

Turning Power Into Precision: A Guide to Industrial Rotary Actuators

In industrial automation, rotation doesn't just mean movement it means control, torque, and reliability. Whether you're indexing a part into place, rotating a load between operations, or precisely positioning a fixture, the rotary actuator you choose can make or break your application.

At [Donald Engineering](#), we don't just sell actuators, we offer Partnership Driven Solutions. That means we work side-by-side with you to solve real-world challenges using the right tools for the job. And when it comes to rotary motion, we have a deep breadth of technologies designed to meet a wide range of needs from compact power to high-torque precision.

Let's take a closer look at the options in our rotary actuator toolbox, and how each one fits into a larger strategy for smarter, safer motion.

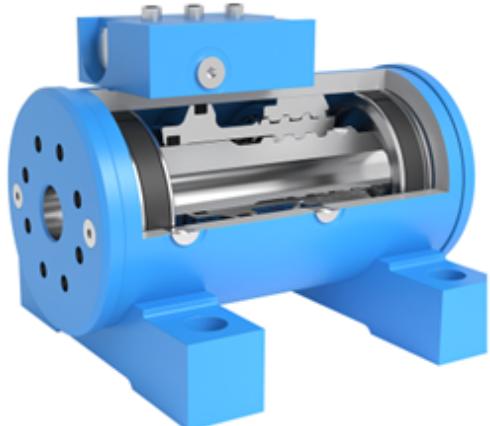
Oilgear - Helical Gear, Hydraulic Muscle

If you need serious torque in a compact footprint, Oilgear's hydraulic rotary actuators deliver. These units use helical gear technology to generate extreme torque with precise, repeatable motion.

- ★ **Key Advantage:** High torque in a small size.
- ★ **Rotation:** Up to 180° (with future expandability).
- ★ **Precision:** Excellent due to hydraulic control, though very slight inherent backlash may exist between gear set and piston.

This is the kind of power and control that makes tough applications easy and it's one of many tools we use to build systems that work harder and smarter.

OILGEAR



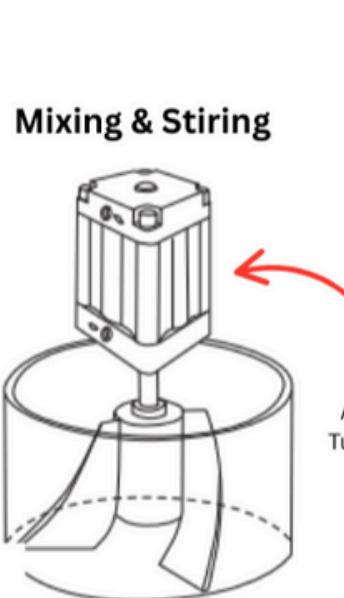
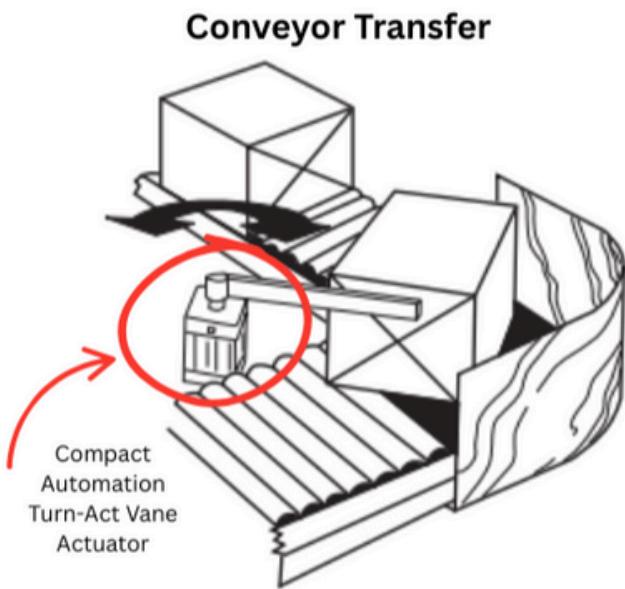
Compact Automation - Turn-Act Vane Actuator



Compact Automation's Turn-Act series uses vane technology housed in an aluminum extruded body. Internal vanes provide large surface area for high torque while maintaining a zero-backlash design.

- ★ **Key Advantage:** No backlash, high torque density, small footprint.
- ★ **Design:** Simplified construction with precise fit between shaft and vane.
- ★ **Applications:** Great for tight spaces that still demand accuracy and torque.

In situations where precision matters and space is limited, this is a go-to option in our lineup.



View it
in action
here!

Compact
Automation
Turn-Act Vane
Actuator

Rack-and-Pinion Rotary Actuators

A time-tested design, rack-and-pinion actuators use linear motion to generate rotation. A piston drives a rack, which spins a pinion gear offering scalability and flexibility. Two of our Vendors lead in this space.

Rotomation - Modular & Customizable

Rotomation delivers configurable rotary actuators, with options extending to 1080° of rotation and beyond. Their design is modular, robust, and built to spec.



★Flexibility: Build exactly what you need.

★Rotation: Catalog options up to 720°, custom up to 1080°.

★Specialty Options: Up to 5 positions possible, single-direction steppers and indexers, and other niche mechanisms like “nitpickers.”

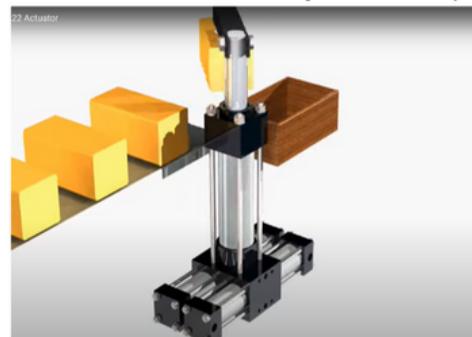
★Indexer: Great for things like incrementally moving a conveyor in a single direction, precisely and repeatably, with no accumulated error

★Stepper: Like an indexer, but allows for some freewheeling and variance due to outside forces

★Note: Slight inherent backlash exists between the rack and pinion.

Their modular designs let us build rotary solutions tailored to complex or unusual needs perfect for customers who need more than a standard answer.

Pick and Place Rotomation Rotary Actuator Example



SCHUNK - Precision with Built-In Features

SCHUNK takes rack-and-pinion to the next level with pre-engineered, feature-rich designs.

★Rotation: 90° & 180° options.

★Repeat Accuracy: .05°

★Built-In Benefits: Cushions, internal shock absorbers, and pneumatic/electrical pass-throughs.

★Range: Broadest torque and size range in our portfolio.

★Applications: Ideal for off-the-shelf solutions that don't sacrifice performance.

Schunk offers a broad range of electric rotary actuators featuring encoders for positioning and internal brakes for load holding. When you want a clean, reliable, and proven solution SCHUNK gives us an easy button without sacrificing flexibility.



Designing for Deceleration: The Real Limiting Factor

It's easy to rotate. The challenge? **Stopping the load.**

High-speed rotation paired with abrupt stopping introduces mechanical stress, like hitting a brick wall. That's why actuator selection must consider deceleration strategies:

- ✓ Internal cushions or shock absorbers (SCHUNK, Rotomation).
- ✓ External stops or absorbers for high-energy loads.
- ✓ **Rule of thumb:** Avoid transferring stopping force through the actuator if possible. External stops, when possible are great and eliminate backlash.

 **We help our customers factor this in early because solving problems before they happen is part of the value we bring.** 

Sensor Options & Position Feedback

Across all pneumatic solutions (Compact Automation Turn-Act, SCHUNK, and Rotomation) position sensors are available to detect full strokes or intermediate positions, enhancing control and process visibility.

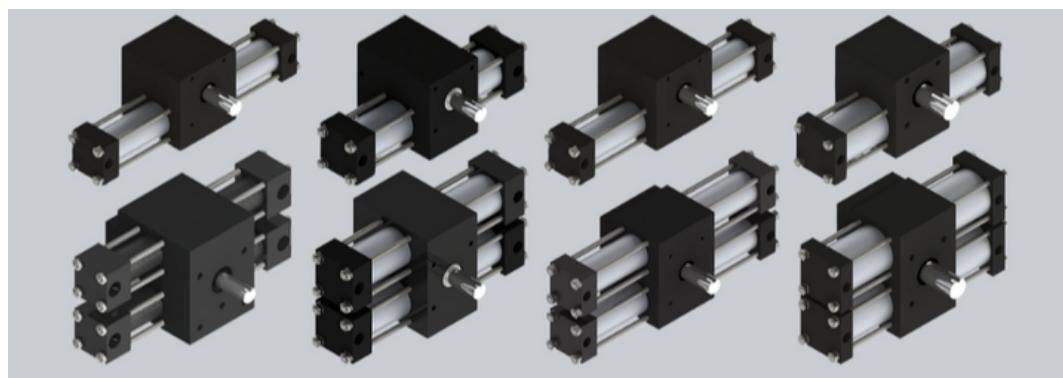
Need Something More? Rotomation has it!

Rotomation offers more than just standard oscillating actuators:

- ★ **Indexer:** One way motion utilizing a clutch-pawl mechanism, with no accumulated error.
- ★ **Stepper:** Continuous one way rotation without the clutch and stop mechanism
- ★ Other niche actuators solve unique motion problems few others can.



These are specialty tools in our kit that open the door to innovative automation design.



Built for Your Success

At **Donald Engineering**, we don't believe in one-size-fits-all automation. Our job is to understand your challenge, pull from our diverse options of rotary technologies, and help you design a solution that works today and grows with you tomorrow.

Whether you need brute force, pinpoint precision, or modular flexibility, we've got the right actuator and the engineering expertise to back it up.

Lets talk about your next rotation challenge.

Donald Engineering can help determine the best solution for your operation.



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