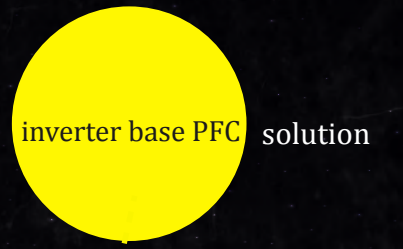
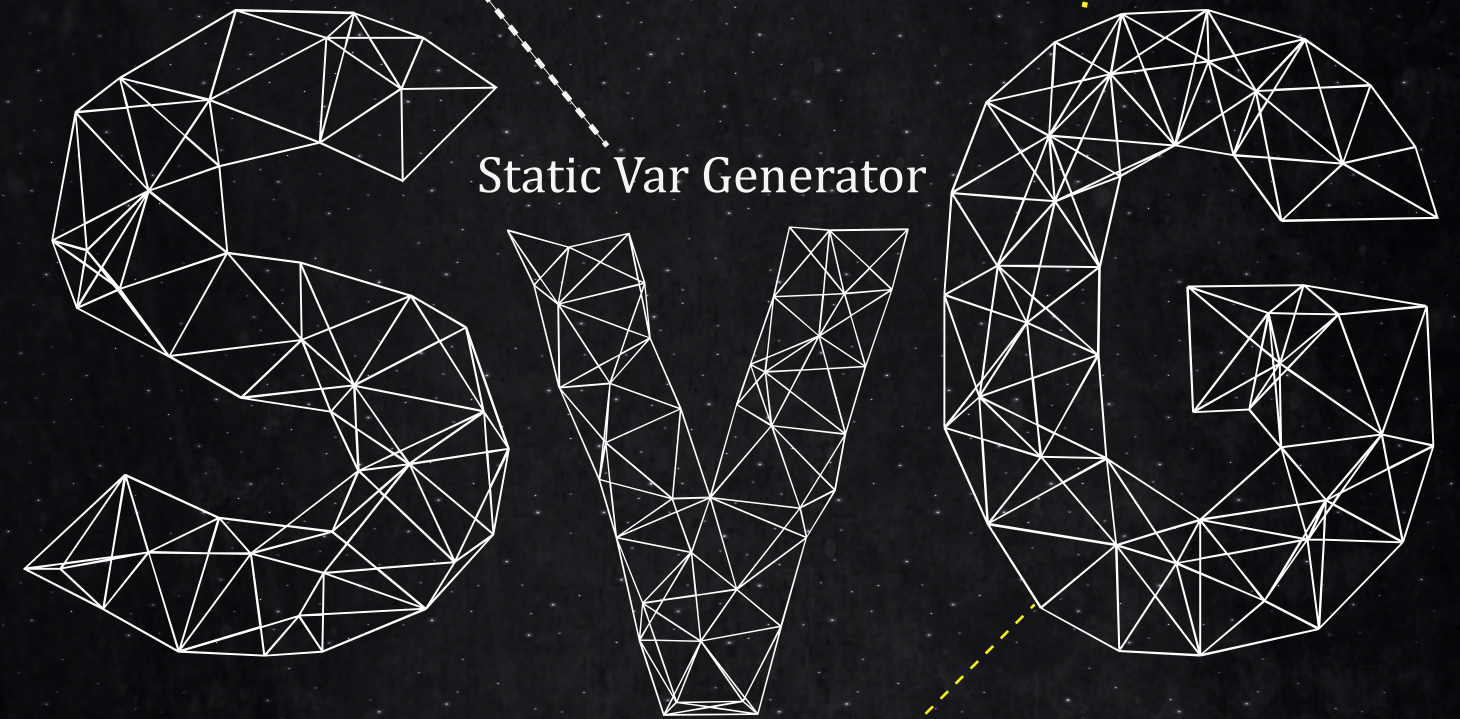
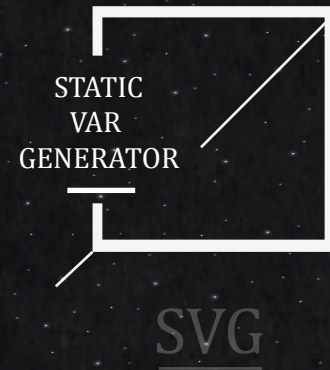


**Sinexcel**



inverter base PFC solution

Power quality



Static Var Generator

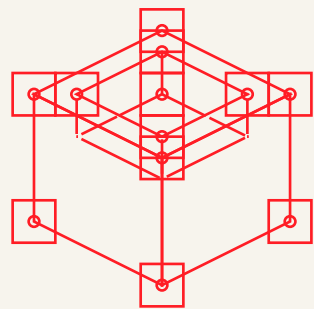


Maintenance Free

**PF 0.99**

Stepless PFC



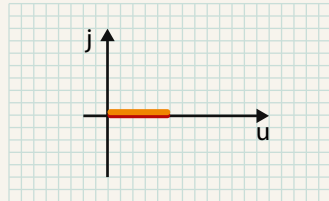


Static Var Generator  
SVG, reactive power compensation  
SVG, with the idea of using as a component, could compensate both inductive and capacitive loads to achieve PF 0.99 and avoid under and over compensation.

# REACTIVE POWER COMPENSATION

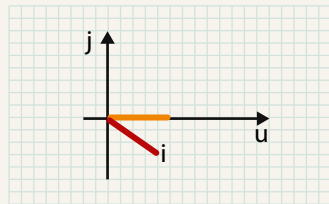
Different compensation model for different loads

★ 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.

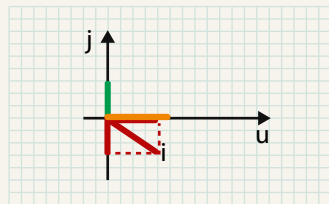


## Inductive load

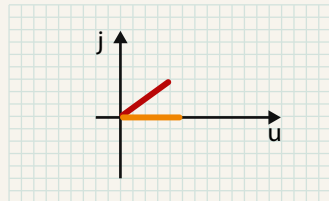
INDUCTIVE LOAD such as motor, compressor, relay and transformer.

### 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.

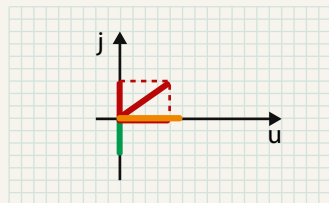


## Capacitive load

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.

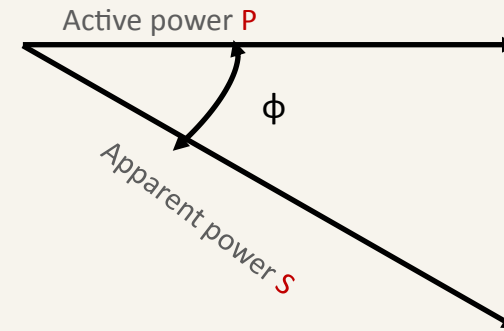


SVG generates inductive current to neutralize capacitive content of the load, achieving the performance for current and voltage phase congruency.

# POWER FACTOR

Optimize your reactive power compensation efficiency

Active power, reactive power, Apparent power and power factor



Reactive power Q

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

Power factor  $\cos \phi$

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

## Benefit from PFC



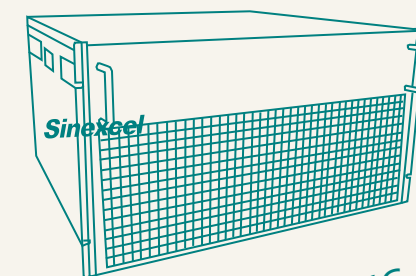
★ Avoid penalty for low PF by Utility Company



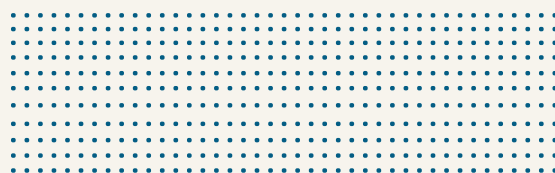
★ Reduce electric energy loss



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



SVG Inverter Base

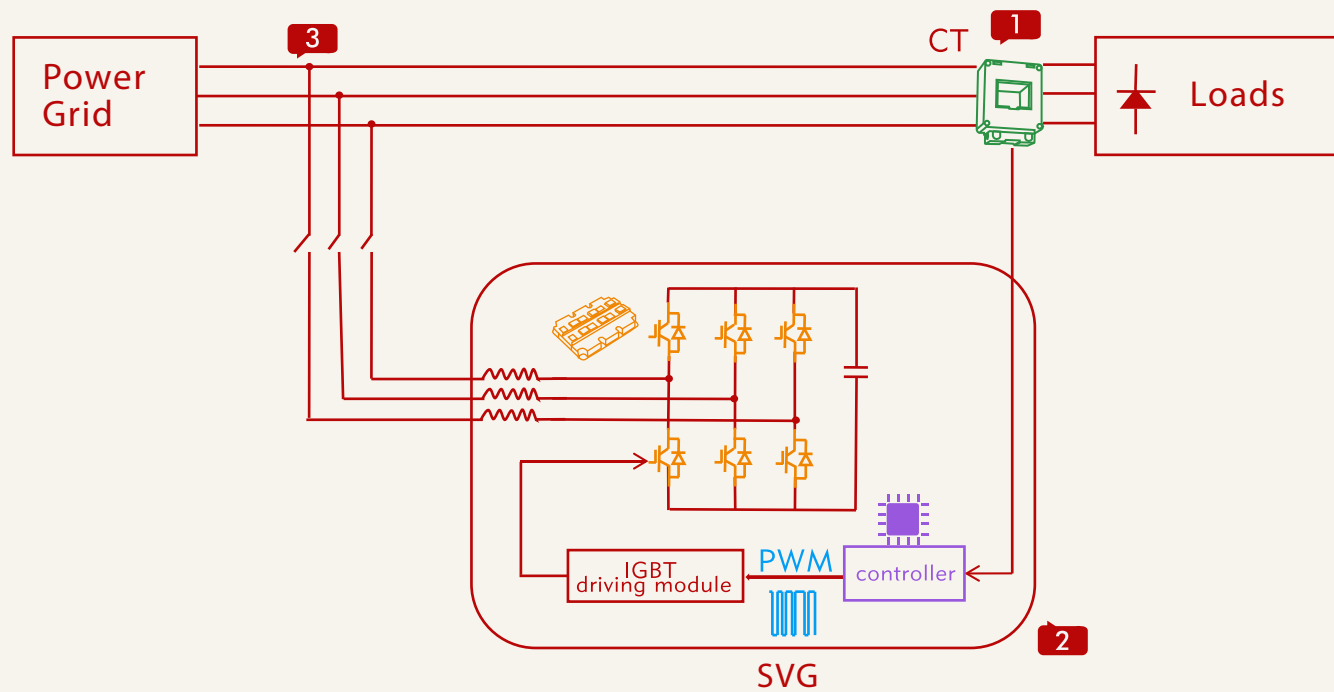


# SVG WORKING PRINCIPLE

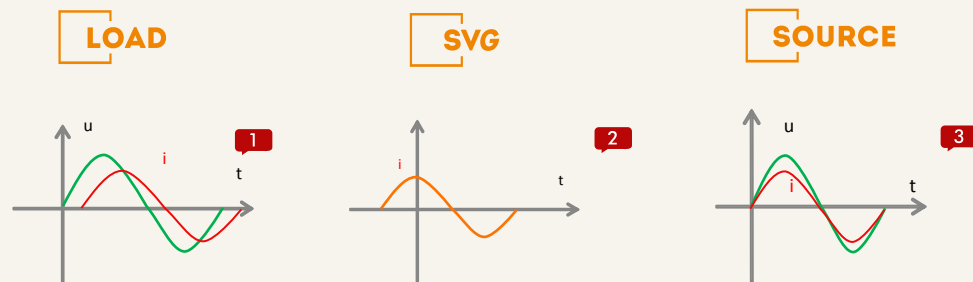
Optimize your reactive power compensation efficiency



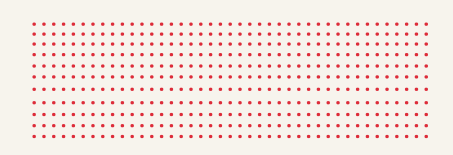
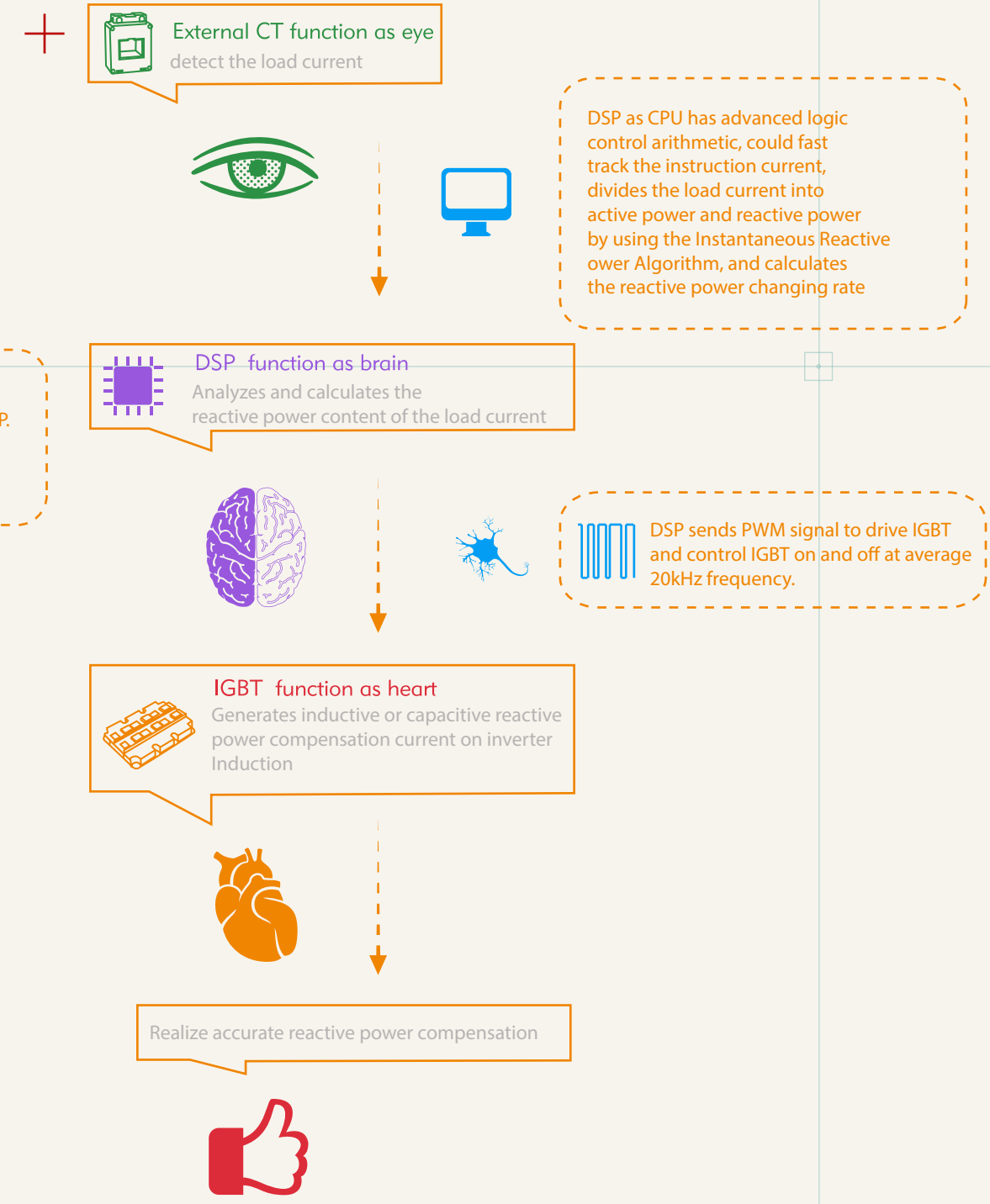
External CT detects the load current. DSP as CPU has advanced logic control arithmetic, could fast track the instruction current, divides the load current into active power and reactive power by using the Instantaneous Reactive Power Algorithm, and calculates the reactive power change rate rapidly and 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.



## WAVEFORM



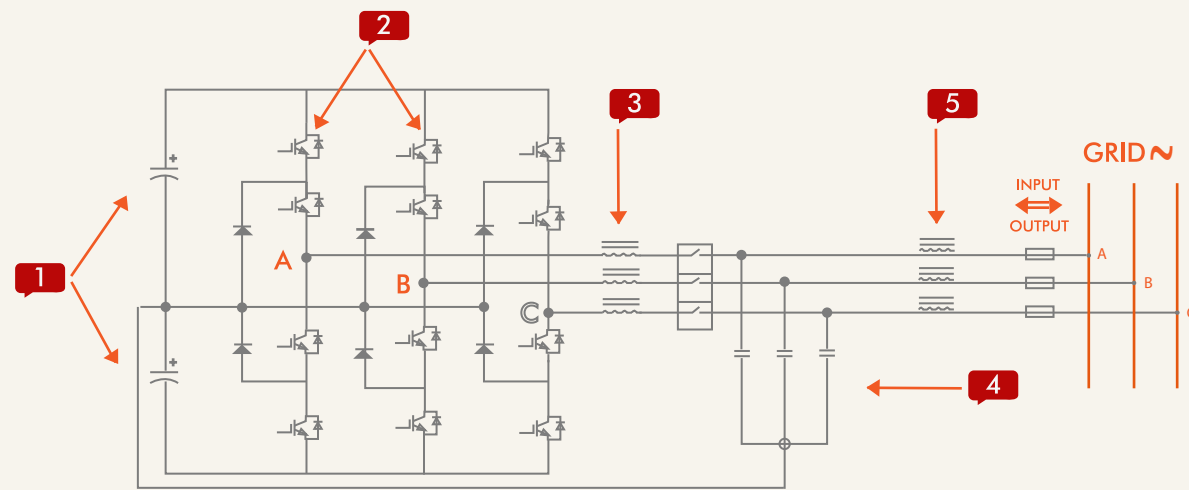
— Voltage  
— Current  
— Output Capacitive Reactive Power





# UNDERSTAND HOW SVG COMPENSATE REACTIVE POWER

Optimize your reactive power compensation efficiency

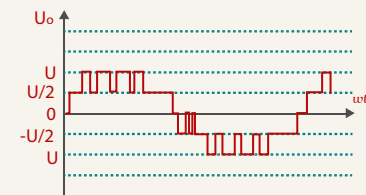


## DC bus capacitor

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

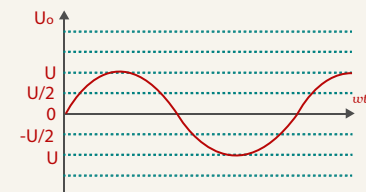
IGBT Compensating inductive reactive power or capacitive reactive power by controlling inverter induction to generate a capacitive current or inductive current to achieve bidirectional reactive power compensation.



## 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.

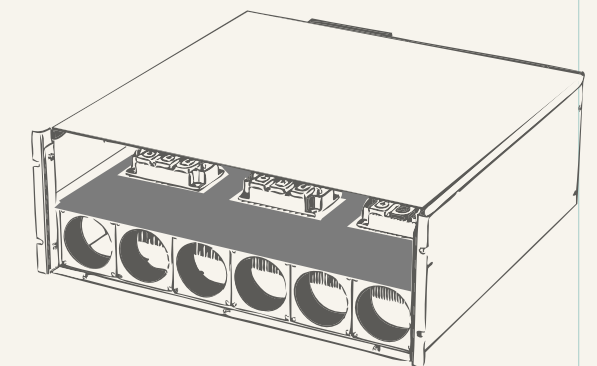
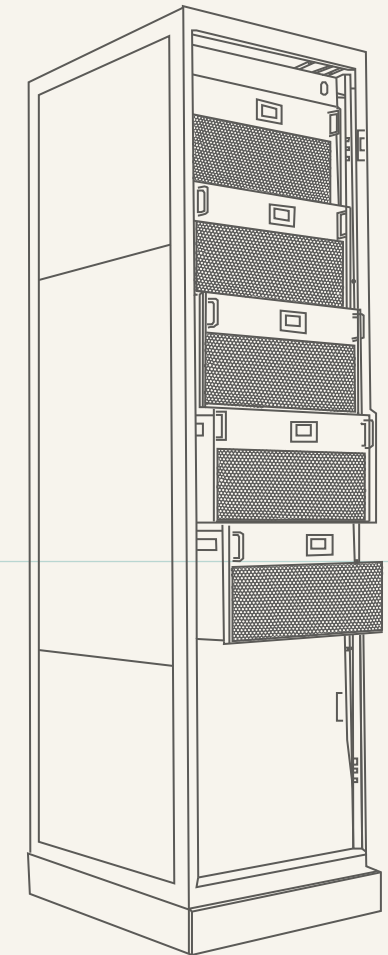
Minimal loss, maintenance-free and no need to replace cap bank every certain time.

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

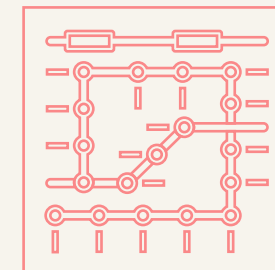
Advanced technology and easy to use with HMI monitor

## Space and Capacity

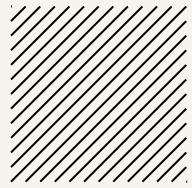
Minimal footprint to save more than 70% space compared with cap bank.



SVG Inverter Base



ENTER THE



400V Grid Voltage

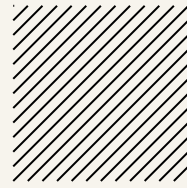
Specification

|   |
|---|
| Item                                      |
| Rated input line voltage                  |
| Input phase voltage range                 |
| Power grid frequency                      |
| Parallel operation                        |
| Overall efficiency                        |
| Power grid structure                      |
| CT  |
| Circuit topology                          |
| Single-module compensation capacity       |
| Response time                             |
| Target power factor                       |
| Cooling mode                              |
| Noise level per module                    |
| Communications ports                      |
| Communications protocols                  |
| Alarm                                     |
| Monitoring                                |
| Mounting type                             |
| Cable entry mode                          |
| Dimensions (W x D x H) (mm <sup>3</sup> ) |
| Module net weight                         |
| Color                                     |
| Altitude                                  |
| Ambient temperature                       |
| Relative humidity                         |
| Protection grade                          |
| Qualifications                            |
| Standards compliance                      |

|   |  |                               |  |  |                        |
|---|--|-------------------------------|--|--|------------------------|
| 400V  |  |                               | 480~690V (large capacity)                              |  |                        |
| Sinexcel SVG 030  | Sinexcel SVG 050   | Sinexcel SVG 100              | 75   | 95   | 110                    |
| System parameters   |  |                               |  |  |                        |
| 400V  |  |                               | 480V   | 600V   | 690V                   |
| 228V~456V   |  |                               | 384V~576V  | 480V~720V                                      | 552V~759V              |
| 50Hz/60Hz (range : 45Hz ~ 62.5Hz)   |  |                               | 50Hz/60Hz (range : 45Hz ~ 62Hz)                        |  |                        |
| Unlimited   |  |                               | 4  |  |                        |
| > 97%   |  |                               | >99% (at 50% inductive load)                           |  |                        |
| 3P3L/3P4L   |  |                               | 3P3L   |  |                        |
| 150/5 ~ 10,000/5  |  |                               | 800/5~10000/5  |  |                        |
| 3-level   |  |                               |  |  |                        |
| Performance indicators  |  |                               |  |  |                        |
| 30kvar  | 50kvar   | 100kvar                       | 480/960/1440/1920kvar                                  | 600/1200/1800/2400kvar                         | 690/1380/2070/2760kvar |
| < 15ms  |  |                               | < 40ms   |  |                        |
| Adjustable from -1 to +1  |  |                               |  |  |                        |
| Smart air cooling: 220 L/sec  |  | Smart air cooling: 405 L/sec  |  | Smart air cooling: 3000m <sup>3</sup> /h(*1-4) |                        |
| < 65dB  |  |                               | < 70dB   |  |                        |
| Communications and monitoring capabilities  |  |                               |  |  |                        |
| RS485, CAN (reserved), and Ethernet port (RJ45)   |  |                               | RS485 and Ethernet port (RJ45)                         |  |                        |
| Modbus  |  |                               |  |  |                        |
| Available   |  |                               |  |  |                        |
| No display  | 2.2-inch or 4.3-inch touch screen monitor and optional 7-inch touch screen centralized monitor |                               | 7-inch touch screen centralized monitor                |  |                        |
| Mechanical properties   |  |                               |  |  |                        |
| Rack-mounted, wall-mounted, and cabinet   |  |                               |  |  |                        |
| Rear entry for rack-mounted type; top entry for wall-mounted type; top or bottom entry for cabinet                |  |                               | bottom entry   |  |                        |
| 440*445*150<br>(Rack-mounted)   | 500*557*190<br>(Rack-mounted)  | 500*520*269<br>(Rack-mounted) | 600*800*2200/1200*800*2200/1800*800*2200/2400*800*2200 |  |                        |
| 440*160*481<br>(Wall-mounted)   | 500*191*582<br>(Wall-mounted)  | 500*271*553<br>(Wall-mounted) |  |  |                        |
| 21kg  | 35kg   | 48kg                          |  |  |                        |
| 500kg(One cabinet)  |  |                               |  |  |                        |
| RAL7035(gray)   |  |                               |  |  |                        |
| Environment requirement   |  |                               |  |  |                        |
| 1500 m. Between 1500 m and 4000 m, according to GB/T3859.2, the power decreases by 1% for every additional 100 m. |  |                               |  |  |                        |
| -10°C~40°C (may derate capacity if ambient temperature exceeds 45°C)  |  |                               |  |  |                        |
| 5%~95%, non-condensing  |  |                               |  |  |                        |
| IP20 (other IP degrees are customizable)  |  |                               |  |  |                        |
| Related qualifications and standards  |  |                               |  |  |                        |
| CE  |  |                               |  |  |                        |
| IEEE519, ER G5/4  |  |                               |  |  |                        |



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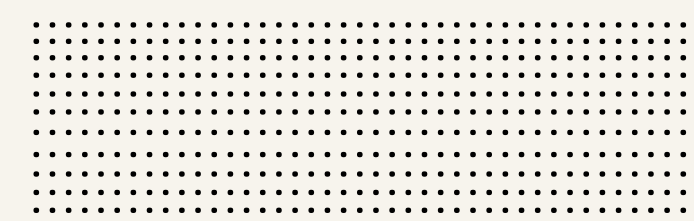


North America  
& 690V Grid voltage



Specification

| Item                                       | 480~690V (North America)  |                          |                              |
|--|---|--------------------------|------------------------------|
|  | Sinexcel SVG<br>50/75   | Sinexcel SVG<br>50/75/95 | Sinexcel SVG<br>50/75/95/110 |
| System parameters                          |   |                          |                              |
| Rated input line voltage                   | 480V(USA)   | 600V(Canada)             | 690V                         |
| Input phase voltage range                  | 384V~552V   | 420V~690V                | 483V~793V                    |
| Power grid frequency                       | 50Hz/60Hz (range : 45Hz ~ 62Hz)   |                          |                              |
| Parallel operation                         | Unlimited   |                          |                              |
| Overall efficiency                         | >97%  |                          |                              |
| Power grid structure                       | 3P3L/3P4L   |                          |                              |
| CT   | 150/5~10,000/5  |                          |                              |
| Circuit topology                           | 3-level   |                          |                              |
| Performance indicators                     |   |                          |                              |
| Single-module compensation capacity        | 50/ 75kvar  | 50/75/95kvar             | 50/75/95/110kvar             |
| Response time                              | < 15ms  |                          |                              |
| Target power factor                        | Adjustable from -1 to +1  |                          |                              |
| Cooling mode                               | Smart air cooling 190CFM*4  |                          |                              |
| Noise level per module                     | <65dB   |                          |                              |
| Communications and monitoring capabilities |   |                          |                              |
| Communications ports                       | RS485, CAN (reserved) , and Ethernet port (RJ45)  |                          |                              |
| Communications protocols                   | Modbus  |                          |                              |
| Alarm                                      | Available   |                          |                              |
| Monitoring                                 | 7-inch touch screen centralized monitor(rack -mount) and 4.3-inch touch screen monitor(wall-mount)                |                          |                              |
| Mechanical properties                      |   |                          |                              |
| Mounting type                              | Rack-mounted, wall-mounted,   |                          |                              |
| Cable entry mode                           | Top and bottom entry for cabinet  |                          |                              |
| Dimensions (W x D x H) (mm <sup>3</sup> )  | 500*590*180/544*640*250(Rack-mounted)   |                          |                              |
|  | 500*184*627/504*253*640(Wall-mounted)   |                          |                              |
| Module net weight                          | 66kg  |                          |                              |
| Color                                      | RAL7035(gray)   |                          |                              |
| Environment requirement                    |   |                          |                              |
| Altitude                                   | 1500 m. Between 1500 m and 4000 m, according to GB/T3859.2, the power decreases by 1% for every additional 100 m. |                          |                              |
| Ambient temperature                        | -20°C~40°C (may derate capacity if ambient temperature exceeds 45°C)  |                          |                              |
| Relative humidity                          | 5%~95%, non-condensing  |                          |                              |
| Protection grade                           | IP20 (other IP degrees are customizable)  |                          |                              |
| Related qualifications and standards       |   |                          |                              |
| Qualifications                             | CE , cETLus (CSA C22.2,UL508)   |                          |                              |
| Standards compliance                       | IEEE519,ER G5/4   |                          |                              |



# INVERTER



400V



400V



30kvar/50kvar/Wall-mounted  
500\*190\*560(mm)/35kg



100kvar/Wall-mounted  
500\*270\*470(mm)/48kg



30kvar/50kvar/Rack-mounted  
500\*510\*190(mm)/35kg



100kvar/Rack-mounted  
500\*470\*270(mm)/48kg





400V

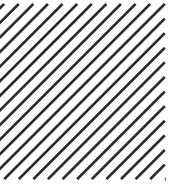


### Flexible Engineering Cabinet

- Flexible dimension  
600\*1000\*2200mm, 3,800\*1000\*2200mm, 3,800\*800\*2200mm are available.
- Flexible capacity  
AHF, 25A/35A/50A/60A/75A/100A/150A adapt to cabinet  
SVG, 30kvar/50kvar/100kvar adapt to cabinet  
AHF, SVG module adapt to cabinet
- Flexible incoming connection  
Top / Bottom cable entrance  
Top / Bottom MCCB position

### 600mm Flexible Engineering Cabinet

- Dimension (W\*d\*h) 800\*600\*2200
- Capacity: Maximum Up To 3 Modules  
(SVG/AHF-400/480/600/690v)
- Power Incoming: Incoming From The Top,  
Copper Bar Is Not Available



400V

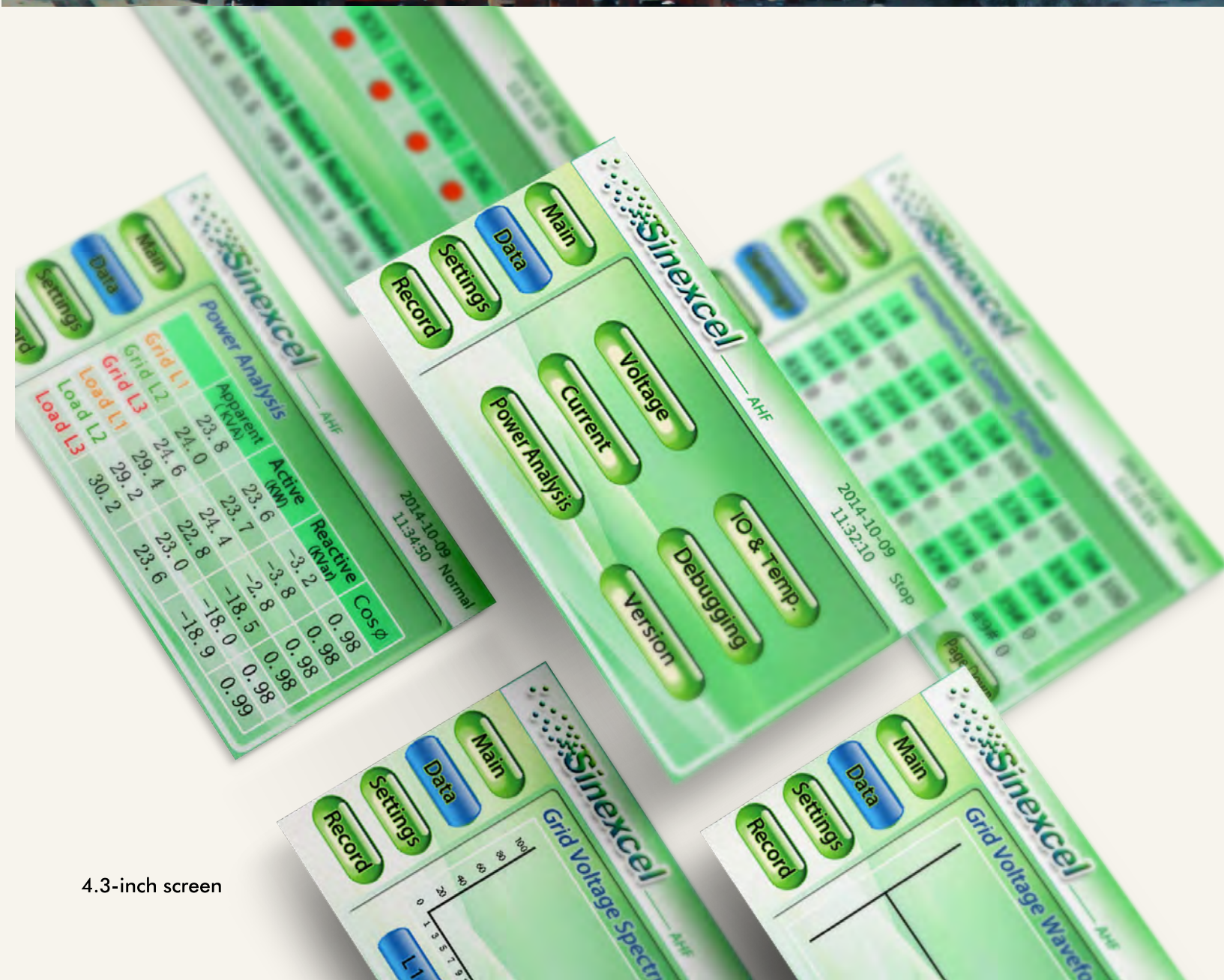


### 400V SVG PLUG TYPE CABINET

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.



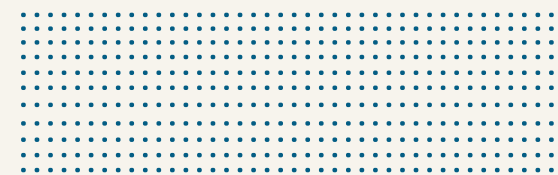
# MONITORING



4.3-inch screen



Centralized monitoring System







## GLOBAL APPLICATION







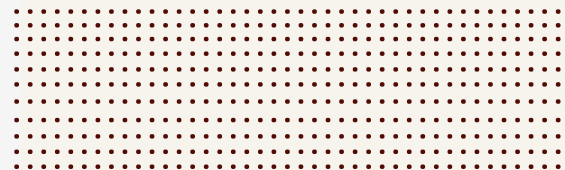
**GLOBAL APPLICATION**







China, IDC, SVG, ZTE IDC center



Hongkong, Commercial, SVG, Far East Finance Center,







The United Kingdom Green Energy, SVG, Wind Farm in Belfast







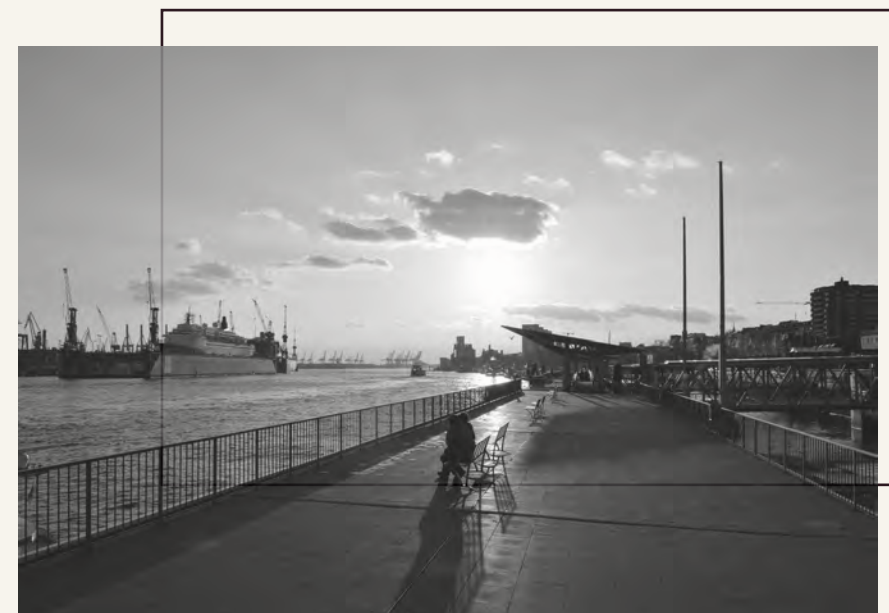




New Zealand, Commercial, SVG, Te Papa Tongarewa Museum,



Malaysia, industrial SVG, Johor Port







Sri Lanka, industrial, SVG, Prima Flour Mill Powder





## GLOBAL APPLICATION

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

North America, South America.