Converting From Pneumatic to Electric Actuators

Exlar® Electric Actuators

Modern electric actuators can deliver the force manufacturers need while reducing energy use, maintenance, leaks and downtime.

Young Mechatronics
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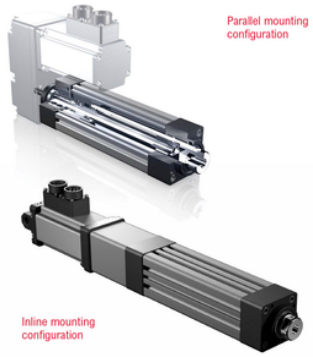
Why Convert From Pneumatic to Electric Actuators?

Pneumatic actuators have long been a standard for many applications in manufacturing. They provide cost-effective actuation under certain conditions - including an underlying compressed air infrastructure..

But, pneumatic systems carry significant downsides and risks that are eliminated and/or mitigated by electric actuation.



ELECTRIC VS PNEUMATIC

EFFICIENCY

Electric actuators only require power when moving. Pneumatic systems invariably leak and these leaks cost energy. This, and other efficiencies leave them operating with a significant overall energy consumption advantage and **reduced utility consumption.**

MAINTENANCE EASE

Electric actuators **require very little maintenance** through their lifecycle and repair/replacement is simple. This leads to less downtime and a **more predictable and profitable** production cycle.

WORKPLACE NOISE AND CLEANLINESS

Pneumatic actuators are loud and pneumatic systems often have noisy leaks. Compressed air forms condensate water that must be dealt with as well. **Electric systems are clean and quiet** and supportive of a pleasant, productive work environment.

PERFORMANCE AND STABILITY

Modern electric actuators **provide the thrust and force necessary** for many applications that have traditionally used pneumatic actuation. Electric actuators can also perform more complex work and can be programmed for multiple stop positions.

ENVIRONMENTAL IMPACT

Electric actuation completely **eliminates the contamination risks and costs** associated with pneumatics. Pneumatic systems create water condensation and leaks with multifaceted costs - **including environmental issues, lost production time and worker safety** - for manufacturers and production teams.

DATA AND AUTOMATION

Electric actuators **integrate with servo systems** designed and built for modern automation and diagnostic processes, **including IIOT**. Easy to plan and execute machine maintenance and **reduce downtime.**

Bottom Line: **Electric actuators offer significant advantages vs. pneumatic actuation systems and can significantly reduce costs and improve bottom line for manufacturers and OEMs.**

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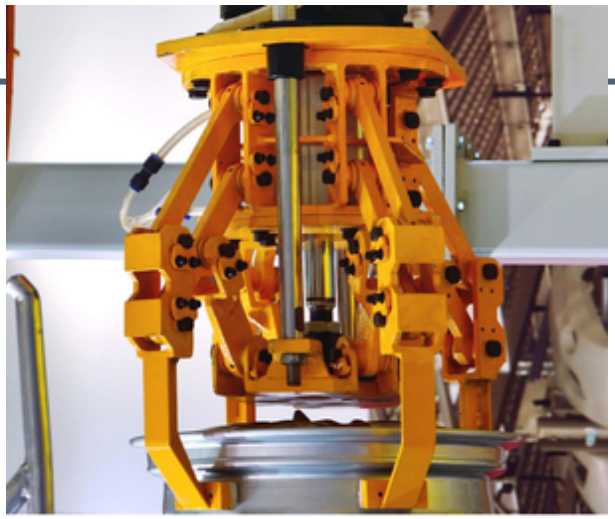
Comparing Pneumatic and Electric Actuators

Category	Electric System	Pneumatic System
Efficiency & Emissions		
Energy Usage	Low	High
Green-house Emissions	Zero-Emissions	High
Cost		
Actuator Price	Higher	Lower
Installation Labor Price	Lower	Higher
Performance		
Time to Open/Close	As little as a second; speed does not affect actuator life	As fast as several seconds, quick speeds negatively affect system life
Controllable Thrust/Speed	Programmable speed, position, thrust	Very limited
E-Stop Mid-Stroke	Easy	Requires external brake
System Construction	Robust design	Limited life
Maintenance		
Repair & Replace	Easy, just replace the actuator (or servo motor)	Easy to replace, complicated to diagnose
Ongoing Maintenance	Minimum system components for minimum maintenance	Maintain fittings, hoses, compressor, supporting air components, mechanical wear



Converting to Electric from Pneumatic Actuators

An important part of getting accurate estimates in the initial cost equation when switching from pneumatic to electric actuators is making sure that the electric actuator is properly sized for the actual application. Pneumatic actuators are often over-sized and matching force specifications with electric actuators leads to needlessly inflated costs for the new electric actuators.

USING SYSTEM PRESSURE AND PISTON AREA CAN OVER-ESTIMATE FORCE REQUIREMENTS OVER 60%

Don't:

- ✗ Use current rated system pressure
- ✗ Use piston area plus measured system pressure

Do

- ✓ Get a realistic work force estimate (we can help!)
- ✓ Work with your Young Mechatronics rep to test actuators in your machine or system!

We're Here to Help!

Young Mechatronics has worked with many clients to reap the benefits of electric actuation. Call or email to discuss your project. We are are trained engineers and will work with you from concept to completion to make your electric actuator conversion an ROI success story.

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Curtiss-Wright Electric Actuators

Exlar® KX Actuators

Designed as the perfect pneumatic actuator replacement

The Exlar KX actuators are ideal replacements for pneumatic cylinders in linear motion control applications. Instead of ballscrews, Exlar KX linear actuators feature a planetary roller screw, assuring long life and high shock resistance. This feature makes Exlar actuators far superior to alternative methods for applying all- electric linear actuation in industrial applications.

Model	Frame Size mm (in)	Stroke mm (in)	Max Continuous Force kN (lbf)	Max Speed mm/s (in/s)
Exlar® KX60 Actuator	60 (2.36)	150 (6), 300 (12), 600 (24), 900 (36)	6 (1,350)	833 (32.8)
Exlar® KX75 Actuator	75 (2.95)	150 (6), 300 (12), 600 (24), 900 (36)	11.1 (2,500)	666 (26.2)
Exlar® KX90 Actuator	90 (3.54)	150 (6), 300 (12), 600 (24), 900 (36)	15.6 (3,500)	500 (19.7)

Exlar® GTX Actuators

Compact integrated linear motor actuator

GTX Series actuators offer up to 15X the life and 3X the power density of conventional ball screw electric actuators. Integrating unique inverted roller screw and T-LAM brushless servo motor technologies delivers the programmability and precision of electric actuators combined with the high-power density and rugged durability of hydraulics, all in one compact package.

Use with most servo drive brands- Rockwell, Siemens, Beckhoff, etc.

Model	Frame Size mm (in)	Peak Force N (lbf)	Continuous Force N (lbf)	Max Speed mm/s (in/s)
Exlar® GTX060 Actuator	60 (2.36)	AC - 5,336 (1,200)DC - 5,336 (1,200)	AC - 2,668 (600)DC - 2,668 (600)	AC - 1,270 (50.0)DC - 847 (33.3)
Exlar® GTX080 Actuator	80 (3.15)	AC - 16,730 (3,762)DC - 14,202 (3,192)	AC - 8,365 (1,881)DC - 7,101 (1,596)	AC - 1,270 (50.0)DC - 508 (20.0)
Exlar® GTX100 Actuator	100 (3.90)	AC - 30,784 (6,920)	AC - 15,392 (3,460)	AC - 953 (37.5)

For More Information & Product Specs Visit

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