

ELECTRIC FORKLIFT

Counterbalance truck with lithium-ion battery

Clark has relaunched the GEX and GTX series. The three and four-wheel electric forklifts in 48-V technology with load capacities of 1,6 t to 2 t are now also available with a lithium-ion (Li-ion) battery. The included control system uses CAN.



Customers with intensive applications in particular benefit from the properties of the Li-ion battery (Source: Clark)

The electric forklifts with Li-ion battery are used for example in multi-shift operations in distribution or industry, where high availability is important, as well as in the food, beverage, chemical, and pharmaceutical industries, where clean operation is essential.

Wear-free motors with CAN

Two traction motors in the parallel front drive, each with 4,4 kW power and 48-V three-phase technology, ensure rapid acceleration of the vehicles and travel speeds of up to 16 km/h. The AC motors used are designed to be wear-free and robust, said the company. The Zapi Dual AC control system is equipped with a CAN network. Three driving modes are available for use of the truck. Also, individually programmable are the wear-free, regenerative braking with the motor brake and the automatic reduction of speed when cornering. Safe use on ramps is provided by the regular ramp function, which prevents unintentional acceleration or rolling back of the truck and ensures that the operator always has the vehicle under control, explained the company.

The GTX/GEX electric trucks have lift heights of up to 7075 mm. The range is available with two wheelbases. The GTX16/GEX16 has a wheelbase of 1312 mm. The GTX18/GEX18 and the GTX20s and GEX20s each have a wheelbase of 1420 mm.

The Clark Li-ion solution consists of the Li-ion battery including battery management system (BMS) and a high-frequency charger, said the company. The battery capacity is 460 Ah for all models in the GTX/GEX series. This means that both the vehicles with a smaller wheelbase and those with a larger wheelbase have the same battery power. The 48-V (160 A) charger requires a power connection (CEE 16 A plug) and fully recharges the battery in about 2,5 hours. The charging status of the Li-ion battery is shown on the truck display. During the charging process, the charger's display shows the charging status. The BMS has a safety cut-out, the company added.

Charging

Approximately 6 % to 7 % of the charge quantity can be achieved in 10 minutes. Decentralized charging points directly at the place of use ensure that charging can take place at any time. Li-ion trucks can thus be used around the clock without the need to change batteries. This reduces the downtimes required for battery replacement. In addition, the operator does not have to keep any exchangeable batteries or infrastructure for battery replacement. The battery scores with a constant voltage during the entire operation. Full power is always available $\hat{=}$ ¼ even when the battery is 85 % discharged, the company continued.



(Source: Clark)

According to them, the batteries are based on lithium iron phosphate technology (Lifepo4). With Lifepo4 batteries, no oxygen is released during the chemical reaction within the cells. The battery comes with 2 500 guaranteed charging cycles. And even after that, the battery can still be used for 10+ years for further uses, the company continued. "The investment in a Li-ion truck is not only

worthwhile for intensive applications, but also for all drivers who want to operate a maintenance-free, long-lasting, and fast-charging battery with a high safety standard," said Rolf Eiten.



(Source: Clark)

Operator workplace

A choice of adjustable comfort seats with air or mechanical suspension are available. The tilt of the steering column can be individually adjusted to suit the operator. The pedals are car-compliant. The truck can be operated either by adjustable mini-levers integrated in the armrest or by ergonomically arranged hydraulic levers on the truck bonnet. A change of direction is made via the steering column, the armrest or via a double pedal. The multi-colored display provides information on all important driving parameters. Storage options for documents and mobile phones are provided.

With a steering angle of 101 °, the GEX16-20s four-wheel forklift turns on the spot almost like a three-wheel forklift. The inner front wheel runs in the opposite direction when the steering angle is high. The rear wheel is thus not pushed over the ground. The

GTX16-20s three-wheel truck has double tyres on the steering axle. With a steering angle of 90 °, the three-wheel trucks therefore turn on the spot.

The three- and four-wheel electric forklifts are available with additional equipment so that they can be individually adapted to a range of operating conditions. The optional equipment includes, among other things, different cabs, such as rain protection (steel roof), weather protection (steel roof and front windscreen), partial (steel roof, front and rear windscreen as well as PVC side panel) and full cab, mini-levers or mechanical levers, blue LED warning lights, orange safety belt, attachments as well as additional safety options.

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