High Protection Series
Power Quality Products
ASVG 100kvar

User Manual

Data version A02
Archive date 24-04-2025
ERP encoded:19090019

Our company provides customers with a full range of technical support, users can contact the nearest company office or customer service center, or directly contact the company headquarters.

Special statement

- Personal Safety

  1. The installation of this product must be carried out by the professional engineer of the manufacturer or the manufacturer's authorized agent, and the debugging must be carried out by the engineer designated by the manufacturer, otherwise it may lead to product failure or endanger personal safety.

  2. Before installing and debugging this product, be sure to read this product manual and safety matters in detail, otherwise it may lead to product failure or endanger personal safety.

  3. This product should not be used as a power supply for any life support equipment.

- Equipment Safety

  1. If stored or left unused for a long time, this product must be placed in a dry, clean and specified temperature range.

  2. When the distortion rate of grid voltage is higher than 15%, the user needs to put forward special instructions in order to propose different solutions.

  3. This product should be used in an appropriate working environment (see the environmental requirements section of this product manual for details).

It is forbidden to use this product in the following work environments:

- High temperature, low temperature or humid places that exceed the technical specifications of this product'.
- Places where there is vibration and are susceptible to collision.
- Close to heat sources or places with strong electromagnetic field interference.
- Places with corrosive gases and dusts.

Statement of Responsibility

Our company is not responsible for defects or malfunctions caused by the following reasons:

- Exceed the scope of use and working environment specified in the product
- Unauthorized modification or maintenance, wrong installation, improper operation
- Force majeure
- Other matters that violate the provisions of this product manual

This manual covers the following products

	product	
ASVG High Protection static var generator - rail mount type	ASVG 100KVar	208/400/480Vac Three-phase four-wire/three-phase three-wire 100KVar(400Vac) modular ASVG -High Protection - Rail mount
ASVG High Protection static var generator - wall mount type	ASVG 100KVar	208/400/480Vac Three-phase four-wire/three-phase three-wire 100KVar(400Vac) modular ASVG -High Protection - Wall mount

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I Overview

1.1 Security

This manual uses the following safety signs, so be sure to follow them!

Improper use can cause dangerous situations and is highly likely to lead to personal injury or death!

 warning
1. It is strictly forbidden to place flammable materials near this product module, as it poses a fire hazard. 2. It is strictly forbidden to install this product module in an environment containing explosive gases, as it poses a risk of explosion. 3. This product must be wired by a qualified professional to avoid the risk of electric shock. 4. Ensure the input power is completely disconnected before wiring work is carried out, otherwise there is a risk of electric shock. After power is applied, do not touch parts of the product module other than the operation panel. 5. The grounding terminal of this product module must be reliably grounded, as poor grounding can lead to abnormal operation and poses an electric shock hazard. 6. Maintenance operations should be carried out 15 minutes after disconnecting the power to this product, to avoid the risk of electric shock. 7. The exposed parts of the cable lugs in the main circuit wiring must be wrapped with insulating tape to avoid safety hazards.
 warning
1. When handling, do not lift the module of this product by the front panel handle to avoid personal injury or damage to the item. 2. Do not let screws, washers, or metallic foreign objects fall into the module of this product, as this poses a risk of fire and damage to the components. 3. If the module of this product is damaged or components are missing, do not install or operate it, as this poses a risk of fire and personal injury. 4. The main circuit terminals and wire lugs must be securely connected.

1.2 Precautions for Use

Incorrect Installation

If the module of this product is incorrectly installed or applied (such as the current transformer being connected in reverse), it can increase the harmonic current and reactive current in the power system, potentially endangering the power system or other equipment.

Exceeding Input Voltage Value

Please use the module within its rated voltage range. For special circumstances, use a step-up or step-down device.

Lightning Surge Protection

The module of this product is equipped with an overcurrent protection device for lightning strikes. After wiring correctly according to the manual, it has a certain level of self-protection against induced lightning.

1.3 Disposal Precautions

When disposing of this product module, please note:

1.The electrolytic capacitors on the printed circuit board may explode when incinerated.

2.Burning plastic components will produce toxic gases.

3.Please treat it as industrial waste for disposal.

II Mechanical Installation

2.1 Precautions

Warning:Professional installation required
1.Power can be applied to this product module only after obtaining the approval of the commissioning engineer. 2.The installation of this product module must be carried out by qualified engineers according to this user manual.
Note: Three-phase five-wire input power is required (the three-phase three-wire system does not connect the N line to this product module).
This product module must be connected to a three-phase five-wire (A, B, C, N, PE) TN AC power distribution system (IEC60364-3). The three-phase three-wire system does not connect the N line to this product module.
Warning
1. In order to ensure personal safety, the installation tools operated with electricity must be insulated with insulating gloves.

2.2 Environmental Characteristics

The power quality product module is a power electronic module equipped with complex control devices. The installation environment may affect its operational reliability and service life. This product module is equipped with a cooling fan to dissipate heat generated during operation. Therefore, do not block the ventilation openings during installation. Do not install this product module in environments that are excessively dusty, hot, humid, corrosive, or subject to vibration.

Table 2-1 Environmental characteristics

		Rated Capacity
characteristics	Current Rating	150A
	208Vac Power Rating	54KVar
	400Vac Power Rating	100KVar
	480Vac Power Rating	120KVar

Noise within 1m (front)	dB	＜60dB	65dB
altitude	m	≤1500,1% derating per 100m in the range of 1500m～3000m	
relative humidity	％RH	0～95,No condensation	
Operating temperature	℃	-10～55℃ When the ambient temperature is between -10 to 40°C, the system has no output power derating; when the ambient temperature is between 40 to 45°C, the system's output power is derated to 90%; when the ambient temperature is between 45 to 50°C, the system's output is derated to 80%; when the ambient temperature exceeds 55°C, a "High Ambient Temperature" fault occurs, and the functionality will be restored when the ambient temperature drops to 50°C.	
Storage and transport temperature	℃	－20～＋70	
Overvoltage rating		Overvoltage Level II.	

2.3 Mechanical Characteristics

Table 2-2 Mechanical characteristics

characteristics			Rated Capacity
	Current Rating		150A
	208Vac Power Rating		54KVar
	400Vac Power Rating		100KVar
	480Vac Power Rating		120KVar
Mechanical dimensions(W×D×H)	3U	mm	500*550*130（No packaging material）；617*617*204（With packaging materials）
Weight (maximum)	kg		28
Color	N/A		Black fine grain (customizable)
Degree of protection, IEC（60529）	N/A		IP20(Front door opens or closes, back door closes)

2.4 Electrical Characteristics

Table 2-4 Electrical Characteristics of SVG Product Module

characteristics			Rated Capacity
	208Vac Power Rating		54KVar
	400Vac Power Rating		100KVar
	480Vac Power Rating		120KVar
Rated AC voltage	Vac	208Vac	208, Three-phase four-wire/three-phase three-wire
		400Vac	380/400/415, Three-phase four-wire/three-phase three-wire
		480Vac	480, three-phase three-wire
Current rating	A		150
Rated neutral current	A		150
frequency	Hz		50/60
Voltage range	%Vac	208Vac	Lower limit:－25; Upper limit:＋15
		400Vac	Lower limit:－25; Upper limit:＋15
		480Vac	Lower limit:－20; Upper limit:＋8
Frequency range	%		±10
loss	%		<2
CT ratio range			50:5～10000:5
Harmonic compensation	Harmonic		2～13

2.5 Installation Drawing

2.5.1 Operating Space

To facilitate the tightening of the power terminals inside the cabinet during daily operation, in addition to meeting local regulations, sufficient space should be reserved at the front and back of the cabinet. This allows a person to pass freely when the front and rear doors of the cabinet are fully opened. Additionally, at least 500mm of space should be reserved at the back of this product, and the dust-proof film should be removed to ensure unobstructed ventilation for this product.

2.5.2 Structural Dimensions

Figures 2.1 to 2.2 illustrate the structural dimension diagrams of various types of high-protection-grade power quality product modules.

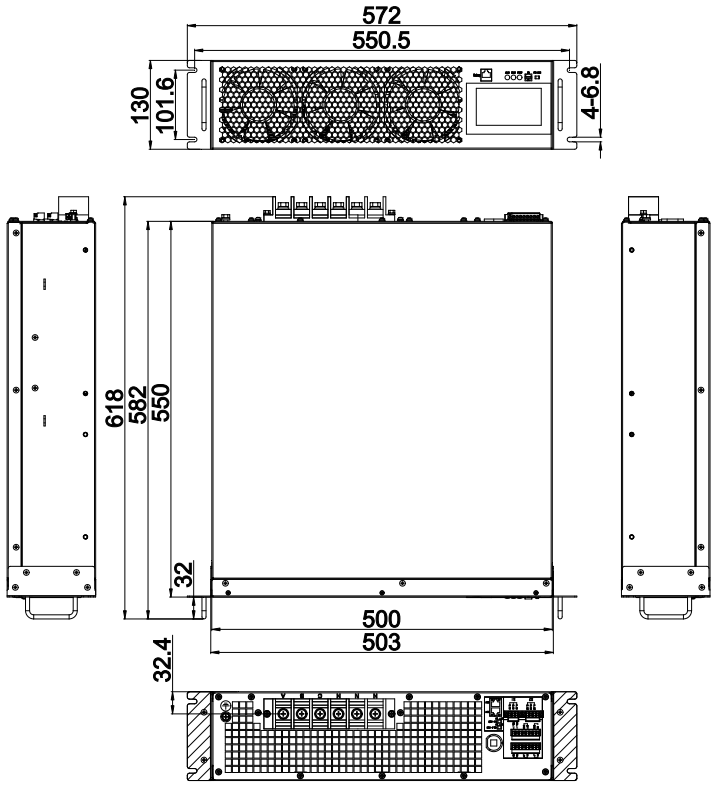

Figure 2.1 ASVG 100KVar -Rail Mounted

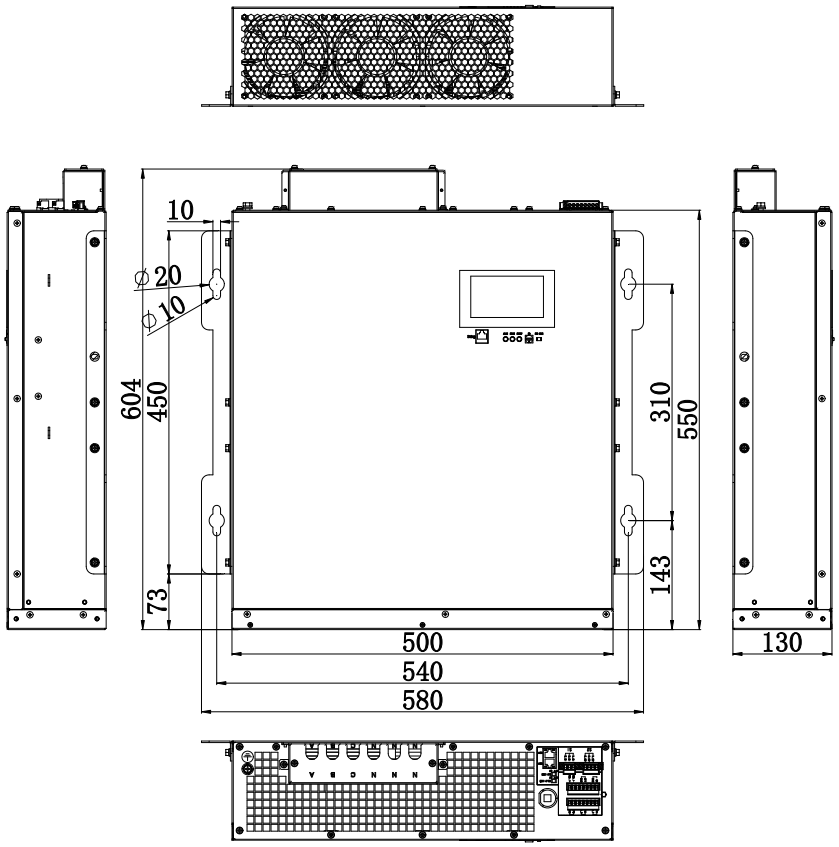

Figure 2.2 ASVG 100KVar －Wall Mounted

2.5.3 Mechanical Installation

When installing the universal rail-mounted module, it is fixed to the installation pillars of the cabinet through the front two side ears, as shown in Figure 2.5. Wall-mounted models should be secured to a solid wall along the upper and lower edges or hung within the cabinet

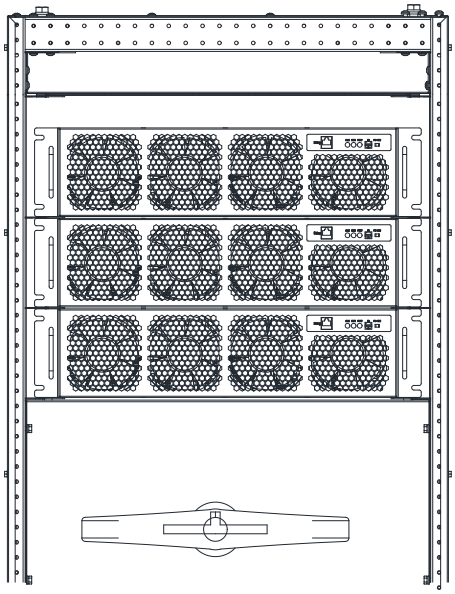

Figure 2.5 Schematic diagram of the rail-mounted model

III Routine Maintenance and Care

3.1 Safety Precautions

Modules operate with high voltage. For safety, maintenance personnel must not touch any live terminals while the equipment is in operation. Ensure the grounding terminal of the equipment is reliably connected.

Due to the large number of capacitors in the module's bus, maintenance and inspection should only be performed 15 minutes after power is disconnected.

3.2 Routine Inspections

Do not open the module during operation or while it is powered. Perform a visual inspection from the outside to check for any abnormalities in the operation. The following items should typically be inspected:

1. Whether the display screen data meets requirements.
2. Whether the display screen shows any fault information.
3. Any abnormal sounds, vibrations, or odors.
4. Signs of overheating, discoloration, or other irregularities.
5. When following safety precautions, periodic inspections should be conducted after disconnecting the module from the grid.

The routine inspection items are listed in Table 5.1.

Table 5.1: Routine Inspection Items

category	Check the items	remark
circumstances	Temperature, humidity, presence of metal dust, corrosive gases	
Electrical connections	Whether the cables and terminals are damaged	
	Whether the main circuit wiring, grounding wire, CT wiring, communication wiring, etc. are reliably connected	
Heat dissipation of the device	Whether there is a blockage in the air duct	

3.3 Alarm List

This table outlines the comprehensive alarm information that can be accessed through the "Current Records" and "Historical Records" menus on the module's display interface. Each entry includes the alarm type, and description for troubleshooting.

Table 5.2 Alarm List

Alarm	interpretation
Soft Start Failure	Abnormalities in bus voltage or inverter output voltage during the soft-start process.
Abnormal Grid Voltage	Grid voltage exceeds 115% of the rated voltage or drops below 85% of the rated voltage.
Abnormal Grid Frequency	Grid frequency exceeds 3Hz above or drops 3Hz below the rated frequency.
Abnormal Grid Phase Sequence	Grid phase sequence is ACB, BAC, or CBA.
Input Neutral Missing	Main circuit input neutral line (N) not detected.
Bus Undervoltage	Bus voltage drops below 80% of the rated voltage.
Bus Overvoltage	Bus voltage exceeds 120% of the rated voltage.
Relay or Fuse Open Circuit	At least one output fuse or relay is in an open-circuit state.
Relay Short Circuit	At least one relay is closed without an enable signal.
Overload Timeout	Current overload during or after the soft-start process.
Auxiliary Power Abnormal	Auxiliary power failure or power loss.
Emergency Shutdown	Emergency stop (EPO) switch on the touch control panel is pressed, or external EPO command is received.
Fan Abnormality	At least one fan has failed.
Abnormal Output Current	Actual output current differs from the IGBT bridge arm output current by more than 20% of the rated current.
Overtemperature (Environment)	Ambient temperature exceeds 55°C.
Overtemperature (IGBT)	IGBT temperature exceeds 90°C.
CT Polarity Reversed	Secondary side of the current transformer (S1, S2) is reversed.
CT Current Overload	CT current exceeds 1.2 times the CT sampling range.
CAN Communication	CAN cable not connected or loose when CT is positioned on the grid side.

Alarm	interpretation
Failure	
Communication Failure	No 485 communication modules detected.
Model Mismatch	Alarm triggered if different models are used in a parallel configuration.
Voltage Level Mismatch	Alarm triggered if different modules have different voltage levels in a parallel configuration.
Frequency Level Mismatch	Alarm triggered if different modules have different frequency levels in a parallel configuration.
Start Method Mismatch	Alarm triggered if different modules use different start methods in a parallel configuration.
Target Cosine Value Mismatch	Alarm triggered if different modules have different target cosφ values in a parallel configuration.
CT Position Mismatch	Alarm triggered if different modules have different CT positions in a parallel configuration.
CT Ratio Mismatch	Alarm triggered if different modules have different CT ratios in a parallel configuration.
Compensation Function Mismatch	Alarm triggered if different modules have different compensation functions in a parallel configuration.