

● BATTERY DATASHEET

# 12V 230Ah LiFePO4 Battery

TITAN Lithium 12V 230Ah · Industrial 385mm case · TITAN Custom 250A BMS

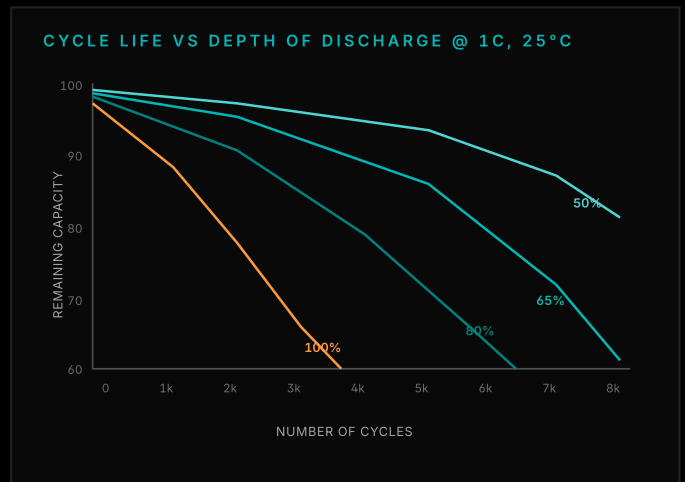
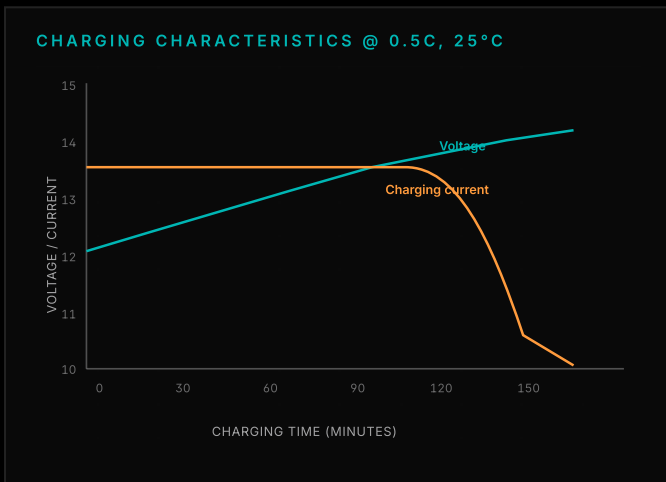
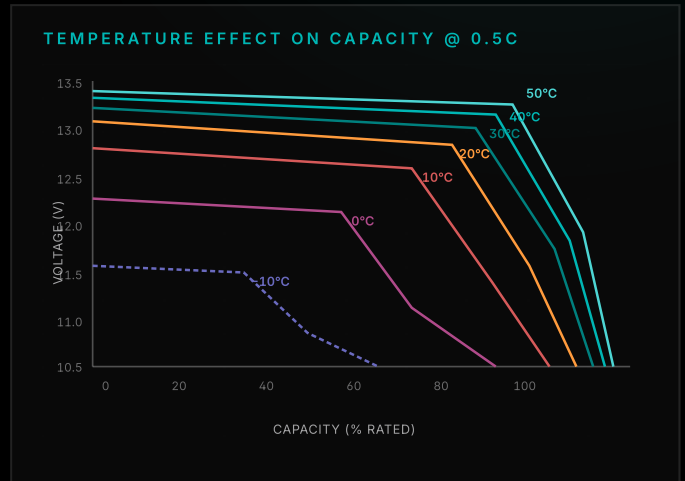
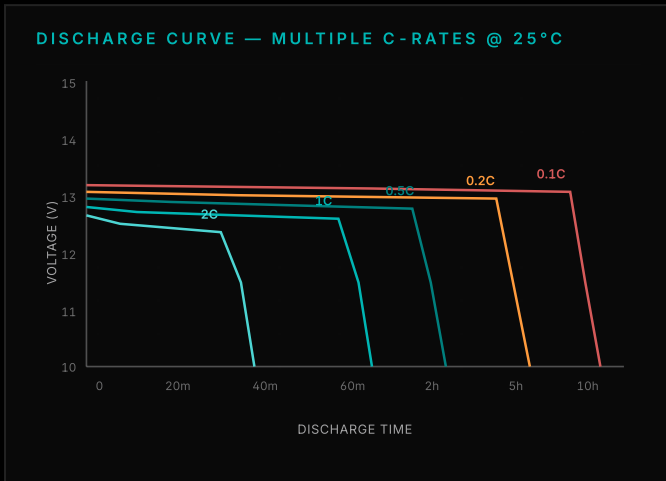
VOLTAGE	CAPACITY	ENERGY	REAL CAPACITY	WEIGHT	DIMENSIONS
<b>12.8V</b> Nominal	<b>230 Ah</b> Rated @ 20Hr	<b>2,944 Wh</b> Total stored	<b>245 Ah</b> Achievable	<b>≤21 kg</b> Per unit	<b>385×190×245 mm</b> L × W × H (±0.5mm)

<p><b>CHARGE PERFORMANCE</b></p> <p>Charge voltage: 14.2V – 14.4V</p> <p>Float voltage: 13.3V – 13.9V</p> <p>Recommended current: 50A – 150A</p> <p>Max continuous charge: 250A</p> <p>Charge over-current (1°): 280A · 5s</p> <p>Charge over-current (2°): 300A · 500ms</p>	<p><b>DISCHARGE PERFORMANCE</b></p> <p>Continuous: 250A</p> <p>Peak (1°): 280A · 5s</p> <p>Peak (2°): 300A · 500ms</p> <p>Short-circuit trip: 1,200A · 380µs</p> <p>Short-circuit release: Remove load / connect charger</p> <p>Internal resistance: &lt;10mΩ</p>
<p><b>VOLTAGE PROTECTIONS</b></p> <p>Cell over-voltage: 3650mV · rel 3500mV (2000ms)</p> <p>Cell under-voltage: 2500mV · rel 3000mV (3000ms)</p> <p>Pack over-voltage: 14.4V · rel 14.0V (2s)</p> <p>Pack under-voltage: 10.0V · rel 12.0V (3s)</p> <p>Auto-recovery: 10 attempts · 1–10min</p> <p>End-of-charge: 14.0V CV · tail 1.0A · 10s</p>	<p><b>TEMPERATURE WINDOWS &amp; PROTECTIONS</b></p> <p>Operating — charge: -30°C to 60°C</p> <p>Operating — discharge: -20°C to 65°C</p> <p>Storage: ≤7d 60°C · ≤3m 40°C · &gt;4m 25°C</p> <p>Charge cut-off: high 65°C · low 0°C</p> <p>Discharge cut-off: high 65°C · low -20°C</p> <p>MOSFET high: 110°C trip · 80°C release</p>
<p><b>ACTIVE HEATER &amp; BMS POWER</b></p> <p>Heater activation: ≤0°C</p> <p>Heater deactivation: ≥10°C</p> <p>Heater draw: 85W ±5% · 5.8A</p> <p>Heater feed: Powered by the connected charger. If charge current isn't enough to fully run the heater, the BMS will draw up to 3.6A from the battery to make up the shortfall. The heater never draws from the battery when the charger is disconnected.</p> <p>BMS draw: ≤23mA idle · ≤46mA w/ comms</p> <p>Hibernation: ≤800µA (after 48h &amp; &lt;3.3V cell)</p>	<p><b>CELL BALANCING</b></p> <p>Mode: Active + Passive</p> <p>Start voltage: 3400mV cell</p> <p>Passive trigger: ≥15mV cell diff</p> <p>Passive current: 68mA</p> <p>Active trigger: ≥30mV cell diff</p> <p>Active current: 1A – 5A (dynamic)</p>
<p><b>BUILD &amp; COMMUNICATIONS</b></p> <p>Case material: ABS Plastic (industrial case)</p> <p>Terminals: M8 threaded insert (bolts included)</p> <p>Cycle life: &gt;3,000 @ 100% DOD</p> <p>Self-discharge: &lt;3% per month @ 25°C</p> <p>Inverter comms: CAN · RS485 · Victron VE.CAN</p> <p>Parallel comms: Ethernet (CAT5e)</p>	<p><b>TYPE APPROVALS &amp; WARRANTY</b></p> <ul style="list-style-type: none"> <li>● UN38.3</li> <li>● RoHS</li> <li>● UN ECE R10 (E-Mark)</li> <li>● CE</li> <li>● UKCA</li> <li>● EMC EN 61000-6</li> </ul> <p>All values nominal. Refer to BMS protocol documentation for variant-specific tuning. Lifetime estimated under recommended charge regime; deeper cycles &amp; higher temperatures will reduce useful life.</p>

● PERFORMANCE & CYCLE BEHAVIOUR

# How TITAN Lithium 12V 230Ah Performs

Charge / discharge characteristics, temperature behaviour and projected cycle life. Curves illustrative for 1C reference cells; refer to commissioning notes for system-level tuning.



**Note** · 1C refers to one times the rated capacity in amps. Example: 1C of a 230Ah pack is 230A; 0.5C is 115A. Curves are illustrative — actual performance depends on cell temperature, age and load profile.

## ● SAFETY DATA SHEET · GHS / CLP

# TITAN Lithium 12V 230Ah — SDS

Issued 2024-03-01 · revised 2026-04-22 · Technical Department · UN3480 Class 9 dangerous goods.

## SECTION 1 — IDENTIFICATION

Product name	Lithium Iron Phosphate Rechargeable Battery
Common name	Lithium Iron Phosphate (LiFePO <sub>4</sub> )
Part number	LFP-230 · TITAN Lithium 12V 230Ah
Distributor	Groves Batteries Ltd T/A TITAN Lithium
Address	Lypiatt Street, Cheltenham, GL50 2UB, United Kingdom
Company reg.	05699836
Phone · email	+44 (0)1242 501802 · info@titanlithium.co.uk

## SECTION 2 — HAZARDS IDENTIFICATION

Article. The product as supplied is a sealed battery and during normal, intended use the user will not be exposed to its chemical contents. Hazards listed below relate to rupture, fire, mechanical damage or thermal runaway events.

**CAS 1333-86-4**

Signal: Danger

GHS Self-heating substances and mixtures (1) · Carcinogenicity (2) · Specific target organ toxicity, repeated exposure (1) — lung

HAZARD H251 Self-heating; may catch fire · H351 Suspected of causing cancer · H372 Causes damage to organs through prolonged or repeated exposure (lung)

**CAS 7440-50-8**

Signal: Danger

GHS Skin sensitisation (1, 1A, 1B) · STOT single exposure (1) — digestive system · STOT single exposure — respiratory tract irritation (3)

HAZARD H317 May cause an allergic skin reaction · H370 Causes damage to organs (digestive system) · H335 May cause respiratory irritation

**CAS 7429-90-5**

Signal: Danger

GHS Substances which, in contact with water, emit flammable gases (2, 3) · STOT repeated exposure (1) — lung · Hazardous to the aquatic environment, long-term hazard (4)

HAZARD H261 In contact with water releases flammable gases · H372 Causes damage to organs through prolonged or repeated exposure (lung) · H413 May cause long-lasting harmful effects to aquatic life

For physical and chemical hazards see Section 10. For human-health hazards see Section 11. For environmental hazards see Section 12.

### SECTION 3 — COMPOSITION / INFORMATION ON INGREDIENTS

Mixture (article)

COMPONENT	CAS NO.	EC NO.	WEIGHT %
Lithium iron phosphate (LiFePO <sub>4</sub> )	15365-14-7	604-917-2	20-40%
Lithium hexafluorophosphate	21324-40-3	244-334-7	10-20%
Aluminium	7429-90-5	231-072-3	10-20%
Graphite	7782-42-5	231-955-3	10-20%
Copper	7440-50-8	231-159-6	7-13%
Poly(vinyl chloride)	9002-86-2	618-338-8	1-5%

### SECTION 4 — FIRST AID MEASURES

General	No special measures required during normal handling.
Eye contact	Flush eyes with plenty of water for several minutes while holding eyelids open. Get medical attention if irritation persists.
Skin contact	Remove contaminated clothing and shoes. Wash immediately with water and soap, rinse thoroughly. Wash clothing and shoes before reuse. If irritation occurs, get medical attention.
Inhalation	Move victim to non-exposed area. Administer artificial respiration if breathing is difficult. Seek medical attention.
Swallowing	Do not induce vomiting. Get medical attention.

- Personal protective equipment for first-aid responders: no data available.
- Most important symptoms / effects, acute and delayed: no data available.
- Indication of immediate medical attention and special treatment needs: no data available.

## SECTION 5 — FIRE-FIGHTING MEASURES

Suitable media	Use extinguishing agent suitable for local conditions and the surrounding environment — typically ABC dry chemical, foam, CO <sub>2</sub> , powdered graphite, copper powder or sodium carbonate (soda) commonly used on combustible fires.
Unsuitable media	No data available.
Specific hazards	Battery may rupture and release hazardous decomposition products when exposed to fire. Lithium-ion batteries contain flammable electrolytes that may vent, ignite and spark when subjected to high temperature (>150°C / 302°F), or when damaged or abused (e.g. mechanical damage or electrical overcharging); may burn rapidly with a flare-burning effect and may ignite other batteries in close proximity.
Fire-fighter PPE	Wear self-contained breathing apparatus and a fully-protective impervious suit.

## SECTION 6 — ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.
Emergency procedures	Remove ignition sources, evacuate area. Sweep up using a method that does not generate dust. Collect as much of the spilled material as possible and place in a suitable container for disposal. Keep spilled material out of sewers, ditches and bodies of water.
Environmental precautions	Do not allow material to be released into the environment without proper governmental permits.
Cleanup methods	All waste must comply with United Nations, national and local regulations for disposal. See Section 7 for safe handling, Section 8 for PPE, Section 13 for disposal information.

## SECTION 7 — HANDLING AND STORAGE

### SAFE HANDLING

- Avoid food and beverages in work areas; wash hands before eating or drinking.
- Ground containers when transferring liquids to prevent static accumulation and discharge.
- Batteries may explode or cause burns if disassembled, crushed or exposed to fire or high temperatures.
- Do not short-circuit or install with incorrect polarity.

### STORAGE CONDITIONS

- Store in a cool, dry, well-ventilated place.
- Keep away from heat; avoid prolonged exposure to sunlight.
- Keep container tightly sealed.
- Maintain air gap between stacks or pallets.

## SECTION 8 — EXPOSURE CONTROLS / PPE

Engineering	The usual precautionary measures for handling chemicals should be followed. Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work.
Respiratory	Wear a suitable protective mask. In case of leakage, wear chemical protective clothing including self-contained breathing apparatus.
Hand	Wear appropriate protective gloves to reduce skin contact.
Eye	Wear safety goggles or eye protection combined with respiratory protection.
Skin / body	Wear suitable protective clothing for the working environment to minimise skin contact. PPE selection should match the concentration and content of any hazardous substances in the workplace.

## SECTION 9 — PHYSICAL & CHEMICAL PROPERTIES

Colour	Black	Physical state	Prismatic cell pack inside a sealed case
Odour	Not available	pH	Not applicable (solid article)
Melting / freezing point	Not available	Initial boiling point / range	Not available
Flash point	Not available	Flammability (solid, gas)	Not available
Explosion limits (vol% in air)	Not available	Vapour pressure (kPa @ 20°C)	Not available
Vapour density	Not available	Density (water = 1)	Not available
Solubility(ies)	Not available	Auto-ignition temperature	Not available
Decomposition temperature	Not available	Viscosity	Not available

## SECTION 10 — STABILITY & REACTIVITY

Reactivity	No data available.
Chemical stability	Stable under recommended storage and handling conditions.
Hazardous reactions	No data available.
Conditions to avoid	Flames, sparks and other sources of ignition; incompatible materials.
Incompatible materials	Oxidising agents, acids, bases.
Decomposition products	Carbon monoxide, carbon dioxide, lithium - oxide fumes.

## SECTION 11 — TOXICOLOGICAL INFORMATION

Acute toxicity data unavailable for the assembled article.

### ACUTE TOXICITY

CAS	LC50 / LD50
15365-14-7	No data available
21324-40-3	No data available
7429-90-5	No data available
7782-42-5	No data available
7440-50-8	No data available
9002-86-2	No data available

### OTHER ENDPOINTS

- Skin corrosion / irritation: no data available
- Serious eye damage / irritation: no data available
- Respiratory or skin sensitisation: no data available
- Germ - cell mutagenicity: no data available
- Carcinogenicity: no data available
- Reproductive toxicity: no data available
- STOT — single & repeated exposure: no data available
- Aspiration hazard: no data available

## SECTION 12 — ECOLOGICAL INFORMATION

Ecological toxicity	No data available
Persistence and degradability	No data available
Bioaccumulative potential	No data available
Mobility in soil	No data available
Other adverse effects	No data available

### SECTION 13 — DISPOSAL CONSIDERATIONS

Disposal method	Consult state, local or national regulations to ensure proper disposal. Do not incinerate. End-of-life packs should be returned to TITAN or to an approved battery-recycling facility.
Uncleaned packaging	Disposal must be made according to official regulations.

### SECTION 14 — TRANSPORT INFORMATION

FIELD	IATA	IMDG	ADR	UN MODEL
UN number	UN3480	UN3480	UN3480	UN3480
Proper shipping name	Lithium ion batteries			
Hazard class	9	9	9	9
Packing group	N/A	N/A	N/A	N/A
Marine pollutant	No			
Label	Class 9 — Miscellaneous Dangerous Goods			

- TITAN LiFePO4 packs have passed UN38.3 testing alongside CE / RoHS / UKCA / EMC compliance.
- Watt-hour rating exceeds the threshold for excepted batteries — packs are classed as dangerous goods.
- Packed per IATA DGR Packing Instruction 965 Section IA — cargo aircraft only.
- Packed per IMDG Special Provisions 230 / 348 (37-14 amendment).
- Packed per UN Recommendations on the Transport of Dangerous Goods — Model Regulations (19th rev.).
- Cells and batteries must include a safety venting device or be designed to prevent violent rupture under normal transport conditions.
- Lithium-ion cells and batteries must be offered for transport at a state of charge  $\leq 30\%$  of rated capacity.
- Modes accepted: by air, by sea, by rail, by road.

### SECTION 15 — REGULATORY INFORMATION

CAS	TSCA	IECSC	DSL / NDSSL	EINECS / ELINCS
15365-14-7	Listed	Listed	DSL	Listed
21324-40-3	Listed	Listed	DSL	Listed
7429-90-5	Listed	Listed	DSL	Listed
7782-42-5	Listed	Listed	DSL	Listed
7440-50-8	Listed	Listed	DSL	Listed
9002-86-2	Listed	Listed	DSL	Listed

## SECTION 16 — OTHER INFORMATION

**Issue department** · Technical Department

To the best of our knowledge, the information contained herein is accurate. Neither TITAN Lithium nor any of its subsidiaries assumes any liability for the accuracy or completeness of the information herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution.

## GLOSSARY & ABBREVIATIONS

<b>CAS</b>	Chemical Abstracts Service	<b>EC</b>	European Commission
<b>ACGIH</b>	American Conference of Governmental Industrial Hygienists	<b>NIOSH</b>	US National Institute for Occupational Safety and Health
<b>OSHA</b>	US Occupational Safety and Health Administration	<b>TLV</b>	Threshold Limit Value
<b>TWA</b>	Time-Weighted Average	<b>STEL</b>	Short-Term Exposure Limit
<b>PEL</b>	Permissible Exposure Limit	<b>REL</b>	Recommended Exposure Limit
<b>LC50</b>	Lethal Concentration, 50% kill	<b>LD50</b>	Lethal Dose, 50% kill
<b>IARC</b>	International Agency for Research on Cancer	<b>EC50</b>	Median Effective Concentration
<b>BCF</b>	Bio-concentration Factor	<b>BOD</b>	Biochemical Oxygen Demand
<b>NOEC</b>	No Observed Effect Concentration	<b>NTP</b>	US National Toxicology Program
<b>RTECS</b>	Registry of Toxic Effects of Chemical Substances	<b>IATA</b>	International Air Transport Association
<b>IMDG</b>	International Maritime Dangerous Goods	<b>TDG</b>	Recommendations on the Transport of Dangerous Goods — Model Regulations
<b>TSCA</b>	Toxic Substances Control Act (USA)	<b>DSL</b>	Domestic Substances List of Canada
<b>NDSL</b>	Non-Domestic Substances List of Canada		

## DOCUMENT CONTROL

Document	LFP-230 datasheet & SDS
Revision	Rev 06
Issued	2026-06-24
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