

## Contactless Energy Transfer

### A Better Solution For A Mobile World

Talk to any plant engineer or production system designer and you'll find that electrical wiring is the bane of their existence. From installing the wires, to rewiring as production lines need to be changed, to repairing damage caused by careless workers, electrical wires represent an ongoing cost and risk for downtime in manufacturing plants.

Until recently, the miles of electrical wiring that snake around any manufacturing facility, hanging down from ceilings and extending across corridors between equipment, have been viewed as a necessary aspect of industrial automation.

But today industry is moving toward a wireless world. Like consumers with their cell phones, laptops and PDA's, industrial companies want wireless technologies that improve versatility, reduce costs and maintain connectivity. One of the latest developments to draw interest among engineering personnel is contactless energy transfer for powering and controlling motors

While wireless communication is now common in factories, wirelessly transferring 16kW of electricity through the air to power equipment is a relatively new phenomenon in the United States.

In a typical automated manufacturing environment, where carts full of parts must be moved between the different stages of a production process, a contactless system transfers electrical energy inductively from an insulated conductor in a fixed installation to one or more mobile loads. Electromagnetic coupling is realized via an air gap, so it is not subject to wear and costly maintenance.

Contactless energy transfer reduces costs in several ways: It eliminates festooning or overhanging utilities. The underground wiring is compact and poses no trip hazards. There is no carriage to run out on the shop floor. There are also no pits to be dug to drop in trailing utilities.

In addition to lower costs, a mobile system using contactless energy transfer provides greater versatility: The contactless system enables more flexible track layout with curves and switches, simple segmentation of tracks, which makes it easy to extend a track or change travel directions, and higher speeds.

Contactless energy transfer is ideal for applications where:

- The mobile equipment has to cover long distances
- A variable, extendable track layout is required
- High speeds have to be achieved
- The energy transfer has to be maintenance free
- Additional environmental contaminants are not permitted in sensitive areas
- The operation takes place in wet and humid areas

Maintenance and ambient conditions are important factors in constructing systems for material handling and transportation applications, such as automotive assembly, storage and retrieval logistics and sorting. Typical applications that could benefit from contactless energy transfer include:

- Overhead trolleys
- Conveyor trolleys
- Guided floor conveyors
- Push-skid conveyors
- Storage and retrieval units
- Pallet transportation systems
- Baggage handling
- Panel gantries
- Elevator equipment
- Amusement park rides
- Battery charging stations

By replacing a drag-chain system in a conveyor trolley that transports and sorts pallets, for example, contactless energy transfer enables pallets to transverse over longer distances. Complicated holders for drag chains are eliminated, as is downtime for repairing cable breaks and battery charging. Repairs for wear from bending or torsion are also eliminated.

The wear-free power supply in a contactless system has many advantages in designing and maintaining push-skid conveyors used in automotive assembly, for example, or in storage and retrieval units in a high-bay warehouse. Because there is no conductor rail, there is no danger of introducing contaminants from system leakages and no components that are difficult to reach for maintenance. Problems with fitting the platforms into conveyor belts are also eliminated, since there's no need for high mechanical tolerances between the line cable and pick-up.

Perhaps the biggest advantage of a system based on contactless energy transfer is higher system availability because the system is essentially maintenance free. In a manufacturing environment where change is a constant and speed is an imperative, the versatility, flexibility and reliability of contactless energy transfer systems can reduce the wear-and-tear on plant engineers as well as equipment.

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Engineering excellence and customer responsiveness distinguish SEW-EURODRIVE, a leading manufacturer of integrated power transmission and motion control solutions. SEW introduced the world's first gearmotor more than 75 years ago and its systems are known for high performance and rugged reliability in the toughest operating conditions.

SEW-EURODRIVE offers a comprehensive range of electromechanical and electronic drive solutions. The company's modular product designs allow components to be quickly and cost-efficiently assembled in literally millions of different configurations to create a truly customized solution for every customer.



With its global headquarters in Germany and sales of more than 1.5 billion Euros, the privately held company has more than 11,000 employees with a presence in 46 countries worldwide. SEW operates from 12 manufacturing facilities and 63 regional assembly centers located around the world.

U.S. operations include a state-of-the-art manufacturing facility, five regional assembly centers, more than 60 technical sales offices and hundreds of distributors and support specialists. This enables SEW-EURODRIVE to provide local manufacturing, service and support, coast-to-coast and around the world.