

HTS - Active Power Filters

1. Overview

HTS - Active Power Filters (APF) models APF90 and APF100 utilize digitally controlled, highly dynamic compensation modules to eliminate: harmonics, phase imbalance, and reactive power. By continuously monitoring the power network and by injecting the right amount of compensation current, most power quality issues are effectively and accurately resolved.

Our APF instantly restores current waveform distortions up to the 25th harmonic and eliminates both phase imbalances and reactive power. This results in power consumption reduction and increased reliability of the client's power system operation which immediately lowers power bills and long-term maintenance expenses.



Figure 1: Two APF module enclosures

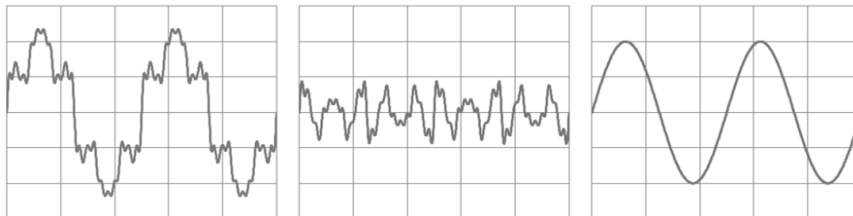


Figure 2: Harmonics elimination

2. Circuit Topology

HTS APFs consist of an electric cabinet, power modules, human machine interface, cooling systems and cable interconnections. Optionally, the power modules and HMI can be integrated into a different structure such as an MCC thus eliminating the need for an additional cabinet. Power modules with Infineon's IGBT components ($V_{CES}=1200V$) have a three-level converter configuration that generate inverse current values for harmonic compensation. This modular design is available in the following voltages: 208V~480V/3W, 480V~690V/3W and 208~415V/4W. The power module current rating is 100 A, with a 3x current peak rating. An output inductance level filter loop (LCL filter) is used with each module.

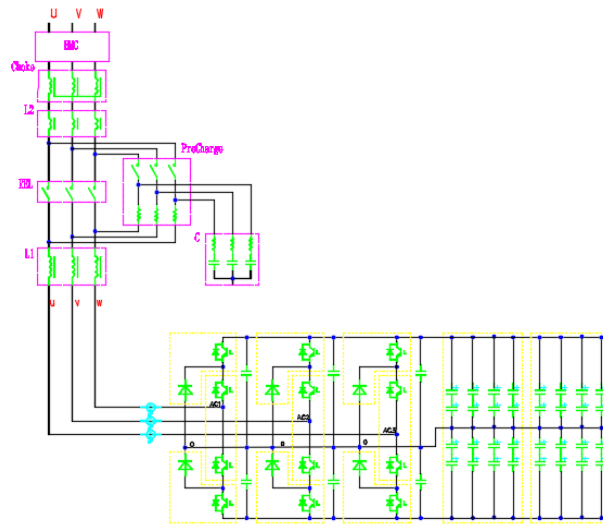


Figure 3: Topology of three-level APF

3. Layout

HTS Active Power Filters are air cooled by a base mounted centrifugal blower fan forcing all heat through the top of the panel. Power cables enter through the bottom of the cabinet. Overall dimensions (690V/90A/3W) are: 240x480x1200mm.



Figure 4: Internal APF layout with fan at the bottom

4. Installation configurations

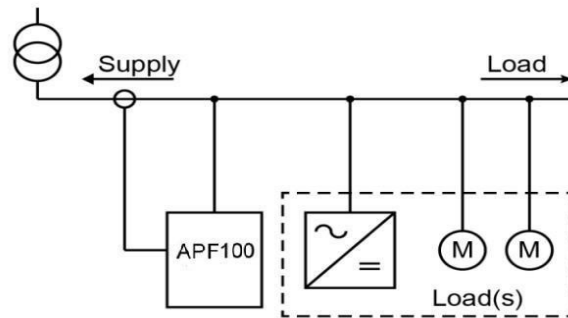


Figure 5: current transformers are placed near source

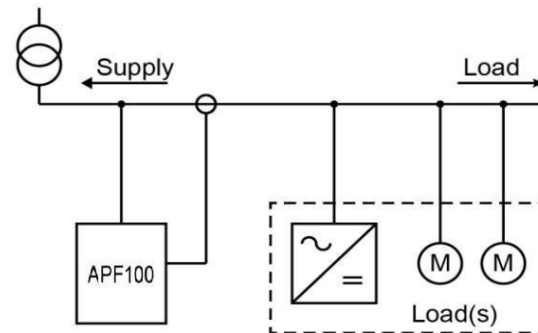


Figure 6: current transformers are placed near load side

5. Power modules in parallel operation

APF capacity can be expanded connecting modules in parallel with one module acting as the master, and the other modules slaved.

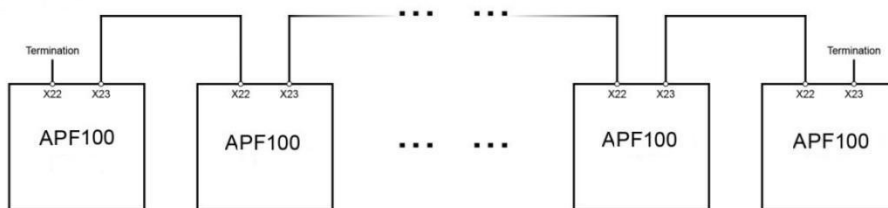


Figure 7: Modules in parallel configuration

Data Sheet

Model	APF 690/90A/100A/3W, APF 480/130A/3W
Rated power	108 kVA
Compensation current capacity at 50/60 Hz	90A(RMS)/130A(RMS)
System voltage	690V/480V
Nominal frequency	50/60 Hz \pm 2 %



Number of phases	3 phase 3 wire
Harmonic current compensated	individual compensation up to 25th order
Rate of harmonic reduction	>98%
Expandability	Parallel to 4~6 modules
Noise level	<65dB
Response time	10ms
Environment	0 to 95 % RH non-condensing, max altitude 1000 m
Operating temperature	0 to 50 °C, up to 40 °C without derating
Dimensions	240x480x1200mm (W×H×D)
Weight	90Kg
Protection class	NEMA 1 or IP20 according to IEC 529

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