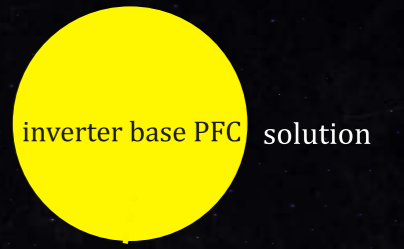
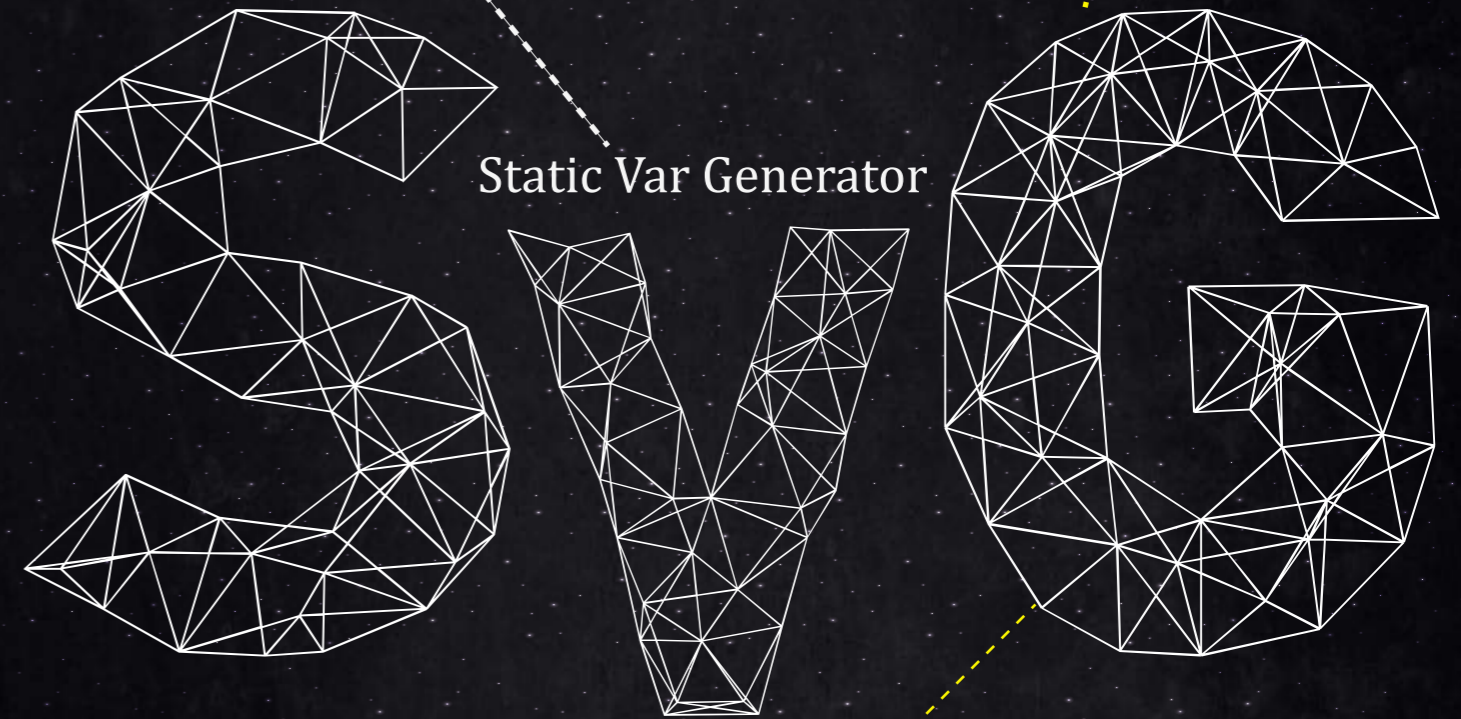
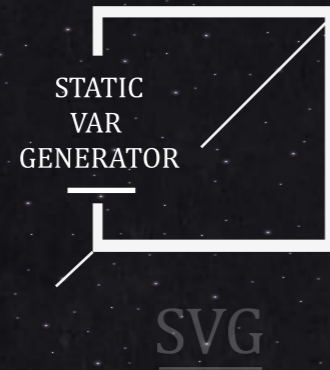


**Sinexcel**

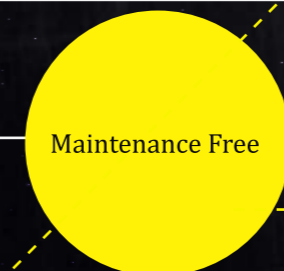


inverter base PFC solution

Power quality



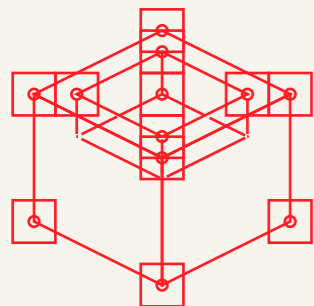
Static Var Generator



Maintenance Free

**PF 0.99**

Stepless PFC

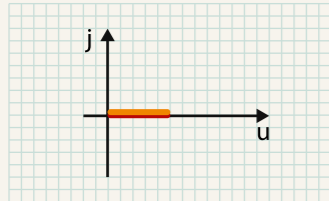


Static Var Generator  
SVG, reactive power compensation  
SVG, with the idea of using as a component, could compensate both inductive and capacitive loads to achieve PF 0.99 and avoid under and over compensation.

# REACTIVE POWER COMPENSATION

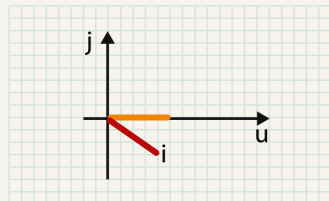
Different compensation model for different loads

★ Current  
Voltage  
Compensation Current



## RESISTIVE LOAD

RESISTIVE LOAD such as filament lamp in vector gram, load appears resistive when current and voltage are phase congruency.

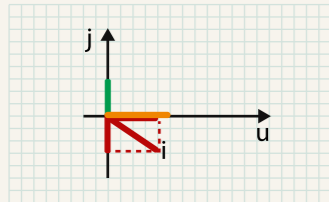


## Inductive load

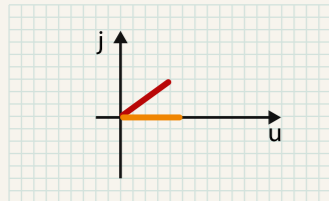
INDUCTIVE LOAD such as motor, compressor, relay and transformer.

### 1、 Current of inductors lags voltage

In vector gram, anticlockwise direction is set to be positive direction and U direction as the horizontal direction. Load appears inductive and resistive when I is within 0 to -90 degree.



SVG generates capacitive current to neutralize inductive content of the load, achieving the performance for current and voltage phase congruency.

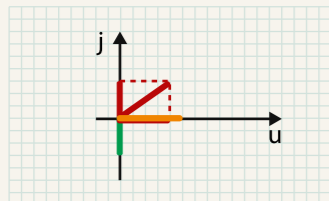


## Capacitive load

CAPACITIVE LOAD such as capacitor bank

### 2、 Current of capacitors leads voltage

In vector gram, anticlockwise direction is set to be positive and U direction as the horizontal direction. Load appears capacitive and resistive when I is within 0 to 90 degree.

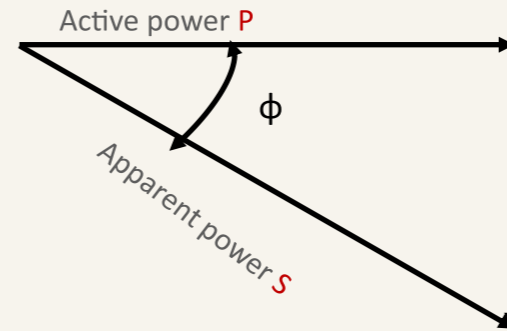


SVG generates inductive current to neutralize capacitive content of the load, achieving the performance for current and voltage phase congruency.

# POWER FACTOR

Optimize your reactive power compensation efficiency

Active power, reactive power, Apparent power and power factor



$$P^2+Q^2=S^2$$

Power factor  $\cos \phi$

$$\cos \phi = \frac{P}{S}$$

## Benefit from PFC



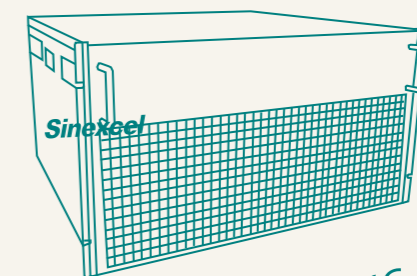
★ Avoid penalty for low PF by Utility Company



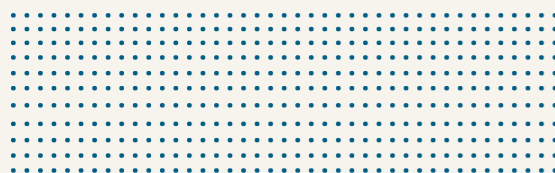
★ Reduce electric energy loss



★ Release system capacity occupied by reactive power, increase usage effectiveness of system capacity.



SVG Inverter Base



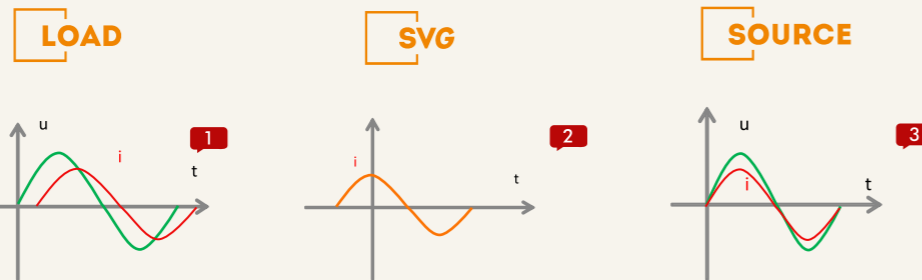
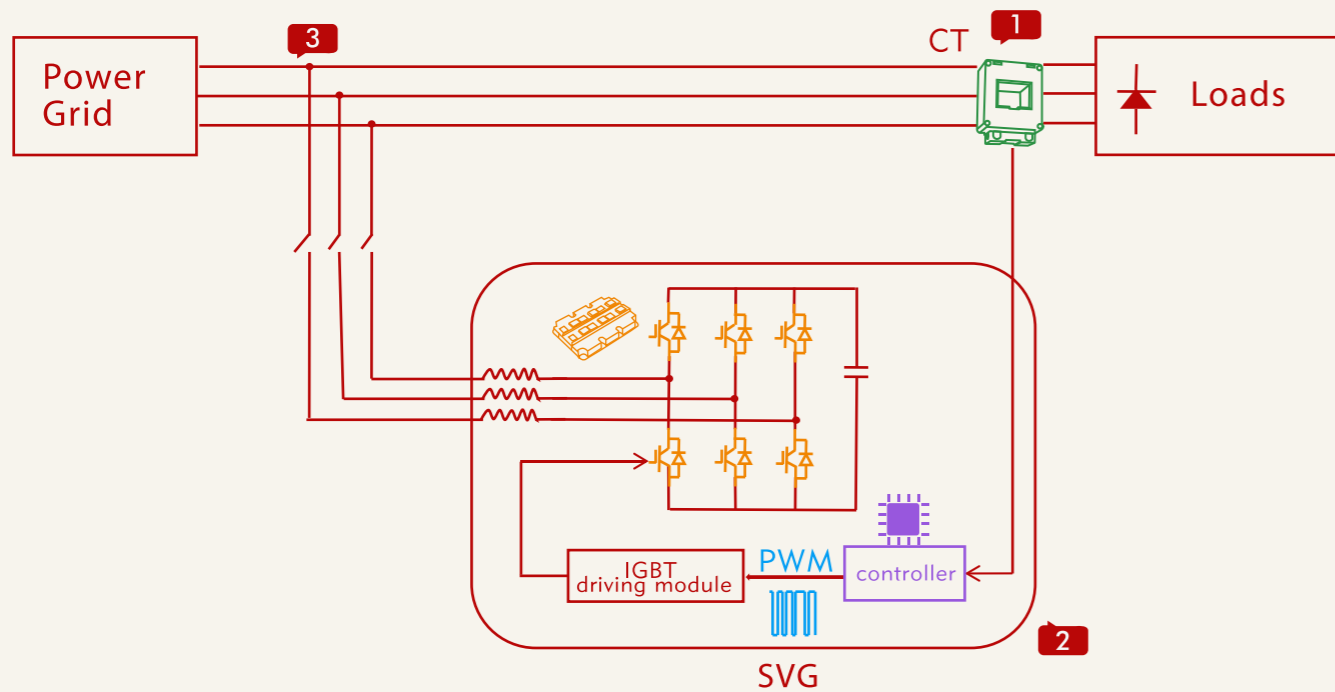


# SVG WORKING PRINCIPLE

Optimize your reactive power compensation efficiency

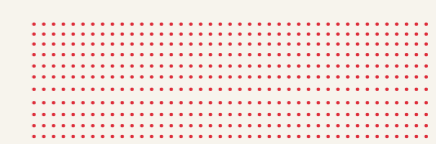
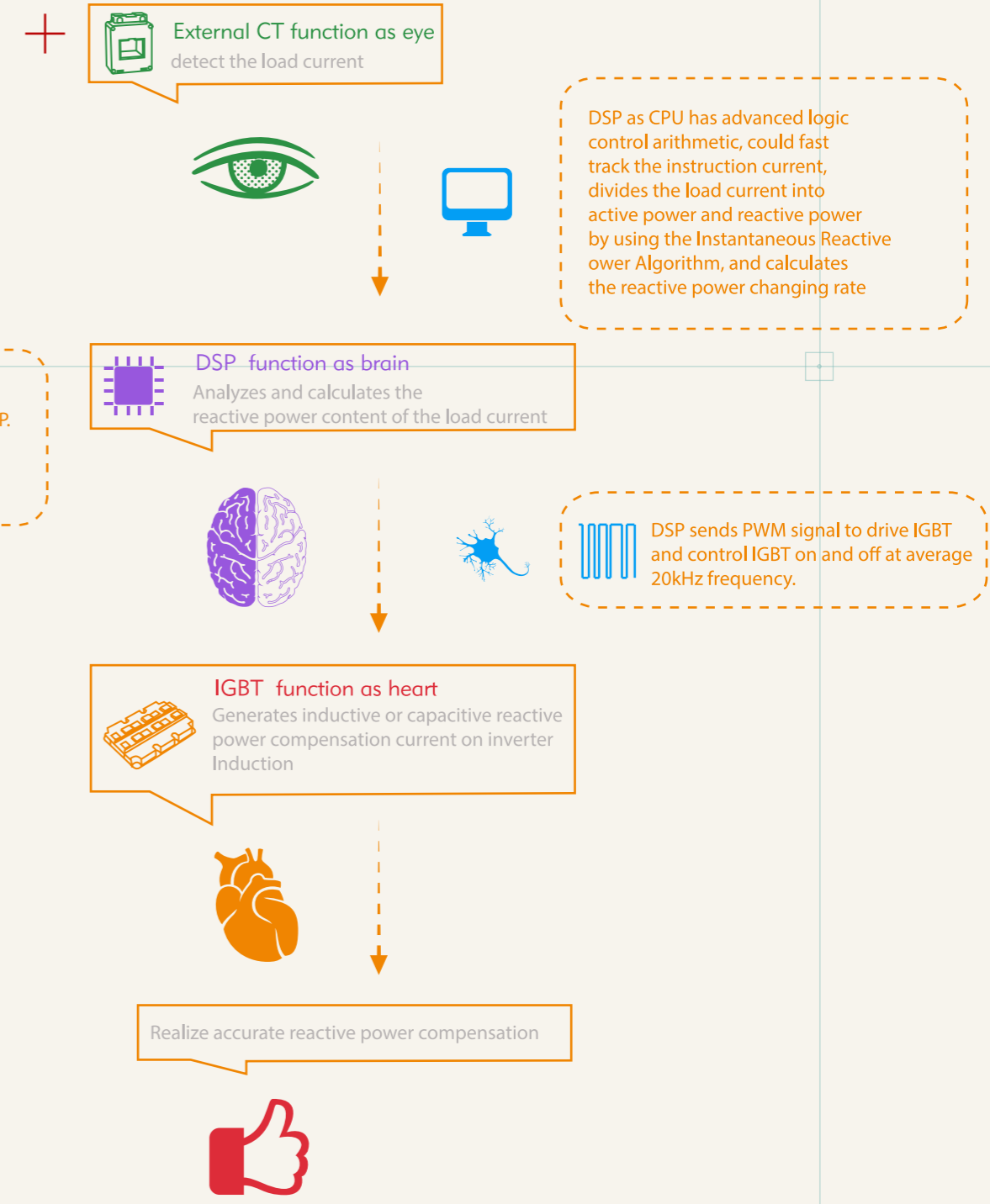


External CT detects the load current. DSP as CPU has advanced logic control arithmetic, could fast track the instruction current, divides the load current into active power and reactive power by using the Instantaneous Reactive Power Algorithm, and calculates the reactive power change rate rapidly and accurately, then sends PWM signal to IGBT's driver board to control IGBT on and off at average 20kHz frequency. Finally inductive or capacitive power compensation current is generated on inverter induction, at the same time CT also detects the output current and forms a negative feedback to DSP. Then DSP proceeds the next logical control to achieve more accurate and stable system.



— Voltage  
— Current  
— Output Capacitive Reactive Power

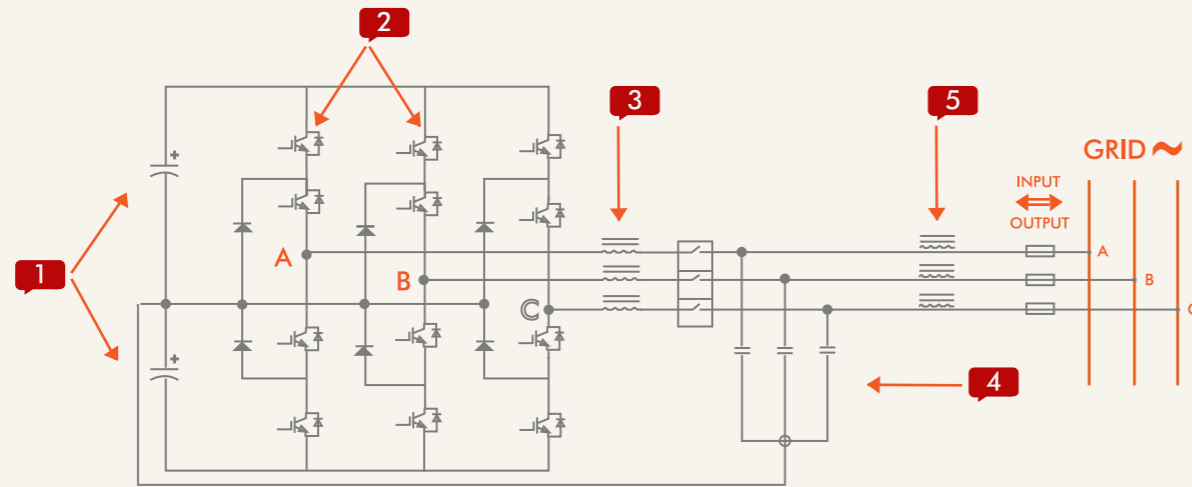
WAVEFORM





# UNDERSTAND HOW SVG COMPENSATE REACTIVE POWER

Optimize your reactive power compensation efficiency



## DC bus capacitor

DC bus capacitor, AC to DC rectifier storage

## IGBT

Controlled by DSP software algorithm, IGBT on-off timing selection and length could control inverter to generate an accurate reactive power compensation current.



## Inverter Induction

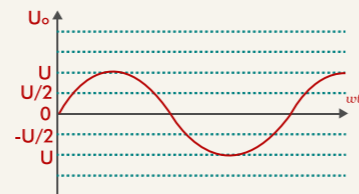
IGBT Compensating inductive reactive power or capacitive reactive power by controlling inverter induction to generate a capacitive current or inductive current to achieve bidirectional reactive power compensation.



## LC filter circuit

## high frequency inductor

Both are for filtering. The combination of LC filter circuit and high frequency inductor are called LCL filter circuit



# KEY FEATURES AND BENEFITS

Impressive compensation effect of SVG

## PFC Performance

PFC performance 0.99

Step-less compensation without over-compensation and under-compensation, compensate specific capacity that system needs.

Full PFC process within 15ms and maintain at PF0.99 no matter how the system reactive power changes.

Compensation with inductive reactive power and capacitive reactive power.

The voltage of the grid has little influence on SVG compensation capacity as SVG is like a current source.

## Maintenance free, safe and easy to use

Could work under high THDu up to 15%, no capacitor explosion risk and no safety accident.

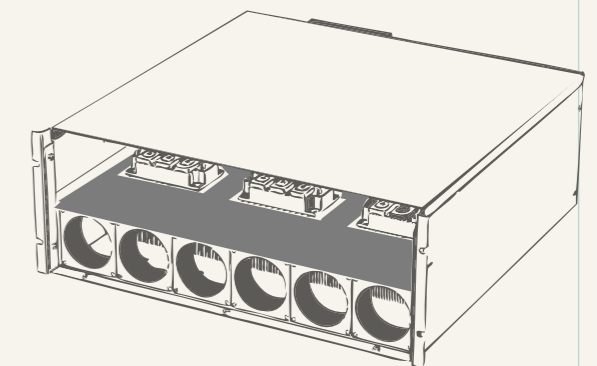
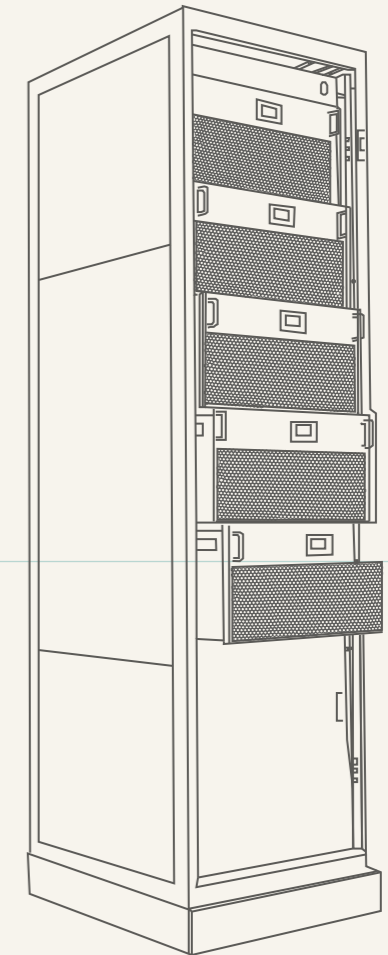
Minimal loss, maintenance-free and no need to replace cap bank every certain time.

MTBF (mean time between failures) up to 100,000 hours, helps consumers lower the cost.

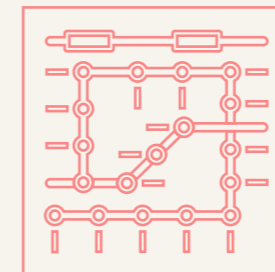
Advanced technology and easy to use with HMI monitor

## Space and Capacity

Minimal footprint to save more than 70% space compared with cap bank.



SVG Inverter Base



POWER



400V Grid Voltage

Specification

Item	
Input phase voltage range	
Power grid frequency	
Parallel operation	
Overall efficiency	
Power grid structure	
CT Ratio	
Circuit topology	
Rated capacity	
Function	
Response time	
Target power factor	
Cooling air requirement	
Noise level	
Communications ports	
Communications protocols	
Protection functions	
Fault alarm	
Module display interface	
Mounting type	
Cable entry mode	
Dimensions (W x D x H)(mm <sup>3</sup> )	Rack mount, LED Rack mount, LCD Wall mount, LCD
Module net weight	
Color	
Altitude	
Ambient temperature	
Relative humidity	
protection class	
Qualifications	

400V				Integrated large capacity SVG		
Sinexcel SVG 030	Sinexcel SVG 050	Sinexcel SVG 100	Sinexcel SVG 200	Sinexcel SVG 480	Sinexcel SVG 600	Sinexcel SVG 690
<b>System Parameter</b>						
228V~456V				384V~576V	480V~720V	552V~759V
Unlimited				50Hz/60Hz(range:45Hz~62Hz)		
>97%				4 units		
3P3W/3P4W				>99% (at 50% inductive load)		
150/5~30,000/5		600/5~10000/5		3P3W		
				800/5~10,000/5		
3-Level						
<b>Performance Indicator</b>						
30kvar	50kvar	100kvar	200kvar	480/960/1440/1920/2400kvar	600/1200/1800/2400/3000kvar	690/1380/2070/2760/3450kvar
Reactive power compensation, Three phase balancing, Voltage regulation						
<15ms				<40ms		
Adjustable from-1 to+1						
115L/Sec	222L/Sec	360L/Sec	500L/Sec	Smart air cooling: 5040CFM(*1-4)		
<56dB	<56dB	<65dB	<75dB	<70dB		
<b>Communication &amp; Monitoring Capability</b>						
RS485, CAN (reserved), Ethernet port (RJ45)				RS485, Ethernet port (RJ45)		
Modbus						
Abnormal voltage/frequency protection; Inverter short-circuit protection; Abnormal output current protection; Inverter over-loaded protection, Over-temperature protection etc.						
Available						
4.3-inch touch screen monitor and optional 7-inch touch screen centralized monitor				7-inch touch screen centralized monitor		
<b>Mechanical Properties</b>						
Wall-mounted/Rack-mounted/Cabinet				Fixed cabinet		
Rear entry for rack-mounted type Top entry for wall-mounted type; Top or bottom entry for cabinet				Bottom entry		
500*515*180	500*546*190	500*605*269	500*722*370	600*800*2200/1200*800*2200/1800*800*2200/2400*800*2200/3000*800*2200		
500*515*180	500*586*190	500*630*269	500*722*370			
500*180*540	500*190*571	500*273*638	500*370*722			
23kg	28kg	44kg	110kg	500kg(one cabinet)		
Aluminium-Zinc alloy coated for rack mounted, LED type / RAL7035 for rack mount LCD and wall mounted type				Cabinet design, inner modules are aluminum-zinc coated.		
<b>Environment Requirement</b>						
≤1500m; Between 1500m to 4000m, derating 1% every additional 100m.						
-10°C~40°C(may derate capacity if ambient temperature exceeds 45°C)						
5%~95%,non-condensing						
IP20(other IP degrees are customizable)						
<b>Related Qualifications &amp; Standards</b>						
CE				CE		

INVERTER

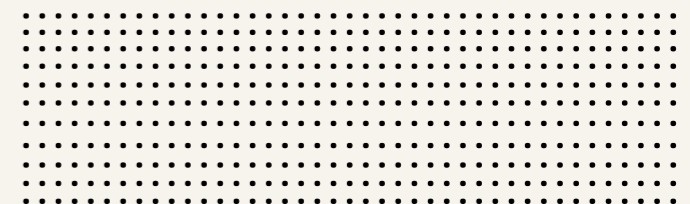


North America  
& 690V Grid voltage



Specification

Item	208V	480~690V		
	Sinexcel SVG 35	Sinexcel SVG 30/40/50/80	Sinexcel SVG 40/50/80/100	Sinexcel SVG 40/50/80/120
System Parameter				
Rated input line voltage	208V	480V	600V	690V
Input phase voltage range	220V(176V~264V)	384V~552V	420V~690V	483V~793V
Power grid frequency	50Hz/60Hz(range:45Hz~62Hz)			
Parallel operation	Unlimited			
Overall efficiency	>97%			
Power grid structure	3P3W/3P4W			
CT	150/5~30,000/5			
Circute topology	3-Level			
Performance Indicator				
Single-module compensation capacity	35kvar	30/40/50/80kvar	40/50/80/100kvar	40/50/80/120kvar
Response time	<15ms			
Target power factor	Adjustable from-1 to+1			
Cooling mode	359L/Sec	342L/Sec (30/40kvar) 359L/Sec (50/80kvar)	342L/Sec (40/50kvar) 359L/Sec (80/100kvar)	342L/Sec (40/50kvar) 359L/Sec (80/120kvar)
Noise level per module	<65dB			
Communication & Monitoring Capability				
Communications ports	RS485, CAN(reserved), Ethernet port(RJ45)			
Communications protocols	Modbus			
Protection functions	Abnormal voltage/frequency protection; Inverter short-circuit protection; Abnormal output current protection; Inverter over-loaded protection, Over-tempearture protection etc.,			
Alarm	Available			
Monitoring	7-inch touch screen centralized monitor(rack-mount) and 4.3-inch touch screen monitor(wall-mount)			
Mechanical Properties				
Mounting type	Wall-mounted/Rack-mounted/Cabinet			
Cable entry mode	Top and bottom entry for cabinet			
Dimensions (W×D×H)(mm³)	500*675*250 (Rack-mounted) 500*250*723 (Wall-mounted)	For 30/40kvar 500*540*180 (Rack-mounted) 500*184*627 (Wall-mounted) For 50/80kvar 500*675*250 (Rack-mounted) 500*250*723 (Wall-mounted)	For 40/50kvar 500*540*180 (Rack-mounted) 500*184*627 (Wall-mounted) For 80/100kvar 500*675*250 (Rack-mounted) 500*250*723 (Wall-mounted)	For 40/50kvar 500*540*180 (Rack-mounted) 500*184*627 (Wall-mounted) For 80/120kvar 500*675*250 (Rack-mounted) 500*250*723 (Wall-mounted)
Module net weight	70kg	40kg (30/40kvar) 70kg (50/80var)	40kg (40/50kvar) 70kg (80/100var)	40kg (40/50kvar) 70kg (80/120var)
Color	RAL7035(gray)			
Environment Requirement				
Altitude	≤1500m; Between 1500m to 4000m, derating 1% every additional 100m			
Ambient temperature	-20°C~40°C(may derate capacity if ambient temperature exceeds 45°C)			
Relative temperature	5%~95%, non-condensing			
Protection grade	IP20(other IP degrees are customizable )			
Related Qualifications & Standards				
Qualifications	CE, cETLus, cULus			

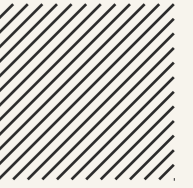




# PRIMEVENT



400V



400V



30kvar Wall-mounted  
500\*180\*540mm<sup>3</sup> /23kg  
50kvar Wall-mounted  
500\*190\*571mm<sup>3</sup> /28kg  
100kvar Wall-mounted  
500\*273\*638mm<sup>3</sup> /44kg



30kvar Rack-mounted  
500\*515\*180mm<sup>3</sup> /23kg  
50kvar Rack-mounted  
500\*546\*190mm<sup>3</sup> /28kg  
100kvar Rack-mounted  
500\*605\*269mm<sup>3</sup> /44kg



200kvar Wall-mounted  
500\*370\*722mm<sup>3</sup> /110kg  
200kvar Rack-mounted  
500\*722\*370mm<sup>3</sup> /110kg

VERTICAL

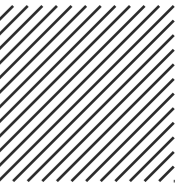


400V



### Flexible Engineering Cabinet

- Flexible dimension  
600\*1000\*2200mm, 800\*1000\*2200mm, 800\*800\*2200mm, 1000\*1000\*2200mm are available.
- Flexible capacity  
AHF, 25A/35A/50A/60A/75A/100A/150A/300A adapt to cabinet  
SVG, 30kvar/50kvar/100kvar/200Kvar adapt to cabinet  
AHF, SVG module adapt to cabinet
- Flexible incoming connection  
Top / Bottom cable entrance  
Top / Bottom MCCB position



400V

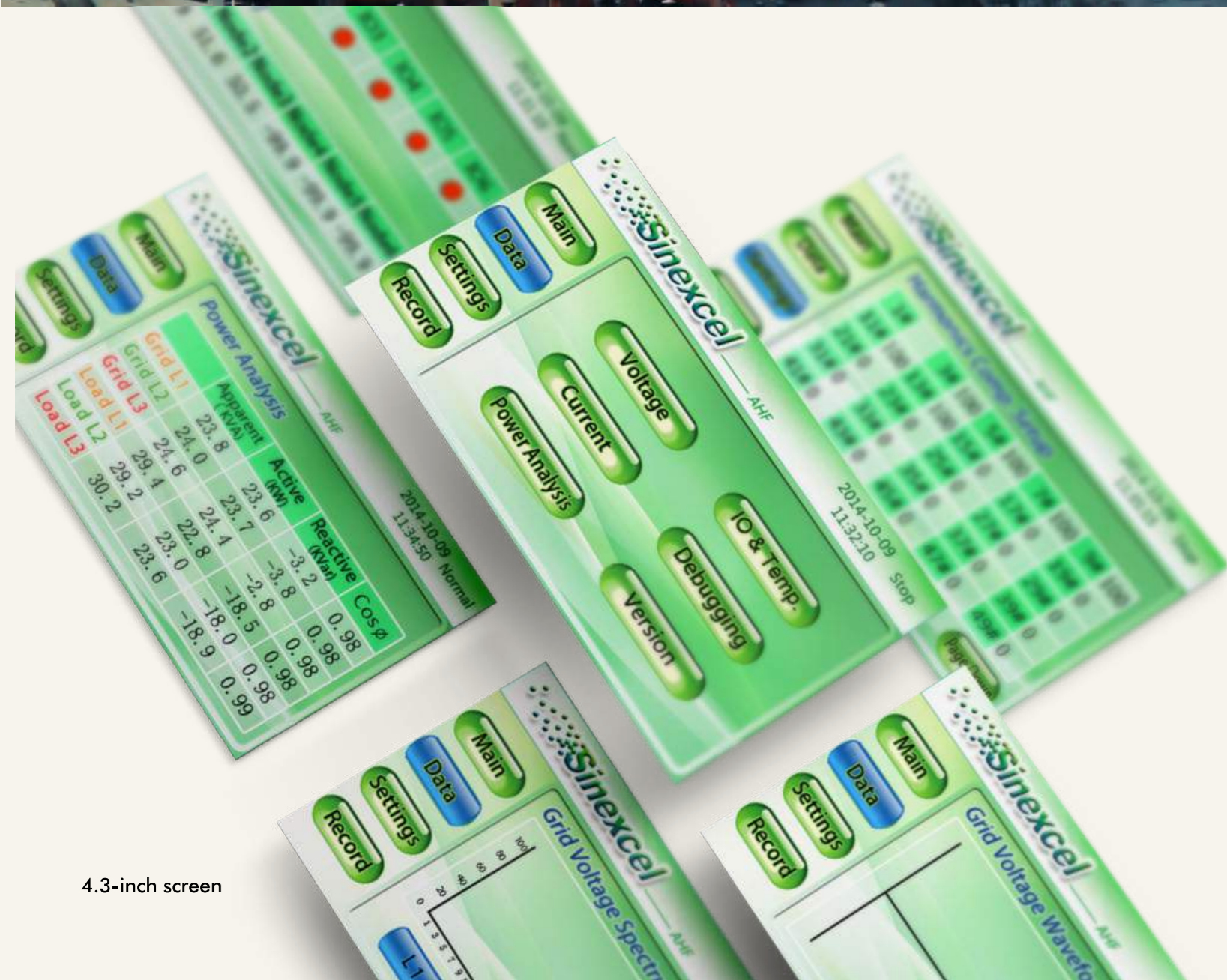


### 400V SVG PLUG TYPE CABINET

One plug type cabinet could hold five 100kvar modules to achieve 500kvar .  
The plug type cabinet has built-in module which can be easily removed and added.  
The dimension of plug type cabinet: 600\*800\*2200mm.



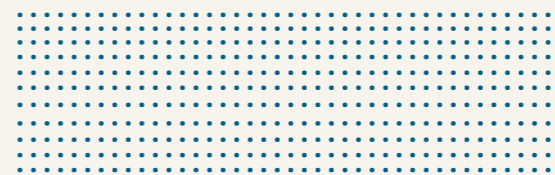
# MONITORING



4.3-inch screen



Centralized monitoring System







**GLOBAL APPLICATION**







# Industrial Manufacturing

Food and beverage, plastic, paper, semiconductor, chemistry, pharmacy,  
paper, cement, oil drilling, automotive



# Infrastructure

Airport-metro and railway, tunnel, water treatment, schools/campus,  
museums, hospital, government building

More than 2million kvar installation around the world

Application cover Automation Manufacturing, Infrastructure, ECO building, IDC

Application cover indoor/outdoor, high altitude (hot cold) mechanical environment/dusty  
application, land/offshore severe environment



# ECO Building

Skyscraper-Commercial building, shopping mall, apartments



# IDC

Telecom, bank, internet companies





Malaysia, Perodua, SVG 1800kvar  
Welding process load change too fast, Capacitor bank can not switch in.

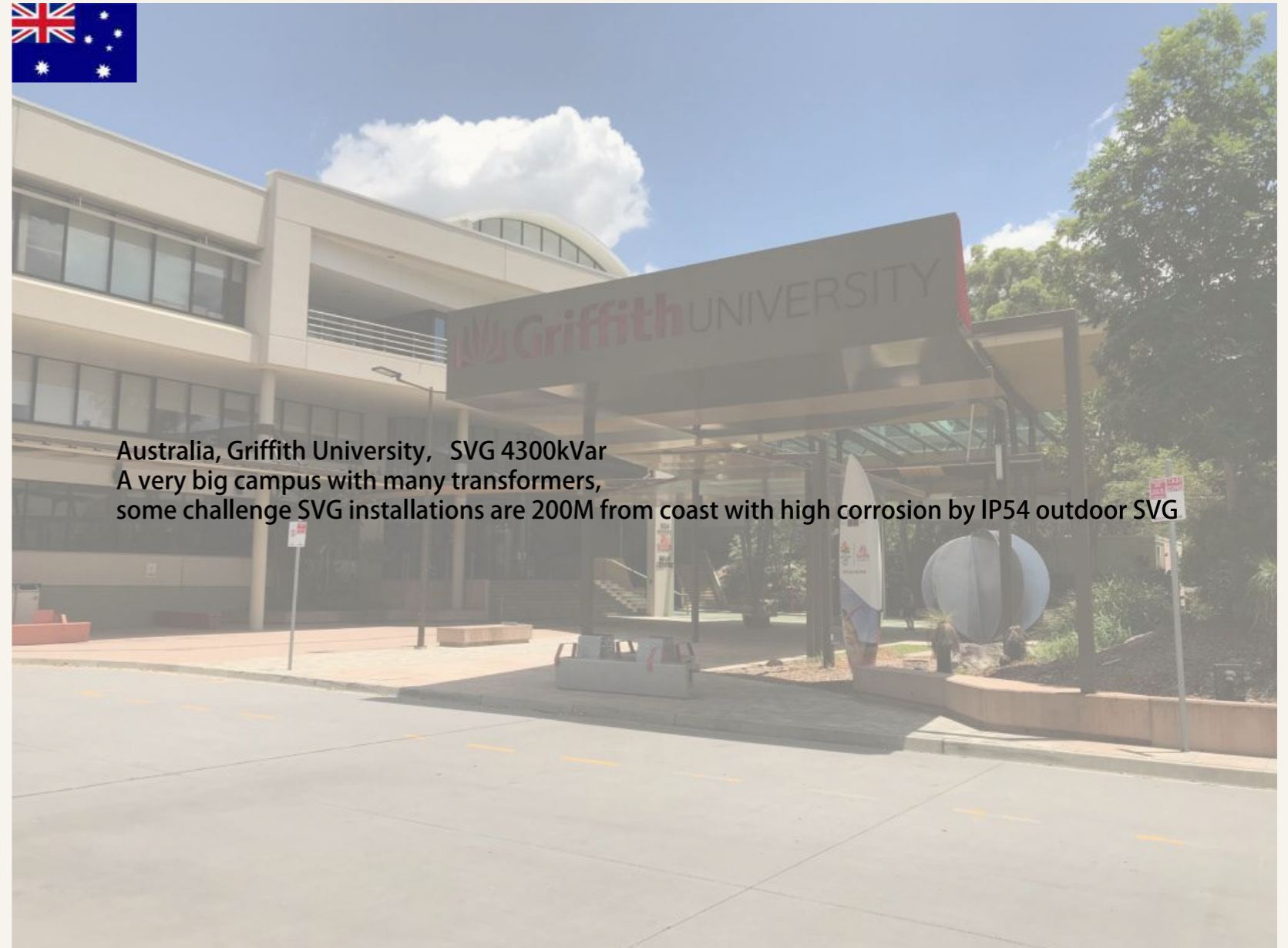


# Industrial Manufacturing



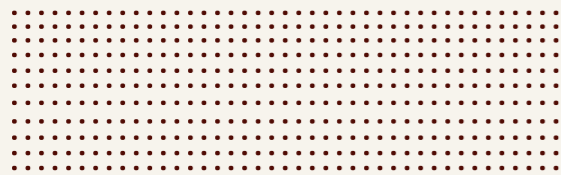


New Zealand, Parliament Library, SVG 200kVar  
John Fulton was taking photo for SVG performance,  
because he be surprised at the consistent Cos fi 0.99 by SVG



Australia, Griffith University, SVG 4300kVar  
A very big campus with many transformers,  
some challenge SVG installations are 200M from coast with high corrosion by IP54 outdoor SVG

## Infrastructure





# IDC

Hong Kong, China, NTT Data Centre, SVG 3500kvar

One of the most important data center in Asia, the stock market data of the US is running at this facility.  
SVGs take charge of both lagging and leading PF from UPS, fully protect the normal operation of the mainframe.







## ECO building

Hong Kong, China, Far East Financial Centre, SVG 100kvar  
High speed lift keeps running up and down which generates very dynamic current,  
SVG 15ms full response time to easily cover the fast changing current challenge realizes cos fi 0.99





Sri Lanka, industrial, SVG, Prima Flour Mill Powder





## GLOBAL APPLICATION

Sinexcel SVG application covers Asia, Oceania, Europe, Africa,

North America, South America.