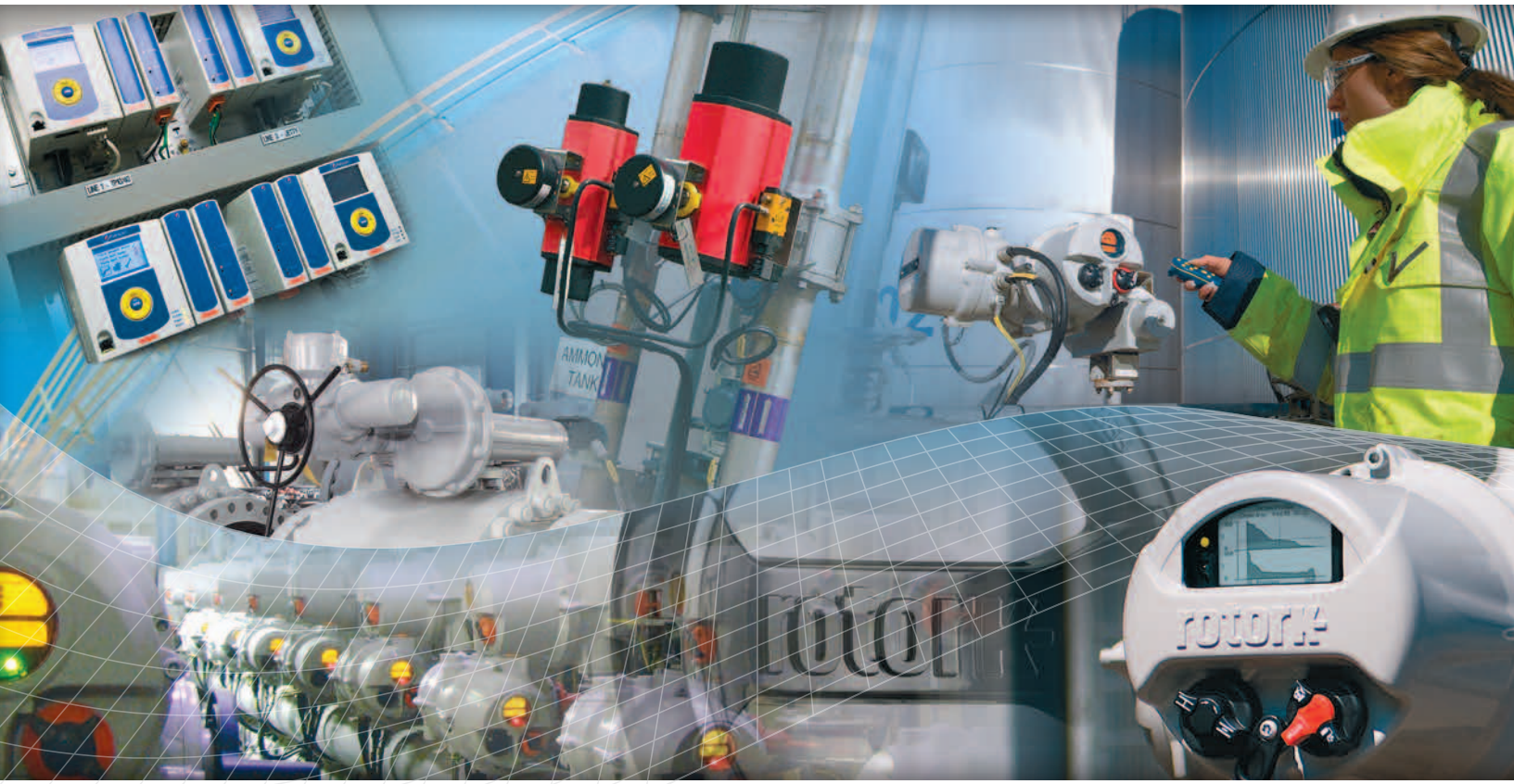
rotork®

Group Product **Portfolio**



Redefining Flow Control

Contents

Introduction

rotork®

For over fifty years, engineers have relied upon Rotork for the most innovative and dependable valve actuation and flow control solutions. From safety systems that may be needed just once in a lifetime to high precision controls that are constantly on the move, Rotork products remain the clear choice, worldwide.

Leaders in Flow Control

From its inception over 50 years ago, Rotork has grown to be a major international business with subsidiaries all around the world.

We are recognised as global leaders, designing and building the most reliable products, backed up by highly acclaimed customer service.

A genuine, long-term commitment to customers and partners underpins our culture of engineering excellence, making Rotork a consistently dependable choice for products and service.

Committed to Innovation

Throughout the company's history, our engineers have focused on solving customer challenges and developing new solutions with levels of engineering skill and creativity that our competitors still cannot match.

Some innovations are adopted almost immediately, whilst others may require thousands of hours of testing and certification before they can be offered to our customers.

With every product that Rotork develops, you can be sure of one thing: That quality and reliability are an integral part.

Serving the World

Rotork has always been committed to a global customer-base, supporting operations in some of the most remote and challenging environments.

We have established manufacturing facilities across the globe plus over 350 offices and regional centres of excellence. These provide our staff with all the training and support they need to deliver excellent service, wherever they are needed.

Whether you work directly with Rotork or engage through a partner, you can be confident that our products and support remain the best in the world.

Rotork Divisions

rotork® Controls

Rotork Controls manufactures electric valve actuators for heavy-duty valve applications, highly accurate process control actuators, explosionproof HVAC actuators and network control systems. Our products are trusted by customers worldwide for their reliability, precision and durability.

rotork® Fluid Systems

Rotork Fluid Systems specialises in the production of pneumatic and hydraulic actuators and control systems. We are dedicated to providing the latest technology, consistently high quality, innovative design and superior performance.

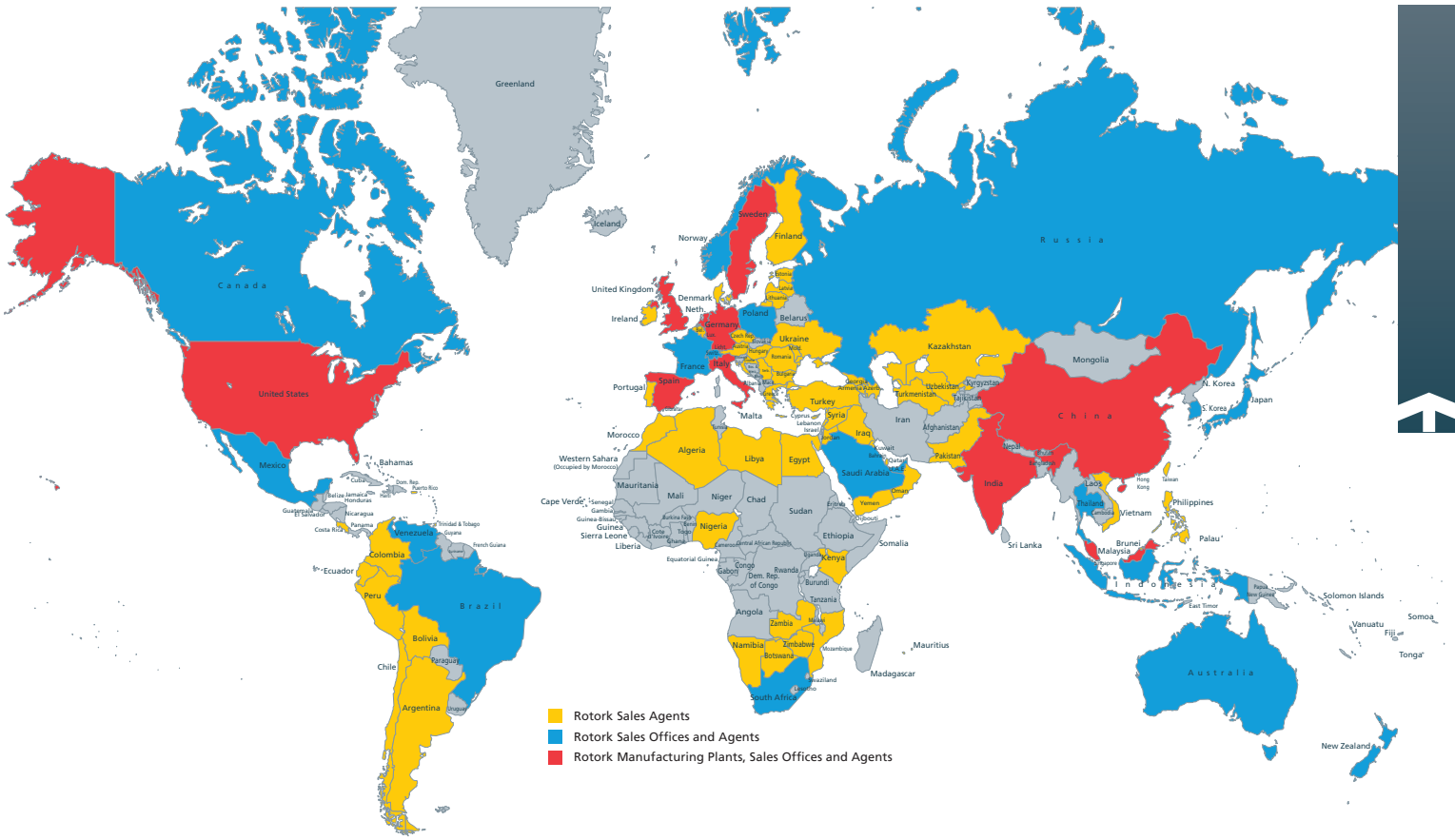
rotork® Gears

Rotork Gears manufactures gearbox assemblies for use with actuators and as direct valve operators. Facilities around the world manufacture complete gearbox assemblies as well as a wide range of switch boxes, valve position monitors and adaption accessories.

rotork® Instruments

Rotork Instruments are experts in flow control, pressure control, flow measurement and pressure measurement. We manufacture products and components that are trusted for applications where high precision and reliability are most needed.

Worldwide Service



rotork® Site Services

In each of our divisions, Site Services staff are dedicated to providing customer service and support, carrying out new installations and delivering retrofit projects. These teams are based out of service centres around the world and are complemented by factory-trained agents.

Our expert technicians support Rotork customers, allowing us to deliver on our promise of global solutions backed by local service.

rotork®
Controls

Heavy-duty valve actuators are Rotork's core business and since it's inception in 1957 Rotork has grown to be the world's largest independent manufacturer.

In addition to our traditional multi- and quarter-turn actuators, Rotork also manufactures highly accurate rotary and linear actuators for process control applications as well as a range of HVAC actuators and control systems.

Rotork Controls has manufacturing facilities in the UK, USA, Germany, China, Malaysia and India. Rotork Controls is headquartered in Bath on the same site as the Group R&D centre.

A full listing of our worldwide sales and service network is available on our website at **www.rotork.com**

Worldwide Manufacturing and Support Facilities

The Rotork global sales and service network supports all Rotork Controls products. This network is the biggest global actuation support organisation with direct sales offices and agents in all industrialised countries. Worldwide customer service and field support provides quick and effective response to customer requirements.

Rotork Controls manufactures actuators and network systems at six locations around the world. These sites provide manufacturing, research and development, service, technical support and factory fit facilities to all our customers. Rotork Controls has the knowledge and expertise to design and provide the highest level of actuation product reliability to our customers wherever they are located.

Test Facilities – Quality and Safety

Rotork Controls is continually researching new technologies and developing innovative and industry leading products. We have dedicated research and development centres around the world that all work together to produce the strongest line of valve actuation products available on the market today.

The continual development of our products allows our customers to benefit from the latest technologies such as wireless network control and highly accurate, extremely fast motor driven operation of valves.

Rotork made its name for innovative product design and clever solutions to age old problems. We are proud to continue that tradition and offer our customers products that are constantly ahead of the competition.

Reliability and Quality Assurance

Rotork Controls is committed to providing our customers with robust and dependable products that meet or exceed their expectations. To that end we have engineered our own custom test systems to ensure proper operation and functionality of our products and to assist in our research and product development.

We have test facilities located at all of our manufacturing centres. Every product is tested and qualified before shipment to the customer. Our products are manufactured to comply with stringent quality testing from standards authorities around the world.

All Rotork products are designed and manufactured to the highest levels of performance and reliability.

Multi-functional Electric Actuators

IQ – multi-turn actuators

IQ
range

Intelligent communication options and multilingual display. The IQ offers multi- and quarter-turn isolating/regulating duty.

- Torque range:
  Multi-turn direct drive 14 to 3,000 Nm (10 to 2,200 lbf.ft)
  Multi-turn with IS or IB gearbox, up to 40,800 Nm (30,000 lbf.ft)
  Quarter-turn with IW gearbox up to 250,000 Nm (185,000 lbf.ft)
- Complete integrated motor control
- Infra-red or *Bluetooth*® wireless technology for simple set-up and adjustment
- Digital, analogue or bus system remote control and status reporting
- Comprehensive software tools for plant records and valve performance analysis

See PUB002-001 for further details.

IQM – multi-turn modulating actuators

IQM
range

The IQM range combines Rotork's motor and gearing technology developed over 50 years, with the latest electronic techniques used in IQ to produce the IQM modulating range.

- Torque range 12 to 550 Nm (9 to 400 lbf.ft)
- Thrust range with linear output IQML 16 kN to 57 kN (3,500 to 12,800 lbf)
- Modulating duty on valves and dampers
- Up to 1,200 starts/hour. S4 – 50% duty
- Solid state starter
- Dynamic breaking facility, for high accuracy

See PUB002-001 for further details.

IQT *Pro* – quarter-turn actuators

IQT
range

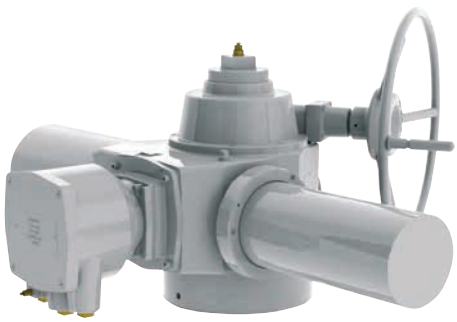
For quarter-turn applications the IQT is designed for direct drive, and can be mounted at any operating angle. The rugged construction is double-sealed to prevent water and dust ingress even during site wiring.

- Torque range 50 to 2,000 Nm (36 to 1,475 lbf.ft)
- Available for single-phase, three-phase or DC supplies
- Variable output speed
- Multiport controller option
- Secure self-locking output for butterfly valve and dampers without the use of additional brakes

See PUB002-001 for further details.

Nuclear applications

NA
range



Rotork NA range actuators have been qualified for safety related duty in nuclear reactor installations. The qualification is in accordance with US standard IEEE 382, 1980.

Rotork type NA actuators have been manufactured in strict accordance with the latest quality procedures for use in nuclear environments.

- Total environmental sealing
- Designed for active and passive duty
- Torque limiter brake options
- Thrust compensator options
- Inside and outside containment capability

See PUB004-001 for further details.

Multi-functional Electric Actuators

A and AWT – multi-turn actuators

A/AWT
range

The A / AWT range combines the qualities of a robust electric motor and a well proven simple mechanical drive. Total environmental sealing to IP68 allows the inclusion of integral motor starter and control electronics.

- Torque range:
  Direct drive 14 to 3,000 Nm (10 to 2,200 lbf.ft)
  Quarter-turn up to 250,000 Nm (185,000 lbf.ft)
  Multi-turn up to 40,800 Nm (30,000 lbf.ft)
- Oil bath lubricated IP68 double-sealed option
- Complete integral motor control or customer supplied motor control. Separate motor control available where required (syncroset actuator)
- Isolating and regulating duty

See PUB003-001 (A) or PUB005-001 (AWT) for further details.

ROM – compact and lightweight design

ROM
range

Building on the simple specification of the ROM / RBM range, Rotork now offer a more complete control solution with the introduction of the new ROMpak.

ROMpak introduces: Local controls for ease of operation; Dual local indicators – mechanical and LED; Phase rotation correction for ease of installation. Options include: *Bluetooth* non-intrusive configuration, bus communication, Folomatic/CPT and datalogger.

- Torque range 35 to 650 Nm (25 to 480 lbf.ft)
- Efficient yet simple gearing
- Wide range of supply voltages available
- Single-phase, three-phase and DC options
- Watertight IP67 rating

See PUB008-001 for further details.

Q – single-phase quarter-turn

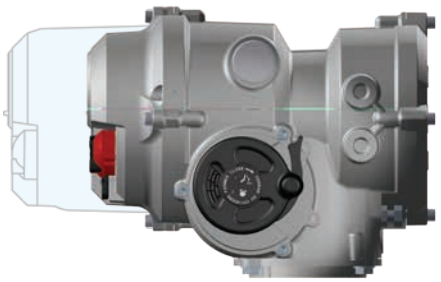
Q
range

The Q range is a single-phase quarter-turn direct drive electric actuator available in two versions, both environmentally sealed to IP68. Q standard for simple open/close duties where on/off control is required and the Q Pak which incorporates a specially designed control interface module enabling operation from a variety of remote control signals.

- Torque range 30 to 406 Nm (22 to 300 lbf.ft)
- Rugged compact, double-sealed
- Positive travel limitation through externally adjustable mechanical stops
- Marine option
- Simple remote control for basic applications

See PUB007-001 for further details.

Special applications



Rotork offer many actuation solutions for specialised applications around the world.

For example, the IQT-N (shown above) has been especially developed for use in marine applications where space is at a premium. The IQT-N has been engineered to enjoy all the benefits and performance of the standard IQT range whilst reducing the actuators weight and space envelope and increasing its shock and vibration resistance.

HVAC Solutions – Explosionproof Actuators and Control Systems

Quarter-turn explosionproof actuators

ExMax
range

ExMax electric 90° quarter-turn damper and valve actuators are designed for use in Ex areas for all gases, mists, vapours and dust.

- 24 to 240 VAC/VDC universal power supply
- Torque range 5 to 150 Nm (3.7 to 110.6 lbf.ft)
- ATEX 94/9/EC, zone 1, 2, 21, 22 + others
- Control modes: On-off, 3 pos., modulating (0-10 VDC, 4 to 20 mA)
- Optional spring-return configuration (1 second available), SIL2
- Watertight IP66 rating
- Stainless steel housing (option)
- Temperature range: -40 to 50 °C (-40 to 122 °F)
- Optional extras: 2 external Ex-auxiliary switches; Ex-e terminal box; Safety temperature trigger; Manual override

Linear explosionproof actuators

ExMax+Lin/ ExRun
range

ExMax + LIN and ExRun electric linear valve actuators are designed for use in Ex areas for all gases, mists, vapours and dust. Linear conversion for safety applications (Fail-Safe-Function) in combination with ExMax.

- Thrust range 500 to 10,000 N (112 to 2,248 lbf)
- ATEX 94/9/EC, zone 1, 2, 21, 22 + others
- Optional spring-return configuration (1 second available), SIL2
- Control modes: On-off, 3 pos., modulating (0-10 VDC, 4 to 20 mA)
- Watertight IP66 rating
- Stainless steel housing (option for ExMax)
- Temperature range: -40 to 50 °C (-40 to 122 °F)
- Optional extras: Ex-d auxiliary switch with 2 adjustable contacts (2 mounting options available); Ex-e terminal box; Manual override

HVAC sensors and switches

ExCos/ ExBin
range

ExCos modulating sensors and ExBin binary switches are designed for use in hazardous areas. No additional modules in the panel required. No intrinsically safe wiring required. All parameters adjustable on site without additional tools or measuring devices. Sensors and switches for pressure, delta pressure, temperature and humidity available, Explosionproof design for all gases, mists, vapours, dust.

- Operating temperature range -20 to 50 °C (-4 to 122 °F)
- Measurement pressure range 0 Pa to ±7,500 Pa
- Measurement temp. range -40 to +125 °C (-40 to 257 °F)
- Measurement humidity range 0 to 95% rH
- Stainless steel housing (option)
- ATEX 94/9/EC, zone 1, 2, 21, 22 cert + others
- Watertight IP66 rating, integrated junction box

HVAC control systems

ExReg
range

ExReg controller system has been designed for use in Ex areas for all gases, mists, vapours and dust. In combination with Ex-actuators it is a closed loop control system for volume flow control (VAV, CAV), pressure, temperature and humidity.

- Operating temperature range -20 to 50 °C (-4 to 122 °F)
- Measurement differential pressure range 0 Pa to 300 Pa
- Measurement temp. range -40 to +125 °C (-40 to 257 °F)
- Measurement humidity range 0 to 95% rH
- Stainless steel housing (option)
- ATEX 94/9/EC, zone 1, 2, 21, 22 cert + others
- Watertight IP66 rating, integrated junction box
- Integral PID loop
- Pre-defined parameter sets for the most common control tasks
- Can be configured on site in the hazardous location

Highly Accurate Electric Control Valve Actuators

Linear and rotary actuators

CVA range

- Linear: Thrust range 890 to 22,241 N (200 to 5,000 lbf)
- Rotary: Torque range 54.2 to 271 Nm (480 to 2,400 lbf.in)
- High performance, continuous unrestricted modulating duty - S9
- High resolution and repeatability
- Pakscan, HART®, Profibus®, Modbus and Foundation Fieldbus® available. Optional hard wired RIRO (Remote In Remote Out)
- Comprehensive data logging
- Watertight IP68 and explosionproof enclosures
- Programmable fail-to-position option
- Temp. range -30 to 70 °C (-22 to 158 °F) + Low Temp. Option
- 'Intrinsically Safe' control & instrumentation. Non-intrusive setup/calibration using *Bluetooth* wireless technology
- Optional manual override

See PUB042-001 for further details.

Linear, quarter-turn and rotary actuators

CMA range

- Linear: Up to 3336 N (750 lbf) rated thrust and 5004 N (1125 lbf) shut off thrust
- Quarter-turn: Up to 113 Nm (1000 lbf.in) rated torque and 124 N (1100 lbf.in) shut off torque
- Rotary: up to 28 Nm (250 lbf.in) rated torque, up to 45 Nm (400 lbf.in) rated torque with GB3
- All units have speed adjustment to 50-100% of operation
- Pakscan, HART®, Profibus®, Modbus and Foundation Fieldbus® available. Optional hard wired RIRO (Remote In Remote Out)
- Shut off torque/thrust capability (60-150% of rated) for required tight shut off at the valve in the CLOSE position
- Temp. Range for EP Product: -4 to +149 °F (-20 to 65 °C)
  Temp. Range for WT Product: -22 to +158 °F (-30 to 70 °C)
- Low power consumption

See PUB094-001 for further details.

Smart valve actuators

GPSA range

- Rotary: Rotation 90° to 20 turns
- Rotary: Torque range up to 14 Nm (125 lbf.in)
- Linear: Stroke distance up to 35 mm (1.375")
- Linear: Thrust range up to 890 N (200 lbf)
- Continuous unrestricted modulating duty
- HART, Profibus and Foundation Fieldbus available
- Temperature range from -30 to 65 °C (-22 to 150 °F)
- Automatic thrust limiting
- Self-locking drive system to hold in last position and prevent backdriving up to thrust rating
- Manual override standard

See PUB043-001 for further details.

Rotary actuators

1500/ 1600 series

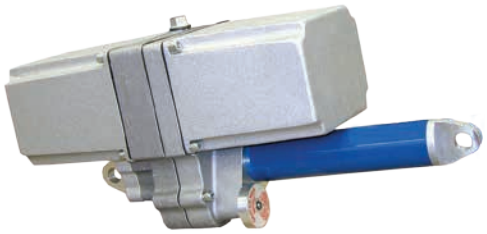
- Torques from 6 to 131 Nm (3.5 to 1,000 lbf.in)
- Rotation 40° to 324 turns
- Modulating duty: 2,000 starts per hour
- Manual override option
- Watertight IP-65 and explosionproof enclosures
- AC input power (single-phase) or DC input power versions
- Temperature range from -40 to 65 °C (-40 to 150 °F)
- FM and CSA certified

See PUB046-001 for further details.

Highly Accurate Damper Drive Valve Actuators

Heavy-duty linear actuators

2000 series



- Stroke distance from 6" to 30" (152 to 762 mm)
- Thrust range up to 27,335 N (6,150 lbf)
- Modulating duty: 2,000 starts per hour
- HART available
- Temperature range from -40 to 65 °C (-40 to 150 °F)
- Automatic thrust limiting
- Self-locking drive system to hold in last position and prevent backdriving up to thrust rating
- ATEX approved for LA-2520
- Manual override standard

See PUB045-002 for further details.

Heavy-duty rotary actuators

1700/ 5000 series

- Torques from 67 to 16,950 Nm (50 to 12,500 lbf.ft)
- Rotation 90° to 120°
- Modulating duty: 2,000 starts per hour
- Manual override standard
- Automatic torque limiting
- Self locking drive system to hold in last position and prevent back driving up to thrust rating
- AC input power (single- or three-phase); DC input power version for 1700 only
- Temperature range from -40 to 85 °C (-40 to 185 °F)

See PUB050-001 for further details.

Heavy-duty rotary actuators

6000 series

- Up to 313° rotation
- Torque range up to 35,256 Nm (26,000 lbf.ft)
- Double o-ring sealing
- Continuous unrestricted modulating duty
- HART, Profibus and Foundation Fieldbus available
- Temperature range from -40 to 85 °C (-40 to 185 °F)
- Automatic torque limiting
- Self-locking drive system to hold in last position and prevent backdriving
- Manual override standard

See PUB052-001 for further details.

rotork®
Fluid Systems

Rotork Fluid Systems manufactures a comprehensive range of high quality fluid power actuators and control systems. We are dedicated to providing superior performance actuators for use on general purpose (on/off), protective service and special valve applications.

Our manufacturing facilities are located in Melle, Germany; Lucca, Italy; Falun, Sweden; Leeds, UK; Dallas TX, Pittsburgh PA and Rochester NY, USA and provide the capacity to produce a high volume of product to ensure you deliver your projects on time.

In addition to these facilities, we maintain a network of *Centres of Excellence* strategically located around the world. These centres hold stock, provide application engineering and packaging of control components as well as providing sales, service, installation and commissioning support.

A vast network of Rotork international sales offices and agents provides even greater global coverage and ensures quick and effective response to customer requirements.

A full listing of our worldwide sales and service network is available on our website at **www.rotork.com**

Centres of Excellence – Knowledge and Experience

Rotork Fluid Systems' *Centres of Excellence* are stocking centres that serve as hubs in a global support network from which our staff provides support from quote, to contract, to installation and commissioning, to after sale service and support. They are fluid power actuation specialists able to provide solutions to virtually any application requirement.

Worldwide Locations

- Australia – Melbourne
- Canada – Calgary
- Netherlands – Rotterdam
- Singapore
- Spain – Bilbao
- UAE – Dubai
- United Kingdom – Leeds
- United States – Houston, Texas
- United States – Petaluma, California

Services

- Sales and contractual support
- Application engineering
- Consulting
- Mounting of control components
- Mounting of actuators on valves
- Preventative maintenance
- Actuator/controls service and repair
- Retrofit
- Installation, commissioning and on-site service (offshore qualified)
- Torque and thrust testing
- Hydraulic flushing and NAS6 capabilities
- Delta P testing of valve packages from 1"-24"; class 150-1500. Higher pressures and sizes can be accommodated

Fluid Power Actuators and Control Systems

Test Facilities – Quality and Safety

Rotork Fluid Systems' test facilities include bespoke specialist testing systems that ensure reliable operation and lifetime functionality of our products.

In keeping with Rotork's philosophy of continuous development, Rotork Fluid Systems has dedicated research and development facilities around the world.

Our test systems incorporate the following features:

- Static continuous and dynamic analysis on a full range of torques throughout the complete stroke of the actuator
- Cyclic and repetitive tests, with variable parameters such as load, cycle times and temperature
- Automatic or manual setting and recording of pressure, position and temperature parameters
- Hydraulic filtration and flushing capabilities
- Torque testing up to 600,000 Nm (5,000,000 lbf.in)
- Thrust testing up to 10,000 kg (22,046 lbf)
- Pneumatic pressures up to 120 bar (1,740 psi)
- Hydraulic pressures up to 360 bar (5,220 psi)

Our test systems include provision for a temperature controlled and monitored environment. The facilities are equipped with pneumatic, hydraulic and electrical connections.

Test Operation

A fixed scotch yoke actuator on one side of the test fixture serves as a load device. The actuator under test is mounted on the other side of the fixture and is connected to the load actuator via a torque shaft. The torque shaft incorporates strain gauges for data collection. A hydraulic control system connected to the load actuator facilitates control of load actuator dynamics. Data acquisition software is used to acquire, store, and present measurement data from strain gauges, strain gauge based transducers and other commonly used transducers.

Rack and pinion actuators

RCR
range

- Double-acting and spring-return pneumatic actuators
- Extruded aluminium body with cast aluminium end caps
- Corrosion resistant cylinders and nickel-plated pinion
- Mechanical interfaces to ISO 5211, EN 15714-3-4, NAMUR VDI/VDE 3845
- Torque output to 2.4 to 5,800 Nm (51,000 lbf.in)
- Supply pressures 2 to 10 bar
- Actuators certified to ATEX 94/9/EC
- Compatible with smart controller partial stroke testing
- Certified suitable for use at SIL3 as a single device (IEC 61508)

See PUB014-004 for further details.

Compact scotch yoke actuators

RC200
RCI200
ranges

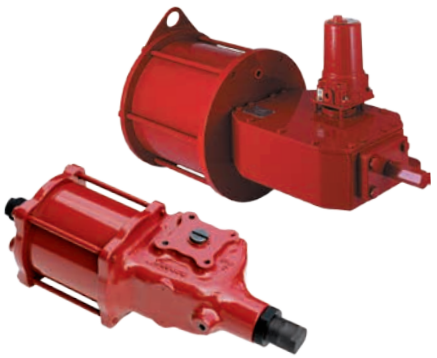
- Extremely compact scotch yoke pneumatic actuator
- Double-acting and spring-return configurations
- Contained spring module for safety and convenience
- Torque output to 4,400 Nm (38,000 lbf.in)
- Valve mounting dimensions per ISO 5211/DIN 3337
- Compatible with SVM partial stroke testing
- Certified suitable for use at SIL3 as a single device in accordance with IEC 61508
- Actuators certified in accordance with PED 97/23/EC
- Actuators certified to ATEX 94/9/EC

See PUB014-001 (RC200) and PUB014-002 (RCI200) for further details.

Fluid Power Actuators and Control Systems

Heavy-duty scotch yoke actuators

CP/ GP/ GH range



- Pneumatic and hydraulic actuators in double-acting and spring-return configurations
- Corrosion resistant cylinders
- Complies with EN60529 (1991) + (A1:2000) for IP67M
- Actuators certified to ATEX 94/9/EC
- Actuators certified in accordance with PED 97/23/EC
- Torque output to 600,000 Nm (5,000,000 lbf.in)
- Compatible with smart controller partial stroke testing
- Certified suitable for use at SIL3 as a single device (IEC 61508)

See PUB011-001 (GP/GH) and PUB013-001 (CP) for further details.

Linear actuators

LP/LH range

- Pneumatic and hydraulic actuators in double-acting and spring-return configurations
- Electroless nickel-plated cylinders, chromium-plated piston rods
- Hammer blow and standard valve stem coupling designs available
- Thrust up to 5,000,000 N (1,124,000 lbf)
- Compatible with SVM partial stroke testing

See PUB020-001 for further details.

Heavy-duty rack and pinion actuators

RH range

- Double-acting and spring-return configurations
- Heavy-duty hydraulic actuators with cast iron bodies and torque output to 3,400 Nm (30,000 lbf.in)
- Electroless nickel-plated cylinders for corrosion resistance
- Valve mounting dimensions per ISO 5211 DIN 3337
- Compatible with SVM partial stroke testing
- Complies with EN60529 (1991) + (A1:2000) for IP67M
- Actuators certified to in accordance with PED 97/23/EC
- Certified suitable for use in SIL3 as a single device in accordance with IEC 61508

See PUB019-004 for further details.

Extreme-duty rack and pinion actuators

RHQ range

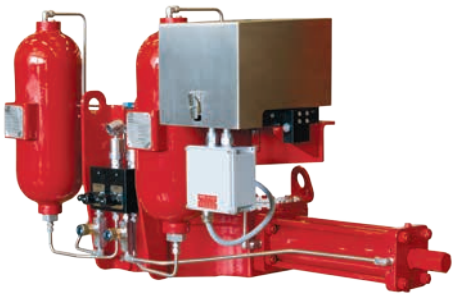
- Hydraulic, double-acting actuators
- Balanced, compact design
- Totally enclosed weatherproof housing to IP 68
- Electroless nickel-plated cylinders with redundant piston seals
- Precision machined rack and pinion mechanism with zero backlash
- Female input shaft allows direct mounting to valve topworks
- Torque output to 5,650,000 Nm (50,000,000 lbf.in)
- Supply pressures to 207 bar (3,000 psi)

See PUB019-009 for further details.

Fluid Power Actuators and Control Systems

Gas-oil actuators

GO range



- Low- or high-pressure control logic options
- ASME certified tanks
- Hydraulic manual override standard
- Speed control in both directions standard
- PED or ASME approved gas/oil and power gas storage tanks
- Complies with EN60529 (1991) + (A1:2000) for IP67M
- Actuators certified to ATEX 94/9/EC
- Actuators certified in accordance with PED 97/23/EC
- Torque output to 600,000 Nm (5,000,000 lbf.in)
- Compatible with SVM partial stroke testing

See PUB017-001 for further details.

Direct high-pressure gas actuators

HPG range

- Hydraulic manual override standard
- Speed control in both directions standard
- Complies with EN60529 (1991) + (A1:2000) for IP67M
- Actuators certified to ATEX 94/9/EC
- Actuators certified in accordance with PED 97/23/EC
- Torque output to 600,000 Nm (5,000,000 lbf.in)
- Compatible with SVM partial stroke testing

See PUB016-001 for further details.

Multi-turn fluid power actuators

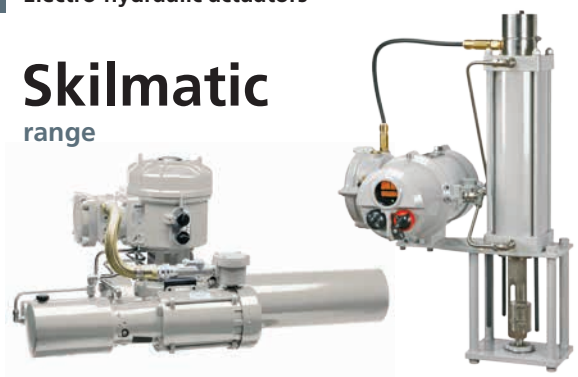
Twin Power range

- Pneumatic or hydraulic versions available
- Torque output to 800 Nm (7,080 lbf.in)
- Modular system for flexibility
- Robust design can be supplied suitably trimmed for various severe or hazardous environments

See PUB025-002 for further details.

Electro-hydraulic actuators

Skilmatic range



Skilmatic range SIL3 certified feature Rotork double-sealed terminal compartments and user displays for position, pressure, diagnostics and fault indication.

- Linear thrusts: 1.7 to 5,500 kN (382 to 1,230,000 lbf)
  ¼ turn torques: 65 to 600,000 Nm (575 to 5,000,000 lbf.in)
- Two-position, ESD or modulating operation in spring-return or double-acting executions
- Single-phase, three-phase or 24 VDC power supply
- Non-intrusive infrared configuration and *Bluetooth* data transfer
- Optional bus communications via all major protocols
- Partial stroke test capability
- Watertight or explosionproof ATEX, FM, CSA IEC and GOST

See PUB021-001 for further details.

Fluid Power Actuators and Control Systems

Subsea actuators

GSH
GSR
GSL
GSP
ranges

The subsea product range encompasses actuator and gearbox designs for retrievable and non-retrievable applications. We are familiar with supplying subsea product to meet the harsh conditions and stringent demands of subsea applications.

- Hydraulic quarter-turn and linear subsea actuators in double-acting and spring-return configurations
- Subsea and splashzone trims
- Retrievable and non-retrievable designs
- Multitude of design options available
- Installed base dating back to 1992 at depths up to 2,500 m
- Compatible with SVM partial stroke testing

See PUB022-001 for further details.

Control systems

Control component packages are a part of any 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 (emergency shutdown) service. Packages can be mounted on a panel or in a cabinet and mounted either on the actuator or at a remote location.

Rotork offers components from all leading industry suppliers as well as those of our own design including limit switch housings, quick exhaust valves, pneumatic and hydraulic manifolds, shuttle valves, linebreak safety systems, partial stroke testing and a torque limiting device.

Smart valve monitor

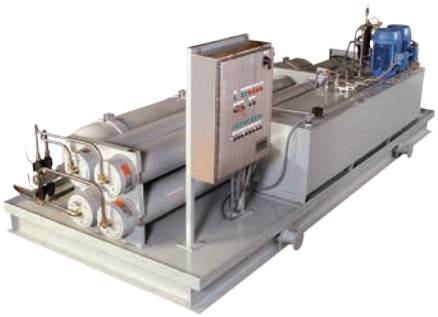
SVM
range

- Compatible with fluid power actuators and valves for on/off service
- Safe and hazardous area versions available
- Comprehensive and versatile partial stroke testing – tests all final elements
- Data logging of valve performance for diagnostics and preventative maintenance
- Suitable for use at any SIL rating
- Can interface with DCS/ESD common system
- Improves SIL verification performance of final elements

See PUB026-001 and PUB026-002 for further details.

Hydraulic power units

HPU
range



- Hydraulic fluid capacity from 19 to 7,570 litres (5 to 2,000 U.S. gal)
- Operating pressures up to 345 bar (5,000 psi)
- Flow rates up to 3,785 lpm (1,000 U.S. gpm)
- Electrical classifications: NEMA 4, 4x, 7 or comparable CSA or ATEX ratings
- Custom engineered solutions to meet the specific demands of each application
- Sole source responsibility for the complete operating system including field survey, design, fabrication, test, installation and start-up
- Best-in-class documentation and service manuals

See PUB062-001 for further details.

Fluid Power Actuators and Control Systems

Vane actuators

K-TORK
range

- Pneumatic actuators in double-acting and spring-return configurations
- Compact no-sideload, constant-torque design with output to 16,950 Nm (150,000 lbf.in)
- Complies with EN60529 (1991) + (A1:2000) for IP67M
- Complies with ANSI/AWWA C540-02 and C541-08
- Conforms to VDI/VDE 3485 control accessory mounting standards
- Modulating accuracy of 0.25% or better

See publication PUB097-001 for further details.

Damper drives

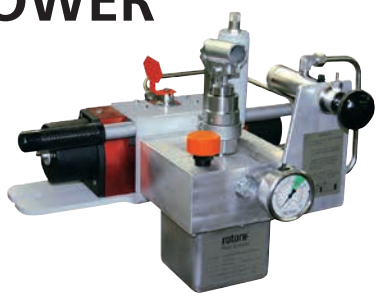
Type K
range

- Direct 'drop-in place' design matches existing damper drive take-out dimensions
- Torque output up to 28,201 Nm (250,000 lbf.in)
- High-speed operation as quick as 3-5 seconds full scale
- Highly accurate and responsive
- Designed for safety and serviceability in harsh environments
- Infinite duty cycle

See publication PUB097-002 for further details.

Self-contained fail-safe actuators

manPOWER
range



- Manually energised, spring-return fail-safe operation
- Cost-effective solution for infrequently operated valves and dampers
- Watertight or explosionproof construction
- Highly configurable with a multitude of options

See PUB062-002 for further details.

Fluid power nuclear applications

Hiller
range

The Hiller range encompasses rotary and linear pneumatic and hydraulic actuators in double-acting and spring-return configurations. The range also includes specialised linear hydro-pneumatic actuators designed to deliver very precise speed control.

Quality assurance for these products conforms to 10 CFR 50 APP B, 10 CFR 21, ANSI N45.2 and has been audited by both NUPIC and NIAC. Environmental and seismic qualifications comprise IEEE 323, 344 and 382.

Hiller products are supported with a stock of more than 10,000 spare parts for safety related service.

See publication PUB068-001 for further details.

rotork®
Gears

Rotork Gears is a specialist supplier of gearboxes, adaptations and accessories to the international valve and actuator industry with manufacturing plants in the UK, Netherlands, Italy, China, USA and India.

Rotork Gears provides the widest range of valve gearboxes in the world, designed to withstand the harsh challenges of various environments, including subsea and nuclear. We also provide a complete range of mounting brackets, extension shafts, pedestals and accessories for the valve and actuator industry. This is complemented by design and consulting services that cover a whole range of valve and actuator adaption needs.

A full listing of our worldwide sales and service network is available on our website at **www.rotork.com**

Engineering and Working Capabilities

From the moment you first contact Rotork Gears you benefit from industry leading expertise gained over several decades working at the forefront of valve technology.

At Rotork Gears we pride ourselves on delivering innovative solutions to suit individual needs, backed up by the product quality and after-sales care you'd expect from one of the most internationally respected names in engineering.

Rotork Gears' products are world-class in design and meet or exceed national and international standards. Although we are, naturally, accredited to BS EN ISO 9001, your assurance of quality comes from our specialist application engineering, continuous testing of materials and the life testing of completed gearboxes. In fact, our quality definition extends beyond the product to include total customer satisfaction. Your valves deserve the best gearboxes and accessories available.

Test Facilities – Quality and Safety

Rotork Gears has extensive test facilities at its manufacturing locations. We have a comprehensive set of test rigs for testing multi-turn and quarter-turn gearboxes across a wide range of torques. We can carry out life testing, overload testing and some environmental testing in-house.

For tests outside our in-house capabilities, such as extremely high torques or salt-spray testing, we can call on the resources of the wider Rotork Group. We also use third party facilities for procedures including nuclear, deep-sea hyperbaric and seismic/vibration testing.

Endurance testing of prototype subsea gearbox.

Discovery Climatic Chamber

Valve Gear Operators and Accessories

Reliability and Quality Assurance

Rotork Gears is committed to fully understanding customer needs and expectations, and meeting or exceeding these needs. Rotork Gears has an established quality management system that meets the requirements of BS EN ISO 9001.

This system embraces all aspects of the organisation from new product design and life testing, to specialist application engineering, purchasing, the control of suppliers, verification of purchased materials, assembly and inspection processes.

Rotork Gears is committed to:

- Building business success through customer satisfaction
- The promotion and full understanding of customer needs within the organisation
- Establishing objectives to promote continuous improvement with the ultimate goal of error free performance and to actively encourage employee contribution towards this goal
- Creating a quality culture by making continuous improvement and quality a fundamental part of every employee's performance and responsibility

Quality objectives with measurable outputs are established on an annual basis and reviews held through the year to verify progress against the objectives. The quality manual and policy documents are also reviewed on an annual basis for adequacy and effectiveness. These documents are available to interested parties on request.

IB manual and motorised multi-turn gearboxes

IB
bevel gear operator

Complete range of heavy duty cast iron multi-turn bevel gearboxes suited for the most demanding manual and motorised applications for cast and fabricated sluice gates, gate valves and globe and pinch valves.

- Torque range up to 10,846 Nm (8,000 lbf.ft)
- Thrust range up to 1,557 kN (350,000 lbf)
- Totally enclosed gearing
- Grease filled for life
- Removable output sleeve
- Input flanges to suit electric actuators
- **IBN gearbox – Tested for nuclear applications**

See PUB030-001 (metric data) and PUB030-002 (imperial data) for further details.

IW manual and motorised quarter-turn gearboxes

IW
worm gear operator

Complete range of heavy duty cast and ductile iron quarter-turn worm gearboxes suited for plug, ball and butterfly valves serving the water, gas, chemical, power, and general industrial applications.

- Size 3 to 13 torque range up to 264,000 Nm (195,000 lbf.ft) Size 14 to 17 torque range from 250,000 to 850,000 Nm (185,000 to 630,000 lbf.ft)
- Worm shaft supported by angular contact bearing
- High efficiency and multiple ratios
- Modulating and nuclear versions available
- Removable drive sleeves up to IW11
- Stroke: 0 to 90° (± 5° adjustable)
- Optional lever arms for damper applications
- **IWN gearbox – Tested for nuclear applications**

See PUB028-001, PUB029-001 (metric data) and PUB028-002, PUB029-002 (imperial data) for further details.

IS manual and motorised multi-turn gearboxes

IS
spur gear operator

Complete range of heavy duty cast iron multi-turn spur gearboxes suited for the most demanding manual and motorised applications where the gearbox input shaft needs to be parallel with the valve stem for globe and gate valves and sluice gates.

- Torque range up to 46,100 Nm (34,000 lbf.ft)
- Thrust range up to 4,350 kN (980,000 lbf)
- Totally enclosed gearing
- Grease filled for life
- Removable output sleeve
- Input flanges to suit electric actuators
- **ISN gearbox – Tested for nuclear applications**

See PUB031-001 (metric data) and PUB031-002 (imperial data) for further details.

Valve Gear Operators and Accessories

Worm gear quarter-turn operators

AB 242
worm gear operators

The AB range of quarter-turn operators are heavy duty cast iron gearboxes suited for ball, plug and butterfly valves. The 242 range of quarter-turn operators are robust and light weight cast iron gearboxes for low torque manual applications.

- AB torque range up to 32,000 Nm (23,600 lbf.ft). 15 sizes. Ratios from 34:1 to 729:1
- 242 torque range up to 2,100 Nm (1,858 lbf.ft). 6 sizes. Ratios from 40:1 to 60:1
- Rugged construction
- Stroke: 0 to 90° (± 5° adjustable)
- Sealed to IP67
- Temperature range -20 to 120 °C (-4 to 248 °F)
- ABLX range available with integrated limit switches

For further details - AB: PUB033-001 (metric data) and PUB033-002 (imperial data). 242: PUB099-001 (metric data) and PUB099-002 (imperial data). ABLX: contact Rotork Gears.

Override quarter-turn operators

ILG-D ILG-S
override worm gear operators

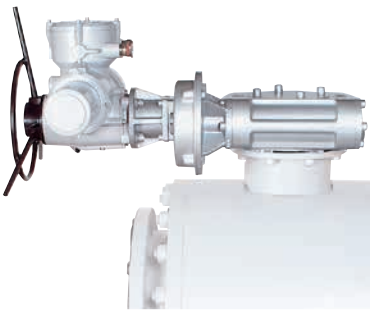
Complete range of manual declutchable sandwich override quarter-turn gearboxes for double-acting (D) and spring-return (S) pneumatic actuators.

- ILG-D torque range up to 17,000 Nm (12,540 lbf.ft). 9 sizes. Ratios from 35:1 to 468:1
- ILG-S torque range up to 32,000 Nm (23,600 lbf.ft). 10 sizes. Ratios from 34:1 to 707:1
- Protected input shaft
- Cast iron housing
- Axial needle bearings
- ILG-D: IP67/IP68 optional. ILG-S: IP65

For further details - ILG-D: PUB038-001 (metric data), ILG-S: PUB039-001 (metric data) and PUB039-002 (imperial data).

Worm gear operators

MOW
range



Heavy duty quarter-turn modulating gearboxes suited for control valves.

- Torque range up to 47,000 Nm (34,500 lbf.ft)
- 9 sizes. Ratios from 40:1 to 2,940:1
- Up to 1,200 starts per hour
- Ground and polished worm shaft
- Aluminium bronze worm wheel
- Comprehensive gear ratios combined with a selection of spur input reducers
- Angular contact bearings
- Removable output drive sleeves

Options: All types of environment.

WGS subsea quarter-turn operators

WGS
worm gear operator

The WGS range of quarter-turn operators are designed for heavy-duty subsea applications at any depth with carefully chosen materials to offer the highest level of reliability required in this very harsh environment. The operators are equipped with membrane or piston type pressure compensators to balance the pressure and allow them to work at any depth.

- Torque range from 500 to 500,000 Nm (370 to 370,000 lbf.ft)
- Worm shaft supported on taper roller bearings
- High strength alloy steel worm screw hardened and ground
- Vertical or horizontal carbon steel ROV input (class 1 to 7)
- Stroke: 0 to 90° (± 5° adjustable)

See PUB036-001 (metric data) and PUB036-002 (imperial data) for further details.

Valve Gear Operators and Accessories

Light-duty worm gear operators

232
worm gear operator

The 232 range of quarter-turn operators have a die-cast aluminium housing and are intended for applications in power waterworks and gas pipelines, HVAC, fire protection and most general industrial applications.

- Lightweight design
- Protected steel input shaft
- 7 models up to 1,500 Nm (1,100 lbf.ft)
- Removable drive sleeve
- Axial needle bearing
- Stroke 0 to 90° (± 5° adjustable)
- 2 keyways to cater for 45° & 90° positions
- Various inserts to suit all valve stems
- 232LX range available with integrated limit switches

232: See PUB034-001 (metric) and PUB034-002 (imperial) for further details. 232LX: contact Rotork Gears.

Stainless steel gear operators

300
AB-SS
WG-SS
stainless steel ranges

300: Light duty pressed stainless steel quarter-turn gearboxes.

- Torque range up to 1,000 Nm (738 lbf.ft)
- 3 sizes. Ratios from 37:1 to 45:1

AB-SS: Stainless steel 316 housing quarter-turn gearboxes.

- Torque range up to 26,000 Nm (23,012 lbf.ft)
- 14 sizes. Ratios from 37:1 to 592:1

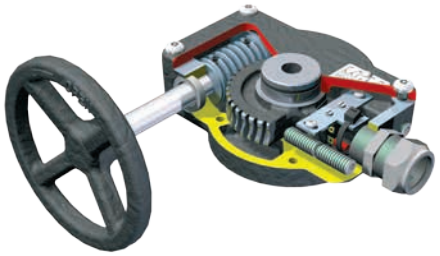
WG-SS: Heavy duty stainless steel 316 housing quarter-turn gearboxes.

- Torque range up to 125,000 Nm (110,634 lbf.ft)
- 2 sizes. Ratios up to 3,795:1

For further details - 300: PUB035-001 (metric) and PUB035-002 (Imperial). AB-SS: PUB100-001 (metric) and PUB100-002 (Imperial). WG-SS: contact Rotork Gears.

Worm gear operators

FB
range



Quarter-turn cast iron gearbox suitable for use with fire protection (i.e. sprinkler) systems, includes limit switches to be incorporated into a supervisory electrical circuit. Designed and tested specifically to meet UL1901 specification and FM1112 Approval.

- Torque range up to 1,000 Nm (885 lbf.ft)
- 5 sizes. Ratios from 40:1 to 60:1
- Worm gear
- Manual drive
- 3 x overload capacity
- 1,000 duty cycles

Worm gear operators

MTW
range

The multi-turn worm gearboxes are used for applications such as sluice gates and dampers.

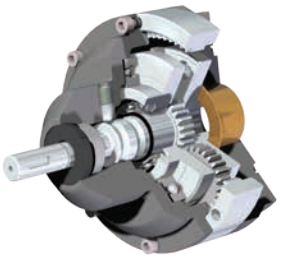
- Torque range up to 162,000 Nm (119,000 lbf.ft)
- 11 sizes. Ratios from 40:1 to 5,760:1
- Ground and polished worm shaft
- Aluminium bronze worm wheel
- Comprehensive gear ratios combined with a selection of spur input reducers
- Angular contact bearings supporting worm shaft
- Removable output drive sleeves

Options: Travelling nut for applications requiring mechanical stops. Lever arms. AWWA. All types of environment.

Valve Gear Operators and Accessories

Dual speed gear operator

DSIR



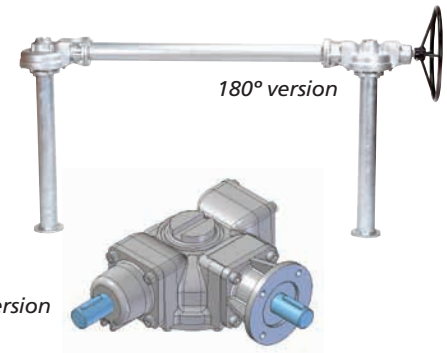
The Dual Speed Input Reducer is used to reduce the number of input turns required and therefore the operating time on manual gearbox applications.

- For use with any manual gearbox which can be fitted with an F14 or FA14 input flange
- Ratio can be switched between 1:1 and 4.25:1
- Output torque 720 Nm (6,373 lbf.in)

See PUB040-001 (metric data) and PUB040-002 (imperial data) for further details.

Dual shaft bevel gear operators

DSB
range



Complete range of multi-turn bevel gearboxes with two shafts for use with dual stem sluice gates and penstocks.

- Torque range up to 10,846 Nm (8,000 lbf.ft)
- Thrust range up to 1,557 KN (350,000 lbf)
- 11 sizes. Ratios from 2:1 to 120:1
- Ductile iron baseplates
- Comprehensive gear ratios combined with a selection of spur input reducers
- Pinions mounted on ball bearings
- IP67

Options: All types of environment. Various position indications. IP68. Input shafts available at 90° & 180° to each other.

Remote mounting and extension spindles

Valve and actuator remote mounting and extension spindles

Remote actuator mounting can be achieved using valve extension spindles or pedestal adaptors. Design and manufacture is done in house for specific applications. Lengths can be from 500 mm to 8 metres, in stainless steel or carbon steel.

Extension Spindle

- Underground applications
- Customer specified extension
- Welded construction for weight saving
- Position indication option
- Suitable for manual or actuated drives

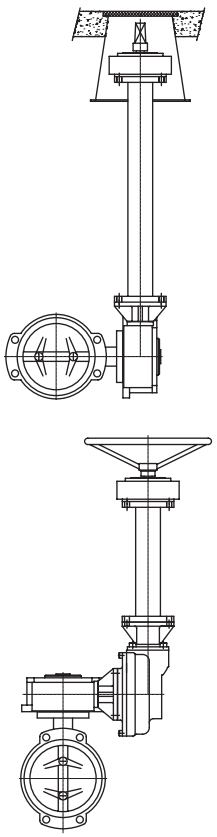
Options: Oil filled, environmental sealing, galvanized, plain or dynamic bearings, swivel joints.

Remote Position Indicator

Mechanical remote position indicators for buried service and shaft extension applications. 3 sizes. Ratios: ECL1 up to 35:1, ECL2 up to 120:1, ECL3 up to 394:1.

W100 1:1 Bevel Gearbox

1:1 bevel gearbox designed primarily to be used on AB and manual duty IW ¼ series gearboxes to change the input shaft direction by 90° for underground applications.

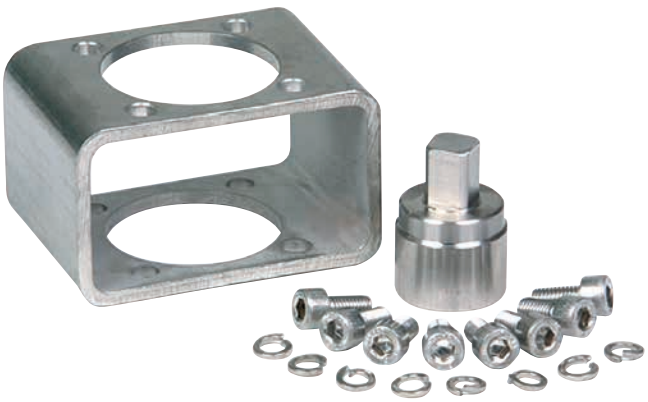


1 - Remote position indicator
2 - Extension spindle
3 - W100 90° bevel gearbox
4 - AB880 quarter-turn gearbox

Ball, butterfly and plug valve kits designed to order, precision CNC machined in stainless steel

Mounting kits

ball, butterfly and plug valve kits



Rotork Valvekits has manufactured, designed and supplied standard and non-standard mounting brackets to the valve and actuator industry since 1987. ISO 9001 accreditation was achieved in 1992. Rotork Valvekits manufactures the following components to the highest standards, with market leading delivery times:

- Mounting brackets and couplings
- Extensions
- Pedestals
- Locking devices
- Flexible drive technology
- Chainwheels, handwheels and spring-return handles
- Solenoids, switch boxes and positioners

See PUB063-040 for further details.

Spool and pedestal adaptors

Quarter-turn valve adaption for rack and pinion or pneumatic actuators can be provided in the form of spool or pedestal type mounting kits.

These are fully enclosed adaptors with options of DD, square or keyed drives.

Construction materials will be carbon steel, supplied complete with fasteners, painted or natural.

- Valves from ¼" to 48"
- F03 - F35 Flanges - ISO 5211/ DIN 3337
- Welded to ASME 9 standards
- Square, key or double D drive
- 100 to 500 mm in length

Options: O-ring seals, stress calculations, material certification.

Switch box and position indication

Local and remote

position indication

The Soldo range of switch boxes for use on quarter-turn valves and actuators. They are available in durable polycarbonate, 316 stainless steel and aluminium, and can be used on actuators, valves, or in conjunction with a hand wheel or lever.

- IP66, IP67, IP68, Safe area operation
- Hazardous approval, Exd IIC, Ex ia IIC +H2 -ATEX
- Beacon/Local indicator available
- 4 to 20 mA
- V3 micro switches or Inductive sensors
- Open/Closed feedback sensors for Multi-turn valves are also available.

See PUB108-001 for further details.

Pakscan Bus Control System

Integration of the plant controls by use of network connectivity has been a hallmark of Rotork's actuator products for many years. The use of proprietary and open systems makes the commissioning of the plant and the subsequent control and monitoring a simple and reliable task.

All Rotork actuators are compatible with a wide range of communication and process controls systems by including the appropriate option card. The actuator reports status feedback, via the field highway, to the overall plant control system (DCS or PLC) and valve control commands are actioned.

Our own Pakscan system compliments the open systems from Foundation Fieldbus, Profibus, Modbus and DeviceNet. See page 28 for more details. Innovative technology together with expert bus system knowledge ensures that Rotork can always provide the ideal solution for the control system.

A full listing of our worldwide sales and service network is available on our website at **www.rotork.com**

The Rotork Pakscan system is a world leader in actuation control automation. First launched in 1986, Pakscan has been at the forefront of network technology since its inception and helps control over 100,000 actuators. Pakscan network systems offer the customer unrivalled control, reliability and customer support. This is supported by a worldwide service and support network to keep your plant running 24 hours a day, 7 days a week.

Modern facilities require up to date communications right down to plant level. Plant managers demand more information more quickly than ever before. Process operators need full control facilities at all times of the day and night. Maintenance managers want information so that their services can be scheduled economically. To meet these requirements, design engineers include field communications networks to allow every piece of critical plant to be controlled and monitored by computer. These computers are assigned to management, operations and maintenance tasks within their own network, exchanging data about the equipment and process under their control.

The Pakscan system provides the vital link between valve actuator and supervisory control. It is an intelligent, reliable, high integrity, fast and easy to install network between field equipment and the control room. It is specially designed for use with Rotork products. With their high reliability and efficiency, coupled with low maintenance costs, Pakscan networks have proved to be the unrivalled leader in valve actuator communications.

Most Rotork actuators can connect to Pakscan using an additional option module. Other equipment can connect using Pakscan adaptors.

Completely Engineered Package

- Automatic network monitoring and fault management
- Field network fault tolerant and redundant connection to host
- Fully pre-configured master station
- HMI screen and keypad built-in
- Simple Modbus RTU / TCP host communications
- Field network wired and/or wireless
- Defined 2-wire transaction times and network distance
- Field and host communication diagnostics
- Easily expandable
- Hot standby capability
- Commission without the need for a host DCS or PLC
- Proven track record
- Over 100,000 installed field units
- Built-in web server for full systems diagnostics

See PUB059-030 for further details.

Pakscan Bus Control System

P3 master station

The Pakscan P3 master station is capable of controlling up to 300 actuators, split between a wired current loop option card and a wireless option card. The P3 includes a fully redundant Hot Standby master station as an option. The Pakscan P3 master station incorporates a local HMI which has a full colour integral display showing the status of all the field devices, the current state of the communications ports, system alarms and diagnostic information plus actuator control and set up facilities. The simple 5 button keypad provides easy navigation through the display screens.

Remote access to the asset management features are available via the built in web pages as well as the status, diagnostic, set up and control facilities provided by the local HMI. Asset management information includes historical master station command log, host port analyser, automatic alarm notification via email and event loggers for both the master station and field control units. Web security is provided by named IP access, https (secure web pages) and password protection.

The two serial and two ethernet host ports allow for redundant communication. Pakscans pre-configured database and vast interface experience ensure smooth integration with any Modbus host system.

See PUB059-030 for further details.

Rotork P3 Field Mount master station

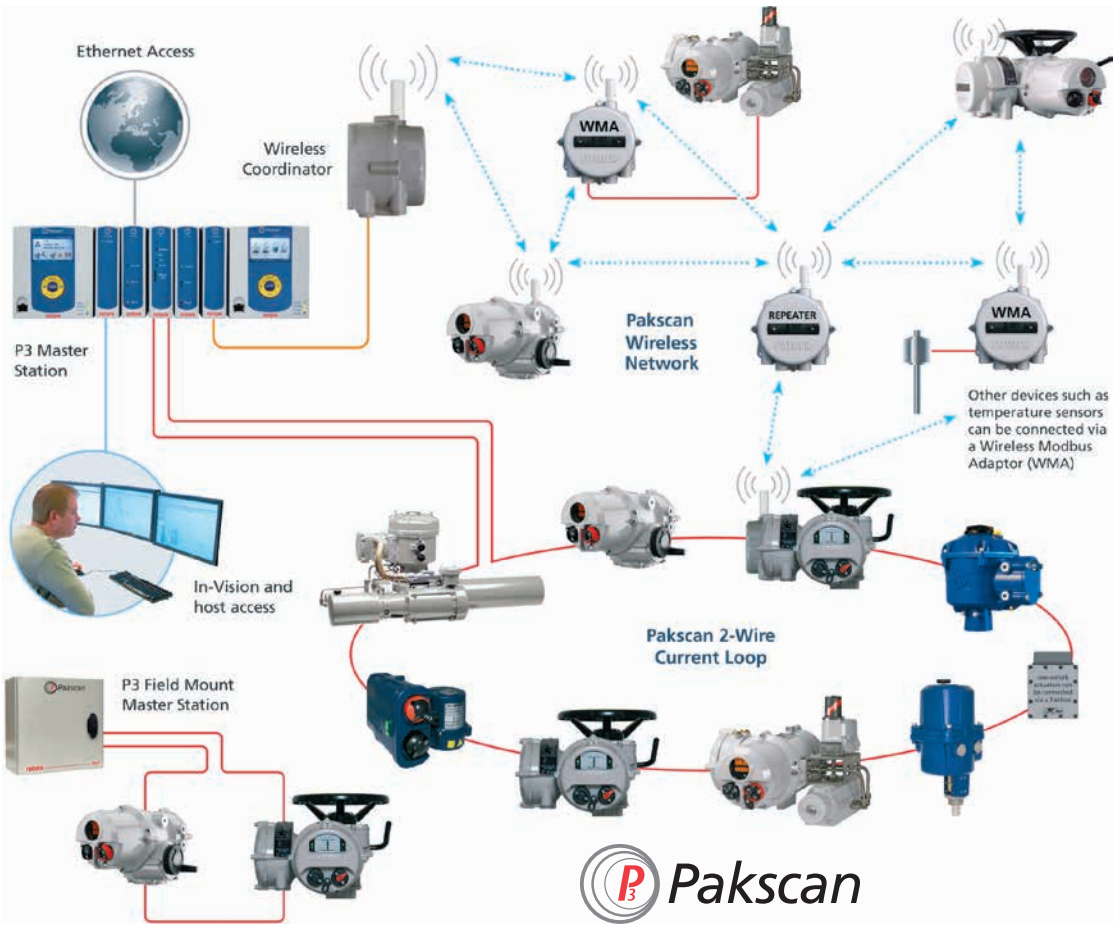
The Rotork P3 Field Mount (P3F) master station enhances the P3 range by allowing the master station to be mounted close to the process. Enclosed in an environmentally protected IP65 box, it provides (via a DCS or PLC) control and monitoring of 32 field units utilising serial or TCP/IP Modbus communications. Configuration is achieved using the comprehensive built in web pages.

See PUB059-030 for further details.

In-Vision - powerful, user friendly

In-Vision is a SCADA (Supervisory Control And Data Acquisition) software application for full, user friendly control of complex installations, such as oil storage depots and water treatment plants, where there may be a high number of actuators and process signals to control and display. Working with Pakscan and running on a standard PC, In-Vision offers a highly flexible series of graphic displays and controls that allow plant managers to view and control all aspects of their process at a fraction of the cost of other comparable systems.

See PUB059-024 for further details.



Multiple Bus Connectivity

Multiple fieldbus connectivity

Rotork actuators are compatible with most industry standard fieldbus systems via network cards that are fitted in the main electronics enclosure.

Foundation Fieldbus®

Foundation Fieldbus has become widely accepted for use in process control systems. It's primary feature is the ability to distribute control away from the central DCS. The Rotork Foundation Fieldbus interface card connects directly onto the standard Foundation H1 bus system. The function blocks embedded in the module cover the control and monitoring of the valve and actuator. Using the certified Device Description files the FF card is simple and easy to use. The ability to report extensive actuator feedback within a single input block as well as system diagnostic information makes Rotork the first choice for use with a Foundation Fieldbus system.

- Foundation ITK inter-operability certified
- Fully compliant with IEC61158-2 standard
- Includes Link Master and LAS capability
- Independent HIST approval by major DCS vendors
- Full H1 Field capability

See PUB060-003 for further details.

Profibus®

Profibus is a leading international network protocol for high speed data communications in industrial automation and control. The Rotork Profibus DP interface card provides comprehensive control and feedback data about the valve and actuator using DP-V0 cyclic communications whilst extended actuator diagnostics and configuration is included in the DP-V1 acyclic data supported by this module. EDD and DTM files allow the Rotork device to be incorporated into asset management systems giving access to performance critical parameters, whilst the independently certified GSD file guarantees device interoperability. Rotork provide an optional switch disconnect module allowing for ease of installation and have multiple configuration options within the GSD file to enable a choice of data collection.

- RS485 Profibus DP V0 and V1 compliant
- Single and Dual Redundant options
- Fully meets IEC61158-3 standard
- Profibus PNO certified
- Supports speeds up to 1.5 Mbit/s

See PUB060-002 for further details.

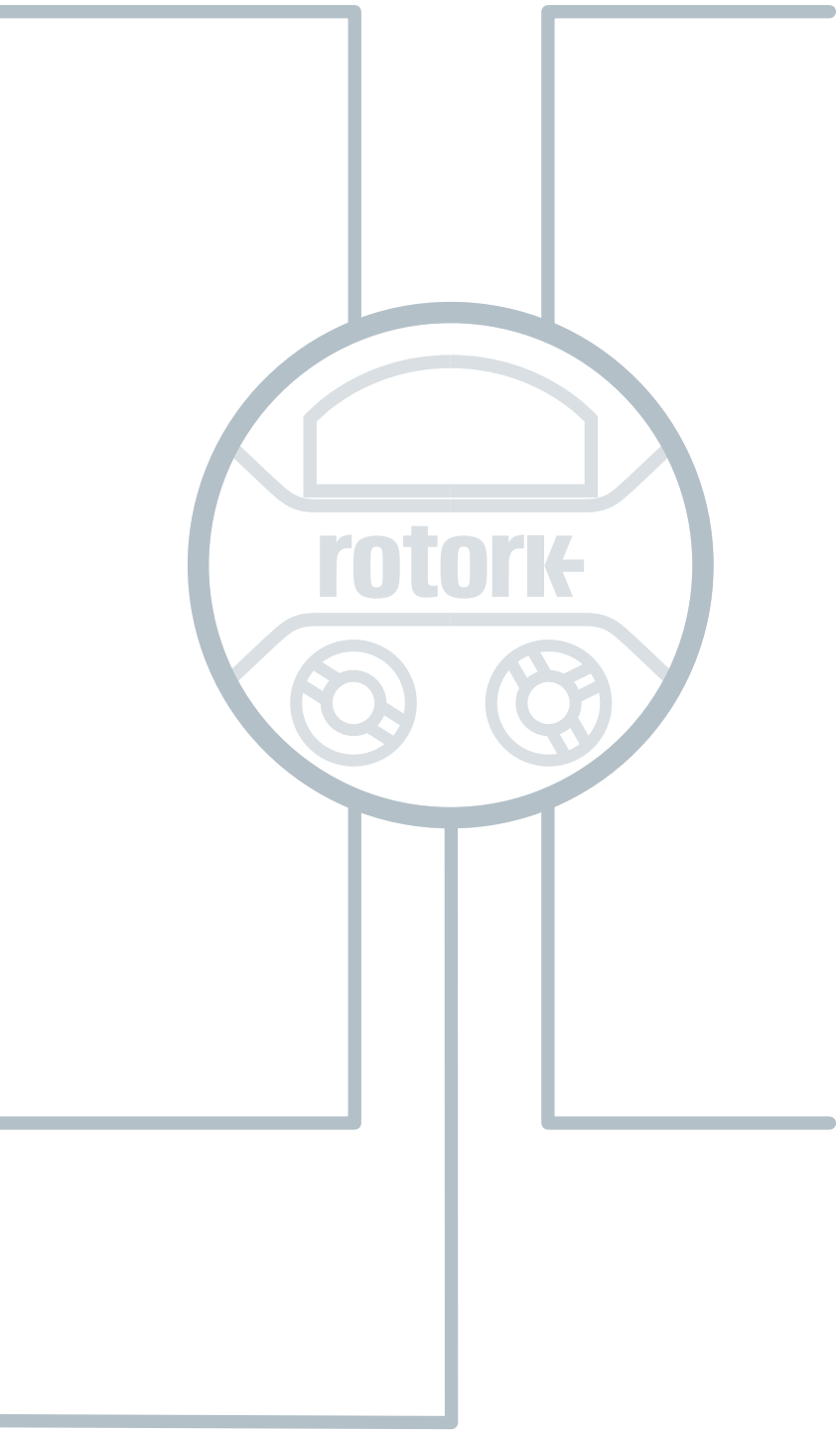
DeviceNet®

DeviceNet is an Open Network Standard for communication networks using the main features of CAN bus in an industrial environment. The Rotork DeviceNet interface module provides easy access to actuator process control and feedback information. The Electronic Data Sheet description file is used to set up the actuator parameters to allow the systems performance to be optimised. In addition to the standard actuator torque and position feedback a further analogue input is included as standard enabling integration of external analogue equipment onto the network. The Rotork module has been certified by the Open DeviceNet Vendor Association to ensure its interoperability with other devices.

- Up to 63 devices on each network
- 4-wire cable, 2 for signal, 2 for power
- Trunk and Drop line permitted
- ODVA certified to ensure compatibility
- EDS electronic device description file

See PUB060-004 for further details.

Modbus



Modbus

Modbus remains the most popular process communication protocol in use today with the widest acceptance and highest number of applied systems of any automation protocol. Rotork's Modbus interface card allows actuators to be connected to a 2-wire RS485 network for direct communication to a PLC or DCS using Modbus RTU protocol. The resulting network is able to monitor and control the connected actuator. As the Modbus protocol is so simple the system engineer has full control over the data flow on the highway and the information to be collected and controls implemented. There are no complications with device description files or special programming tools required when setting up a Modbus system.

- RS485 2-wire RTU communication
- International open standard
- Single and Dual redundant options
- Integral Repeater modules included where necessary
- Up to 115 kbps

See PUB060-005 for further details.

HART®

HART (Highway Addressable Remote Transducer) is a process control communication protocol based upon the Bell 202 telephone communication standard and uses the FSK (Frequency Shift Keying) principle. The signal consists of two parts, the analogue 4 to 20 mA current loop and a superimposed digital variable frequency signal. Traditionally the 4 to 20 mA loop is used for control and the superimposed digital signal for feedback, diagnostics and configuration. Configuration and feedback using the HART digital signal can be achieved using the host connected to the actuator to select the parameters required. The majority of the user configurable settings can be made over the HART communication protocol.

- Up to 63 devices on each network
- Electronic device description (DD) files
- HART 7 compatible

See PUB060-006 for further details.

Precision Control and Indication

rotork®
Instruments

Rotork Instruments are specialist manufacturers of products for flow control, pressure control, flow measurement and pressure measurement. Our solutions are trusted wherever there is a need for high precision and reliability, including pharmaceutical, biomedical, oil & gas and manufacturing industries.

We have production facilities throughout the world, complemented by a large network of distribution and support centres.

A full listing of our worldwide sales and service network is available on our website at **www.rotork.com**

Worldwide Industry and Application Experience

With more than 50 years of extensive knowledge and experience, Rotork has provided products and services worldwide for virtually every industrial actuator application.

Rotork Instruments offers a range of valve accessory products from the Rotork Fairchild and Soldo® companies:

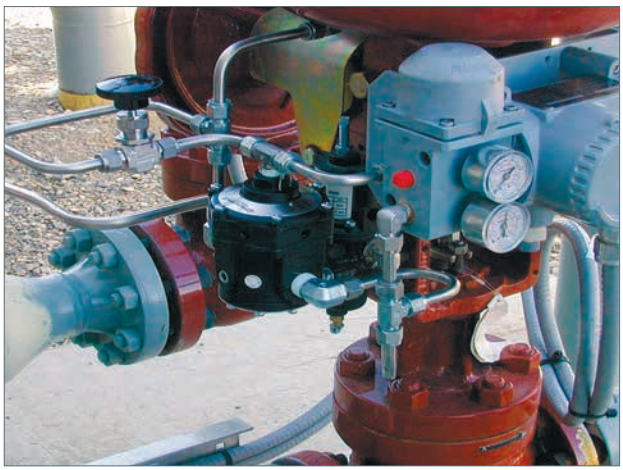
Rotork Fairchild

- Pneumatic pressure regulators
- Electro-pneumatic transducers
- Pneumatic volume boosters
- Pneumatic relays

Soldo

- General purpose limit switch boxes (polymer, aluminium or stainless steel)
- Explosionproof limit switch boxes (aluminium or stainless steel)
- Integrated solenoid/limit switch box units
- Bolt proximity switches
- NAMUR pneumatic components

Rotork Instruments is proud to offer a diverse range of products which serve many different duties in a wide variety of applications. We also offer a factory customisation service, to create one-off units to meet specific needs.



Rotork Fairchild's high flow M4500 volume boosters and precision M63 filter regulators improve both performance and response of valve systems.

Precision Control and Indication

rotork®
Fairchild

The Rotork Fairchild range of industrial control products offers one of the largest varieties of precision pneumatic and electro-pneumatic control devices available for process, machine tool, robotic and OEM applications. Rotork Fairchild products are valued by customers for their advanced capabilities including:

Precise and accurate

From miniature regulators, embedded within medical equipment, to transducers in industrial robots and pipelines, our products provide the degree of control that each different application demands.

High flow, high pressure

Rotork has always been at the forefront with products that handle the most demanding duties. Our ranges include models which are designed to handle exceptionally high pressure and deliver the greatest flow rates.

Safe and non-reactive

From explosionproof units which carry volatile gases, through to specialised polymer-based components which are optimised for medical applications, we offer a wide range of products to meet the most exacting requirements.

SOLDO CONTROLS

The Soldo® range of limit switch boxes, proximity sensors, and accessories offers a variety of options. Soldo specialises in the design and manufacture of control accessories for valve automation, providing high quality products and services that guarantee a link between the control room and automated process valves. Product development programmes ensure Soldo is always ready for new markets and applications and able to meet or exceed customer requirements. Soldo products are valued by customers for their advanced design and capabilities including:

Versatile

From cost effective, when price is a concern, to corrosion resistant and explosionproof, when harsh environments are encountered, Soldo products provide the protection and automation that each application demands.

Unique design features

Soldo units are a step above the competition with unique split shaft designs. This allows installation where space is a factor and where a low profile limit switch box is not preferred. Soldo limit switches also have easy-set 3 degree cams for independent tool free adjustment.

Hassle free installation

Pre-wired PCB switch modules ensure installation is worry free and allows easy installation and wiring directly into terminal strips. The pre-wired boards are conformal coated for environmental protection. Soldo also offers a full line of mounting brackets for all models that do not come with an integral mounting kit.

Engineering Capabilities

Rotork Instruments is committed to bringing the latest innovative technology and leading edge design methods to market while maintaining the Rotork name for reliability.

- In-house prototyping for quick creation of concept designs provides immediate understanding of how a unit will function under given conditions for a customer's unique application
- 3D CAD modelling means our designs can be accurately manufactured, allowing for more complex forms to further optimise part geometry
- FMEA (Failure Modes and Effects Analysis) allow the design to be robust whilst maximizing the mapping of consumer requirements to the product

Test Facilities - Quality and Safety

Rotork Instruments has extensive test facilities at our Winston Salem, NC and Desenzano, Italy locations. We have a comprehensive set of test stands for testing pneumatic regulators, transducers, volume booster, relays, and limit switches. We carry out life cycle testing, pressure testing and environmental testing including climate chamber and salt-spray testing in-house.

For tests beyond our in-house capabilities, such as extremely high temperature testing, we can call on the resources of the wider Rotork Group. We also use third party facilities for procedures including nuclear, deep-sea hyperbaric and seismic/vibration testing.

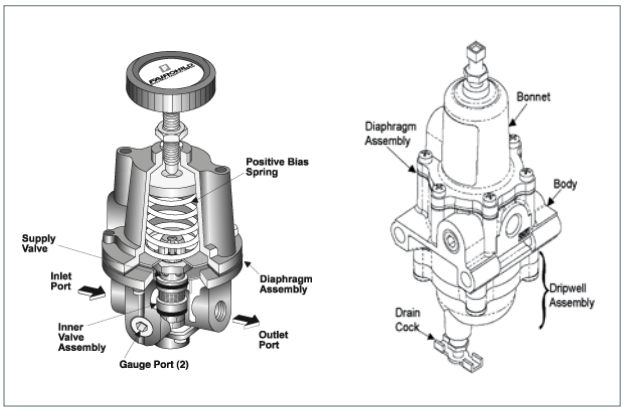
Quality Assurance

Rotork products are designed and manufactured to the highest possible level of engineering – a principle which drives all areas of our business. To facilitate this objective a documented Quality Management system is established in accordance with ISO9001:2008. This quality management system embraces every aspect of the company's business and involves all personnel.

Valve Control Accessory Products

Pneumatic pressure regulators

PPR series



A pressure regulator reduces an unregulated high input pressure to a regulated lower output pressure. Its primary function is to maintain the regulated output pressure under flowing and non-flowing conditions.

Rotork Fairchild manufactures a complete line of precision pneumatic regulators including pressure reducing, back pressure and vacuum models. Quality engineering and manufacturing excellence assures that our regulators meet all the requirements of a precision device.

Our large selection of pressure ranges and flow capacities lets you select the models that meet your needs for instrument or general industrial control applications.

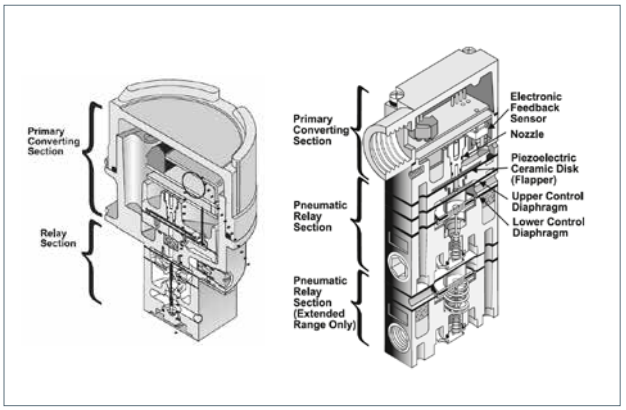
Highly accurate output pressure control, even with fluctuating supply pressure, temperature, or vibration.

- Max Supply Pressure: 41,368 kPa (6,000 psi)
- Max Output Pressure: 20,684 kPa (3,000 psi)
- Flow Capacity: 4 to 2,550 m^3/hr (2.5 to 1,500 SCFM)
- Sensitivity: As low as 0.127 cmWC (0.05 inWC)
- Supply Pressure Effect: As low as 0.05% of change in supply pressure
- Pipe Sizes (NPT): $^1/_{16}$" to 1½"

See PUB103-001 for further details.

Electro-pneumatic transducers

EPT series



Electro-pneumatic transducers convert electrical input signal (mA or VDC) to proportional pneumatic output. Rotork Fairchild manufactures piezo-electric and feed-and-bleed versions that are extremely resistant to shock, vibration, and changes in positional orientation.

Piezo-Electric – An electronic signal to the piezo-electric ceramic disk causes a deflection of the disk that variably closes the nozzle orifice. Internal electronic feedback assures precise output pressure control.

Feed-and-Bleed – Microprocessor controlled electro-pneumatic solenoid valves feed supply pressure to the control chamber and bleed excess pressure to atmosphere. Analogue or digital input control signals and feedback electronics control the solenoids and maintains the regulated output.

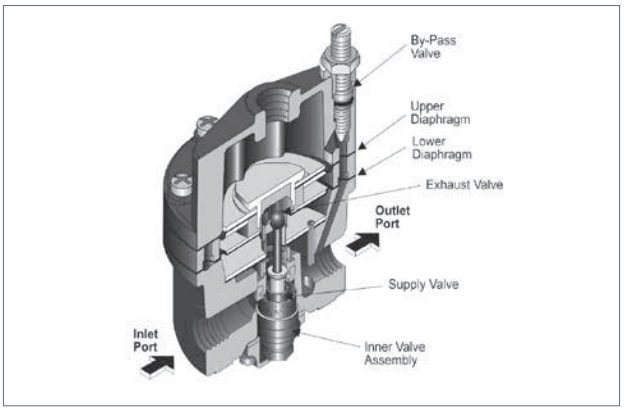
- Accuracy: As low as + 0.15% full scale
- Repeatability: As low as + 0.1% full scale
- Max Supply Pressure: 1,380 kPa (200 psi)
- Max Output Pressure: 1,050 kPa (150 psi)
- Flow Capacity: 15.3 to 1,189 m^3/hr (9 to 700 SCFM)
- Pipe Sizes NPT: ¼" to 1"

See PUB103-002 for further details.

Valve Control Accessory Products

Pneumatic volume boosters

PVB
series



A pneumatic air volume booster uses a low flow control signal pressure to produce a regulated output pressure with a high flow capacity. It uses an unregulated input pressure to maintain a regulated output pressure under flowing and non-flowing conditions.

Rotork Fairchild volume boosters meet all the requirements of a precision device including accuracy, sensitivity, fast response, stability, drift-free settings, low output droop, supply pressure effect immunity, high forward & exhaust flow capacity.

The regulated output of a pneumatic air volume booster can be any of the following: a direct reproduction of the pneumatic control signal, a multiple of the pneumatic control signal or a fraction of the pneumatic control signal.

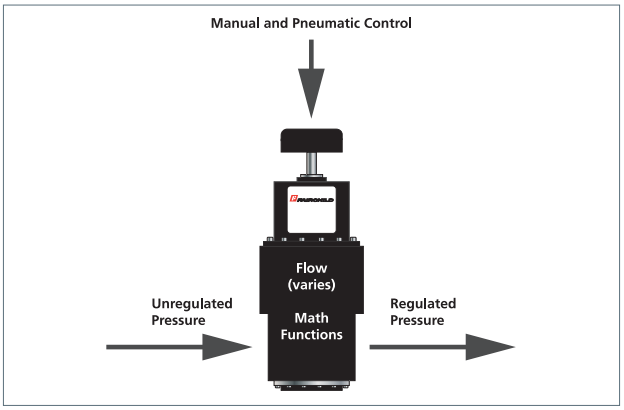
Pneumatic air volume boosters maintain signal pressure accuracy while boosting output flow.

- Max Supply Pressure: 1,700 kPa (250 psi)
- Max Output Pressure: 1,050 kPa (150 psi)
- Flow Capacity: 77 to 2,550 m^3/hr (45 to 1,500 SCFM)
- Exhaust Capacity: 12.8 to 552.5 m^3/hr (7.5 to 325 SCFM)
- Cv Flow Coefficients of 1 to 18 in both forward and exhaust
- Sensitivity: As low as 0.64 cmWC (0.25 inWC)
- Pipe Sizes NPT: ¼" to 1½"

See PUB103-003 for further details.

Pneumatic relays

PR
series



Pneumatic relays perform mathematical functions on one or more input signals to result in a single regulated pneumatic output including:

- Average
- Sum

Rotork Fairchild pneumatic relays meet all the requirements of a precision device including:

- Accuracy
- Sensitivity
- Fast response

- Max Signal Pressure: 1,050 kPa (150 psi)
- Max Supply Pressure: 1,700 kPa (250 psi)
- Max Output Pressure: 1,050 kPa (150 psi)
- Flow Capacity: 24 to 255 m^3/hr (14 to 150 SCFM)
- Sensitivity: As low as 0.32 cmWC (0.13 inWC)
- Pipe Sizes NPT: ¼" to ¾"

See PUB103-004 for further details.

Valve Position Indication

General purpose & intrinsically safe limit switch boxes

SS

SP

SB

SF

This is a small selection of the general purpose range

General purpose limit switch boxes provide a compact design and heavy duty housing for both visual and electrical indication of rotary valve/actuator position. All Soldo limit switch boxes with local and remote position indication can be fitted with standard mechanical switches or proximity sensors to link the automated valve to the control room.

- Polymer, aluminium or stainless steel enclosures
- Cost effective corrosion resistant enclosures NEMA 4/4X (IP65)
- Intrinsically Safe (IS) certification option
- Certification options: UL, CE
- SIL 3 rated models available
- AS-i interface capable
- Split shaft design available on most models
- Tool free adjustable 3 degree cams
- SPDT or DPDT mechanical, proximity, or NOVA switch options
- 4 to 20 mA analogue transmitter option available on most models
- Integral mounting brackets provide additional cost savings by eliminating the need for a separate mounting kit – available on most models

For further details see www.soldo.net

Explosion proof limit switch boxes

SY

SX

SQ

SW

This is a small selection of the explosion proof range

Hazardous location aluminium or stainless steel limit switch boxes provide visual and electrical indication of valve/actuator position. Heavy duty construction makes them suitable for use in a wide range of industrial environments including indoor and outdoor applications.

- Aluminium or stainless steel enclosures
- Explosionproof certification
- Certification options: UL, ATEX, INMETRO, CCOE, GOST, IECex, SIL
- AS-i interface or DeviceNet capable
- Split shaft design
- Tool free adjustable 3 degree cams
- SPDT or DPDT mechanical, proximity, or NOVA switch options
- 3 position and dribble control options
- 4 to 20 mA analogue transmitter option available on most models
- Integral mounting brackets provide additional cost savings by eliminating the need for a separate mounting kit – available on most models

For further details see www.soldo.net

Valve Position Indication

Integral solenoid valve limit switch boxes

HW

The HW is a compact limit switch control unit with three key features: Visual and remote electrical indication of valve/actuator position; Internal solenoid valve(s) for valve control; Integral NAMUR mounting kit. These key features ensure the HW is the most cost effective solution for complete valve automation control.

- Aluminium enclosure
- Designed to meet NEMA 4/4X (IP65)
- AS-i interface or DeviceNet capable
- Split shaft design
- Tool free adjustable 3 degree cams
- SPDT or DPDT mechanical, proximity, or NOVA switch options
- 4 to 20 mA analogue transmitter option available on most models
- 3 position and dribble control options
- Integral mounting brackets provide additional cost savings by eliminating the need for a separate mounting kit

For further details see www.soldo.net

Bolt proximity sensors

BOLT Switches

The BOLT switch is a threaded body proximity switch for remote electrical indication of linear and rotary valve/actuator position. These rugged switches are machined from solid billets of stainless steel or aluminium and are totally sealed. The NOVA BOLT proximity sensor has a unique patented sensing system able to sense any ferromagnetic material in any size. This 'Snap Acting' design has full contact pressure in the open or closed state.

- Aluminium or stainless steel enclosures
- UL Class I, Div 1, Groups A-D; Class II Div 2, Groups E-F; Class III, Div 1
- NEMA 4, 4X, 7 & 9
- Explosionproof Ex II 2 GD EEx d IIC T6
- Waterproof IP68
- NOVA BOLT - snap acting proximity sensor
- Subsea bolt switch up to 300 barg
- Stainless steel or aluminium housing
- SPST or SPDT inert gas hermetically sealed contacts
- ½" NPT cable entry or M20x1.5
- No lead seals required

For further details see www.soldo.net

rotork® Site Services

In each of our divisions, site services staff are dedicated to providing customer service and support, carrying out new installations and delivering retrofit projects. These teams are based out of service centres around the world and are complemented by factory-trained agents.

Our expert technicians support Rotork customers, allowing us to deliver on our promise of global solutions backed by local service.

Visit www.rotork.com to identify your nearest Rotork Site Services centre.

Emergency and planned service

We provide a full range of actuator services, covering any type of actuator in any location, including hazardous environments. Our services include installation, commissioning and upgrading as well as connection and installation of bus communication systems. We are also skilled at troubleshooting and repairing damaged or deteriorating assets. Depending on your requirements, we can offer guaranteed emergency response times or planned response.

Actuator overhauls

After a long service life it is sometimes preferable to overhaul rather than replacing actuators. In our workshops we completely strip and rebuild actuators, returning them to their original state.

Health checks

To help customers understand the state of their plant and assets, to better inform maintenance and replacement decisions, we offer full inspection and reporting. In addition to a detailed and intrusive inspection of the actuators, we offer extra insights from our original factory build data.

Projects, Services and Retrofit

Preventative maintenance

To maximise plant up-time and minimise operating costs we offer clients a range of preventative maintenance programmes. We tailor the service in every case to reflect the type of actuators in service, the availability of asset information and the criticality of the plant.

Retrofitting actuators to existing valves

We have extensive experience in fitting actuators to valves, penstocks and dampers that are already installed as part of existing plant. Whether customers are replacing obsolete actuators, changing power sources or motorising manual valves, we offer a tailor made solution to meet customers' specific requirements.

Shutdown outages

For those customers who run tightly-scheduled shutdowns, we engage closely in the project to help meet demanding deadlines. A typical example might involve our staff removing large numbers of actuators, overhauling them in our workshops and re-commissioning them as part of the maintenance of a larger unit.

Factory fitting of actuators to new valves

The careful assembly of valve and actuator is critical to ensure that an automated valve performs correctly and reliably. Whilst this service is often carried out by valve manufacturers, if there is a need we can provide this service.

Extended scope projects

This is a growing requirement and some of our service teams have the wide range of skills necessary to offer a "one-stop-shop" to automate part or all of a customer's process. Our capabilities cover all of the installation phases (scoping, design, procurement, manufacturing, installation, commissioning) on the broad scopes that typically surround actuation projects.

Client Support Programme

Rotork offer a premium level of product reliability and availability through the flexible Client Support Programme. Designed to facilitate the highest production demands while providing a tiered approach to maintenance, the Client Support Programme is committed to reducing maintenance downtime and costs.

Through consultation, the Client Support Programme is tuned to deliver the optimum level of maintenance through predictive maintenance algorithms.

Features of the Client Support Programme are:

- Fixed term prices for Rotork products and services
- Customisable cover based on equipment criticality to production
- Equipment performance related targets for reliability and availability
- Priority support with customisable response times
- Fully parts and labour inclusive, no additional costs or discounted labour and parts
- Fix or replace options
- Periodic equipment performance and status reports
- Built-in regular health checks on all equipment

Benefits of the Client Support Programme include but are not limited to:

- Year-on-year reduced maintenance costs
- Easy budget management
- Maximised production – reduced downtime
- Year-on-year improved reliability and availability
- Optimised resource usage, accelerate in-house projects
- Reduced lifecycle costs

rotork®

Redefining Flow Control

www.**rotork**.com

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

Rotork plc
Brassmill Lane, Bath, UK
tel +44 (0)1225 733200
fax +44 (0)1225 333467
email mail@rotork.com

Scan with your smart phone for more information on rotork products and services

PUB000-002-00
Issue 03/14