

Passive Harmonic Filters

Passive Harmonic Filters in sheet steel cabinets



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LSFC-P4

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Passive Harmonic Filters in sheet steel cabinets for low voltage networks heavily contaminated with harmonics. Filter circuits with intelligent control systems are a reliable means of reducing current and voltage harmonics and offer an excellent cost-benefit ratio.

Passive Harmonic Filters for low voltage networks heavily contaminated with harmonics but needing relatively little reactive power.

- Power range up to 460 A_{rms} per cabinet unit
- Modular construction in freestanding sheet steel cabinet
- LKT power capacitors with dry design and fourfold safety features
- Highly linear filter reactors
- Tuning frequency (detuning factor) individually adjustable for specific network
- Control and self-monitoring system individually configurable via harmonic voltage and filter current, making measurement by external current transformer unnecessary
- Permanent network monitoring by continuous network analysis
- Complete system ready to install

Passive Harmonic Filters (adjusted detuning factor):

- Installation where harmonic levels are 'high' (as per EN 61000-2-4, Class 3 or higher) but
- Reactive power demand is low
- The filter is controlled by voltage harmonics
- The filter current is monitored

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Design and operating principle:

The passive harmonic filter is a voltage controlled filter circuit consisting of premium power capacitors and highly linear harmonic filter reactors. The individual filter circuit stages are matched to the respective network conditions with the utmost care.

The system includes the following components:

- Self-healing LKT-type power capacitors with low-loss dielectric – made from segmented metallised polypropylene film – overpressure disconnection, solder-free design and PCB-free filler material;
- LKT series with discharge resistors to EN 60831-1 and -2 / IEC 60831-1 and -2
- Heavy duty capacitor contactors with precharging contacts
- Highly linear harmonic filter reactors with temperature monitoring
- Control terminal strip with control circuit fuse and thermal trip contact
- PQA-C
- Thermostat-controlled electric cooling fan

The capacitor stages are switched on or off by the control unit according to appropriate voltage parameters, such as:

- The levels of individual harmonics or
- The THDv (geometric sum of all voltage harmonics)

The control unit is also able to monitor the network for compliance with the relevant power quality standards and send an alarm signal if the monitored parameters go beyond set limits!

The heart of every passive harmonic filter from FRAKO is the PQA-C. It is the ideal combination of measuring device (i. e. Power Quality Analyzer) and control device (controller). The PQA-C continues the efficient further development of the control functions of the proven EM-PQ 2300 device.

During development, the focus was placed on the control of passive harmonic filters of the LSFC-PX series from FRAKO. Advanced automatic control of filter performance, depending on volatile environmental variables, was given special consideration.

Here, the PQA-C can make optimal use of its strengths, in which the analyzed power quality measurement data (voltages, currents) as well as information from the environment (temperatures and digital inputs) are directly implemented switching commands for the intended outputs by means of intelligent software in the device.

All relevant information about the operating status can be seen directly on the device or accessed via the integrated web server. Integration into the Industry 4.0 infrastructure is provided by state-of-the-art interfaces (Modbus TCP, REST).

Commissioning and parameterization of the PQA-C is clear and simple - with complete flexibility of settings. Parameters can be set directly on the device or remotely via a web server.

Options:

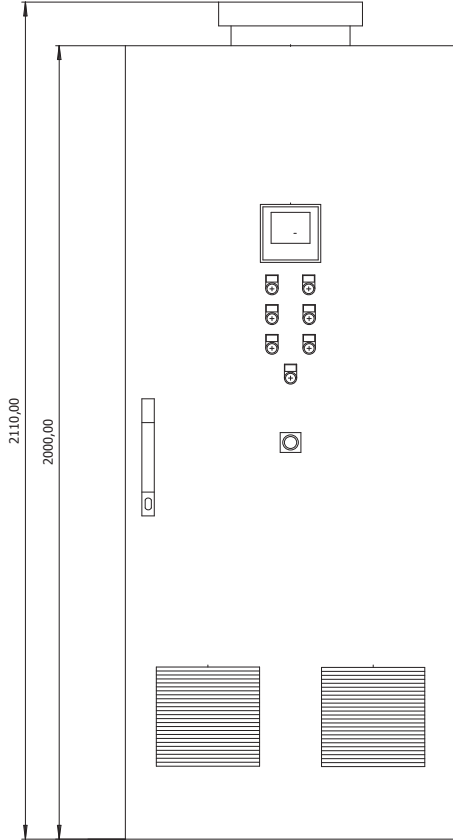
- Power capacitors with up to 909 V overvoltage capacity (continuous)
- Design with modules tuned for several different harmonics – with interlock circuit and monitoring for reliable operation of the complete system
- Compensation circuits for the identification and monitoring of unbalances
- Automatic resonance detuning
- Installation possible in a wide variety of cabinet systems

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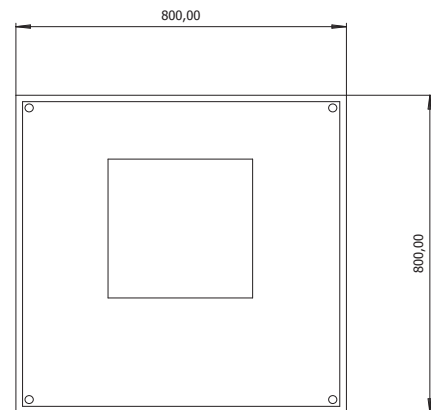
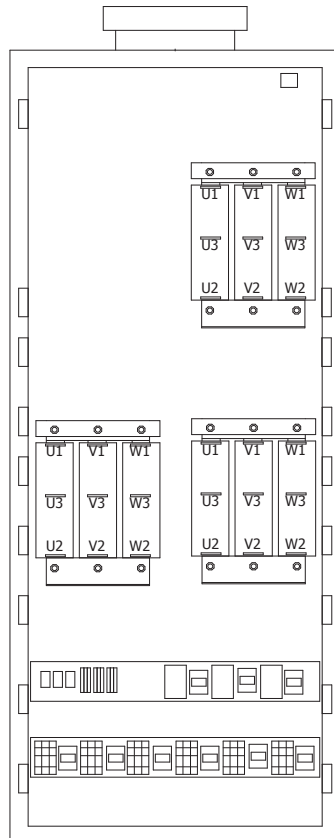
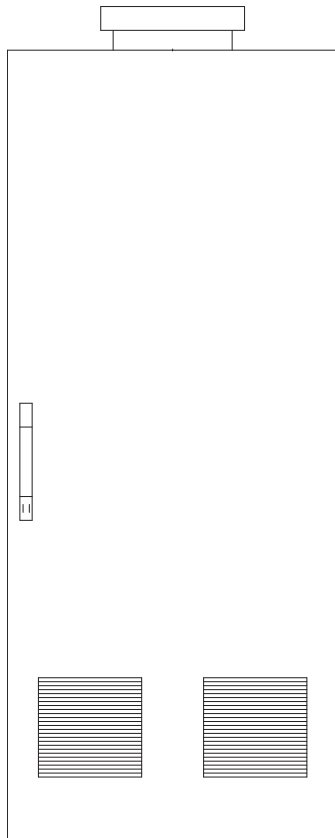
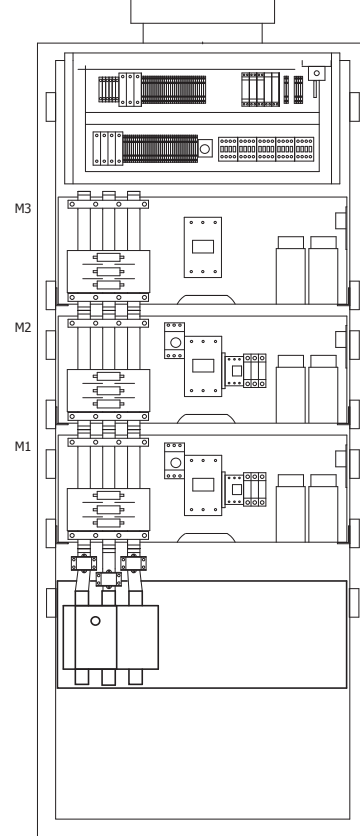
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Dimensions

Front view exterior



Front view interior



All dimensions in mm