

# Ultra capacitor system for tram

## 1 Summary

### Characteristics

- Customized system solution according to the voltage and energy requirements of tram operation
- High power and high energy, dual operation mode including "opportunity charging" and "terminal charging"
- System adapts to contacted network, mixed network, contactless network operation conditions
- Working temperature window: -25 ~ 55°C
- System is designed with multiple level protection, safe and reliable
- CMS can monitor the voltage, temperature, etc of each capacitor and automatically balance the voltage difference

### Applications

- Tram
- Marine charger
- Power compensator
- Other high power and high energy applications

## 2 Dimension



Picture of system S820V29-K8-A



Picture of system S545V19-K8-A

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Picture of system S456V22-K8

### 3 Product Specification

Part Number	S820V29-K8-A
Basic Module	MUCK24V2870
Module Connection Type	36 series
Nominal Capacitance(F)	389
Operating Voltage Window(V)	616 ~ 820
Surge Voltage(V)	906
Stored Energy(kWh)	14.3
Standard Charge Current(A)	300
Standard Discharge Current(A)	300
Maximum Charge/Discharge Current(<20s)(A)	510
Operating Temperature(°C)	-25 ~ 55 (QC/T 741-2014)
	-15 ~ 55 (140A)
Storage Temperature(°C)	-30 ~ +65
Protection Level	IP65(Except inlet and outlet)
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

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Communication Interface	CAN
Size(mm)	1587*1750*530
Weight(kg)	1100
<b>Part Number</b>	<b>S545V19-K8-A</b>
Basic Module	MUCK24V2870
Module Connection Type	24 series
Nominal Capacitance(F)	583
Operating Voltage Window(V)	410 ~ 547
Surge Voltage(V)	605
Stored Energy (kWh)	9.5
Standard Charge Current (A)	300
Standard Discharge Current (A)	300
Maximum Charge/Discharge Current(<20s) (A)	510
Operating Temperature(°C)	-25 ~ 55 (QC/T 741-2014)
	-15 ~ 55 (140A)
Storage Temperature (°C)	-30 ~ +65
Protection Level	IP65(Except inlet and outlet)
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)	1950*1170*645
Weight(kg)	1000

Part Number	S456V22-K8
Basic Module	MUCK24V1910
Module Connection Type	20 series*2
Nominal Capacitance(F)	933
Operating Voltage Window(V)	342 ~ 456
Surge Voltage(V)	504
Stored Energy (kWh)	10.6
Standard Charge Current (A)	400
Standard Discharge Current (A)	300
Maximum Charge/Discharge Current(<20s) (A)	1120
Operating Temperature(°C)	-25 ~ 55 (QC/T 741-2014)
	-15 ~ 55 (140A)
Storage Temperature (°C)	-30 ~ +65
Protection Level	IP65(Except inlet and outlet)
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)	1730*1755*550
Weight(kg)	998

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## 4 Test method

### Test conditions

- Ambient temperature: 25±5°C
- Relative humidity: 25% ~ 85%
- Ambient pressure: 86 ~ 106kPa

### Standards and Conformity

- IEC 61373-2010 Railway applications--Rolling stock equipment--Shock and vibration tests
- GB 4208-2008 Degrees of protection provided by enclosure (IP code)
- EN 60077-1 Railway applications--Electric equipment for rolling stock Part 1: General service conditions and general rules
- EN 50124-1 Railway applications--Insulation coordination Part1: Basic requirements--Clearances and creepage distances for all electric and electronic equipment
- GB/T 24338.4 Railway applications-Electromagnetic compatibility
- QC/T 741-2014 Ultra-capacitor for electric vehicles

## 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 2.85 ~ 3.8V and the maximum voltage difference shouldn't be larger than 300mV
- Collision, strike, crush to the system case is strictly prohibited, forbid opening the box during operation, forbid contacting live part such as positive or negative terminal and power cables with any material
- 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 ~ 65°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 4 months, when cell voltage difference is < 300mV and > 50mV, balance system should be activated until the cell voltage difference drops to ≤40mV, when cell voltage difference is > 300mV, 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