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More flexibility and precision in semiconductor and electronics industry

Manuela Kessler | 12.11.2024 | Lohr am Main / Germany | PI 039/24

Bosch Rexroth presents its automation portfolio at SEMICON Europa 2024



At SEMICON Europa, Bosch Rexroth presents drive and control technology as well as linear motion and assembly technology in a demonstrator for wafer handling. (Image source: Bosch Rexroth AG)

The demand for ever more powerful microchips is increasing. Modern, open automation solutions are the key to being able to react quickly to changes in the market and at the same time guarantee the high demands on production quality. Bosch Rexroth supports the semiconductor industry with its comprehensive industry know-how and a broad portfolio of automation solutions and mechatronic systems across the entire value stream – from wafer production, front-end and back-end to electronics production. At SEMICON Europa, the company will be presenting selected solution packages in a wafer handling use case.

Semiconductors play a key role in industry. And demand is growing: the VDMA expects the number of semiconductors required to double between 2023 and 2030. However, it is not just the quantities, but also the demand for ever more power in ever smaller devices that is increasing the pace of development and production in the industry. Procurement bottlenecks, rising energy costs and the shortage of skilled workers are also increasing the pressure on manufacturers and their suppliers.

“The dynamics in the semiconductor industry continue to increase: if you want to be successful today, you have to develop further and industrialize your solutions even faster. With the open automation solutions from Bosch Rexroth, our customers can strengthen their innovative power and further accelerate the pace of innovation,” summarizes Thomas Kober, Head of the Semiconductor Industry Segment at Bosch Rexroth. Automation solutions must not only be modular, compact and adaptable, but also meet the special requirements of semiconductor production. The components and mechatronic subsystems are designed for maximum precision and speed, cleanroom and vacuum suitability and high resistance to chemicals.

Bosch Rexroth offers end-to-end solutions from the fields of automation, linear and joining technology as well as material handling for the digitalization and optimization of the entire value stream. All components, modules and system solutions have open interfaces and can therefore be easily combined with other solutions and expanded on a modular basis. With over 25 years of experience in the semiconductor industry, the company provides support not only in engineering and rapid, customer-specific prototyping, but also throughout the entire life cycle of a system.

Open, flexible and compact: automation solutions for wafer production

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With the automation system ctrlX AUTOMATION from Bosch Rexroth, manufacturers benefit from maximum openness. The modular system provides all components for comprehensive automation solutions - from controllers, I/Os, IPCs, HMIs, drives and safety solutions to extensive motion, PLC and IoT functionalities. The Linux-based operating system ctrlX OS runs on the control platform ctrlX CORE, the heart of the modular automation component, which now also offers OEMs extensive integration possibilities and new business opportunities. Linear motion technology such as precise, ready-to-install linear axes or highly rigid PSK precision modules with compact dimensions complete the portfolio for wafer production.

Application-specific subsystems for the front-end

For the front-end, Bosch Rexroth offers wafer lifts for transfer and process functions as well as for cleaning and polishing processes. The subsystems are available in numerous versions and are supplied fully tested. Ready-to-install linear and compact modules for precise positioning tasks are available in any length and as multi-axis systems. The extensive and cleanroom-certified aluminum profile system enables the rapid implementation of machine frames, ergonomic workstations, flow racks and safety fences.

Wide range of solutions for the back-end

For the back-end, Bosch Rexroth offers high-precision and dynamic motion control solutions, workstation systems for designing ergonomic workstations and autonomous mobile robots. EMC electromechanical cylinders as well as compact and linear modules enable high-precision and dynamic movements. The compact modules are also available as a multi-axis solution with the Smart Function Kit Handling - including motor, cable, controller and software.

Maximum flexibility for electronics production

The range of solutions for electronics production extends from ready-to-install axes with integrated linear motors for SMT applications (surface mount technology) to motion systems for intralogistics processes. The high-speed motion system ctrlX FLOWHS with its high dynamics and precise positioning is suitable for micro-assembly, for example. The planar system ctrlX FLOW6D operates with high speed and precision in six degrees of freedom and, as the movers are free-floating, without any friction, heat or pollution input.

Bosch Rexroth at SEMICON Europa: hall C2, booth 255

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 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, around 33,800 associates generated sales revenue of 7.6 billion euros in 2023.

Basic Information Bosch

The Bosch Group is a leading global supplier of technology and services. It employs roughly 429,000 associates worldwide (as of December 31, 2023). The company generated sales of 91.6 billion euros in 2023. Its operations are divided into four business sectors: Mobility, Industrial Technology, Consumer Goods, and Energy and Building Technology. With its business activities, the company aims to use technology to help shape universal trends such as automation, electrification, digitalization, connectivity, and an orientation to sustainability. In this context, Bosch's broad diversification across regions and industries strengthens its innovativeness and robustness. Bosch uses its proven expertise in sensor technology, software, and services to offer customers cross-domain solutions from a single source. It also applies its expertise in connectivity and artificial intelligence in order to develop and manufacture user-friendly, sustainable products. With technology that is "Invented for life," Bosch wants to help improve

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quality of life and conserve natural resources. 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. Bosch's innovative strength is key to the company's further development. At 136 locations across the globe, Bosch employs some 90,000 associates in research and development, of which nearly 48,000 are software engineers.

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