 A types



60 to 100 A types



Mechanical data



Dimensions

| | FN 2410 | | | | | FN 2412 | | | | | | | |
|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 8 A | 16 A | 25 A | 32 A | 45 A | 60 A | 80 A | 100 A | 8 A | 16 A | 25 A | 32 A | 45 A |
| A | 130 | 130 | 130 | 130 | 130 | 165 | 165 | 165 | 110 | 110 | 110 | 110 | 110 |
| B | 93 | 93 | 93 | 93 | 93 | 115 | 115 | 115 | 93 | 93 | 93 | 93 | 93 |
| C | 62 | 62 | 76 | 76 | 76 | 100 | 100 | 100 | 73 | 73 | 87 | 87 | 87 |
| D | 108 | 108 | 108 | 108 | 108 | 140 | 140 | 140 | | | | | |
| E | 120 | 120 | 120 | 120 | 120 | 155 | 155 | 155 | | | | | |
| F | 70 | 70 | 70 | 70 | 70 | 90 | 90 | 90 | | | | | |
| G | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | | | | | |
| H | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.2 | 1.2 | 1.2 | | | | | |
| I | 22 | 22 | 25 | 25 | 25 | 39 | 39 | 39 | 22 | 22 | 25 | 25 | 25 |
| J | M6 | M6 | M6 | M6 | M6 | M8 | M8 | M8 | M6 | M6 | M6 | M6 | M6 |
| Rec. torque (Nm) | 3.5 - 4.0 | 3.5 - 4.0 | 3.5 - 4.0 | 3.5 - 4.0 | 3.5 - 4.0 | 8.0 - 9.0 | 8.0 - 9.0 | 8.0 - 9.0 | 3.5 - 4.0 | 3.5 - 4.0 | 3.5 - 4.0 | 3.5 - 4.0 | 3.5 - 4.0 |
| L | 17.5 | 17.5 | 31.5 | 31.5 | 31.5 | 39.2 | 39.2 | 39.2 | 28.5 | 28.5 | 42.5 | 42.5 | 42.5 |

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 | -44 |
|---------------------------|--------------------|--------------------|--------------------|
| | | | |
| Solid wire | 16 mm ² | 35 mm ² | 10 mm ² |
| Flex wire | 10 mm ² | 25 mm ² | 6 mm ² |
| AWG type wire | AWG 6 | AWG 2 | AWG 8 |
| Recommended torque | 1.5-1.8 Nm | 4.0-4.5 Nm | 1.5-1.8 Nm |

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



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