

Three-phase line filter



- EMC filter for applications with high noise levels
- Integrated line reactor for low frequency interference and harmonics reduction
- Compact all-in-one solution for motor drives
- Significant increase of conducted immunity across a broad frequency spectrum

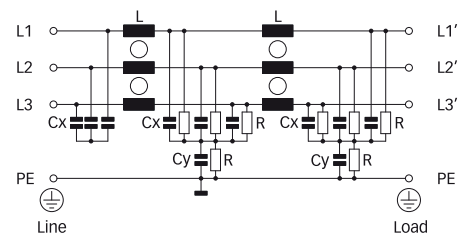
Approvals



Technical specifications

| | |
|--|--|
| Maximum continuous operating voltage: | 3x 480/277VAC |
| Operating frequency: | dc to 60Hz |
| Rated currents: | 8 to 24A @ 50°C |
| Reactor impedance (uk): | 4% @ 400VAC, 50Hz & rated current |
| High potential test voltage: | P → E 2800VDC for 2 sec |
| | P → P 2120VDC for 2 sec |
| Protection category: | IP20 |
| 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 94V-2 or better |
| Design corresponding to: | UL 1283, CSA 22.2 No.8 1986, IEC/EN 60939 |
| MTBF @ 50°C/400V (Mil-HB-217F): | >100,000 hours |

Typical electrical schematic




Features and benefits

- Broadband EMC mains filter with exceptional low frequency attenuation performance.
- Combines the benefits of EMC filter and 4% impedance line reactor.
- Reduction of mains harmonics and commutation notches.
- Protection of motor drive electronics and dc link capacitors against mains transients and inrush currents.
- Improves also conducted immunity.
- Cost-effective 2-in-1 solution to save mounting space and time.

Typical applications

- Motor drives
- Elevators
- Robots
- Machinery
- Applications where both EMC filter and line reactor is required
- SCR dc drives

Filter selection table

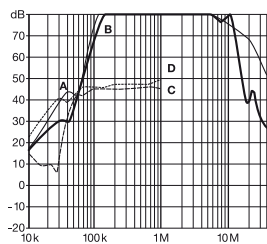
| Filter | Rated current @ 50°C (40°C) [A] | Typical drive power rating* [kW] | Leakage current @ 440VAC/50Hz** [mA] | Power loss @ 25°C/50Hz [W] | Input/Output connections  | Weight [kg] |
|-----------------|---------------------------------------|--|--|----------------------------------|--|----------------|
| FN 3400-8-29 | 8 (8.8) | 4 | 12 | 23.1 | -29 | 3.3 |
| FN 3400-16.5-33 | 16.5 (18.1) | 7.5 | 12 | 32.7 | -33 | 5.2 |
| FN 3400-24-33 | 24 (26.3) | 11 | 12 | 34.6 | -33 | 7.0 |

* Calculated at rated current, 440VAC 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 5.6 times higher levels.

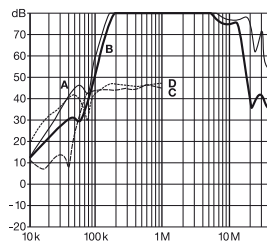
Typical filter attenuation

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

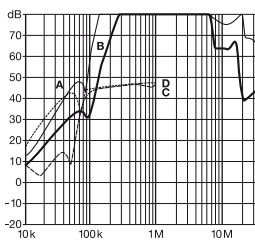
8A types



16.5A types



24A types

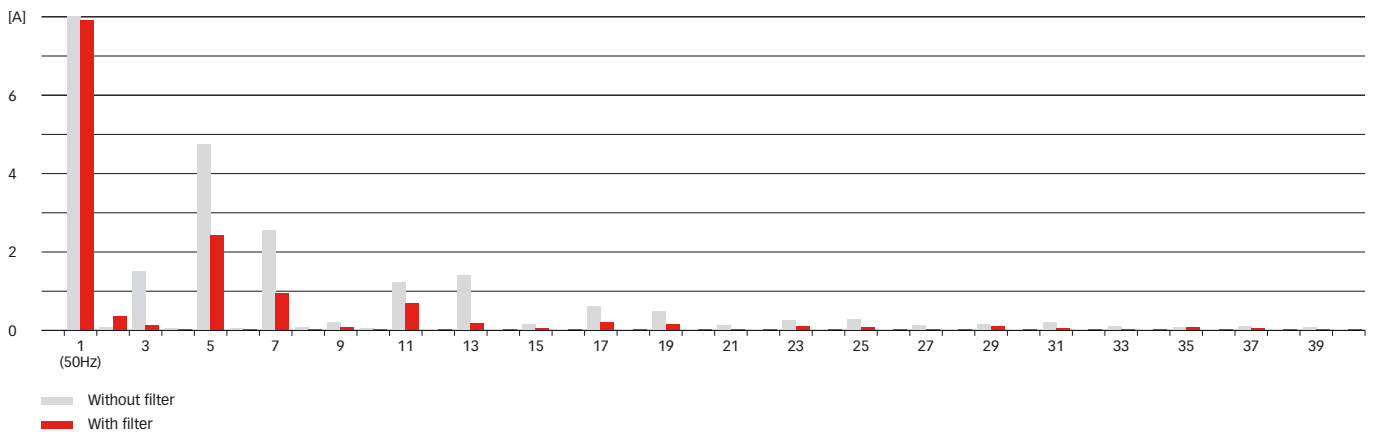


Harmonics reduction

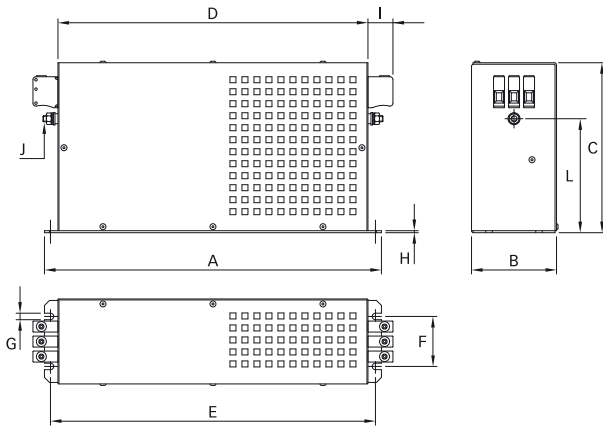
FN 3400 filters contribute significantly to the reduction of low frequency interference and mains harmonics. Most common functional problems related to harmonics – such as overheating of components and conductors or malfunctions of sensitive electronics – can

be solved reliably. However, FN 3400 is not designed to meet harmonic standards like EN 61000-3-2 or IEEE 519. To meet these standards, more complex, bigger and more expensive active or passive harmonic filters are required.

Following results were measured under full load operational conditions and show the actual effect of FN 3400-8-29 on mains harmonics in a three-phase power drive system.



Mechanical data



Dimensions

| | 8A | 16.5A | 24A |
|---|------|-------|-----|
| A | 280 | 337 | 337 |
| B | 65 | 85 | 100 |
| C | 140 | 170 | 170 |
| D | 250 | 310 | 310 |
| E | 270 | 325 | 325 |
| F | 35 | 50 | 50 |
| G | 6.5 | 6.5 | 6.5 |
| H | 2 | 2 | 2 |
| I | 11.5 | 25 | 25 |
| J | M6 | M6 | M6 |
| L | 94 | 114 | 114 |

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

Filter input/output connector cross sections

| | -29 | -33 |
|---------------------------|------------------|-------------------|
| Solid wire | 6mm ² | 16mm ² |
| Flex wire | 4mm ² | 10mm ² |
| AWG type wire | AWG 10 | AWG 6 |
| Recommended torque | 0.6 - 0.8Nm | 1.5 - 1.8Nm |

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