REGNER®
Improving lives through technology

WHAT IS A LINEAR ACTUATOR? HOW DOES IT WORK? HOW TO CHOOSE THE RIGHT ONE?

What is a linear actuator? How does a linear actuator work? What are the uses and applications of linear actuators? How to know which linear actuator is the right one? At REGNER® we design and manufacture some of the most advanced and finest linear actuators, so in the past years we learned everything about linear motion. Below we provide you information to clarify any questions concerning linear actuators you might have.

Advantages of using electric linear actuators

Essentially, a linear actuator is a device that produces motion in a straight line. So, an electric linear actuator transforms electric power into a linear movement. Although electric linear actuators are the most common, mechanical, hydraulic, pneumatic or electrohydraulic devices are also used. The electric actuators' success is due to its unique benefits:

- Quiet and clean
- Precise
- Cost-effective and energy-efficient
- Safe operation
- Easy control and electronic programming
- Simple mounting
- Compact dimensions
- No maintenance

Furthermore, actuators are a highly configurable devices. Speed, stroke, dimensions, force and other features can be adjusted to virtually fit any use. Sectors as diverse as industrial automation, construction, automotive, household equipment, healthcare equipment, machine tools, computer peripherals use electric linear actuators to generate required motion.

How does an electric linear actuator work?

The gearmotor transforms the electric power into circular motion. Motion drives the spindle to the nut, which is attached to the piston. The motion is converted from rotary (spindle) to linear (nut). Likewise the rod could present several endings to fit in any assembly (mounting hole, clevis bracket, screw, t-slot). Actuators may also present an integrated overcurrent protection system that trips out the current in obstruction or excessive load event. Linear actuator parts have their own protective housing and count on several seals to increase its protection against dust or water. Connectors, cable lenghts and mounting brackets are customized depending on the actuator's purpose.

Motor position is one of the most significant features in actuators. The motor can be installed perpendicular to the spindle axis with an additional intermediate gear to transfer the torque, or in a straight line to the spindle axis. The straight configuration (in-line actuators) reduces the overall dimension of the actuator and is perfect for limited space installations and elegant designs.

How to choose the right linear actuator

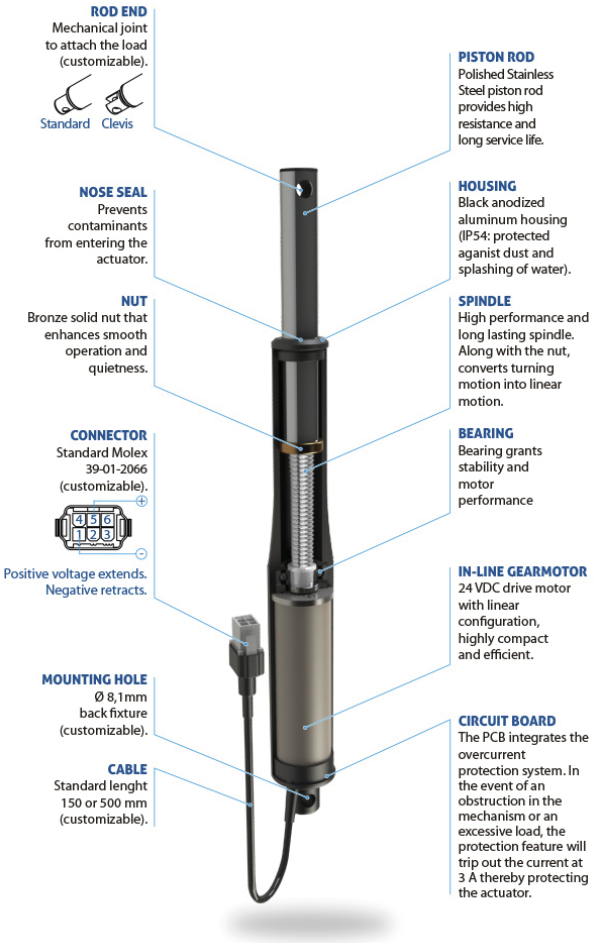
Choose the right actuator for an application enhances the final product value and increases efficiency while reducing the costs. If you are unsure about which linear actuator to choose follow the steps below.

- ***Force.*** First, you may establish the amount of force required (in Newtons). The force will be determined by the weight of the object you are moving, the transmission angle, the torque and the friction. It is extremely important to be precise in this point in order to optimize the configuration. Overestimated force requirements will result in a lower actuator speed or in an oversized actuator that will have an impact on the costs and weight. Underestimated calculation can result in actuator's overload or in reducing the service life.

- ***Speed.*** Determine the rate at which the linear actuator moves (in milimeters per second). Force and speed are directly related to power (Power = Force · Speed) so based on these two values you can approximately calculate the motor's power you will need.

- ***Stroke***. At this point you should measure the distance that the load must travel. The actuator stroke length (in millimeters) determines this length. Stroke has direct bearing with the overall actuator dimensions.

- ***Minimum built-in-dimension***. With regard to the empty space available maximum built-in-dimensions must be set up. Actuator's minimum built-in-dimensions are the distance between the two mounting holes or between the mounting hole and the rod end when the rod is completely contracted. This measurement is essential to plan the actuator's integration in the assembly.



- ***Power supply.*** Based on the power supply available and the power convertion options available actuator's electrical specifications must be settled up. Choose between Direct Current (DC) or Alternative Current (AC) and determinate voltage (in Volts) and if necessary electric current (in Amperes).

- ***Duty cycle***. This is the percentage (%) of one period in which the actuator is active relative to the total time. For example, if the actuator should be in motion 2 minutes out of 20, the minimum recommended duty cycle is 10%.

- ***Environment***. Think about the actuator's environment and determine the protection grade it should have. For indoor applications a low IP grade will be acceptable while in outdoor applications or in dust or water exposed environments a higher grade will be required.

- ***Added features.*** Depending on the final application, the actuator should be equipped with extra features such as limit switches, position feedback devices, control boxes or controllers.

- ***Connectors and brackets***. To end the configuration process cable lenghts, connectors, mounting holes, rod ends, brackets and housing colors are specified to ensure perfect assembly integration.

- ***Assitance***. If you still have any doubts, for further information, 3D drawings, technical support, customized configurations or quotations please contact us.