

centork[®]

Developing the Future



Q Range



Part-turn Electric Valve Actuators

Contents

Centork – Valve Actuation	2
Q Range Overview	3
Q Standard Range	4
Q Pak Range	6
Performance Summary	8
Actuator Performance	8
Actuator Fixings	9
Supply Voltages	9
Design Specification	10

Centork – Valve Actuation

Centork actuators have been developed with over 20 years of experience in actuation solutions. Our valve actuation products range from standard mechanical actuators to advanced digital actuators with integral controls.

Centork has an extensive product range catering for all industries. Our actuation solutions deliver state-of-the-art performance, value and reliability to the global valve industry. We can help you through the process of product selection and specification from the installation of a single actuator up to complex system integration.

With an international network of offices and distributors we can fully support customer and end user requirements. Over 1,000 service technicians are employed by our company, partners and representatives, providing the necessary worldwide infrastructure to fully support actuators in the field.

Worldwide coverage

Our extensive international network enables us to think globally and act locally when it comes to supporting our customers. Centork provides an efficient sales service, after sales commissioning and maintenance support throughout the life of the actuator.

Global manufacturing

Product reliability and integrity are priorities in Centork product development. Our quality control teams source components from suppliers throughout the world to ensure our customers always receive first class actuation solutions.

Customer support

Centork provide service support solutions to maximise your productivity and reduce your operational risk.





Q Range Overview

Robust, reliable and compact part-turn actuator with the flexibility to suit your application

- Continuous position indication at all times, even without power
- Oil bath lubrication provides extended life and the ability to mount in any orientation
- Water ingress protection – double-sealed to IP68 1.2 m for 48 hours
- Safe, motor-independent, handwheel operation available at all times
- Inclusive mechanical travel stops to prevent over-rotation
- Self-locking drive train in electrical and manual modes to prevent valve back driving
- Increased protection by using independent torque and position sensing
- Optional integrated control package to increase site integration possibilities



Q Standard Range

Part-turn Q Standard actuator

Centork Q Standard actuators are the simplest models in the Q range of products. They are designed for use with external controls and motor switchgear. Q Standard actuators comprise the following components:

- Squirrel cage induction motor, drive train and independently declutchable manual override handwheel for hand operation including padlock able hand/auto lever
- Standard valve flange mounting including removable drive nut for machining to match the valve stem
- Self locking drive train in electrical and manual modes
- Drive train permanently immersed in an oil bath to ensure maximum efficiency and avoid the damaging tunneling affects associated with grease filled actuators

To operate a Q Standard, external controls with motor switchgear must be wired to the applicable actuator terminals. The wiring diagram will detail electrical connection requirements for operation.

A Q Standard can be upgraded with a Q Pak control module to provide a ready-to-operate actuation solution with integral controls and motor switchgear.

Motor

To meet the specific torque characteristics of the wide variety of applications in our global market, Centork has developed a range of 3-phase and single-phase motors with high starting torque. Special features have been designed into the drive train to ensure uninterrupted operation even when the valve or damper torque demand increases due to wear or requirement for maintenance. For isolating service applications this includes a hammer blow mechanism within the drive train to provide an impact force at the start of electrical or manual movement.

To avoid damage to the actuator motor, thermal protection is included as standard using three thermostats embedded in the motor windings. This will inhibit actuator operation if the temperature of the motor exceeds specification.



Q Standard Range



Actuator switch mechanism

The purpose of the actuator switch mechanism is to sense valve position and torque so the actuator motor can be controlled appropriately. Q Standard is designed to seat at the ends of travel using torque switches however position switches are also included for remote indication. Torque and position switches are fully adjustable to suit the particular application requirements. Additional position switches can be included to suit application requirements.

Mechanical Position Indication

All Q range actuators incorporate a mechanical position indicator. This is permanently visible through the top cover of the actuator. The indicator mechanism is driven directly from the final output drive of the actuator and is therefore an exact representation of the actuator and valve position.

System Integration

Q Standard incorporates a wide variety of electrical options to ensure exact application demands can be met. In addition to the standard switches, 2 additional switches can be installed to provide intermediate or end of travel position indication.

Some applications may require continuous position indication. Q Standard can meet this requirement with a mechanically driven potentiometer or integrated CPT (Current Position Transmitter) option that transmits a potentiometric or loop powered 4-20 mA output signal to the external motor controller.

Local Control Selectors

Q Standard can include integral selectors that control the actuator operating mode; Local, Stop or Remote, and also provide a local Open or Close input. Wiring for the selector switches is designed to integrate easily with an external motor controller.

If security is a concern, the mode selector can be pad locked in the desired operating mode. Access can then be restricted to authorised personnel only.

Q Pak Range

Q Pak

The Q Pak comprises all the features of the Q Standard with the addition of the control interface module.

This module incorporates a deep cover which houses local control selectors, logic PCB, motor switchgear and transformer. Inclusion of the logic PCB enhances the capabilities of Q range actuators ensuring increased integration with existing site systems.

Phase Rotation Protection

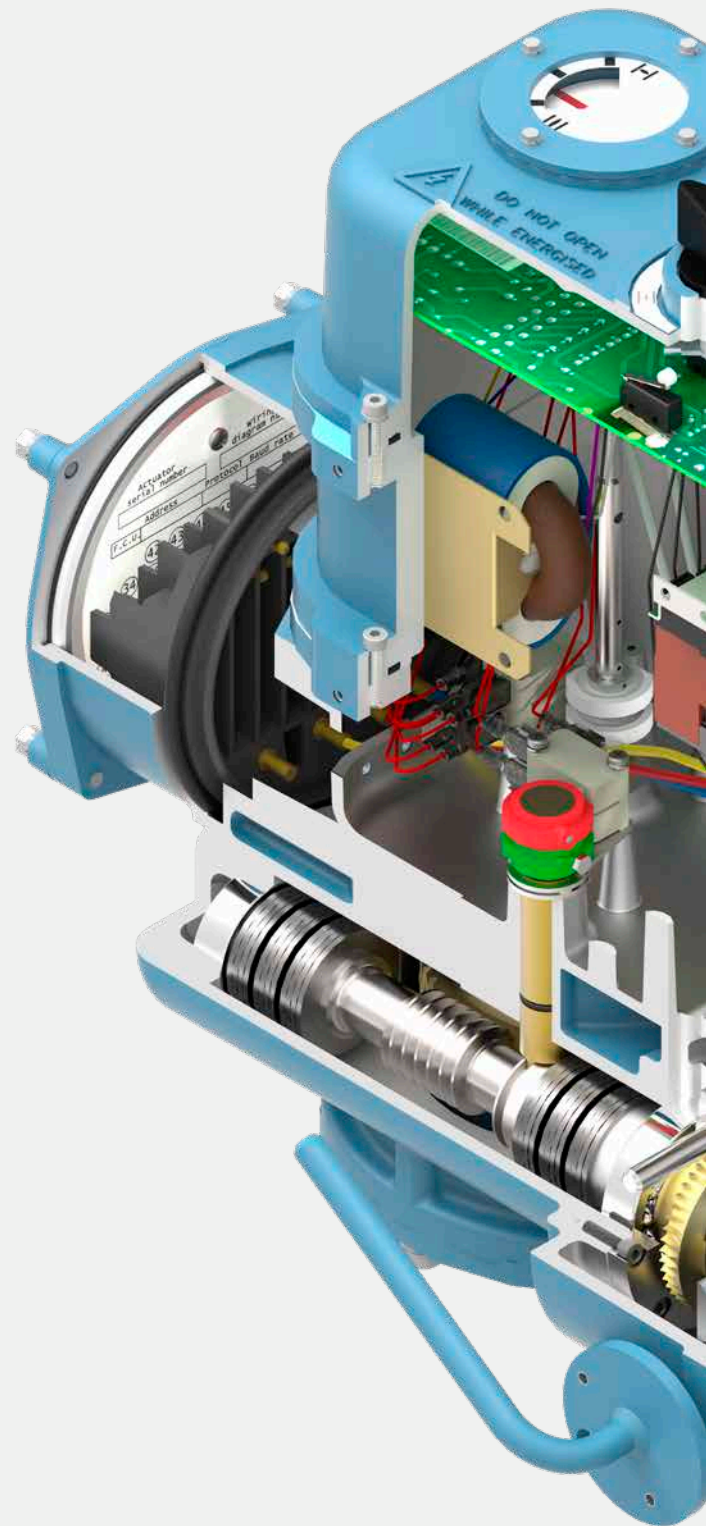
Q Pak actuators include Centork Syncrophase automatic phase rotation correction. This prevents the actuator operating in the wrong direction by ensuring the Q three-phase motor is always presented with the correct phase rotation. Syncrophase senses the incoming phase rotation and energises the appropriate contactor to cause movement in the correct direction.

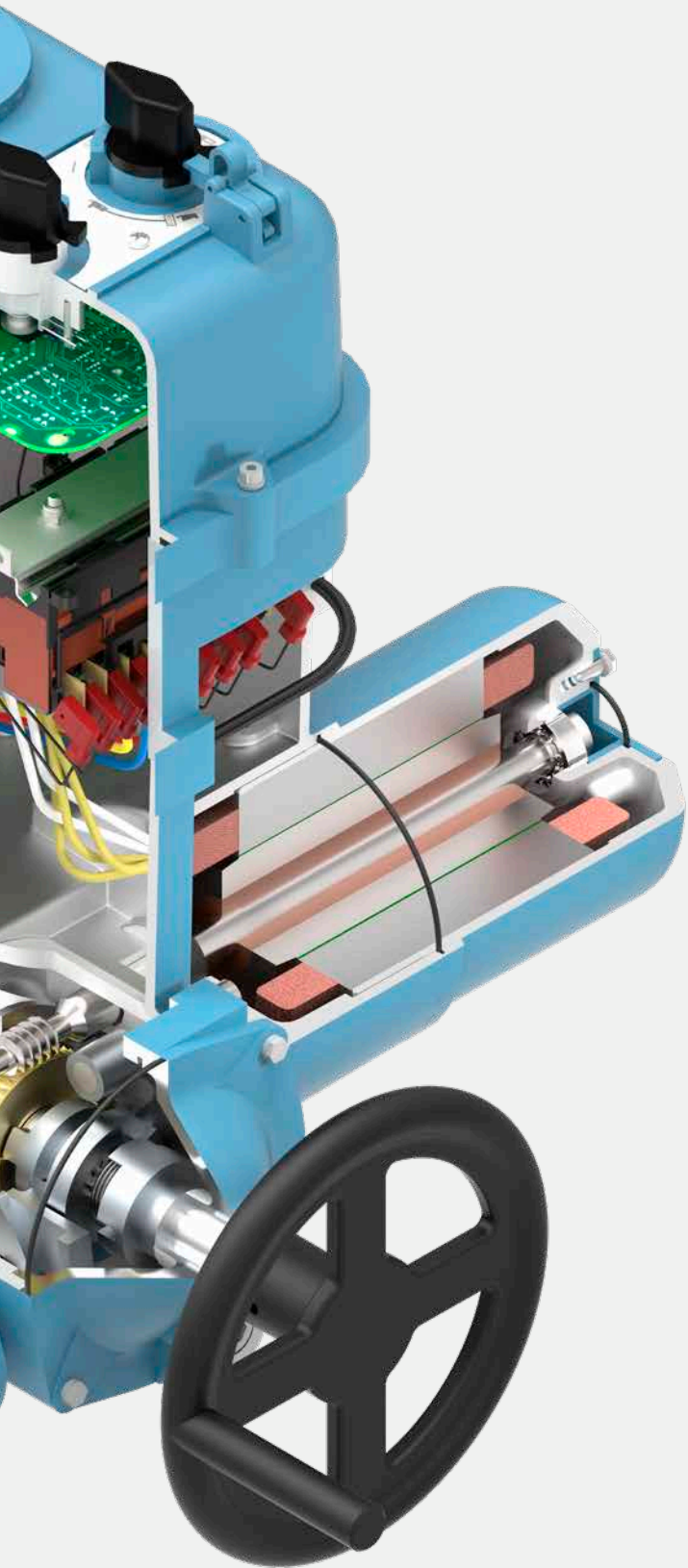
Integral controls

Q Pak actuators are offered as a ready-to-operate actuation solution. The motor switch gear, power supply components and integral control logic interface allow a unit to be operated with the local controls when applying only an adequate power supply. Remote operation can be achieved using appropriate commands to the pre-defined terminals.

Motor switchgear

For Q Pak actuators, the motor switching is controlled with a reversing contactor. This enables integrated directional control for isolating duty applications. The reversing contactor includes an automatic time delay circuit that permits "instant reversal". The time delay avoids excessive shock loads during switching that may cause unnecessary wear to valve stems and also limits current surges through the contactor to prolong service life of the actuator.





Increased Functionality

By including integral controls within the Q Pak actuator, extra functionality can be provided to further meet the demands of modern actuation applications. Intermediate positioning is possible with the 4-20 mA Folomatic analogue control option. Q Pak actuators are also capable of including internally powered 4-20 mA analogue position feedback to remotely indicate intermediate position.

Bus Control Systems

The Centork *Pakscan* system is capable of controlling and monitoring up to 240 field devices (actuators or other devices) using a master station connected by serial or ethernet to a DCS. The *Pakscan* master station includes a full colour integral display that shows the status of all the field devices, current state of the communications ports, system alarms, diagnostic information plus actuator control and set up facilities. In addition to these local features, remote access to the asset management information is available via the built in web pages.

Pakscan™

In addition to being fully compatible with Centork *Pakscan*™, Q Pak actuators can be seamlessly integrated into many other fieldbus digital control systems, such as Profibus, Foundation Fieldbus, DeviceNet and Modbus.



FOUNDATION



Modbus®

Performance Summary

Actuator Performance

Rated torque is the maximum torque switch setting. Torque switches are adjustable from 30% to 100% of rated.

Model	Rated Torque		Operating Time (sec)		Mounting Flange		Handwheel Turns for 90°
	Nm	lbf.ft	50 Hz	60 Hz	ISO 5211	MSS SP-101	
Q100	135	100	27	23	F05/F07*	FA05/FA07*	15
			18	15			
			9	8			
Q300	406	300	54	45	F10/F07*	FA10/FA07*	15
			36	30			
			18	15			
Q450**	610	450	54	45	F10/F07*	FA10/FA07*	15
			36	30			
			18	15			
Q650**	900	664	15	13	F14/F12*/F16*	FA14/FA12*/FA16*	52
			30	25			
			45	38			

*Optional flange.

**3 phase power supply only.



Performance Summary

Actuator Fixings

Model	Flange	Bore & Keyway		Square AF	
		Max mm	Max in	Max mm	Max in
Q100	F05/FA05, F07/FA07	22	$\frac{13}{16}$	16	$\frac{5}{8}$
Q300 / Q450	F07/FA07	28	$1 \frac{1}{10}$	20	$\frac{3}{4}$
	F10/FA10	42	$1 \frac{5}{8}$	30	$1 \frac{1}{8}$
Q650	F14/F12/F16 FA14/FA12/FA16	56	$2 \frac{1}{5}$	40	$1 \frac{5}{8}$

Removeable drive sleeves are supplied blank for machining by valve supplier.

Supply Voltages


Model	1-Phase	3-Phase
Q100	110, 120, 220, 230, 240: 50 Hz 110, 120, 220, 230, 240: 60 Hz	380, 400, 415: 50 Hz 440, 460, 480: 60 Hz
Q300	110, 120, 220, 230, 240: 50 Hz 110, 120, 220, 230, 240: 60 Hz	380, 400, 415: 50 Hz 440, 460, 480: 60 Hz
Q450	-	380, 400, 415: 50 Hz 440, 460, 480: 60 Hz
Q650	-	380, 400, 415: 50 Hz 440, 460, 480: 60 Hz

Permissible power supply tolerances for voltage and frequency:

- Voltage tolerance $\pm 10\%$
- Frequency $\pm 5\%$



Design Specification

Q Standard and Q Pak		
Enclosure	Watertight IP68 (3 m for 48 hours). Protection maintained even when terminal cover removed.	
Operating Temperature	-30 to +70 °C (-22 to +158 °F)	
Vibration	0.5 g over a frequency range of 10 to 200 Hz	
Shock	NSS Grade II	
Gearing	Double reduction Steel worm and Aluminium Bronze worm wheel. Second stage worm gearing prevents back driving.	
Switches	Torque and auxiliary limit switches are changeover type (1 NO/ 1 NC) with the following inductive load ratings:	
	110/240 VAC	15 A
	110 VDC	0.25 A
	50 VDC	2.5 A
24 VDC		3 A
Motor Duty	3-phase - Class A & B (EN 15714-2) or S2 - 20% (IEC 60034-1) 1-phase - Class A & B (EN 15714-2) or S2 - 20% (IEC 60034-1) restricted to a maximum of 5 consecutive operations. 60 starts per hour rating. Q range actuators utilise purpose designed motors that are integral to the actuator. As such, these motors do not fall within the scope of IEC 60034, however they do meet applicable requirements of motor design for actuator operation.	
Insulation	Class F insulation with integrated thermostat	
Conduit Entries	Standard: 2 x M32 or 2 x 1 " ASA NPT Optional: Additional M20 entry	
Material	Gearcase and motor housing are diecast aluminium to BS1490 grade LM4. Other components are aluminium alloy.	
Mechanical Stops	Adjustable 80° - 100° travel	
Approvals	IECEE CB Scheme  and 