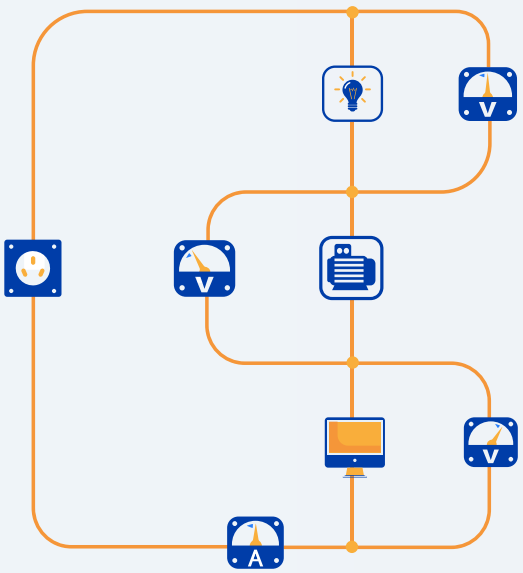
STATIC VAR GENERATOR

compac
ELECTRIC

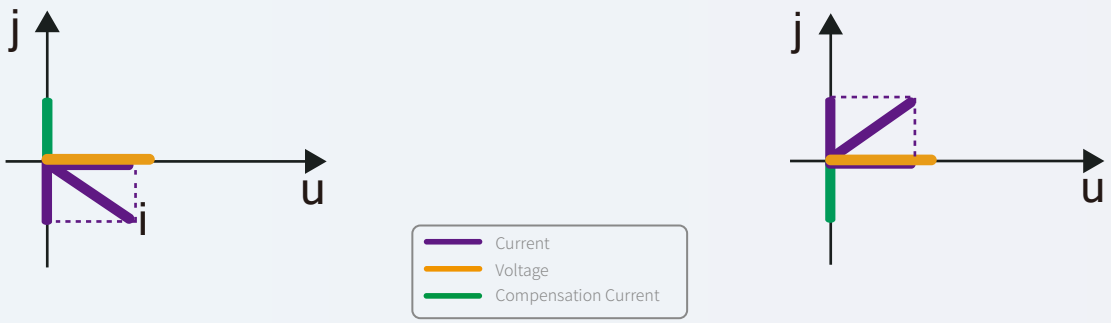
BACKGROUND
REACTIVE POWER COMPENSATION

Power factor is a crucial technical data in the power system. It plays an important role to evaluate the utilization of the electrical equipment in the power system.

In the AC loop, the cosine value of the phase difference between the voltage vector to the current vector is the power factor (PF), represented by the sign of cosϕ. Numerically, the power factor is the ratio of active power to the apparent power, that is cosϕ=P/S.



- When the current vector is in same phase with the voltage vector, the circuit is resistive and cosϕ=1
- When the current vector leads the voltage vector, the circuit is conductive
- When the current vector lags the voltage vector, the circuit is inductive



Because most of the electrical equipment is inductive load, the power factor is obviously less than 1 during operation, a large amount of reactive power needs to be taken from the grid. Therefore, in order to improve the power factor of the grid, it must compensate the reactive power in the grid.

BRIEF INTRODUCTION

COMPAC-SVG is a new-generation product of Static Var Generator (SVG), it used the latest technology application for the reactive power compensation. When the COMPAC-SVG parallel in the grid, it equalized as a dynamic reactive current source. The reactive current of the SVG could be flexibly controlled and compensate the reactive power automatically.

THE SIGNIFICANCE OF REACTIVE POWER COMPENSATION IS AS FOLLOWS

01

STABLE VOLTAGE

Stabilize the terminal voltage of the power grid and improve the quality of power supply.

02

INCREASE POWER FACTOR

Improve the power factor of the power system and the load, reduce the capacity of the power system and the substation equipment investment.

03

REDUCE LINE LOSS

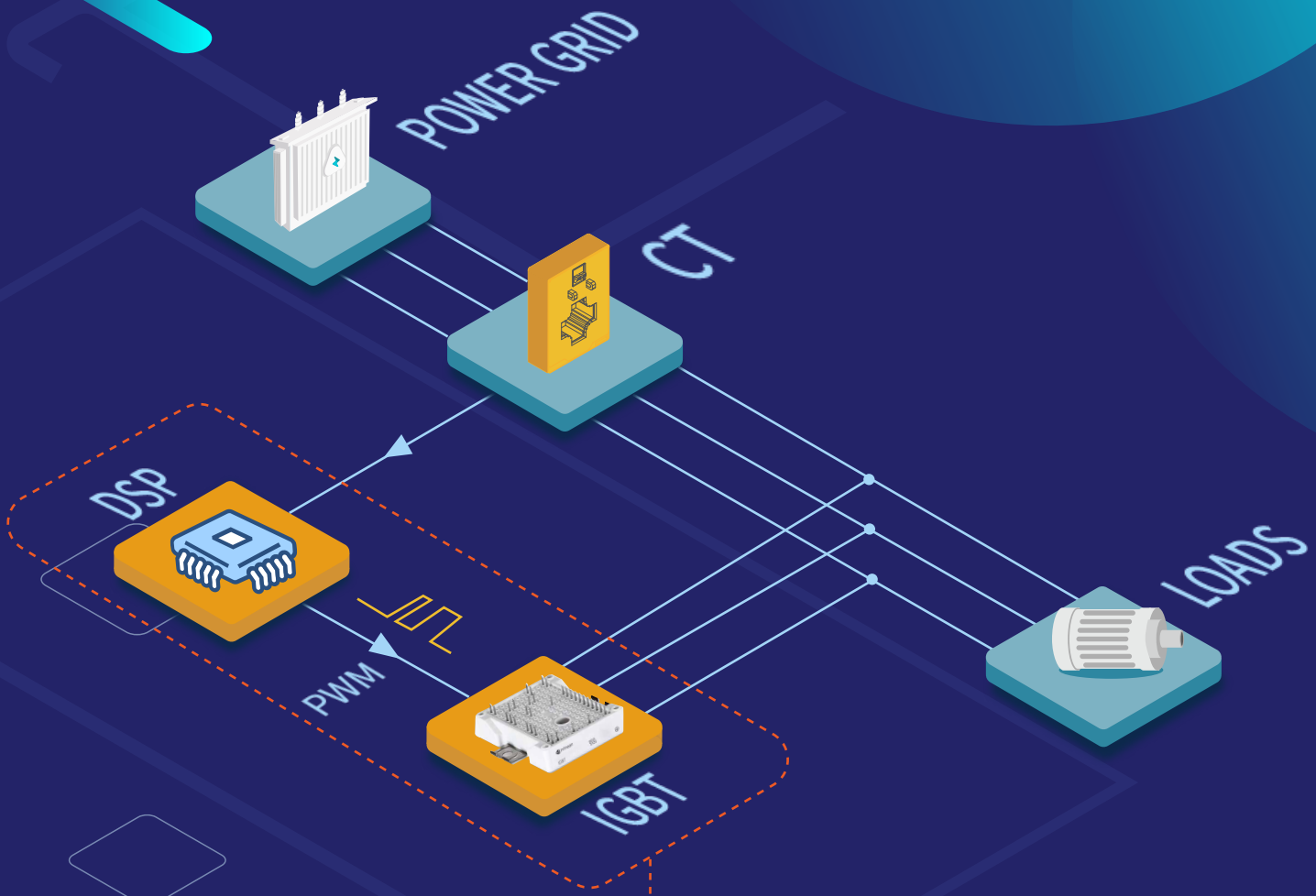
Reduce line loss and improve the power transmission capacity of the power grid.

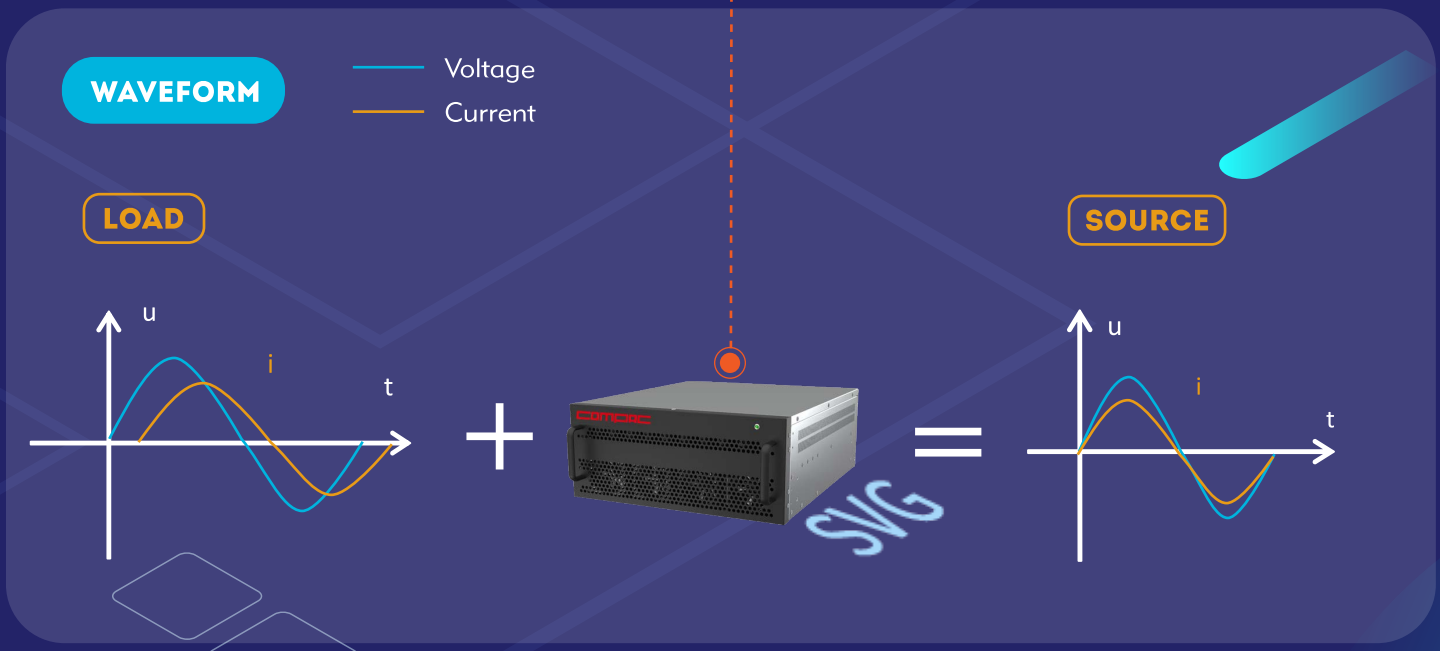
04

BALANCED POWER

Balancing the three-phase active power and reactive power of the grid.

The SVG acquires the current signal of the load by the CT, the DSP tracks the command current in quick than calculate the reactive power rate of change by intelligent algorithm as to send the data to the IGBT by PWM signal. Finally the inductive or conductive power compensation current is generated on the inverter to achieve the real-time dynamic reactive power compensation.


POWER GRID
CT
DSP
PWM
IGBT
LOADS


WAVEFORM
Voltage
Current
LOAD
SOURCE
u
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SVG

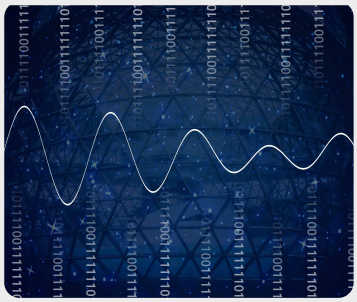
STATIC VAR GENERATOR

MAIN FEATURES

COMPAC-SVG is the type of IGBT compensation device, comparing to the conventional fixed capacitor compensation, mechanical switching capacitors and the thyristor switching capacitors, it has the following advantages:

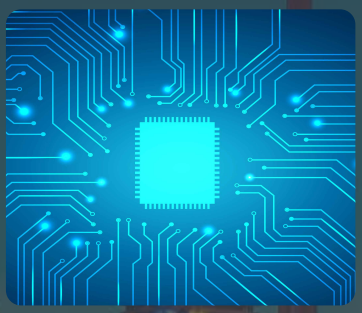
SUPPORT ANTI-HARMONIC FUNCTION TO ENSURE SYSTEM SAFETY

COMPAC-SVG is a controllable current source, avoid harmonic amplification that may be caused by the capacitor bank which is connected in series with reactor, and prevent damage to other system equipment and compensation equipment due to harmonic over voltage.



DYNAMIC CONTINUOUS SMOOTH COMPENSATION

COMPAC-SVG can dynamically and continuously compensate the power factor accordance with the change of the load. The module could export reactive power but absorb reactive power as well, so as to completely eliminate the situation of reactive power reverse transmission.

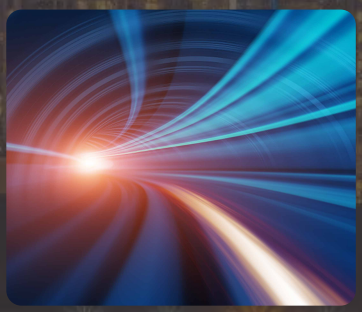


CURRENT SOURCE CHARACTERISTICS

The exportation of reactive current from the COMPAC-SVG is irrele-vant to the voltage of the system.This is great advantages when used for voltage control comparing to the conventional SVC which has impedance characteristics and the export current linearly decreases as the BUS voltage decreases.

FAST RESPONSE

The response time of COMPAC-SVG ≤ 5ms, and the conver-sion from conductive reactive power to inductive reactive power can be accomplished in a very short time. The fast compensation speed can be fully qualified for impact load compensation.



EASY INSTALLATION AND LESS OCCUPATION SPACE

Compared with conventional reactive compensation products, the COMPAC-SVG can save 70% installation space.

SVG

ELECTRIC APPLICATION SOLUTION EXPERT

STATIC VAR GENERATOR

MODEL DESCRIPTION

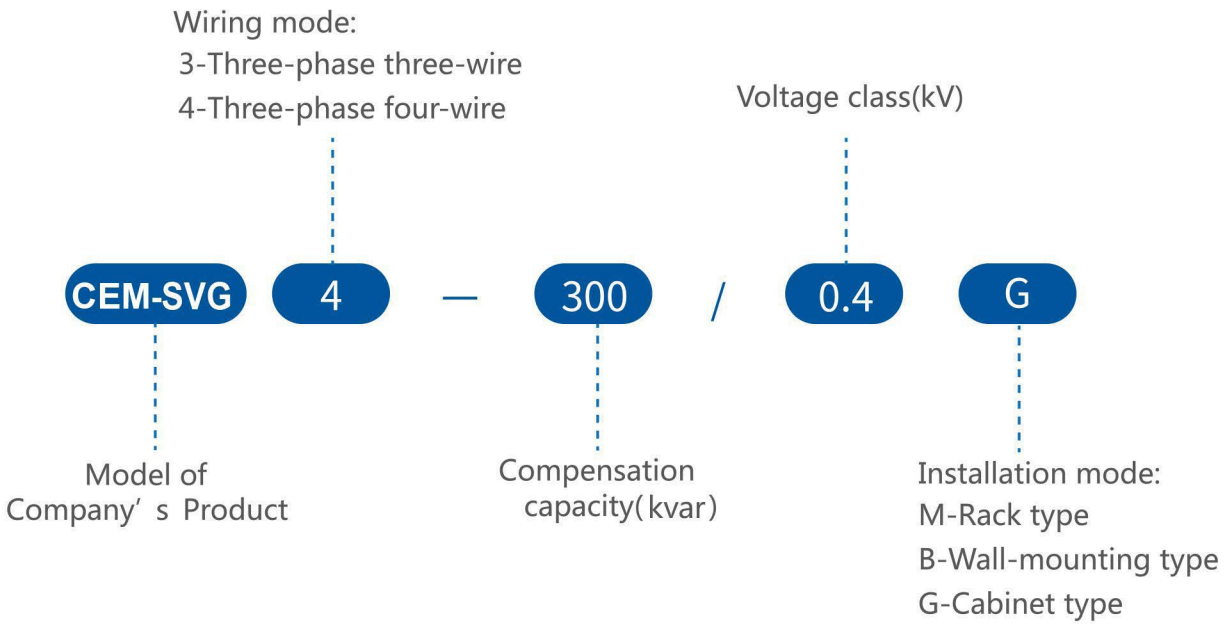


TABLE OF RAPID MODEL CHECKING OF SFSVG

Transformer Capacity (kVA)	Three phase four wire	Three phase three wire
200	**CEM-SVG4-100/0.4 X 1**	**CEM-SVG3-100/0.4 X 1**
250/315	**CEM-SVG4-100/0.4 X 1**	**CEM-SVG3-100/0.4 X 1**
400	**CEM-SVG4-150/0.4 X 1**	**CEM-SVG3-200/0.4 X 1**
500/630	**CEM-SVG4-200/0.4 X 1**	**CEM-SVG3-300/0.4 X 1**
800	**CEM-SVG4-250/0.4 X 1**	**CEM-SVG3-400/0.4 X 1**
1000	**CEM-SVG4-300/0.4 X 1**	**CEM-SVG3-500/0.4 X 1**
1250	**CEM-SVG4-400/0.4 X 1**	**CEM-SVG3-300/0.4 X 2**
1600	**CEM-SVG4-250/0.4 X 2**	**CEM-SVG3-400/0.4 X 2**
2000	**CEM-SVG4-300/0.4 X 2**	**CEM-SVG3-500/0.4 X 2**
2500	**CEM-SVG4-400/0.4 X 2**	**CEM-SVG3-400/0.4 X 3**
Scope of Application:	Business center, office building, hotel, hospital, data theater and other occasions with relatively much single	mmunication, textile, papermaking, printing, tobacco, other occasions with relatively much three-phase load

Note: Types M, B and G can be selected according to field situation.

TECHNICAL PARAMETER

COMPAC-SVG				
Grid	400V		690V	
Mounting Type	Wall-mounted Rack-mounted	Cabinet	Floor type	Cabinet
System				
Rated Input	400V LL ±15%		690V LL ±15%	
Power Grid Frequency	50/60Hz ±5%			
Parallel Operation	8 modules, customizable			
Overall Efficiency	≥97%(laboratory data)			
Power Grid Structure	3P3W,3P4W		3P3W	
Circuit Topology	3-level			
Performance Indicators				
Rated Capacity	30kvar/50kvar/75kvar/100kvar	Up to 400kvar	75kvar/100kvar	Up to 500kvar
Loss of active power	<3% rated module power			
Over-load capability	120%			
Response time	5ms			
Scope of reactive adjustment	Continuously adjustable from rated induced to rated capacitive			
Control algorithm	Compensation algorithm of screening vector of frequency domain possessing self-adaptation capability			
Switching frequency	20kHz/60kHz			
Cooling mode	Forced air cooling			
Noise level	≤65dB			
Filtering ability	Low-order filtering (3 times, 5times, 7 times, 11 times, 13 times)			
Communications and Monitoring Capabilities				
Communications Port	RS485			
Communications Protocol	Modbus-RTU			
Module Display Interface	4.3in LCD/ LED indicator	7in/10in LCD touch screen(optional)	LED indicator	7in/10in LCD touch screen(optional)
Monitoring Alarm	Available			
Monitoring	Independent monitoring and centralized monitoring			
Environment Requirements				
Altitude	1,000m, for every increased 100m, the power is reduced by 1%.			
Operating Temperature	-20℃-45℃			
Relative Humidity	5% to 95%,non-condensing			
Protection Class	IP20			
Related Standards				
Directive	2014/30/EU 2014/35/EU			
Standards Compliance	EN 61000-6-2:2005+AC:2005 EN 61000-6-4:2007+A1:2011 EN 50178:1997			

NOTE

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