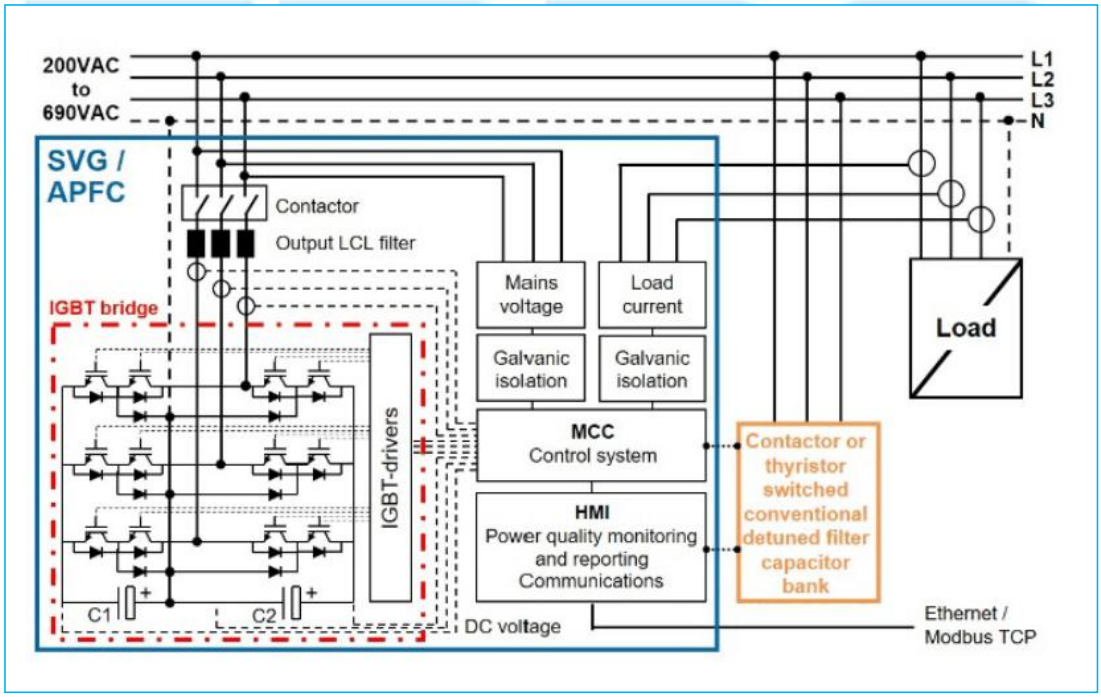
OVERVIEW

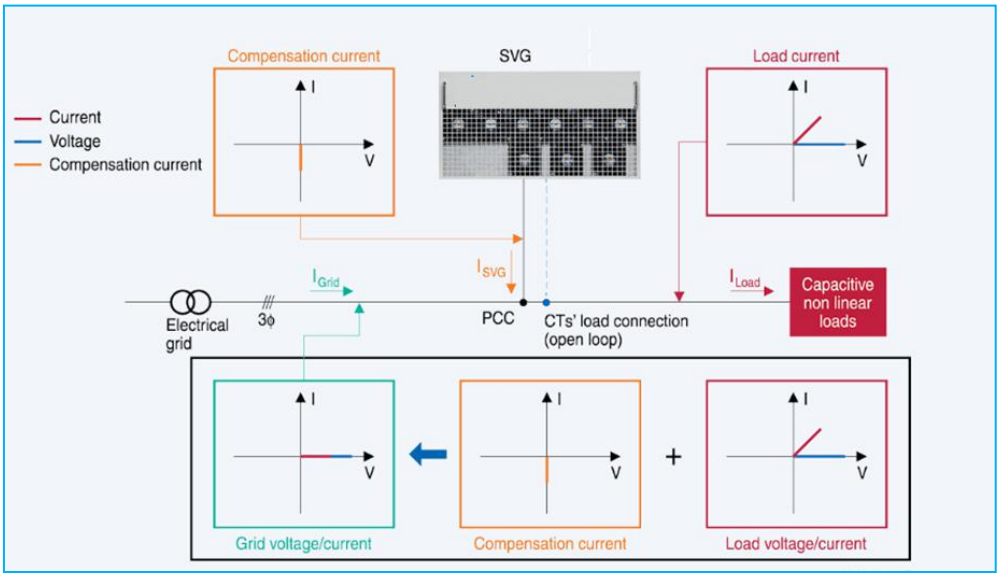
Static Var Generator (SVG) also known as instantaneous stepless reactive power compensators are the ultimate answer to power quality problems caused by low power factor and reactive power demand for a wide range of segments and applications. They are a high performance, compact, flexible, modular and cost-effective type of active power filters (APF) that provide an instantaneous and effective response to power quality problems in low or high voltage electric power systems.
They enable longer equipment lifetime, higher process reliability, improved power system capacity and stability, and reduced energy losses, complying with most demanding power quality standards and grid codes.

Low power factor increases the active energy losses of installations and affects their stability. It is typically caused by inductive or capacitive loads that demand extra reactive power to perform properly. Other contributors to low power factor are harmonic currents produced by nonlinear loads and the change of load in the electric power system.
SVG deliver real-time inductive or capacitive reactive power compensation. Rapid response time provides stable and accurate power factor correction without the drawbacks of conventional solutions like capacitor banks and reactor banks.



Typical Design of SVG

OVERVIEW

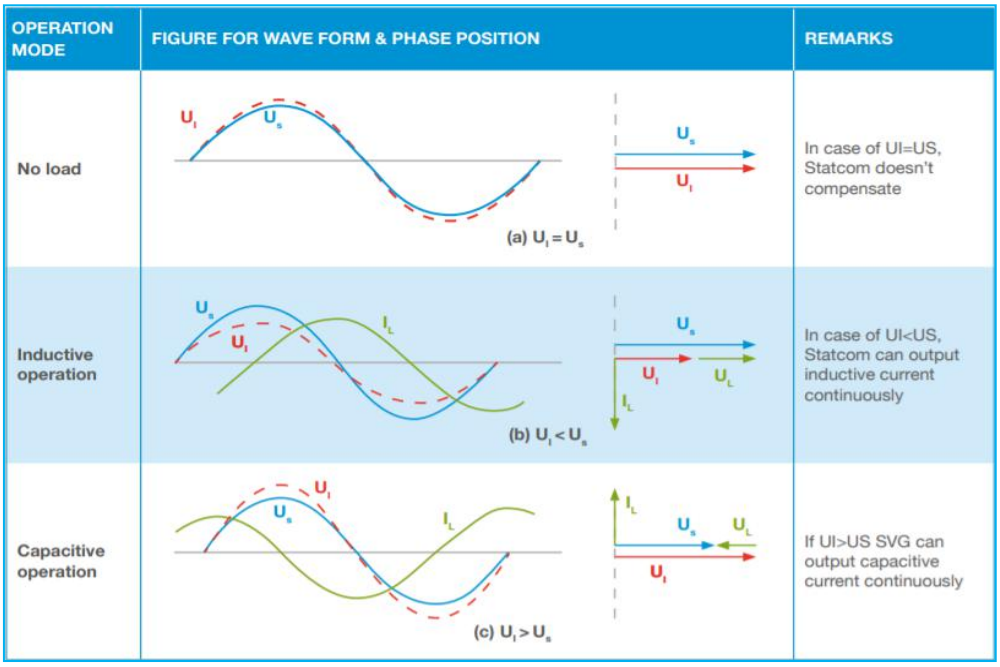


Typical Design of SVG

WORKING PRINCIPLE

Static Var Generator is a power electronics-based device connected in parallel with the load that requires harmonics mitigation. SVG works as a controlled current source providing any kind of current waveform in real time.

When the load generates inductive or capacitive current, it makes load current lagging or leading the voltage. An SVG detects the pase angle difference and injects in real time leading or lagging current into the electric power systems, making the phase angle of the current almost the same as that of the voltage, bringing fundamental power factor to unity.



Working Principle

FEATURES AND BENEFITS

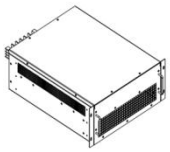
PRECISE COMPENSATION

Continuously outputs and compensates reactive power to maintain power factor >0.99. The compensation performance is 1.2 times better than a traditional compensation device (capacitor).

CAPABLE OF INDUCTIVE AND CAPACITE COMPENSATION

Realize inductive and capacitive compensation, avoid under and over compensation issues.

SUPPRESS HARMONICS



Configures the required amount of reactive current in real-time and compensates the reactive power to filter high order harmonics.

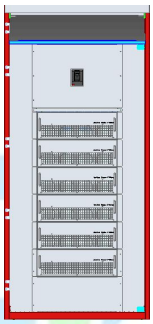
FAST RESPONSE

Fast configuration capability provides fast analysis and response time. Provides cycle response <5ms and dynamic response <200us.

LOW VOLTAGE BENEFITS

Output current is not affected by the mains voltage fluctuation, providing stable support for mains voltage.

MINIMAL LOSS, BETTER ENERGYEFFICIENCY



Adopts new standard IGBT with low power consumption rate and improves full set device efficiency up to 97%. The system provides low power consumption.

MODULAR DESIGN, EASY EXTENSION

No need for additional reactor or capacitors and the compact design reduces volume by20~30%. It is easy to maintain with a specially designed air path that facilitates module assembly and extension.

HIGH RELIABILITY AND SAFETY

Robust design for power system eliminates resonance problems, with no more amplified harmonic current and voltage. It extends components' life cycle and protects the system.

SVG MODULAR 400V

Number of phases (system input)	3-phase 3-wire or 3-phase 4-wire			
Mains frequency	50/60Hz			
Mains voltage	400 V ±20%			
Initial response time	<200us			
Response time	<5ms			
Compensation mode	Compensate Harmonic, Reactive power, and 3 phase load unbalance.			
Reactive power compensation effect	PF>0.98(inductive and capacitive compensation)			
Total harmonic current distortion THDi	<5%			
Filtering control effect	>97%			
3 phase unbalance compensation effect	<5%			
Active Loss of system	<3%			
Inverter topology	IGBT			
Controller	DSP+FPGA			
Control algorithm	Self-adaptive control algorithm			
Control connection	Fiber or electrical connection			
Communication interface	Modbus Protocol,RS485 inter			
Rated Capacity of Modular	30kVAr	50kVAr	75kVAr	100kVAr
Weight	30kg	35kg	40kg	45kg
Output current limit	Automatically limited within 100% of rated capacity to output			
Self protection	Yes			
Protection Function	Short circuit, over and under voltage, over frequency, under frequency, phase sequence error and current inverted sequence protection			
Noise level	<60 dB (depending on load situation)			
Relative humidity	<95% non-condensing			
Temperature	-20~70°C			
Cooling type	Air cooling			
Dimensions	440 mm × 600 mm × 230.5mm (w × d × h)			
Mounting	Wall-mounted or Rack mounted			
Ambient conditions	<1000 m without derating; Up to 4000m with derating 1% per 100m			
Protection class	IP20			
Certification	ISO9001,Type Test Report			
Design standards	EN 50178:1997/IEC 50178:1997 EN61000_6_2(2005)/EN55011,Group1,ClassA IEC61000_6_2(1999)/CISPR11,Group1,GlassA EN50091-3/IEC62040-3/AS62040-3(VFI SS 111)