Electronic Based Power Quality Solutions

AHF-SVG Series

Switching Life to Infinity

aktif ELEKTROTEKNİK

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Aktif Elektroteknik, since 1981, has been a pioneer in the electrical sector, with over 275 experienced employees, a total production facility of 12,000 square meters across 3 locations, and references exceeding 1,000 power quality applications. It is one of the most experienced and leading companies in Turkey in active harmonic filter applications.

Aktif Elektroteknik meticulously analyzes power quality issues encountered in facilities with its expert teams and implements the most accurate solutions. It designs and executes electronic-based power quality systems using Aktif Brand Static Var Generators, Aktif Brand Active Harmonic Filters, and ABB Brand Active Harmonic Filter Modules.

Active Harmonic Filters

Active harmonic filters are filter systems used to mitigate high-frequency harmonic disturbances. The type-tested SLV series is designed with a modular panel structure, making it suitable for scalability and capacity expansion.

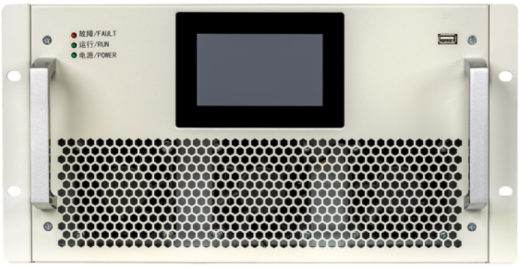
Switching Type:
High frequency IGBT
Operating Principle:
Separate filtering on each phase and the neutral line
Operation Type:
Automatic / Manual
Connection Type:
Drawer design with plug-in bushings offering quick service capability.
Installation Type:
Wall-mounted / Panel-mounted.

Application Requirements

Power quality is a major concern for transmission and distribution facilities, industrial plants, buildings, offices, hospitals, as well as the transportation and infrastructure sectors. Poor power quality affects grid reliability and productivity, leads to higher operating costs, and results in non-compliance with grid requirements. Aktif Elektroteknik provides healthier energy consumption through its low and high-voltage power quality solutions, including active harmonic filters.

Application Advantages

- Prevents malfunctions in electrical equipment caused by the harmful effects of poor quality in transmitted, distributed, and consumed energy.
- Enhances the operational life of equipment, leading to lower facility operating costs.
- Ensures stable operation of devices, more consistent planned energy consumption, and reliable equipment performance through more efficient energy use.
- Decreases energy losses in cables and transformers, increasing overall system efficiency and contributing to the reduction of CO_2 emissions.
- Improves electrical safety in facilities, reducing voltage drops between neutral and ground, enabling better performance of sensitive loads.



Application Areas

- Buildings and Offices
- Bank Headquarters
- Steel Plants
- Cement Plants
- Mining Facilities
- Chemical Plants
- Textile Factories
- Petrochemical Facilities
- Ports and Crane Systems

Advantages of Aktif Elektroteknik AHF Systems

- **Modular Design with Plug-in Bushings**

Panel-type active harmonic filter systems with drawer design and plug-in bushings enable quick and easy operation during installation, maintenance, and servicing. With the capability to replace modules in just a few minutes, it ensures uninterrupted system operation and maximizes efficiency.

- **Bidirectional Compensation for Capacitive and Inductive Loads**

In addition to filtering harmonics in your facility, active harmonic filter systems can meet low-level reactive energy requirements (the current value providing reactive energy is subtracted from the filter current capacity of the active harmonic filter).

- **Easy Installation and Power Scaling with Modular Design**

Thanks to the modular panel structure, the filtering current capacity of 600A per panel can be expanded by adding additional panels to the existing system without requiring revisions to the existing panel, ensuring seamless capacity enhancement.

- **Resonance Detection**

Active harmonic filter systems can detect and prevent resonance, which may occur when the system triggers harmonic increases by failing to respond appropriately to existing harmonics. The system can stop filtering the relevant components, reanalyze, and restart operations as necessary.

- **3P and 3P+N Connection Options**

Active harmonic filter systems offer connection options compatible with all types of power grids, ensuring optimal operational conditions.

- **Filtering Up to the 50th Harmonic**

Active harmonic filter systems can automatically detect and filter harmonics present in the system up to a frequency of 2.5kHz. Alternatively, specific harmonics can be targeted for filtering through the control system.

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Active Harmonic Filter

Brand	Aktif
Type	AHF
Origin	Turkey
Rated Voltage	200 V - 800 V (±%10)
Rated Frequency	50 Hz
Switching Frequency	20 kHz
Capacity (A)	500 A
Line current rating per module (A)	50, 100, 150 A
Neutral current rating per module (A)	Up to 3 times of line current rating
Connection Type	3 Phase 3/4 Wire
Inverter technology	Three-level IGBT based NPC
Filtration Type	up to 51st harmonic
PFC Compensation Target	1 ± 0,1 Cos phi
Redundancy	Any unit can become a master
Response Time	≤ 10 ms
Efficiency	≥ 97%
Application	Indoor
Protection Class	IP20 (Modul), IP31 (Panel)
Color	RAL 9003 / 7015
Ambient Temperature	-10 ... +45 oC
CT Configuration / Operation Type	Open/Close cycle for one module, Open cycle in parallel operation
Humidity	Max. 95% non-condensing during operation Max. 85% non-condensing during storage
Cable Entry	Top entry for wall-mounted module Bottom entry for panel type module
Connection type for modules to panel	Plug-in Bushing
Maximum number of modules per panel	Up to 6 Modules
CT requirements	3 CT‘s are required (class 1.0 or better, 15 VA)
Communication type	RS485
Cooling	1000 m3/h Air Flow with Metal Fan
Controller	4.3 / 7 inches HMI
Dimensions (W x L x H)	700 x 900 x 2100
Standart	EN IEC 61000-6-4:2019, EN IEC 61000-6-2:2019

Static Var Generator

SVG series static var generators are used for inductive / capacitive reactive power compensation. SVG modules are designed for expansion and power increase with wall type single module or type tested SLV series modular panel structure.

Operation Type:
Automatic / Manual / Fixed
Switching Type:
High frequency IGBT
Connection Type:
Pull-out design with plug-in bushing for fast serviceability
Current Harmonic Filtering Structure:
Up to 17th harmonic filtration
Reactive Power:
Inductive / Capacitive

Application Requirements

Power quality is a significant concern for transmission and distribution facilities, industrial plants, buildings, offices, and hospital facilities, as well as the transportation and infrastructure sectors. Poor power quality impacts grid reliability and productivity, leading to higher operational costs and non-compliance with grid requirements. Aktif Elektroteknik provides low-voltage and high-voltage power quality solutions, including static var generators, ensuring healthier energy consumption. These solutions result in reduced energy transmission in cables and transformers, thereby enhancing system efficiency while contributing to the reduction of CO2 emissions.

Application Areas

- Buildings and Offices
- Bank Headquarters
- Steel Plants
- Cement Plants

- Mining Facilities
- Chemical Plants
- Textile Factories
- Petrochemical Facilities
- Ports and Crane Systems

Aktif Elektroteknik SVG Systems Advantages

- **Modular Design with Plug-In Bushings**

Panel-type static var generator systems with plug-in bushing drawer designs enable fast and easy operation during installation, maintenance, and service. The ability to replace modules within minutes ensures system continuity without downtime and maximizes efficiency.

- **Bidirectional Compensation for Capacitive and Inductive Loads**

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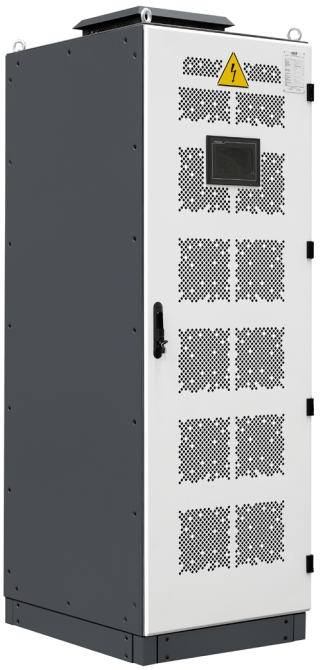
Static var generators, being electronic-based systems, offer millisecond-level responses to inductive and capacitive reactive power demands within the same system. Their advanced technology allows independent three-phase control, providing stability and high power factor ratios compared to conventional compensation systems, all in a much smaller footprint.

• **Easy Installation and Power Scaling with Modular Design**

Thanks to their modular panel structure, systems can easily scale beyond 600 kVAr compensation capacity by adding additional panels to the existing setup. This allows capacity increases without the need for revisions to the current system..

• **3P and 3P+N Connection Options**

Static var generators support various connection options, ensuring compatibility with all grid types.



• **Electronic Control System and Operation**

Unlike conventional systems, static var generators do not perform fixed load switching, eliminating transient currents during compensation switching. Since these systems are continuously energized, they compensate by adjusting voltage amplitude without mechanical switching, allowing them to react instantly to rapid load changes. This design also makes them compatible with generators.

• **Instant Response to Rapid Load Changes**

Static var generators, by design, do not perform fixed load switching, enabling them to respond instantly to load changes and provide the most stable power factor for facilities.

Static Var Generator

Brand	Aktif
Type	SVG
Origin	Turkey
Rated Voltage	200 V - 800 V (±%10)
Rated Frequency	50 Hz
Switching Frequency	20 kHz
Bank Reactive Power (@ 400 V network voltage)	500 kVAr
Line current rating per module (kVAr)	50, 100 kVAr
Neutral current rating per module (kVAr)	Up to 3 times the line current rating
Connection Type	3 Phase 3/4 Wire
Inverter technology	Three-level IGBT based NPC
Filtration Type	up to 17th harmonic
PFC Compensation Target	1 ± 0,1 Cos phi
Redundancy	Any unit can become a master
Response Time	≤ 10 ms
Efficiency	≥ 97%
Application	Indoor
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