

24V 180Ah/100Ah Lithium-Ion Battery and Lynx Ion + Shunt

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24V 180Ah and 100Ah Lithium-Ion Battery

The advantages of a Lithium-ion battery over conventional lead-acid batteries

- High energy density: more energy with less weight;
- High charge currents (shortens the charge period);
- High discharge currents (enabling for example electrical cooking on a small battery bank);
- Long battery life (up to six times the battery life of a conventional battery);
- High efficiency between charging and discharging (very little energy loss due to heat development);
- Higher continuous power available.

Why Lithium-Iron-Phosphate?

Lithium-Iron-Phosphate (LiFePO₄ or LFP) is the safest of the mainstream Li-ion battery types. The nominal voltage of a LFP cell is 3,2V (lead-acid: 2V/cell). A 25,6V LFP battery consists of 8 cells connected in series.

Complete system

A complete system consists of:

- One or more **24V 180Ah or 100Ah Lithium-Ion batteries**.
- (optional) The **Lynx Power In**, a modular dc bus bar.
- The **Lynx Ion + Shunt** is the Battery Management System (BMS) that controls the batteries. It contains a main safety contactor and a shunt. There are two models are available: a 350A model and a 600A model.
- (optional) The **Lynx Distributor**, a DC distribution system with fuses.
- (optional) The **Ion Control**, a digital control panel.
- (optional) The **Color Control GX**, a more advanced digital control panel

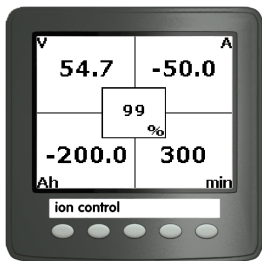


Lynx Ion + Shunt

The advantages of the Victron Lynx Lithium-ion battery system

The modular system used adds the following advantages:

- The Victron Lithium-Ion Battery System is easy to install due to its modularity. No complicated wiring diagrams are required.
- Detailed information is available on the waterproof Ion Control display.
- The relay in the Lynx-Ion + Shunt provides maximum safety: in case the chargers or loads do not respond to the commands from the Lynx-Ion + Shunt, the main safety relay will open to prevent permanent damage to the batteries.
- For typical marine installations there is an extra small output, so you can still power the bilge pump while disconnecting all other house loads by opening the main relay.



Ion control: Main screen

24V 180Ah/100Ah Lithium-Ion Batteries

The base of the Victron Lithium-Ion Battery System is formed by individual 24V/180Ah Lithium-ion batteries. They have a built-in Cell Management System (BMS) which protects the battery on a cell level. It monitors individual cell voltage and system temperature, and actively balances the individual cells. All measured parameters are sent to the Lynx Ion which monitors the system as a whole.

Lynx Ion + Shunt

The Lynx Ion + Shunt is the BMS. It contains the safety contactor, and controls the cell-balancing, charging and discharging of the system. Also, it keeps track of the State of Charge of the batteries and calculates the Time to Go. It protects the battery pack from both overcharging and depletion. When an overcharge is imminent, it will signal the charging devices to decrease or stop charging. This is done with the VE.Can bus (NMEA2000) compatible, and also via the two available open/close contacts. Same when the battery is nearing empty, and there is no charging capability available. It will signal big loads to switch off.

For both overcharging and depletion there is a last safety resort, the built-in 350A or 600 A contactor. In case signalling does not stop the imminent overcharge or depletion, it will open the contactor.

VE.Can / NMEA2000 Canbus

Communication with the outside world is done via the VE.Can protocol.

Ion Control

See the separate **Ion Control** datasheet for more information.

Color Control GX

See the separate **Color Control GX** datasheet for more information.



Ion control: History screen



Ion control: Lynx Ion Status

Lynx Ion Status

State	Running
Error	No error
System Switch	Enabled
Balancing	Disabled

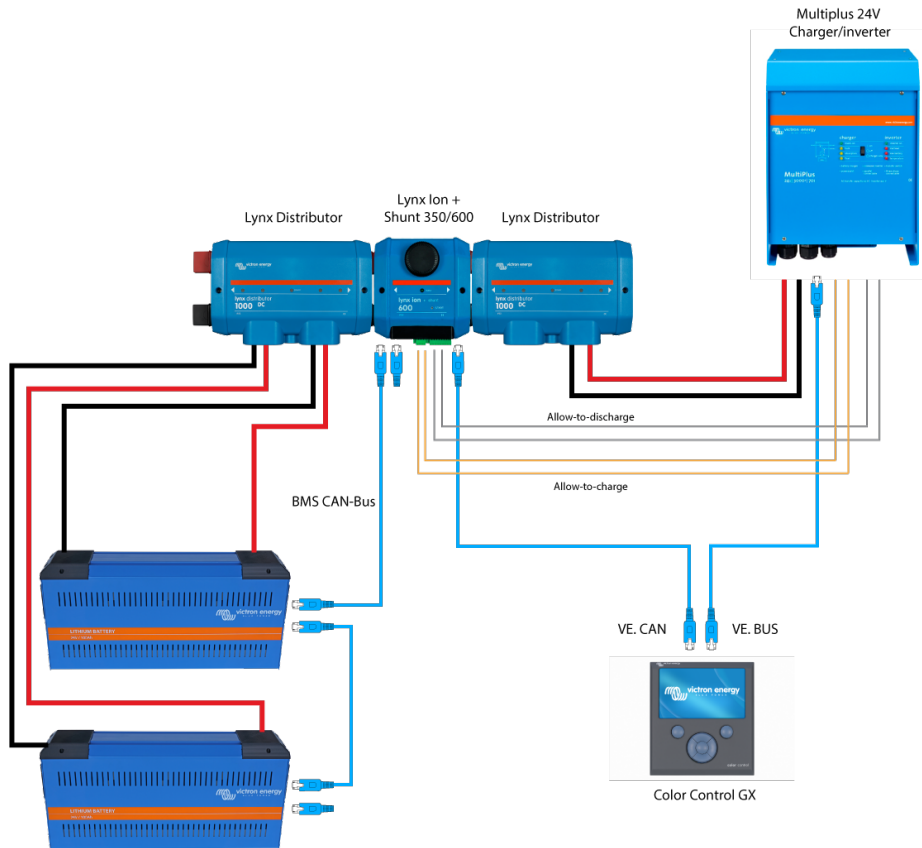
Lithium-Ion battery specifications

	Lithium-ion 24V 100Ah 2.6kWh battery	Lithium-ion 24V 180Ah 4.75kWh battery
Technology	Lithium iron phosphate (LiFePO4)	Lithium iron phosphate (LiFePO4)
Nominal voltage	25,6V	25,6V
Nominal capacity	100Ah	180Ah
Nominal power	2,6kWh	4,75kWh
Weight	30kg	55kg
Power/Weight ratio	86Wh/kg	86Wh/kg
Dimensions (lxwxh)	592 x 154 x 278 mm	623 x 193 x 351 mm
Charge/Discharge		
Charge cut-off voltage at 0.05C	28,8V	28,8V
Discharge cut-off voltage	20V	20V
Recommended charge/discharge current	30A (0,3C)	54A (0,3C)
Maximum charge current (1C)	100A	180A
Maximum discharge current (1.5C)	150A	270A
Pulse discharge current (10s)	500A	1000A
Cycle Life @80% DOD (0.3C)	3000	3000
Configuration		
Series configuration	Yes, up to 2 (more in series on request)	Yes, up to 2 (more in series on request)
Parallel configuration	Yes, easy up to 10 (more parallel on request)	Yes, easy up to 10 (more parallel on request)
Environmental		
Operating temp. charge	0~45°C	0~45°C
Operating temp. discharge	-20~55°C	-20~55°C
Storage temp.	-20~45°C	-20~45°C
Standards		
EMC: Emission	EN-IEC 61000-6-3:2007/A1:2011/C11:2012	
EMC: Immunity	EN-IEC 61000-6-1:2007	
Low voltage directive	EN 60335-1:2012/AC:2014	

Lynx Ion + Shunt specifications

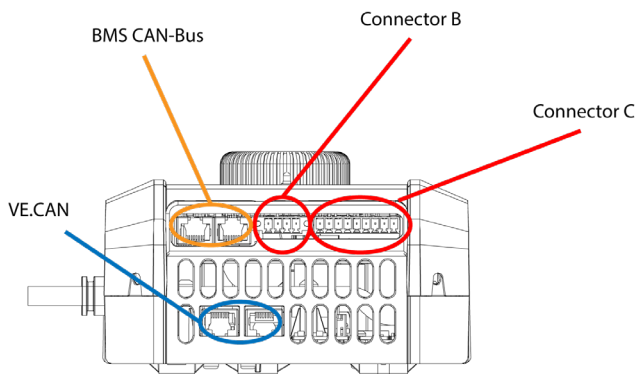
Lynx Ion + Shunt	350A	600A
Maximum number batteries in series	2 (= 48 VDC)	
Maximum number batteries in parallel	48	
Supply voltage range	9 ... 60VDC	
Standby mode	73mW @ 26,2V and 138mW @ 52,4V	
Active mode	8,7 W	
Main safety contactor	350A	600A
Enclosure		
Material	ABS	
Weight	2,0kg	
Dimensions (lxwxh)	185 x 165 x 85 mm	
IO		
Aux. output	5A (output voltage = battery voltage), short circuit protection	
External safety contactor	5A (output voltage = battery voltage), short circuit protection	
Allow-to-charge	1A @ 60VDC, potential free	
Allow-to-discharge	1A @ 60VDC, potential free	
External status signal	12V / 140mA	
Environmental		
Operating temperature range	-20 °C to 50 °C	
Humidity	Max. 95% (non-condensing)	
Protection class	IP22	IP20
Standards		
EMC: Emission	EN-IEC 61000-6-3:2007/A1:2011/C11:2012	
EMC: Immunity	EN-IEC 61000-6-1:2007	
Low voltage directive	EN 60335-1:2012/AC:2014	
RoHs	EN 50581:2012	

Block diagram Lithium-Ion Battery System

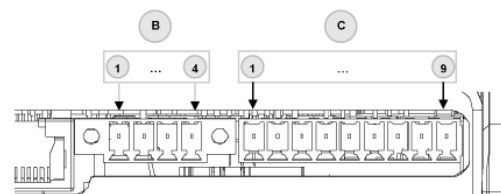


Allow-to-discharge
Connect the allow-to-discharge to the **Temp. sense input** of the Multi.

Allow-to-charge
Connect the allow-to-charge to the **AUX input** of the Multi.



Lynx Ion + Shunt connection overview:



Connector pins and specifications					
Conn.	Pin	I/O	Voltage Max.	Current Max.	Purpose
B	1	Out	+ V System	5 A	External status output
	2		GND		
	3	Out	+ V System	5 A	External safety contactor
	4		GND		
C	1		60 V	1,0 A @ 60 V	Allow-to-charge
	2		60 V	1,0 A @ 60 V	Allow-to-discharge
	3		60 V	1,0 A @ 60 V	Allow-to-discharge
	4		60 V	1,0 A @ 60 V	Allow-to-discharge
	5		60 V	1,0 A @ 60 V	Future use
	6		60 V	1,0 A @ 60 V	Future use
	7	In			External START-button
	8	Out	12 V	140 mA	External status signal
	9				GND used for status signal and/or START-button