

TECHNICAL SPECIFICATIONS



**12V 50AH**  
DEEP CYCLE + STARTING  
**LITHIUM ION**  
**BATTERY**

UN 3480 TESTED AND APPROVED



FIRE PROOF

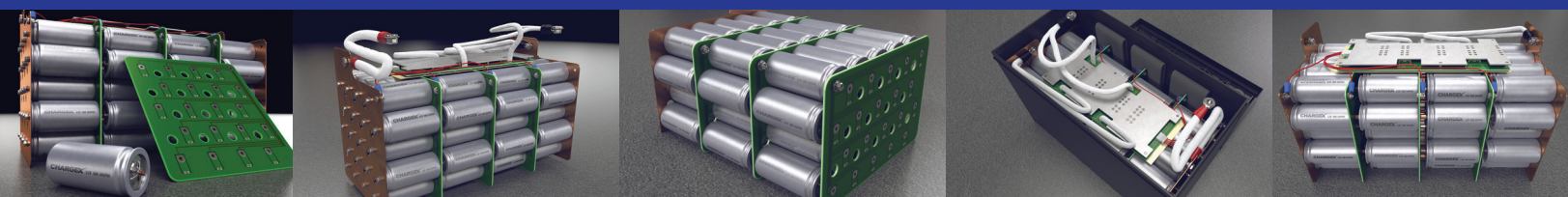


THERMAL FUSE



SAFETY VENT

GROUP SIZE



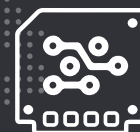
SAFE



**LiFePO<sub>4</sub>**  
TECHNOLOGY

**BUILT IN BMS**

Internal Battery Management System



**HIGH OUTPUT**

500 Cold Cranking Amps and 54 Usable Amp Hours



**DROP-IN REPLACEMENT**

Plug and Play for any application currently using a Lead Acid, AGM or Gel Battery



Model: **CX50**

**12V 50AH** Lithium Ion battery (LiFePO<sub>4</sub>) **GROUP SIZE-N/A** **DEEP CYCLE + STARTING** **BMS**

### COMMERCIAL | MARINE | RV | GOLF | AUTOMOTIVE | UPS | OFF-GRID

A substantial plug and play upgrade suitable for starting or deep cycle applications including Marine, RV, Golf, Solar, Off Grid, Propulsion, etc. to replace Lead Acid, Gel or AGM Batteries. • Higher efficiency • lighter weight • increased cyclability • safety • output rate • bolted cells for far greater resistance to vibration and shock • unrivalled temperature performance. The proprietary, intelligent BMS (battery management system) helps CHARGE<sup>EX</sup>® deliver **over 20X the life expectancy of conventional batteries.**

*significant/numerous advantages over conventional battery systems\**

#### ADVANTAGE\*

### POWER | ENERGY

Nominal Voltage	12.8V
Charge Voltage	14.4V - 14.6V
Peak Discharge (5 Sec)	500A
Continuous Charge / Discharge Rate	50A
Capacity (amp hours)	50AH
Capacity (watts)	600W
Chemistry	Lithium Iron Phosphate (LiFePO <sub>4</sub> )

#### ADVANTAGE\*

### DIMENSIONS | WEIGHT

Group Size	N/A
Weight	15 Lbs
Length	7.75"
Width	6.5"
Height	6.75"

#### ADVANTAGE\*

### TEMP PERFORMANCE

CELCIUS	FARENHEIT	USABLE CAPACITY
60°	140°	103%
50°	122°	102%
40°	104°	100%
30°	86°	100%
20°	68°	98%
10°	50°	92%
0	32	83%
-10	14	80%
-20	-4	70%
-30	-22	60%
-40	-40	10%
-50	-58	0%

#### ADVANTAGE\*

### TECHNOLOGY

Usable Capacity (AH)	54AH
Depth of Discharge	>100% DOD
Reserve Minutes @ 20A	150 min
Reserve Minutes @ 60A	60 min
Self Discharge	<3% per mo
Chemistry	Lithium Iron Phosphate (LiFePO <sub>4</sub> )
Cell Type	Cylindrical
Modular	Series or Parallel Connection

#### ADVANTAGE\*

### SAFETY | PROTECTION

Automatic Low Voltage Disconnect	8V
Automatic Short Circuit Protection	Instant
Automatic Over Voltage Protection	15.8V
Automatic Reverse Polarity Protection	Instant
Internal Cell Thermal Safety Fuse	Yes
Flame Retardant Electrolyte	Yes
Length Way Circuit Boards	Yes
Automatic Internal Cell Balancing	Yes
Automatic Fault Recovery	Yes
Explosion Proof Stainless Steel Cells	Yes



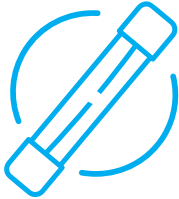
## CELL SAFETY FEATURES AND DESIGN 1.1

The main issue with all lithium batteries is cell overheating and rupturing due to over-charges. CHARGEEX® Lithium battery systems have several layers of safety redundancy at the cell level. Notably, an internal thermal fuse between the anode and cathode which shuts down the cell before overheating occurs, to prevent pressure build-up. In the unlikely event this thermal fuse fails, pressure releases through a 1.5MPa safety vent to the cell's electrolyte composition that includes a highly effective flame-retardant additive. These conditions would likely only occur if a charger or controller failed spiking current into the battery. The BPS is designed to protect the cells from this anomaly by opening at 15.8V and would have to fail in the closed state allowing excess current into the cells. **This 12V 50AH is built with 40 cylindrical 3.2V 5AH (32650) cells combined with 4 sets of 10 cells in parallel and then combined in series. All 40 cells are matched by measuring 10 consistencies during several charge / discharge cycles at the end of production.**



### Retardant

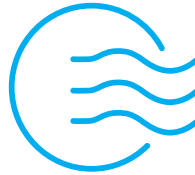
**FLAME RETARDANT ELECTROLYTE:**  
Chargex® cells are safeguarded with flame retardant additive in the electrolyte for best safety.



### Thermal Fuse

**INTERNAL CELL SAFETY FUSE:**

Our latest cell technology has a built-in thermal safety fuse between the anode and cathode that breaks in the unlikely event a cell begins to overheat.



### Safety Vent

**HIGH PRESSURE SAFETY VENT:**  
A high pressure safety vent will flip open to release energy and prevent explosion if exposed to extreme heat.



### Explosion Proof

**STAINLESS STEEL CELL:**

Every Cell is manufactured in an explosion proof stainless steel cylindrical case.





## CELL SAFETY FEATURES AND DESIGN 1.2

### Cell Balancing

The BMS balances the cells by sending more current through the *Lengthway Circuit Boards* and into the cells with a lower voltage. The BMS will also discharge any cell that exceeds 3.65V during charging.



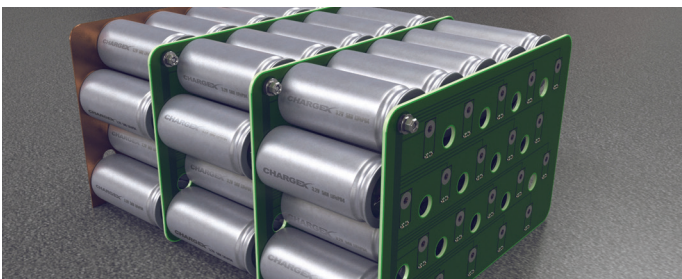
### Bolted Cells

Most of our cells positive and negative terminals are bolted vs the more common tab welded method. This creates a superior connection for higher amperage loads and better current conductivity.



### Lengthway Board

The *Lengthway Circuit Boards* have a unique function of over-current and cross-protection. The cells' bolt-through *Lengthway Circuit Board* provides balancing, even current flow, short circuit protection and add rigid strength to the battery pack.



### Cell Matching Processes

1. Consistency of Self Discharge
2. Consistency of Voltage
3. Consistency of Inner Impedance
4. Consistency of Capacity
5. Consistency of Cycle Life
6. Consistency of Platform
7. Consistency of Constant Current Rate
8. Consistency of Cell Power Control
9. Consistency of Parallel Module Control
10. Consistency of Finished Battery Module

### Circuit Protection

If a cell overheats or if the battery is penetrated by a metal object the *Lengthway Circuit Board* will disconnect the impacted cells allowing the rest of the battery to continue to function normally.

