

## PRESS INFORMATION

# Bosch Rexroth collaborates with the Da Vinci Science Center on new T-REX exhibit.

Jennifer Fanning | 09/12/2023 | USA | DC23011

The project team revitalized and re-imagined a popular exhibit created years ago for the science center.

**Some might say a T-Rex brought to life, others a hydraulic animatronic marvel. Visitors control various moving parts of the towering 8 ft. tall and 11 ft. long robotic dinosaur to observe the power and precision of hydraulic systems. Portions of the dinosaur's scenic shell are removed, exposing the inner hydraulic components in the head, hips, neck, and jaw.**

The display uses a Rexroth XM42 motion controller that uses the MLC-H (MLC for Hydraulics) control package to provide position control for the hydraulic cylinders on the dinosaur. There are four axes of control: Hip Rotate, Jaw Open/Close, Head Nod, and Neck Turn. Each individual axis consists of a ctrlX Drive servo drive, an MS2N motor, an AZMB hydraulic pump and Rexroth hydraulic cylinder.

The MLC-H control uses a linear transducer to close the position loop with the hydraulic cylinder. Within this loop, the servo motor runs a velocity loop to turn the hydraulic pump, providing oil pressure/flow on one side of the cylinder or the other, providing linear motion on the cylinder to move the mechanism. A Rexroth CytroPac provides boost pressure for all for axes.

The users can actuate four different joysticks, one for each axis, to control the dinosaur. If no one is using the joysticks, the dinosaur reverts back to Auto mode where it runs 10 different motion profiles that are pre-programmed using the Rexroth MLC FlexProfile function. A ctrlX CORE provides a Node Red user interface for maintenance needs, along with providing flexibility for future enhancements such as a digital twin, camera tracking system, and other analytics on dinosaur performance.

Watch the video to see the dino in motion during commissioning at the Bethlehem, PA Rexroth plant. <https://youtu.be/9lYc1a4AMy4>

The multi-disciplinary team that worked on the project attended a special reception at the science center before the opening to the public. The exhibit is already popular on its opening weekend.

The Rexroth team that created the dinosaur comprised Application Engineers, Control/Design Engineers, Assembly Testing & Paint Technicians, Project Managers, Customer Service Representatives, Marketing, and Graphic Designers – a multidisciplinary example of STEAM in Action.

For more information about the T-REX or the group that worked on the dino project, contact Jon Frey at [jon.frey@boschrexroth-us.com](mailto:jon.frey@boschrexroth-us.com).

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Visitors to the science center will be able to bring the dinosaur to life using the same hydraulic technology that Rexroth developed to drive industrial and mobile machines, ranging from motors to pump systems, including controls.

### 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 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.

### Press Contact

Please get in touch with our Press Contact

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**Mike Thompson**

+1 7044309203

[Michael.Thompson2@boschrexroth-us.com](mailto:Michael.Thompson2@boschrexroth-us.com)