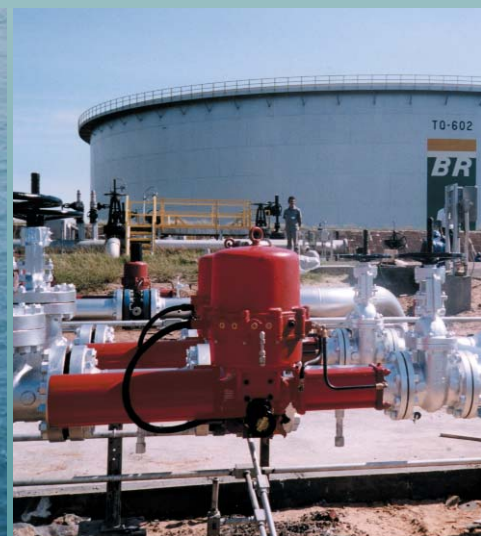


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Electric Fail-Safe Actuators



Linear - 1/4 turn - Modulating - Isolating - Spring return

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Rotork Skilmatic Actuation

Established Leaders in Actuation Technology

Rotork Skilmatic provides a unique and reliable solution to electric fail safe and modulating control. Combined with Rotork's worldwide reputation and experience in valve automation, this allows the Rotork group to offer a total solution for all valve and damper applications.

The robustness of Rotork meets the precision of Skilmatic.

Simplicity, Precision & Reliability

Skilmatic Linear and Quarter-turn actuators are compact and robust self-contained electric units for both modulating and two-position control of all types of valves and dampers. They are also suitable for adjustable slow-opening applications and ESD quick closure.

The actuators combine the simplicity of electrical operation with the precision of hydraulic control and the reliability of spring-powered fail-safe action.

Skilmatic actuators use an internal spring-return mechanism to provide the most reliable means of positioning a valve in a safe condition. They can be fail-safe to close or open or lock in position on power or system failure.

With both weatherproof and flameproof models, the range simplifies process automation, by providing true electronic control from process variable to valve, and supply a total electric system for all environments.

The unit can be supplied with the appropriate electronic controls to match any process control system requirement.

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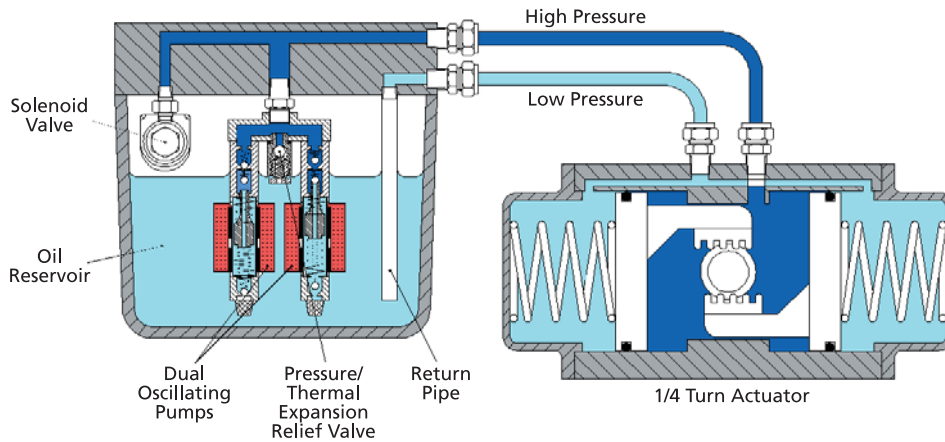
Principles of Operation

The Skilmatic Electric Actuator incorporating a totally sealed electro-hydraulic system consisting of a power unit with integral hydraulic fluid reservoir and spring return actuator.

When an electrical supply is applied to the power unit, hydraulic fluid is transferred to the actuator via the oscillating pumps and high pressure line into the spring opposed side of the actuator. This causes the two pistons to part and by means of a rack and pinion, transmits a rotary motion to the control drive shaft.

As the actuator rotates through 90°, hydraulic fluid on the low pressure side of the piston is transferred back to the reservoir, to maintain a constant level of hydraulic fluid in the reservoir.

When the actuator achieves the desired position, the hydraulic pumps are de-energised and locks the actuator in position via the non-return valve, relief valve and bleed solenoid. In the reverse direction, the solenoid valve controls the vent of hydraulic oil back to the power unit and the return spring forces the actuator pistons together.



Principle of Operation for Skilmatic 1/4 Turn Electro-Hydraulic Actuator

Features

- Self contained electrically operated.
- Spring-powered fail safe action.
- Skilmatic internal digital electro-hydraulic control.
- Simplicity of design, minimal moving parts.
- Minimal power consumption ac Supply.
- Resolution, better than 0.25%.
- Quick closure option.
- Weatherproof and flameproof.

Benefits

- Eliminates the need for expensive compressors and the inherent high running / maintenance cost.
- The most reliable means of positioning valve or dampers in a safe condition. No batteries or charger units required.
- Precise positioning control – incompressible fluid resulting in positive valve movement.
- Increased reliability – ideal for modulating duties.
- Eliminates energy wastage. Reduced running costs.
- Provides superior loop control compared to conventional electric actuators.
- Ideal for two-position Emergency Shutdown.
- Can be used in a wide variety of applications and environments.

SQ - Quarter Turn Actuator Range

The GP Range - General Purpose

Skilmatic Model SQ301/2 general purpose, two-position, quarter turn actuators, offer the simplest solution to spring return fail-safe electric actuation. Operating from a standard 230/110V AC supply, the actuators are designed for general purpose application with ball, butterfly valve and fire damper. The actuator utilises the fully sealed electro-hydraulic power system with internal spring return action for clockwise or anti-clockwise rotation. The actuators provide a torque range of 24 NM (212 in lbs.) to 510 NM (4513 in lbs.)

Optional manual override gearbox and thermal jacket is available.

For further details see product specification sheet E740E.



The WP Range - Weatherproof

Skilmatic Model SQ405/6/7 quarter turn actuators, are specifically designed for modulating control application. Accepting a standard 4-20mA or pulsed signal to position a valve or damper to a resolution better than 0.2 of a degree and offering a 100% duty rating.

The units are also ideal for two position and emergency shutdown applications where fail-safe spring return action is required. The actuators are housed in a compact and robust weatherproof enclosure to IP66/NEMA 4X to suit all industries and remote valve locations with torque range from 24NM (212 in lbs.) to 510NM (4513 in lbs.)

For further details see product specification sheet E741E.



The FP Range - Flameproof

Skilmatic Model SQ413 flameproof quarter turn actuators are designed for both modulating and two-position fail-safe electrical actuation in Zone 1 hazardous areas.

Certified to EExdme IIB T3 and FM Class I AExmd IIB T3 (Ta -35 to +60 deg C).

The actuators are housed in compact and robust weatherproof enclosures to IP66/NEMA4X, ideal for all 1/4 turn applications with torque range from 52 NM (460 in lbs.) to 510 NM (4513 in lbs.)

The Model SQ413 is available with internal 4-20mA positioner and fail-safe quick closure ESD options.



SL - Linear Actuator Range

The GP Range - General Purpose

Skilmatic Model SL481 general purpose linear electric actuators are designed to provide advanced positioning control with the added benefit of spring return safety features.

Operating from a standard 230/110V ac supply and a 4-20mA or pulsed signal the actuators offer the most accurate means of electrically positioning all types of control valves with a resolution better than 0.25%.

Housed in an aluminium enclosure the actuator will provide thrusts from 0.66kN (150 lbf) to 1.32 (300 lbf) with a stroke up to 41mm. The actuators are available as spring return direct or reverse acting for fail-safe open, closed or locking in position.

For further details see product specification sheet E744E.



The WP Range - Weatherproof

Skilmatic Model SL411 is similar in principle to the Model 481 but with dual electro-hydraulic power source providing thrusts from 1.76 kN (400 lbf) to 10 kN (2300 lbf) with strokes up to 64mm (2.5")

Housed in a weather-proof enclosure to IP66/NEMA 4X. The units are available with an internal electronic positioner accepting a 4-20mA signal, and providing a 4-20mA output of valve position.

The actuators are available as spring return direct or reverse acting for fail open, closed on lock in position on power failure.

For further details see product specification sheet E745E.



The FP Range - Flameproof

Skilmatic Model SL413 flameproof linear electric actuators are designed specifically for modulating controls on all type of control valves, but can be equally used on two-position applications.

Housed in a weatherproof enclosure to IP66/NEMA4X and available in thrusts from 1.76kN (400 lbf) to 10kN (2300 lbf) with strokes up to 64mm (2.5") the actuators are certified to EExdme IIB T3 and Class I, Zone 1 AExmd IIB T3, with an operating temperature of -35 to +60 deg C.

For further details see product specification sheet E745E.



SH - High Torque & High Thrust Actuator Range

The Model SH416 /417 high volume electro-hydraulic power units are designed to provide a source of hydraulic power to suit the high torque and thrust actuators within the Skilmatic range.

Combining the Skilmatic high volume power unit with the spring return or double acting actuator provides an electrically operated self contained electro-hydraulic system to accurately control a linear or quarter turn valve or damper.

The Model SH416 power unit is housed within a heavy duty cast aluminium weatherproof enclosure to IP67/NEMA6.

The Model SH417 power unit is certified for use in Zone 1, and Division 1, hazardous area.

Approved to CENELEC- EExd IIB T3 and FM - Class I, Division 1 Group C and D, Class II Division 1, Group E, F and G (Ta -35 to +60 deg C).
Weatherproof to IP65/NEMA4.

Both power units are fitted with a microprocessor based electronic positioner for modulating application. Accepting an analogue or digital input signal the actuator provides accurate positioning control with minimal power consumption, and superior control to that of conventional electric motorised or pneumatic actuators. The positioner also has a discrepancy alarm facility to provide remote indication of a system error.

Optional manual hand pump override, local auto manual station and emergency shutdown facilities are also available.

The SHQ Range - Quarter Turn

Skilmatic Model SHQ416 weatherproof (IP67/NEMA6) quarter turn actuators are robust electrically operated devices. Designed for both modulating and two-position control, the actuators are available as fail-safe spring return or double acting to suit all types of valves requiring a 1/4 turn action.

Torque Range:

From 525Nm (4,647 in lbf)
To 7397Nm (65,469 in lbf)

The Model SHQ417 is the flameproof version of the actuator certified for Zone 1/Division 1 hazardous areas. Weatherproof to IP65/NEMA4.

For further details see product specification sheet E746E.



The SHL Range - Linear

Skilmatic Model SHL416 weatherproof (IP67/NEMA6) linear actuators are robust electrically operated devices. Specifically designed for 4-20mA modulating control of all types of linear control valves.

Available as fail-safe spring return or double acting with thrust from 8.8KN (2000 lbf) to 70KN (16000 lbf), and strokes up to 89mm (3 1/2").

The Model SHL417 is the flameproof version of the actuator certified for Zone 1/Division 1 hazardous areas. Weatherproof to IP65/NEMA4.

For further details see product specification sheet E743E.



General Specification

Enclosure:	Aluminium alloy optional steel. Weatherproof to IP65 to IP67.
Flameproof:	Model SQ & SL 413 – CENELEC EExdme IIB T3 and FM Class 1, Zone 1, Aexmd IIB T3. Model SHQ & SHL 417 – CENELEC EExd IIB T3 and FM Class 1, Div. 1, Group C and D, Class II, Div. 1, Group E, F and G T3.
Springs:	Steel.
Finish:	2 pack epoxy resin.
Operating Temperature:	See product specification sheets for options. Std -20 °C to 70 °C, Optional low temperature -35 °C to 60 °C
Mounting:	Vertical or horizontal.
Failure Mode:	Fail-safe spring return or Fail in Position.
Cable Entry:	M20 conduit entries or 1/2" NPT.
Power Consumption:	Pumping 305VA, reducing to 15VA in balanced state on all models except Model 416/7 – pumping 350VA reducing to 25VA in balance.
Supply:	Available in standard single and three phase as supplies
Input Signal:	4-20mA, 0-10v dc.
Resolution:	<0.25%.
Hysteresis:	<0.1%.
Repeatability:	<0.2%.

Quarter Turn

Torque:	Up to 7397Nm (65,469 in lbs.).
Travel:	0 to 92 deg. adjustable between 80 and 92 deg.
Action:	Clockwise or anti-clockwise spring return.

Linear

Thrust:	Up to 70KN (16000 lbs.).
Stroke:	Standard up to 89mm (3 1/2"), optional up to 150mm (6") reduced thrust.
Action:	Direct or reverse acting spring return.

CE Marking

All actuators conform to the requirements of:-

- a) EMC Directive 89/336/EEC amended by 92/31/EEC and 95/54/EEC by the application of the Standards BS-EN 5008-1-1992 and BS-EN 50082-2-1995.
- b) The Low Voltage Directive 73/23/EEC amended by 93/68/EEC by the application of the Standard BS-EN60204-1-1993 and BS-EN61010-1-1993.

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