

# Ultra capacitor system for electric locomotive

## 1 Summary

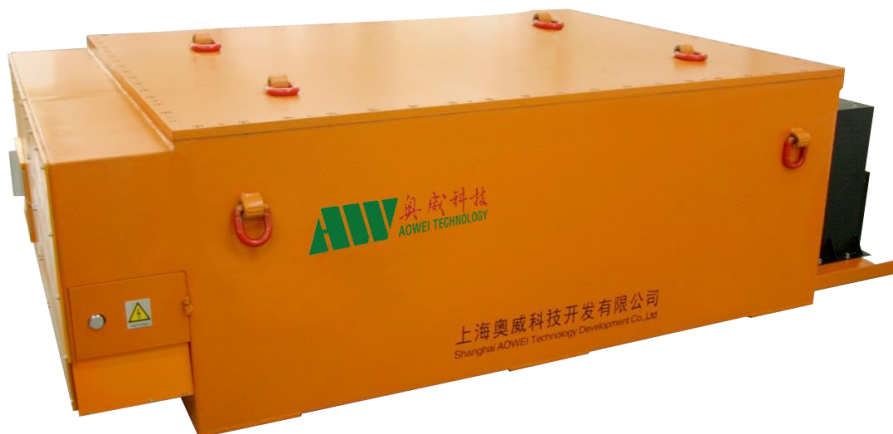
### Characteristics

- Customized system solution according to customer requirements, typical systems are S585V55-K7 and S585V73-K7
- Working temperature window: -25 ~ 55 °C
- Designed with multiple protection case filled with nitrogen, safe and reliable
- 24 hours continuous operation
- CMS can monitor the voltage, temperature, etc of each capacitor and automatically balance the voltage difference

### Applications

- Tunnel locomotive
- Mining locomotive
- Port truck
- Heavy duty traction vehicle
- Other high power and high energy applications

## 2 Dimension



### 3 Product Specification

Part Number	S585V73-K7
Nominal Capacitance(F)	2200
Operating Voltage Window(V)	420 ~ 590
Surge Voltage(V)	600
Stored Energy(kWh)	60
Standard Charge Current(A)	760
Standard Discharge Current(A)	≤760
Maximum Charge/Discharge Current(<20s)(A)	1500
Time for Charging(min)	26
Operating Temperature(°C)	-25 ~ +55
Storage Temperature(°C)	-30 ~ +65
Protection Level	IP67
Electric Property	Overvoltage, overcurrent, overheat, overload, short circuit, DC leakage protection, etc
Capacitor Management System	Automatic balance, voltage monitor, temperature monitor, DC leakage monitor, etc
Cooling Mode	Air cooling
Communication Interface	CAN
Size(mm)	2440×1425×850
Weight(kg)	3000

## 4 Test method

### Test conditions

- Ambient temperature:  $25\pm 5^{\circ}\text{C}$
- Relative humidity: 25% ~ 85%
- Ambient pressure: 86 ~ 106kPa

### Standards and Conformity

- GB 4208-2008 Degrees of protection provided by enclosure (IP code)
- GB/T 31467.1-2015 Lithium-ion traction battery pack and system for electric vehicles----Test specification for high power applications
- GB/T 31467.3-2015 Lithium-ion traction battery pack and system for electric vehicles----Safety requirements and test methods
- QC/T 741-2014 Ultra-capacitor for electric vehicles
- Factory inspection standard of ultra capacitor system for electric locomotive

## 5 Announcements

### Operating requirements

- System should be placed vertically upward during operation
- As a high voltage device, the system shall not be used, disassembled or maintained by non-professionals.
- When connecting the system to external circuit, the circuit switch must be cut off first, otherwise there would be danger of high-voltage shock
- Before operating the system, connect communication cables to vehicle system correctly, and make sure the positive and negative polarity of power supply and load
- Short-circuit and reverse connection of the system is strictly prohibited, cut off circuit and take safety measures once such cases happen
- Check each parameter on the human-computer interface(HMI) to ensure the voltage of each cell is between 2.80 ~ 4.05V and the maximum voltage difference shouldn't be larger than 200mV
- The system case is filled with nitrogen to positive pressure, when the pressure in box is  $< 0.01\text{bar}$ , nitrogen should be refilled until the pressure goes to 0.3 ~ 0.4bar
- Please stop charging when peculiar smell or abnormal noise is found during charging the system
- Abandoning used capacitor is strictly prohibited, please discharge capacitor to 0V before recycling

### Storage and transportation requirements

- Ambient temperature:  $-30 \sim 65^{\circ}\text{C}$
- Relative humidity: 0 ~ 95%
- Ambient pressure: 86 ~ 106kPa
- System should be placed vertically upward during storage and transportation
- Keep power interfaces protected in order to prevent collision, which may cause short circuit during the process of storage and transportation
- System must be charged to rated voltage before long term storage and transportation. Check cell voltage difference every 45 days, when cell voltage difference is  $< 200\text{mV}$  and  $> 50\text{mV}$ , balance system should be activated until the cell voltage difference drops to  $\leq 40\text{mV}$ , when cell voltage difference is  $> 200\text{mV}$ , child node or capacitor should be checked, replace the bad child node or cell if necessary
- When system is kept unused for longer than 1 year, it should be tested by Aowei before using.
- Avoid contacting corrosive materials, keep away heat sources and fire sources
- Prevent violent vibration, collision or crush during the process of transportation
- Prevent exposing in the sun and rain, and keep dry and ventilated during transportation
- The system can be transported by cars, trains, ships, etc

## 6 Product liability

- Aowei shall not be held responsible for the accident which caused by the violation of this specification
- Improvements of the product or upgrading of related technologies may change without further notice
- Please deal with the used ultra capacitor according to local environmental protection regulations. The used capacitor shall be treated as general industrial waste. Considering the recycling classification and resource reutilization of trashed or used chemical power units, used capacitor should be submitted to the company with professional qualifications. For the matters of disposal and recycle, GB/T 33598-2017 Recycling of traction battery used in electric vehicle-Dismantling specification can be the reference. Aowei could provide part of technical support depending on mutual agreements.
- To learn about the new products, welcome to contact us.