

## Lithium Ion Rechargeable Battery

**Model No.: CVEV48V15AH**

**Datasheet Revision No.:** Rev\_00

This document outline the product characteristics, performances, relevant conditions & recommendations and safety protocols under standard conditions for above model.

### 1. Battery Pack Specification

Parameter	Technical Description	Specification
<b>General</b>	Chemistry	NMC
	Nominal Voltage(V)	48
	Capacity(Ah)	15
	Configuration	13S6P
	Specific Energy(Wh)	720
	Volumetric Energy(Wh/Kg)	219
	Cycle Life	>1200
<b>Electrical Characteristics</b>	Cell Balancing	Yes
	Charging Mode	CC-CV
	Charge Current(A)	7
	Max Charge Current(A)	15
	Discharge Current(A)	7
	Max Discharge Current(A)	15
	Peak Discharge Current(A)	30
	Voltage Range(V)	36~54.6
	Over temperature protection in discharging mode(°C)	60°
	Over temperature protection recovery in discharging mode(°C)	50°
	Over temperature protection in Charging mode(°C)	50°
	Over temperature protection recovery in Charging mode(°C)	40°
Efficiency	>=98%	
Connector Type	Customized	
<b>Mechanical Characteristics</b>	Operating Temperature(°C)	-5 to 60°C
	Storage temperature	0°-35°C
	IP Class	IP65
	Humidity (RH)	<90% (Non Condensing)
	Dimensions ( W x D x H )	As per Requirement
<b>Protections</b>	Under Voltage Protection level(V)	2.5
	Under Voltage protection recovery level(V)	3
	Over Voltage protection level(V)	4.25
	Over Voltage protection recovery level(V)	4.1

	Charging Over Current Protection(A)	30
	Discharging over current Protection(A)	45
	Output short circuit Protection	Yes
	Cell temperature protection in discharging mode	Yes
<b>Communication Interface</b>	MODBUS,CANBUS	As per Requirement
<b>Applicable Standards</b>	Transportation	UN/DOT 38.3
	Safety	IEC 62133 - 2 : 2017/IS 16046-2018

## 2. Cell Electrical Characteristics

**Standard Test Conditions** - Test should be conducted with new batteries within three months after shipment from our factory and cells shall not be charged more than five times before test at 20±5°C

**Standard Charge** - The standard charge means charging with constant current @0.2C and constant voltage up-to a specified voltage as mentioned in the manufacturer datasheet, charging cut-off at 0.05C.

**Standard Discharge** - The standard discharge means discharging the cell with constant current @0.2C down to a specified voltage as mentioned in the manufacturer datasheet.

## 3. Cell Safety Characteristics

Parameter	Test conditions	Remarks
Over Charge	Charge the cell at 3C current up-to max V	No Fire/Explosion
Over discharge	After standard charge. Discharge the cell at 0.2C at constant Voltage 2.0V	No Fire/Explosion
Short Circuit Test	After standard charge the cell is to be short-circuited with Copper wire of a maximum resistance load of 80±20mΩ	No Fire/Explosion
Heating Test	After standard charge the cell placed in a circulating air oven. The temperature of the oven is raised at a rate of 5°C±2°C/min to a temperature of 130°C±2°C,insulation time 30 min	No Fire/Explosion
Temperature Cycling	After Standard charge – Cells are placed in a test chamber with 75±2°C for 6h Then put the cell in -40°C for 6h,repeat both with 10 Cycle and then rest the batteries for 24h	No Fire/Explosion No smoke
Impact Test	A test sample cell is to be placed on a flat surface a 15.8±0.1 mm diameter bar is to be placed across the center of sample. A 9.1kg±0.46kg mass is to be dropped from the height of 610±25 mm to the sample	No Fire/Explosion

#### 4. Cell Environment Characteristics

Parameter	Test conditions	Remarks
Drop Test Free Fall Test	After standard charge the cell is dropped from a height of 1 meter with three different orientation on to a concrete floor	No Fire/Explosion
Crush Test	After standard charge the cell is crushed between two flat surfaces, the force with $13\pm 1\text{KN}$ for the crushing apply a hydraulic ram. Once the maximum force is applied or abrupt voltage drop of one-third or 10% of deformation has occurred compared to the initial dimension, Release the force	No Fire/Explosion
Altitude simulation test	The full charged cell to be stored for 6 hours at an absolute pressure of 11.6 KPa with the temperature of $20\pm 3^{\circ}\text{C}$	No Fire/Explosion No leakage

#### 5. Safety Precaution & Prohibitions:

In order to prevent battery leakage, heating, fire, reduced performance or life drops, explosion and other accidents, we recommend the following provisions of the normal use of battery, and compliance with preventive matters.

##### Handling

- Do not wet
- Do not expose to heat
- Do not deform
- Do not connect batteries in Series or Parallel

**Charge:** Battery to be charged with recommended/approved charger. Do not leave the battery pack connected to the charger, it may cause degradation of battery performance

**Storage:** Batteries should be stored in a well-ventilated, dry area kept in between  $20^{\circ}\text{C}$  to  $35^{\circ}\text{C}$ . It should be stored away from direct sunlight, heat sources, and water. Batteries should be stacked so that they're protecting battery terminals from contacting each other and are stable



Do not disassemble or alter the battery, the battery may be shorted and result in heat generation or fire. Do not connect the battery in reverse polarity (-+) terminals in equipment/charger. If battery leaks and its electrolyte comes into contact with skin or clothes, wash the contact area well with tap water or other clean water right away. Take medical help if required.

**Note:** Datasheet is subject to amendments/change without any prior notice at company discretion, before designing system please connect to sales representative