



...mobil mit Batterien



LITHIUM ION  
BATTERY SYSTEMS

EN

# LITHIUM ION BATTERY SYSTEMS



## Lithium-ion batteries for rail vehicles

Tailored to your use and application

Lithium technology has ushered in a new era in electric drive technology. For us as part of the Triathlon Group, this development was decisive at an early stage.

TRIATHLON® lithium-ion battery systems are developed and designed for safe and reliable use. The high performance lithium-ion cells used offer maximum safety and predictability for the most demanding applications.

„Made in Germany“ and enduring in use

TRIATHLON® lithium-ion battery systems „Made in Germany“ are characterized by intelligent monitoring and control electronics.

The appropriate high-frequency fast charger communicates with the battery or vehicle via CAN bus. Sophisticated safety components and protective devices allow the monitoring of all operating states and offer maximum protection against incorrect use in practice.

## CELL TECHNOLOGY

### Lithium Iron Phosphate (LFP)

- Nominal cell voltage 3.2 V to 3.3 V
- No risk of thermal runaways
- High cycle stability of up to 4,000 cycles at 80 % DoD
- Wide operating temperature window -20 °C / +55 °C
- Energy density 125 Wh/kg and 292 Wh/l

### Lithium Titanate (LTO)

- Nominal cell voltage 2.3 V
- High cycle stability of up to 30,000 cycles at 80 % DoD
- High safety thanks to LTO anode
- Wide operating temperature window -30 °C / +55 °C
- Energy density 96 Wh/kg or 202 Wh/l

### Nickel-Manganese-Cobalt (NMC)

- Nominal cell voltage 3.6 V bis 3.7 V
- High cycle stability of min. 6,000 cycles at 80 % DoD
- Wide operating temperature window -30 °C / +60 °C
- Energy density 230 Wh/kg and min. 309 Wh/l

# FERTIGUNGSSTANDORTE

## ■ Glauchau / Saxony

State-of-the-art production and welding facility for high-performance lithium-ion battery modules



## ■ Freiberg / Saxony

Manufacturing facilities according to automotive standards ISO 14001 | ISO 45001 | ISO 9001



## ■ Zwönitz / Saxony

Assembly plant for electronic components such as printed circuit boards: Procurement | Manufacturing | Testing



# ON-BOARD BATTERIES

Standards and guidelines according to IEC-62928 are fulfilled



## ■ Lithium ion battery systems

Nominal voltages: 24, 36, 48, 72, 80, 96, 108, 120 volts

Available energy contents: 1.9 to 190 kWh

Available capacities: 74 to > 2000 Ah

Temperature range discharge: -28 °C to +50 °C

Temperature range charging: -28 °C to +50 °C

Charge factor: < 1.03

## ■ System concept for on-board batteries

### Scalability

- Customized system

- Individual scaling (voltage, power)

- Selection of the most suitable modules

### Cooling

- Air cooling at system, cell and module level

- Optimized temperature management for optimal lifetime

### Safety

- Container design according to EN45545

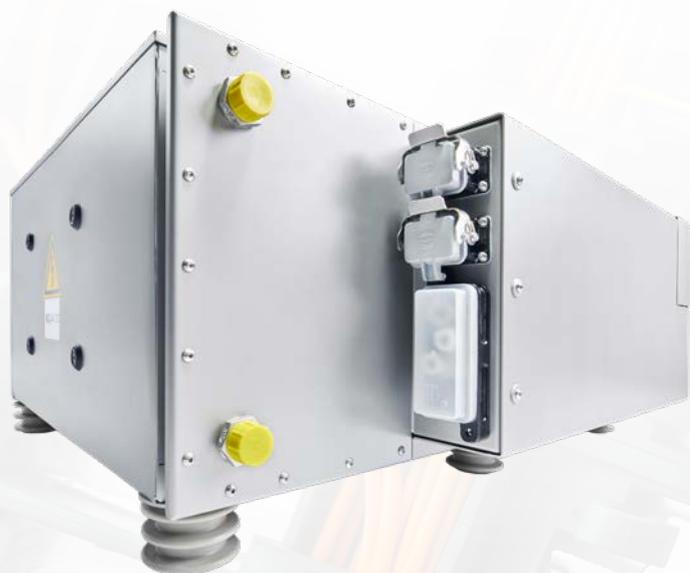
- Safety circuits to avoid critical states

- SIL-2 qualified safety software

### Monitoring

- IoT monitoring from anywhere

- Preventive maintenance and fault diagnosis



# DRIVE BATTERIES HIGH VOLTAGE

## LTO-STANDARD CONTAINER

Parameters	LTO-Standard Container
Capacity:	23 Ah
Max. charge rate:	75 A
Max. discharge rate:	75 A
Energy density:	44 Wh/kg
Dimensions (LxWxH):	953 x 788.5 x 387 mm
Energy:	15.26 kWh
Cell connection:	24s1p
Module connection:	12s1p
Voltage:	662.4 V
General features	
Heating / cooling:	built-in / external liquid cooled
Certifications:	ISO 26262 / UN38.3 / KBA (Eucaris) / ECE R100 / ECE R010
Protection:	IP54
Duplication:	up to 6 batteries

## NMC-MODULAR CONTAINER

Parameters	NMC Modular Main & Sub 644	NMC Modular Main 644	NMC Modular Main 322
Capacity:	100 Ah	50 Ah	100 Ah
Max. charge rate:	100 A	50 A	100 A
Max. discharge rate:	100 A	50 A	100 A
Energy density:	143 Wh/kg	143 Wh/kg	143 Wh/kg
Dimensions (LxWxH):	827 x 736 x 500 mm	827 x 736 x 245 mm	827 x 736 x 245 mm
Energy:	64.4 kWh	32.2 kWh	32.2 kWh
Cell connection:	11s2p	22s1p	11s2p
Module connection:	8s1p	8s1p	8s1p
Container connection:	2s1p	-	-
Voltage:	644.2 V	644.2 V	322.1 V
General features			
Heating / cooling:	built-in / external liquid cooled		
Certifications:	ISO 26262 / UN38.3 / KBA (Eucaris) / ECE R100 / ECE R010		
Protection:	IP6K6K		
Duplication:	up to 12 batteries (main & sub)		



...mobil mit Batterien

GW Batterien GmbH  
Emilienstraße 24a  
D - 08056 Zwickau

Tel: +49 (0)375 211855-0  
Fax: +49 (0)375 211855-55

info@gwbatt.de  
www.gwbatt.de

Dated 10/2022  
subjects to modifications

