



# Single-Phase Filters FN 2410 / FN 2412

## Single and Two-phase EMC/RFI Filters for Industrial Electronics



- Excellent filter performance for applications with high interference levels
- Fast and comfortable snap-in installation on popular TS 35 DIN-rails up to 45A
- Industrial grade terminal blocks for unsurpassed electrical safety

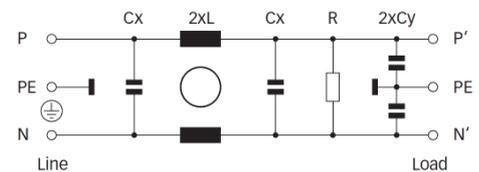
### Approvals



### Technical specifications

|   |  |
|---|--|
| Design corresponding to :                   | UL 1283, CSA 22.2 No. 8 1986, IEC/EN 60939   |
| Flammability corresponding to:              | UL 94V-2 or better   |
| High potential test voltage :               | P → E 2000VAC for 2 sec<br>P → N 1100VDC for 2 sec<br>P → E 2700VDC for 2 sec (H types)<br>P → P 2250VDC for 2 sec (H types) |
| Maximum continuous operating voltage :      | 1x 250VAC (FN 2410 / FN 2412)<br>2x 520/300VAC (FN 2410H / FN 2412H)   |
| MTBF @ 50°C/250V (Mil-HB-217F):             | 1,200,000 hours  |
| MTBF @ 50°C/520V (Mil-HB-217F):             | 250,000 hours (H types)  |
| Operating frequency :                       | dc to 400Hz (except FN 2410H-60/-80/-100: 250Hz)   |
| Overload capability :                       | 4x rated current at switch on,<br>1.5x rated current for 1 minute, once per hour   |
| Performance indicators:                     | FN2410_2412.jpg  |
| Protection category :                       | IP20   |
| Rated currents :                            | 8 to 100 A @ 50°C (FN 2410)<br>8 to 45A @ 50°C (FN 2412)   |
| Temperature range (operation and storage) : | -25°C to +100°C (25/100/21)  |

### Typical electrical schematic



### Features and benefits

- FN 2410 filters up to 100A are designed for traditional chassis mounting.
- For extra fast installation, FN 2412 filters up to 45A 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 520VAC.
- 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

Filter selection table

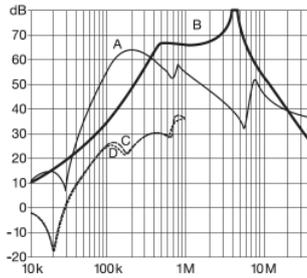
| Filter          | Rated current<br>@ 50 °C (40 °C) | Leakage current*<br>@ 230VAC/50Hz | Power loss<br>@ 25 °C/50Hz | Input/Output<br>connections | Weight<br>[kg] |
|-----------------|----------------------------------|-----------------------------------|----------------------------|-----------------------------|----------------|
|                 | [A]                              | [mA]                              | [W]                        |                             |                |
| FN 2410-8-44    | 8 (8.8)                          | 3.4                               | 2.6                        | -44                         | 0.4            |
| FN 2410-16-44   | 16 (17.5)                        | 3.4                               | 3.5                        | -44                         | 0.5            |
| FN 2410-25-33   | 25 (27.4)                        | 3.4                               | 5.5                        | -33                         | 0.6            |
| FN 2410-32-33   | 32 (35.0)                        | 3.4                               | 5.6                        | -33                         | 0.7            |
| FN 2410-45-33   | 45 (49.3)                        | 3.4                               | 7.4                        | -33                         | 0.7            |
| FN 2410-60-34   | 60 (65.7)                        | 3.4                               | 5.5                        | -34                         | 1.8            |
| FN 2410-80-34   | 80 (87.6)                        | 3.4                               | 9.9                        | -34                         | 1.8            |
| FN 2410-100-34  | 100 (109.5)                      | 3.4                               | 15.4                       | -34                         | 1.8            |
| FN 2410H-8-44   | 8 (8.8)                          | 3.4                               | 2.6                        | -44                         | 0.5            |
| FN 2410H-16-44  | 16 (17.5)                        | 3.4                               | 3.5                        | -44                         | 0.6            |
| FN 2410H-25-33  | 25 (27.4)                        | 3.4                               | 5.5                        | -33                         | 0.7            |
| FN 2410H-32-33  | 32 (35.0)                        | 3.4                               | 5.6                        | -33                         | 0.8            |
| FN 2410H-45-33  | 45 (49.3)                        | 3.4                               | 7.4                        | -33                         | 0.8            |
| FN 2410H-60-34  | 60 (65.7)                        | 3.4                               | 5.5                        | -34                         | 1.9            |
| FN 2410H-80-34  | 80 (87.6)                        | 3.4                               | 9.9                        | -34                         | 1.9            |
| FN 2410H-100-34 | 100 (109.5)                      | 3.4                               | 15.4                       | -34                         | 1.9            |
|                 |                                  |                                   |                            |                             |                |
| FN 2412-8-44    | 8 (8.8)                          | 3.4                               | 2.6                        | -44                         | 0.4            |
| FN 2412-16-44   | 16 (17.5)                        | 3.4                               | 3.5                        | -44                         | 0.6            |
| FN 2412-25-33   | 25 (27.4)                        | 3.4                               | 5.5                        | -33                         | 0.7            |
| FN 2412-32-33   | 32 (35.0)                        | 3.4                               | 5.6                        | -33                         | 0.8            |
| FN 2412-45-33   | 45 (49.3)                        | 3.4                               | 7.4                        | -33                         | 0.8            |
| FN 2412H-8-44   | 8 (8.8)                          | 3.4                               | 2.6                        | -44                         | 0.5            |
| FN 2412H-16-44  | 16 (17.5)                        | 3.4                               | 3.5                        | -44                         | 0.7            |
| FN 2412H-25-33  | 25 (27.4)                        | 3.4                               | 5.5                        | -33                         | 0.8            |
| FN 2412H-32-33  | 32 (35.0)                        | 3.4                               | 5.6                        | -33                         | 0.9            |
| FN 2412H-45-33  | 45 (49.3)                        | 3.4                               | 7.4                        | -33                         | 0.9            |

\* Maximum leakage under normal operating conditions. Note: if the neutral line is interrupted, worst case leakage could reach twice this level.

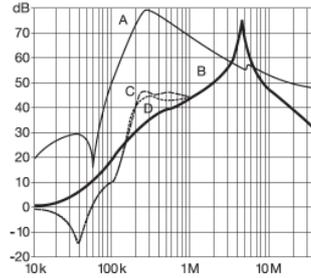
Typical filter attenuation

Per CISPR 17; A = 50Ω/50Ω sym; B = 50Ω/50Ω asym; C = 0.1Ω/100Ω sym; D = 100Ω/0.1Ω sym

8 to 45A types

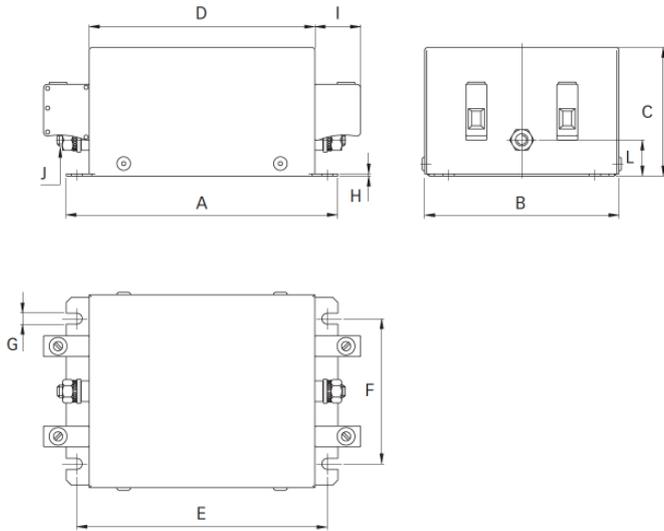


60 to 100A types

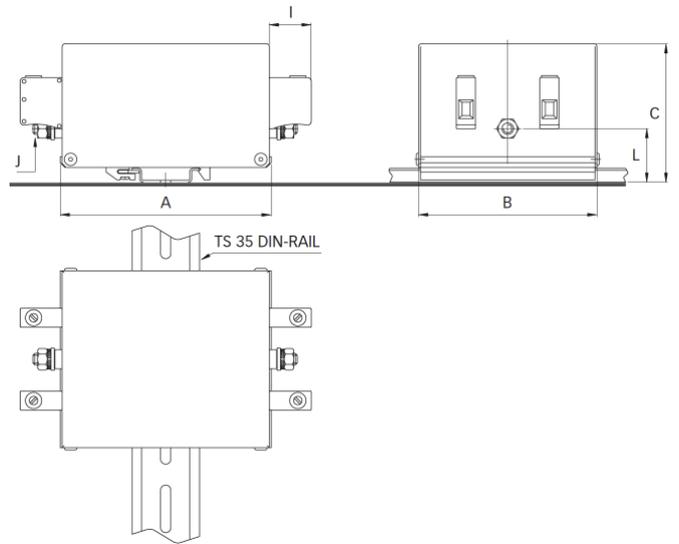


**Mechanical data**

FN 2410(H)



FN 2412(H)



**Dimensions**

|   | FN 2410 |      |      |      |      |      |      |      | FN 2412 |      |      |      |      |
|---|---------|------|------|------|------|------|------|------|---------|------|------|------|------|
|   | 8A      | 16A  | 25A  | 32A  | 45A  | 60A  | 80A  | 100A | 8A      | 16A  | 25A  | 32A  | 45A  |
| 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   |
| 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 = 25.4mm  
Tolerances according to: ISO 2768-m / EN 22768-m

**Filter input/output connector cross sections**

|                    | -33               | -34               | -44               |
|--------------------|-------------------|-------------------|-------------------|
| Solid wire         | 16mm <sup>2</sup> | 35mm <sup>2</sup> | 10mm <sup>2</sup> |
| Flex wire          | 10mm <sup>2</sup> | 25mm <sup>2</sup> | 6mm <sup>2</sup>  |
| AWG type wire      | AWG 6             | AWG 2             | AWG 8             |
| Recommended torque | 1.5 - 1.8Nm       | 4.0 - 4.5Nm       | 1.5 - 1.8Nm       |

Please visit [www.schaffner.com](http://www.schaffner.com) to find more details on filter connectors.

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