

# Drypower

Rechargeable Lithium LiFePO4

**RECHARGEABLE LITHIUM**



**Rechargeable Lithium LiFePO4 high power modules to handle anything SLA can. Get 100% capacity utilisation at less than half the weight.**

Advanced battery technology for cyclic and motive power applications such as mobility, recreational caravan & RV, marine, medical equipment, solar applications and more.



- HIGH CYCLE LIFE
- BUILT IN CIRCUIT PROTECTION
- SUPERIOR CHARGE / DISCHARGE EFFICIENCY
- LOWER TOTAL COST OF OWNERSHIP
- LONG SERVICE LIFE

FOR RECHARGEABLE LiFePO4 BATTERIES  
[www.drypower.com.au](http://www.drypower.com.au)





# Rechargeable Lithium Series










Suitable for:

- Deep Cycle
- RV & Recreation
- Electric Mobility
- Medical Equipment
- Material Handling Equipment

- Deep cycle power rechargeable lithium batteries with over 2000 cycles to 100% DoD in industrial or high drain applications.
- All the power without the bulky weight of Lead Acid battery equivalents.
- High rate discharge capable and superior total capacity utilisation (up to 100% DoD) with a flat discharge curve for strong, consistent power delivery.
- Low self discharge and long storage life with no risk of sulphation.
- Integrated layers of safety to IEC62133-2:2017 and UN38.3 standards at the cell level as well as BMS level protection against over charge, over voltage, under voltage and over temperature. Enclosed in IP5x/IP6x rated protective case for better durability in harsh environments.



## Why Choose Drypower Lithium?

FEATURES & BENEFITS		Drypower Lithium LiFePO <sub>4</sub>	VRLA Lead Acid Equivalent
	<b>Long Service Life &amp; Reliability</b> >2000 cycles @100% DoD (25°C) to 80% of original capacity - longer service life than SLA to reduce maintenance costs.	>2000 cycles (100% DoD) >3000 cycles (80% DoD) >4000 cycles (50% DoD)	Approx. 300 cycles (80% DoD)
	<b>High Energy Density - More Power Wh/kg</b> Higher total system capacity and superior utilisation (full 100% DoD) to reduce overall system size and footprint.	100Ah size = 100Ah (1C)	100Ah size = 60Ah (1C)
	<b>Robust Enclosure</b> Enclosed in IP5x (dust resistant) or IP6x (dust tight) case with closed loop terminals - suitable for harsh environments.	IP5x or IP6x	Not IP rated
	<b>Stable Chemistry &amp; Built-in Circuit Protection</b> IEC & UN38.3 Safety Certified at cell level and integrated BMS protection to ensure safety and prevent damage.	BMS Protected	Valve Regulated
	<b>Lightweight</b> Approx. 1/2 the weight (or less) of equivalent in SLA means lower logistics costs and minimal OH&S concerns.	100Ah: 12.5kg	100Ah: 30kg
	<b>Superior Charge &amp; Discharge Efficiency</b> Faster charge/discharge rates (C/2 LiFePO <sub>4</sub> vs C/20 SLA) for higher power usage and less downtime when charging.	2hrs Charge at C/2 96% efficiency	8-12hrs Charge between 60-90% efficiency
	<b>Wide Operating Temperature Tolerance</b> Suitable for use in a wider range of applications where ambient temperature is atypical: from -20°C up to +60°C.	Discharge up to +60°C	Discharge at +25°C recommended
	<b>Better Shelf Life</b> Storage is not a problem thanks to extremely low self discharge (LSD) and no risk of sulphation.	12-18 months+	6 months
	<b>Fully Recyclable Battery</b> An environmentally friendly battery option, with no lead or calcium that can leak into the environment.	Recyclable	Recyclable

# Cylindrical vs Prismatic

Drypower Rechargeable Lithium batteries are constructed with either cylindrical or prismatic lithium iron phosphate (LiFePO<sub>4</sub>) cells inside. Both types provide the benefits of high cycle life, superior charge and discharge efficiency and light weight with differences outlined below.

## Cylindrical Cells Inside

Drypower models constructed with cylindrical cells inside are the most versatile design, expected to be suitable replacements for Lead Acid batteries in equivalent sizes for most of the same applications.

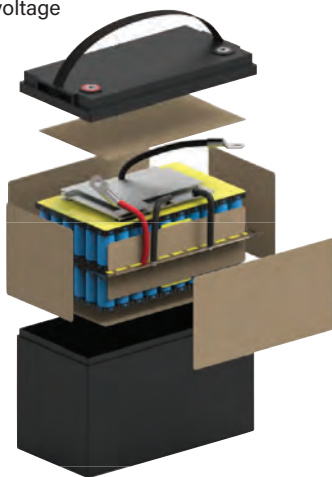
As is the case with ever evolving technology, the manufacturing process of LiFePO<sub>4</sub> cells is constantly refined to a higher degree of consistency in quality. The strict level of quality control ensures the cells used inside are voltage and capacity matched for a balanced, higher quality battery module overall.

Internal cell safety in addition to the integrated BMS in every battery module, plus multi-layer internal structure safety measures results in a battery that is more tolerant to vibration and thermal cycling.

Most importantly, if one cell fails, the whole pack does not fail. This provides peace of mind for use in critical applications, and safety in mobility.



**Any orientation** - offering ultimate flexibility in a wide variety of applications.



## Prismatic Cells Inside

Drypower models constructed with LiFePO<sub>4</sub> prismatic cells inside are designed for users who require an inexpensive rechargeable lithium solution that provides more optimal use of space.

The size and shape of prismatic cells lends itself to being an easier format for assembly, requiring less cells overall and lower manufacturing costs - a price advantage that is passed on to benefit Drypower users from the word go.

The larger format of a prismatic cell compared to a cylindrical cell does mean there is a larger thermal runaway potential. However, with the combination of built-in BMS, robust case enclosures and due care, Drypower users can capitalise on and reduce the overall cost of their battery system.



**Upright orientation only** - for the best service life.



## Built-in Battery Protection

All Drypower Rechargeable Lithium batteries adhere to strict safety guidelines by incorporating Battery Management Systems (BMS) into each battery.

The BMS comprises different protection components:

- Integrated Circuit (IC)
- MOSFET - compact transistor
- Fuse - protects against excessive current
- Thermistor - temperature sensor
- Protection Circuit Module (PCM)

The inclusion of a BMS helps to:

- Maintain safety for users.
- Prevent damage to equipment and property.
- Eliminate concerns about use of the wrong charger for this chemistry type.
- Minimise the risk of overdischarge causing damage.
- Provide short circuit and overcharge protection.

The BMS ensures optimal operating conditions for your battery to last longer and perform at its best in your devices and equipment.

## Cost Comparison - Let's Look at the Numbers



### What is Total Cost of Ownership?

Total Cost of Ownership (TCO) refers to the cost of owning and running an asset. It is a useful way of assessing the value of a product over its service life, as opposed to simply looking at its upfront pricing.

If you are considering installing Drypower Rechargeable Lithium batteries but feel deterred by the higher initial purchase cost, we have examined a typical TCO scenario of installing a Drypower Lithium battery compared to an AGM lead acid battery.

In this example, we use approximate and average figures, but encourage you to apply your own to achieve a more relevant comparison. In this table, we are:

- Comparing Drypower 12SB110CLS-FR 110Ah AGM battery (SRP \$434.95) with Drypower 12LFP100PS 100Ah LFP (SRP \$949.95).
- Using a \$100 installation cost for both.
- Estimating freight costs at \$0.30/kg for Lead Acid and \$0.45/kg for LiFePO<sub>4</sub>. Excludes basic charge (con-note).

We have not included other associated costs such as ongoing maintenance, call-out fees, charging costs (downtime, electricity), or dangerous goods/battery disposal costs.

	Drypower 12LFP100PS	AGM 100Ah
Specification	12.8V 100Ah (5hr rate)	12V 85Ah (5hr rate)
Weight	11.4kg	30kg
Usable Capacity	100%	50%
Estimated Cycle Life	2000 cycles (100% DoD)	300 cycles (80% DoD)
Number of Batteries	1	1 + 5 replacements req'd
Battery Cost	\$950	\$2,610 (\$435 x 6)
Installation Cost	\$100	\$600 (\$100 x 6)
Logistics Cost (exc. basic charge)	\$5.13 (\$0.45/kg)	\$54.00 (\$0.30/kg)
Total Cost of Ownership	\$1,055	\$3,264
Cost per Cycle	\$0.53 per cycle	\$1.63 per cycle
Total Savings over Service Life	\$2,209 saved	

**Drypower Lithium has lower Total Cost of Ownership**



Data in this table is in rounded figures and based on current data and/or assumptions as of Oct 2020. This information is provided as a guide only and may vary by region, provider/s, battery brand/models, device and/or application, and user's individual usage pattern.



## Range Specifications

Model No.	Specifications			Max. Current		Dimensions				Weight (kg)	Assembly	Terminal Type	Series Conn. (Max)
	Volts (V)	Capacity 5hr (Ah)	Watt Hour (Wh)	Charge (A)	Disch. (A)	L mm	W mm	H mm	HT mm				
CYLINDRICAL CELLS INSIDE													
6LFP3.8	6.4	3.8	24.32	3.8A	5A	70	47.5	101	108	0.29	2S1P-Cyl	F1	4S
6LFP7.6	6.4	7.6	48.64	7.6A	8A	150	35	93	101.2	0.4	2S2P-Cyl	F1	4S
6LFP11.4	6.4	11.4	72.96	10A	10A	150	50	93	101.2	0.6	2S3P-Cyl	F2	4S
12LFP3.8	12.8	3.8	48.64	3.8A	5A	90	70	101	108	0.5	4S1P-Cyl	F1	4S
12LFP7.2	12.8	7.2	92.16	7.2A	10A	151	65	94	101	0.95	4S2P-Cyl	F2	4S
12LFP10.8	12.8	10.8	138.24	10A	10A	151	99	94	99	1.5	4S3P-Cyl	F2	4S
12LFP11.4	12.8	11.4	145.92	10A	10A	151	65	94	101	1.3	4S3P-Cyl	F2	4S
12LFP15.2	12.8	15.2	194.56	15A	15A	151	99	94	99	1.7	4S4P-Cyl	F2	4S
12LFP21	12.8	21.6	276.48	20A	20A	182	77	168	168	2.9	4S6P-Cyl	F6	4S
12LFP28	12.8	28.8	368.64	28.8A	30A	176	166	125	125	3.6	4S8P-Cyl	F8	4S
12LFP30	12.8	30.4	389.12	30A	30A	165.5	125	174	174	3.72	4S8P-Cyl	F8	4S
12LFP36	12.8	36	460.8	36A	36A	195	133	170	170	4.43	4S10P-Cyl	F8	4S
12LFP48	12.8	47.6	609.28	48A	50A	198	166	169	169	6.1	4S14P-Cyl	F18	4S
12LFP75	12.8	74.8	957.44	75A	75A	260	168	211	216	9.65	4S22P-Cyl	F18	4S
12LFP102SL	12.8	102.6	1313.28	80A	80A	395	110	286.5	286.5	13.1	4S27P-Cyl	F18	4S
12LFP108	12.8	108	1382.4	100A	100A	329	171	217	222.5	13.8	4S30P-Cyl	F18	4S
12LFP122	12.8	121.6	1556.48	80A	80A	329	171	217	222.5	14.36	4S32P-Cyl	F18	4S
PRISMATIC CELLS INSIDE													
12LFP50P	12.8	50	640	50A	50A	229	138	210	216	5.95	4S1P-Pris	F8	4S
12LFP100P	12.8	100	1280	100A	100A	490	170	240	240	12.5	4S2P-Pris	F18	4S
12LFP100PS	12.8	100	1280	100A	100A	329	171	217	222.5	11.4	4S2P-Pris	F18	4S
12LFP150P	12.8	150	1920	150A	150A	520	240	220	223	18.7	4S3P-Pris	F18	4S
12LFP150PS	12.8	150	1920	150A	150A	406	173	211.8	240	16.6	4S3P-Pris	F18	4S
12LFP200P	12.8	200	2560	150A	150A	490	170	240	240	21.5	4S4P-Pris	F18	4S
24LFP50P	25.6	50	1280	50A	50A	329	171	217	222.5	11.1	8S1P-Pris	F18	2S
24LFP100P	25.6	100	2560	100A	100A	490	170	240	240	21.2	8S2P-Pris	F18	2S
GOLF RANGE													
12LFP18TB^	12.8	18	230.4	5A	25A	168	127.6	76	101.3	2.5	4S5P-Cyl	T-Bar to ADS PP	1S
12LFP25TB^	12.8	25.2	322.56	5A	30A	168	127.6	102	127.8	2.8	4S7P-Cyl	T-Bar to ADS PP	1S
12LFP32	12.8	32.4	414.72	30A	30A	175	175	110	113	3.6	4S9P-Cyl	F18 to ADS PP	1S

^This golf model comes with charger included.

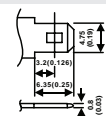
Capacity measured at 5 hour rate. Performance may vary depending on application. All specifications are correct at time of creation. All specifications and operation conditions contained herein are subject to change or improvement without prior notice to the user. This data is for evaluation purposes only. No guarantee is intended or implied by this data. For clarification and updated information, please contact us - Oct2020 Rev1

**FOR MORE INFORMATION**

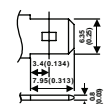
Please refer to our website [www.drypower.com.au](http://www.drypower.com.au) for more comprehensive information, datasheet downloads, terminal type guide, product catalogues, compatible battery charger options, etc.

TERMINAL  
TYPE

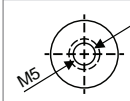
**F1**  
**(Faston Tab 187)**



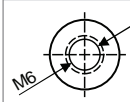
**F2**  
**(Faston Tab 250)**



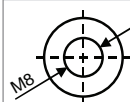
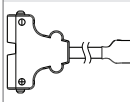
**F6**  
**(M5 Bolt)**



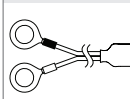
**F8**  
**(M6 Bolt)**



**F18  
(M8 Bolt)**

T-Bar to  
ADS PP

T-Bar to Anderson  
Powerpole Lead  
260mm (included)

F18 to  
ADS PP

M8 Rings to Anderson  
Powerpole Lead  
380mm (included)



Manufactured in China



### 1. What is a Lithium Iron Phosphate battery?

Lithium Iron Phosphate (LiFePO<sub>4</sub>) is a type of rechargeable battery, specifically a lithium-ion battery, which uses LiFePO<sub>4</sub> as the positive (cathode) material. LiFePO<sub>4</sub> provides advantages over traditional Lithium-Ion batteries based on Lithium Cobalt Oxide (LiCoO<sub>2</sub>).

LiFePO<sub>4</sub> batteries have somewhat lower energy density than the more common LiCoO<sub>2</sub> design found in consumer electronics, but offer longer service life, better power density (the rate that energy can be drawn from them) and are inherently safer.

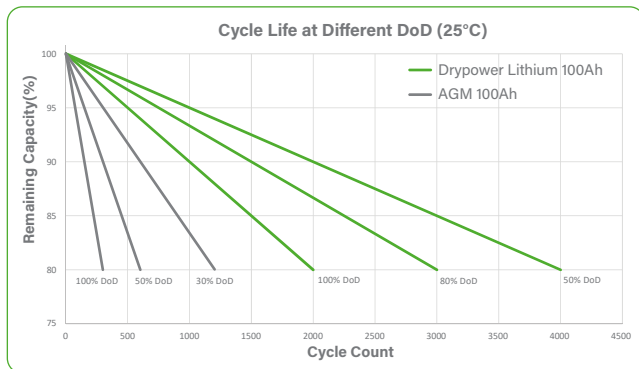
Nominal voltage of **3.2V per cell** - charge voltage of 3.6V per cell.

Drypower Rechargeable Lithium (LFP) batteries can offer a cycle life of over 2,000+ charge and discharge cycles, have an average service life of between 7 to 10 years, and can be expected to deliver reliable and consistent performance throughout its service life.

### 2. Why switch to Drypower Rechargeable Lithium?

Drypower Rechargeable Lithium is for users who are looking to significantly reduce bulk and weight in their system with a low maintenance battery that provides over 6x more cycle life and reduces their total cost of ownership.

Available in 6.4V, 12.8V and 25.6V models, Drypower Rechargeable Lithium batteries are designed as drop-in replacements for lead acid 6V/12V/24V batteries.



### 3. How safe are Drypower Rechargeable Lithium batteries?

Drypower Rechargeable Lithium batteries are considered to be non-flammable, non-hazardous and therefore safe by international and federally regulated (IEC62133-2:2017 and UN38.3) standards at the cell level as well as BMS level protection against over charge, over voltage, under voltage and over temperature.

All Drypower Rechargeable Lithium batteries adhere to strict safety guidelines by incorporating Battery Management Systems (BMS) into each battery. Additionally, the battery cases are robust enclosures with closed loop terminals and minimum IP5x or IP6x rating (dust resistant or dust tight) for greater protection.

### 4. What applications are Drypower Rechargeable Lithium batteries suitable for?

Drypower Rechargeable Lithium batteries can be used in any application that would normally use a single or multiple configurations of Lead Acid, GEL or AGM batteries. LiFePO<sub>4</sub> in 2S = 6.4V, 4S = 12.8V and 8S = 25.6V is closest to lead acid equivalent models - 6V, 12V, 24V.

Suitable applications include caravan, marine, golf carts & buggies, solar storage, remote monitoring, switching applications and more.

In solar storage applications, compared with lead acid batteries, Drypower Rechargeable Lithium batteries are able to capture and store more solar generated power per photovoltaic panel, improving the overall usability and efficiency of your solar power system.

The maximum allowable connection is 4 in series in pre-approved<sup>[1]</sup> applications with the correct LiFePO<sub>4</sub> charger specified.

<sup>[1]</sup> Please consult with a Drypower technical expert for more information regarding the requirements and limitations in your application.

### 5. Can Drypower Rechargeable Lithium batteries be used in series and parallel configurations?

Series connection: 12V models can be connected in series up to 4S. 24V models can be connected in series up to 2S. It is highly recommended that these modules are voltage and capacity matched to ensure system longevity.

Golf specific 12V models can only be used in 1S max. (stand-alone use).

No parallel connection is allowed without prior approval from a Drypower technical expert.

### 6. Can Drypower Rechargeable Lithium batteries be used under a car bonnet?

NO - We recommend you do not use Drypower Rechargeable Lithium batteries in a vehicle with a combustion engine that has an alternator, generator or stator charging system - these charging systems are not compatible with LiFePO<sub>4</sub> charging requirements. Excessive heat environment exposure over 65°C will drastically shorten battery life.

Drypower Rechargeable Lithium batteries are designed for deep cycle or standby use and the maximum current output is limited. Do not use for jump starting or engine starting systems.

### 7. Can Drypower Rechargeable Lithium batteries be charged using SLA chargers?

NO - We recommend using a battery charger with a Lithium Charge profile. A major difference between how one treats rechargeable Lithium type batteries (including Li-ion and LiFePO<sub>4</sub>) and Lead Acid (SLA) batteries appears at the point of full charge:

For SLAs, one obtains the best lifetime by continuously maintaining them at a constant voltage - typically 13.5-13.8 Volts for a 12V lead acid battery. Lithium types should not be maintained at the full charge voltage after full charge has been achieved.

No High Voltage desulphation charge is recommended (PCM/BMS controlled).

What happens with Lithium-Ion batteries (including LiFePO<sub>4</sub>) is that if the full charge voltage is maintained, the battery's internal chemistry degrades much more rapidly than if it was fully charged and then immediately disconnected from the source, allowing the voltage to sink down a bit on its own. What this means is that you will get much better longevity out of a Lithium battery pack if you do not keep it on a high-level float charge.

### 8. Can Drypower Rechargeable Lithium batteries be stored for long periods of time?

Yes, Drypower Rechargeable Lithium batteries have a much better storage tolerance than lead acid batteries due to their very low self discharge rate, with no risk of sulphation. We do recommend storing them at 50% SoC and voltage checking them every 6 months to gain maximum benefit when back in use.

### 9. What are the transportation requirements for Drypower Rechargeable Lithium batteries?

Drypower Rechargeable Lithium batteries over 100Wh (per battery) are classed as Class 9 Dangerous Goods and need to be shipped in accordance with these requirements.

However, please note that if a Drypower Rechargeable Lithium battery is being shipped with other goods, the entire shipment may be considered as Class 9 DG. Please check with your preferred carrier for the most up-to-date transportation guidelines.







## Compare the Drypower Range

Application	Backup & Main Power Range	Cyclic Range	High Rate UPS Range	Standby Long Life Range	High Power Standby Long Life Range	Front Terminal Standby Long Life Range	Solar Power Range	Hybrid Gel Range	Pure Gel Range	Recharge-able Lithium Range
General Electronics	☼	☼					☼	GEL		LiFe
Toys	☼	☼						GEL		LiFe
UPS & Data	☼		☼	☼	☼	☼			☼	
Security	☼		☼	☼	☼	☼				
Fire Alarm	☼		☼	☼	☼	☼				
Emergency Lighting	☼			☼	☼	☼				
Medical	☼	☼		☼	☼	☼		GEL	☼	LiFe
Mobility / Wheelchair / AGV		☼						GEL	☼	LiFe
Golf Cart / Buggy		☼						GEL	☼	LiFe
Wind Power		☼					☼	GEL	☼	LiFe
4x4/RV/Marine Storage		☼					☼	GEL	☼	LiFe
Deep Cycle Applications		☼					☼	GEL	☼	LiFe
Telecommunications / Data			☼	☼	☼	☼		GEL	☼	LiFe
Off Grid Solar		☼					☼	GEL	☼	LiFe
Infrastructure	☼	☼		☼	☼	☼	☼	GEL	☼	LiFe
Utilities	☼	☼		☼	☼	☼	☼	GEL	☼	LiFe

This chart is to be used as a guide only. Specific application requirements may need to be considered. If unsure, please contact us.