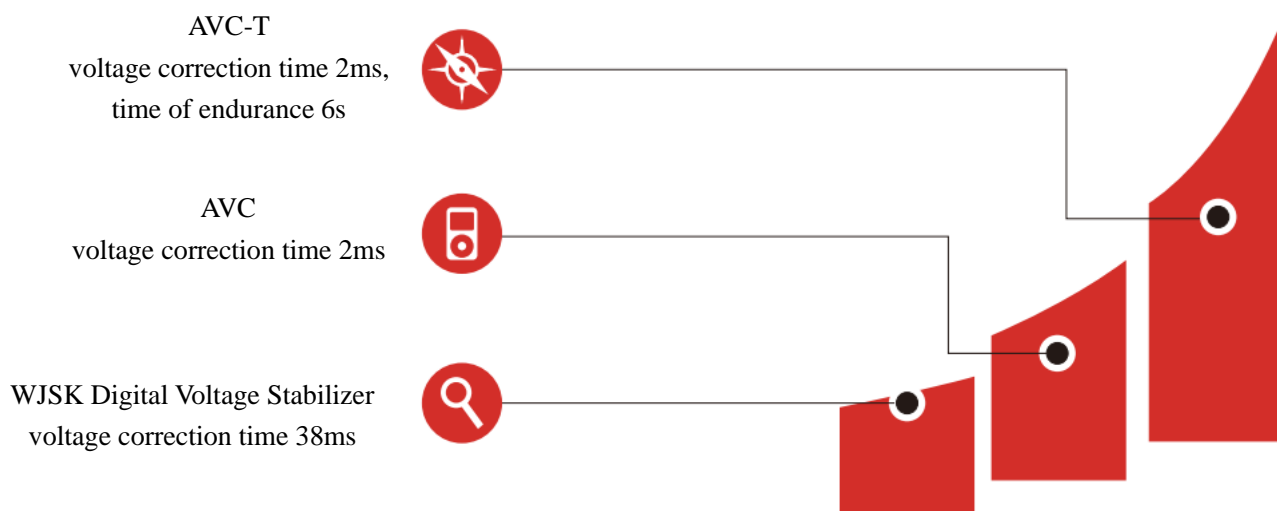


A Full Series of Solutions for Voltage Issues



Integrated Introduction to Voltage Sag

Overview to Voltage Sag

With the rapid development of the modern power industry and significant changes in the load structure of electrical systems, the dependence on electronic equipment in factories and office automation has grown rapidly. Voltage sags have become a major concern of power users. The entire process of electricity, from generation to consumption, spans vast geographical areas. During this journey, the entire transmission system commonly encounters unexpected events such as lightning, storms, strong winds, construction activities and human errors. These events can lead to short-circuit faults and result in voltage sag phenomena, some of which are significant enough to affect the normal operation of sensitive equipment.

In the current power grid, voltage sags/surges are common voltage issues. Abnormal increases in the effective value of voltage can directly damage equipment. Voltage sags, which can lead to electrical equipment failure or shutdown, occur over 10 times more often than complete main grid outages. According to authoritative data from EPRI (Electric Power Research Institute), over 92% of power quality events are voltage sags and surges, while other power quality events account for less than 8%. Voltage sags have been identified by numerous international research institutions as the most widespread events in power systems. Therefore, it is particularly important to protect sensitive equipment from voltage sags/surges. Our company can provide comprehensive three-dimensional solutions for voltage sags, ranging from various levels of sag measures to power quality monitoring, data analysis, effectively addressing the economic and production losses caused by voltage sags.

Comparison of Voltage Sag Control Plans

S/N	Control Plan	Voltage Correction Time	Correctable Voltage Range	Time of Endurance during Power Outage	Safety	Operation and Maintenance Cost	Environmental Requirements	Purchase Cost
1	AVC	2ms	50%-150%	0	Direct access to mains power, good reliability	1% power loss	Small footprint	Medium
2	AVC-T	2ms	0-150%	6s	Direct access to mains power, good reliability	1% power loss Replace the capacitor	Small footprint	High
3	UPS	2ms	Unlimited	Adjustable	AC/DC conversion, average reliability	5% power loss Replace the battery	There are rectifier harmonics, large footprint	High
4	Digital Control Voltage Stabilizer	38ms	50%-150%	0	Direct access to mains power, good reliability	1% power loss	Small footprint	Small

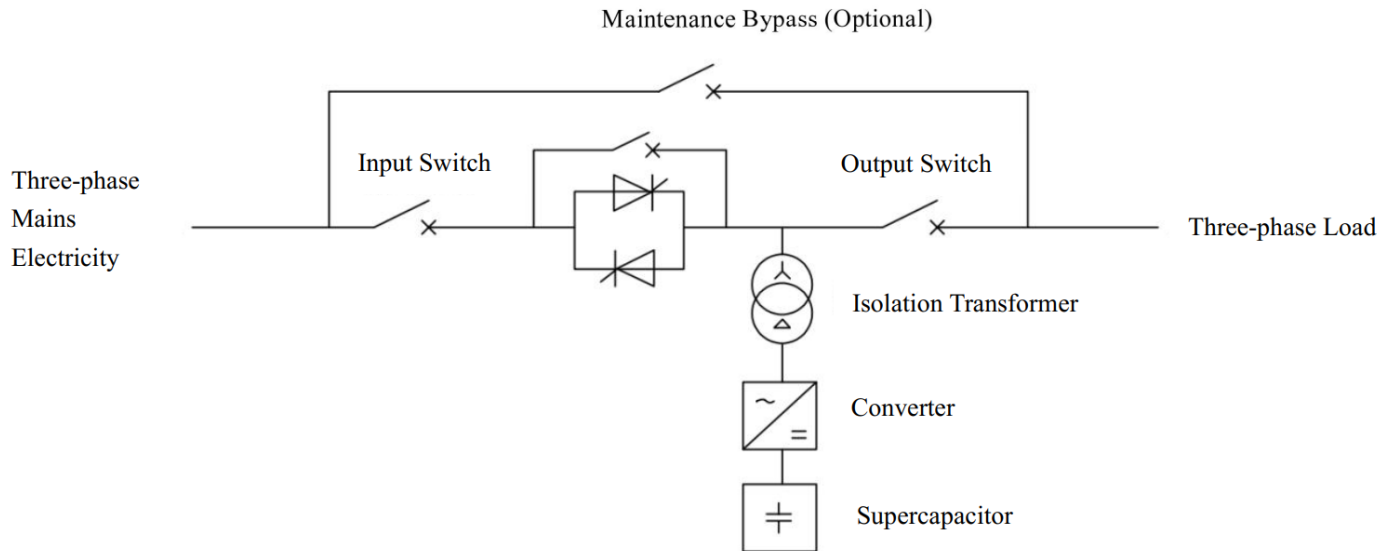
Dynamic Voltage Regulator AVC-T



Working Principle

● Grid operation mode

When the grid voltage is within the normal range, the AVC-T is in a standby state, the control thyristor SCR is in a conductive state, the inverter does not work, and the supercapacitor is in a fully charged state. The output voltage is the grid voltage.



AVC-T Performance Features:

- **Safe:** The main path is straight through and the current in the bypass path is continuous
- **Convenient:** Supercapacitor and lithium battery are optional
- **Recording:** Grid voltage sag and surge wave recording function
- **Stable:** 0-100% residual voltage to 100%, rated voltage perfect compensation, 6s of endurance
- **Energy-saving:** Efficiency 99.4%
- **Speed:** Typical voltage correction time 2ms

AVC-T Technical Specifications

System parameters	
Rated A.C. input line voltage	208V/220V/380V/400V/480V/600V/690V
Input voltage range	-20% to +20%
Power grid frequency	50/60Hz ($\pm 10\%$)
System line system	3 phases and 3 lines/3 phases and 4 lines
System indexes	
System capacity	30/60/100/150/200/300/400/500/600/800/1000/1500/2000/3000/4000 kVA
Overall efficiency	>99.4%
Fast response time	< 250 μ s
Voltage correction time	2ms
Voltage regulation accuracy	Continuously regulative, gradient 0.1V
Voltage sag compensation capability	Compensate to 100% from the residual voltage 0 to 130% for 3-30s. Support time for standard machines 3s. It can be tailored for other needs
Fault bypass	Yes
Maintenance bypass	Optional
Noise	<65dB
Heat radiation	Smart air cooling
Telecommunication monitoring capacity	
User interface	7-inch color touch screen, multiple languages available
Touch panel	All-parameter control, system event log, and voltage event log
Event and data recording	Yes
Wave recording and display	Yes
Telecommunication interface	Network port, RS485
Telecommunication protocol	Modbus Protocol, TCP
Dry contact	Operation status and fault dry contact
Mechanical features	
Installation mode	Total cabinet
Incoming wiring mode	Lower wiring
Protection level	IP20 (top ventilation)
Color	Light grey (China national standard 7035)/or customization
Environmental requirements	
Altitude	<1,500m, within the range from 1,500m-3,000m, as per China national standard GB/T3859.2, for each 100m raised, power decreased by 1%
Operation temperature	-10°C to +40°C
Relative humidity	5%-95%, without condensation

AVC-T Compensation Capability

Grid voltage events	Residual voltage	Output voltage	Voltage correction endurance
Three-phase grid voltage sag	130% residual voltage	100%	3s or customization
	90% residual voltage	100%	3s or customization
	50% residual voltage	100%	3s or customization
	0% residual voltage	100%	3s or customization
Single-phase grid voltage sag	50% residual voltage	100%	3s or customization
	30% residual voltage	100%	3s or customization
	60%~120% residual voltage	100%	3s or customization

AVC-T Product Features

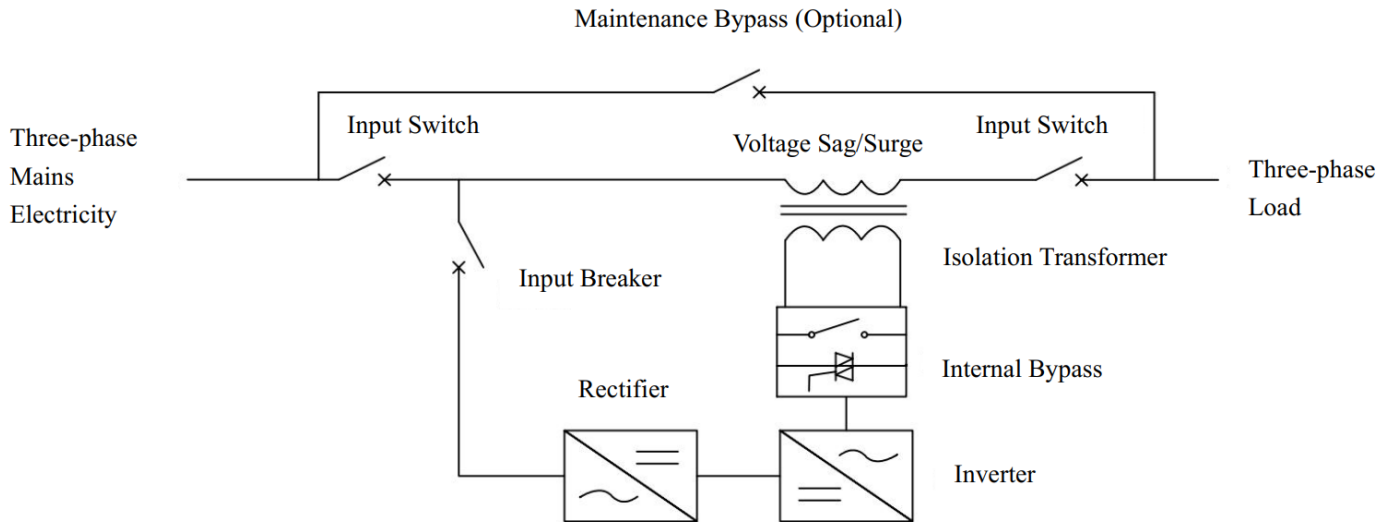
Product features	Benefits to users
Supercapacitor energy storage element is used	Maintenance-free, low operation costs, free of environmental pollution
High reliability	Low fault rate, without power failure by AVC-T fault
Isolation transformer is used	AC and DC isolation
High efficiency, low loss	Long-term operation, saving energy
Plug-in module design	Higher power density for further maintenance
Standard endurance of 3s	It can effectively solve continuous voltage sag and instantaneous voltage interruption

Dynamic Voltage Regulator AVC



Working Principle

AVC detects real-time grid voltage based on the coordinated operation of rectifiers and inverters. When the grid voltage deviates from the nominal voltage, it immediately controls the inverter to inject corrective voltage into the main circuit through a series-connected compensating transformer. This rapid and precise compensation brings the load voltage back to the nominal voltage, ensuring normal operation of the load without being affected by voltage anomalies.



AVC Performance Features:

- **Safe:** The main path is straight through and the current in the bypass path is continuous
- **Convenient:** No consumables, small footprint
- **Recording:** Grid voltage sag and surge wave recording function
- **Stable:** at 20% residual voltage, it can stabilize voltage continuously; when the residual voltage is 50%, it can output 90%; when the residual voltage is 60%, it can output 100%
- **Energy-saving:** Efficiency 99%
- **Speed:** Typical voltage correction time 2ms

High-capacity AVC Technical Specifications

System parameters	
Rated A.C. input line voltage	400V
Input voltage range	-20% to +20%
Power grid frequency	50/60Hz (±10%)
System line system	3 phases and 3 lines/3 phases and 4 lines
System indexes	
System capacity	30/60/100 150/200/300/400/500/600/1000/2000/3000KVA
Overall efficiency	>99%
Voltage correction time	2ms
Voltage drop response time	<250μs
Voltage regulation accuracy	0.1V
Continuous adjustment range	±20%
Fault bypass	Yes
Maintenance bypass	Standard configuration (optional for some models)
Noise	<65dB
Heat radiation	Smart air cooling
Telecommunication monitoring capacity	
User interface	7-inch color touch screen
Touch panel	All-parameter control, system event log, and voltage event log
Event and data recording	Yes
Wave recording and display	Yes
Telecommunication interface	Network port, RS485, CAN
Telecommunication protocol	Modbus Protocol, TCP
Dry contact	Operation status and fault dry contact
Mechanical features	
Installation mode	Total cabinet
Incoming wiring mode	Lower wiring
Protection level	IP20 (top ventilation)
Color	Light grey (China national standard 7035)/or customization
Environmental requirements	
Altitude	<1500m, within the range from 1500m-3000m, as per China national standard GB/T3859.2, for each 100m raised, power decreased by 1%
Operation temperature	-10°C-+40°C
Relative humidity	5%-95%, without condensation

Product Features

Product features	Benefits to users
Excl. battery and other energy storage components	Maintenance-free, low operation costs, free of environmental pollution
High reliability	Low fault rate, without power failure by AVC fault
Fewer floor area required	Installed in power distribution room or dustless workshop, saving much space
High efficiency, low loss	Long-term operation, saving energy
Plug-in module design	Higher power density for further maintenance

High-capacity AVC Compensation Capability

Grid voltage events	Residual voltage	Output voltage	Voltage correction endurance
Three-phase grid voltage sag	80%~120% residual voltage	100%	Continuous
	70% residual voltage	100%	280s
	60% residual voltage	100%	45s
	50% residual voltage	90%	8s
	30% residual voltage	50%	200ms
Single-phase grid voltage sag	60%~120% residual voltage	100%	Continuous
	50% residual voltage	90%	Continuous
	30% residual voltage	50%	200ms