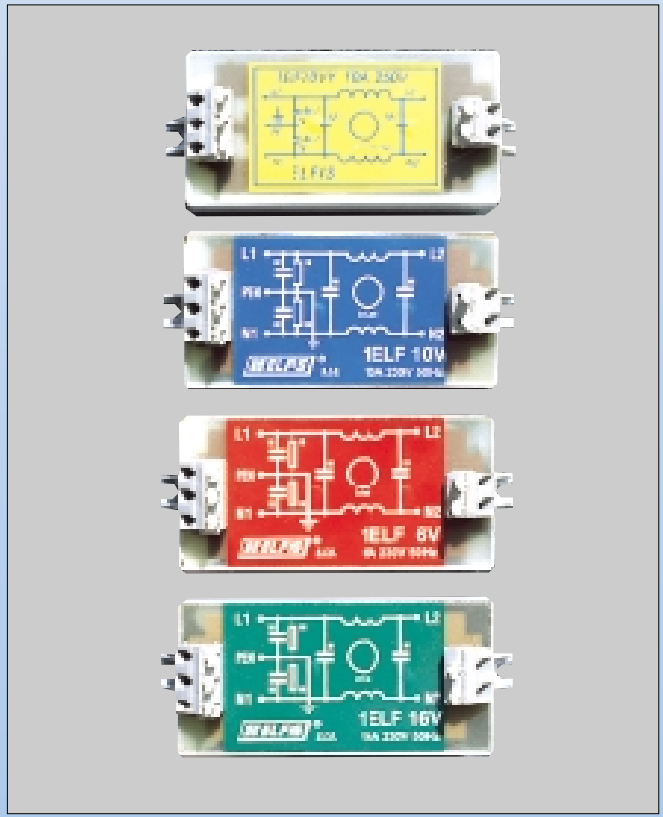
# EMC/EMI FILTERS

**Single- and three-phase 3-16 A, 230 and 400 V, 40 - 65 Hz, plastic case**




- **EMI suppression in frequency range 150 kHz – 30 MHz**
- **insertion attenuation at 150 kHz > 40 dB**
- **protection IP20, WAGO screwless terminals**
- **can be mounted into a switchboard with screws or on DIN rail**

**Use:**
- **EMI suppression for frequency converters for asynchronous motors**
- **EMI suppression for switching power supplies**
- **EMI suppression for dc converters**
- **EMI suppression for individual sources of interference**
- **improvement of degree of EMI suppression, e.g. shift from industrial limits to residential limits**

EMI suppression means suppression of interference (emission) produced by various devices within 0.15 - 30 MHz frequency range so that these devices meet appropriate EMI suppression standards, especially EN 50081-1, 50081-2, EN 55011, 55014 and 55022.

**Recommendations for mounting**
ELFIS filters are designed to be mounted in a switchboard. Standard connection of the filter to the distribution network is via L1, N1 terminals, or U1, V1, W1 and N1. The connection between grounding point of the filter and grounding terminal of the cabinet must be as short as possible, the wire used must have maximum available cross section. Maximum effect is acquired when the input terminal of the filter constitutes the input terminal of the device so that the power supply cable is connected only (directly) to the filter. The input cable and output cable of the filter should not run in parallel or in parallel with other cables or wires. Failure to prevent this may result in significant loss of efficiency of the filter, as its insertion attenuation may be reduced for 30 dB (at particular frequencies).

**Notes**
When using filters, sum of input currents must equal to sum of output currents. If current runs through neutral wire, you must use 4 pole filter (4 ELF xx type) for three-phase electrical network - N must be separated from PE (at load side)!! PE and N must be connected before the filter. In no way the load can be connected between one of output terminals (phases) and PE!!

**Safety requirements**
With equipment and devices that have flexible power cord and no additional grounding, beware of leakage current. Leakage current is the current that flows through the capacitors connecting phase and ground terminals of the equipment. Individual types are designated with maximum value of leakage current. When selecting flexible power cords, select Y type. The general rule, however, is that the smaller the leakage current, the smaller the insertion attenuation of the filter (at low frequencies).

## *BASIC TECHNICAL PARAMETERS*

| | |
|---|---|
| **nominal voltage $U_{1n}$** | 230 V, 3 x 400 V, 40-65 Hz or dc (higher voltage on request) |
| **nominal load current $I_{1n}$** | 3, 6, 10, 16 A |
| **number of wires** | 2, 3 and 4 |
| **type of filter** | Low-pass filter. transmission band 0 - 10 kHz, suppression band 10 kHz - 30 MHz |
| **insertion attenuation** | 40 dB min. at 150 kHz |
| **leakage current** | 230 V, 3 x 400 V 50 Hz - see table |
| **protection** | IP20 |
| **weight** | 0.2 kg |
| **operating temperature** | -25 to +40 °C |
| **storage temperature** | -40 to +70 °C |

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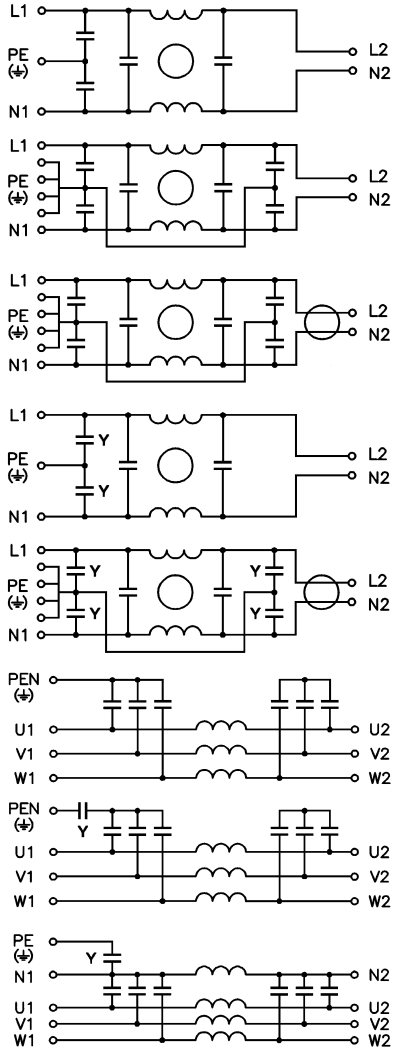
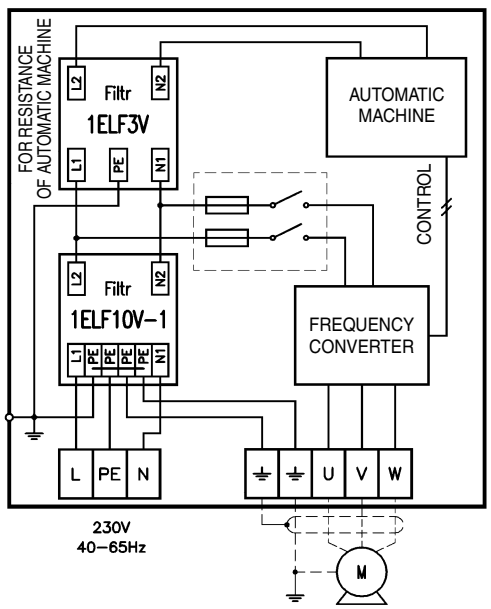
## OVERVIEW OF STANDARD TYPES

| Mounted with M4 screws | Mounted on DIN rail | Nominal voltage Un | Nominal curren In | Leak current |
|---|---|---|---|---|
| 1 ELF 3V | 1 ELF 3V /D | 230 V | 3A | 29 mA |
| 1 ELF 6V | 1 ELF 6V /D | 230 V | 6A | |
| 1 ELF 10V | 1 ELF 10V /D | 230 V | 10A | |
| 1 ELF 16V | 1 ELF 16V /D | 230 V | 16A | |
| 1 ELF 3V-1 | 1 ELF 3V-1 /D | | 3A | 43 mA |
| 1 ELF 6V-1 | 1 ELF 6V-1 /D | 230 V | 6A | |
| 1 ELF 10V-1 | 1 ELF 10V-1 /D | 230 V | 10A | |
| 1 ELF 16V-1 | 1 ELF 16V-1 /D | 230 V | 16A | |
| 1 ELF 3V-2 | 1 ELF 3V-2 /D | 230 V | 3A | 29 mA |
| 1 ELF 6V-2 | 1 ELF 6V-2 /D | 230 V | 6A | |
| 1 ELF 10V-2 | 1 ELF 10V-2 /D | 230 V | 10A | |
| 1 ELF 16V-2 | 1 ELF 16V-2 /D | 230 V | 16A | |
| 1 ELF 3VY | 1 ELF 3VY /D | 230 V | 3A | 0,7 mA |
| 1 ELF 6VY | 1 ELF 6VY /D | 230 V | 6A | |
| 1 ELF 10VY | 1 ELF 10VY /D | 230 V | 10A | |
| 1 ELF 16VY | 1 ELF 16VY /D | 230 V | 16A | |
| 1 ELF 3VY-2 | 1 ELF 3VY-2 /D | 230 V | 3A | 6,3 mA |
| 1 ELF 6VY-2 | 1 ELF 6VY-2 /D | 230 V | 6A | |
| 1 ELF 10VY-2 | 1 ELF 10VY-2 /D | 230 V | 10A | |
| 1 ELF 16VY-2 | 1 ELF 16VY-2 /D | 230 V | 16A | |
| 3 ELF 3V | 3 ELF 3V /D | 400 V | 3A | 29 mA |
| 3 ELF 6V | 3 ELF 6V /D | 400 V | 6A | |
| 3 ELF 10V | 3 ELF 10V /D | 400 D | 10A | |
| 3 ELF 16V | 3 ELF 16V /D | 400 V | 16A | |
| 3 ELF 3VY | 3 ELF 3VY /D | 400 V | 3A | 1,6 mA |
| 3 ELF 6VY | 3 ELF 6VY /D | 400 V | 6A | |
| 3 ELF 10VY | 3 ELF 10VY /D | 400 V | 10A | |
| 3 ELF 16VY | 3 ELF 16VY /D | 400 V | 16A | |
| 4 ELF 3VY | 4 ELF 3VY /D | 400 V | 3A | 1,6 mA |
| 4 ELF 6VY | 4 ELF 6VY /D | 400 V | 6A | |
| 4 ELF 10VY | 4 ELF 10VY /D | 400 V | 10A | |
| 4 ELF 16VY | 4 ELF 16VY /D | 400 V | 16A | |




Example: connection of frequency converter, device and filters to suppress EMI to residential limits according to EN 55011B, 50081-1




Dimensional drawing