

# Service Manual Battery power pack SLI120-EV12 SLI240-EV12

**Original instructions** 



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# 1. Safety Precautions

VebaBox is a specialized custom-made product that contains electric and cooling circuits, installation, use and maintenance of which are subordinated to special directives and regulations for protection of human health and global environment.

This is why the VebaBox company as legal owner of the product design and manufacturer declares and warns that only appointed qualified distributors and technical services are authorized to install and to service the VebaBox products.

During normal product usage the users should be aware of the following dangers.

CAUTION: Danger of fatal injury from electric shocks! When using the VebaBox, if the VebaBox/ power pack is powered by mains voltage, ensure that the power supply has a power circuit breaker! Check that the voltage specification on the plug label is the same as that of the power supply.

Only connect the VebaBox or battery power pack as follows:

• with the mains connection cable included with the battery power pack to the mains socket.

If the cable is damaged, it must be replaced to prevent possible electrical hazards.

Disconnect the connection cable before cleaning and maintenance, after use and before changing a fuse.

**<u>CAUTION</u>**: Danger of injuries! Batteries contain aggressive and caustic acids. Avoid battery fluid coming into contact with your body. If your skin does come into contact with battery fluid, wash the part of your body in question thoroughly with water. Disconnect the VebaBox and other electric devices from the battery before you connect the battery to a quick charging device. Overvoltage can damage the electronics of the VebaBox.



CAUTION: The power pack is not intended for use by children and teenagers or invalid persons unless they have been adequately supervised by a responsible person to ensure that they can use the appliance safely.

Do not operate the power pack if it is visibly damaged. The VebaBox power pack may only be repaired by qualified personnel. Inadequate repairs can cause considerable hazards. If your power pack should need repairing, please contact your local distributor.



CAUTION: Use tools with insulated handles that during operation and maintenance are in proper condition only.



CAUTION: Danger of fatal injury due to electric shocks! Do not touch exposed cables with your bare hands. This especially applies when operating the Power pack from an AC power supply.

Before starting the power pack, make sure that the power supply line and the plug are dry. Do not place any electrical devices connected to a live electric power source inside the cooling container.

Set up the power pack in a dry location where it is protected against splashing water. Protect the power pack and the cable against rain and moisture. Do not place it near open flames or other heat sources (heaters, direct sunlight, gas ovens etc.).



CAUTION: Danger of overheating! Always make sure there is sufficient ventilation so that heat generated during normal operation can dissipate.

Ensure that the ventilation slots are not covered.

Leave at least 100 mm free from the of powerpack to ensure adequate ventilation.

WARNING: Always wear goggles or safety glasses when working with or around the refrigeration system or battery. Refrigerant or battery acid can cause permanent damage if it comes in contact with your eyes.

WARNING: Control circuits (except mains input) used in the VebaBox are low voltage. This voltage potential is not considered life threatening, but the large amount of current available can cause severe burns if shorted to ground.

WARNING: Do not wear jewelry, watches, or rings. These items can shortcut electrical circuits and cause severe burns to the wearer.



**IMPORTANT:** VebaBox cannot be held liable for claims for damage resulting from the following:



• Misuse, improper installation, abnormal servicing, storage of hazardous chemicals, use of corrosive substances, transit damage, recharging of cooling system, accident, fire, improper repair, tampering or abuse.

• Incorrect voltages or faults with regard to power supply which falls outside of the VebaBox operating parameters.

#### First Aid

#### First Aid – Electric shock

**First:** Immediately disconnect the electric power source in the safest way (switch off the car engine, or emergency switch or disconnect / cut off the live circuit with a suitable insulated tool).

Second: When you are sure that the power is off remove the victims from the dangerous area and put them in anti-shock position

**Third:** Call your local medical emergency aid and act according to their instructions until the medical aid specialist comes to take over and provide further aid.

#### First Aid–Burns from heat.

First: Immediately remove the victims from the source of heat in the safest way.

Second: When you are sure that the heat source is eliminated put the victims in anti-shock position

**Third:** Call your local medical emergency aid and act according to their instructions until the medical aid specialist comes to take over and provide further aid.

## 3. General safety rules for working with batteries

- · Always wear protective clothing, gloves and googles
- Do not smoke near batteries.
- Keep sparks, flames and metal objects away from batteries.
- Use insulated tools when making battery connections.
- Electrolyte is a solution of acid and water, so avoid skin contact. If acid contacts skin or eyes, flush with

water immediately and contact a medical professional.

- Ensure the cable connections to the terminals are properly tightened.
- Do not lay objects on top of battery.
- Always charge and handle batteries in a well-ventilated area.
- Never add acid to a battery.
- Never remove or alter gel vent caps.



## 4. Product specifications

	Versions				
Product	SLI120-EV12	SLI240-EV12			
specifications					
Dimensions (LxWxH)	646x278x208mm	866x278x208mm			
Weight	20 Kg	40 Kg			
Power source input	12	/DC			
Power source output	12V DC 1004	A (150A fuse)			
Battery type/ nominal capacity	Lithium Iron Phosphate Battery	Lithium Iron Phosphate			
	100Ah	Battery 100Ah (2pcs)			
Ambient temperatures / non -20°C to 50°C					
condensing	(-4°F to 122°F)				
Discharge protection	Battery vo	ltage <10V			
Expected life of fully charged	3hours/30Ah	6,3hours/30Ah			
battery at					
current consumption. *					
Expected battery life*	Expected battery life* 3000 Cycles (80% DOD, 0,5C 25°C)				
Self-discharge (shelf life) *	6 Months (25°C)				
	After this period a refreshening charge is required.				
* Informative value, real values are influenced by battery state, temperature, current					

Note: This battery pack is equipped with a DC/DC converter with a maximum charge capacity of 50Ah. This will be enough to power the TUC2001 and TUF1005 thermal units. The TUC6000 thermal unit has a max power consumption of 80Ah. This can result that TUC6000 thermal unit will drain the battery and will activate low voltage protection.



# 5. Installation

Pos

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180mm 350mm	Connector pin SB120 25 pin SB120 25	mm² mm²	7		(*  -   -   -	0		L	2		1	7 1	
460mm 750mm	Cable lug M8 Cable lug M8	25mm² 25mm²		Neg-	12 3	PV+		9				Leaffe	
: 400mm : 350mm	Cable lug M8 Cable lug M8	25mm² 25mm²	-		٠				10				
: 400mm :400mm	pin SB120 25 pin SB120 25	mm² mm²			11	Switch	status	Battery type	e Absor 12V	Charging V rption 24V	foitage (V) Floa 12V	ting 24V	
							OFF, OFF	AGM	14.6	29.2	13.5	27	
		QTY		<b>/</b> •			OFF, ON	GEL	14.2	28.4	13.8	27.6	
ing zwart M8		1					ON, OFF	LFP	14.4	28.8	13.5	27	
Converter 12V	30A+MPPT	1					ON, ON	WET	14.8	29.6	13.8	27.6	
housing 80A to 1	20A Grey	2											
		1		Date:	Author:	Descriptio	n		Version	1	10	ha	Davi
12V		1		November 2024	R. Holleman	Schematic	s SLI120-E	V12	2	۱	<i>l</i> e	Dg	
5mm²		4			1					_			

Pos	Connector	Cable	Connector
1	Cable lug M8 25mm²	Red 25mm <sup>2</sup> L: 180mm	pin SB120 25 mm²
2	Cable lug M8 25mm²	Red 25mm <sup>2</sup> L: 350mm	pin SB120 25 mm²
3	Cable lug M8 25mm <sup>2</sup>	Red 25mm <sup>2</sup> L: 460mm	Cable lug M8 25mm <sup>2</sup>
4	Cable lug M8 25mm²	Red 25mm <sup>2</sup> L: 750mm	Cable lug M8 25mm <sup>2</sup>
7	Cable lug M8 25mm²	Black 25mm <sup>2</sup> L: 400mm	Cable lug M8 25mm²
8	Cable lug M8 25mm²	Black 25mm <sup>2</sup> L: 350mm	Cable lug M8 25mm²
9	Cable lug M8 25mm <sup>2</sup>	Black 25mm <sup>2</sup> L: 400mm	pin SB120 25 mm²
10	Cable lug M8 25mm <sup>2</sup>	Black 25mm <sup>2</sup> L:400mm	pin SB120 25 mm²

Pos	Article number	Description	QTY
11	6007000005	Contactstrip 1 aansluiting zwart M8	1
12	6005000009	Nemo DDX1230 DC/DC Converter 12V 30A+MPPT	1
13	6007000006	BMC series connector housing 80A to 120A Grey	2
14	601000005	Zekeringhouder mega	1
15	601000006	Mega zekering 100AH	1
16	600400003	LiFePO4 Battery 100Ah 12V	1
17	600700008	Connector pin SB120 25mm²	4
18	6008000002	Led lamp groen 12V	1





Pos

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Connector pin SB120 25mm<sup>2</sup>

Led lamp groen 12V

Pos





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# 6. Software setting of Nemo charger

The nemo dc/dc charger needs to be installed with the correct software settings. To adjust the software settings you need to have the following applications.

-Laptop installed with RapNEMO software



-TBB interface cable (connection of nemo charger to laptop)



Connect the COM-RS485 from the nemo charger to the interface cable and the USB to the laptop.





Open the RapNEMO tool on the laptop.

Select the communication port and click on open.

Please note that the Nemo must be activated (+13,5V) in order to open the software settings. The Nemo can be activated through the 12v input from the battery pack. The green led on the Nemo shows that it is activated.



The program tool has pre-set configurations. Please select under the tab Battery&Charger the correct battery type. This is LFP for the lithium battery used in the SLI-EV.

Chose the correct battery capacity. For the SLI120-EV is this 100Ah and for the SLI240-EV is this 200Ah. Batteries that are parallel connected should be count together. (e.g. 2x 100Ah is 200Ah)





😁 RapNEMO V2.08			– 🗆 X
File Port Target Simualtion Firmware	Help		
Port(Com): COM3 v	Close		
Information           Model:           Firmware version:           V0.00 (00.00.0017)	Undervoltage Battery&Charger Parameter correction Alternator Smart alternator disconnect voltage:	11.60 V	
Serial number:	Smart alternator connect voltage: Conventional alternator disconnect voltage:	12.00 V 12.00 V	
	Conventional alternator connect voltage:	12.40 V	
Real time data	AUX Battery		
	AUX battery disconnect voltage:	11.20 V	
Send Setting	AUX battery connect voltage:	12.20 V	
LE LE LE PURSUIT OF PERFECTION			

There is also an option to view the realtime data, this can be useful during maintenance or service.

Real time data				-		Х
Alternator voltage:	14.48	v	DC IN status	ALT	_	
Charging voltage:	14.72	v	Charging status:	Bulk-CC		
Charging current:	11.60	А	Alternator type:	Conventional		
Battery Temperature:	23.0	°C	PV voltage:	2.29	v	
Fridge/Load Voltage:	2.29	v	PV current:	0.00	А	
Fridge/Load Current:	0.00	А	NTC1 temperature:	27.0	°C	
AUX battery V-Sen:	14.65	v	NTC2 temperature:	34.0	°C	
DC IN voltage:	14.36	v	NTC3 temperature:	36.0	°C	
🛕 Active Alarms						

When all parameters are correct press send setting to send the parameters to the nemo device. After you can close the RapNEMO and disconnect the cables.



#### 6. Labels

The following labels need to be placed on the battery pack.





The serial number is made out of: EVYYWWXX (YY=year WW=weeknumber, XX=opeenvolgend nummer van de betreffende week.

QR Code (article number 350300006)

Label: Thermal unit & Car to indicate which cable should be connect to the connector.



## 7. Installation inside vehicle

The power pack needs to be fixated to the floor of the car. Preferred position is underneath the thermal unit. Connect the cables from the car and towards the thermal unit according to below. Do not switch these cables.



## 8. Operation

The power pack is made with a lithium battery and a dc/dc charger. This battery will be charged automatically by the 12V system from the electric vehicle. The charging process is automatic, and the battery is protected for undervoltage and overvoltage and can't be overcharged. The maximum charge current of the DC/DC converter is 50Ah.

The power pack 12V output must be connected to thermal unit.

Battery should be stored fully charged if not used for longer periods. Every 6 months of storage it should be fully recharged.

The lithium battery is equipped with a self-heating system so the battery will be able to operate during cold conditions. This self-heating system may use some power from its own batteries.

#### Controls

The power pack does not have any user controls. Its function is automatic, and a main switch is not used. On top of the power pack there is a green LED light. This led light indicates the state of the battery. On: battery is active

Off: battery is in undervoltage protection and need to be charged directly.





#### External battery charger

When the battery is empty and there is no option to charge it through the EV. Then it can be charged with external charger: 8010000002 - External battery charger for VebaBox SLI-EV12 battery packs. This charger is programmed with the custom charging parameters for the battery of the SLI-EV12 battery packs.



In order to charge the battery with the external charger, please follow these steps.

-Disconnect the 12V cable from the thermal unit.

-connect the external charger connector to this 12V cable.

-Make sure that the Victron charger is in Li-ion modus.

-the led on the Victron charger indicates the state of charging.

-After charging disconnect the external charger and reconnect the cable to the thermal unit.





## 9. Troubleshooting

Problem	Analyze	Solution
Battery does not	Battery empty. The	Start EV so that battery will be charged.
give 12V output.	battery might be in	The battery can be charged with external battery
	discharge protection.	charger. This charger can be ordered under article
	This can be checked by	number: 8010000002 - External battery charger for
	the green led light.	VebaBox SLI-EV12 battery packs
	Fuse	Device contains internal protective fuse (150A).
		Before proceeding with replacement, contact the
		service/distributor. Make sure the reason for the
		failure is corrected (i.e. short circuit on supply cables)
Battery not	Cable connection	Check if the 12V connection cable is connected.
charging		
	Charger defect	Check status of charger and parameters with the
		help of the RapNEMO software.
	Input EV	EV fails to give 12V input to the SLI-EV battery pack.

## 10. Storage

Please follow the tips below to ensure that the battery emerges from storage in a good condition:

- Charge the battery to 30% to 50% SOC.
- Disconnect the battery from the system.
- Store the battery in a well-ventilated, dry, clean area with temperatures between (-10°C) and (30°C).
- Do not expose the battery to direct sunlight, moisture, or precipitation.
- Handle the battery carefully to avoid sharp impacts or extreme pressure on the battery housing.
- Charge the battery at least once every 3~6 months to prevent it from over discharge.
- Fully charge the battery when it is taken out of storage.







The battery pack should be connected to the low voltage battery (12V) of the electric vehicle. This low voltage battery from the vehicle is supplied with power by the high voltage battery trough a dc/dc converter which is factory installed from the car manufacturer. Make sure the cable connection is fused with fuse 80A.