Control, Instrumentation and Automation in the Process and Manufacturing Industries

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Beckhoff rethinks rotary and linear drive technology

A dynamic linear motor that drives in a circle

The new XTS drive system (eXtended Transport System) from Beckhoff offers new degrees of freedom for mechanical engineering. It combines the benefits of tried and tested rotational and linear drive systems and represents a drive system that extends the conventional linear motor principle.

XTS is a linear motor that moves in a circle. The motor is completely integrated together with power electronics and displacement measurement into one assembly. One or more wireless movers can be moved highly dynamically at up to 4 m/sec on an almost arbitrary and flexible path. The compact XTS enables completely new, space-saving machine concepts.

XTS is a mechatronic system with a few components that contain all the functions necessary for operation: A modular, fully integrated linear motor with power electronics and displacement measurement in one device; one or more movers as moveable parts; a mechanical guide rail system and an industrial PC with TwinCAT control software.

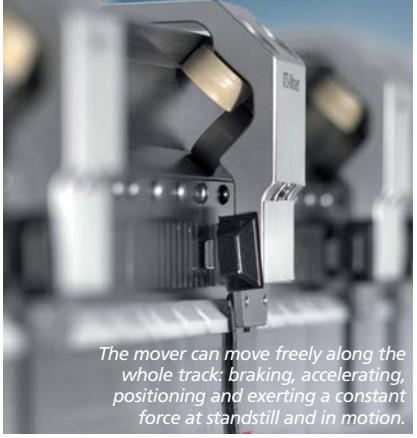
The geometries, lengths and radii of the drive system are formed by the number and choice of the components. Complex cabling and drag chains are not required. The position measurement system is also integrated. The unit enables maximum utilisation of the machine footprint, because the circular movement utilises travel in both directions as well as along curves for active material transport. In this way you can make savings in both hardware, and in expensive production space. Maximum positioning accuracy is achieved at speeds of up to 4 m/sec. All XTS components are developed and produced by Beckhoff in Germany. With its TwinCAT automation software and PC-based Control technology, Beckhoff is able to offer a complete drive solution.

The new linear motor principle

There are virtually no limits to the possibilities of use of XTS: the movers can accelerate, brake, position and synchronize; they can take up absolute positions relative to each other; they can group themselves and accumulate; they can create clamping forces in motion; they can travel through curves as fast as along straights; they can recover energy through regenerative braking and utilise both travel directions for transport purposes. And all of that with precise position control without oscillations, without backlash, without material fatigue, virtually without wear – and without cost-intensive maintenance.

This new linear motor principle gives rise to completely new possibilities in drive technology, including:

- Linear motor characteristics on an endless path.
- Any desired number of movers on a common path.
- Modular structure, simple adaptation to the application.



The mover can move freely along the whole track: braking, accelerating, positioning and exerting a constant force at standstill and in motion.

- Low spatial and power requirements.
- Simple implementation of demanding transport tasks.
- Low project engineering and assembly expenditure.

The XTS system components

The XTS system is simple and modularly configurable. The motor modules form a unit with the movers and guide rails. They contain the electromagnetic coils and all other active functions necessary for the operation of the system.

The fully integrated linear motor with power electronics and displacement measurement represent a mechatronic unit. It contains the electromagnetic coils and all other active functions necessary for the operation of the system. Only a power supply and an EtherCAT connection are required.

Areas of application

XTS can be used in many different ways in the most diverse industries. It is ideal for high-speed material handling and is able to push product, adapt product spacing, reduce or increase product speed; clamp and move product; transport and discharge product; manipulate product - lift out, close, rotate, and screw caps on.

An irregular product flow is isolated and transferred at a constant interval and constant speed to the next workstation. Products are picked up and transported from one workstation to the next. If the tracks between stations are free, the products are moved with high-speed.

Otherwise, the products approach the target in a moving buffer. At slow processing stations the products can be processed in parallel groups. Fast stations process one product at a time. The return movement can always be used actively.

www.beckhoff.com/XTS