

WHITE PAPER

Electric Actuation and what it can do for you



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Norgren has a proud history of creating innovative engineering solutions in precise motion control and fluid technology, and we collaborate with our customers across more than 50 countries in critical areas such as Factory Automation, Material Handling, Rail, Energy, Process Control, Life Science and Commercial Vehicles.

From improving speed, productivity, reliability and efficiency of equipment, to generating significant energy and cost savings, or lowering total cost of ownership across many industries, Norgren's high-quality solutions are designed to help customers pursue progress, achieve new goals and overcome problems.

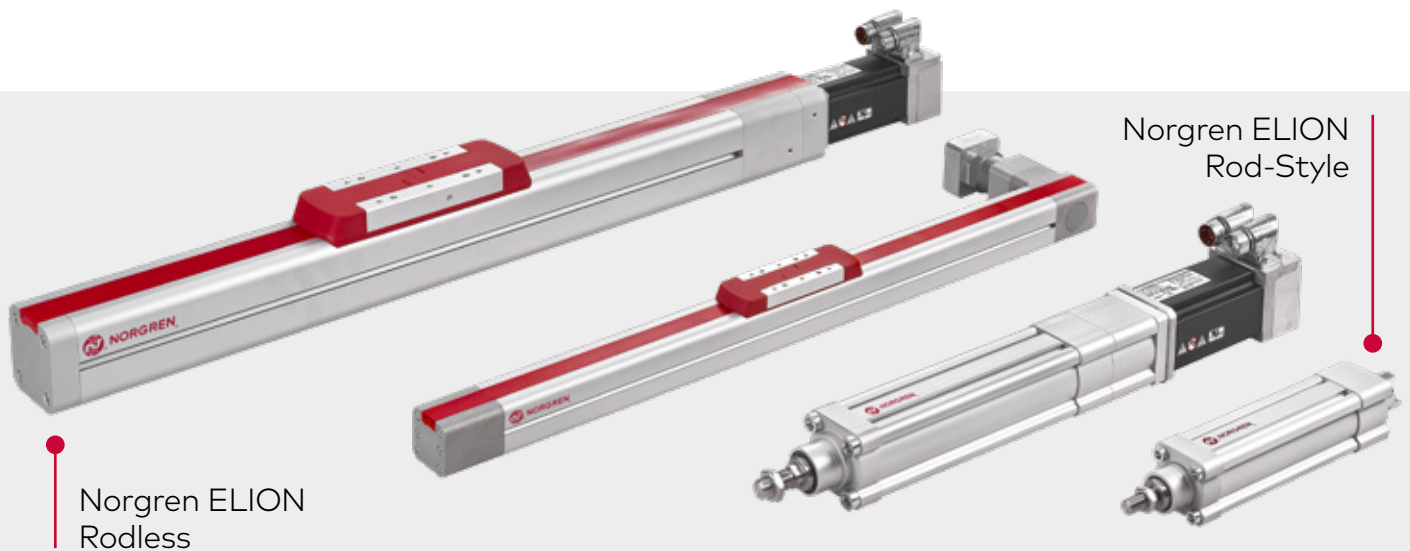
With market-leading industry expertise, we offer the capability, resources, engineering intelligence and global support infrastructure to tackle the largest project demands.

Our world-class portfolio of fluid and motion control products include Norgren, Buschjost, FAS, Herion, Kloehn, Maxseal and Thompson Valves. Supplied either individually or combined into powerful customised solutions to meet customer needs.

Breakthrough engineering you can count on.

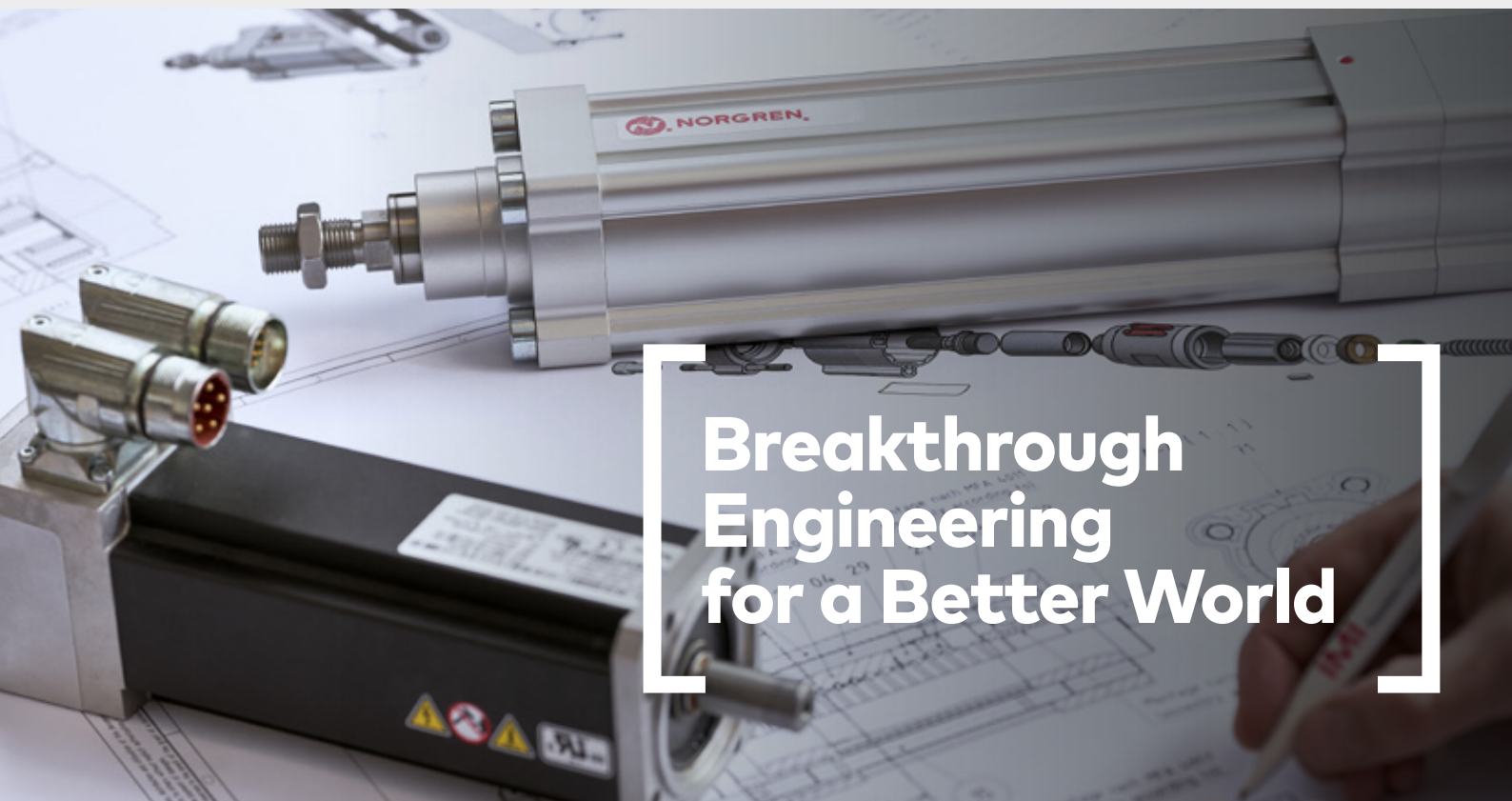
Introduction

When it comes to linear actuation, manufacturers face a choice when selecting the best solution for their individual application. In this white paper we explore the advantages of electric actuation and its multiple industrial applications. In addition, we also outline some key considerations manufacturers are making ahead of selecting the best linear actuation solution.



Norgren ELION
Rodless

Norgren ELION
Rod-Style



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Today's requirements for linear actuation

Increasingly complex machine requirements are leading manufacturers to consider alternative linear motion technologies, to ensure they are selecting the best solution for their applications.

While the operational benefits and tradition of pneumatic actuators are well established, the popularity of electric actuation in recent years has continued to grow.

Linear actuators create a straight line motion and have been designed to withstand a range of operating conditions. Converting energy into motion or force they can be powered by pressurised fluid and air, as well as electricity

Electric actuation

Electric actuators, such as Norgren ELION, work by converting energy produced by an electric motor into torque, which then moves a load in a linear direction. The direction of movement will depend on the direction of rotation, and the actuator will return to its original position on completion.

For some, electric actuators will offer the best possible option when it comes to precision control, better flexibility, guaranteed repeatability and easy connectivity.



Key considerations for electric actuation

The influence of electric actuator technology is being felt across many industrial sectors, including food & beverage, packaging and labelling, material handling and processing and automotive. In these industries alone, electric actuators offer optimal performance for precision control, better flexibility, guaranteed repeatability and easy connectivity; helping companies address productivity, cost and energy consumption challenges.

Understand your application

Clearly when considering if electric actuation is the best solution, much will depend on the application. Here, manufacturers must decide on their key objectives, when it comes to operations, before switching to an Norgren ELION electric actuator.

In some instances, pneumatic actuation can still provide the optimum solution. Moving a load quickly between two fixed points, requiring a smaller installation footprint and hazardous conditions, are all examples where a pneumatic system would be preferable.

In certain applications such as large, multiple axis machines, a combination of electric and pneumatic actuation can be appropriate as there may be both simple and complex linear motion positioning requirements.

The advantages of electric actuation Total control and flexibility

Electric actuators can provide the highest degree of precision-control over the linear motion stroke, offering unmatched performance when it comes to controlling speed, position, accuracy and repeatability. For example, accuracies of $\pm 0.02\text{mm}$ are possible with a repeatability of $\pm 0.01\text{mm}$.

Multiple intermediate positions can be achieved and the in-built positioning flexibility allows several actuators to move in unison, changing speed without the need to stop or overrun a position.

In addition, acceleration and deceleration control also allows the cylinders to glide into position without stopping abruptly, making electric actuation suitable for applications where vibration and disruptive movement is not acceptable.



Connectivity

The Industrial Internet of Things (IIOT) is increasing connectivity between machines and operators. Therefore the ability to extract real-time data streams via networked sensor technology can help users monitor and analyse actuator performance.

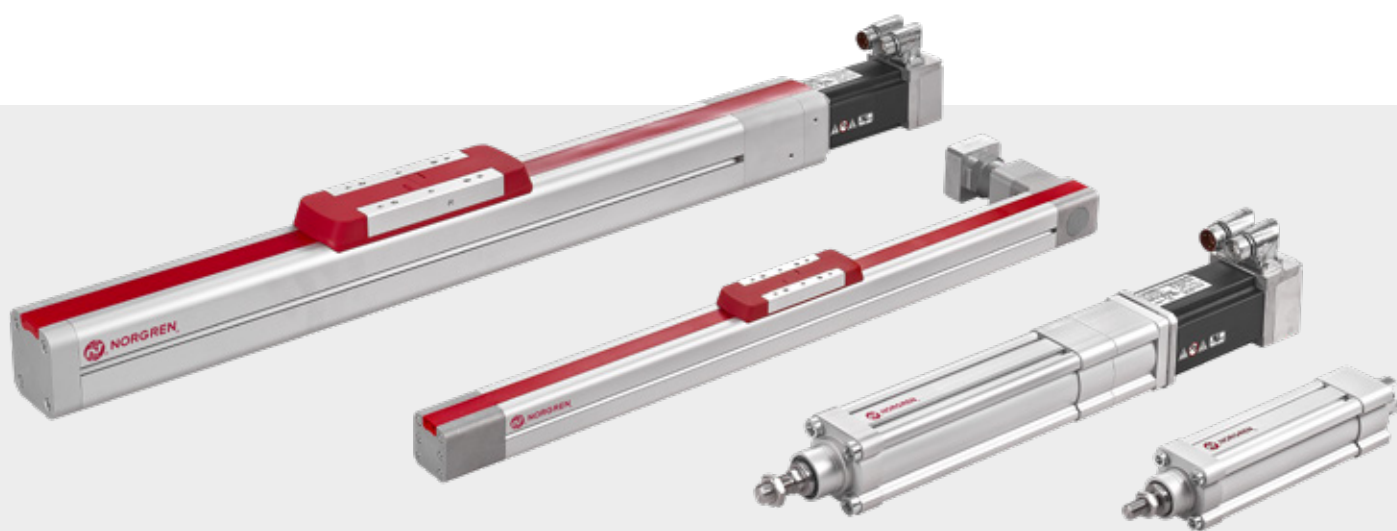
Key indicators such as operating temperature, level of current and position can be quickly visualised and offer valuable insight to help identify ongoing running levels and avoid unwanted downtime; improving productivity and reducing cost.

Sizing options for compact spaces

From a practical perspective, the availability of electric actuators in a variety of sizes and motor mounting options can help in applications where space is at a premium. Maximum performance via minimal footprint means that users can build compact machines if space is tight, all without compromising on performance.

Energy saving

Finally, Norgren ELION electric actuators can make a significant contribution to lowering running costs and improving the operating environment. With electromechanical components efficiently converting electricity to mechanical power, energy savings and a reduction in energy consumption are possible as the motor is only energised when movement is required, or an external force is present. As a result, electric actuation helps create a cleaner and quieter operating environment.



User checklist

Electric or pneumatic

When choosing between pneumatic and electric actuators, specification should always be based upon the requirements of the application. Below is a checklist to help clarify the most appropriate solution when it comes to pneumatic and electric actuation solutions.

Consideration	Electric	Pneumatic
I require the highest level of precision control and repeatability	✓	
I want the most simple linear motion solution		✓
My application requires multiple linear stops	✓	
I have limited space		✓
I require the solution to be networked to extract data streams around position, torque and temperature	✓	
I need a solution that reduces operating noise and lowers my energy consumption	✓	
I need a solution that can cope with a challenging operating environment such as hazardous and flammable areas or temperature extremes		✓
I need a cost-effective solution which doesn't require significant upfront CAP-EX		✓
I need a solution with lower running costs	✓	

Norgren's linear motion portfolio has recently been extended with the introduction of the Norgren ELION Electric Actuator Rod-Style and Rodless Range



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