

# AST -320

## Lithium Battery

### Manual&Specifications



## Dear Clients,

Thanks for choosing our AST -320 lithium battery.

Please take your time to read this user manual which will help you to make full use of the battery.

## 1 、 Technical Specifications of AST -320

<b>AST -320</b>	Nominal voltage	12.8V			
	Nominal capacity	320Ah/4096Wh			
<b>Application</b>	Installment	Supports parallel connection, not series connection			
	Control	Battery management system (BMS) 300A			
<b>Mechanical</b>	Case material	ABS+ PC			
	Cell assembly	324Ah square LFP battery cells*4 pcs			
	Dimension	353mm(L)*198mm(W)*250mm(H)			
	Weight	27.2KG			
<b>Electrical Parameters</b>					
(The test should be performed indoors at a temperature of 25±2°C and a relative humidity of 65+/-20%.)					
Function	Test items	Specification			Unit
		Minimum	Typical value	Maximum	
Operating voltage	Voltage range	9.2		14.6	V
Working current	Recharging current			300	A
	Discharge current			300	A
Charging protection	Charger voltage(CC -CV)	14.4			V
	Overcharge protection voltage	3.620	3.650	3.680	V
	Over- voltage delay	1000	2000	3000	mS
	Over- voltage release	3.500	3.550	3.600	V
	Over- voltage release conditions	Discharging recovery Voltage self recovery. If overcharge protection is triggered three times in a row, discharging is required to release the protection.			
Balance function	Balance function turn -on voltage	3.170	3.200	3.230	V
	Balance function turn -on voltage difference		15		mV
	Balance function turn - off voltage difference		8		mV
	Balance current		1000	2000	mA
	Balance model	Idle Balance			
	Balance type	Pulsed model			

Discharge protection	Under- voltage	2.400	2.500	2.600	V
	Under- voltage delay	1000	2000	3000	mS
	Under- voltage release	2.450	2.550	2.650	V
	Under- voltage release conditions	Charging recovery Voltage self recovery If over- discharge protection is triggered three times in a row, the load must be disconnected or charging must occur to release the protection.			
Over- current Charge protection	Over- current Charge protection value	305	325	345	A
	Over- current Charge delay	5	10	15	S
	Over- current Charge release conditions	Automatic recovery occurs after a 32 -second delay. If charging over- current is triggered three times in a row, discharging is required to release the charging over- current protection.			
	1st Over- current Discharge value	305	325	345	A
	1st Over- current Discharge delay	50	60	70	S
	2nd Over- current Discharge value	940	1140	1340	A
	2nd Over- current Discharge delay	200	640	1200	mS
	Over- current Discharge release	Automatic recovery occurs after a 32 -second delay. If over- discharge protection is triggered three consecutive times, the load must be disconnected to release the protection.			
Short circuit protection	Short circuit protection current value	1300	1600	1900	A
	Short circuit protection delay time	200	560	1000	uS
	Short circuit protection recovery	Recover by disconnecting load ( approximate 5S)			
Temperature protection	High temperature protection value in charging	60	65	70	°C
	High temperature protection release value in charging	50	55	60	°C
	High temperature protection value in discharging	70	75	80	°C
	High temperature protection release value in discharging	60	65	70	°C

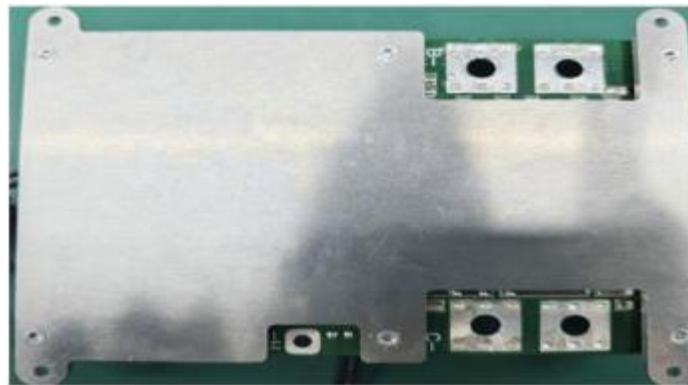
## 2、 Advantages of AST -320



- **Standard size & light weight:** AST -320 has the same standard size (353mm\*198mm\*250mm) as conventional lead acid batteries and weighs less than half of the capacity - equivalent lead acid battery.
- **Cycle life:** Longer than traditional lithium batteries, with up to 6,000 charge and discharge cycles, while other types of lithium batteries (such as lithium cobalt batteries) generally last for 500 - 1,000 cycles.
- **Body design:** The entire body is made of ABS+PC flame -retardant material using a single mold. The product is aesthetically pleasing, has a robust structure and designed for easy standardization. The front of the battery displays the brand and specifications. Handrails are provided on both sides for easy handling. The cover features a QR code sticker that provides user instructions and supports mobile app connectivity.
- **PCB Board:** The confluence and voltage detection are routed through the PCB board, featuring a simple wiring design that significantly reduces the failure rate. Each cell is connected in series with a fuse, which melts and disconnects the circuit in the event of constant over -current, effectively preventing fire risks.
- **BMS Protection:** The Battery Management System (BMS) balances voltage to ensure optimal battery performance. Each AST -320 battery has an integrated BMS that protects it from extreme conditions, enhancing safety and reliability.
- **Anti -swelling Protection:** An aluminum alloy plate is used to secure and position the battery cells, while the stainless steel hoop provide reinforcement for the entire battery cell group. Square battery cells have the tendency to swell after long - term use. When fixed with tape, the cells may swell over time, potentially damaging the battery shell. The purpose of the stainless steel hoop is to ensure adequate strength, preventing swelling and maintaining the structural integrity of the battery during extended use.



### 3、 BMS Specifications



#### Protection function description

**Single cell voltage balancing:** The protection board uses active balancing or passive balancing technology to regulate the battery voltage during the charging process. This ensures that the voltage across all single cells in the battery pack remains consistent. This improves the overall efficiency of the battery pack and extending its lifespan.

**Overcharge protection:** During charging, the voltage continues to rise. When the protection board detects that the voltage of any cell is higher than the overcharge protection value, the protection board immediately starts timing. Once the overcharge protection time is reached, the protection board deactivates the charging MOS tube, stopping the charging process. Further charging is disabled to ensure safety and prevent overcharging.

**Overcharge protection recovery:** After the overcharge protection is triggered, the battery voltage decreases either while the battery is idle or discharging. When the protection board detects that the voltage of each cell falls below the overcharge recovery value, it sends a signal to activate the charging MOS tube, allowing the battery to resume charging.

**Over - discharge protection:** During discharge, the voltage continuously decreases. When the protection board detects that the voltage of any cell is lower than the over -discharge protection value, the protection board immediately starts timing. Once the over -discharge protection delay time is reached, the protection board sends a signal to deactivate the discharging MOS tube, cutting off the discharge process. The load lock circuit is activated, preventing further discharge until the condition is resolved.

**Over - discharge protection recovery:** After over -discharge protection is triggered, the battery voltage continues to rise when the battery is idle or charging. Once the protection board detects that the voltage of each cell exceeds the over -discharge recovery voltage, it either disconnects the load or initiates charging. The protection board then sends a signal to activate the discharge MOS tube, allowing discharge to be performed.

**Over - current protection:** If the current suddenly increases when the battery is in a static or discharging state, the protection board detects when the current exceeds the over -current protection value and the protection board starts timing. Once the current duration surpasses the over -current protection delay time, the protection board sends an output signal to deactivate the discharge MOS tube, and the load lock circuit is activated. This prevents further discharge at that moment.

**Over - current protection recovery:** After the discharge over-current protection is triggered and the discharge MOS tube is turned off, the current in the circuit drops to 0. At this point, the load or charging should be disconnected. Once the protection board detects that the conditions are safe, it sends a signal to activate the discharge MOS tube, allowing discharge to resume.

**Status monitoring and communication:** The protection board continuously monitors the battery parameters (such as voltage, current, temperature, charging status, etc.) in real time. It transmits this data to external devices (such as displays, chargers, smart terminals, etc.) through the communication interface. This enables users or systems to view real -time battery status, perform fault diagnostics and receive early warnings.