

# MASTERVOLT

USER'S MANUAL / GEBRUIKERSHANDLEIDING / BETRIEBSANLEITUNG  
MODE D'EMPLOI / MANUAL DE UTILIZACION / INSTRUZIONI PER L'USO

## Lithium-ion battery

MLS series: 12/80, 12/130, 12/260, 12/390 & 24/260



MASTERVOLT  
Snijdersbergweg 93, 1105 AN Amsterdam  
The Netherlands  
Tel.: +31-20-342 21 00  
Fax.: +31-20-697 10 06  
www.mastervolt.com

10000010505/02

# ENGLISH

# WARNINGS

	Observe these instructions and keep them located near the battery for future reference. Work on the battery should only be carried out by qualified personnel.
	While working on batteries wear protective eye-glassing and clothing. Observe accident protection rules.
	Any uncovered battery material such as electrolyte or powder on the skin or in the eyes must be flushed with plenty of water immediately. Then seek medical assistance. Spillages on clothing should be rinsed out with water.

	Explosion and fire hazard. Terminals of the battery are always alive; therefore do not place items or tools on the battery. Avoid short circuits, too deep discharges and too high charge currents. Use insulated tools. Do not wear any metallic items such as watches, bracelets, etc. In case of fire, use a type D, foam or CO2 fire extinguisher.
	Never try to open or dismantle the battery. Electrolyte is very corrosive. In normal working conditions, contact with the electrolyte is impossible. If the battery casing is damaged do not touch the exposed electrolyte or powder because it is corrosive.
	Ensure adequate and secure mounting. Handle with care because batteries are sensitive to mechanical shock.

# SPECIFICATIONS

Model	MLS 12/80	MLS 12/130	MLS 12/260	MLS 12/390	MLS 24/260
Article number	65010006	65010010	65010020	65010030	65020010
Chemistry	Li Fe PO4, Lithium iron phosphate				
<b>Charge/discharge specifications</b>					
Nominal voltage	12.8V	12.8V	12.8V	12.8V	25.6V
Nominal capacity	6Ah	10Ah	20Ah	30Ah	10Ah
Nominal energy capacity	77Wh	128Wh	256Wh	384Wh	256Wh
Maximum charge current	6A (1C)	10A (1C)	20A (1C)	30A (1C)	10A(1C)
Maximum continuous discharge current	6A (1C)	10A (1C)	20A (1C)	30A (1C)	10A(1C)
Maximum pulse (30s) discharge current	12A	25A	40A	60A	25A
Charge Voltage Bulk/absorption	14.25V	14.25V	14.25V	14.25V	28.5V
Charge voltage Float	13.5V	13.5V	13.5V	13.5V	27.0V
Over voltage cut off limit	15.2V	15.2V	15.2V	15.2V	30.4V
Under voltage cut off limit	9.2V	9.2V	9.2V	9.2V	18.4V
<b>Mechanical specifications</b>					
Length (mm/inch)	90mm / 3.5in	151mm / 5.9in	180mm / 7.1in	182mm / 7.2in	180mm / 7.1in
Width (mm/inch)	70mm / 2.8in	65mm / 2.6in	77mm / 3.0in	127mm / 5.0in	77mm / 3.0in
Height excl. terminals (mm/inch)	103mm / 4.1in	97mm / 3.8in	154mm / 6.1in	134mm / 5.3in	154mm / 6.1in
Height incl. terminals (mm/inch)	109mm / 4.3in	103mm / 4.1in	160mm / 6.3in	140mm / 5.5in	160mm / 6.3in
Approximate weight	0.8kg (1.8lbs)	1.5kg (3.3lbs)	3.1kg (6.8lbs)	4.9kg(10.8lbs)	3.1kg (6.8lbs)
Terminal	Insert M5	Insert M5	Insert M5	Insert M5	Insert M5
<b>General</b>					
Parallel configuration	Yes, up to 3 (see section "Parallel Connection")				
Series configuration	No				
Nominal operating temp.	5 to 30°C (41 to 86°F), Recommended: 25°C (77°F)				
Max. operation temperature	-20 to 60 °C (-4 to 140°F)				
Over temperature cut off	≥90°C (194°F)				
Storage temperature	-20 to 60 °C (-4 to 140°F)				
Protection degree	IP65 (enclosure)				
Safety protections (BMS)	Integrated disconnect: Overvoltage, under voltage, over temperature				
Cell balancing	Yes, passive				
Warranty	2 years				
Self-discharge	<2% per month @ 20°C (68°F)				
Cycle life	>2500 cycles (@1C charge/discharge @100% DOD @20°C, 80% capacity remaining)				

**General**

Mastervolt MLS batteries must be installed and used in accordance with the instructions and specifications in this manual as well as DIN VDE 0510.

MLS batteries are protected against over voltage, under voltage or over temperature; see Trouble shooting section.

**Installation**

- Prior to installation check MLS battery for mechanical damages and firmly tightened terminals.
- During installation all loads and chargers must be switched off.
- Installation in upright position is recommended. Installation on either long side (90°) is allowed
- Keep >2cm (>0.8 inch) space between the batteries.
- Keep away from heat sources. See specifications for allowed operation temperatures. Temperatures below 5 °C (41°F) and above 30 °C (86 °F) may affect battery capacity, life time and cycle life.
- Clean the terminals before connection.
- Use properly sized and reliable cable lugs, battery terminals, terminal insulators and fuses. Tighten all connections firmly. Recommended torque for battery terminal connections: 2 to 3 Nm (18 to 27 InLbs).
- **Connect the Li-ion battery with correct polarity. The position of the battery terminals may differ from previous installed batteries!**
- Connect the minus cable last of all.
- Max allowed batteries in parallel: 3. Batteries must be of the same type, capacity and state of charge. Do not mix old and new batteries. See section "Parallel Connection". Series connection is not permitted!

**Charging**

MLS batteries must be fully charged before its first use. Use only chargers with IUoU characteristic. Charger settings, depending on battery nominal voltage 12V/24V: absorption charge 14.25V/28.5V; float charge 13.5V/27.0V. Maximum charge current: 100% of nominal capacity (1C).

**Discharge**

Maximum continuous discharge current: 100% of nominal capacity (1C). Maximum 30 sec pulse discharge: 150% of nominal capacity (1.5C). Do not discharge below the under voltage cut off limit.

**Maintenance**

Check batteries and connections on a regular base, at least every three months. Defects such as loose or corroded connections must be corrected immediately. Keep the battery dry and clean. Use only a wet soft cloth to clean the battery. Never use any additives, acids and/or abrasives.

Do not open the battery.

**Trouble shooting**

Failure	Possible cause	What to do
No battery voltage	High temperature	Let the battery cool down. Check installation environment.
	Battery discharged below under voltage cut-off limit	Disconnect load(s). Charge the battery.
	Charge voltage higher than overvoltage cut off limit	Check/reduce charge voltage.

**Storage**

The Li-ion battery should be stored in a dry and well ventilated environment. The rate of self-discharge is less than 2% per month. Elevated environmental temperatures increase the self-discharge rate of the batteries and natural aging. If the Li-ion battery will not be used for a period exceeding 3 months, we advise:

- If external power is available: switch off all loads and switch on the charger. Apply a float voltage as specified in section 'Charging'
- If no external power is available: switch off all loads. In this setup the batteries can be kept at least 6 months without maintenance.

**Transportation warnings**



The Li-ion battery must be transported in its original or equivalent package and in an upright position.

Never lift the battery at the terminals.

Batteries are tested according to UN Handbook of Tests and Criteria, part III, sub section 38.3 (ST/SG/AC.10/11/Rev.5).

For transport the batteries belong to the category UN3480, Class 9, Packaging Group II and have to be transported according to this regulation. This means that for land and sea transport (ADR, RID & IMDG) they have to be packed according to packaging instruction P903 and for air transport (IATA) according to packaging instruction P965. The original packaging satisfies these instructions.

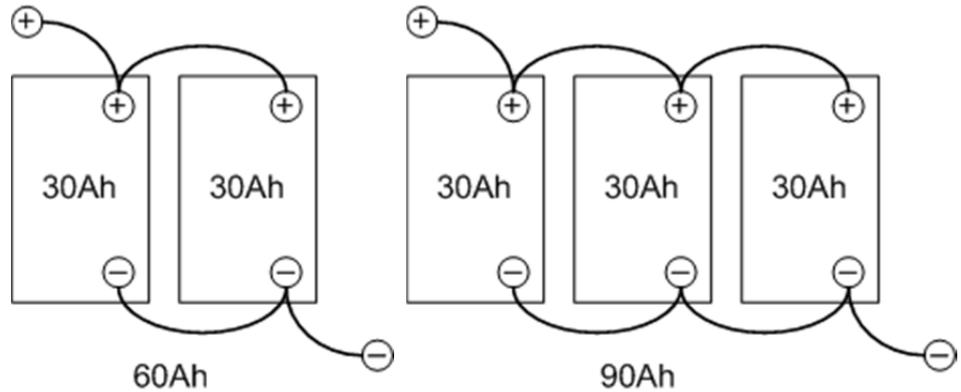


**Disposal of batteries**

Used batteries are harmful to health and the environment. Therefore batteries may not be mixed with domestic or industrial waste but must be collected and recycled separately. Contact your supplier for recollection and recycling of batteries or contact an authorized waste management company.

## PARALLEL CONNECTION

Parallelschakeling  
Parallel connection  
Parallelschaltung  
Connexion en parallèle  
Conexión en paralelo  
Collegamento in parallelo



Maximum number of batteries: 3  
Maximum aantal accu's: 3  
Maximale Anzahl an Batterien: 3  
Nombre maximum de batteries : 3  
Número máximo de baterías: 3  
Numero massimo di batterie: 3

Connection of the plus and minus wiring must be crosswise.

Aansluiting van de plus- en min-bedrading moet diagonaal worden uitgevoerd

Der Anschluss der Plus- und Minus-Verdrahtung muss diagonal ausgeführt werden

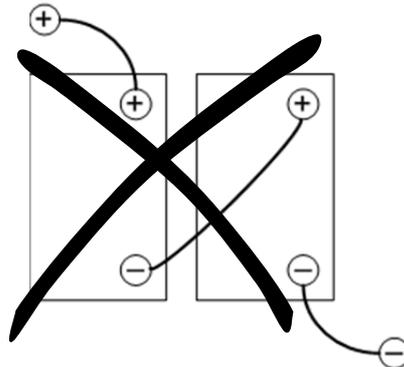
Les bornes de câblage plus et moins doivent être connectées de façon transversale

Las conexiones de los cables positivos y negativos deben ser del tipo de cruzamiento

Il cablaggio negativo e quello positivo devono essere incrociati



Series connection is not permitted!  
Serieschakeling is niet toegestaan!  
Reihenschaltung is nicht erlaubt!  
Ne pas brancher en série !  
¡No conecte la batería en serie!  
Non collegare le batterie in serie



**MASTERVOLT**  
THE POWER TO BE INDEPENDENT

© 2015, Mastervolt BV, Snijdersbergweg 93, 1105 AN Amsterdam, Netherlands  
Tel: + 31-20-3422100 Fax: + 31-20-6971006 Email: [info@mastervolt.com](mailto:info@mastervolt.com)

Mastervolt cannot be held liable for possible errors in the manual and the consequences of these

Mastervolt kan niet aansprakelijk worden gesteld voor eventuele fouten in de handleiding en de gevolgen daarvan.

Mastervolt kann nicht haftbar gemacht werden für: eventuelle Fehler in der Anleitung und die daraus entstehenden Folgen.

Mastervolt décline toute responsabilité dans les cas suivants éventuelles erreurs dans le manuel et leurs conséquences.

En ningún caso Mastervolt asumirá responsabilidad alguna derivada de eventuales errores en el manual de instrucciones y sus posibles consecuencias.

La Mastervolt declina ogni responsabilità per eventuali errori o omissioni nelle istruzioni per l'uso e le conseguenze che ne derivano.