

PRESS INFORMATION

Battery production of the future is automated and sustainable

Manuela Kessler | 24.05.2023 | Lohr am Main / Germany | PI 038/23

- Battery production must become more flexible, transparent and intelligent
- Bosch Rexroth at Battery Show Europe: components, modules and system solutions for automation
- Systems for the circular economy: recycling batteries

The demand for lithium-ion batteries (LIBs) is growing rapidly. To meet this demand, global battery production must pick up speed and expand its capacities. Efficient approaches to the economical production of batteries are just as much in demand as concepts for battery recycling. At the Battery Show Europe from May 23 to 25 in Stuttgart (Hall 10, Booth A20), Bosch Rexroth will present automation solutions that support the entire value stream: from electrode and cell production to battery module and pack assembly to end-of-line testing and recycling.

"Batteries are one of the most important key technologies in a CO2-neutral, electrified world. Battery manufacturing must become more flexible, transparent and intelligent to enable manufacturers to keep pace with the rapid pace of change in the industry. At the same time, ways must be found to extend the life cycle of the lithium-ion battery and its starting materials in order to implement responsible resource management for sustainable mobility," explains Andreas Letsch, Head of Center of Competence Battery at Bosch Rexroth.

Bosch Rexroth has answers to these challenges. The supplier of automation solutions provides components, modules, and system solutions that are based on open interfaces and designed for optimal connectivity. The goal: interlocking solutions for the entire value stream that enable agile, automated, and sustainable battery production.

Automate, connect and handle

At the Battery Show Europe, Bosch Rexroth will provide an insight into its portfolio and showcase solutions for automation and connection technology as well as for material handling along the entire value stream.

In the field of automation, for example, systems from linear technology can be easily combined with advanced drive and control solutions and apps. The hardware and software solutions from the ctrlX AUTOMATION modular automation toolkit aim to increase productivity, make efficient use of resources, improve quality and shorten time-to-market in battery production. ctrlX AUTOMATION removes the classic boundaries between machine control, IT and the Internet of Things. Various components, such as the compact ctrlX CORE controller with app technology and the ctrlX DRIVE drives, provide support along the entire battery production process chain.

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For joining technology, Bosch Rexroth offers products and sub-systems for pressing and joining, dispensing, rack assembly, and tightening or resistance welding. The portfolio is used, for example, in pack assembly or cell production. The NEXO cordless screwdriver stands for maximum freedom with the highest process reliability and accuracy and meets all requirements for safety-critical tightening connections according to VDI/VDE 2862. The Smart Flex Effector, a sensor-based compensation element, gives industrial robots the sensitivity of a human hand and increases precision, e.g. for electrical contacting of modules or when joining pins.

Bosch Rexroth will also be showing innovations for material handling at the Battery Show Europe. The battery cell manufacturing process, for example, is supported by a fast and flexible transfer system. The combination of the Flexible Transport System FTS with the VarioFlow chain conveyor system ensures flexibility and high speed. The combination of the two systems reduces costs. VarioFlow can be easily designed and adapted for any plant layout thanks to the MTPro planning software. Along the planned logistics path, the battery cells and associated material are transported quickly and safely to the individual process stations. At the process stations (e.g. stacking, welding, testing), the AGV flexible transport system takes over the control for each workpiece carrier individually and thus enables precise positioning and synchronized movement for each carrier and the corresponding process axes.

The linear robots from Bosch Rexroth have also proven themselves many times over in module assembly, for example for handling the cells themselves, for housing and cover assemblies, as well as modules and packs. Based on a cartesian multi-axis system, this mechatronic solution moves components precisely and reliably. Linear axes are combined with control technology and software from Bosch Rexroth in such a way that applicators on site have minimal commissioning and programming effort. The basic linear robot concept is also available for dispensing operations. Compatible dispensing heads allow processes such as the application of thermal conductive pastes or adhesive beads to be implemented precisely with high quality.

Resource efficiency through recycling

Bosch Rexroth is increasingly focusing on resource conservation and thus supports the return of valuable raw materials to the battery manufacturing process - with scalable and economical system solutions.

"Raw materials form the basis of industrial value creation. In the manufacturing process of lithium-ion cells, they account for a large proportion of the costs. With our solutions designed for efficiency in production, raw material consumption and costs can be reduced sustainably. At the end of the product life cycle, battery packs are dismantled so that the materials can then be sorted and reprocessed. The valuable raw materials can then be returned to the production process," explains Andreas Letsch.

Bosch Rexroth will be presenting these and other solutions and concepts for modern, sustainable battery production at the Battery Show Europe from May 23 to 25 in Stuttgart in Hall 10, Stand A20.

Basic Information Bosch Rexroth

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As one of the world's leading suppliers of drive and control technologies, Bosch Rexroth ensures efficient, powerful and safe movement in machines and systems of any size. The company bundles global application experience in the market segments of Mobile and Industrial Applications as well as Factory Automation. With its intelligent components, customized system solutions, engineering and services, Bosch Rexroth is creating the necessary environment for fully connected applications. Bosch Rexroth offers its customers hydraulics, electric drive and control technology, gear technology and linear motion and assembly technology, including software and interfaces to the Internet of Things. With locations in over 80 countries more than 32,000 associates generated sales revenue of around 7.0 billion euros in 2022.

Basic Information Bosch

The Bosch Group is a leading global supplier of technology and services. It employs roughly 421,000 associates worldwide (as of December 31, 2022). The company generated sales of 88.2 billion euros in 2022. Its operations are divided into four business sectors: Mobility, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT provider, Bosch offers innovative solutions for smart homes, Industry 4.0, and connected mobility. Bosch is pursuing a vision of mobility that is sustainable, safe, and exciting. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to facilitate connected living with products and solutions that either contain artificial intelligence (AI) or have been developed or manufactured with its help. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 470 subsidiary and regional companies in over 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. At 136 locations across the globe, Bosch employs some 85,500 associates in research and development, of which nearly 44,000 are software engineers.

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