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Three ways to the optimum linear application

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These tips will help you to build future-proof machines and systems using modern linear motion technology and save time, money and resources in the process

- How digital tools are streamlining engineering and commissioning
- How further developments are improving performance and profitability
- How future-proofing is increased and potential is released



With the right components, systems and smart mechatronic solutions, linear movements can be achieved even more reliably, economically and sustainably. (Image source: Bosch Rexroth AG)

Machine and system manufacturers are under pressure: They have to hold their own in international competition and are expected to implement high-performance, profitable solutions in a short time – solutions that are future-proof, low-maintenance and sustainable. The following tips show how linear motion technology can help to meet these complex requirements.

1. Reducing the time to market with digital processes

Machines and systems should be planned, constructed and put into operation in a short time. Digital aids such as design tools, selectors and configurators significantly speed up engineering processes. With the help of e-tools, linear axes or multi-axis systems can be designed in a very short space of time – simply by entering the application parameters. A particularly futuristic e-

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tool is the selector for electromechanical cylinders from Bosch Rexroth which covers the entire selection and configuration process on one website. The previous time required for seamless order processing via EDI or online shop can thus be reduced by up to 90 percent.

A significant amount of time can also be saved when commissioning linear and gantry robots – up to 80 percent – if they are ordered from Bosch Rexroth as mechatronic subsystems with pre-installed operating software. The so-called Smart Function Kits comprising linear motion technology components and suitable automation hardware are available for pressing and joining, handing or dispensing applications. A wizard guides users intuitively and reliably through the commissioning process including automatic drive parameterization. Graphical sequencing replaces complex PLC programming. The connection to a higher-level control system can also be achieved quickly and easily with the help of ready-made programming modules.

2. Improving performance and profitability

Supporting productivity is a key task in linear motion technology. However, it can also optimize production and increase the profitability of machines and systems. This is achieved through higher power density, as for example in the case of further developed profiled rail systems and screw drives with improved load capacity, and with multifunctional components. In the case of the IMS and IMScompact position measuring systems, the guidance and measurement functions are combined in a solution, which makes applications more economical and reliable while reducing maintenance requirements.

Thanks to ongoing product improvements and longer service lives, linear motion technology can also help to minimize operating costs. For example, extra long relubrication intervals not only save lubricants. They also ensure that ball rail systems and ball screw assemblies can achieve a service life of up to 20,000 km or 200 million revolutions with the first factory lubrication. Depending on the application, this can even mean lifelong lubrication.

Complete mechatronic packages that combine several individual solutions into one subsystem are highly interesting from an economic point of view. To save time and coordination work in engineering and logistics, Bosch Rexroth supplies linear axes and electromechanical cylinders under one order number and together in one package – including automation hardware and cable management. This complete package is also available for multi-axis systems, optionally with pre-installed operating software as so-called Smart Function Kits.

3. More reliable and sustainable solutions

Modern automation solutions also have to be sustainable. With long lubrication intervals and the option of electrification, linear motion technology helps to ensure energy efficiency and the minimal use of materials. For example, electromechanical cylinders are an economical alternative to pneumatic actuators. Servicing can also help to conserve resources. This includes repairs and low-maintenance products such as linear guides where the rails and runner blocks can be replaced independently of each other.

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Last but not least, linear motion technology offers entirely new possibilities for automation. For example, measuring systems integrated into linear guides can provide linear motor axes with exact position data – a process which would normally involve a great deal of additional work. New sensor systems combined with innovative mechanics result in entirely new approaches like the Smart Flex Effector: The sensor-based compensation module gives industrial robots the sensitivity of a human hand, allowing manual or other complex processes to be automated in an economical manner.

Conclusion

New developments in linear motion technology offer solutions for current challenges in factory automation and relieve the burden on users in various ways. If used correctly, they are a real asset for mechanical engineering and production companies.

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.

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