

Shreem



Active Harmonic Filter
**POWER CONDITIONING
EQUIPMENT**



The effect of harmonic pollution is an increasing problem caused by growth of sophisticated power electronics and proliferation of nonlinear loads in power system such loads are used in industrial, commercial and residential installations.

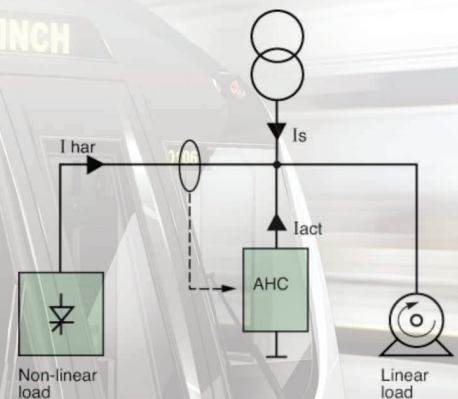
Typical nonlinear Load includes..

Variable speed Drives, Induction furnaces, Static converters, UPS systems, DC Power Supplies, welding machines, Induction furnaces, Solid state elevator controls; office equipments like computers, servers, printers, photocopy machines, Household appliances such as fluorescent lightings, TV, light dimmers, microwave ovens, saturated magnetic devices.

The existence of harmonic current gives rise the RMS current in network. The flow of distorted current through the system impedance causes to increase voltage distortion in the network resulting deterioration of the supply voltage quality. Such adverse effect are more pervasive for consumers and often seen in the following form.

- Overheating of transformers, motors and cables
- Overloading of neutral conductors
- Malfunction/premature failure of equipment
- Capacitor overloading and network resonance
- Undue tripping of circuit breakers and blowing of fuses
- Disturbances to sensitive loads, control and monitoring devices, computer and networking equipments.
- Causes increase in replacement cost due to reduced life of equipments, increase in capital cost of installation due to over sizing of equipments and increase in operating cost due to overloading of equipments.

Such effects are sporadically related to harmonic distortion while the conventional remedy for this problems is passive filter, but this have certain limitations like Filtering efficiency depends on network parameters, danger for overloading filter components, difficult to extend, possibility of resonance, multiple branches required for filtering more than one harmonic and hence large space requirement. Hence, Shreem has SPF-PCE series of Active harmonic filter called "Power Conditioning Equipment" have much higher levels of efficiency in harmonic cleaning and having flexibility of installation.



Working Principle

SHR-PCE is Power Quality Conditioning device which is solid state IGBT based power converter which monitors harmonic currents generated by nonlinear load. It generate opposite phase shifted harmonic currents of the same amplitude and inject to the network to cancel the load harmonic currents and thento obtain the sinusoidal current and hence voltage in the utility and also improving power quality and compensating unbalance currents.

Features	Benefits
Modular construction, most unique design concept	Basic modules of 75/100 A/200 A, which can be paralleled to get the desired rating. There will be horizontal and vertical modularity can give rise to capacity of 1800 A.
Based on Floating point 32 bit DSP	Excellent attenuation even at the lower load levels, hence overall better performance on entire load cycle.
Selective harmonic elimination methods. CT can be connected in load as well as in source	Flexible design, hence particular harmonics which are causing damages can be kept under control.
Works up to 690 VAC (optional)	Wider voltage window, with inbuilt auto transformer.
Ethernet based Remote monitoring and 7 inch SVGA touch screen display	Enhanced monitoring and control of filter and hence the entire distribution system.
Lower audible noise	Suitable for installing near servers inside datacentr. It helps to curtail down harmonics, where they are generated.
Compact in size	Saves space, reduces installation cost.
Compliant to protection up to IP 51 (optional)	Ideal for the harsh industrial environments.

Additional Features

- Internal CAN Communication
Employs high speed IGBTs in power circuit
- Closed loop active filter with source current sensing
- High attenuation up to 96% of individual harmonics
- Programmable selective harmonic elimination
- PF compensation, leading as well as lagging
- Helps in achieving the compliance with Power Quality regulations like IEEE 519



User Interface with Advance Graphics Display

The SHR-PCE series integrates HMI including graphical Interface –@DSP Regulator. It offers direct control, configure, monitoring and harmonic analysis without use of PC.

Communications options, alarm events and fault recording with real time basis is included.

7 inch, touch pad sensitive, SVGA color display makes it more user friendly interface for setting and viewing different electrical parameters along with various wave forms.

Almost all power parameters can be monitored and logged for future reference and corrective actions. The firmware is running on proprietary software, there is provision for the up gradation of software.

User Benefits

- Reduces capital expenditure cost of the electrical distribution network due to reduction in the over-sizing of cables, transformers and other equipments
 - Safe and reliable AC power supply and distribution network
 - Reduced overloading and overheating of the neutral conductor
 - Nuisance tripping of protection circuit breakers avoided
 - Reduction of the THD (V) due to cancellation of current harmonics
 - Increased lifetime of distribution equipments
 - Increased productivity by eliminating downtime
 - Increased generator performance and life
 - Lowers energy consumption bill
- Reduces operating expenses



Applications

The SHR-PCE series is widely used in Industries enjoyment like Oil and Gas, waste water, Pulp and paper, Steel, Foundries, Textile, Cement, Automotive, Printing and Commercial enjoyments such as Offices and buildings, Hospitals, Malls, Stadiums, Data centers and other like UPS systems, lifts and advanced lighting systems, railway and metro applications.

Model No.	SHR-PCE30	SHR-PCE60	SHR-PCE75	SHR-PCE100	SHR-PCE150	SHR-PCE200	SHR-PCE225	SHR-PCE300	SHR-PCE400	SHR-PCE600
Rating in Amp	30	60	75	100	150	200	225	300	400	600

Input

Nominal Voltage	400V AC, 3Ph 4 wire, +10%, -15%
Frequency	50 Hz, +/-5%

Filter

Harmonic Range	2 nd to 50 th order
Filter Power Loss	Up to 3 % of equipment rating
Harmonic Selectio	Any 20 Harmonics can be selected at a time
Harmonic Attenuation Ratio	Up to 96% at rated current
Response time	<10 m Sec
Reactive Current compensation	Yes
Compensation Method	Closed Loop
Priority Selection	Power Factor and Harmonics
With Ambient Temperature	100% at 40 Deg C 80% at 80 Deg C
Overload (peak value)	2.5 times rated compensation current
Current transformer	200% of Running line current, Secondary 5A, Class 1 or Better with 15VA rating

Environment

Operating temperature	0 to 40 Deg C
Storage temperature	-20 Deg C to 70 Deg C
Relative Humidity	Up to 95% RH (Non condensing)
Maximum operating altitude	1000 meters; 1% de-rating per 100 meters, Max 2000M
Acoustic noise at 1m from panel front(Ref ISO3746)	< 65 dBA for 30A to 100A, < 68 dBA for 150 to 225A, < 70 dBA for 300A and Above
Cooling	Forced air Cooling

Physical Characteristics

Ingress Protection (IP) of cabinet	Ip20
Cable entryCabinet steel thickness	Cabinet steel
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Cable Entry	Bottom Front
Cabinate Colour	RAL 7032 Texture –Siemens Grey
Cabinet steel thickness	Frame 2mm, Front door 2mm Covers 1.2mm
Installation	Free standing, Floor Mounting
Service access	Front
Structure	Modular structure (For 150A and Above)

Dimension

For 30 to 100Amp - W 620 x D 450 x H 1000mm For 150 to 300Amp - W 800 x D 850 x H 1750mm For 400 to 600Amp - W 1000 x D 900 x H 1750mm

Display

7 Inch TFT Touch screen Color display

User Interface

User Parameter Settings	From system display or serially using setting software
Audible Alarm	For Fault condition
Data log & Events	Built in Alarm log 1000 numbers and Data log - 200 numbers

Protection

MCCB & fast acting semiconductor fuses

Communication

Monitoring Software on Ethernet Port

Reference Standard

IEEE519 for compensated Harmonics