

APF/SVG

35~200A/30-150kVAR

400V/690Vac

IGBT TOPOLOGY

MODULAR DESIGN
MAX. 2400A/1800KVAR
FOR ONE SYSTEM



Power Quality Filters

APF-SVG-SPC

Harmonics mitigation, load balancing and reactive compensation on LV networks

Power Quality and Control Solutions



The cost of poor power quality

Power quality affects the smooth functioning of a business. Issues like disturbances or harmonic pollution cause downtime, equipment malfunction, and damage which impact the financial bottom line. Prioritize power quality to ensure uninterrupted business functioning.

Poor power quality sources:

There are three significant sources of power quality caused by variety of loads in customer installations:

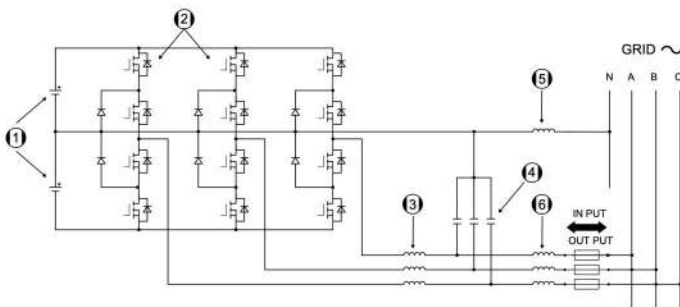
- Harmonic solution due to non-linear loads
- Loads imbalance resulting in voltage imbalance and phase to neutral voltage
- Poor power factor due to lagging and leading currents

Poor power quality costs money due to:

- Frequency failures of equipment, nuisance tripping, etc.
- Reduce lifetime of equipment
- Production loss due to unschedule downtime
- Reduced safety levels of installations
- Increased carbon footprint
- Non-compliance with utility regulations

In addition, there are costs incurred due to extra kWh losses in typical network components such as transformers, cables and motors. These losses cascaded back to the utility power plants result in increased CO2 emissions. The emissions can be significant or marginal depending on the process and the fuel type from which the electrical power is generated.

Understand Topology of APF/SVG/SPC



IGBT Technology

- 1 : DC Bus capacitors
- 2 : IGBT Controlled by DSP software algorithm could control inverter to generate an accurate reactive power and harmonic filter.
- 3 : Inductors of 3-Level Inverter are controlled by IGBT to generate inductive or capacitive reactive power
- 4,5 : LC Filter Capacitors and Inductors to make sinusoidal voltage output



RACK MOUNTED MODULE

CBC PQC filters solve complex power quality problems including harmonic distortions, uneven load distribution, and reactive power needs.

CBC Power Quality Filters(PQC) active filters work for industrial and commercial installations of any size, providing harmonic mitigation, load balancing and reactive power control for inductive and capacitive loads. With a large range of ratings, optimal filter solutions can be achieved by combining master and slave units. Filter load is evenly distributed across units in parallel under normal conditions.

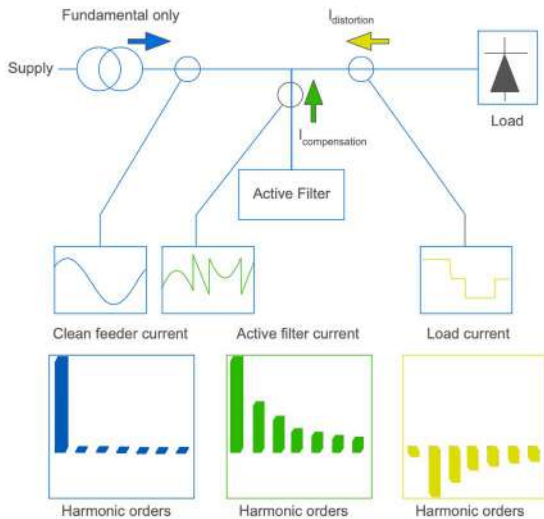
CBC PQC active filters can be installed in LV networks. They can also be employed in MV networks through the use of a suitable coupling transformer.

CBC PQC active filters offer the following system benefits:

- Reduced production downtime and/or installation downtime.
- Increased system efficiency and reduction of CO2 emissions.
- Compliance with the strictest power quality regulations thanks to their unique control concept, thereby avoiding penalties and/or refusal by utilities to connect installations to the electrical grid.
- No detailed network analysis required, rapid and easy implementation of the solution.
- Not overloadable, thanks to their active concept, hence well adapted to LV installations where loads are upgraded frequently.

A Unique Operating Principle

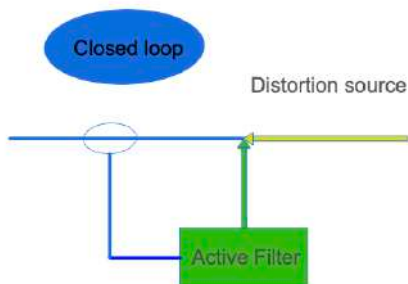
CBC PQF active filters excel thanks to the quality of the compact and user-friendly control system, built according to the highest CBC manufacturing and quality standards.



An CBC PQF active filter is a power electronics based electrical equipment that is installed parallel to the polluting loads. It monitors the line current harmonics, as well as the customer requirements programmed by the user. It can then generate for each harmonic frequency a compensation current in perfect phase opposition to the polluting current.

The use of a closed loop control system in combination with the selection capability of individual harmonic components makes the CBC PQF active filter the most precise active filter in the market:

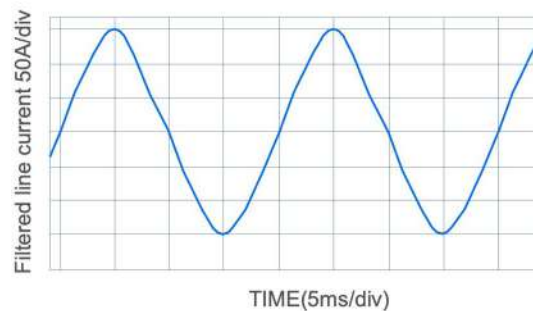
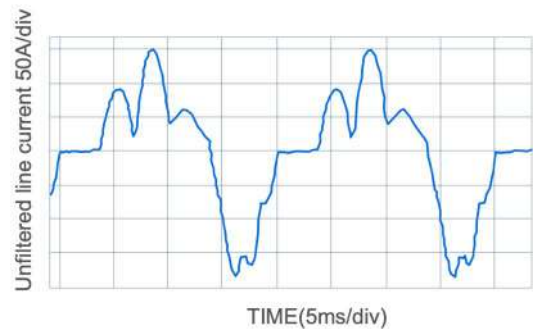
- The closed loop control system measures the line current for each harmonic and reactive power component and compares this with the target set by the customer. Any deviation is automatically eliminated.



The selection capability of individual harmonic components is the result of an advanced control algorithm. A compensation current with perfect opposite phase is injected for each harmonic selected. This ensures optimal cancellation of all harmonic components that are selected by the user.

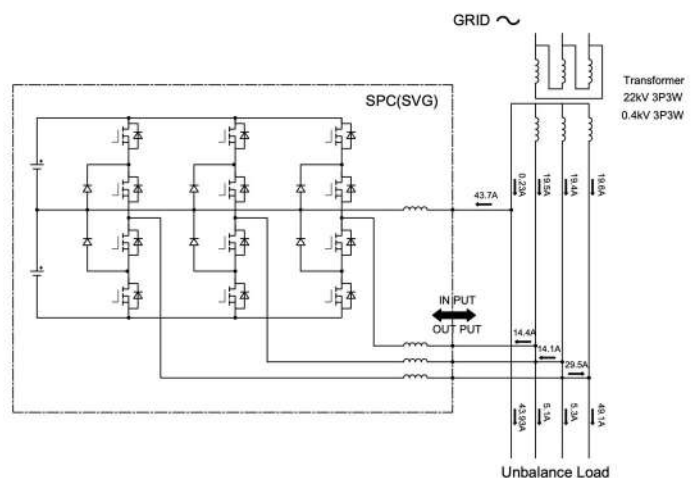
Active Harmonic Filter

This unique CBC technology enables installations to comply with even the most stringent of harmonic regulations and guidelines such as IEEE519, G5/4, etc. Unlike other active filter products on the market, the CBC PQF active filters allow setting individual harmonic target limits as imposed by the regulations.



Active load balancing and Power factor

The closed loop control concept also enables the filter to demonstrate excellent performance for achieving target power factor and load balancing.



Specifications

Model	SVG				APF				
Electrical characteristics									
Rated voltage	400V			690V	400V				690V
Rate capacity	30kVar	50kVAR	100k/ 150kVar	50k/ 100kVar	35A	50A/75A	100A/150A	200A	50A/100A
Input voltage	400V-20%/+15%, 690V ± 20%								
Input frequency	50Hz ± 10%								
Current transformer	100:5 ~ 10000:5								
Neutral current rating per base unit	2 times the line current								
Modularity	Maximum 12 units can be combined								
Equipment losses	2.5% of equipment power								
Internal power circuit protection	Fuses, over voltage, overcurrent, short circuit protection								
Filter characteristics									
Harmonic range	2 nd to 50 th order								
Harmonic selectable simultaneously	20 orders								
Filtering degree	Programmable per harmonic in absolute Ampere value								
Harmonic attenuation factor	≥ 97% at rated load								
Reaction time	0.1 ms								
Response time	5 ms								
Reactive power characteristics									
Target cos φ	Programmable 0.6 inductive to 0.6 capacitive								
Load balancing characteristics	L-L: ON/OFF; L-N: ON/OFF								
Programming/Communication									
Digital I/O									
Alarm contact	1 NO (potential free)								
Programming/Monitoring	RS485 (Modbus RTU)								

Model	SVG					APF				
Physical aspects										
Rated voltage	400V				690V	400V				690V
Rate capacity	30kVar	50kVar	100kVar	150kVar	50k/ 100kVar	35A	50A/75A	100A/ 150A	200A	50A/100A
Dimensions w*h*d mm										
480*130*440	✓					✓				
480*200*530		✓					✓	✓		
680*200*530		✓	✓				✓	✓	✓	
680*200*580					✓					✓
Weight (kgs)	17.5	26	38.5	45.5	38.5	17.5	26	38.5	45.5	38.5
Color	RAL 7035 (light gray)									
Installation aspects										
Altitude	Indoor installation in clean environment up to 1000 m altitude *reduced 1% every 100 m >1000 m									
Ambient temp.	-10°C to + 50°C									
Humidity	<95% without condensation									
CT requirements	100:5 ~ 10000:5									
IP protection	Shell: IP21, PCB IP42 (customized IP54)									

For more information visit: cbcinter.com



Power Quality and Control Solutions

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