# AHF

## Active Harmonic Filters

**Harmonic control, Reactive power compensation, Three-phase unbalance control**

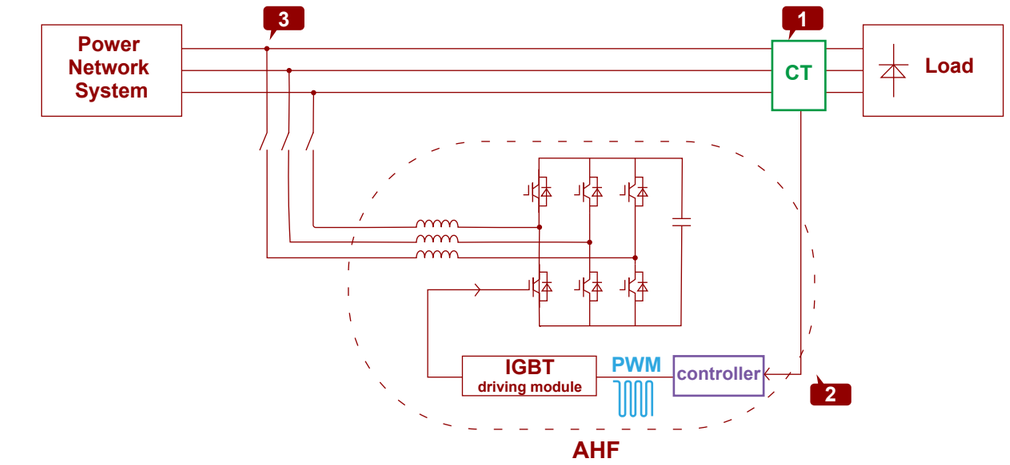
**Active harmonic filters (AHF)** are the ultimate answer to power quality problems caused by waveform distortions, low power factor, voltage variations, voltage fluctuations and load unbalance for a wide range of segments and applications. They are a high performance, compact, flexible, modular and cost-effective type of active power filters (APF) which provide an instantaneous and effective response to power quality problems in low or high voltage electric power systems. They enable longer equipment lifetime, higher process reliability,improved power system capacity and stability, and reduced energy losses, complying with most demanding power quality standards and grid codes.

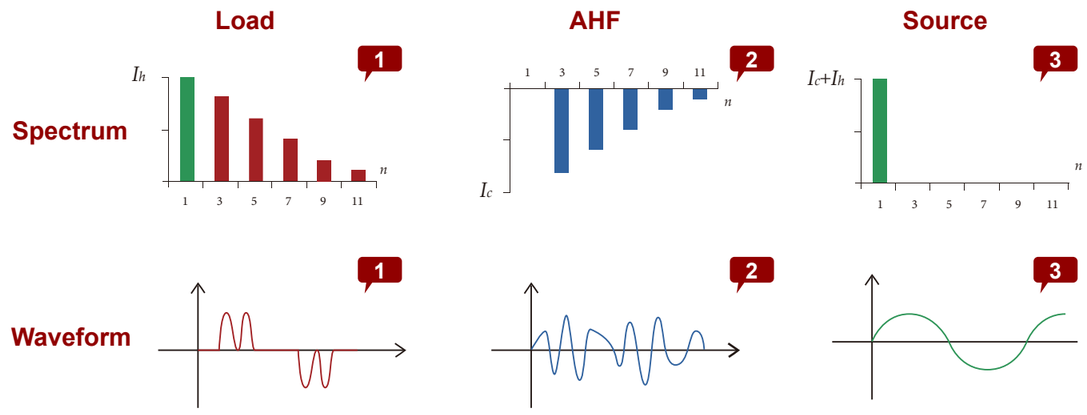
**AHFs** eliminate waveform distortions from the loads like harmonics, inter harmonics and notching,and harmonic voltages caused by harmonic currents, by injecting in real-time the distorted current of same magnitude but opposite in phase in the electric power system. In addition, AHFs can take care of several other power quality problems by combining different functions in a single device.


## GEN-AHF Working Principle:

External CT detects the load current, DSP as CPU has advanced logic control arithmetic, could quickly track the instruction current, divides the load current into active power and reactive power by using the intelligent FFT, and calculates the harmonic content rapidly and accurately. Then it sends PWM signal to internal IGBT's driver board to control IGBT on and off at 20KHZ frequency. Finally generates opposite phase compensation current on inverter induction, at the same time CT also detects the output current and negative feedback goes to DSP. Then DSP proceeds the next logical control to achieve more accurate and stable system.

### AHF operating principle



## GEN-AHF Technical Specifications:

| TYPE | Series 220V | Series 400V | Series 500V | Series 690V |
|---|---|---|---|---|
| Max neutral wire current | 23A | 15A、25A、50A、75A、100A、150A | 100A | 100A |
| Nominal voltage | AC220V(-20%~+20%) | AC380V(-20%~+20%) | AC500V(-20%~+20%) | AC690V(-20%~+20%) |
| Rated frequency | 50Hz±5% | | | |
| Network | Single phase | Three-phase three-wire/three-phase four-wire | | |
| Response time | <40ms | | | |
| Harmonics filtering | 2th to 50th Harmonics,The number of compensation can be selected, and the range of single compensation can be adjusted | | | |
| Harmonic compensation rate | >92% | | | |
| Neutral line filtering capability | / | The filtering capacity of three-phase four-wire neutral line is 3 times of that of phase filtering | | |
| machine efficiency | >97% | | | |
| Switching frequency | 32kHz | 16kHz | 12.8kHz | 12.8kHz |
| Feature selection | Deal with harmonics | | | |
| Numbers in parallel | No limitation. A single centralized monitoring module can be equipped with up to 8 power modules | | | |
| Communication methods | Two-channel RS485 communication interface (support GPRS/WIFI wireless communication) | | | |
| Altitude without derating | <2000m | | | |
| Temperature | -20~+50°C | | | |
| Humidity | <90% RH,The average monthly minimum temperature is 25℃ without condensation on the surface | | | |
| Pollution level | Below level Ⅲ | | | |
| Protection function | Overload protection, hardware over-current protection, over-voltage protection, power failure protection, over-temperature protection, frequency anomaly protection, short circuit protection, etc | | | |
| Noise | <50dB | <60dB | <65dB | |
| Installation | Rack/wall hanging | | Rack | |
| Into the way of line | Back entry (rack type), top entry (wall-mounted) | | Top entry | |
| Protection grade | IP20 | | | |

## Type Code:

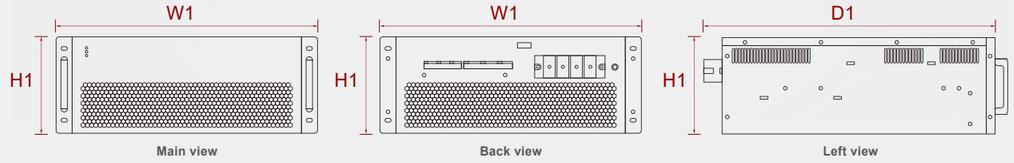
GEN AHF-075-0.4-4L-W

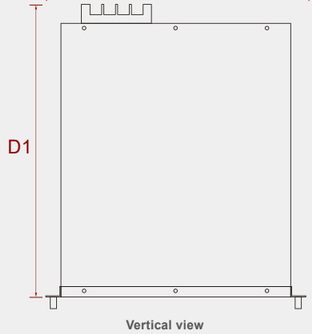
- W:Wall-mounted
- R:Rack-mounted
- C:FCL device
- 3L:Three phase three wire system
- 4L:Three phase four wire system
- 0.4:400V voltage class
- 0.5:500V voltage class
- 0.69:690V voltage class
- Nominal capacity(A):050/075/100/150
- Active harmonic filters
- GENen Electric Brand name



## GEN-AHF Product Appearance

AHF Rack-mounted

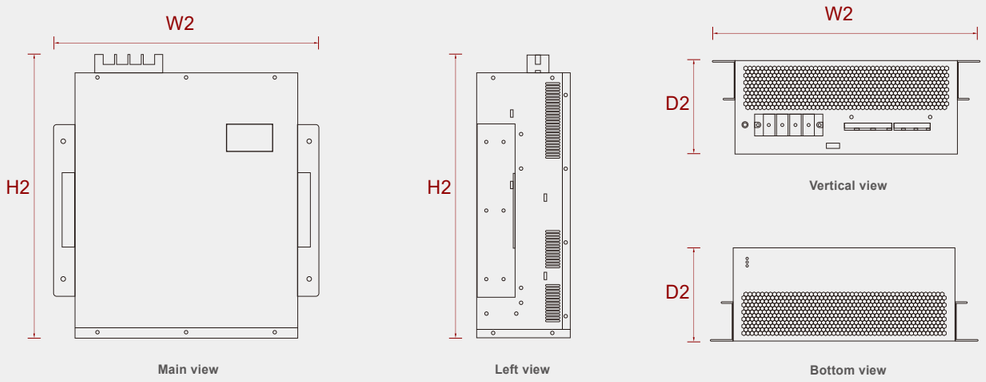




## Model Range:

| Model | Compensation capacity (A) | System voltage(V) | Size(D1*W1*H1)(mm) | Cooling mode |
|---|---|---|---|---|
| GEN AHF-23-0.22-2L-R | 23 | 220 | 396×260×160 | Forced air cooling |
| GEN AHF-50-0.4-4L-R(Compact) | 50 | 400 | 515×510×89 | Forced air cooling |
| GEN AHF-75-0.4-4L-R | 75 | 400 | 546×550×190 | Forced air cooling |
| GEN AHF-100-0.4-4L-R | 100 | 400 | 586×550×240 | Forced air cooling |
| GEN AHF-150-0.4-4L-R | 150 | 400 | 586×550×240 | Forced air cooling |
| GEN AHF-100-0.5-4L-R | 100 | 500 | 675×495×275 | Forced air cooling |
| GEN AHF-100-0.69-4L-R | 100 | 690 | 735×539×275 | Forced air cooling |

*The table is the standard specification, if you need other sizes, please contact us for customization

## AHF Wall-mounted

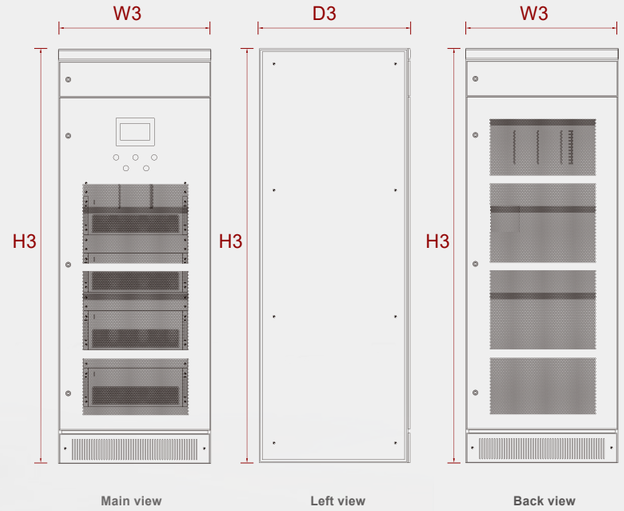

### Model Range:

| Model | Compensation capacity (A) | voltage(V) | Size(D2*W2*H2)(mm) | Cooling mode |
|---|---|---|---|---|
| GEN AHF-23-0.22-2L-W | 23 | 220 | 160×260×396 | Forced air cooling |
| GEN AHF-50-0.4-4L-W(Compact) | 50 | 400 | 89×510×515 | Forced air cooling |
| GEN AHF-75-0.4-4L-W | 75 | 400 | 190×513×599 | Forced air cooling |
| GEN AHF-100.-0.4-4L-W | 100 | 400 | 240×600×597 | Forced air cooling |
| GEN AHF-150-0.4-4L-W | 150 | 400 | 240×600×597 | Forced air cooling |
| GEN AHF-100-0.5-4L-W | 100 | 500 | 275×495×675 | Forced air cooling |
| GEN AHF-100-0.69-4L-W | 100 | 690 | 275×539×735 | Forced air cooling |

*The table is the standard specification, if you need other sizes, please contact us for customization



## AHF FLC




### Model Range:

| Model | Compensation capacity (A) | System voltage(V) | Size(D3*W3*H3)(mm) | Cooling mode |
|---|---|---|---|---|
| GEN AHF-100-0.4-4L-C | 100 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN AHF-150-0.4-4L-C | 150 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN AHF-200-0.4-4L-C | 200 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN AHF-250-0.4-4L-C | 250 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN AHF-300-04-4L-C | 300 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN AHF-400-0.4-4L-C | 400 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN AHF-300-0.5-4L-C | 300 | 500 | Cabinet 1 | Forced air cooling |
| GEN AHF-300-0.69-4L-C | 300 | 690 | Cabinet 1 | Forced air cooling |

*Cabinet 1 size: 800*1000*2200 mm,Can accommodate 5 modules.

*Cabinet 2 size: 800*1000*1600 mm,Can accommodate 3 modules.

*The table is the standard specification, if you need other sizes, please contact us for customization

# SVG

## Static Var Generators

**Reactive power compensation, harmonic control, three-phase unbalance control**

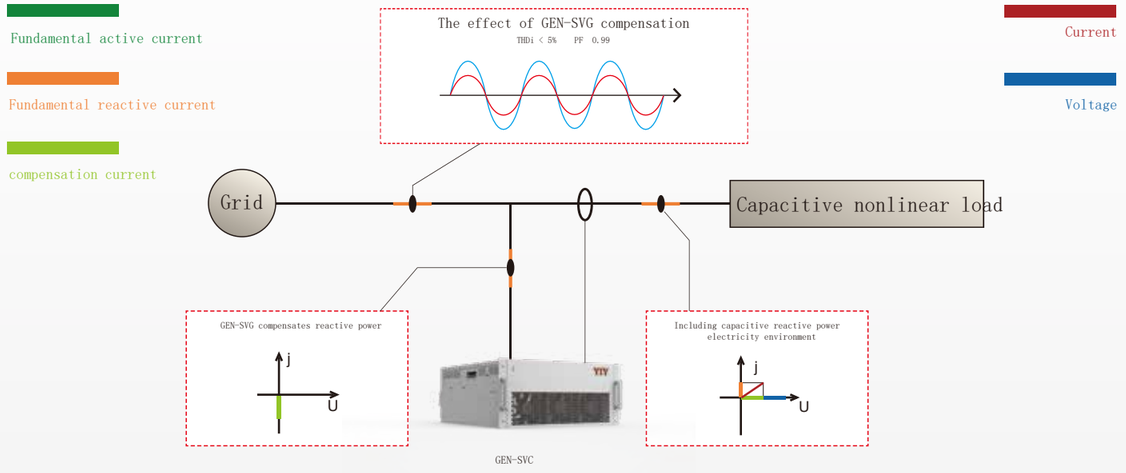
**Static var generators (SVG)**, also known as active power factor compensators (APFC) or instantaneous stepless reactive power compensators, are the ultimate answer to power quality problems caused by low power factor and reactive power demand for a wide range of segments and applications. They are a high performance, compact, flexible, modular and cost- effective type of active power filters (APF) that provide an instantaneous and effective response to power quality problems in low or high voltage electric power systems. They enable longer equipment lifetime, higher process reliability,improved power system capacity and stability, and reduced energy losses, complying with most demanding power quality standards and grid codes.

Low power factor increases the active energy losses of installations and affects their stability. It is typically caused by inductive or capacitive loads that demand extra reactive power to perform properly. Other contributors to low power factor are harmonic currents produced by nonlinear loads and the change of load in the electric power system.

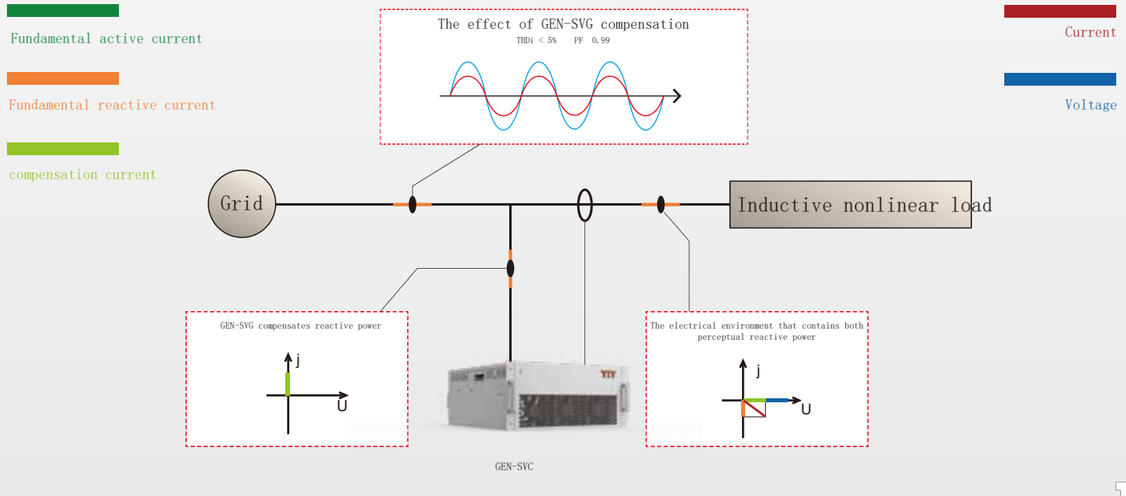

## GEN-SVG Working Principle:

The principle of the SVG is very similar to that of Active Power Filter, When the load is generating inductive or capacitive current, it makes load current lagging or leading the voltage. SVG detects the phase angle difference and generates leading or lagging current into the grid, making the phase angle of current almost the same as that of voltage on the transformer side, which means fundamental power factor is unit. GEN-SVG is also capable of correcting load imbalance.

GEN-SVG compensates capacitive reactive power and harmonics




GEN-SVG compensates inductive reactive power and harmonics



## GEN-SVG Technical Specifications:

| TYPE | Series 220V | Series 400V | Series 500V | Series 690V |
|---|---|---|---|---|
| **Max neutral wire current** | 5KVar | 10KVar15KVar/ 35KVar/50KVar/ 75KVar/100KVar | 90KVar | 120KVar |
| **Nominal voltage** | AC220V(-20%~+20%) | AC380V(-20%~+20%) | AC500V(-20%~+20%) | AC690V(-20%~+20%) |
| **Rated frequency** | 50Hz±5% | | | |
| **Network** | Single phaser | Three-phase three-wire/three-phase four-wire | | |
| **Response time** | <10ms | | | |
| **Reactive power compensation rate** | >95% | | | |
| **Machine efficiency** | >97% | | | |
| **Switching frequency** | 32kHz | 16kHz | 12.8kHz | 12.8kHz |
| **Feature selection** | Deal with harmonics | Deal with harmonics | | |
| **Numbers in parallel** | No limitation. A single centralized monitoring module can be equipped with up to 8 power modules | | | |
| **Communication methods** | Two-channel RS485 communication interface (support GPRS/WIFI wireless communication) | | | |
| **Altitude without derating** | <2000m | | | |
| **Temperature** | -20~+50°C | | | |
| **Humidity** | <90% RH,The average monthly minimum temperature is 25℃ without condensation on the surface | | | |
| **Pollution level** | Below level Ⅲ | | | |
| **Protection function** | Overload protection, hardware over-current protection, over-voltage protection, power grid voltage imbalance protection, power failure protection, over-temperature protection, frequency anomaly protection, short circuit protection, etc | | | |
| **Noise** | <50dB | <60dB | <65dB | |
| **Installation** | Rack/wall hanging | | Rack | |
| **Into the way of line** | Back entry (rack type), top entry (wall-mounted) | | Top entry | |
| **Protection grade** | IP20 | | | |

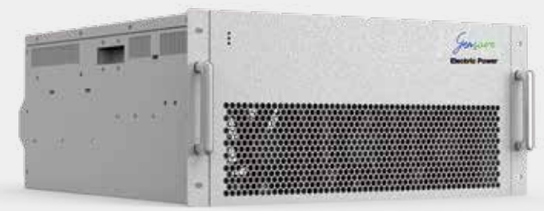
### Type Code:

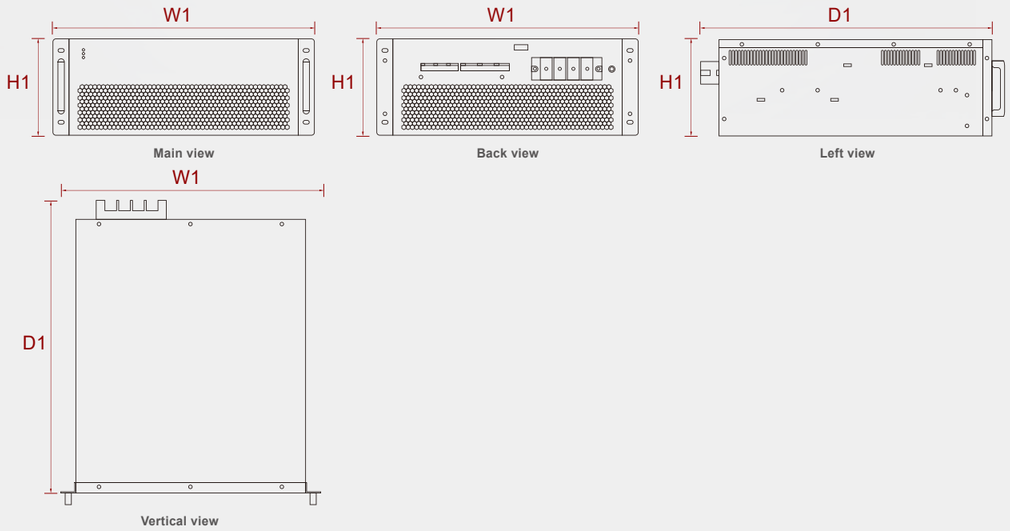
GEN SVG-075-0.4-4L-W

- W:Wall-mounted
- R:Rack-mounted
- C:FCL device
- 3L:Three phase three wire system
- 4L:Three phase four wire system
- 0.4:400V voltage class
- 0.5:500V voltage class
- 0.69:690V voltage class
- Nominal capacity(kVar):035/050/075/100
- Static var compensator
- GENen Electric Brand name

## GEN-SVG Product Appearance

SVG Rack-mounted



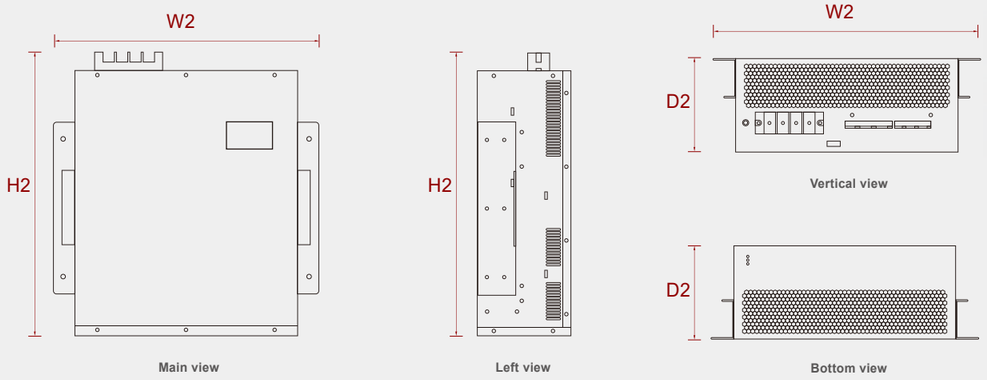



### Model Range:

| Model | Compensation capacity(kvar) | System voltage(V) | Size(D1*W1*H1)(mm) | Cooling mode |
|---|---|---|---|---|
| GEN SVG-5-0.22-2L-R | 5 | 220 | 396×260×160 | Forced air cooling |
| GEN SVG-35-0.4-4L-R(Compact) | 35 | 400 | 515×510×89 | Forced air cooling |
| GEN SVG-50-0.4-4L-R | 50 | 400 | 546×550×190 | Forced air cooling |
| GEN SVG-75-0.4-4L-R | 75 | 400 | 586×550×240 | Forced air cooling |
| GEN SVG-100-0.4-4L-R | 100 | 400 | 586×550×240 | Forced air cooling |
| GEN SVG-90-0.5-4L-R | 90 | 500 | 675×495×275 | Forced air cooling |
| GEN SVG-120-0.69-4L-R | 120 | 690 | 735×539×275 | Forced air cooling |

*The table is the standard specification, if you need other sizes, please contact us for customization

## SVG Wall-mounted

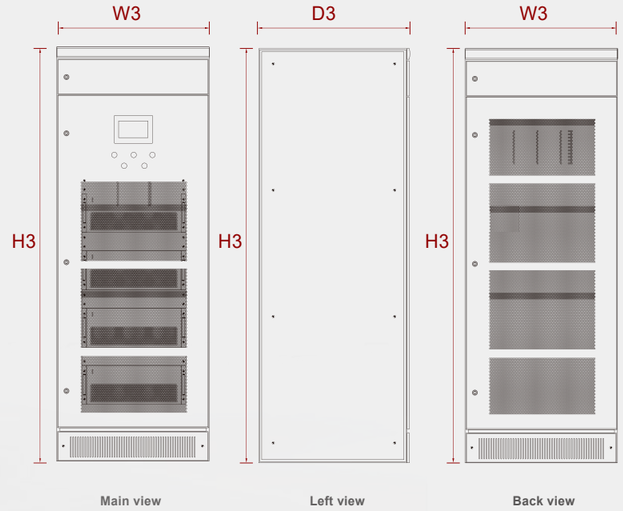

### Model Range:

| Model | Compensation capacity(kvar) | System voltage(V) | Size(D2*W2*H2)(mm) | Cooling mode |
|---|---|---|---|---|
| GEN SVG-5-0.22-2L-W | 5 | 220 | 160×260×396 | Forced air cooling |
| GEN SVG-35-0.4-4L-W(Compact) | 35 | 400 | 89×510×515 | Forced air cooling |
| GEN SVG-50-0.4-4L-W | 50 | 400 | 190×513×599 | Forced air cooling |
| GEN SVG-75-0.4-4L-W | 75 | 400 | 240×600×597 | Forced air cooling |
| GEN SVG-100-0.4-4L-W | 100 | 400 | 240×600×597 | Forced air cooling |
| GEN SVG-90-0.5-4L-W | 90 | 500 | 275×495×675 | Forced air cooling |
| GEN SVG-120-0.69-4L-W | 120 | 690 | 275×539×735 | Forced air cooling |

*The table is the standard specification, if you need other sizes, please contact us for customization



## SVG FLC




### Model Range:

| Model | Compensation capacity(kvar) | System voltage(V) | Size(D3*W3*H3)(mm) | Cooling mode |
|---|---|---|---|---|
| GEN SVG-50-0.4-4L-C | 50 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN SVG-100-0.4-4L-C | 100 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN SVG-200-0.4-4L-C | 200 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN SVG-250-0.4-4L-C | 250 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN SVG-300-04-4L-C | 300 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN SVG-400-0.4-4L-C | 400 | 400 | Cabinet 1/ Cabinet 2 optional | Forced air cooling |
| GEN SVG-270-0.5-4L-C | 270 | 500 | Cabinet 1 | Forced air cooling |
| GEN SVG-360-0.69-4L-C | 360 | 690 | Cabinet 1 | Forced air cooling |

*Cabinet 1 size: 800*1000*2200 mm,Can accommodate 5 modules.

*Cabinet 2 size: 800*1000*1600 mm,Can accommodate 3 modules.

*The table is the standard specification, if you need other sizes, please contact us for customization