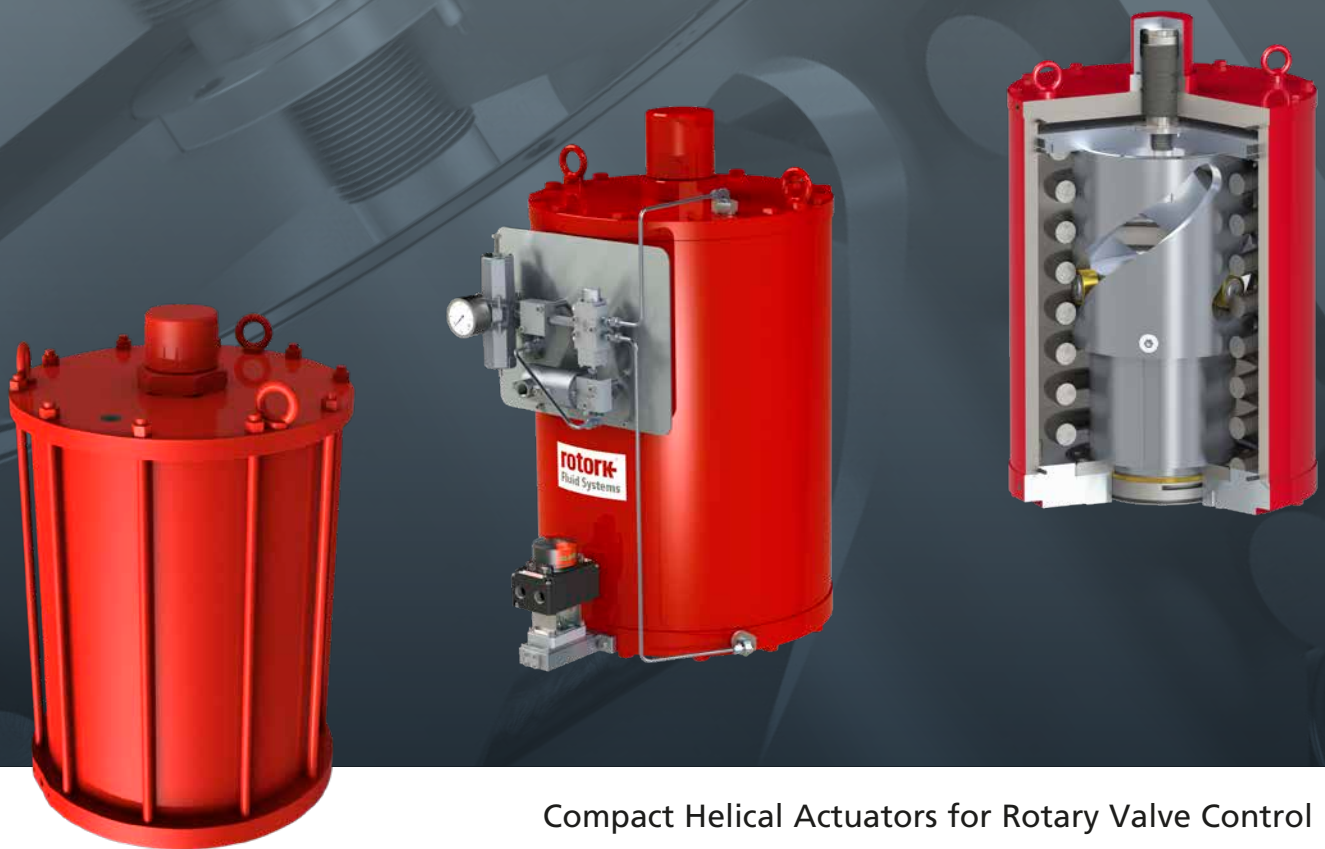


rotork®

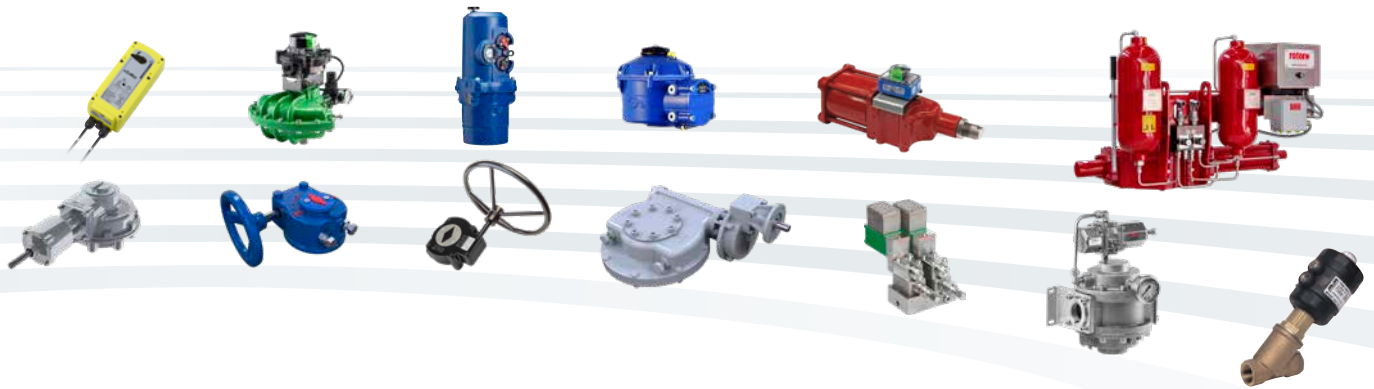
Keeping the World Flowing
for Future Generations

CQ Range



Compact Helical Actuators for Rotary Valve Control

Reliability in critical flow control applications



› Reliable operation when it matters

Assured reliability for critical applications and environments. Whether used infrequently or continuously, Rotork products will operate reliably and efficiently.

› Quality-driven global manufacturing

We offer products that have been designed with over 60 years of industry and application knowledge.

Our research and development ensures cutting edge products are available for multiple applications across multiple industries.

› Customer focused service and worldwide support

Rotork solve customer challenges and develop new solutions that are tailored to the needs of our clients.

We offer dedicated, expert service and support from initial inquiry, to product installation, to long term after sales care.

› Low cost of ownership

Long-term reliability prolongs service life.

Rotork helps to reduce long term cost of ownership and provides greater efficiency to process and plant.

CQ Range

Section	Page
Rotork	2
CQ Range Compact Helical Actuators	4
Inside the CQP Pneumatic Actuator	6
Model Number Designation	7



Comprehensive product range serving multiple industries

Rotork products offer improved efficiency, assured safety and environmental protection across sectors such as the Power, Oil & Gas, Water & Wastewater, HVAC, Marine, Mining, Pulp & Paper, Food & Beverage, Pharmaceutical and Chemical sectors.

Market leaders and technical innovators

We have been the recognised market leader in flow control for over 60 years.

Our customers rely upon Rotork for innovative solutions to safely manage the flow of liquids, gases and powders.

Global presence, local service

We are a global company with local support.

Manufacturing sites, service centres and sales offices throughout the world provide unrivalled customer services, fast delivery and ongoing, accessible support.

Corporate social responsibility is at the heart of our business

We are socially, ethically and environmentally responsible and committed to embedding CSR across all our processes and ways of working.

CQ Range Compact Helical Actuators

The CQ range provides an innovative fully-concentric and balanced actuator design for quarter-turn valves. The design features a helical mechanism that transforms linear piston motion into quarter-turn valve stem rotation. CQ actuators are capable of delivering the same torque range as traditional scotch yoke design actuators, but within a much smaller footprint.

They are therefore ideally suited for installation in confined spaces. Further, Rotork's unique helical cam follower bearing design provides higher efficiency than a helical gear mechanism utilised by other valve actuator manufacturers.

As standard, the CQ torque output profile, like that of a scotch-yoke actuator, is engineered to parallel the torque demand profile typically found with popular quarter-turn valve types. The CQ design however is unique in that the torque profile can be custom engineered and manufactured to meet non-standard valve torque requirements.

Pneumatically powered CQP actuators are available in both double-acting and spring-return configurations. Several cylinder sizes are available to suit a wide range of valve torque requirements.

A variety of options and accessories are available to make the CQ range a perfect choice for virtually any quarter-turn application with challenging space envelope requirements.

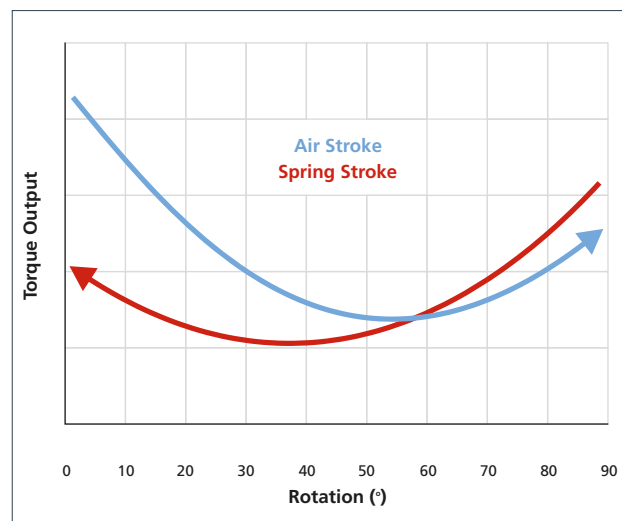
As a global leader in valve actuation technology, we provide a comprehensive range of valve actuators, controls and associated equipment. We also supply a variety of valve actuator services including commissioning, preventive maintenance and retrofit solutions.

Rotork specialises in the production and support of fluid power actuators and control systems. We are dedicated to providing the marketplace with the latest technology, consistently high quality, innovative design, excellent reliability and superior performance.

We maintain dedicated engineering groups for Applications, Product Improvement and New Product Development so that our customers can gain all the benefits that ever advancing technologies have to offer and to ensure our efforts are in step with the continually evolving needs of our customers.

Most importantly, we have a long-standing commitment to meeting the special needs of a wide range of applications including: oil and gas exploration and transportation; municipal water and wastewater treatment; power generation; and the chemical and process industries.

With over 60 years of engineering and manufacturing expertise, we have tens of thousands of successful valve actuator installations throughout the world.



CQ Range Compact Helical Actuators

Every Rotork actuator is built to provide long and efficient service with minimum maintenance. The design, engineering and materials used in their construction ensure optimum performance even in very harsh environments.

Operating Pressure

Pneumatic: Up to 7 bar (175 psi)

Torque Output:

Standard: Up to 150,000 Nm (1.3m lbf.in)

The CQ standard range of sizes is suitable for applications that require a pneumatically powered actuator with torque demand of up to 150,000 Nm. We also offer CQ actuator designs with greater output and/or hydraulic power. Please contact Rotork for these applications.

Temperature Ranges

Standard: -30 to +100 °C (-22 to +212 °F)

Low: -40 to +100 °C (-40 to +212 °F)

Extreme Low: -60 to +100 °C (-76 to +212 °F)

For high temperature range up to 160 °C (320 °F), please contact Rotork.

Stroke Adjustment

Standard: 0°±5°

Rotations beyond 90° can be provided upon request.

Approvals and Industry Standards

- Actuators certified in accordance with IP66M/68M
- Actuators certified in accordance with ATEX Directive
- Actuators certified in accordance with PED Directive
- EAU Certificates of Conformity
- Management System in accordance with ISO 9001:2008
- Certified suitable for use at SIL3

Standard Features and Benefits

- **Compact Design**
The design has the smallest footprint and envelope dimensions of any actuator type for a given torque output. Valve adaption is normally within the actuator envelope which further reduces the space requirements.
- **Ease of Maintenance**
Designed with maintenance in mind, disassembly and access to internal components can be easily and safely accomplished.
- **Environmental Protection**
The completely enclosed design provides optimum resistance in corrosive environments. Epoxy paint is standard.
- **Balanced Design**
The concentric design provides even weight distribution that facilitates installation and removal as well as minimal load stress on the valve.

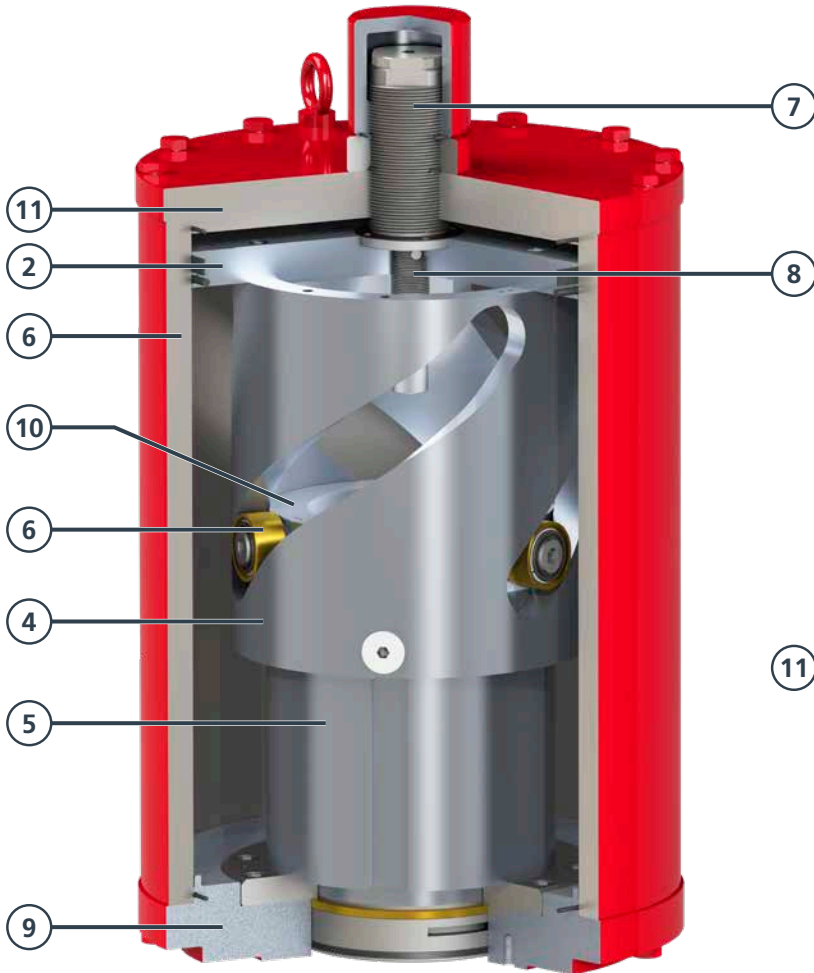
Optional Features and Benefits

- **Manual Override**
For override on a CQP pneumatically powered actuator, please consult Rotork.
- **Closed Loop System**
Although CQ actuators are designed with corrosion protection through material specification and surface treatments, some operating environments are extremely corrosive. Additional protection is available using a closed loop or clean breath control circuit in which the surrounding atmosphere does not enter the actuator.
- **Complete Control Systems**
Control component packages are part of an actuator/valve installation. Rotork has extensive experience in the design and assembly of all types of fluid power control systems to satisfy any customer requirement for on/off, modulating or ESD service. Control packages can be mounted on a panel or in a cabinet, either on the actuator or at a remote location.

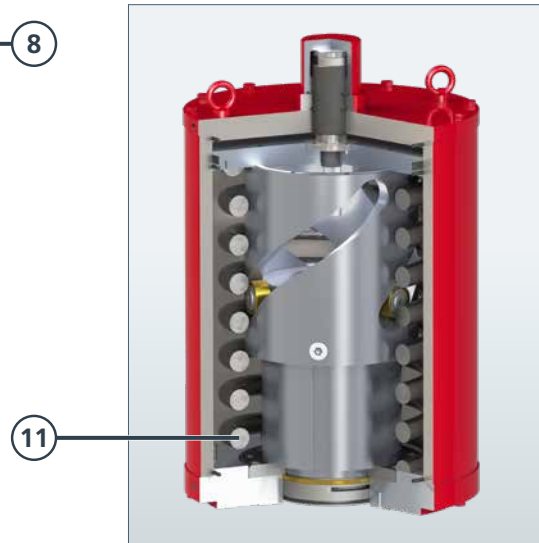
Rotork offers components from all leading industry-leading suppliers as well as a comprehensive array of reliable and innovative products of our own design. These products include pneumatic and hydraulic manifolds, control valves, regulators, switch boxes, and other ancillary components for general purpose or severe service and explosion-proof applications.
- **Special Paint**
Rotork can accommodate any specification for special paint.

Inside the CQP Pneumatic Actuator

Typical CQP Double-Acting Actuator
(CQP 040-485AD1B)



Typical CQP Spring-Return Actuator¹
(CQP 040-485AC1B)



Operation of the Mechanism

The actuator's basic components consist of a cylindrical body containing a cylinder with vertical slots connected to the bottom flange, and a cylinder with helical slots connected to the pneumatic piston. Cam follower bearings are attached to the upper part of the drive and are positioned within the slots of the helical slot cylinder.

A set of keys on the lower part of helical slot cylinder are mated to linear slots/keyways in the vertical slot cylinder. Pneumatic pressure on the piston provides linear motion of the helical slot cylinder, while rotation of the same is inhibited by the keys. In combination with this linear movement, the cam follower bearings travel along the helical slots providing rotation of the drive shaft.

ITEM	DESCRIPTION	MATERIAL
1	End Flange	Carbon Steel
2	Piston	Carbon Steel
3	Cam Follower Bearing	Aluminium Bronze
4	Helical Slot Cylinder	Carbon Steel
5	Vertical Slot Cylinder	Carbon Steel
6	Pneumatic Cylinder	Carbon Steel (<i>internally ENP²</i>)
7	Upper Stop Bolt	Alloy Steel
8	Lower Stop Bolt	Alloy Steel
9	Bottom Flange	Carbon Steel
10	Drive Shaft	Carbon Steel
11	Spring	Spring Steel
12	Tie Rod (<i>not shown</i>) ³	Alloy Steel

1. Models 010-090 utilise a single spring. Larger sizes utilise multiple springs.
2. Electroless Nickel Plated
3. Bodies can be provided with tie rods or with threaded end flanges.

Model Number Designation

Example Model Number **CQ P - 040 - 435 A / C 1 - A - F25 - 072**

ACTUATOR TYPE

CQ = Compact Helical Actuator

SUPPLY TYPE

P = Pneumatic

BODY SIZE

010, 020, 030, 040, 050, 060, 070, 080, 090, 100, 110, 120

CYLINDER SIZE

Pneumatic = 300-980

SEALS

A = NBR: -30 to +100 °C (-22 to +212 °F)

B = Viton: -20 to +100 °C (-4 to +212 °F)

C = Fluorosilicone: -40 to +100 °C (-40 to +212 °F)

E = Fluorosilicone: -60 to +100 °C (-76 to +212 °F)

EXECUTION TYPE

C = Spring-return Fail Close

O = Spring-return Fail Open

D = Double-acting

SPRING / DA MODULE

1, 2, 3

ASSEMBLY TYPE

A = External Tie Rods Sizes 010 to 090

B = Threaded Flange Sizes 010 to 090

C = Internal Tie Rods Sizes 100 to 120

FLANGE DRILLING

F14 Size 010

F16 Sizes 010, 020, 030

F25 Sizes 020, 030, 040

F30 Sizes 040, 050, 060

F35 Sizes 050, 060, 070, 080

F40 Sizes 070, 080, 090, 100

F48 Sizes 090, 100, 110, 120

F60 Sizes 110, 120

MAXIMUM SHAFT SIZE mm

48 Size 010

60 Size 020, 030

72 Size 040

98 Size 050, 060

160 Size 070, 080

180 Size 090, 100

220 Size 110, 120

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A full listing of our worldwide sales and service network is available on our website.

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