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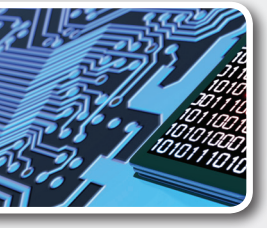
inside:

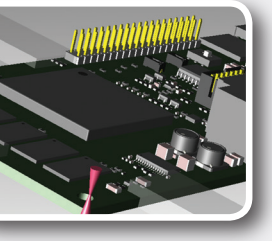
Motion Control:
Air apparent: benefits of air motors for motion

p. 60



Internet of Things:
Best practices for IIoT security

p. 74



Electronics
Better simulation brings fewer surprises in HALT

p. 80

Linear actuators: smarter, more powerful

page 66

Linear actuators: smarter, more powerful

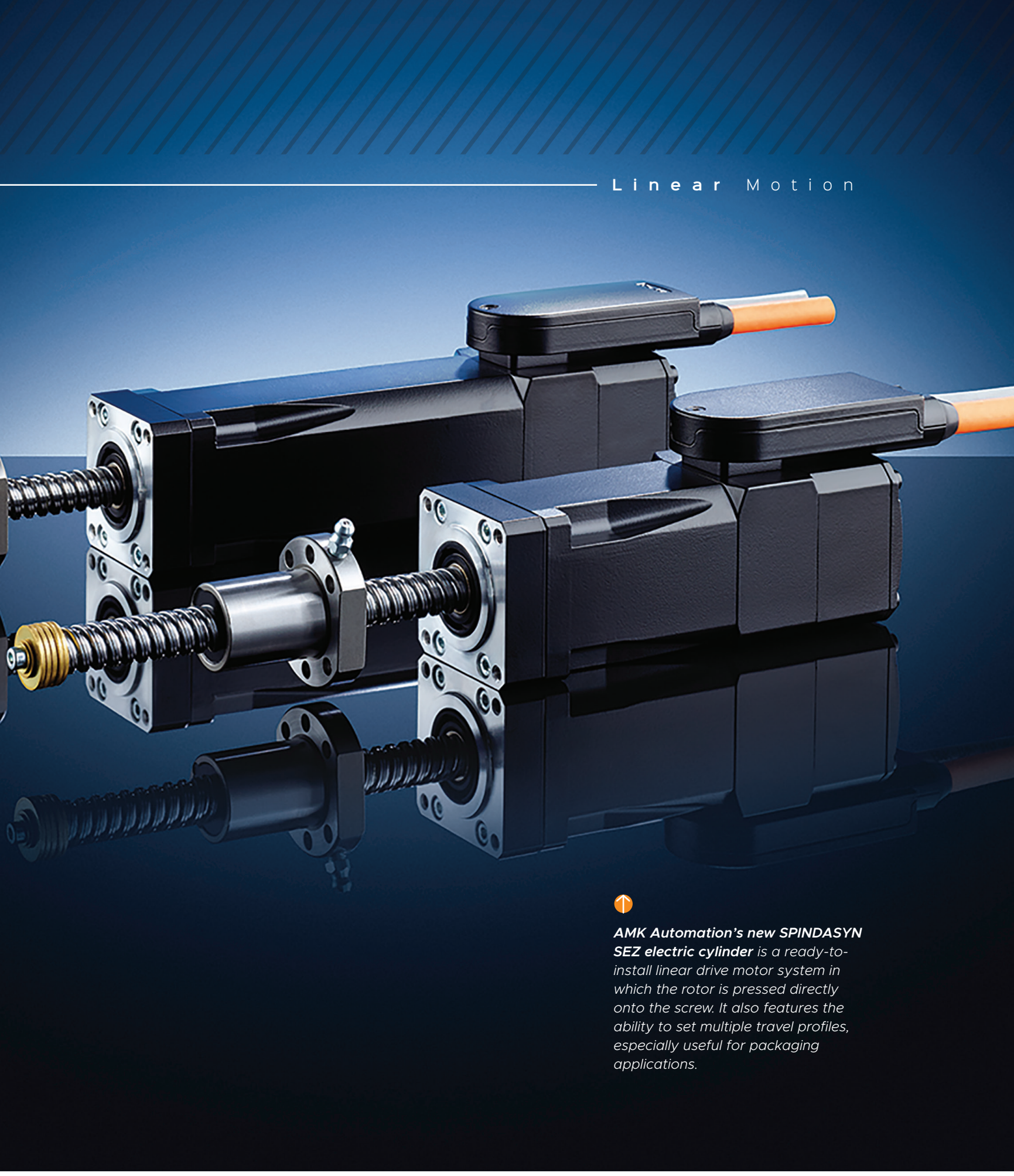
Electromechanical actuators *continue to evolve with more integration as well as more power, challenging some fluid power mainstays.*

Putting together a linear motion system has never been easier, considering the options available to designers along with powerful new tools with which to design such systems. The availability of more integrated components and so-called smart actuators has a lot to do with this.

Along with the ongoing trends of integrating more components into single units, the force capabilities of actuators are getting better, gaining ground on fluid power technologies like hydraulics, in what is by now a familiar story. Hydraulic actuators are still at their best when it comes to high force capacity, but electromechanical actuators are catching up, primarily in the area of controllability.

The reality is that there is a wide range of linear actuator options to meet diverse application needs and design challenges. Here are some of the best recent examples.

Miles Budimir | Senior Editor



AMK Automation's new SPINDASYN SEZ electric cylinder *is a ready-to-install linear drive motor system in which the rotor is pressed directly onto the screw. It also features the ability to set multiple travel profiles, especially useful for packaging applications.*

Electrak HD electromechanical actuators *from Thomson Industries handle loads of up to 16 kN (3,600 lb).*

Programmable servo actuators

Integrated actuators are far more commonplace today. Take for example a new 35-mm-diameter electric cylinder with a built-in controller from SMAC Corp. The company's CBL35C can control force, position, and velocity and features simple installation.

The durable actuators boast a long life expectancy of over 100 million cycles. With a 35 mm diameter and lengths from 135 to 217 mm, depending on stroke length needed, and peak force of 61 N and encoder resolution to 5 um, they're suitable for applications with limited space but needing accurate control.

Many of these actuators like the CBL35C series enable the direct replacement of existing pneumatic cylinders and retrofits without any machine modifications required. Plus, a GUI lets users easily change product profiles and setup parameters on the fly, improving factory uptime.

Another innovation among electric cylinders comes from AMK Automation. The company's new SPINDASYN SEZ electric cylinder is a ready-to-install linear drive motor system in which the rotor is pressed directly onto the screw.

Featuring high and constant force, high precision and position accuracy and high energy efficiency, the closed-loop positioning and force control of the SEZ make it a suitable alternative to other linear technologies such as pneumatic or hydraulic cylinders, rack and belt drives and linear motors. With several options available for screw and strength length, motor type and acceleration, the SEZ provides high rigidity without additional wearing parts.

With the ability to set multiple travel profiles, the SEZ can be easily integrated into machine automation processes and applications such as tubular bag packaging, blister packaging, carton forming, pick and place as well as labeling, wrapping, and other packaging tasks.

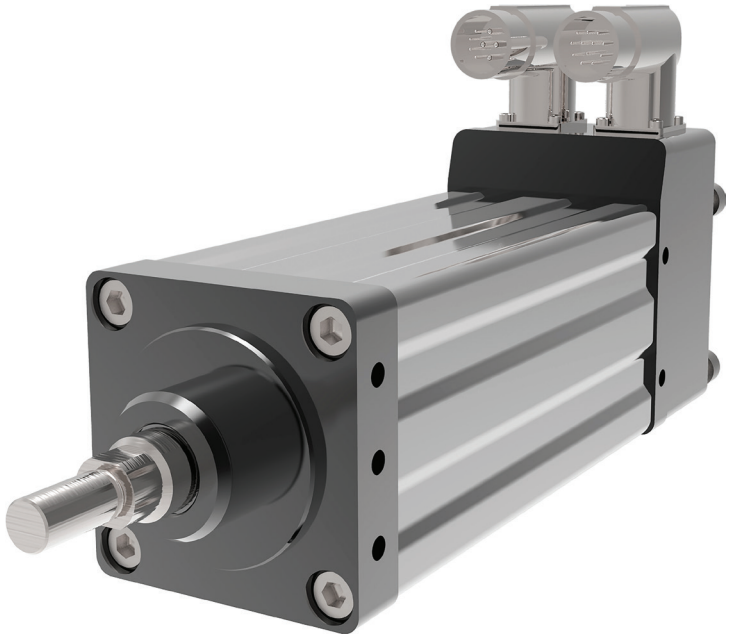
High force hydraulics competitor

As mentioned before, electromechanical actuators continue to offer higher force capacities, which make them attractive alternatives to some hydraulic actuators.

For instance, consider Tolomatic's high force electric rod-style actuators, which now feature stroke lengths to 1.5 m (60 in.) They offer more flexibility for converting motion control applications with hydraulic or pneumatic cylinders to electric linear motion. Designed for high duty-cycle performance in demanding applications, the RSX, RSA and ERD electric rod-style product families use planetary roller screws for longer service life in a compact package compared to electric actuators using ball screw technology.

Specifically, the highest-force actuator, the RSX, is expanded to 1.5 m stroke length (from 600 mm). The RSA and ERD are expanded to 1.5 m and 1.2 m, respectively, from 450 mm.

Along with the ongoing trends of integrating more components into single units, the force capabilities of actuators are getting better, gaining ground on fluid power technologies like hydraulics.



The Exlar GTX080 *integrated motor/actuator from Curtiss-Wright features continuous force ratings up to 5,680 N (1,277 lbf), suitable for replacing hydraulic actuators in some applications.*

The RSX uses a tie-rod design, provides forces up to 133.5 kN (30,000 lbf) and is suitable for hydraulic replacement applications. The RSA HT is available in four sizes, with forces up to 58 kN (13,039 lbf) and is the most flexible product line for fluid power replacement. The ERD stainless steel, hygienic electric actuator, rated IP60k for applications in the food and beverage market, is available with forces up to 35 kN (7868 lbf). Tolomatic's IMA servo linear actuator and ServoWeld spot-welding servo actuator platforms are also available with roller screw configurations at various thrust ratings and stroke lengths.

The company's roller screw actuator families are available with unique features to aid conversion of fluid power cylinders and maximize life, including easy re-lubrication and IP ratings from IP65 to IP69k.

Another example of roller screw technology with high force capacity comes from Curtiss-Wright's Sensors & Controls Division. The company's new Exlar GTX080 next-generation integrated motor/actuator features a number of design enhancements. Incorporating the company's patented inverted roller screw technology, the GTX080's high power density and compact form factor makes it a suitable replacement for hydraulic cylinders in some applications.

The GTX Series actuators offer the power, precision, and programmability of a servo system while minimizing the maintenance associated with hydraulics. With continuous force

ratings up to 5,680 N (1,277 lbf), speeds up to 4,200 rpm, and stroke lengths from 100 mm (4 in.) to 450 mm (18 in.), the actuators can be applied across a wide range of factory automation applications.

The high-capacity planetary roller screws offer up to 15 times the life and significantly higher shock load resistance than a comparably sized ball screw. They also feature IP65S environmental protection. As for integration with other systems, they easily integrate into most leading motion-control architectures. Helping that are removable front seal bushings that simplify maintenance and re-greasing of the nut assembly to maximize actuator life. Also, a modular design with bolt-on mounting hardware allows mounting style reconfiguration or replacement in the field using commonly available tools.

Other manufacturers are adding force capacity to their actuator lines as well. Case in point: Thomson Industries has extended the capability of its Electrak HD electromechanical linear actuator line to loads of up to 16 kN (3,600 lb.) It delivers heavy load handling capacity comparable to hydraulic actuators, but with greater controllability, smaller footprint and lower maintenance.

Smart electromechanical actuators accomplish all operation and control functions with onboard electronics, reducing actuator footprint as well as installation and maintenance costs. Electrak HD actuators connect to a power supply and PLC or other control source to bring the benefits of onboard electronics to high load applications for construction and agriculture, material handling, and factory automation.

Force and stroke lengths have been expanded from 10 kN (2,250 lb) to 16 kN and stroke lengths up to 500 mm (20 in.) The company claims that the minimum duty cycle of 25 % among stroke lengths up to 500 mm is the highest in the industry, assuring maximum continuity of operation with minimum current draw. For 16 kN loads at those stroke lengths, Thomson also offers speed options up to at least 5 mm/sec (0.197 in./sec.)

With enhanced functionality provided by an advanced onboard Electrak Modular Control System (EMCS) and its optional functions, the Electrak HD line offers a simpler method of control and communication, which reduces

operating costs, requires less space and simplifies setup and installation. Optional out-of-the-box J1939 CAN bus communication enables control and monitoring, while optional low-level switching, end-of-stroke indication output, choice of analog or digital feedback, and a customer control interface provide additional versatility.

Contributing to durability in high-load operations are environmental resistance ratings of IP69K static, IP67 static and IP66 dynamic. Even with high loads, the actuators will operate in temperatures ranging from -40 to +85 °C (-40 to +185 °F), can withstand salt spray for 500 hours, and are CE, RoHS and REACH (EU) compliant. DW

SMAC Corp. | www.smac-mca.com

Curtiss-Wright | www.curtisswright.com

Thomson Industries | www.thomsonlinear.com

AMK Automation | us.amk.systems

Tolomatic | www.tolomatic.com