

Press Release

Connected gear manufacturing in China

Bosch Rexroth implements assembly line with Chinese partner for multifaceted production based on Industry 4.0 principles

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Industry 4.0 solutions from Rexroth have proven themselves in Europe, Asia and North America.

The third-largest machine tool manufacturer in China, QCMT&T, has built a complete Industry 4.0 production line together with Bosch Rexroth in China. With it the Chinese company manufactures and assembles 35 different variants of robot gears without set-up times. Previously, assembly was done only manually; now people, workpieces and processes are connected via Rexroth solutions. This week at the Industrial Automation Show in Shanghai (IAS), the company will present other approaches that can help Chinese companies benefit from "smart manufacturing".

The Chinese government has given the go-ahead for a comprehensive modernization of the industry with the program "Made in China 2025". The target is a much higher degree of automation, working toward the networking of manufacturing with the IT world. With this "smart manufacturing", the intention is to transform the growth in pure volume of the past decades into qualitative growth.

As one of the leading manufacturers of machine tools, the Qinchuan Machine Tool & Tool Group (QCMT&T) based in northwestern China, produces robot gears, components and precision parts. In a project with Bosch Rexroth, the company connected the previously manual installation of these assemblies based on Industry 4.0 principles. To accomplish this, Bosch Rexroth has

Contact for Journalists:
Bosch Rexroth AG
Johanna Rauch
97816 Lohr a. Main
Tel.: +49 9352 18-1358
Fax: +49 9352 18-1812
johanna.rauch@boschrexroth.de

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drawn on its experience at introducing Industry 4.0 to its own plants in Europe, the USA and China. In numerous small but quick steps, the drive and control manufacturer has already implemented a number of connected solutions. Automation modules and software solutions that have been developed on this basis are also being used at QCMT&T.

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Without no change-over effort required, the QCMT&T employees, guided by digital assistants, easily mount seven different types of gears in five different sizes. The individual work stations are connected via transfer systems from Rexroth. These transfer the workpieces through the assembly line on carriers equipped with RFID tags. The workstations read RFID chips to retrieve the configuration of finished gears stored in the IT system. Displays show the employees at each station which steps the respective workpiece requires. The intelligent cordless Nexo nutrunners are connected with the manufacturing execution system (MES). In turn, it wirelessly sets the necessary torque for the tightening process and checks that the step is executed correctly. This ensures that each screw is firmly seated.

Employees log on to their stations at the beginning of the shift and the system ensures that only qualified individuals perform the appropriate installation steps. The ActiveCockpit interactive communication platform collects all relevant production data and prepares it in real time. On this basis, the staff continuously improve the processes in regular meetings. Persons outside of the production hall can also retrieve this information from their smartphone or tablet PC.

For Bosch Rexroth, the project with QCMT&T includes the analysis of the existing value stream and the planning and commissioning of the connected assembly line. It is based on decentralized, intelligent assembly stations with Rexroth automation components and software components. Due to its modular design, the Chinese company can extend the line with additional stations at any time. For QCMT&T, connected production is a milestone on its way to increasing the annual production of robot gears to 60,000.

At the IAS, Bosch Rexroth (Hall 6.1, stand D001) will be presenting further opportunities offered by smart manufacturing. For example, a modular production line for machining and assembling various product versions shows how greater productivity and flexibility can be achieved today at a certain cost. All stations are completely horizontally and vertically connected via open interfaces and provide all relevant information in real time. The line connects fully automatic and manual stations, pure Rexroth automation solutions and 3rd party modules to a complete production solution which seamlessly

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exchanges all necessary information with higher-level IT systems all the way to the cloud.

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Economical, precise, safe, and energy efficient: drive and control technology from Bosch Rexroth moves 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 to develop innovative components as well as tailored system solutions and services. Bosch Rexroth offers its customers hydraulics, electric drives and controls, gear technology, and linear motion and assembly technology all from one source. With locations in over 80 countries, more than 31,100 associates generated sales revenue of approximately 5.4 billion euros in 2015.

To learn more, please visit www.boschrexroth.com

The Bosch Group is a leading global supplier of technology and services. It employs roughly 375,000 associates worldwide (as of December 31, 2015). The company generated sales of 70.6 billion euros in 2015. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiaries and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing and sales network covers some 150 countries. The basis for the company's future growth is its innovative strength. Bosch employs 55,800 associates in research and development at 118 locations across the globe. The Bosch Group's strategic objective is to deliver innovations for a connected life. 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."

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