

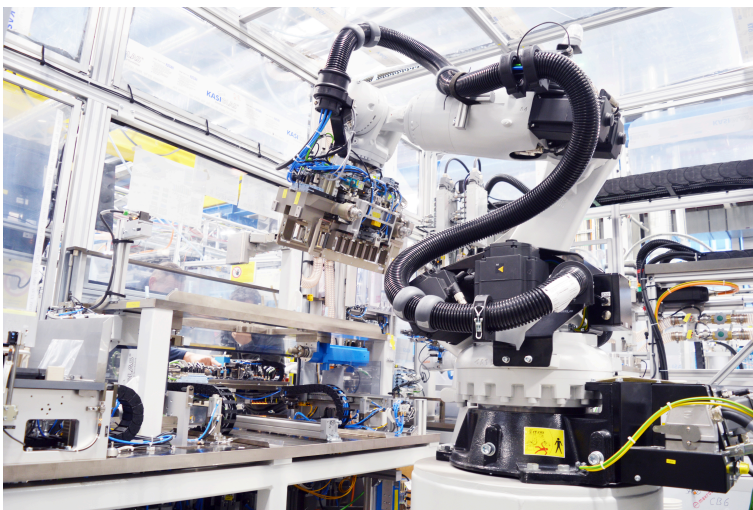
## PRESS INFORMATION

### Quickly boosting battery batch sizes

Manuela Kessler | 28.06.2022 | Lohr am Main / Germany | PI 037/22

Modular automation solutions and web-based software tools shorten engineering, commissioning and cycle times in battery production

- ctrlX AUTOMATION reduces engineering outlays by 30 percent to 50 percent
- Smart linear robots for multifaceted automation jobs
- TS 7 transfer system for battery-pack assembly
- Start of battery recycling



Automated assembly of stacks (Photo: Bosch)

**A total of 6.5 million electric cars were sold in 2021, according to a study by McKinsey – twice the total recorded the previous year. Automakers can meet this high demand only by quickly scaling their battery-production capacities. Bosch Rexroth offers rapidly applicable automation solutions that extend across the entire value chain of battery manufacturing – from role unwinding of the film, all process steps in cell manufacturing and battery-module and battery-pack assembly to end-of-line testing and recycling. Their modular design and state-of-the-art software architecture equipped with web-based commissioning tools reduce engineering outlays and time-to-market for the construction of new facilities and the retrofitting of existing operations.**

The ctrlX AUTOMATION system erases the boundaries between machine control, IT and the Internet of Things. ctrlX AUTOMATION cuts component and engineering outlays by 30 percent to 50 percent with the help of the real-time operating system Linux, fully open standards, app programming technologies, web-based engineering and a comprehensive IoT connection. The automation toolkit boosts both productivity and flexibility. Users can add functions at any time by installing apps that Bosch Rexroth, third-party providers or they themselves have developed.

**Plug and produce: Smart function kits**

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The latest linear robots – made of Rexroth's best-in-class linear motion technology components as well as automation hardware and software – can be used in a wide range of automation jobs, including joining, pressing, handling and dispensing. The pre-installed, intuitive operating software facilitates fast commissioning and simple graphic program production. No programming knowledge is required. The subsystems can be easily integrated into superordinate systems with the help of open interfaces and can be used in many ways, including the sensor-based compensation module Smart Flex Effector. Thanks to a sensitivity level that is comparable to that of the human hand, the Smart Flex Effector creates an array of new factory-automation opportunities. Difficult processes can now be automated, optimized and monitored

### **Contactless thanks to process chambers**

The flexible transport system FTS contactlessly leads battery components through process chambers. Linear motorically driven, it creates a high degree of freedom with straight paths, curves and inclines. In the process, the FTS can transport loads weighing one gram to two tons with positioning precision of up to 1 µm. Coils on the outside power magnetic carriers inside the chambers – without any seals and feedthroughs. The individual bodies can move a workpiece forward or backward and haul it at various speeds.

### **Smart battery pack assembly: low maintenance, safe, efficient**

The new TS7 transfer system can safely and reliably transport battery packs weighing well more than a ton through assembly areas. The system is optimally geared to the special safety and environmental requirements in battery production, allowing large battery packs to be moved on workpiece pallets.

The TS 7 portfolio is standardized, modular and especially low maintenance. It is readily available anywhere in the world and allows systems to be rapidly set up, commissioned and modified at any time.

### **End-of-line testing and recycling**

The compact, modular drive system ctrlX DRIVE and the control platform ctrlX CORE are used in the end-of-line testing of battery packs. They can also be used to discharge batteries in preparation for recycling. With the help of Rexroth transfer systems, other usage areas in battery production and reuse will arise.

Bosch Rexroth at the Battery Show Europe 2022: Hall 8, Booth D70

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The sensor-assisted compensation unit Smart Flex Effector increases precision and productivity, avoids errors and allows greater automation. (Image source: Bosch Rexroth AG)



The flexible transport system FTS contactlessly leads battery components through process chambers. (Image source: Bosch Rexroth AG)

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The new TS7 transfer system can safely and reliably transport battery packs weighing well more than a ton through assembly areas. (Image source: Bosch Rexroth AG)



the control platform ctrlX CORE is used, for example, in the end-of-line testing of battery packs. (Image source: Bosch Rexroth AG)

### Basic Information Bosch Rexroth

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 Applications, Machinery Applications and Engineering, and Factory Automation. With its intelligent components, customized system solutions 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 31,000 associates generated sales revenue of around 6.2 billion euros in 2021.

### Basic Information Bosch

The Bosch Group is a leading global supplier of technology and services. It employs roughly 402,600 associates worldwide (as of December 31, 2021). The company generated sales of 78.7



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billion euros in 2021. Its operations are divided into four business sectors: Mobility Solutions, 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 440 subsidiary and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. With its more than 400 locations worldwide, the Bosch Group has been carbon neutral since the first quarter of 2020. The basis for the company's future growth is its innovative strength. At 128 locations across the globe, Bosch employs some 76,100 associates in research and development, of which more than 38,000 are software engineers.

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