

rotork[®]

Keeping the World Flowing
for Future Generations

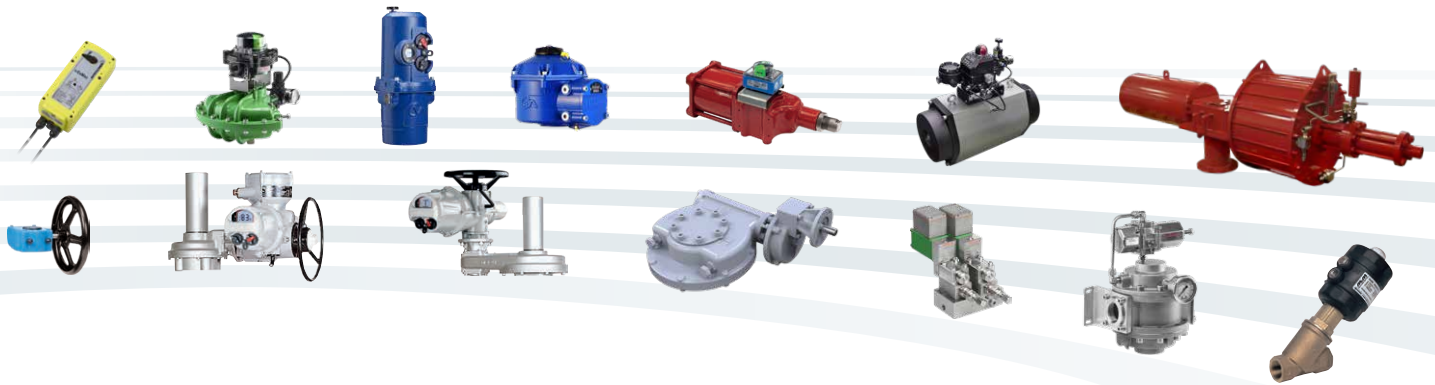
Servo-Control Hydraulic Actuator



CE

Modulating service electro-hydraulic actuator

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

At Rotork we 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.

Servo-Control Hydraulic Actuator

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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.

Environmental Social and Governance is at the heart of our business

We have a range of policies in place that support our performance across environmental, social and governance topics. The majority of our policies are publicly available.

Introduction

The Servo-Control Hydraulic Actuator is a self-contained electro-hydraulic solution specifically designed for valve position control using a continuous process command signal.

The precision of a hydraulic system combined with an embedded electronic motion control system guarantees high accuracy in achieving the valve target position.

The architecture consists of three primary components:

- High performance rack and pinion double-acting hydraulic actuator
- On-board hydraulic power unit based on a close-loop hydraulic circuit with a reversible gear pump
- Electric control cabinet complete with embedded motion control automation and a touch screen user friendly human machine interface (HMI)

Actuator drive torque, angular speed and rotation direction are governed by the reversible gear pump displacing oil between the cylinder chambers. The gear pump flow rate and direction of rotation are controlled by an electric motor piloted via a motor-driver.

The control system manages pressure and flow rate in the hydraulic circuit to achieve the target position according to the process command signal within the requested stroking time.

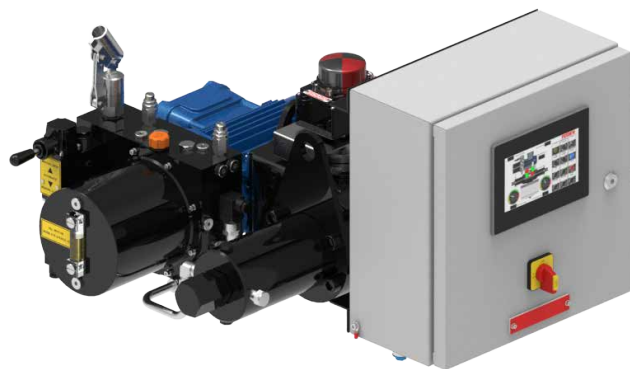
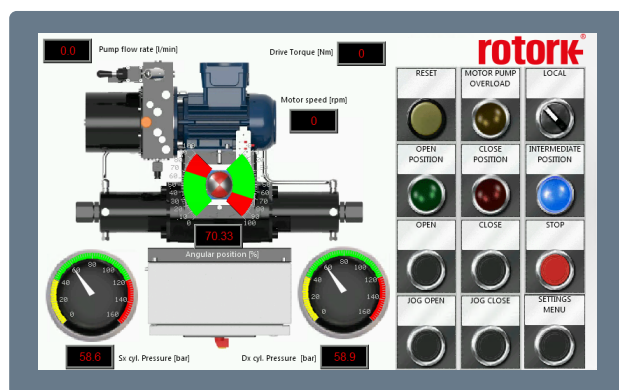
An analogue feedback signal is displayed on the monitor screen in real-time indicating the actuator angular position.

The field HMI allows the actuator to be controlled locally with access to all the parameters defining the motion dynamics.

The hand pump allows the actuator to be stroked manually in case of power supply failure.

Key benefits

- Only requires electrical power
- Self-contained with fully-enclosed built-in hydraulic power source reduces installation and maintenance costs
- Non-intrusive setting and easy troubleshooting via the touch screen HMI
- Remote control via 4-20 mA or hardwired 24 VDC signal
- Local control via touch screen HMI
- Modulating control accuracy to 0.3%
- Local indication (position/pressure/torque/flowrate)
- Low power consumption (0.9 kW)
- Torque (500-4,500 Nm) and Speed (13-130 s) adjustability
- Alarm indication via status relays
- Manual override



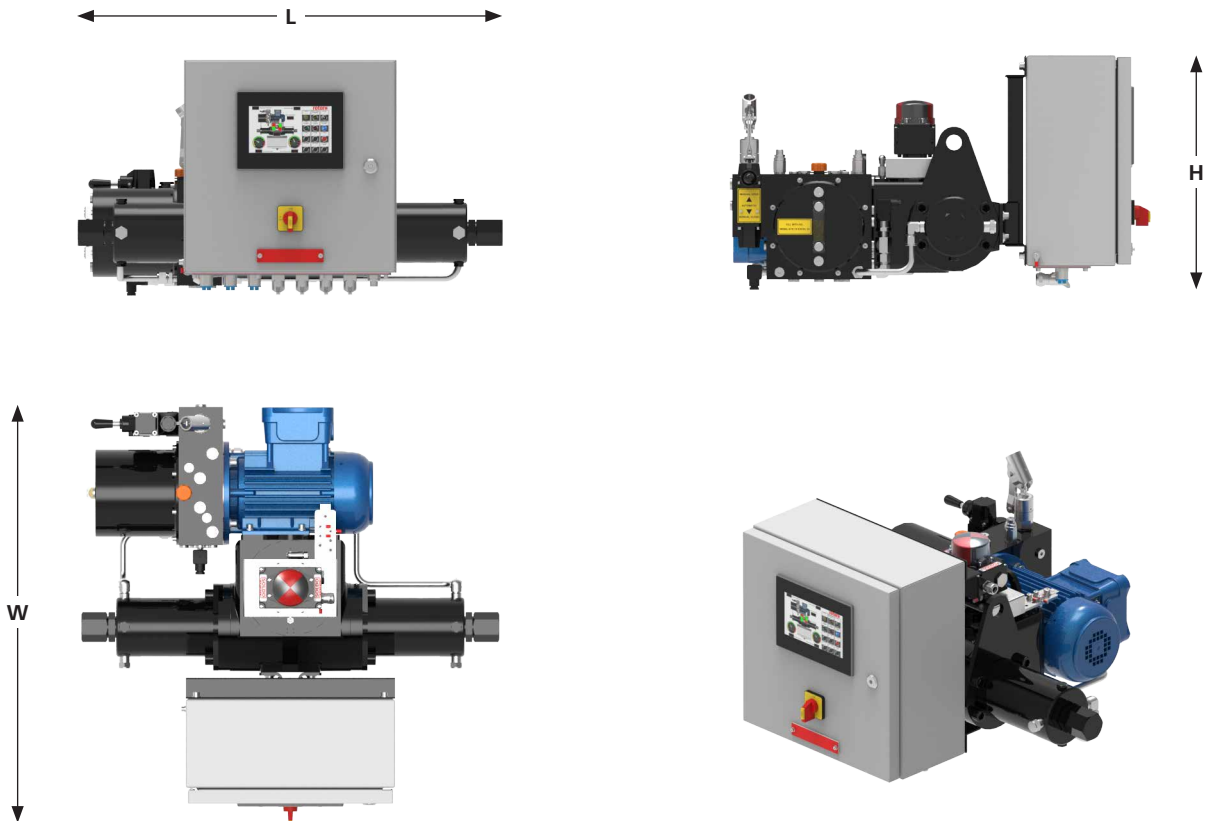
Specifications

The servo-control hydraulic actuator is a double-acting self-contained unit specifically engineered to provide dynamic performance, reliability in heavy duty services and to suit specific applications and process conditions. Actuator design features are shown on the data plates annex to the actuator itself.

Actuator data			
Working temperature	Standard Temperature -10 to +50 °C Low Temperature -30 to +50 °C	Supply voltage	Single Phase 240 1Ph VAC Three Phase 400 3Ph VAC
Ingress protection rating	IP65	Frequency	50 Hz
Dimensions [L x H x W]	802 x 442 x 764 mm	Max power consumption	0.9 kW
Weight	170 kg	Max current consumption	Single Phase 3.5 A Three Phase 2.0 A
Min output torque	500 Nm	Max working pressure	130 barg
Max output torque	4, 500 Nm	Max flow rate	2.8 l/min
Min stroking time	13 s	Oil displacement	0.65 l
Interface	ISO F16, Shaft Hole Ø 65 (+0.05) (+0.15)		

If you require a different output torque or stroking times, please contact Rotork.

Dynamic performances		
Accuracy	0.3 %	Max position end deviation to target position
Hysteresis	±1 %	Band amplitude according max stiction of motion response to continuous control signal
Sensitivity	0.5 %	Min drive signal resolution able to control the actuator motion
Dead time	750 ms	Max system reaction timing
Duty cycle	1 M	Cycles number guaranteed considering a duty cycle torque @ 40% of the actuator MAST



Features

Local control and indication

A 7" touch type HMI screen is front mounted on the electrical control cabinet allowing access to local controls and settings and showing actuator variables, status and alarms.

Local controls

Local controls are displayed on the HMI main screen.

The Local/Remote selector switches the system from "remote" control mode to "local" control mode and vice versa.

The Open and Close push buttons engage the opening and closing strokes, while a Stop push button inhibits the automatic strokes.

Additional Jog Open and Jog Close push buttons engage the stepping opening and closing movements. Manoeuvres are performed uniformly until the required angular position is reached by maintaining the buttons pressed.

A reset push button resets the motor-pump from the overload protection mode.

Dedicated menu pages allow calibration and setting of actuator performance, pressure and flow rate.

Local indicators

Gauges and numeric displays on the screen show the actuator position, pressure and output torque and motor-pump speed and flow rates values.

Additional LEDs indicate end of travel limits (Open and Closed), intermediate position and the motor-pump overload protection status.

Remote control

Two types of remote control are available: remote manual and remote automatic.

Remote hardwired control

With this configuration the actuator is remotely controlled via hardwired power 24 VDC signals to command actuator opening and closing strokes, actuator stop and motor-pump overload protection mode reset.

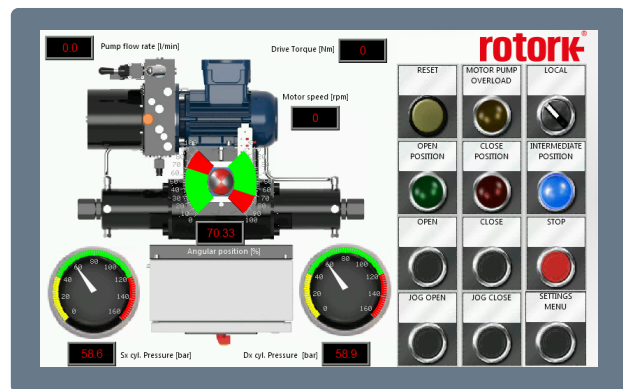
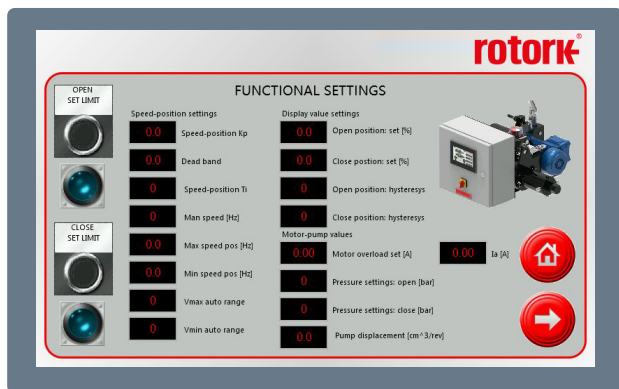
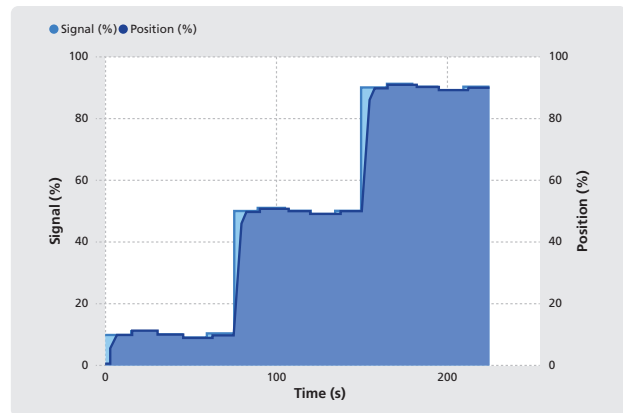
Remote automatic control

The actuator position remotely controlled by using a 4-20 mA drive process signal.

Actuator motion control can be optimized to suit process conditions thanks to the adjustability of dead-band, Kp and Ki parameters in the main menu.

Manual override

The hydraulic power unit is equipped with a manual hand pump to override the actuator upon loss of power or control signal. The manual override is manually engaged into the circuit via a manual selector valve.



Features

Actuator variables monitoring

The electrical panel displays the actuator position and pressures.

The signals are then used by the local controller to adjust the position and limit pressures and flowrate and consequently adjust the output torque and stroking times.

Status relays remotely signal the actuator open, close, intermediate position status and hydraulic power unit local/remote and overload protection alarm constantly regardless of control unit configuration.

Position

Reliable valve position monitoring is critical in all remote valve automation applications, constantly monitoring the position throughout the valve stroke.

The inbuilt position sensors are designed for high duty cycling with minimum moving parts and are directly connected to the valve drive shaft for high resolution.

Position feedback is supplied as a 4-20 mA output signal.

The HMI screen shows the real-time actuator position through a dedicated gauge and numerical display in the interval between 0% and 100%.

Local mechanical indicator

Mechanical position indication is also available via a 3D beacon indicator in UV-resistant polycarbonate mounted on the actuator.

Pressure

The hydraulic pressure sensors are integral to the hydraulic power unit monitoring the pressure generated to overcome the valve force throughout the actuator stroke.

The control system detects potential overpressure in mid-travel and on the open/close stroke limits, tripping an alarm remotely and moving the motor-pump into the overload protection mode.

Eventual large ambient temperature changes are automatically compensated via a couple of redundant thermal relief valves integrated into the hydraulic power unit that guarantee the structural integrity of the closed-loop system.

The HMI screen shows the real-time actuator pressure through a dedicated gauge and numerical display in the interval between 0 barg and 160 barg.

Output torque

The HMI can be used to set the hydraulic pressure limits during the actuator opening and closing strokes and consequently the maximum output torque.

The HMI screen shows the real-time actuator output torque through a dedicated numerical display.

Motor-pump speed and flow rate

Actuator stroking speed can be adjusted using the flow regulator and pump speed settings through the HMI.

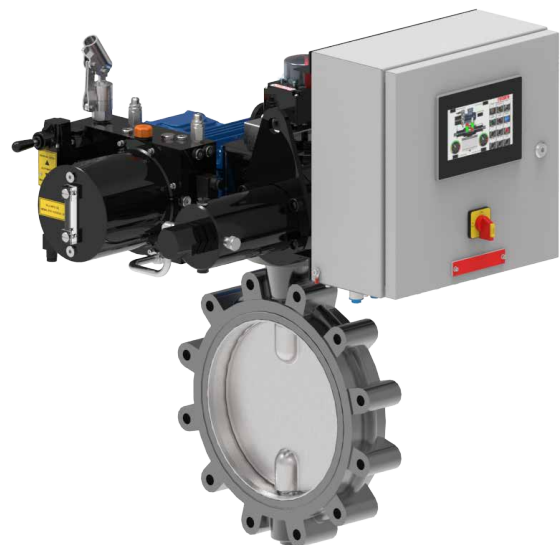
The HMI screen shows the real-time motor-pump speed and flow rate through a dedicated numerical display.

Oil level indicator

The hydraulic power unit is fitted with a sight oil level gauge in UV resistant polycarbonate.

The actuator, hydraulic power unit and electrical panel are designed in compliance with the following regulations and directives:

- 2006/42/EC: Machinery Directive
- EN ISO 12100: Safety of Machinery
- EN ISO 4413: Safety requirements for fluid power systems
- EN IEC 60204: Electrical equipment of machines
- EN IEC 60439: Low-voltage switch/control gear assemblies
- EN IEC 60529: Degrees of protection by enclosures
- 2014/30/EU: Electromagnetic Compatibility Directive



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www.rotork.com

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

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