

Advanced Static VAr Generator



Wall Mount



Rack Type

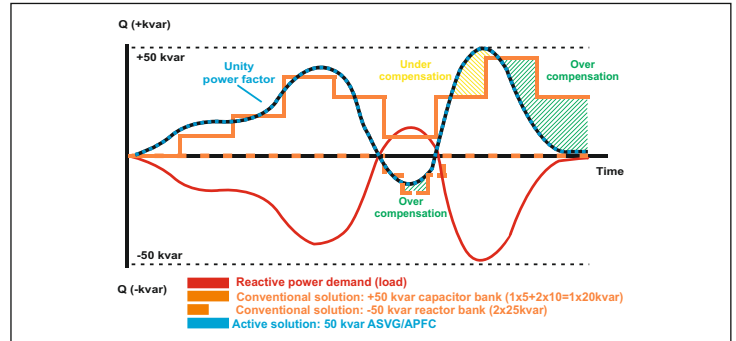
- 50 kVAr
- 100 kVAr

What is ASVG?

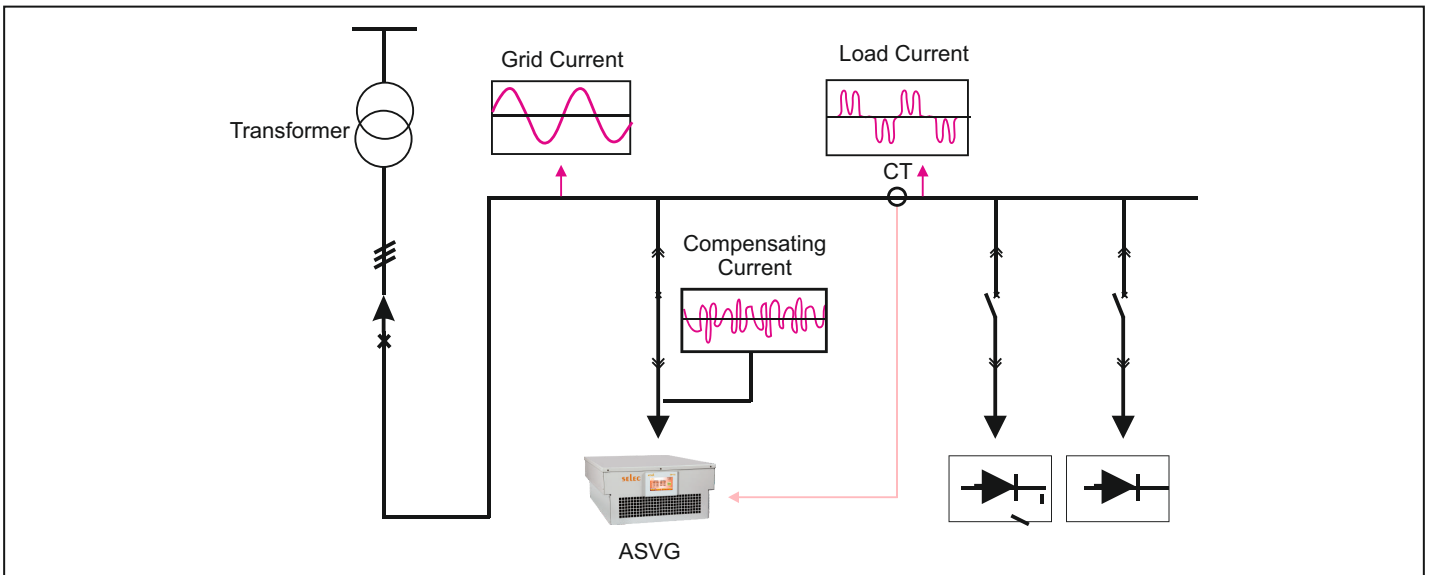
- ASVG stands for Advanced Static Var Generator.
- ASVG acts as a current source that generates a compensation current working as a dynamic current source. It monitors the current phase angle and generates real time compensation current to achieve the set displacement power factor.
- Advanced static var generator, additionally monitors harmonics up to order of 15th Level and compensates the same on real time basis, thus improving the power quality.
- A correctly sized ASVG can not only correct displacement Power factor, but also it can reduce harmonics to <5% THDi.
- Dealing in both can result in true unity power factor.

Working Principle of ASVG:

- When the load generates inductive or capacitive current, it makes load current lagging or leading the voltage.
- ASVG detects the phase angle difference and generates leading or lagging current into the grid, making the phase angle of current almost the same as that of voltage on the transformer side, which corrects the fundamental power factor to almost unity.
- ASVG draws the harmonic current from the supply grid in such a way that the magnitude of its current is same as that of the load side harmonic current, whereas its phase is opposite with respect to that of the load side harmonic current, which ensures that the effective value of the harmonic current on the supply side reduces to a negligible level.

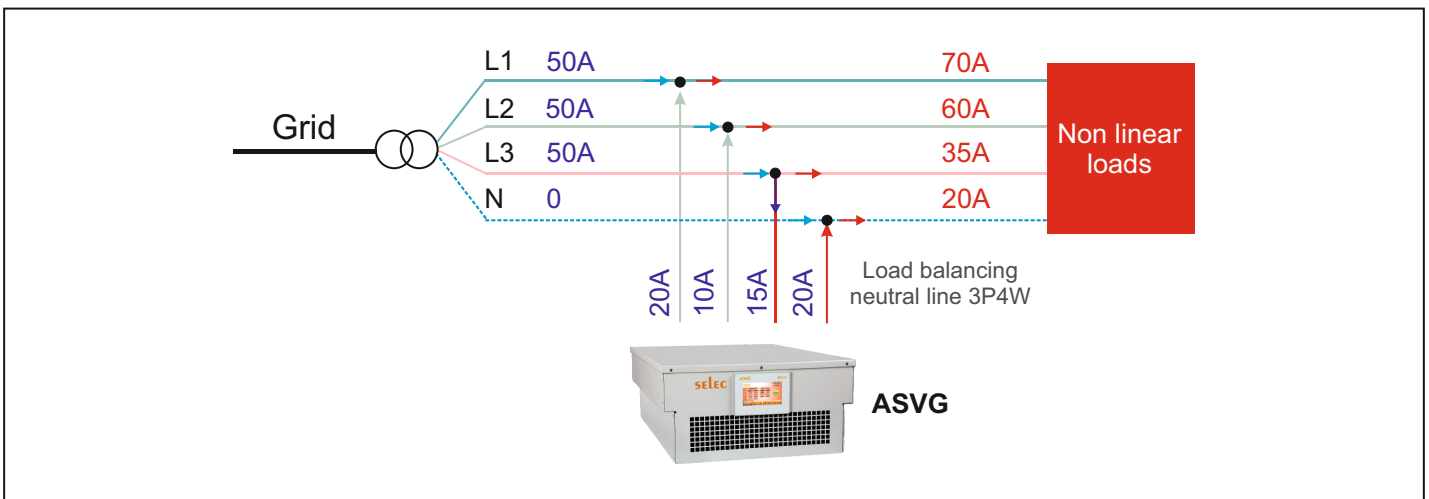


Compensation of reactive power and harmonics with Selec ASVG



Compensation of series load balancing for 3P3W and 3P4W

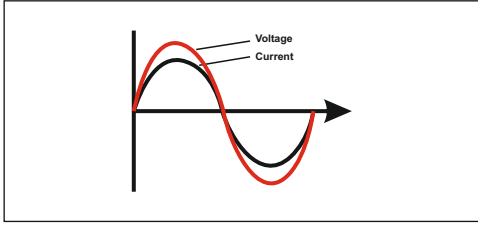
- ASVG can correct unbalance between phase – phase and phase to neutral
- Therefore, ASVG is a perfect solution to reactive power compensation with unbalanced load
- ASVG detect the current of each phase, Even if the current is different in each phase, it individually feeds compensation current to each phase to improve the power factor.



Advantages of using ASVG

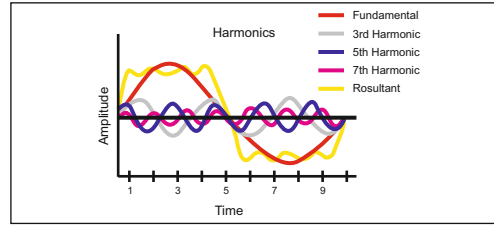
Improves power factor

Continuous and step-less compensation of power to maintain power factor >0.99. The compensation performance is much better than a traditional compensation device (capacitor).



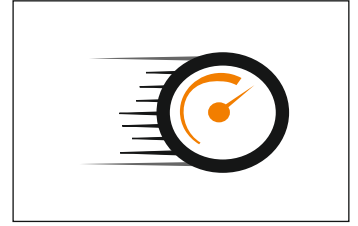
Suppresses harmonics

Configures the required amount of reactive current in real-time and compensates the harmonic current (up to 15th order) drawn by the non linear loads.



Fast response

Fast configuration capability provides fast response time as low as 50 micro sec and full response less than 1 cycle.



Works under unbalance grid condition

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

Modular design, easy extension

It is easy to expand the system as 8 modules can be connected in parallel. ASVG can also be used as a hybrid solution in combination with conventional capacitor based system.

Highly reliable and safe

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.

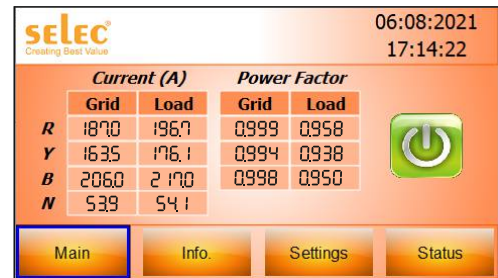
Control and monitoring through ASVG

User can monitor and control the system parameters via Ethernet or serial communication.

Data logging and alarm can also be done

User can monitor & control HMI screen using VNC software on PC or laptop.

Data can be monitored using selec IoT platform and can be accessed across the world.



Features of ASVG

- Controllable reactive current source
- Compensates current harmonics up to 15th order
- Stepless & precise control
- Compensates current unbalance created by the load
- Leading and lagging reactive power mitigation
- Individual correction of current on all three phases
- Instant response time of 50 micro sec & full response less than 1 cycle
- Modular arrangement - Parallel operation up to 8 modules
- Can be installed along with conventional APFC panel

Advantage of using ASVG over conventional Power factor correction system

	Conventional APFC System	Advanced Static Var Generators
Response	<ul style="list-style-type: none"> • APFC take at least 30s to 40s to switch banks and thyristor-based solutions 20ms to 30ms 	<ul style="list-style-type: none"> • Real-time compensation of power quality problems as the overall response time is less than 100µs
Output	<ul style="list-style-type: none"> • Depends on step sizes, cannot match load demand in real time • Depends on grid voltage as capacitor units & reactors are used 	<ul style="list-style-type: none"> • Instantaneous, continuous, stepless and seamless • Grid voltage fluctuation has no influence on the output
Power factor correction	<ul style="list-style-type: none"> • Capacitor banks needed for inductive loads and reactor banks for capacitive loads. Problems in systems with mixed loads • Not possible to guarantee unity power factor as they have steps, system will be having continuous over and under compensation 	<ul style="list-style-type: none"> • Corrects simultaneously from -1 to +1 power factor of lagging (inductive) and leading (capacitive) loads • Guaranteed unity power factor always without any over or under compensation (stepless output)
Unbalance	<ul style="list-style-type: none"> • Do not correct load unbalance 	<ul style="list-style-type: none"> • Can correct by selecting the amount of load balancing
Design & sizing	<ul style="list-style-type: none"> • Reactive power studies needed to size the proper solution • Usually over-sized to better adjust to changing load demands • Need to be designed considering system harmonics • Custom-built for specific load and network conditions 	<ul style="list-style-type: none"> • Not required extensive studies as it is adjustable • Mitigation capacity can be exactly what load demands • Unaffected by harmonic distortion in the system. • Can adapt to load and network conditions & changes
Resonance	<ul style="list-style-type: none"> • Parallel or series resonance can amplify currents in the system 	<ul style="list-style-type: none"> • No risk of harmonic resonance with the network
Transients	<ul style="list-style-type: none"> • Caused by the switching of capacitor units or shunt reactors 	<ul style="list-style-type: none"> • Not created (no switching of passive components)
Installation	<ul style="list-style-type: none"> • Not simple installation, especially if loads upgraded frequently 	<ul style="list-style-type: none"> • Simple installation as modules are compact in size
Expansion	<ul style="list-style-type: none"> • Limited and depends on load conditions and network topology 	<ul style="list-style-type: none"> • Simple (and not dependent) by adding modules
Maintenance	<ul style="list-style-type: none"> • Using components that need extensive maintenance like fuses, circuit breakers, contractors, reactors, and capacitor units 	<ul style="list-style-type: none"> • Simple maintenance and service life up to 15 years as there is no electro-mechanical switching and no risk of transients or resonance

TECHNICAL SPECIFICATION

System Parameter	50kVAr	100kVAr
Rated voltage	308V to 480V	
Frequency	50/60 Hz (± 2.5 Hz)	
Parallel operation	8	
Power efficiency	> 97%	
Power grid structure	3P3W / 3P4W	
CT ratio	Settable through HMI up to 10000/5A	
CT location	Grid side / Load side	
Circuit topology	3 level invertors (I type)	
Performance		
Single-module compensation capacity	50kVAr	100kVAr
Response time	50 micro sec and full response less than 1 cycle	
Target power factor	Adjustable from -1 to +1	
Cooling mode	Forced air cooling	
Noise level	< 65 dB	
Normal Spectrum of compensation	Up to 15 th order of Harmonics	
Protection Functions	Over current, over voltage, over temperature, IGBT saturation protection, grid fault	
Communications and Monitoring Capabilities		
Communication ports	MODBUS-RTU over RS485(7" HMI), MODBUS-RTU over RS232(4.3" HMI) Possible using LAN, WiFi (Paid basis)	
Communication protocols	MODBUS-RTU over RS485, Possible using LAN, WiFi (Paid basis)	
Communication Interface	4.3" Touch screen (7" available on request)	7" and 10" HMI (4.3" available on request)
Software updates	Possible Through WIFI or through Laptop	
Mechanical Properties		
Mounting type	Floor-mounted, Wall-mounted	
Dimensions (W x D x H) mm	470 x 653 x 240	470 x 700 x 240
Module net weight	50 kg	75 kg
Color	RAL 7035	
Environment Conditionse		
Altitude	Less than 2000m (Higher altitudes on special request)	
Operating temperature	-10°C to 45°C	
Relative humidity	95%, no condensation	
Protection class	IP 2x	
Operating temperature	-10°C to 45°C	
Certification and standard		
Certification	CE	
Protection class	50/60 Hz (± 2.5 Hz)	
Parallel operation	8	
Certification and standards	EN 50178:1997/ IEC 50178:1997	
Certification	EN 61000_6_2(2005)/ EN55011, GROUP1, CLASS A IEC 61000_6_2(1999)/ CISPR11, GROUP1, CLASS A	
ASVG PQvar Series performance requirement	EN 50091-3/ IEC 62040-3/ AS 62040-3(VFI SS 111)	

ORDERING INFORMATION

Eg : ASVG-050-WLL-4P-04

ASVG	050	WLL	4P	04
Advanced static var generator	050 - 50 kVAr	WLL - Wall Mount	3P - 3P3W	XX - No Display
	100 - 100 kVAr	RCK - Rack Type	4P - 3P4W	04 - 4.3" HMI

APPLICATIONS



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