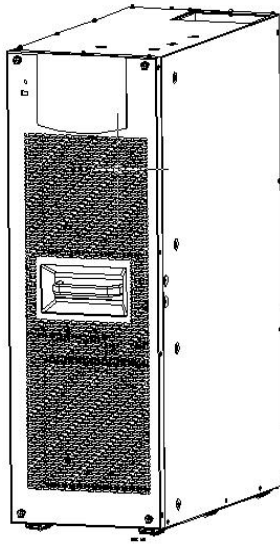


Static Var Generator

User Manual



JIANGSU SFERE ELECTRIC CO., LTD

Product available in this manual

This manual applies to the following types of static var generators in this series:

	Type
1	Three-phase four-wire 200 kvar static var generator rack module
2	Three-phase three -wire 200 kvar static var generator rack module
3	Three-phase four-wire 150 kvar static var generator rack module
4	Three-phase three -wire 150 kvar static var generator rack module
5	Three-phase four-wire 70 kvar static var generator rack / wall-mounted module
6	Three-phase three-wire 70 kvar static var generator rack / wall-mounted module
7	Three-phase four-wire 50 kvar static var generator rack / wall-mounted module
8	Three-phase three-wire 50 kvar static var generator rack / wall-mounted module
9	Three-phase four-wire 30 kvar static var generator rack / wall-mounted module
10	Three-phase three-wire 30 kvar static var generator rack / wall-mounted module

1. Static Var Generator System

1.1 Principle of Static Var Generator

This series of static var generators (SFR-SVG for short) is a parallel type static var generator. The basic principle is to connect the bridge type convertor circuit in parallel (or directly in parallel) on the power grid through reactors. The phase and amplitude of the output voltage of the AC side of the bridge converter circuit or the AC side current of the bridge converter circuit are appropriately adjusted so that the circuit can absorb or issue a reactive current meeting the requirements, thereby realizing the purpose of dynamic reactive power compensation. The system diagram is shown in Figure 1-1:

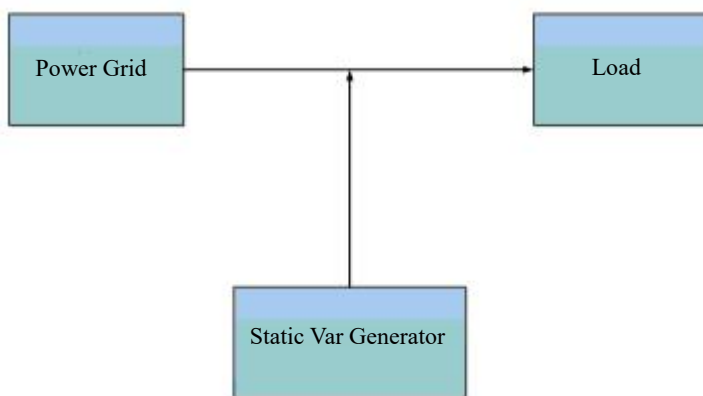


Fig. 1-1 SFR-SVG diagram

1.2 This Series SFR-SVG Features

The series SFR-SVG adopts the latest generation of semiconductor power conversion devices and a powerful all-digital control platform, making this series of SFR-SVG achieve industry-leading levels in both product performance and functionality. The main features are as follows:

- With fully independent intellectual property rights, suitable for application in the Chinese market;
- With intelligent resonance elimination function and strong adaptability;

- With fundamental wave reactive power compensation, harmonic compensation and unbalance compensation function;
- With modular design, flexible configuration, multi-machine operation in parallel, easy to expand capacity.

2. SFR-SVG Installation

2.1 Environmental Requirements

Table 2-1 shows the environmental requirements for the storage and operation of this series SFR-SVG:

Table 2-1 This series SFR-SVG environment parameters

Item	Scope
Operating temperature	-25°C~40°C(Derating when above 40°C)
Storage temperature	-40°C~70°C
Relative humidity	5~95%, No condensation
Altitude	<2000m
Pollution level	Level II

2.2 Storage Environment Requirements

If the SFR-SVG need not to be installed immediately, it must be stored in the complete package in the room and the number of SFR-SVG stacked with the package does not exceed 2 units.

2.3 Handle SFR-SVG

2.3.1 SFR-SVG Packaging

A graphic description of the precaution is located at the front right corner of the package for the packaged SFR-SVG, as the figure shows in Fig 2-1 with the specific meanings as follows: upward, fragile, keep dry, avoid dumping, and maximum stacking quantity.

2.3.2 Unpack and Inspection

2.3.2.1 Remove the SFR-SVG Package

Take out the SFR-SVG and place it in a flat environment to avoid tilting or impacting the SFR-SVG. As shown in Fig. 2-2.

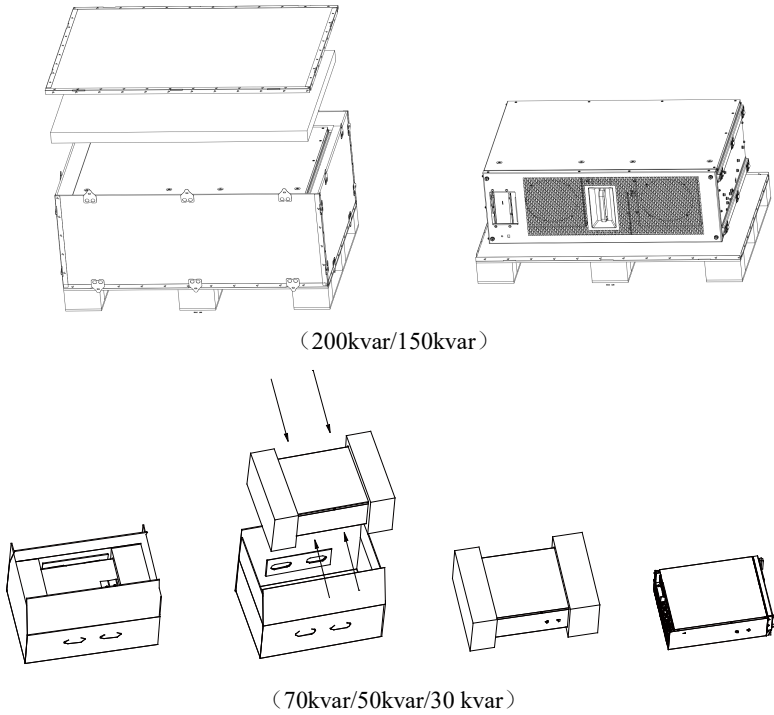
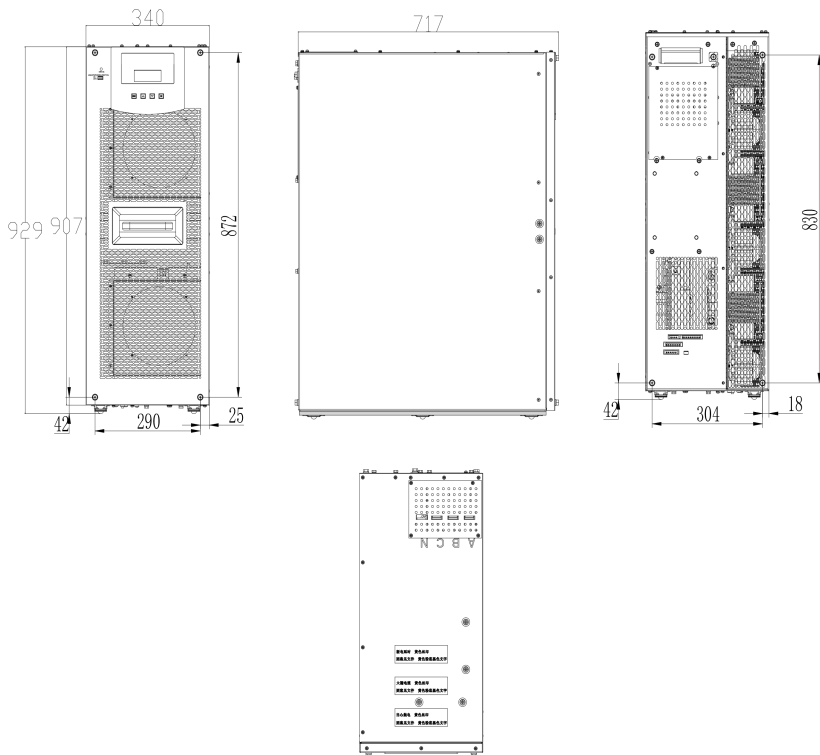


Fig.2-2 SFR-SVG unpacking diagram

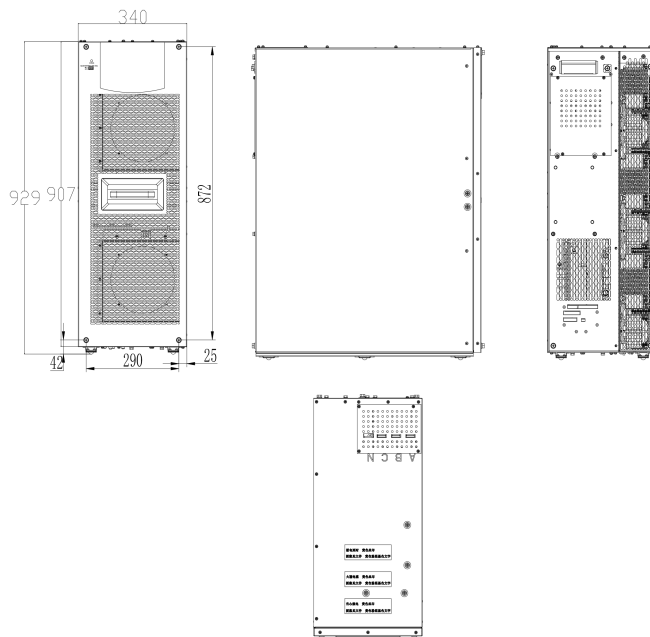
2.3.2.2 Check the Appearance of SFR-SVG

Check the appearance of the SFR-SVG after removing the package. See Figure 2-3 and Figure 2-4 for the appearance of the SFR-SVG. SFR-SVG appearance inspection items should include but not be limited to the following:

- The appearance should be smooth, without scratches, rust and stains;
- The paint layer shall be free of bumps and color fading;
- No missing or damaged terminal block
- The LCD screen is not damaged, chipped or peeled off;

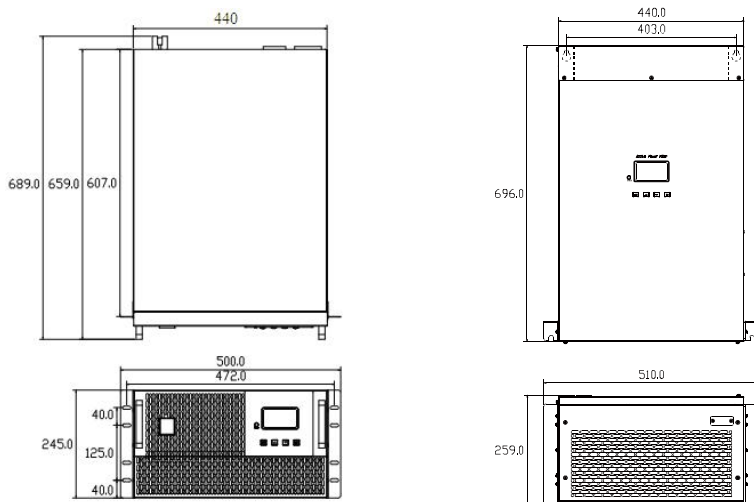


200kvar/150kvar SFR-SVG rack-mounted LCD power module



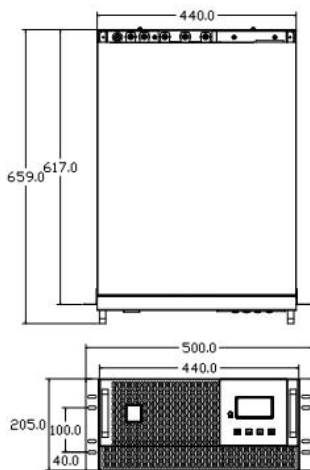
200kvar/150kvar SFR-SVG rack-mounted LED power module

Fig 2-3 200kvar/150kvar SVG power module

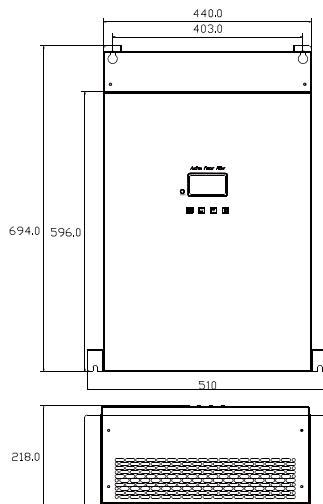


70 kvar /50kvar SVG rack-mounted power module

70 kvar/50kvar SVG wall-mounted power module



30kvar SVG rack-mounted power module



30kvar SVG wall-mounted power module

Fig 2-4 30/50/70kvar SVG power module

Lift of the shipping accessories can be found in Table 2-2 below.

3. Product Specifications

3.1 Application Standards

The SFR-SVG design meets the relevant standards:

- DL/T 1216-2013 Technical Specifications for Static Synchronous Compensator in the power distribution network

3.2 Environmental Conditions

Table 3-1 Environmental conditions

Item	Scope
Operating temperature	-25°C~40°C (Derating when above 40°C)
Storage temperature	-40°C~70°C
Relative humidity	5~95%, No condensation
Altitude	<2000m (Please consult manufactures when it exceeds 2000m)

3.3 Mechanical Features

Table 3-2 Mechanical features
150kvar/200kvar

Product model	Dimensions W×H×D (Unit: mm)	Weight (kg)	Colour
Three-phase four-wire 150kvar/200kvar rack- mounted power module	340*930*710	120	RAL7035
Three-phase three-wire 150kvar/200kvar rack- mounted power module	340*930*710	120	RAL7035

30kvar/50kvar/70kvar

Product model	Dimensions W×H×D (Unit: mm)	Weight (kg)	Colour
Three-phase four-phase 30kvar rack-mounted power module	500*205*659	33	RAL7021
Three-phase three- phase 30kvar rack-mounted power module			
Three-phase four-phase 50/70kvar rack-mounted power module	510*245*694	44	
Three-phase three -phase 50/70kvar rack-mounted power module			
Three-phase four -phase 30kvar wall-mounted power module	510*659*218	34	
Three-phase three -phase 30kvar wall-mounted power module			
Three-phase four -phase 50/70 kvar wall-mounted power module	510*694*258	45	
Three-phase three -phase 50/70 kvar wall-mounted power module			

3.4 Electrical Characteristics

Table 3-3 AC output

Item	150kvar SFR-SVG		200kvar SFR-SVG
Rated input line voltage	380 Vac	400 Vac	415 Vac
Input phase voltage range	-40%~20%	-40%~15%	-40%~10%
Frequency	45~55Hz		
Rated output current	225A		300A

Item	30kvar SVG	50kvar SVG	70kvar SVG
Rated input line voltage	380/400/415 Vac		
Input phase voltage range	-20%~20% (415Vac 为-20%~15%) -20%~20% (415Vac is-20%~15%)		
Frequency	45~55Hz		
Rated output current	45A	75A	105A

Table 3-4 System features

Item	Specification
Overall efficiency	97.5 %
Display operation interface	LCD+ indicator
Insulation resistance	$>10\text{ M}\Omega$ (500Vdc)
Insulation strength	(input and output port to ground) DC 2820Vdc, 1min, steady-state leakage current of less than 10mA, no arcing or breakdown
Protection level	IP20
Cooling method	Forced air-cooled
Noise	<70 dB