



## Datasheet

Preliminary data

### 3-line filters

#### active common mode line filter *LeaXield*

207/360 to 305/530V, 50/60 Hz, 50 °C

#### Special features:

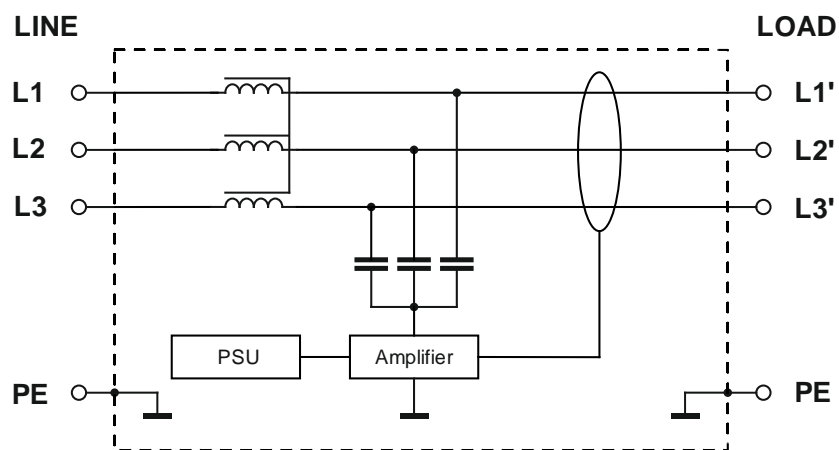
- Highest reduction of earth leakage current in compact package
- Improves RCD compatibility
- Add-on to reduce common mode conducted emissions

**Preliminary code :** P300193

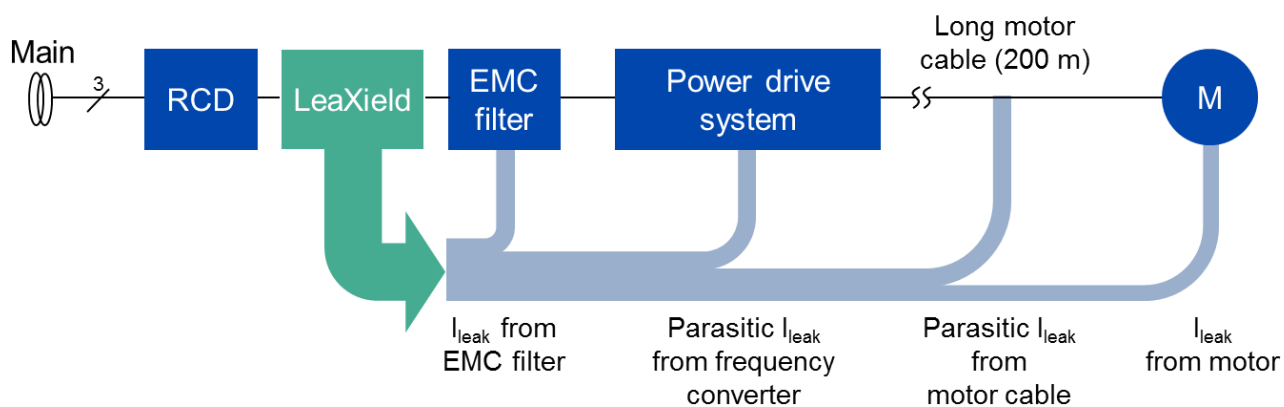
**Date :** 2015-01-28

**Version:** 01

Typical circuit diagram



Intended point of installation



Please refer to LeaXield application note.

**active common mode line filter LeaXield**

Preliminary data

**Functional description**

LeaXield is designed to be connected on the power line to significantly reduce the common mode current harmonics resulting from the motor drive carrier frequency.

LeaXield can be added to the drive system as a stand-alone component to reduce common mode emissions, minimize earth leakage current and consequently improve RCD compatibility.

LeaXield is an active common mode filtering unit which does not need any additional power supply. It is installed into a drive system in a similar way as an EMC line filter.

Attenuation of more than 40 dB is possible within the range 4 kHz up to 500 kHz

LeaXield reduces EMC emissions and can provide improved EMC compliance from C3 to C2 or C2 to C1 (according to EN 61800-3) on existing systems. Alternatively LeaXield can reduce the attenuation required from other EMC measures within the system.

**Technical data and measuring conditions**

|   |                        |  |
|---|------------------------|--|
| Rated voltage                                 | $U_R$ [L-PE / L-L]     | 305/530 V AC (50/60 Hz)  |
| Minimum operating voltage <sup>1)</sup>       | $U_{MIN}$ [L-PE / L-L] | 207/360 V AC (50/60 Hz)  |
| Test voltage line to line for 2 s             | $U_{test}$             | 1770 V DC  |
| Test voltage line to case for 2 s             | $U_{test}$             | 2700 V DC  |
| Rated temperature                             | $T_R$                  | 50 °C  |
| Overload capability (thermal)                 |                        | 1.5 x $I_R$ for 3 min per hour or<br>2.5 x $I_R$ for 30 s per hour |
| Typical line-side operational leakage current | $I_{LK-LINE}$          | < 5 mA   |
| Peak load-side leakage current                | $I_{LK-LOAD}$          | 1 A  |
| Climatic category (IEC 60068-1: 1992)         |                        | 25/100/21  |
| Degree of protection (IEC 60529: 2013)        |                        | IP 20  |

1) Below this voltage the product will not operate

**Characteristics and ordering codes**

| $I_R$ | Terminal cross section | $R_{typ}$ | Approx. weight | Preliminary code | Approvals <sup>2)</sup> |         |                 |
|-------|------------------------|-----------|----------------|------------------|-------------------------|---------|-----------------|
|       |                        |           |                |                  | IEC 60939               | UL 508C | CSA C22.2 No.14 |
| A     | mm <sup>2</sup>        | mΩ        | kg             |                  |                         |         |                 |
| 150   | 50                     | 0.07      | 3.0            | P300193-F001     | Z                       | Z       | Z               |

2) **X** = approval granted

**P** = pending

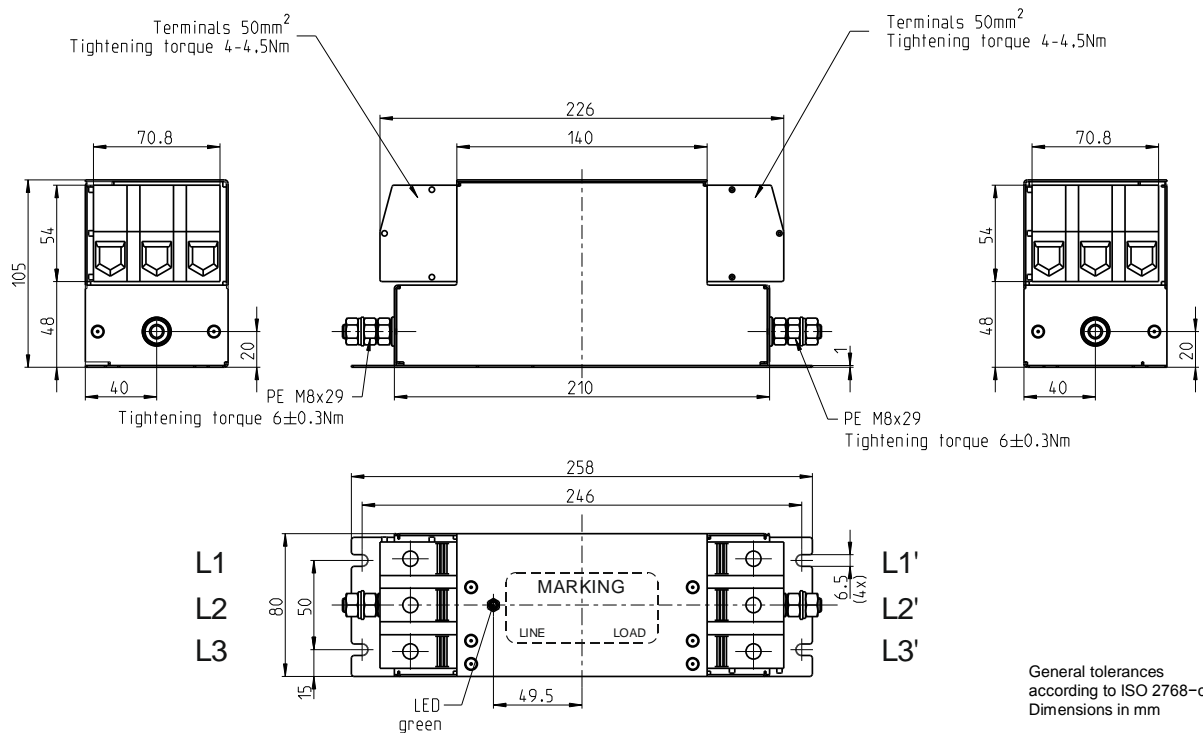
**Z** = in preparation

- = none

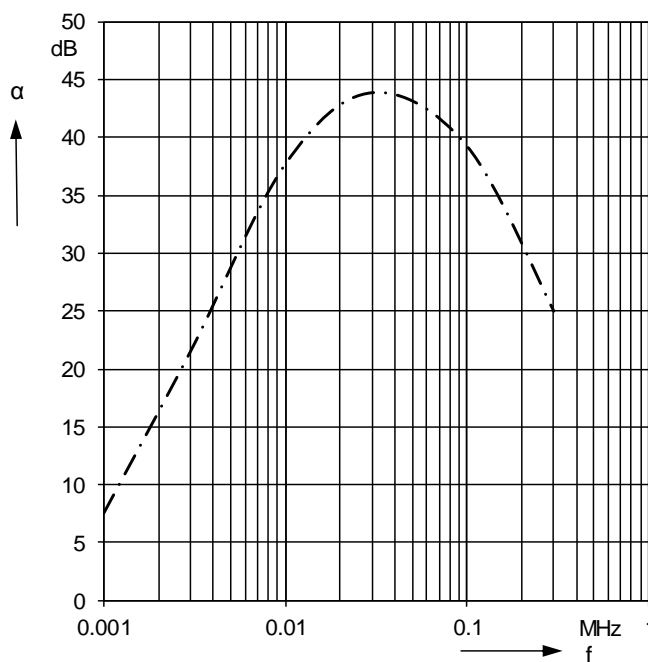
3) Rated voltage ( $U_R$ ) see technical data, according to UL / CSA standards maximum 600 V

Please read *Cautions and warnings* and *Important notes* at the end of this document.

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**Dimensional drawings**

**Insertion loss (typical values at Z = 50 Ω)**

- · - common mode, all branches in parallel (asymmetrical)



**active common mode line filter LeaXield**

## Preliminary data

**Cautions and warnings**

- Please note the advices in our data book "EMC Filters" (latest edition); attention should be paid to the chapter "General safety notes".
- It shall be ensured that only qualified persons (electricity specialists) are engaged on work such as planning, assembly, installation, operation, repair and maintenance. They must be provided with the corresponding documentation.
- Danger of electric shock. EMC filters contain components that store an electric charge. Dangerous voltages can continue to exist at the filter terminals for longer than five minutes even after the power has been switched off.
- The protective earth connections shall be the first to be made when the EMC filter is installed and the last to be disconnected. Depending on the magnitude of the leakage currents, the particular specifications for making the protective-earth connection must be observed.
- Impermissible overloading of the EMC filter, such as with circuits able to cause resonances, impermissible voltages at higher frequencies etc. can lead to bodily injury and death as well as cause substantial material damages (e.g. destruction of the filter housing).
- EMC filters must be protected in the application against impermissible exceeding of the rated currents by overcurrent protective devices.
- In case of leakage currents  $> 3.5$  mA you shall mount the PE conductor stationary with the required cross section before beginning of operation and save it against disconnecting. For leakage currents  $I_L^a \leq 10$  mA the PE conductor must have a KU value <sup>b)</sup> of 4.5; for leakage currents  $I_{LK} > 10$  mA the PE conductor must have a KU value of 6.
- Output chokes and output filters must be protected in the application against impermissible exceeding of the component temperature.
- The converter output frequency must be within the specified range to avoid resonances and uncontrolled warming of the output chokes and output filters.

a)  $I_L$  = Leakage current let-go

b) The KU value (symbol KU) is a classification parameter of safety-referred failure types designed to ensure protection against hazardous body currents and excessive heating. (DIN VDE 0800-1, 0800-8, 0800-9)

A value of KU = 4.5 with respect to interruptions is attained:

- with a permanently connected protective earth connections  $\geq 1.5$  mm<sup>2</sup>

- with a protective earth connection  $\geq 2.5$  mm<sup>2</sup> via connectors for industrial equipment (IEC 60309-2).

KU = 6 with respect to interruptions is achieved for fixed-connection lines  $\geq 10$  mm<sup>2</sup>, where the type of connection and installation is conform to the specification for PEN conductors according to DIN VDE 0100-540.

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