

# SMART BATTERY SYSTEM





# LE300

EXTEND EVERY 12 V LEAD BATTERY SYSTEM WITH  $\text{LiFePO}_4$  HYBRID TECHNOLOGY



## SMART LITHIUM BATTERY

IDEAL FOR:

-  **BOATS**
-  **MOTORHOMES AND VANS**
-  **MOBILE APPLICATIONS**
-  **SMALL PV-SYSTEMS**









THE LE300 SMART BATTERY SYSTEM IS AN INTELLIGENT LITHIUM BATTERY, DESIGNED FOR THE EXTENSION OF 12 V LEAD-ACID BATTERY SYSTEMS. THIS HYBRID-COMBINATION ADDS CAPACITY, IMPROVES PERFORMANCE, AND INCREASES THE LIFESPAN OF THE ENTIRE SYSTEM.

**Working principle:** The LE300 Smart Battery System takes over most of the charging cycles while the lead-acid battery functions as cheap backup storage. The lead-acid battery is charged with a higher priority, with the lithium battery taking up the excess energy. When discharging, the lithium battery is primarily discharged. This means that the

life of the lead-acid battery is significantly extended. The LE300 detects the voltage of the lead-acid battery and automatically begins to support it with a maximum current of 12.5 A. Larger loads are supplied by the lead-acid battery and the lithium battery in parallel, which means that both batteries are discharged with less current.

### CORE ADVANTAGES AT A GLANCE

-  **10 years lifespan** Extends the service life by up to 10 years for both batteries.
-  **Small, light, scalable** Can be extended to the required capacity at any time.
-  **Safe and robust** It is E1 certified for use in vehicles. The user is protected by built-in safety functions.
-  **Plug and Play** No additional charge controller required. LE300 modules are connected in parallel to the poles of the lead-acid system.
-  **Guaranteed performance** Each lithium module has its own BMS and works independently of the others.
-  **Winter functionality** Thanks to the integrated cell heating, it can also be used in freezing temperatures.

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## LE300

System voltage	12 VDC
Nominal voltage	12.8 VDC
Voltage range	11 – 15 VDC
Battery packs used in LE300	IFpR/26/65 [8p/4s] E/-20NA/95 LiFePO <sub>4</sub> rechargeable battery
Nominal lithium capacity	28 Ah/358 Wh
Usable lithium capacity	90 % (25,2 Ah/322 Wh)
Numbers of cycles at room temperature	3000 full cycles (80% remaining capacity after 3000 cycles)
Recommended lead acid capacity for each LE300 (not included)	70 – 125 Ah @ 12 VDC
Recommended lithium/lead acid capacity ratio (net)	1/3 in solar home applications. Values vary depending on needed autonomy and on application.
Continuous charging/dischargin current	Max. 12.5 A between 5 and 40 °C, at higher and lower temperatures current is limited.
Battery efficiency	> 90 %
Housing dimensions	175x229x67 mm
Weight	3.4 kg
Connection terminals	RAST 5/mini module 4 pin/communication interface/external display
Recommended wire size	1.5 – 4 mm <sup>2</sup>
Ambient temp. (operation & warehousing)	-20 – 50 °C ambient temperature with maximum battery life at 15 - 25 °C. Warehousing temperature 10 – 30 °C.
Low and high temperature protection, heating, charging & discharging	Temp. sensor prevents lithium battery charge under -5 °C or above 55 °C cell temp. Charging starts once cell temp. is higher than -5 °C. Device has an integrated heating that is active between -20 °C and 10 °C cell temp. Discharge possible between -20 °C and 60 °C cell temp. At cell temp. below -20 °C and over 60 °C system is running in pure lead acid mode for higher battery lifetime.
Lithium cell balancing	Battery management inclusive balancer
Protection features	Overcurrent, overvoltage, short circuit, deep discharge, wrong polarity protection.
Operation mode/compatible external batteries	Works in combination with any 12 V lead acid battery & lead acid charge controller.
Max. parallel LE300s	In standard version, a maximum of 24 LE300 can be connected in parallel, higher quantities possible after consulting BOS partner.

### EXEMPLARY BATTERY PACK CONFIGURATION

	<b>Parallel</b>	
Qt. of packs connected in parallel	6	2
Total nominal voltage	12.8 VDC	12.8 VDC
Total lithium capacity	168 Ah/2,15 kWh	56 Ah/ 716 Wh
Continuous charging/discharging current	Max. 75 A	Max. 25 A
Recommended lead acid capacity (not included)	Min 40 Ah	Min 20 Ah