

# Pneumatic Rack & Pinion Actuators and Accessories

Reliable actuators to “Fit and Forget”



**EL-O-MATIC™**

  
**EMERSON™**  
Process Management

## Optimum performance

As a manufacturer, Emerson Process Management - Valve Automation realise that performance of our pneumatic actuators is vitally important to your production process. An actuator that does not function well can have serious consequences for the outcome of the process which can cost you dearly in down-time and loss of production. That is why for over 35 years and well over two million actuators produced, reliability has been our primary concern in actuator development. **El-O-Matic** pneumatic actuators are manufactured to worldwide industry standards and directives that ensures the production of reliable, quality products, continuously providing the optimum "Fit and Forget" performance to a wide range of end-user applications in process industries such as Chemical, Refining, Power Generation, Pulp & Paper and the utilities areas of Pharmaceuticals and Food & Beverage.

**El-O-Matic** ¼ turn rotary actuators have a unique cast aluminium alloy body and a two component polyurethane paint finish, ensuring many years of faithful performance against harsh environments. In addition, actuators are built inclusive of features that are well proven in their required application environments.

### Application and Features

For use on ball, plug and butterfly valves.

- Compact rack & pinion design.
- Choice of thirteen sizes, with a torque range from 12 Nm to 4000 Nm (106 in/lbs to 36,474 in/lbs)
- Also used in other ¼ turn applications, such as dampers and pressure regulators.
- High duty aluminium alloy provides optimum strength and corrosion resistance.
- Can be supplied in single (spring return) or double acting versions.
- Mounting for solenoid valves and position signallers to the NAMUR standard (VDI / VDE 3845).
- Valve mounting and drive dimensions to the ISO 5211 or DIN 3337 standard.
- Pinion provided with removable insert for low cost, versatile, direct mounting to valve stem.
- Pinion with anti blow-out design.

### Operating principle

Both the double acting and single acting (spring return) versions of these pneumatic actuators are designed in such a way that there are no moving parts on the outside (with the exception of the position indicator). This makes them safe, easy to install and virtually maintenance free.

Furthermore, the compact rack and pinion construction means that actuators are lightweight and occupy a minimum of space, allowing users to install them in any orientation between close pipe configurations.



### Ample choice of spring packages

Spring return, single acting actuators are used in the majority of systems as a fail-safe method of either closing or opening the valve to suit the application. Their ability to automatically return the valve to its fail-safe position upon air failure provides the vital link for ultimate system safety and shut down. El-O-Matic spring return actuators contain modular spring cartridges, which enable them to be easily configured, by adding or subtracting individual

springs, to provide combinations that cover a wide variety of torque capabilities under different supply pressures and operating parameters.



**El-O-Matic** is renowned as an industry benchmark for delivering the range of features and benefits required from a rack & pinion actuator

A proven track record of over 35 year's service in over 2 Million applications

High reliability offering second to none service levels

A flexible modular package offering multiple configurations and \$/torque value for money



## Application



The choice of actuator size depends primarily on the torque requirement of the valve

and with El-O-Matic you have the wide choice of 13 basic model sizes covering a torque range from 12 Nm to 4000 Nm. (106 in/lbs to 36,474 in/lbs)

However for optimum actuator sizing many factors may need consideration, so to provide the best "Fit and Forget" option, the El-O-Matic range is matched against all available relevant technical data on the majority of major quarter-turn valve manufacturers in the world. This electronic database enables us to select just the right actuator for you, whatever the valve type: ball, butterfly or plug valve.

## Long life span

The 3-point guiding system of the enclosed pistons allows for a smooth operation with the aid of fully synthetic bearings and a rack & pinion gearing. The high precision gear cutting methods provide close tolerances between the rack and pinion teeth to ensure minimum gear backlash and avoid mechanical hysteresis, all of which helps limit-switch point accuracy and contributes to a very long working life. El-O-Matic actuators are guaranteed to perform in high cycle applications according to the CEN standard exceeding 500,000 cycles, and perform extremely well in comparison to any rack and pinion actuator in the industry.

## Inserts

All actuator sizes up to 1600 Nm are fitted with removable drive inserts, to accommodate different valve stem profiles. This enables actuators to be directly mounted on to suitable valves and eliminates the need for a bracket and coupling type mounting kit. The use of direct mount inserts significantly cuts the cost of the valve / actuator assembly. Standard actuators are fitted with square drive inserts in accordance with ISO 5211 (or DIN 3337 as required) but a wide variety of other inserts are also available. Special inserts may have oversize or undersize squares or made with double-D profile or shaft key-way forms. These can be supplied on factory built actuators or as separate spare part items. Drive inserts are easily replaceable at distributor or end user level.



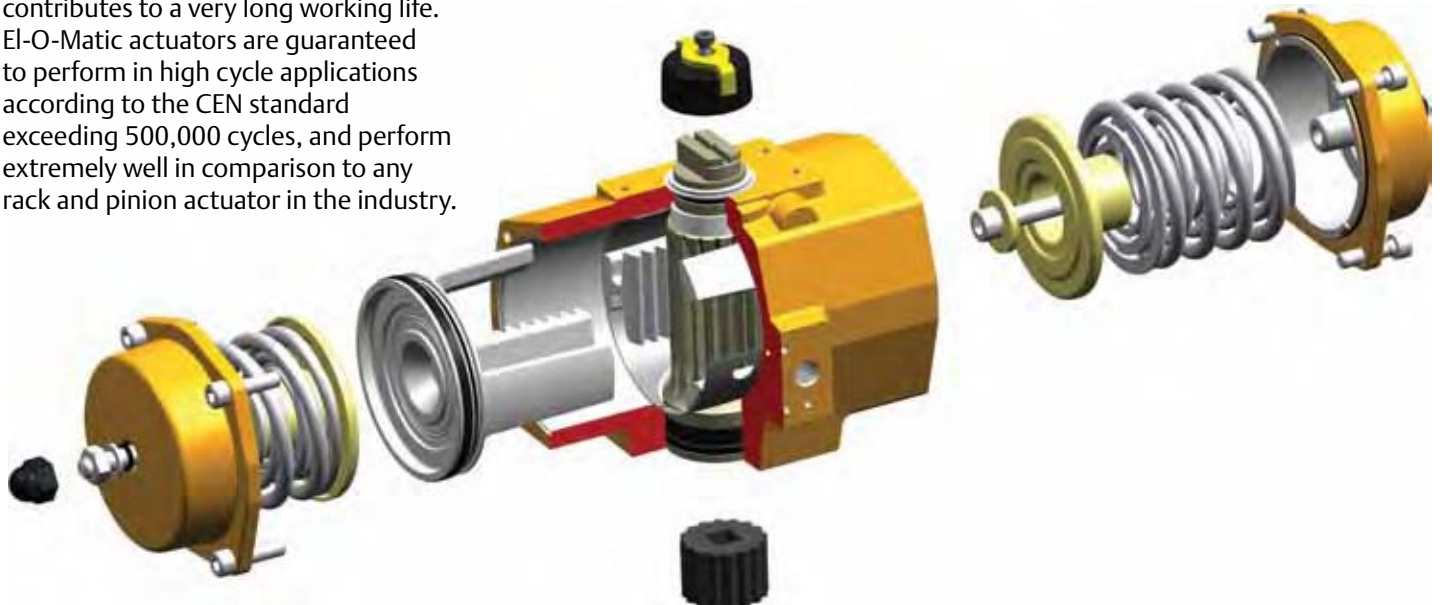
Where direct mounts are not possible, for instance on valves with exposed gland packing or high bonnets, the use of inserts often simplifies the design of the mounting kit, saving time and money in installation.

## Limit stops

A limit stop bolt, used for switch setting, is necessary where the open position of the valve requires precise adjustment. These are standard on all actuators up to 1600 Nm. and optional on the two larger sizes. Actuators with double stroke adjustment are also available for those applications on high performance butterfly valves, for example, to ensure confirmation of the closed position.

## Standardisation

El-O-Matic actuators comply fully with all the relevant industry standards for interfaces and connections. Control interfaces for solenoid valves, switch boxes and position controllers satisfy the NAMUR standard (VDI / VDE 3845). Valve mounting and drive dimensions conform to the ISO 5211 standard (with an option for DIN 3337).



# Design and construction based on the “Fit and Forget” Principles

## Fit and forget - Reliability

One of the main-stay’s in the development of our El-O-Matic actuator product is the “Fit and Forget” principle: Reliability is key to customer satisfaction and so actuators and their accessories must be quick and easy to install and function faultlessly through a long working life. This is made possible by the high degree of modular construction in our products, ensuring that mass produced components are made to a high degree of quality assurance and comply with ISO 9001.

## Fit and Forget - Innovation

While El-O-Matic was traditionally a manufacturer of only actuators, Emerson’s Valve Automation business strives to maintain the brand in a leadership position by the introduction of new developments to support the “Fit and Forget” principle. Our policy continues to be focused on the supply of all the automation components located between the hardware of the valve and the software of the process-control system. This means a continuous activity of updates, new development and product innovation.

## Fit and Forget - Modular construction

Our actuators and accessories are mainly made up of standard components. This means that they can be assembled and delivered fast in a variety of frequently used configurations. In order to meet new and ever demanding market requirements, our products are the subject of continuous refinement, adapting to multiple industry applications.

## Fit and Forget – Proven Track Record

Based on proven technology with an installed base of over two million actuators worldwide the El-O-Matic brand is well recognised as the industry ‘benchmark’ for a multitude of process industry applications. The robust, corrosion resistance design offers an easy to install actuator which functions faithfully giving many years of dependable performance.

## Fit and Forget - Comprehensive offering

With single and double acting actuator in 13 sizes, ranging from 12 Nm to 4100 Nm (106 in/lbs to 36,474 in/lbs), El-O-Matic offers an even more versatile and competitive actuator range giving excellent \$/torque value.

## Fit and Forget - Cost effectiveness

Standardised mounting interfaces offer easy valve and accessory assembly. Dual valve flange drilling patterns and an interchangeable insert drive system allows for direct mounting capability, reduces the need for maintenance and increasing plant efficiency.

El-O-Matic E and P series actuators means:

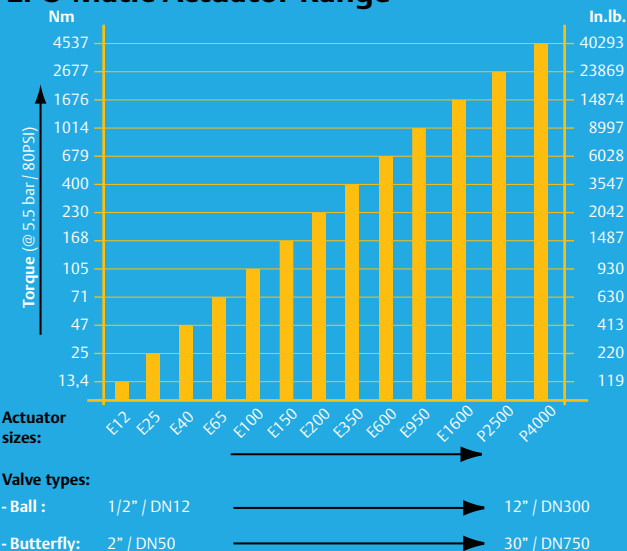
### More

Process reliability  
Plant up-time  
Plant and operator safety

### Lower

Capital cost  
Assembly cost  
Installation cost  
Maintenance cost

## El-O-Matic Actuator Range



## Specifications:

|              |  |                                |                    |
|--------------|--|--------------------------------|--------------------|
| Pressure:    | Double acting                            | 0.2 to 8 Barg                  | (3 to 116 Psig)    |
|              | Spring return                            | 3 to 8 Barg                    | (43.5 to 116 Psig) |
| Temperature: | Standard                                 | -20°C to +80°C                 | (-4°F to +176°F)   |
|              | High Temp.                               | -20°C to +120°C                | (-4°F to +248°F)   |
|              | Low Temp.                                | -40°C to +80°C                 | (-40°F to +176°F)  |
| Materials:   | Housing:                                 | Aluminium alloy.               |                    |
|              | Pinion:                                  | Hard anodised aluminium alloy. |                    |
| Finish:      | Polyester non-TGIC based powder coating. |                                |                    |
| Life span:   | Minimum of 500.000 cycles.               |                                |                    |

For more detailed technical information see our online documentation under [www.El-O-Matic.com](http://www.El-O-Matic.com). Document number [DOC.DSE.PN.UK]

## Actuator / Accessory interfaces

El-O-Matic actuators can be packaged together with a range of accessories including;



Wireless transmitter



Solenoids



Pressure Regulators



Digital valve positioners (DVC's)



Manual override gear-boxes

In addition, these accessories often include dedicated options like;



Speed control plates



Breather blocks



Block & bleed valves

All of the above fit together by way of standard product interfaces such as NAMUR for solenoid and switch box connections and ISO-5211 for valve flange connections. Using these well known international standards ensures that El-O-Matic products will comply with application requirements in projects worldwide

**Emerson Process Management - Valve Automation is pleased to confirm their association with these other famous Emerson brands as the most commonly requested actuator accessories:**

- Fisher – Position Controller's (DVC's)
- Fisher - Regulators
- Fisher – TopWorx switch boxes
- Asco Numatics – Solenoid valves



El-O-Matic actuators with TopWorx accessories



EL-O-Matic actuators are manufactured to these worldwide standards as follows;

**Safety Standards**



**Product Interface Standards**

VDI/VDE3845 (NAMUR)  
ISO – 5211

**Company Operations Standards**

ISO – 9001 Quality Assurance

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