Product brochure

PQactiF

Higher flexibility and modularity
for improved power quality

Power quality is a major concern for transmission and distribution utilities, industries, and transport and infrastructure sectors. Poor power quality affects grid reliability, productivity, leads to higher operating costs and penalties for non-compliance with grid codes. that is a technology leader with a wide range of products, systems and services that improve power quality including capacitors and filters, power electronics-based compensators and software solutions, across the power value chain for low, medium and high-voltage applications, helping shape a sustainable, flexible and secure power network.

20 years of Active filter PQF

Active filter PQF has been present globally in the market for more than 20 years. It makes installations compliant with prevailing power quality regulations by mitigating harmonic pollution, load unbalance and reactive power demand.

The modular power quality filter PQactiF offers all these benefits with additional features

Flexibility

Modularity

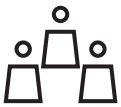
Improved efficiency

for applications which are suffering from poor power quality.

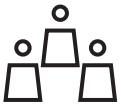
Experience
in vessel, port, ski resort and skyscrapers

Suitable for each type of segment
like mining, metal, paper, commercial and infrastructure, aluminum, steel and other metal industries

We offer solution
not only for commercial segment, but for infrastructure and industrial segments also



Continuous training
to service teams around the world



Factory service team
with global experience more than 20 years

Local service teams
available to perform commissioning and site support

Commissioning and troubleshooting
experience worldwide

PQactiF

Features and benefits

Harmonic filtering

Individual harmonic selection capability and unique filtering efficiency due to three-level inverter and proven control system
PQactiF has an improved capability of filtering up to 25 harmonics simultaneously, between the orders H2 to H50.

Reactive power compensation

Stepless reactive power compensation for both inductive and capacitive loads, target settable
PQactiF can perform precise stepless reactive power compensation of both inductive and capacitive loads. The target power factor is programmable from 0.6 (inductive) to 0.6 (capacitive) which makes PQactiF a superior alternative to a conventional capacitor bank. This also allows compensation of loads fed by generators without the risk of overcompensation.

Load balancing

Balancing the load currents to address neutralto-earth voltages and negative impact of voltage unbalance
Load balancing feature is available in both 3-wire and 4-wire systems between phases and between phase and neutral.
This feature helps to improve voltage unbalance on the phases which increases the safety of the installation and allows sensitive loads to operate.

Enhanced communication features

Wi-Fi enabled modules allow users to monitor and set parameters via smartphone or computer
Parameter settings and simple diagnostics can be performed by a web server on a mobile device. The optional user-friendly HMI (called PQoptiM) interface offers direct access to filter control, programming and monitoring with its 7-inch touchscreen.

PQactiF - Higher flexibility. More reliability.

Adaptable

Compact
Small footprint

Modular
Mix & match
20 A – 400 A

Configurable
Module, wall-mounted or standalone cabinet

Efficient

3-level inverter
Energy efficient and compact

Closed loop control
Offering high accuracy

Reasonance protection
Added operational stability

Easy to operate

User-friendly HMI
7-inch interactive touchscreen GUI (PQoptiM)

Wi-Fi enabled
Control through PC or smartphone

Reliable
Suited to both new and retrofit applications

PQactiF

Portfolio offering

PQactiF is offered in two different module ratings of 20 A and 40 A. Depending on the application, PQactiF is available in either as a module, a wall-mounted solution or a standalone cabinet.

PQactiF - M - Module
- Modular design: Suitable for OEMs, LV switchgear and drive manufacturers
- Very compact: Can be integrated into a small cubicle, either vertically or horizontally
- Low losses: Reduced losses and built-in forced air cooling

PQactiF - WM - Wall-mounted
- Distributed filtering: For building applications where space
  restrictions exist
- Easy to install thanks to wall-mounting kit
- Silent solution: <65dBA, perfect solution for installing on office floors

PQactiF - C - Standalone cabinet
- Complete solution: Factory made fully functional tested panel
- Flexibility: Rating can be extended in modular way from 20 A to 400 A in single cabinet

Sizing tools
Our online tool PQF Size enables our customers to size and
select the active filter at maximum economic benefit. The tool also generates an automatic sizing report that allows customer to review the level of improvement before and after the application.

Please contact us for more information in PQF Size tool.

01 PQactiF - M Module

02 PQactiF - WM Wall-mounted

03 PQactiF - C Standalone cabinet

PQactiF

Technical specifications

Specifications	PQactiF - M Module	PQactiF - WM Wall-mounted	PQactiF - C Standalone cabinet [1]
Electrical characteristics			
Connection method	3-wire/ 4-wire [2]		
Network voltage (+/- 10%)	208 - 480 V (3-wire) 208 - 415 V (4-wire)		
Network frequency (+/- 5%)	50/ 60 Hz		
Line current rating per base unit (A)	20 A, 40 A		Max. 400 A
Neutral current rating per base unit (A)	3 times the line current rating [2]		
Inverter technology	Three level inverter		
Switching frequency of semiconductors	18 kHz		
Modularity	Up to 16 modules can be combined. Different module rating allowed		
Redundancy	Any unit can become a master (defined as lowest ID that is operational). In case of master unit failure, next higher ID module takes the lead as master		
Equipment losses	<2.2% of the equipment power typically		
Filter characteristics [3]			
Harmonic range	2^{nd} to 50^{th} order, 25 (for 3-wire) / 20 (for 4-wire) harmonic orders [3]		
Harmonic attenuation factor (I_H (source)/ I_H (load))	Better than 97% at nominal load		
CT configuration	Closed loop		
Reaction time	27 µs		
Response time	2 networks cycles typically (10-90% filtering) <1 network cycle typically for fundamental compensation		
Reactive power characteristics [4]			
Target power factor	Programmable from 0.6 (inductive) to 0.6 (capacitive)		
Load balancing characteristics [4]			
Unbalanced current compensation	Up to 50% of nominal rating		
Programming/ communication			
Wi-Fi communication	Webserver on smartphone or computer for simple diagnostics and parameters setup		
USB	With dedicated optional software (servicing/programming)		
PQoptiM (Optional)	7-inch color TFT screen (800 x 480 pixels) 198 x 141 x 40 mm IP65 front side/ IP20 backside CAN 2B (internal) – RJ12 for communcating with units Ethernet (Modbus TCP) – RJ45 USB 2.0 (for servicing only)		
Digital I/O on PQoptiM	2 insulated digital inputs - 24 V (AC or DC) 6 digital NO outputs – 250 Vac/ 5 A (one common polarity), dry contacts		

Specifications	PQactiF - M Module	PQactiF - WM Wall-mounted	PQactiF - C Standalone cabinet [1]
Physical aspects			
Mounting	Module unit, suitable to integrate into a cabinet	Wall-mounted	Standalone cabinet
Approximate dimensions (W x D x H)	435 x 459 x 130 mm	438 x 198 x 525 mm	Full size cabinet: 600 x 800 x 2100 mm
Color	Surface treated metal frames Front side painted RAL 7035	Optional HMI holder painted RAL 7035	RAL 7035
Installation aspects [5]			
Altitude	Indoor installation in clean environment up to 1000 m altitude (1% derating for each 100m above 1000 m. Maximum limited to 2000 m)		
Ambient temperature	-10°C to 40°C during operation (up to 50°C with auto-derating) [6] -27°C to 70°C during storage		
Humidity	Max. 95% non-condensing during operation Max. 85% non-condensing during storage		
Fixation	Special kit allows module to be integrated into cabinet	Wall-mounted	Floor fixation / lifting lugs provided
Cable entry	Rear for power cables Front for control cables	Top for power cables Bottom for control cables	Top / Bottom for both power and control cables
CT requirements	3 CT's are required (class 1.0 or better, 15 VA)		
IP protection	IP20 from front access	IP30	IP20
Compliance with standards			
General construction and safety aspects for PQactiF - M and PQactiF - WM	EN 62477-1 (2012) "Safety requirements for power electronic converter systems and equipment"		
General construction and safety aspects for PQactiF - C	EN 61439-1 (2011) "Low-voltage switchgear and control gear assemblies – Part 1: General rules"		
EMC immunity (CE version only)	EN/ IEC 61000-6-2, Industrial level		
EMC emissions (CE version only)	EN/ IEC 61000-6-4, Class A		
cUL compliance	UL recognized	UL508 certified	Not applicable
Certification	CE, cUL [7]		

1. Cabinet configuration available only in CE version
2. 4-wire application available only for CE version
3. First 6 harmonic orders fixed in both configurations. Rest are selectable. 4 wire application only for CE version
4. Functions other than filtering, i.e. reactive power compensation and load balancing are performed based on the availability of spare capacity (amperes) of device after harmonics mitigation. Or, a priority function (kvar compention/ harmonics filtering) can be selected from device settings.
5. Environment conditions 3K20, 3K21, 3K22, 3B1, 3S5 and 3M11 as per IEC 60721 3-3 (2019).
6. Under full load conditions, the product may automatically derate beyond 45° C ambient temperature
7. cUL Applicable only to module and wall mount versions