

Sinexcel

AVC-RTS
Real-time Active Voltage Conditioner

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Real-time Active Voltage Conditioner

MH

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**IDEAL SOLUTION
FOR VOLTAGE SAG
TO MAINTAIN
POWER RELIABILITY**

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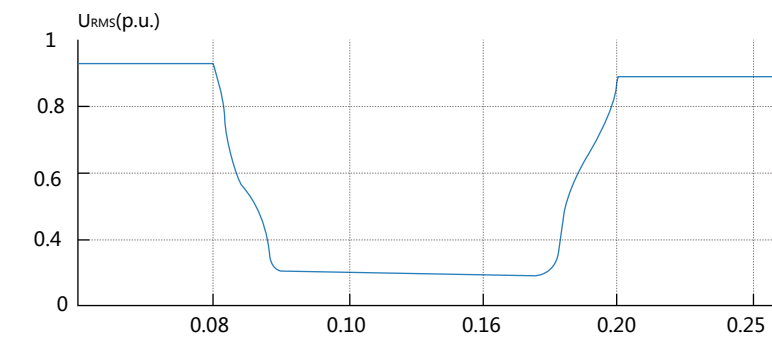
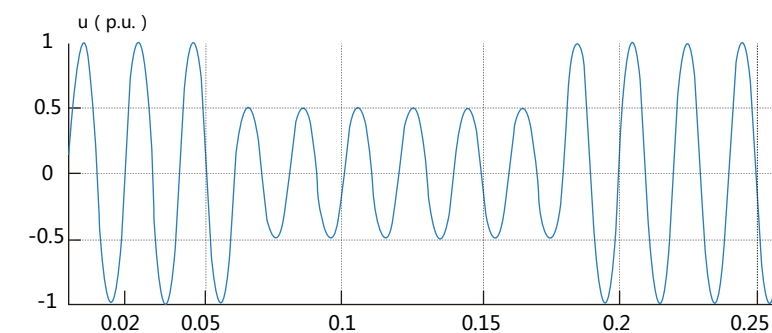
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WHAT IS VOLTAGE SAG?

IEEE standard and GB/T30137-2013 specified that voltage sag means the voltage RMS is temporarily reduced to 10% ~ 90% of the rated voltage and the duration time lasts for 10ms ~ 1min.



According to the authoritative data of EPRI (American Electric Power Research Institute) that more than 92% of power quality problems are voltage sag and voltage swell, other power quality events account for less than 8%. Voltage sag has been identified by many international research institutions as the most common event in power systems.

Sinexcel AVC-RTS

Support your factory with reliable power environment to help you maintain uptime as every minute counts



Control module: Collect operating information of the system / Analyze and upload message to the monitor

Thyristor Module: Ensure fast switching of the system / Prevent the super capacitor output voltage flow back to grid

Option: Maintenance bypass: Redundancy protection / Ensure the system reliability



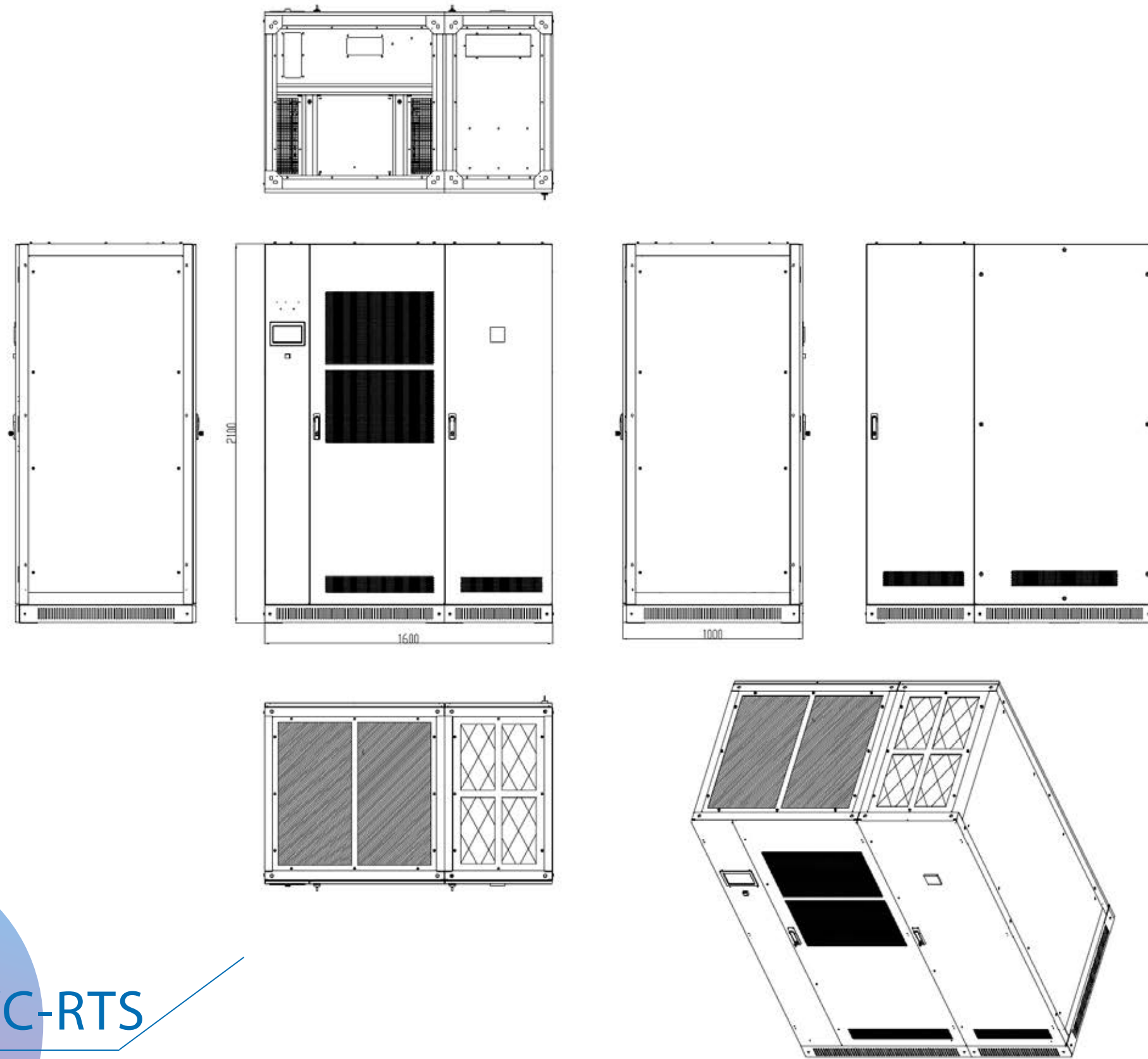
Super capacitor: Work as an energy storage module
MTBF: 100000 hours

Inverter module: Provide bi-directional energy flow /
Ensure short discharge time

Isolation transformer: Isolating the direct current /
Stabilize the output voltage

Perfect compensation 0~130% residual voltage to 100% rated voltage
Fast switching time less than 100us, full response time less than 5ms
Strong over-voltage regulation ability, rated voltage can be set between -15% and 15%
Redundancy design with high reliability, free maintenance and low cooling cost of super capacitor





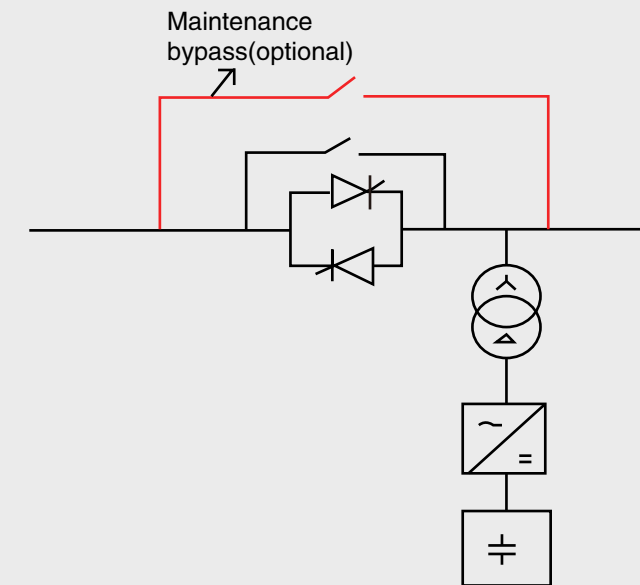
Sinexcel **AVC-RTS**
300KVA Dimension

SPECIFICATION

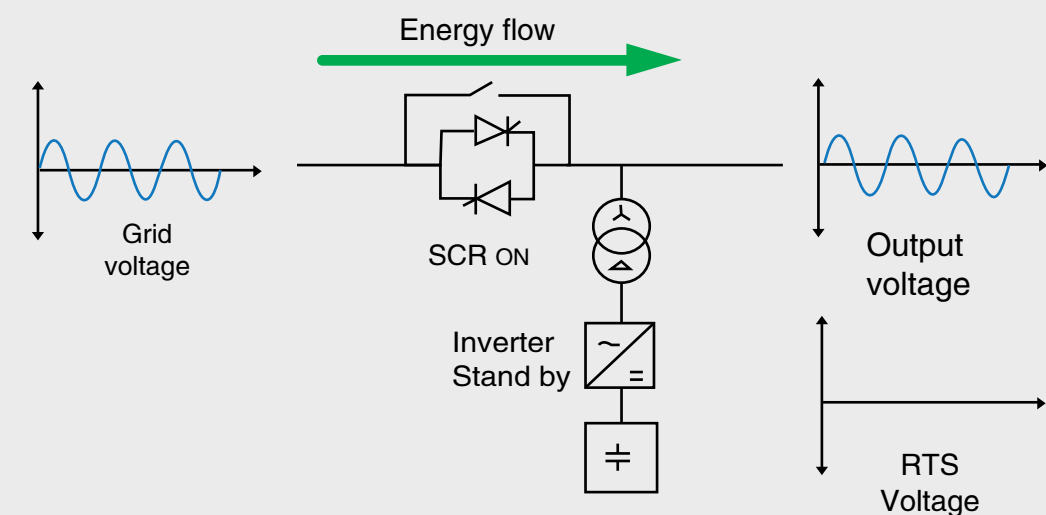
WORKING PRINCIPLE

System parameter	
Rated input voltage range	208V/220V/380V/400V/480V/600V/690V
Input voltage range	-20%~+20%
Frequency	50/60Hz(45Hz ~ 65Hz)
Efficiency	>99%
Network structure	3P3L/3P4L
Topology design	3-level
Performance index	
System capacity	50/60/100/150/300/450/600/750/900/1200/1500/1800/2100/2400 kVA
Function	Voltage sag compensation, Voltage swell compensation
Compensation capability	Compensate 0~130% residual voltage to 100% voltage lasting for 3s to 30s as standard module can support 3s. Other requirement can be customized.
Target voltage	-40%~+20%
Switch voltage value	Continuously adjustable gradient 0.1V
Quick response time	<100μs
Whole response time	<5ms, normally 2ms
Breakdown bypass	enable
Maintain bypass	Can be selected
Noise level	<65db
The cooling way	Fan cooling
Communication capability	
Screen	7-inch full color touch screen
Language	Chinese/English
Parameter setting and data display	Status information, Operation information, Events recording, etc.,
The event log and data records	Comply
Wave record and display function	Optional
Interface	RS485/Ethernet
Communication protocol	Modbus、TCP/IP
Dry contact	Working status and breakdown points
Protection function	ShInverter short-circuit protection / Inverter bridge reverse protection, / Over-voltage/under-voltage protection (DC bus) / Over-loaded protection / Cooling system protection / Leakage current protection / Lightning strike protection / Control system fault protection / Over-temperature protection / Thyristor failure protection, / Bypass fault protection, etc.,
Mechanical properties	
Mounting	Cabinet
Cable entry way	Bottom entry/can be customized
Color	Lightgray, can be customized
Altitude	<1500m, derating 1%/100m
Ambient temperature	-10 ~ +40 °C
Relative humidity	5%~95%, non-condensing
Protection class	IP20, can be customized
Relevant qualifications and standards	
Standards	DL/T12292013, Q/GDW681—2011, En50178. CISPR11,C-Tick, CE, Semi F47

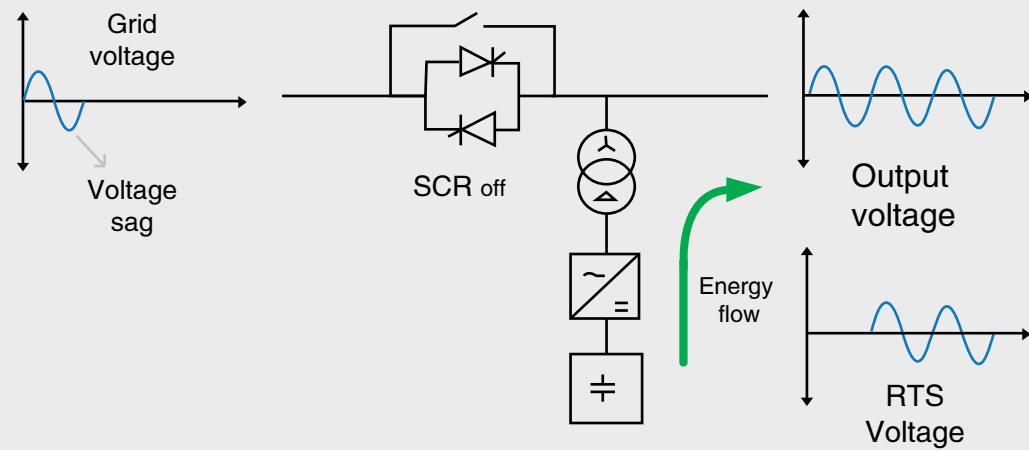
Sinexcel AVC-RTS is composed by inverter, injection transformer, super capacitor, SCR. For 50/60/100KVA module, maintenance bypass is a standard configuration. For large capacity module, maintenance bypass is an option.



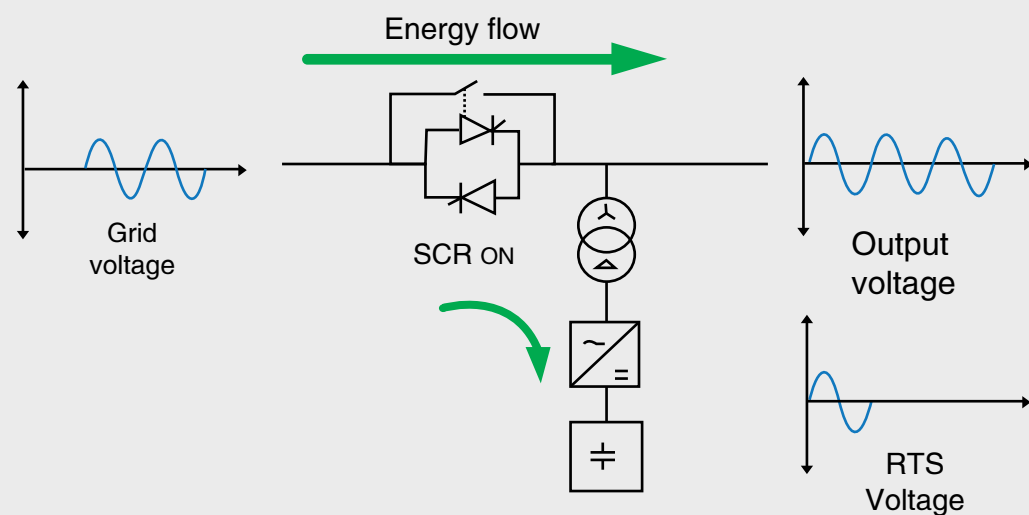
When the grid voltage is within the normal range, AVC-RTS standby, the control thyristor turn on, the inverter is not working, and the super capacitor is in full power state. The output voltage is the grid voltage.



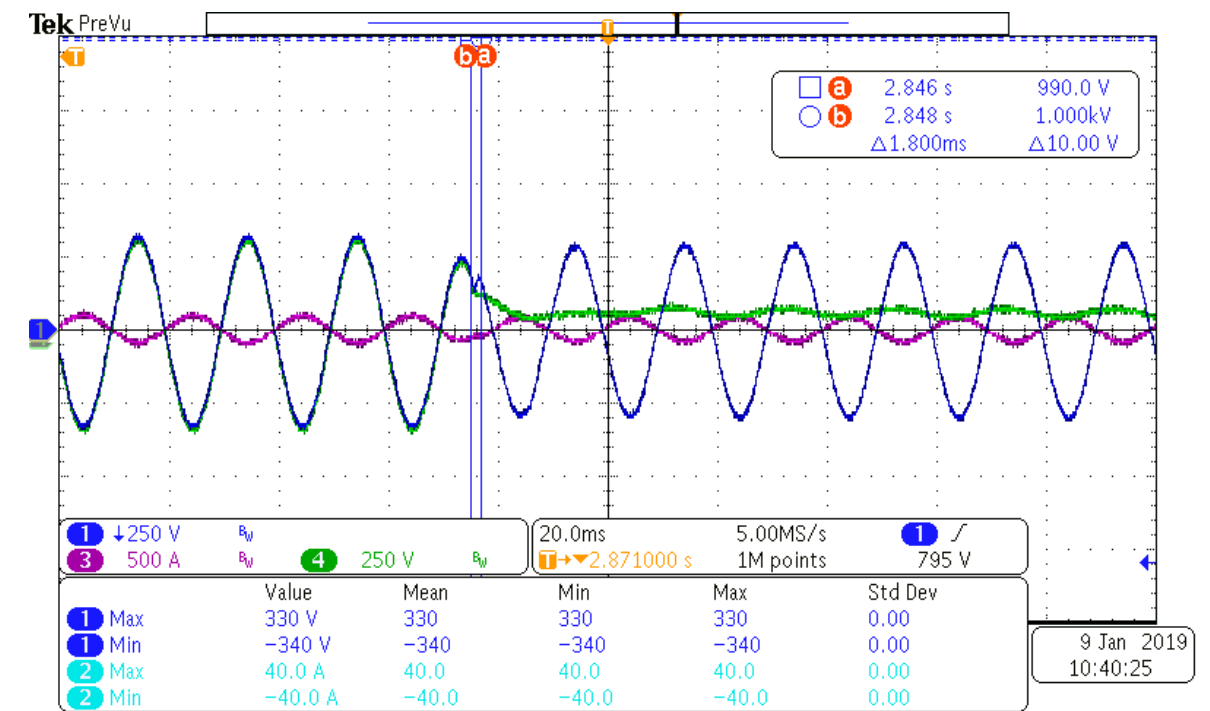
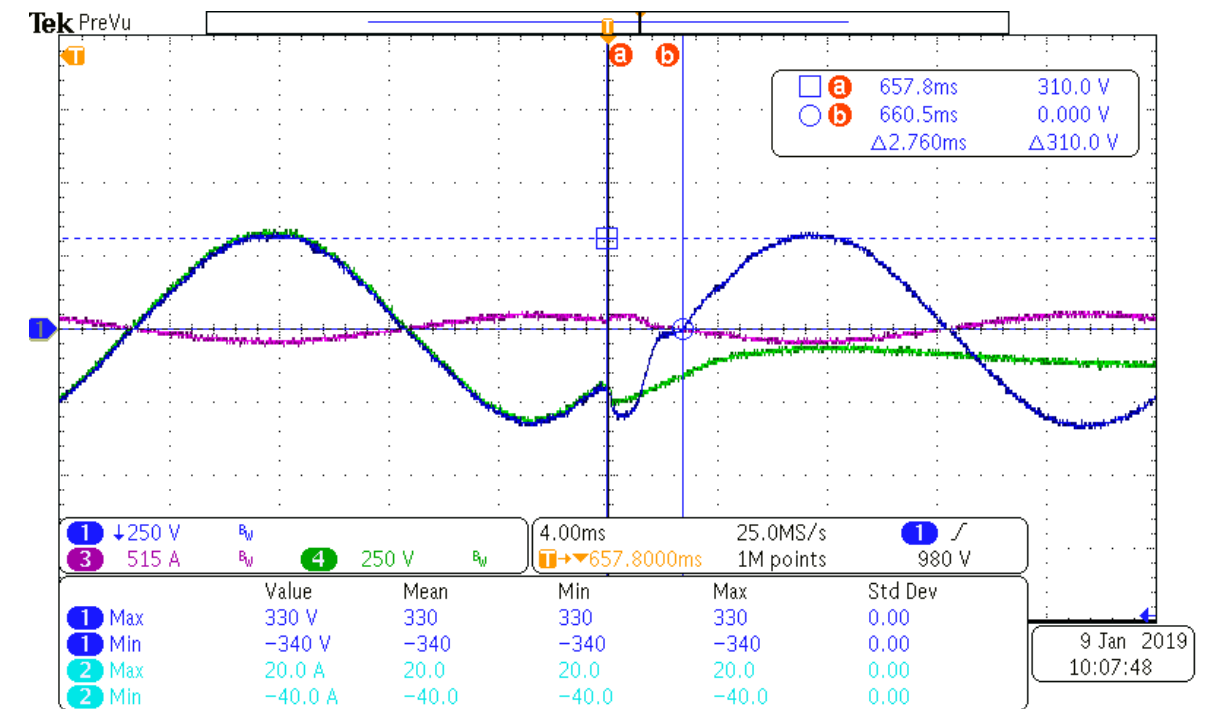
When voltage sag occurs, AVC-RTS immediately controls the thyristor to turn off, and the grid voltage is completely isolated from the load. Within 5ms, after being discharged by the inverter, a preset voltage is output to the load through an injection transformer. The voltage support of AVC-RTS completely avoids the harm to the load caused by voltage sag.



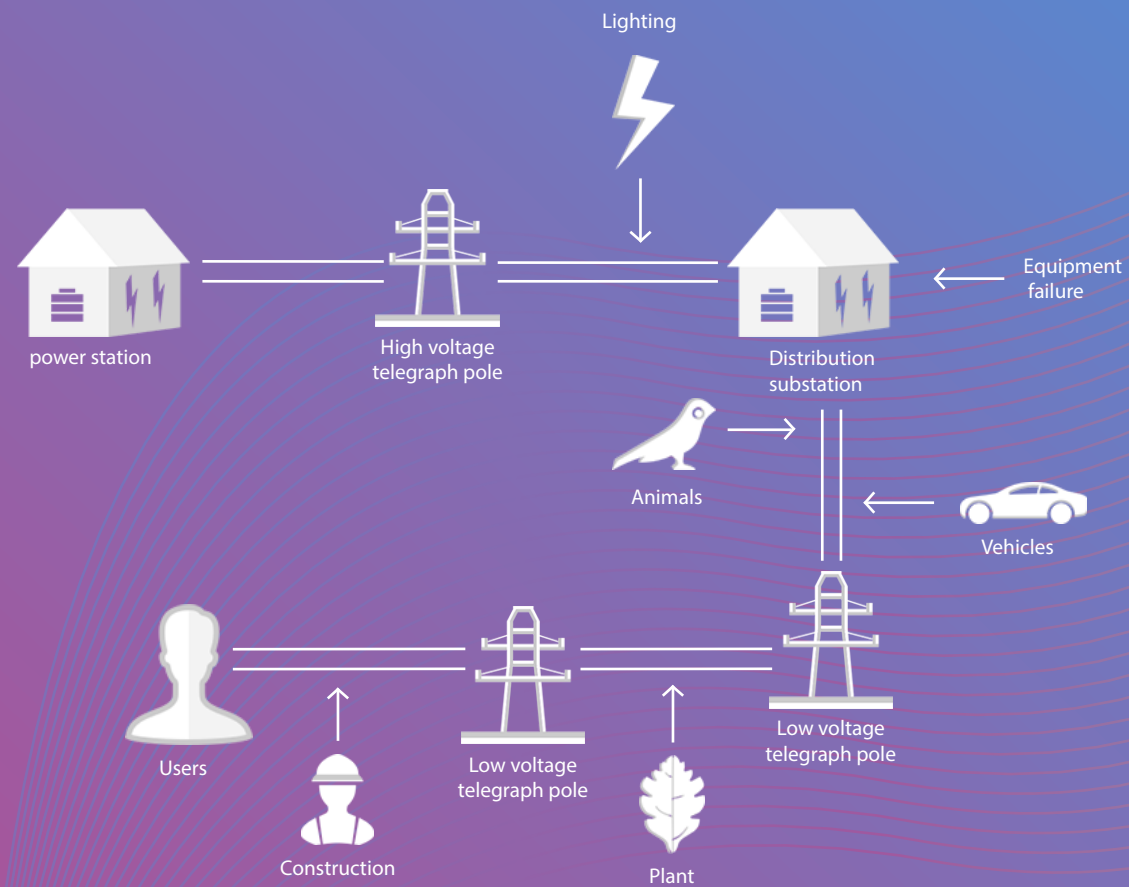
When the grid voltage returns to normal value, AVC-RTS stops working and controls the thyristor to turn on, the output voltage returns to the grid voltage, and the super capacitor begins to charge in preparation for the next voltage sag.



COMPENSATION EFFECT



THE CAUSE OF VOLTAGE SAG



Voltage sag is generally caused by the failure of power grid, substation facilities or sudden large changes in load. In the process of long-distance transmission, there are many unpredictable situations, such as power system fault, lightning strike, large motor starts, capacitor switching and other events in the transmission and distribution system.

COMMON CAUSE



Power system cause:

Starting of heavy machine and short circuit fault.

Natural cause:

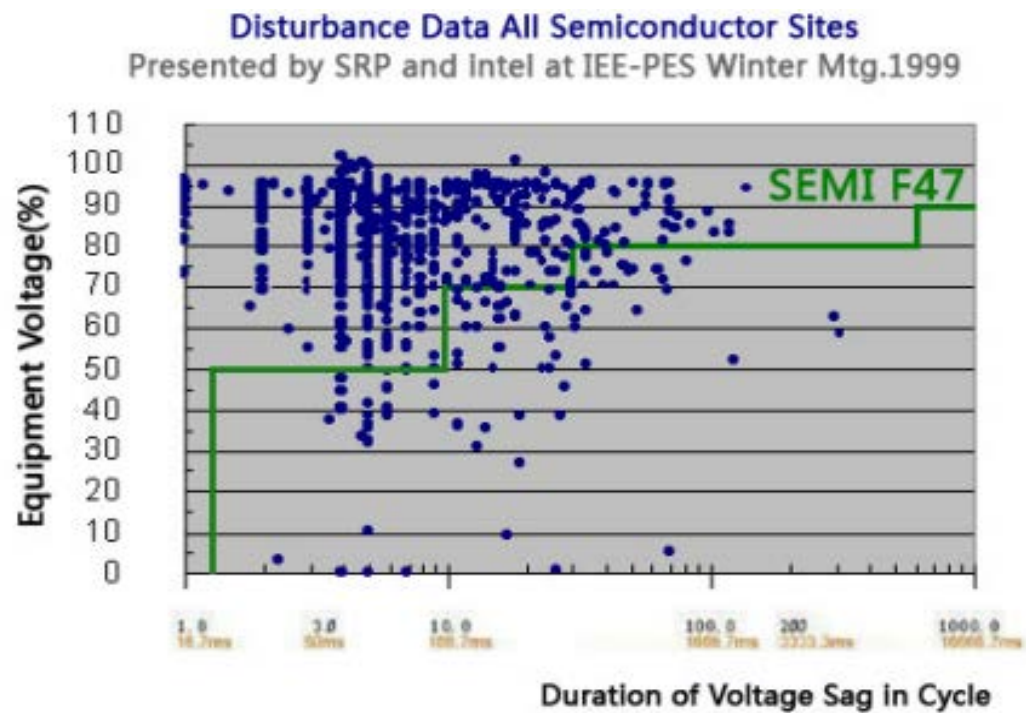
Extreme weather like lightning strikes, hurricanes and storms cause a short circuit to the ground in the transmission line, activated the protective action, causing voltage sag around the fault point. (The most common cause from Sinexcel reference)

Unpredictable accident:

Traffic accident may damage the electric pole; Construction accidents like hoist machine contact the overhead line and excavation construction can destroy the underground electric cable; Animals invasion to the transmission line. All of these sudden and inevitable accidents may cause short circuit which lead to voltage sag.

WHY IS AVC THE PERFECT SOLUTION FOR VOLTAGE SAG?

SEMI (Semiconductor Equipment and Materials International) going research 22 sites in America with 1076 voltage sag incident. 93% of them is above the green line(SEMI standard). Only 6 of them is outage and within 1s. Only 3 of them is over 2s.



Specialty of voltage sag

1. Duration mainly less than 2s
2. High depth
3. Unpredictable

Specialty of AVC

1. Standard compensation time is 3s
2. Full compensation 0~130% residual voltage to 100% rated voltage
3. Quick response, full response time less than 5ms

As UPS applied for voltage interruption, Sinexcel AVC is an OFF-Line unit specifically designed to correct voltage sag and voltage swell with 99% efficiency.

CAPACITY SIZE PARAMETER TABLE

Capacity (KVA)	Description	Cabinet Dimension (W*D*H)	Number (pcs)	Standard Cabinet (mm)
AVC-RTS 50	Main cabinet	600*800*1800	1	1200*800*1800
	Capacitors	600*800*1800	1	
AVC-RTS 100	Main cabinet+Capacitors	800*1000*2200	1	800*1000*2200
AVC-RTS 150	Main cabinet	1000*1000*2100	1	1600*1000*2100
	Capacitors	600*1000*2100	1	
	Maintenance Bypass (optional)	600*1000*2100	1	2200*1000*2100
AVC-RTS 300	Main cabinet	1000*1000*2100	1	1600*1000*2100
	Capacitors	600*1000*2100	1	
	Maintenance Bypass (optional)	600*1000*2100	1	2200*1000*2100
AVC-RTS 450	Main cabinet	1200*1000*2100	1	2400*1000*2100
	Capacitors	600*1000*2100	2	
	Maintenance Bypass (optional)	600*1000*2100	1	3000*1000*2100
AVC-RTS 1.8M	Main cabinet	1000*1000*2100	6	6200*1000*210
	Capacitors	600*1000*2100	6	
	Maintenance Bypass	1000*1000*2100	1	7200*1000*210
AVC-RTS 2.4M	Transformer	1200*1000*2100	1	8200*1000*2100
	System bypass cabinet	1000*1000*2100	1	
	Module cabinet	1000*1000*2100	2	
	Capacitors	1000*1000*2100	3	
	Maintenance Bypass	1000*1000*2100	1	

HOW VOLTAGE SAG CAUSE YOUR FINANCIAL LOSS?

Production loss

Affect the normal operation of equipment, resulting in product quality and quantity decline;
 Damage and waste of precision products and scrap of raw materials;
 Production line cleaning and restarting can make the delivery delayed which may cause the loss of the order.

Damage to electrical equipment

The automatic device stops or maloperation, the frequency converter shutdown;
 Computer system failure, data loss, motor of production line shutdown, programmable logic controller (PLC) failure;
 Make electrical equipment life shortened or even damaged.



For time-sensitive products, the time to restart the machine and reorganize the process line can totally ruin the value of products, such as newspapers and magazines.

For user like high-tech enterprises have strict requirements on delivery date normally have multiple suppliers and may choose other suppliers in case of delivery delay.



For high value production, the economic losses caused by the decrease of yield could be huge. Normally the equipment can also get damaged.

For process production, once the conveyor belts get tripped, it not only ruin the products, but also the materials.

For long cycle production, the sag could ruin all the efforts, not only the materials, but also the time has spent.

HOW VOLTAGE SAG
CAUSE YOUR FINA

INDUSTRIAL ANALYSIS



Semiconductor manufacturer

Characteristic: Ultra-fine processing and high cleanliness production environment requirements, high quality demand of power supply.

Requirement: Explicit loss: product damaged, decrease in production

Recessive loss: delivery time delayed and order lost



Automotive Industry

Characteristic: Flexible automatic control and chain supply line management.

Requirement: The sag affects the welding quality of robot welder, and even requires restart of the welding procedure. And it makes the paint line stop suddenly which takes a long time to clean up.



CNC machine

Characteristic: Voltage sensitive

Requirement: CNC tools damaged, materials scrapped. (Laser cutting is an industry with similar characteristics)



Food & Beverage industry

Characteristic: Low price, great quantity, sterilization process is strictly controlled.

Requirement: Processing and packaging lines are easily



Printing & Packing

Characteristic: High speed printing presses plus high speed block cutting, folding and gluing machines.

Requirement: The conveyor belts may get tripped, the packaging materials can be ruined. And it needs a long time to reorganize the procession line.



Water treatment

Characteristic: UV lamps are commonly used in the sterilization process nowadays.

Requirement: UV lamps are very sensitive to voltage sags, once voltage sag happens, the outage of UV lamp



Pharmaceutical

Characteristic: High cleanliness and sterility requirement, long pharmaceutical cycle.

Requirement: The system cannot be shut down or suffer any disturbance or product will be lost during this period.



Hospital

Characteristic: Equipment like MRI, CT, X-ray all have significant starting currents.

Requirement: Any interruption in the course of treatment is a significant risk to the patient and the device



HVAC system (Heating Ventilation and Air Conditioning)

Characteristic: VFD driven & controlled

Requirement: VFD is a voltage sensitive device, the sag can make VFD control of HVAC system to shutdown.

CASE TABLE

Industry	Installation site	Capacity
Cigarette factory	Wuhan	Sinexcel AVC-RTS 1*300kVA
Beverage packaging	Inner Mongolia	Sinexcel AVC-RTS 1*300kVA
Power Supply manufacture	Shenzhen	Sinexcel AVC-RTS 1*300kVA
LED panel	Taiwan	Sinexcel AVC-RTS 1*300kVA
Semiconductor	Shanghai	Sinexcel AVC-RTS 2*300kVA
Automobile industry	Guangzhou	Sinexcel AVC-RTS 5*60kVA
Automobile industry	Zhengzhou	Sinexcel AVC-RTS 4*50kVA
Heating factory	Lhasa	Sinexcel AVC-RTS 3*150kVA



Plastic factory



Car manufacturer



Chemical fiber factory



Semiconductor manufacturing



Aircraft manufacturing

APPLICABLE



Beverage factory



Pharmaceutical



Steel (Rolling mill, Frequency converter)



Processing plant



packaging plant



Gold making



Paper mill



Chemical plant

— Sinexcel AVC-RTS - Help to maintain uptime as every minute count —



Sinexcel