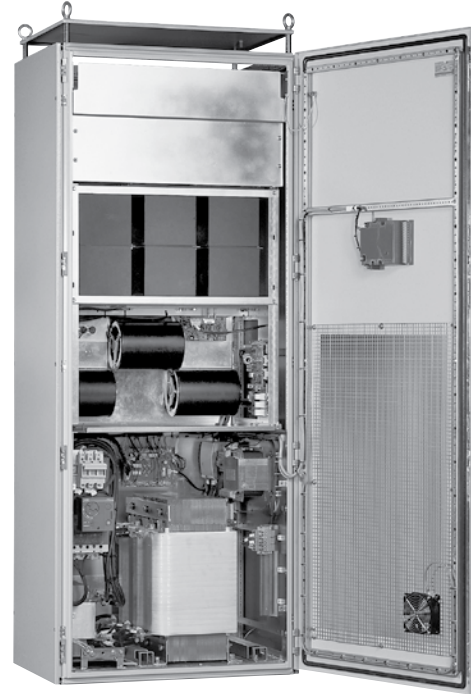


Type PQF Power^{IT} LV Active Filter



Power^{IT} Active Filter
Type PQF



Typical application

Power distribution systems which require multiple harmonic elimination or power factor correction.

Product description

The power quality filters developed by ABB are active filters offering unprecedented ability to eliminate harmonics from the network. The PQF eliminates harmonics in a controlled way. It is easy to expand and adapt to changes in the network. The PQF monitors the line current in real time and processes the measured harmonics as digital signals in

a high-power DSP (Digital Signal Processor). The output of the DSP controls PWM (Pulse Width Modulated) power modules that through line reactors inject harmonic currents with exactly the opposite phase to those that are to be filtered. The net effect is an elimination of the harmonics and a clean sine-wave as seen by the feeding transformer. The PQF is UL approved (UL File # E254288).

PQF sizing information

Consult your local ABB representative or the factory for assistance in sizing your PQF filter.

General information Power quality filter

Harmonics and power quality

Harmonics caused by non-linear electrical loads such as variable speed drives, rectifiers, UPS's, computers, etc., are a growing problem both for electricity suppliers and users.

Harmonics can lead to serious problems:

- overheating of cables, motors and transformers
- damage to sensitive equipment
- tripping of circuit breakers
- blowing of fuses
- premature aging of the installation

The ABB solution: PQF power quality filters

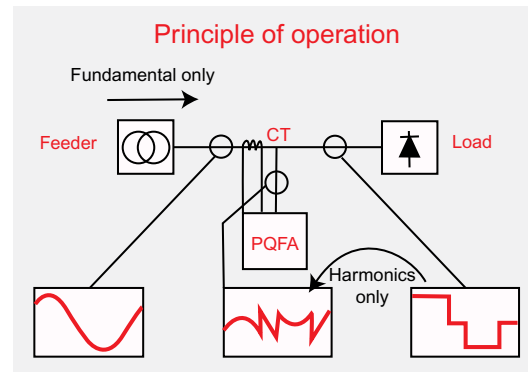
The ABB Power Quality Filter offers unprecedented ability to clean the network from harmonics. The PQF actively eliminates the harmonics present in the supply system in a controlled way. It is insensitive to large network impedance changes due to change in network topology like paralleling of sources, or switching between mains supply and generator operation.

The PQF monitors the line current in real time and processes the measured harmonics as digital signals in a high-power multi-DSP (Digital Signal Processor) based system. The digital controller generates Pulse Width Modulated (PWM) signals that drive IGBT power modules which through line reactors inject harmonic currents in the network with exactly the opposite phase to the components that are to be filtered.

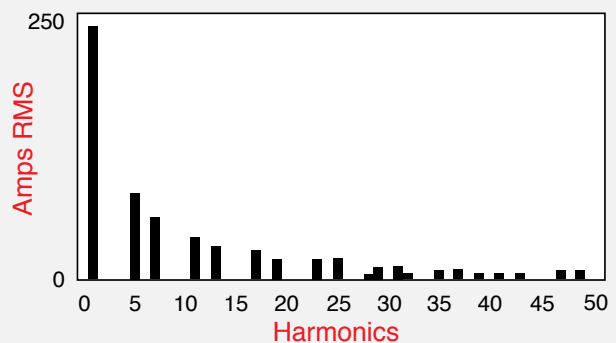
The PQF also offers communication facilities with the customer's existing communication network. This feature which uses Modbus RTU, allows the PQF to be easily monitored and controlled from a remote location. The Modbus communication feature can be used by means of an RS-232 to RS-485 converter (optional).

Advantages of the PQF

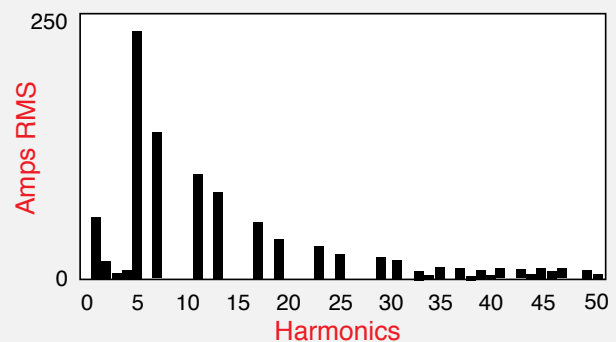
- Filters up to 20 harmonics simultaneously
- Filters up to the 50th harmonic
- Harmonic attenuation factor better than 97%
- Fulfilment of International Guidelines like G5/4, IEEE 519, etc
- Filters with closed loop control for best accuracy
- Is not overloadable
- Has a programmable filtering strategy and free choice of harmonics selection
- Fault and event logging with real time stamp
- Direct connection up to 690V
- Top or bottom cable entry (optional for PQFI)
- Easy commissioning – Auto-detection of CT Polarity
- May filter without generation of reactive power
- May generate reactive power and control power factor
- May balance the load current across the phases
- Has programmable task priorities
- Does not require detailed network analysis
- Does not require special CTs
- Is easy to extend on site
- Comes factory tested
- Auto-adaptation to network impedance changes
- Optical fibre isolation between power and control stages
- Programmable stand-by and re-start functions
- Programmable digital I/O interface
- Modbus RTU communication compatible
- Two sets of compensation parameters for different load type compensation.



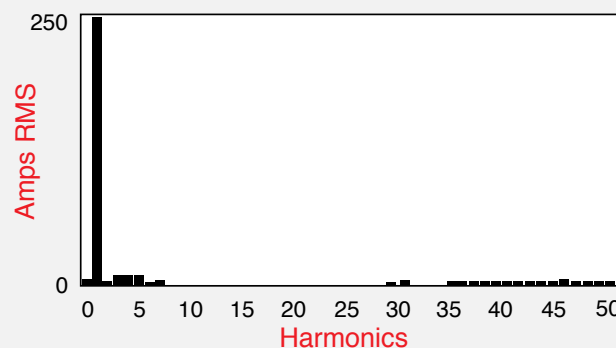
Line current – Initial situation



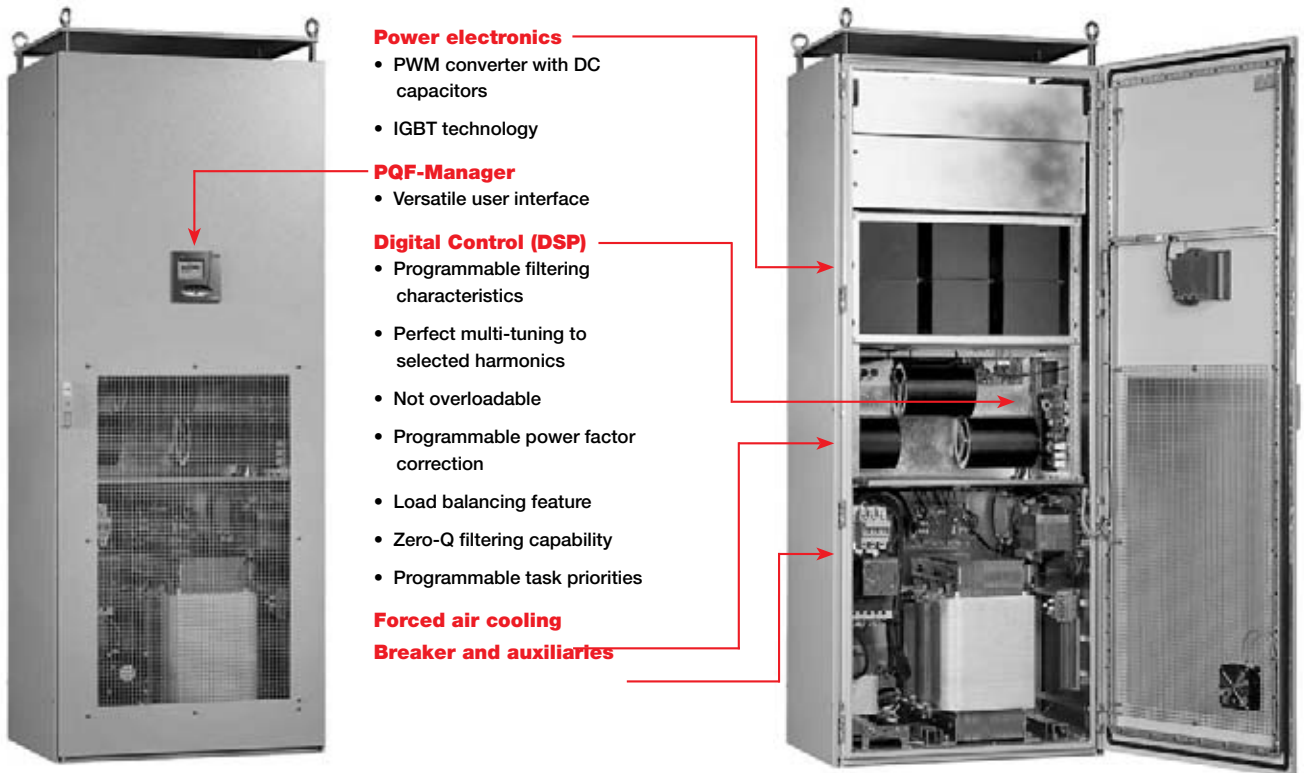
Filter current – Filter running



Line current – Filter running



General information Power quality filter



- Power electronics**
 - PWM converter with DC capacitors
 - IGBT technology
- PQF-Manager**
 - Versatile user interface
- Digital Control (DSP)**
 - Programmable filtering characteristics
 - Perfect multi-tuning to selected harmonics
 - Not overloadable
 - Programmable power factor correction
 - Load balancing feature
 - Zero-Q filtering capability
 - Programmable task priorities
- Forced air cooling**
- Breaker and auxiliaries**

PQF ratings and capabilities

Power modules for the PQF are available with voltage ratings up to 600V for 50 or 60 Hz. The maximum thermal rating of a single cubicle is 450 A rms. Absolute harmonic filtering capability also depends on the content of higher harmonics with the filtering capability following common load spectra. The reactive power compensation capacity per module is given by the thermal rating.

On site extensions are easily made by adding cubicle sections to a maximum of eight cubicles. Several PQF may operate together on the same network.

Systems for 50 Hz and 60 Hz applications can filter 20 different harmonics from the 2nd to the 50th harmonic.

Selected harmonics can be filtered completely, or to a predescribed level defined in absolute or relative terms.

Reactive power compensation may be chosen and controlled to a desired power factor.

The PQF is programmed through the PQF-Manager graphical user interface. Optional PQF-Link software enables users to program the active filter through an RS232 port using a standard PC.

UL File # E254288

The PQF-Manager

The PQF-Manager is the Graphical User Interface provided in all the PQF types as a standard accessory. It offers direct control, programming, monitoring capabilities without a PC, communication facilities and detailed fault and event logging with real time stamp. The PQF-Manager (144 x 144 mm), fitted in the front panel of the PQF with its large LCD screen display (64 x 132 pixel) makes operating the filter very convenient.



