BHFXX0TS Series

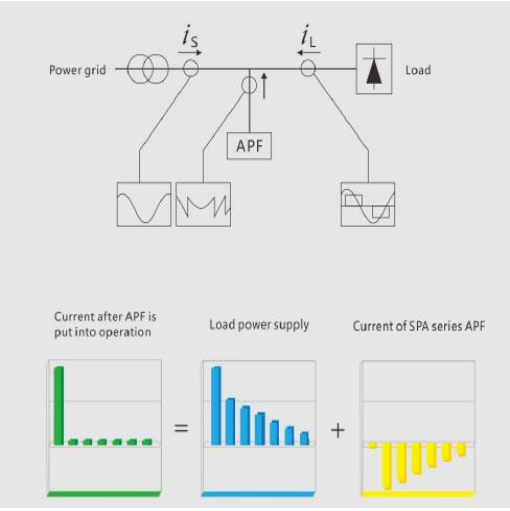
Smart Active Harmonics Filters & SVG

BHFXX0TS is a series of an electronics based smart device that operates as an online active harmonics filter, reactive power consumption and Load balancing of the power network, it connects in parallel with “harmonics” loads to conduct a real time filtering & compensation in order to improve the power network quality, stability and safety.

BHFXX0TS series overcomes the shortcoming of using traditional harmonics suppression of the traditional passive filters and capacitor banks.

Working principle:

The CT’s will Monitor the load current to detect the harmonics wave up to 49th order and performs the computing through the internal DSP unit to analyze and calculate the power factor, Reactive power and apparent power, then to transfer them to the high current capacity rectifier module along with the module processor in order to generate the compensation current in the reverse direction, with overall response time less than 10ms and performance exceeding 97%.



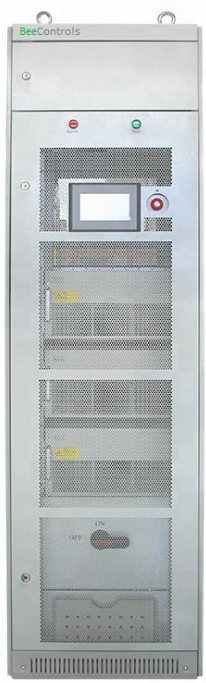
Harmonics sources

The harmonics are caused by any non-linear load connected to the mains distribution network and the waveform of the load can be analyzed to give a harmonic spectrum, the following equipment/components are an example of nonlinear load:

↗ Motors, fans and pumps.
↗ Personal computers, Servers, data Centers, printers and photocopiers.
↗ Video Screens.
↗ Fluorescent lights, LED lights and any lighting that uses electronic transformers.
↗ Wind & Solar Energy Generation systems.
↗ Uninterruptible power supplies (UPS).
↗ Lifts and escalators.
↗ Industrial & Home Furnaces, Ovens & Boilers.
↗ Variable speed drives and switched-mode power supplies.
↗ Rectifiers, power converters and thyristor power controllers.
↗ Chillers, compressors, freezers and microwave cookers.
↗ Air-conditioning, heating and ventilating equipment.

Typical applications and verticals:

↗ Steel & Chemical Factories.
↗ Mining and extraction operations.
↗ Hospitals, office towers and Shopping Malls.
↗ Cinemas & Hotels.
↗ Pumping Stations.
↗ Schools, Universities and data centers.
↗ Oil & gas fields.
↗ Railway & Metro applications.
↗ VFD's & Heavy industrial Machines.

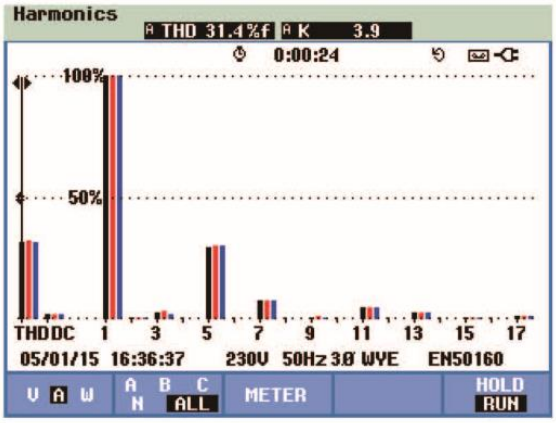


BHFXX0T Advantages:

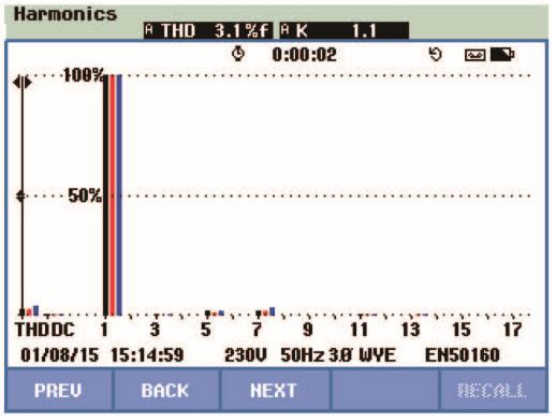
↗ Improve and Maintain the stability of the power network.
↗ Mitigate the communication interference.
↗ Increase the lifetime of the equipment and reduce the running along with maintenance costs.
↗ Compliance with the IEC standards and Utilities’ regulations to avoid any governmental penalties.
↗ Reduce energy losses in cables and transformers.
↗ Increase the safety of the network.
↗ Reduce the voltage drop between neutral and earth that lead to improve the operations of sensitive loads.

Similar Case: Metal Processing Factory

Due to the nonlinear loads, the harmonics order was up to 13th order, that causes many technical problems in the PLC controls, communication along with the regular relays damage.



Before Compensation



After Compensation

Using a combination of our AHF filters "BHFXX0TS series", the total Harmonics distortion THD has been improved to be 3.1% instead of 31.4%, that led to increasing the power network Quality and stability, In addition to improving the power factor that led to reducing the energy losses.

Mounting and Safety Instructions

↗ All Devices and equipment should only be installed and put into operation by qualified electrician or authorized person.
↗ The operator should be fully familiar with the composition, working principle and related standards of the whole power supply system.
↗ Before installing the APF, Please ensure that all power sources are disconnected.
↗ Failure to observe the instructions may cause damage to the device and result in fire and other hazards.
↗ Do not connect the main voltage or any other external voltages to any point of the communication bus.
↗ Ensure that there is enough insulation and space between the AC voltage cables and communication bus.
↗ Installation only in dry locations and do not expose this device to direct sunlight, rain or high humidity.
↗ Do not use aerosol sprays, solvents or abrasives that might damage the device.
↗ Accessibility of the device for operation and visual inspection must be provided.
↗ Do not Open the APF while it is connected to the load.
↗ Inappropriate use can damage the APF product and the connected equipment.
↗ The warning signs on the APF box contain important information about the safe operation and must be strictly followed.
↗ The Nameplate of each APF contains important parameter information related to the product and prohibits human damage.
↗ Before electrical connection, please ensure that the APF is not damaged and is in a safe state, otherwise the electric shock or fire may be caused.
↗ Before conducting an electrical connection, please make sure that the related circuit breaker has been switched off.
↗ During the operation of APF, there is a high voltage. It may cause electrical shock and cause death, Please strictly follow the safety precautions listed in this manual and other related document.
↗ Please don't touch any part of the APF while operating except only the display touch screen.
↗ During the maintenance process, please abide by the standard of electrostatic protection and wear anti - static gloves.
↗ Before the maintenance process, Please ensure that all power sources are disconnected and wait at least 5 minutes.

Electrical Parameters			
Device Type	Rack Type	Wall Mounted Type	Full Cabinet Type
Device Name	BHFXX0RS	BHFXX0WS	BHFXX0CS
Available capacity	50A,100A & 150A	50A,100A & 150A	50A up to 600A
Harmonics order	2^{nd} ~50^{th} order		
THD	≤ 5%		
Power Factor	≥ 0.96		
Harmonics compensation efficiency	≥ 97%		
Full response time	5~10 ms based on the Model		
Compensation mode	↗ Harmonics Compensation. ↗ Three Phase unbalance compensation. ↗ Capacitive & Inductive reactive power compensation		
Wiring Pattern	Three Phase Three wire Three Phase Four Wires		
Switching Frequency	20khz		
Power Grid Voltage	350~750 Volt		
Network frequency	50~60 Hz		
Protection Mode			
Over-voltage protection	Yes	Yes	Yes
Under-voltage protection	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes
Inverter bridge inverse protection.	Yes	Yes	Yes
Over Temperature Protection	Yes	Yes	Yes
Environmental parameters			
Operating Humidity	>85 RH		
Storage Humidity	Up to 9%		
Operating temperature	-10℃ ~ +45℃		
Storage Temperature	-15°C ~ +55°C		
Transport Temperature	-15°C ~ +65°C		
Noise	≤ 65 dB		
Device Parameters			
Protection type	IP20		
Mode of communication	TCP/IP & ModBus		
Cooling Mode	Forces air cooling		
Touch Screen	Yes	Yes	Yes
Available Colors	White - light Gray & Black		