HITACHI
Inspire the Next

Active Power Quality Filters from Hitachi Energy protecting critical low voltage industrial, commercial and residential applications, solving tough power quality problems for all types of applications and customers globally.

Higher flexibility and modularity for improved power quality

PQactiF

Hitachi Energy

Hitachi Energy is a global technology leader that is advancing a sustainable energy future for all. We serve customers in the utility, industry and infrastructure sectors with innovative solutions and services across the value chain. Together with customers and partners, we pioneer technologies and enable the digital transformation required to accelerate the energy transition towards a carbon-neutral future. We are advancing the world's energy system to become more sustainable, flexible and secure whilst balancing social, environmental and economic value. Hitachi Energy has a proven track record and unparalleled installed base in more than 140 countries. Headquartered in Switzerland, we employ around 38,000 people in 90 countries and generate business volumes of approximately $10 billion USD.

Hitachi Energy is a leader in high-voltage technology, offering a wide range of high-voltage products up to 1,200-kilovolt (kV) helping enhance the safety, reliability and efficiency of power networks while minimizing environmental impact. Our technology leadership continues to facilitate innovations in areas such as ultra-high-voltage power transmission, enabling smart grids and enhancing eco-efficiency.

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. Hitachi Energy 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 stronger, smarter and greener grid.

20 years of Active filter PQF

Active filter PQF from Hitachi Energy 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 compensation.

The new power quality filter PQactiF encompasses all these benefits with additional features

Flexibility

Modularity

Improved efficiency

for applications which are suffering from poor power quality.

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

Commissioning and troubleshooting
experience worldwide

Local service teams
available to perform commissioning and site support

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

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 interface offers direct access to filter control, programming and monitoring with its 7-inch touchscreen.

PQactiF - Higher flexibility. More reliability.

Adaptable	Efficient	Easy to operate
Compact Small footprint	**3-level inverter** Energy efficient and compact	**User-friendly HMI** 7-inch interactive touchscreen GUI
Modular Mix & match 20 A – 640 A	**Closed loop control** Offering high accuracy	**Wi-Fi enabled** Control through PC or smartphone
Configurable Module, wall-mounted or standalone cabinet	**Reasonance protection** Added operational stability	**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

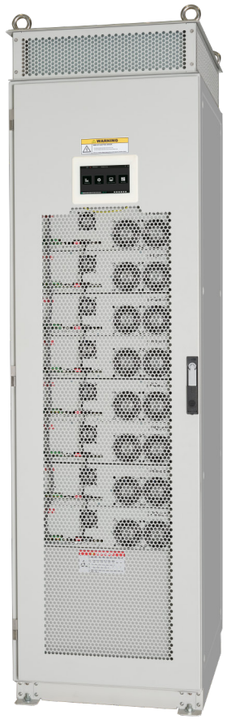
PQactiF - C - Standalone cabinet
- Complete solution: Factory made fully functional tested panel
- Flexibility: Rating can be extended in modular way from 20 A to 320 A in single cabinet

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
Electrical characteristics			
Connection method	3-wire/ 4-wire		
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. 320 A
Neutral current rating per base unit (A)	3 times the line current rating		
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[1]			
Harmonic range	2nd to 50th order, 25 (for 3-wire) / 20 (for 4-wire) harmonic orders[1]		
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[2]			
Target power factor	Programmable from 0.6 (inductive) to 0.6 (capacitive)		
Load balancing characteristics[2]			
Unbalanced current compensation	Up to 100% 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)		
HMI	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 HMI	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
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[3]			
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)[4] -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	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		
Certification	CE		

1. First 6 harmonic orders fixed in both configurations. Rest are selectable
2. 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.
3. Environment conditions 3K20, 3K21, 3K22, 3B1, 3S5 and 3M11 as per IEC 60721 3-3 (2019).
4. Under full load conditions, the product may automatically derate beyond 45° C ambient temperature

Hitachi Energy’s commitment

Quality assurance

At Hitachi Energy, we are committed to providing the best products and services. Our products comply with or exceed the latest international standards. In addition to type tests in independent laboratories, our certified design and manufacturing processes guarantee the highest quality. We are certified according to the latest relevant ISO quality standards.

Sustainability

For Hitachi Energy, sustainability is about balancing economic success, environmental stewardship and social progress to benefit all our stakeholders. Sustainability considerations cover how we design and manufacture products, what we offer customers, how we engage suppliers, how we assess risks and opportunities, and how we behave in communities where we operate and towards one another, while striving to ensure the health, security and safety of our employees, contractors and others affected by our activities. We are certified according to the latest relevant ISO quality standards.