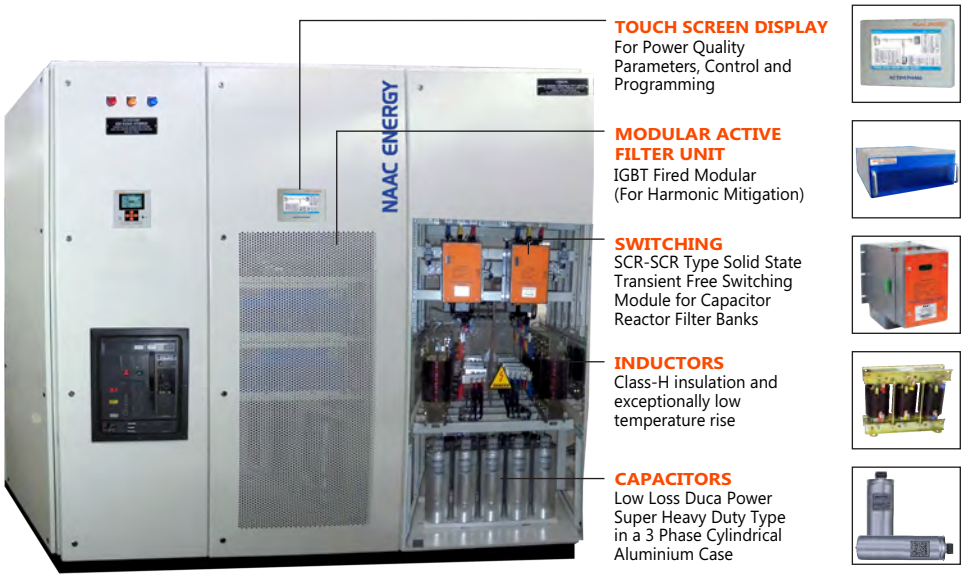
NECPL NAAC ENERGY CONTROLS PVT LIMITED

Activecomp – Hybrid series
Hybrid Harmonic Filter System



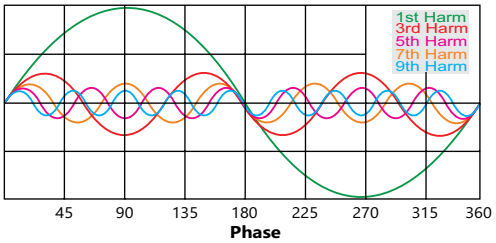
- IGBT Fired Modular Active Filter Units
- Thyristor / Contactor Switched Tuned / Detuned Filter Units
- Touch Screen Display Unit
- High Filtration Efficiency
- Hybrid Technology
- Low Operational Cost
- Long Operational Life
- CE Certified

Background

The increase in frequent use of non-linear loads in industrial facilities and commercial facilities (inverters, fluorescent lamps, welders, DC drives, VFDs, UPS etc.) creates elevated distortions in the waveform of circulating current.

In presence of a "non-linear" load the current waveform will deviate from it's ideal pattern and break down the wave according to the Fourier theorem which will show evidence of harmonics whose number and amplitude will increase with the degree of distortion in the current waveform.

The parameters used to determine the level of harmonic distortion present in an electrical network is (Total Harmonic Distortion) THD % of voltage & current.



Some of the Negative Effects which Harmonics can generate:

- Malfunctioning and failure in sensitive load side equipments
- Overheating and failure in transformers and cables
- Overload and failure in capacitor banks, contactors & switchgears and other distribution equipment
- Higher losses in network leading to higher energy consumption
- Tripping of protections / fuse blowing without apparent reason

Our Hybrid technology comprises of modular Active Filter Modules used with Tuned or Detuned Filter Banks to offer better filtering efficiency in the network. The Hybrid System is used for Power Factor Correction and Harmonic Mitigation with very low running cost.

The Hybrid System is controlled through Touch Screen Controller with standard banking. The modular Active Filter units are IGBT fired with each module is having its own dedicated inbuilt Controller. In case of fault in one module the other modules will keep on operating normally.

The Passive Filtration part is controlled and switched 'ON' through TSM or Contactor as per customer choice. The complete combination of Active and Passive, offers a very reliable combination for very effective filtration and power factor control with low losses.

Advantages of Activecomp Hybrid Harmonic Filtration System :

- Saves electrical energy by bringing down specific energy consumption so properly designed System pay back within very short period
- Very low operational cost in comparison to purely active filtration
- Reliable and scalable modular technology for very long trouble free operational life
- Eliminates current and voltage harmonics, improves power factor, avoid risk of resonance and improves life span of various load side and distribution equipment
- Minimize breakdowns thereby increasing uptime of plant leading to high productivity
- Designed to operate at 50 Deg. ambient without any derating
- Can compensate from 2nd to 51st order harmonics

Activecomp Hybrid Harmonic Filter System with Passive Tuned

Part No.	KVAR Rating Thyristor Switched / Contactor	Active Filter Rating IGBT Fired	Dimensons W x D x H (mm)
HTHF110-415-50	110 KVAR	50A	on request
HTHF235-415-50	235 KVAR	75A	on request
HTHF335-415-50	335 KVAR	75A to 100A	on request
HTHF445-415-50	445 KVAR	100A to 150A	on request
HTHF560-415-50	560 KVAR	100A to 200A	on request
HTHF670-415-50	670 KVAR	200A	on request
HTHF810-415-50	810 KVAR	200A to 300A	on request
HTHF935-415-50	935 KVAR	200A to 400A	on request
HTHF1030-415-50	1030 KVAR	300A to 400A	on request

Activecomp Hybrid Harmonic Filter System with Passive Detuned

Part No.	KVAR Rating Thyristor Switched / Contactor	Active Filter Rating IGBT Fired	Dimensons W x D x H (mm)
HDHF100-415-50	100 KVAR	50A	on request
HDHF200-415-50	200 KVAR	75A	on request
HDHF300-415-50	300 KVAR	100A	on request
HDHF400-415-50	400 KVAR	100A to 300A	on request
HDHF500-415-50	500 KVAR	200A to 300A	on request
HDHF600-415-50	600 KVAR	200A to 400A	on request
HDHF700-415-50	700 KVAR	200A to 400A	on request
HDHF800-415-50	800 KVAR	300A to 500A	on request
HDHF900-415-50	900 KVAR	300A to 500A	on request
HDHF1000-415-50	1000 KVAR	300A to 500A	on request

**Any other rating on request

Specifications

Enclosure Design : Standardized bolted Modular Sheet Steel Enclosure-Non compartmentalized.
Enclosure Finish : Epoxy Powder Coated, in grey (RAL 7035) structure finish
Rated Design Voltage : 415V-440V, 50Hz, 3 Phase 3 Wire (Design available for 380V, 400V, 480V, 690V, 750V - 50/60Hz)
Output Rating : Refer to the table
Other output ratings, switching combination or design voltage are available upon request
Duty : Continuous
Capacitors : DUCA POWER Super Heavy Duty series used are rated at 525V, 690V and 800V, 50/60Hz as per network voltage and Hybrid Filter design
Reactors : H-Class, Single layer Wound 200% Linearity, Cu / AL., high RMS current capability
Switching : Power Contactor / Heavy Duty Thyristor Switched, SCR-SCR type for 415V - 750V network
Active Harmonic Filter : IGBT Fired modular AHF unit
Touch Screen Display : Touch Screen / Graphic Display with Power Quality Parameters, Control and Programming
Incoming / Outgoing : MCCB / ACB as incomer and HRC Fuses / MCCB for backup protection (other combinations on request)
Ambient Temperature : 50 °C max. short time
40 °C average in 24 hours
35 °C annual average
-10 °C low limit
Protection Class : IP 42

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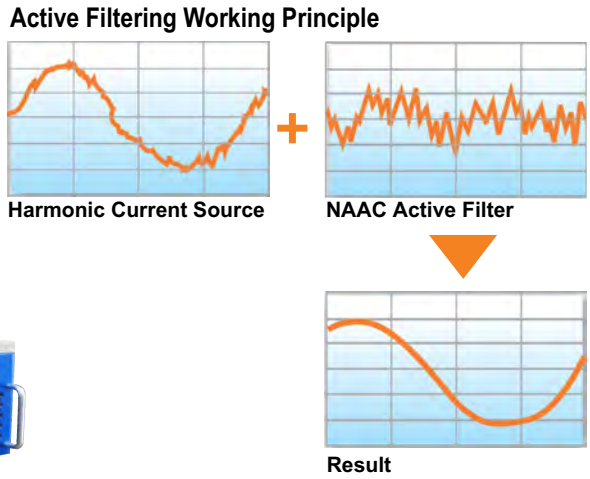
Active Harmonic Filter (Series - ACTIVEPHASE)



Our ACTIVEPHASE series is an advanced modular Active Harmonic Filter (AHF) system. The AHF system is constructed of one or several filter modules with the system controller.

Filter modules and controller, both are embedded in our standard cabinets. CT terminations are fixed in a standard cabinet, and the AHF capacity can be configured accordingly to user requirement.

The filter capacity can be easily expanded at the user's site by adding extra filter modules as per site requirement.

Features

- Supports flexible configuration and capability to expand vertically as well as horizontally
- Compatible with diesel generators & harsh ambient (Temp up to 50°C)
- Eliminates Harmonics, avoiding risk of resonance.
- Highly flexible and scalable solution
- Lower Current could reduce thermal loss in power cables & transformer
- Reduce Voltage Distortion and Fluctuation to extend
- Service time of electric devices
- Suppressing harmonics & reactive power reduces the Total current, so more loads can be driven by the same transformer
- Increase power factor, avoid reactive power penalty. Can compensate from 2nd to 51st order harmonics

Adaptability

- Compatible with diesel generators
- Wider range of input voltage, frequency and faster response time
- Low thermal loss
- Compensates a wide range of harmonics from 2nd order to 51st order harmonics

Flexibility

- Designers have more choices with flexible configuration
- Capability to expand vertically as well as horizontally
- Higher operating temperature up to 50°C

Reliability

- IGBT parallelling technology
- Intelligent air cooling technology
- High quality components of international brands
- Advanced production technology

Hybrid Harmonic Filter

To improve the capability of Filters - Hybrid Solutions is the best option comprising of Tuned / Detuned Thyristor Switching Passive Filters and modular Active Harmonic Filters. Tuned filter circuit improves the power factor of the network, absorbs the basic harmonics and Active Harmonic Filter module feeder improve the network quality by reducing the harmonics from the network. It is a very cost effective solution for improving power factor and at the same time mitigating harmonics.

Application of AHF / Hybrid Harmonic Filters

- Industry
- Automotive
- Arc Welding
- Steel / Metal
- Cement
- Chemicals
- Pharmaceuticals
- Textiles
- Petrochemicals
- Lifts, Port Cranes
- Pulp and Paper Industry
- Wind Farms and Solar Power
- Water and Waste Water Treatment
- Crushers and Shredders

Commercials

- Data Centers and IT-Facilities
- Offices and Buildings
- Traction and Metro Stations
- Fluorescent or HID Lighting
- Hospitals
- Airports
- Shopping Malls

Specifications

Electrical

Rated Voltage	:	AC 415V +20% to - 20% (Other Voltages on request)
Electric Connection	:	3P3W / 3P4W
Rated Frequency	:	50Hz (60Hz) +/- 10%
Input Voltage THD with stand	:	Up to 15%
Harmonic compensation range	:	2nd ~ 51st order (Selectable)
Harmonic compensation degree	:	0 ~ 100% (Selectable)
Harmonic Filtration Efficiency	:	> 98%, grid side after elimination THD-V <3%, THD-I <5%
Reactive Power Compensation Capacity	:	Positive, Negative, Zero Sequence Reactive
Full response time	:	< 10ms
Instant time response	:	< 25us
Thermal Loss	:	≤ 3%
Output Current Limitation	:	Automatic (100% rated current)
MTBF	:	> 100,000 hours

Control Technology

Switching Frequency	:	60 Khz
Controller	:	DSP Control
Communication	:	Modbus Protocol, RS232/485

Physical Dimension

Rating	:	50/75/150 Amp	100 Amp	200/300Amp	400/500 Amp
Dimensions (W x D x H)	:	600x800x1400	850x1050x725	850x1050x1525	850x1050x1825
Weight	:	100/110/160 Kg	160 Kg	210/330 Kg	410/490 Kg
IP Grade	:	IP20	IP20	IP20	IP20
Noise	:	< 65dB (A)			
Cooling Method	:	Intelligent forced air cooling			

Standard

Standard	:	CE

Environment Requirement

Ambient Temperature	:	-10 ~ 50 °C
Relative Humidity	:	(RH) 0~95% (Non-condensting)
Altitude	:	< 1000m Rated Capacity,
	:	1000-2000m (derating 1% per 100m)

*Specifications are subject to change without notification.

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