Lithium-Ion batteries

As an assembly manufacturer and developer of Lead-Acid batteries and Lithium-Ion battery systems, TRIATHLON® produces batteries for a wide range of industrial motive power applications including electric forklifts and pallet trucks, mobile lifting platforms and cleaning machines.

Decades of experience and technical expertise, combined with state-of-the-art production facilities ensure the highest quality of motive power batteries available. The site is certified according to DIN EN ISO 9001:2015, DIN EN ISO 14001:2015 and BS OHSAS 18001:2007.

A solid network of sales and service partners in Germany, Europe and the United States provide competent solution based advice and both flexible and reliable onsite service.

Reliable

Flexible

Powerful

Competent
Multi-shift operations, more hours of actual lift truck usage, and a never ending drive to increase productivity in all sectors of manufacturing and logistics requires full-time availability of electric lift trucks.

The market driven push to respond to greater availability of lift trucks has led to opportunity and fast charging of Lead-Acid batteries. Lead-Acid battery technology simply cannot achieve some of today’s material handling demands without spare batteries and battery change-outs, especially in multi-shift 24/7 operations.

Due to years of research and development we can now offer new and innovative cost effective solutions for heavy-duty electric motive power operations.

TRIATHLON® Lithium-Ion battery systems can be opportunity and fast charged thus enabling multi-shift use without spare batteries and non-productive battery change-outs.

The systems are exclusively designed with high performance Lithium-Ion cells which fulfill all requirements for heavy duty industrial motive power use.

Find out more about the advantages of TRIATHLON® Lithium-Ion technology on the following pages.

tell the story!
A New Way Forward with TRIATHLON® Lithium-Ion Batteries!

Compared to conventional Lead-Acid batteries, Lithium-Ion technology has significant advantages. Now you can fully charge a completely discharged industrial battery within 1 - 2 hours. Opportunity charging is not only allowed but encouraged at any time and will not harm the battery. Time consuming, unsafe and non-productive battery change-outs are no longer necessary.

Lab results and real life field-testing of Lithium-Ion technology has found that these batteries deliver a significantly longer life than that of Lead-Acid batteries.

TRIATHLON® Lithium-Ion batteries are made up of Lithium-Ion cells that are assembled into modules which provide the required voltages and Ah capacities. We offer complete battery systems in all standard battery voltages. The battery system meets the highest safety requirements. Each battery system has an integrated monitoring system with a display unit and an opportunity charger.

TRIATHLON® Lithium-Ion battery systems are significantly more energy efficient than Lead-Acid batteries. The total efficiency of the system is up to 40% greater than that of Lead-Acid batteries.

It pays to consider “a new way forward.” We welcome the opportunity to consult with you in greater detail.
The “Made in Germany” TRIATHLON® Lithium-Ion battery system consists of Lithium-Ion battery cells and modules, intelligent monitoring and control systems, extensive safety componentry, and a high-frequency opportunity/fast charger that communicates with the battery via CAN bus protocol.

If battery discharge communication with the lift truck is not available based on the lift truck’s capabilities, an optional hard-wired external multi-functional display called the ion Battery Guard is provided. The ion Battery Guard is attached directly to the lift truck dash board so that the battery’s state of charge can be displayed and monitored by the operator.

The battery system has active protection componentry which monitors the entire system and virtually eliminates any misuse.
Longer Operating Times

**TRIATHLON® LITHIUM-ION BATTERY**
- Operating time approx. 21 - 22 h.
- Fast/Opportunity charging times approx. 2 - 3 h.

**TRIATHLON® LEAD-ACID BATTERY**
- Operating time approx. 8 h.
- Charging time/rest periods approx. 16 h.

The operating time of the lift truck increases due to flexible fast/opportunity charging of the battery system.

Your lift truck can be used virtually “AROUND THE CLOCK” without a battery change.

Endurance, Productivity and maximum performance under all conditions
SYSTEM FEATURES

- **Flexible** – the TRIATHLON® battery system can be used and charged anywhere and at any time.
- **Fast Charge** – full charging is possible within one hour.
- **Opportunity Charge** – opportunity charging is possible and encouraged at any state of charge and will not reduce battery life.
- **Zero Emissions** – no gassing.
- **Efficiency** – a high tech battery system combined with an extremely efficient high-frequency charger with easy to read display.
- **Capacity** – the available energy is much greater than that of Lead-Acid batteries in the same box size. In most cases multi-shift use is possible without battery change-outs.
- **Performance** – the higher sustained voltage properties of the TRIATHLON® Lithium-Ion battery result in faster more consistent lifting and driving performance, especially noticeable toward the end of the shift.
- **Energy Recuperation** – the TRIATHLON® Lithium-Ion battery readily accepts any current fed back from the lift truck and uses it to increase run-time without any damage to the battery.
- **Safe** – the TRIATHLON® battery system is equipped with deep discharge and overcharge protection, individual cell temperature and voltage monitoring and various other safeguards which will prevent a short-circuit.
- **Active** – the TRIATHLON® battery system has active protection componentry which prevents application errors virtually 100% of the time.
- **TriCOM SR-Switching Technology** – High system efficiency of up to 97%.
TRIATHLON® Lithium-Ion batteries can simply replace current Lead-Acid batteries without any modifications to new or existing lift trucks. Custom designed trays with similar dimensions and weights and features make the conversion very straightforward:

“LEAD OUT – LITHIUM IN”

You begin from day one experiencing the cost savings and efficiency of TRIATHLON® Lithium-Ion technology.
THE ADVANTAGES

- More flexibility due to decentralized charging stations.
- No explosion hazard and no odors due to gassing.
- Longer operating times and higher productivity due to fast and opportunity charging.
- The TRIATHLON® battery system is absolutely maintenance-free - it does not have to be topped off with water.
- No need for battery change-outs and additional spare batteries.
- No battery change-out equipment needed - the TRIATHLON® battery stays in the vehicle during charging and throughout its useful life.
- No need for centralized battery rooms with expensive ventilation systems and fire doors.
- Very low operating costs combined with significant savings in electricity and water costs.
- TCO (Total Cost of Ownership) - significantly reduced total lifetime costs.
- Virtually 100 % protection against application errors.
- Significantly reduced CO₂ footprint.
- Different battery capacities and voltages can be charged on the same charger.
In today’s world, battery systems require a complete economic analysis that considers and evaluates all relevant costs including initial purchase price, chargers and maintenance and service – simply called... “total cost of ownership” (TCO).

When the cost of purchasing a Lithium-Ion battery system is compared with the cost of a conventional Lead-Acid battery, at first glance, the purchase price of the Lithium-Ion battery is higher. However, a conventional Lead-Acid battery needs additional items such as weekly watering, a single point watering system, electrolyte level sensor and maintenance unique to Lead-Acid such as battery washing and other costs associated with truck damage due to corrosion. In addition to the maintenance expenses, costs are also incurred for battery rooms and battery handling equipment, fire and hazmat safety, ventilation systems and of course additional spare batteries. Battery change-outs require valuable production and warehousing space and additional no value-add labor.

Another substantial cost factor is energy consumption. Due to significantly better total efficiency, the energy costs for charging a TRIATHLON® Lithium-Ion battery are up to 40% lower than those of a Lead-Acid battery.

Thus, the conversion to Lithium-Ion batteries reduces total operating costs considerably.

To this end, TRIATHLON® and its sales partners offer professional and competent advice that considers the “Total Cost of Ownership.”
BATTERY SYSTEM SPECIFICATION

- Rated Voltages:
  24, 36, 48, 72, 80 volt

- Available battery system energy content:
  1.2 to 138 kWh

- Available capacities:
  52 to 1716 Ah

- Discharging temperature range:
  -18° F to +131° F

- Charging temperature range:
  -18° F to +131° F

- Storage temperature range:
  -4° F to +113° F

- Charge factor: 1.01 to 1.03

CHARGING SYSTEM SPECIFICATION

- Voltages:
  24 to 80 volt

- Available charging power:
  1.4 to 36 kW

- Available charging currents:
  50 to 400 ampere

- Efficiency: 95 to 97%

- No centralized charging station needed
## TriCom ion Charger Models

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### Specifications

- **Type of Cabinet:**
  - RF 480
  - RF 550
  - RF 660
  - RF 650
  - RF 750
  - RF 950
  - RF 1250

- **Height:**
  - 121 in / 307,4 mm
  - 169 in / 430,0 mm
  - 169 in / 430,0 mm
  - 169 in / 430,0 mm
  - 169 in / 430,0 mm
  - 169 in / 430,0 mm
  - 169 in / 430,0 mm

- **Width:**
  - 50.79 in / 129,0 mm
  - 50.79 in / 129,0 mm
  - 50.79 in / 129,0 mm
  - 50.79 in / 129,0 mm
  - 50.79 in / 129,0 mm
  - 50.79 in / 129,0 mm
  - 50.79 in / 129,0 mm

- **Depth:**
  - 16,9 in / 430,0 mm
  - 16,9 in / 430,0 mm
  - 16,9 in / 430,0 mm
  - 16,9 in / 430,0 mm
  - 16,9 in / 430,0 mm
  - 16,9 in / 430,0 mm
  - 16,9 in / 430,0 mm

### Additional Information

- **Contact:**
  - Coppell, TX 75019
  - Internet: www.triathlon-batteries.com
  - E-Mail: info@triathlon-batteries.com

- **Notes:**
  - Dated March 2018
  - We reserve the right to make changes without notice.