



Linear and Rotary Actuators



Linear and Rotary Actuators

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Overview of Linear and Rotary Actuators

Motors offer excellent controllability and are therefore used as the drive sources of various automated equipment. In many cases, a motor is combined with various mechanical components such as a ball screw, belt and pulley, and rack and pinion, to convert the motor rotation to a different type of motion needed to drive the equipment. Oriental Motor has various linear and rotary actuators consisting of a motor assembled with the necessary mechanical components, to meet the various needs of automated equipment.

Features of Linear and Rotary Actuators

Equipped with a motor offering excellent controllability, our linear and rotary actuators offer the following advantages over hydraulic and pneumatic actuators:

- The actuator is very stable when operated, even at low speeds. It also offers smooth acceleration and deceleration operation.
- Motions can be programmed with multiple stopping points.
- With a linear and rotary actuator using a stepping motor, adjustment of position and speed can be performed easily using data. Setup change is also simple, as all you need do is to change the data.

Advantages of Using Linear and Rotary Actuators

When automated equipment is designed, various factors must be taken into consideration including the production line layout, installation environment, ease of maintenance, configuration of electrical wiring and control system, and so on. This means many man-hours are needed to select the motor and other mechanical components and create a parts list, drawings, operating manuals, and the like.

Oriental Motor offers various linear and rotary actuators to help you improve your design productivity.

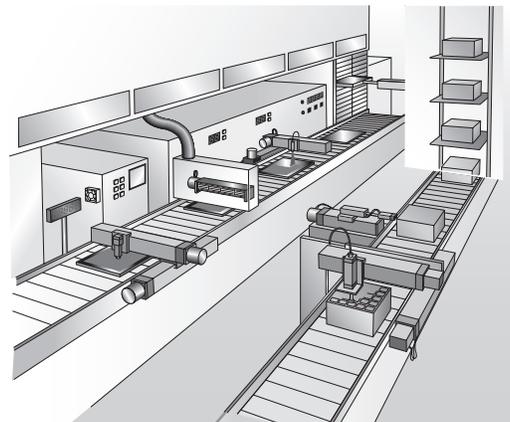
Use of linear and rotary actuators can reduce this time and offers the benefits explained below.

Higher Design Efficiency

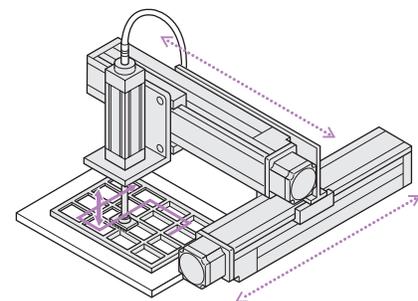
The primary feature of automated equipment is its ability to implement a series of basic operations such as "transfer," "push" and "rotate." In other words, you can design automated equipment by selecting and combining linear and rotary actuators capable of performing these basic operations. Since all you need is to select an actuator, you can save the time and effort.

Shorter Production Time and Higher Quality

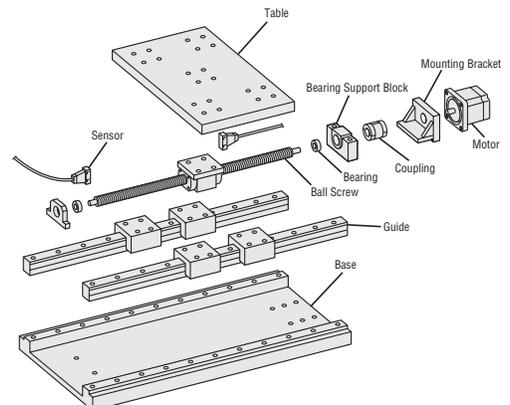
When building equipment in-house by assembling a motor and mechanical components (see the illustration on the right), the quality of assembly affects the traveling resistance and position accuracy, therefore adjustments will be needed to achieve the expected operating performance. On the other hand, our linear and rotary actuators are complete products guaranteed to provide the specified operating performance, so use of linear and rotary actuators reduces adjustment work and ensures uniform quality.



Example of Production Line



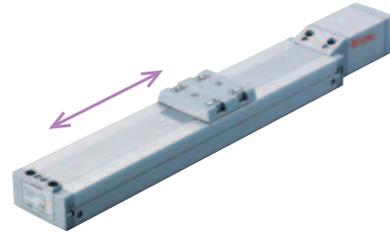
Example Component of Automated Equipment



Example Component of in-house Building

Motorized Linear Slides

The motor is integrated with a linear motion mechanism, which makes an actuator ideal for transferring loads.



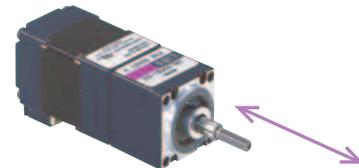
Motorized Cylinders

The motor is integrated with a linear motion mechanism, which makes an actuator ideal for pushing and pulling load.



Compact Linear Actuators

A stepping motor is integrated with a ball screw. An ideal actuator for pushing and pulling small loads or fine-tuning applications.



Hollow Rotary Actuators

A motor is integrated with thrust bearings and a rotary table. Ideal for index-drive and high thrust load applications.

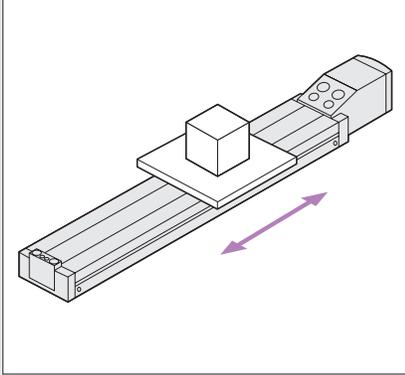


How to Select an Actuator

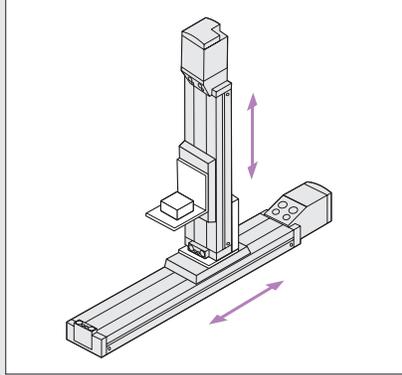
As components of automated equipment, linear and rotary actuators are used in many different ways. From the viewpoint of "motion," they are classified as follows.

Transfer

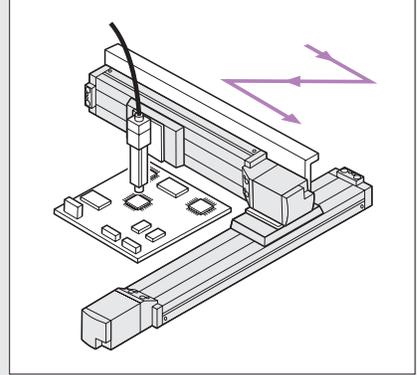
Transferring loads



Transferring loads (Vertical)

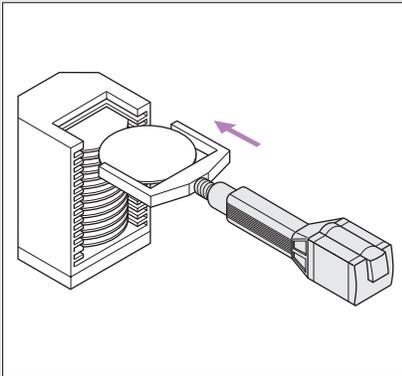


Moving a CCD camera

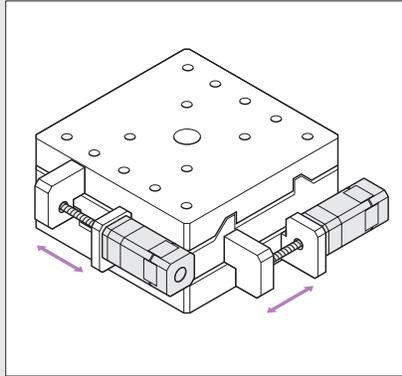


Push, Pull

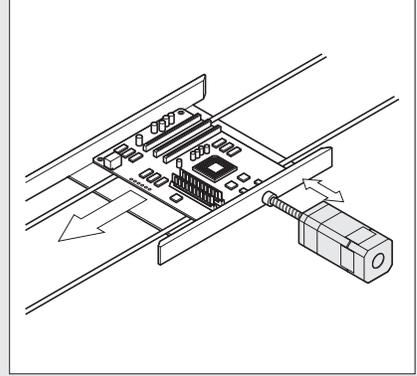
Storing loads



Driving mechanism for a micrometer head X-Y stage

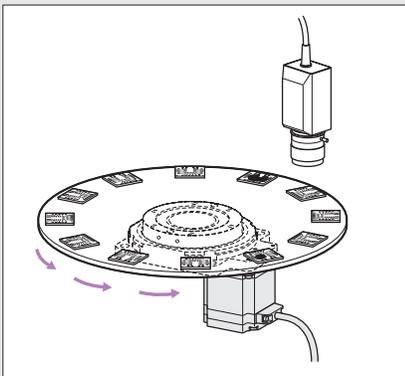


Centering of a board

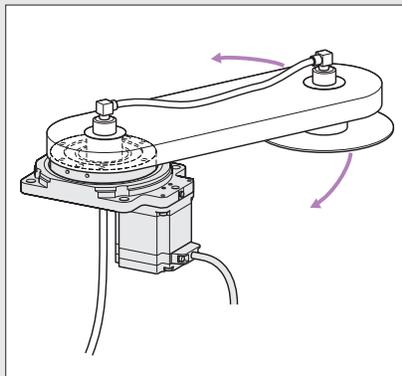


Rotate

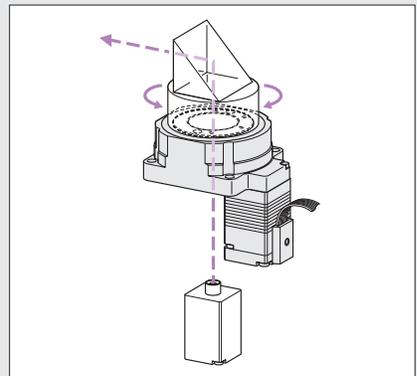
Positioning a table



Transferring by arm



Adjusting an optical axis



We have a broad selection of linear and rotary actuators. Select one that best suits your required specifications (transfer speed, transportable mass, resolution, accuracy), functions, system configuration and other applicable conditions.

Motorized Linear Slides



Motorized Cylinders



Compact Linear Actuators



Hollow Rotary Actuators



Types of Linear and Rotary Actuators

Oriental Motor offers a full lineup of linear and rotary actuators meeting the needs of various applications.

Motorized Linear Slides → Page E-7

Selection of Motorized Linear Slides Page E-12



EZS II Series Using an α STEP Motor

AC Power Input

DC Power Input

- Standard model of the motorized linear slides
- Adopting a Stainless Sheet
- Compact and high-precision

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SPV Series Using an α STEP Motor

AC Power Input

DC Power Input

- High-speed operation is possible due to a belt drive
- Long stroke
- Employing an aluminum frame structure

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Motorized Cylinders → Page E-47

Selection of Motorized Linear Slides Page E-52



EYC II Series Using an α STEP Motor

AC Power Input

DC Power Input

- Adopts our α STEP technology
- Employing a lightweight rod
- Compact and high-precision

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EZA Series Using an α STEP Motor

AC Power Input

DC Power Input

- Adopts our α STEP technology
- LM Guide is housed within the cylinder
- No external guide required

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PWA II Series Using an α STEP Motor

AC Power Input

- Adopts our α STEP technology
- High-power, high thrust force
- Suitable for push-motion operation

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DRL Series Using a Step Angle 0.72° Stepping Motor

DC Power Input

- The compact body houses the linear motion mechanism and the rotating components
- Employing 0.72° step stepping motor
- Wide variation

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DG Series Using an α STEP Motor

AC Power Input

DC Power Input

- Features a hollow table that allows large-inertia discs or arms to be installed directly
- Adopts our α STEP technology
- High-power, high rigidity

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