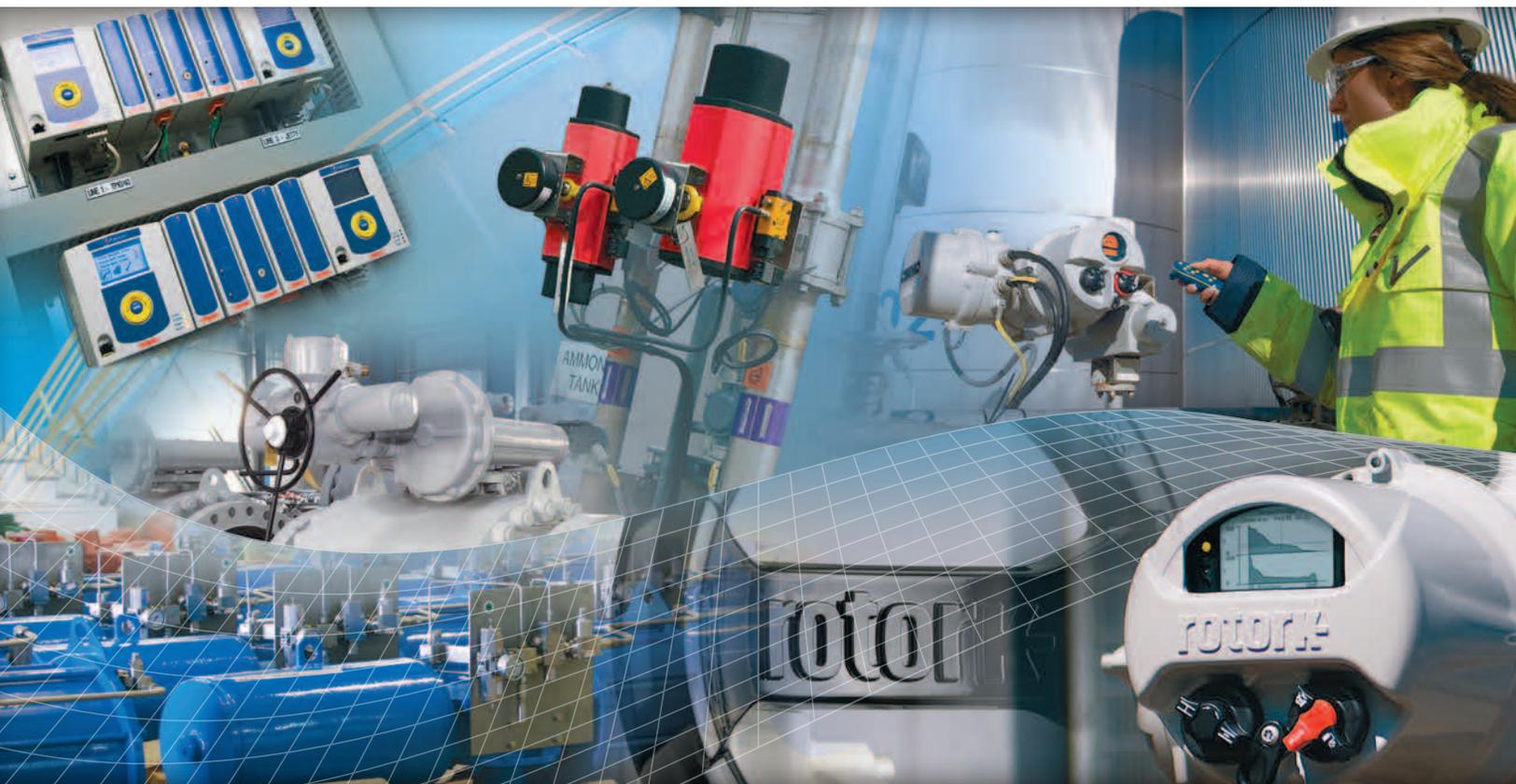


# rotork®

## Group Product Portfolio



Keeping the World Flowing

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## About Rotork



For nearly sixty years, engineers have relied upon Rotork for innovative, dependable solutions to manage the flow of liquids, gases and powders. From safety systems that may be needed just once in a lifetime to process controls that are constantly on the move, Rotork flow control products remain the clear choice, worldwide.

### Keeping the World Flowing

Since 1957, Rotork has grown to be a major international business with subsidiaries all around the world.

When you turn on a tap or switch on a light, turn on a kettle or put fuel in your car, a flow control product is being used somewhere in the process of delivering that service.

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

Rotork has established manufacturing facilities, a global network of local offices and agents who can truly provide a worldwide service. You will be able to locally source Rotork's products, supported by life-of-plant maintenance, repair and upgrade services.

### Committed to Innovation

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

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

### Serving the World

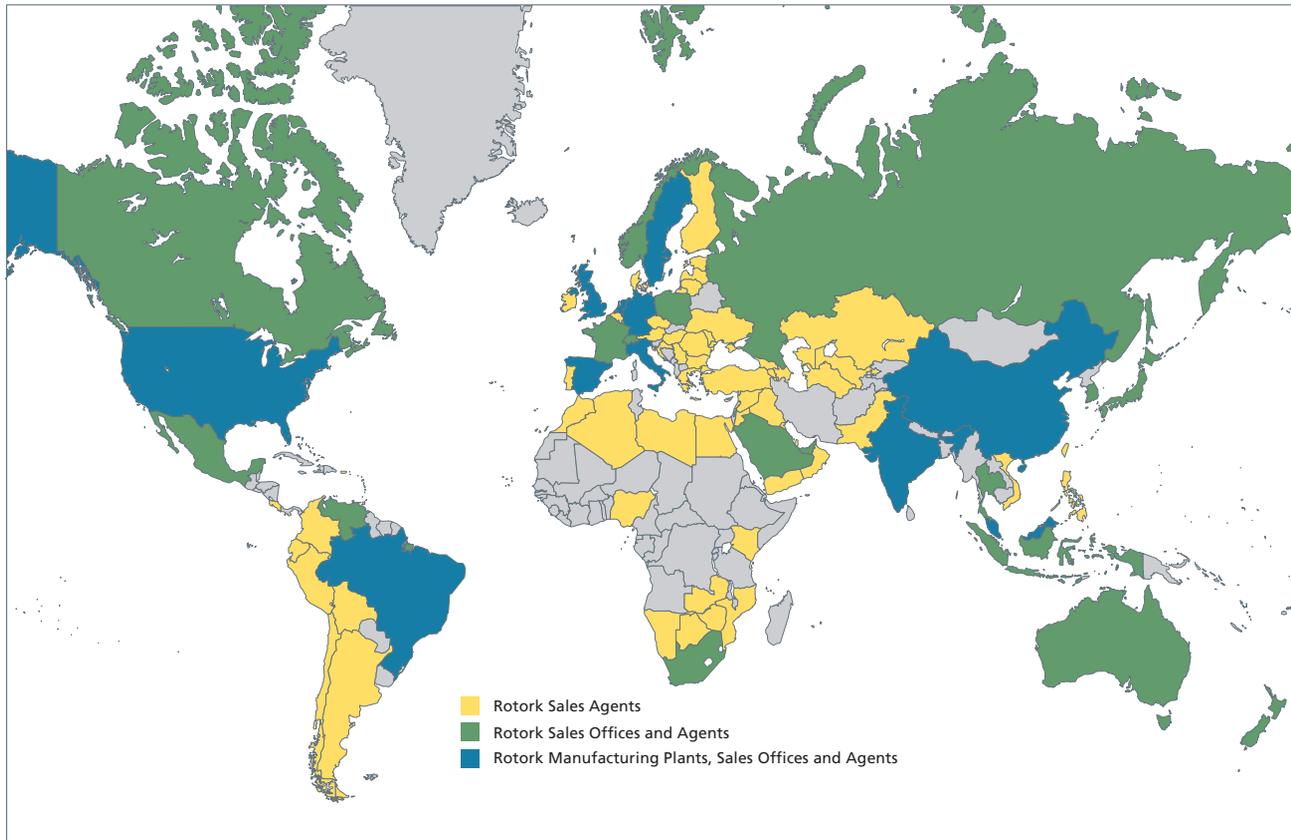
Rotork has always been committed to global supply, supporting operations in some of the most remote and challenging environments.

We have established manufacturing facilities across the globe which together with our own global network of local offices, regional *Centres of Excellence* and agents provide over 800 Rotork outlets worldwide.

**You can be confident that our products and service remain the best in the world.**



## Worldwide Service



# rotork®

### Global Manufacturing

Rotork's manufacturing strength has been built over more than half a century, with international growth and strategic acquisitions. Rotork operates a truly global network of sales offices with manufacturing plants sited in Europe, Asia and North America. From heavy-duty gears to nuclear-certified actuators and pressure regulators, we are proud to be delivering the best solutions everywhere we work.

### Global Culture

As an international business, supporting clients wherever their operations and project installations are located is part of our culture.

### International Sales

Our international sales network allows us to support our clients wherever they are based, worldwide.

### Centres of Excellence

In addition to manufacturing sites throughout the world, Rotork has regional *Centres of Excellence* providing local service and support.

### Supply Chain Integration

We work closely with all our customers – from valve manufacturers and engineering contractors to end users.

Our manufacturing sites and *Centres of Excellence* are strategically located throughout the world to provide the best customer service and support locally, wherever you are based.

## Rotork Structure

### **rotork**<sup>®</sup> 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**<sup>®</sup> Fluid Systems

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

### **rotork**<sup>®</sup> 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 switchboxes, valve position monitors and adaption accessories.

### **rotork**<sup>®</sup> Instruments

Rotork Instruments are specialist manufacturers of products for flow control, pressure control, flow measurement and pressure measurement. Our products are used in a number of sectors including pharmaceutical, biomedical, oil & gas and manufacturing industries.

### **rotork**<sup>®</sup> Site Services

Rotork Site Services supports all the Rotork divisions. Site Services engineers are dedicated to providing customers with on-site support, installation and commissioning.

We operate a comprehensive Client Support Programme (CSP) designed to reduce customer maintenance downtime, increase production efficiency and reduce costs.

These teams are strategically located around the world to provide a local service backed by Rotork's network of manufacturing centres and offices.



## Intelligent Electric Actuators

# rotork® Controls

Heavy-duty valve actuators are Rotork's core business. Since 1957 Rotork has grown to be the world's largest independent manufacturer.

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

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

Rotork Controls delivers the following product ranges:

- Intelligent multi-turn and part-turn valve actuators
- Part-turn / rotary and linear control valve actuators
- Heavy-duty part-turn / rotary and linear valve actuators
- Small part-turn / rotary valve actuators
- Explosionproof actuators, sensors, switches and controls
- Network control systems

A full listing of our worldwide sales and service network is available on our website at [www.rotork.com](http://www.rotork.com)

### Test Facilities – Quality and Safety

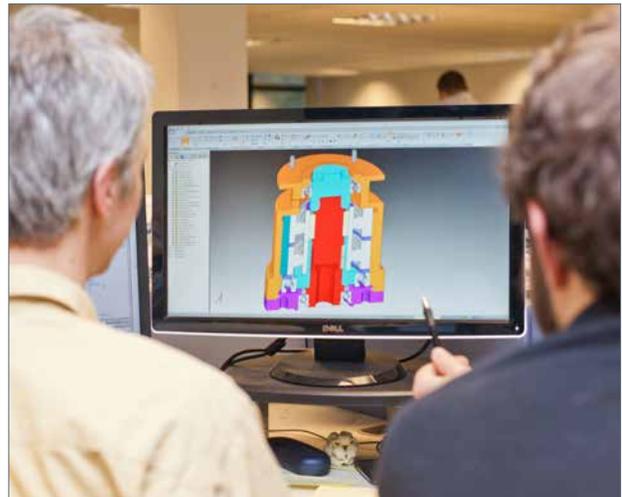
Rotork continually researches new technologies and develops innovative and industry leading products. We have dedicated research and development centres around the world that all work together to produce the strongest line of valve actuation products available on the market today.

### Reliability and Quality Assurance

Rotork Controls is committed to providing our customers with robust and dependable products that meet or exceed their expectations.

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 standards authorities around the world.

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



# Intelligent, Non-Intrusive Electric Actuators

## IQ – multi-turn actuators

IQ  
range



The world's most advanced intelligent, non-intrusive electric valve actuator, proven in the most arduous environments. Available in multi-turn, part-turn and linear configurations.

- Non-intrusive infra-red or *Bluetooth*® technology for simple configuration
- Rugged construction double-sealed to prevent water and dust ingress during site wiring (IP66/IP68 - 7 m, 72 hrs)
- Highly intuitive user interface with multilingual text display for status and setup
- Oil bath lubricated
- Detachable thrust bases across the entire range
- Explosionproof option available
- Approved for use in SIL applications
- Multi-turn direct drive: 14 to 3,000 Nm (10 to 2,200 lbf.ft) Secondary gearboxes are available
- Single-phase, three-phase and DC supplies

See PUB002-001 for further details.

## IQ Remote Hand Station



Remote Hand Station enables remote operation, interrogation and configuration of IQ 3rd generation actuators. For use when the actuator is located in a hazardous, inconvenient or unpleasant location.

- Installation using standard data cable, up to 100 metres away from the actuator
- Powered via the attached actuator (24 VDC output)

See PUB002-056 for further details.

## IQM – multi-turn modulating actuators



The IQM includes all the advanced features of the IQ range combined with Rotork's motor and gearing technology to produce an intelligent modulating actuator range.

- Direct output 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 – part-turn actuators



For part-turn applications the IQT incorporates advanced features from the IQ range, is designed for direct drive and can be mounted at any operating angle.

- Simple configuration and commissioning non-intrusively using infra-red technology
- Secure self-locking output for butterfly valve and dampers without the use of additional brakes
- Direct drive quarter-turn output
- Variable output speed
- Torque range 50 to 2,000 Nm (36 to 1,475 lbf.ft)

See PUB002-001 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)  
Part-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.

## Q – single-phase part-turn

### Q range



The Q range is a single-phase part-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.

## 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.

## 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. 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.

# Electric Control Valve Actuators

## Linear and rotary / part-turn 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.

## IQTF Pro – Full output turn actuators

### IQT range



The IQTF provides extended output rotation for part-turn valve types requiring more than 90° for operation. Typical valves include 180° and 270° diverter valves and multiport manifolds requiring bi-directional 360° operation. The IQTF actuator has a low output speed for increased positional accuracy and may also be utilised for low turn, multi-turn applications where slow operation is required. Additional features listed on p7.

- Available for three-phase, single-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
- Standard duty S2/S3 25%, Modulating duty S4 50%

See PUB002-006 for further details.

## Linear, part-turn and rotary actuators

### CMA range



- Linear: Up to 3336 N (750 lbf) rated thrust and 5004 N (1125 lbf) seating thrust
- Part-turn: Up to 113 Nm (1000 lbf.in) rated torque and 124 N (1100 lbf.in) seating torque
- Rotary: up to 28 Nm (250 lbf.in) rated torque, up to 45 Nm (400 lbf.in) rated torque with GB3
- Precise control and continuous modulation
- *Pakscan*, HART, Profibus, Modbus, Devicenet and Foundation Fieldbus available. Optional hard-wired RIRO (Remote In Remote Out)
- Seating torque / thrust capability (60-150% of rated) for required tight sealing at the valve in the CLOSE position
- Temp. range for EP Product: -20 to 65 °C (-4 to +149 °F)
- Temp. range for WT Product: -30 to 70 °C (-22 to +158 °F)
- Options: local controls & fail-to-position Rotork Power Pack

See PUB094-001 for further details.

## Linear, part-turn and rotary actuators

### GPSA range



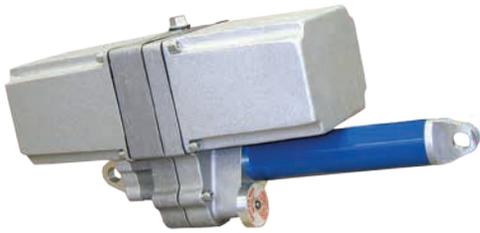
- Rotary: Rotation 90° to 20 turns
- Rotary: Torque range up to 14 Nm (125 lbf.in)
- Linear: Stroke distance up to 35 mm (1.375")
- Linear: Thrust range up to 890 N (200 lbf)
- Continuous unrestricted modulating duty
- HART, Profibus and Foundation Fieldbus available
- Temperature range from -30 to 65 °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.

# Accurate Damper Drive 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.

# HVAC Solutions – Explosionproof Actuators and Control Systems

## Part-turn explosionproof actuators

### ExMax range



ExMax electric 90° part-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)
- Certificates: ATEX, IECEx, CSA, Inmetro, Kosha, GOST, RTN and others
- Control modes: On-off, 3 pos., modulating (0-10 VDC, 4 to 20 mA)
- Optional spring-return configuration (1 second available)
- 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

## 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 and 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)
- Certificates: ATEX, IECEx, CSA, Inmetro, Kosha, GOST, RTN and others
- Watertight IP66 rating, integrated junction box

## 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 (failsafe operation) in combination with ExMax.

- Thrust range 500 to 10,000 N (112 to 2,248 lbf)
- Certificates: ATEX, IECEx, CSA, Inmetro, Kosha, GOST, RTN and others
- Optional spring-return configuration (1 second available)
- 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 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)
- Certificates: ATEX, IECEx, CSA, Inmetro, Kosha, GOST, RTN and 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

# Fluid Power Actuators and Control Systems

## 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 Germany, Italy, Sweden, UK and USA, providing the capacity to produce a high volume of products, ensuring that you deliver your projects on time.

Rotork Fluid Systems delivers the following product ranges:

- Pneumatic rotary and linear valve actuators
- Hydraulic rotary and linear valve actuators
- Electro-hydraulic valve actuators
- Subsea valve actuators
- Vane-type pneumatic valve actuators
- Smart valve monitoring systems (SVM)
- Control systems

A full listing of our worldwide sales and service network is available on our website at [www.rotork.com](http://www.rotork.com)

### Centres of Excellence – Knowledge and Experience

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.

### 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)



## Fluid Power Actuators

### 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)
- Certified suitable for use at SIL3 as a single device (IEC 61508)
- Smart Valve Monitor (SVM) partial stroke testing compatible

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)
- Smart Valve Monitor (SVM) partial stroke testing compatible

See PUB020-001 for further details.

### Compact quarter-turn self-contained actuators

#### CQ range



The CQ self-contained actuator is a fully concentric design based on a helical mechanism, transforming the linear motion of the piston into a quarter-turn rotation of the valve stem.

- Weatherproof housing suitable for harsh environments
- Applications: SIL3, functional integrity, safety, limited space
- Pneumatic and hydraulic, single- and double-acting
- Torques up to 600,000 Nm
- Stroke adjustment 90° ±5°
- Std. temp. range -30 to 100 °C (-22 to 212 °F)  
Low temp. range available down to -60 °C
- Certified to IP66M/IP68M, PED, ATEX, IECEx, GOST

See PUB119-001 for further details.

### 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
- Certified suitable for use at SIL3 as a single device (IEC 61508)
- Smart Valve Monitor (SVM) partial stroke testing compatible

See PUB014-004 for further details.

# Fluid Power Actuators

## Gas over 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)
- Smart Valve Monitor (SVM) partial stroke testing compatible

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)
- Smart Valve Monitor (SVM) partial stroke testing compatible

See PUB016-001 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
- Complies with EN60529 (1991) + (A1:2000) for IP67M
- Actuators certified in accordance with PED 97/23/EC
- Certified suitable for use in SIL3 as a single device in accordance with IEC 61508
- Smart Valve Monitor (SVM) partial stroke testing compatible

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

### 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.

### Electro-hydraulic fluid power stepping actuators

## Midland-ACS range



The Midland-ACS range electro-hydraulic stepping actuators are a cost effective solution for the positioning control of choke valves.

- Extended opening and closing operating speeds with all optional features associated with the double-acting, single-acting and quarter-turn options
- Remote switching to activate / deactivate stepping function
- Reliable operation reduces cost of ownership
- Compact design reduces installation cost
- Lower cost of maintenance

See PUB025-003 for further details.

### 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.

### Mechanical fluid power stepping 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.

# Fluid Power Actuators

## 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.

## Subsea actuators

### GSH GSR GSL GSP ranges



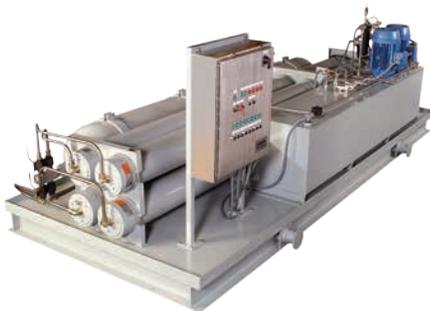
The subsea product range encompasses actuator and gearbox designs for retrievable and non-retrievable applications. We are familiar with supplying subsea product to meet the harsh conditions and stringent demands of subsea applications.

- 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
- Smart Valve Monitor (SVM) partial stroke testing compatible

See PUB022-001 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 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.

# 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 18,300 Nm (155,000 lbf.in)
- Certified to IP66M / IP67M and meets NEMA 4 / 4X
- CE marked and certified in accordance with ATEX 94/9/EC
- 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
- Capable of millions of operations at fast cycle times

See publication PUB097-001 for further details.

## Damper drives

### TYPE K range



- Direct 'drop-in place' design matches existing damper drive take-out dimensions
- Rotary and linear versions available
- Torque output up to 28,201 Nm (250,000 lbf.in)
- High-speed operation as quick as 3-5 seconds full scale
- High temperature options up to 149 °C (300 °F)
- Highly accurate and responsive
- Designed for safety and serviceability in harsh environments
- Control options: Profibus, HART and Foundation Fieldbus bus control. Pneumatic, analogue and digital positioners
- Infinite duty cycle

See publication PUB000-062 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
- Certified suitable for use at SIL3 as a single device (IEC 61508)
- Actuators certified in accordance with PED 97/23/EC
- Actuators certified to ATEX 94/9/EC
- Smart Valve Monitor (SVM) partial stroke testing compatible

See PUB014-001 (RC200) and PUB014-002 (RCI200) 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, filter regulators, shuttle valves, linebreak safety systems, partial stroke testing and a torque limiting device.

## 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](http://www.rotork.com)

### Worldwide Industry and Application Experience

With nearly 60 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, Young Tech, Soldo® and Rotork Midland companies:

#### Rotork Fairchild

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

#### Young Tech Co Ltd.

- Smart positioners for linear and rotary applications
- Aluminium and stainless steel products
- Standard and explosionproof components and systems
- Basic pneumatic and electro-pneumatic positioners
- Pneumatic valve control accessories

#### Soldo

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

#### Rotork Midland

- Air preparation components and assemblies
- Pneumatic solenoid, poppet and spool valves
- Hydraulic control assemblies
- Ancillary products

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.



## 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.



The Soldo® range of limit switchboxes, 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 switchbox 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.

### rotork® MIDLAND

Rotork Midland is internationally known as a manufacturer of 316 stainless steel control equipment with a reputation for high quality, reliability and innovation. Rotork Midland offers comprehensive solutions for filtration and regulation of compressed air and gases for the valve actuation industries:

#### Highest Quality

Using the finest quality stainless steels globally available, Rotork Midland oversees every detail and utilises state of the art quality systems. Our products are renowned for their superior leak proof design and high functionality, achieved through every employee's attention to detail throughout the process.

#### Reliability

Whether the application calls for high accuracy or simply rugged duty in extreme conditions, Rotork Midland has a proven track record for reliable field operation.

#### Innovation

As a worldwide market leader, Rotork Midland strives to provide innovative solutions to simplify the task of valve control packaging.



The YTC product line includes positioners from the base level pneumatic units all the way up to top level performance smart positioners. Available in both linear and rotary configurations, these positioner are highly engineered and quality built to provide dependable high performance.

#### Rugged and reliable

YTC designs utilise rugged torque motor style operation to provide reliability in harsh temperatures and environments. In addition, the heavy aluminium or stainless steel castings are designed for long-term use.

#### Versatile configurations

Whether the application calls for high accuracy automation or simply rugged duty in extreme conditions, YTC has numerous positioner alternatives and covers remote mount, super compact, and even angle seat valve stroke control. Valve monitoring is easy with the internal or external options available with any of the positioner units. YTC also provides a host of accessory products to allow complete pneumatic valve system specification.

#### Global acceptability

As a worldwide supplier, YTC has the track record, expertise and requisite pedigree to meet the needs of global engineering teams. Our R&D team designs for performance, quality and compactness, with an eye toward cost effective features.

## Valve Control Accessory Products

### Precision pressure regulators

#### PPR series



Rotork manufactures a complete line of precision pneumatic regulators including pressure reducing, back pressure and vacuum models.

- 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<sup>3</sup>/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 1 1/2"

See PUB103-001 for further details.

### Pneumatic volume boosters

#### PVB series



Rotork 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.

- Max supply pressure: 1,700 kPa (250 psi)
- Max output pressure: 1,050 kPa (150 psi)
- Flow capacity: 77 to 2,550 m<sup>3</sup>/hr (45 to 1,500 SCFM)
- Exhaust capacity: 12.8 to 552.5 m<sup>3</sup>/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: 1/4" to 1 1/2"

See PUB103-003 for further details.

### Electro-pneumatic transducers

#### EPT series



Rotork manufactures piezo-electric and feed-and-bleed versions that are extremely resistant to shock, vibration, and changes in positional orientation.

- 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<sup>3</sup>/hr (9 to 700 SCFM)
- Pipe sizes NPT: 1/4" to 1"

See PUB103-002 for further details.

### Pneumatic relays

#### PR series



Rotork pneumatic relays meet all the requirements of a precision device including accuracy, sensitivity and 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<sup>3</sup>/hr (14 to 150 SCFM)
- Sensitivity: As low as 0.32 cmWC (0.13 inWC)
- Pipe sizes NPT: 1/4" to 3/4"

See PUB103-004 for further details.

## Valve Positioners

### Smart positioners for valve automation

#### YT-3000 series



YT-3000 series for linear and quarter-turn actuators have flexible stroke range and rotational capability, automated set-up and calibration, and HART protocol operation. Suitable for all applications in hostile environments.

- Aluminium or stainless steel enclosures for standard or Ex IIC T5-T6 explosionproof applications
- Auto calibration and 4 button local control
- LCD display
- HART communication and feedback signal
- Limit switches and feedback signal
- 0.5% linearity

For further details see [www.ytc.co.kr](http://www.ytc.co.kr)

### Electro-pneumatic (E/P) valve positioners

#### YT-1000 series



YT-1000 series for pneumatic valve actuators. The E/P positioners easily adjust zero and span points and are available with a variety of feedback and limit switch indication options in standard or explosionproof versions.

- Aluminium or stainless enclosures – Designed for durability and high performance in high vibration environments
- Proven testing of over 1 million cycles
- 4-20 mA input signal provides quarter-turn or up to 150 mm linear stroke
- 1% linearity with 0.5% repeatability
- Fast internal response for efficient valve packages and low air consumption for economical use
- Simple 1/2 split range adjustment

For further details see [www.ytc.co.kr](http://www.ytc.co.kr)

### Pneumatic to pneumatic (P/P) valve positioners

#### YT-1200 series



YT-1200 series positioners for pneumatic valve actuators. Available with a variety of limit switch and PTM options, the positioner handles basic pneumatic valve actuation with ease.

- 2% linearity with 0.5% repeatability
- Designed for high vibration environments and extreme temperature of -40 to 120 °C (-40 to 248 °F)
- Tested for over 2 million cycles operation
- No resonance from 5 to 200 Hz
- Simple zero / span, direct / reverse & split range selections
- Auto and manual switch operation
- Economical operation due to less air consumption

For further details see [www.ytc.co.kr](http://www.ytc.co.kr)

### Valve positioner accessories



Rotork also provides a variety of pneumatic accessories to complete the valve actuation package including volume boosters, lock up valves and snap acting relays.

- Available in aluminium or stainless steel bodies
- Cv rates as high as 5.24
- Single and double-acting configurations
- ¼" up to ¾" ports available
- Fixed deadband and by-pass control boosters for stability
- Compact size products

For further details see [www.ytc.co.kr](http://www.ytc.co.kr)

## Valve Position Indication

### General purpose & intrinsically safe limit switchboxes

SS  
SP  
SB  
SF



*This is a small selection of general purpose switchboxes*

Limit switchboxes with local & remote position indication can be fitted with mechanical switches or proximity sensors.

- Polymer, aluminium or stainless steel enclosures
- Corrosion resistant enclosures NEMA 4/4X (IP65)
- Intrinsically Safe (IS) certification option; SIL 3 rated models available; Certification options: UL, CE
- 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
- 4-20 mA analogue transmitter available on most models
- Integral mounting brackets available on most models

*For further details see [www.soldo.net](http://www.soldo.net)*

### Integral solenoid valve limit switchboxes

HW



HW compact limit switch control unit with visual and remote electrical indication; internal solenoid valve(s) for valve control; integral NAMUR mounting kit.

- 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
- 4-20 mA analogue transmitter available on most models
- 3 position and dribble control options
- Integral mounting brackets

*For further details see [www.soldo.net](http://www.soldo.net)*

### Explosionproof limit switchboxes

SY  
SX  
SQ  
SW



*This is a small selection of explosionproof switchboxes*

Hazardous location aluminium or stainless steel limit switchboxes 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
- 4-20 mA analogue transmitter available on most models
- Integral mounting brackets available on most models

*For further details see [www.soldo.net](http://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. The NOVA BOLT has a patented sensing system able to sense any ferromagnetic material in any size.

- Aluminium or stainless steel enclosures
- Certification: 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
- SPST or SPDT inert gas hermetically sealed contacts
- 1/2" NPT cable entry or M20x1.5. No lead seals required

*For further details see [www.soldo.net](http://www.soldo.net)*

# Pneumatic and Hydraulic Valve Control

## Pneumatic valves



Designed and constructed of 316 stainless steel our ranges of pneumatic components are ideally suited for both hazardous areas and industrial use.

### Pressure regulators, spool and poppet valves

- Manual or auto drain
- 40, 25 or 5 (option) micron filters
- High flow capacities
- Many ranges available from 2 to 12 bar
- NACE compliant units available
- 3/2 and 5/2 function spool valves (poppet 3/2 only)
- Air pilot or solenoid pilot
- Direct solenoid operated
- Low temperature units available

For further details see [www.rotork.com/midland](http://www.rotork.com/midland)

## Hydraulic valves & manifolds



Custom engineered solutions: direct solenoid operated, low pressure air / hydraulic logic control of wellhead controls, BOP skids, chemical injection valves and partial stroking circuitry.

### DN series of hydraulic valves

Designed for severe offshore environments and certified for Zone 0, 1 and Class 1 Division 1 hazardous areas. These low power consumption units are constructed from 316L stainless steel. NACE compliance available. Low temp. -50 °C (-58 °F)

### Multi-station manifold systems

Compact, space saving systems minimise pipework, reduce system costs and are tailored to client specifications. 316L stainless steel with flow rates up to 200 l/min (45 g/min).

For further details see [www.rotork.com/midland](http://www.rotork.com/midland)

## Modular pneumatic controls



IMPACT (International Modular Pneumatic Actuator Control Technology) is a high integrity, modular pneumatic actuator control assembly in 316L stainless steel used for the control and sequencing of process valve actuators on oil and gas facilities and pipelines.

- Range of circuits available designed to request
- Units will interface with all global pneumatic actuators
- Simplifies valve automation reducing potential failure
- Ideal for both hazardous area and industrial use
- Lighter, stronger & eliminates joining pipework and fittings
- Reduction in CAPEX & OPEX over panel mounted assemblies
- IP66/67 ingress protection

For further details see [www.rotork.com/midland](http://www.rotork.com/midland)

## Valve control ancillary products



In addition to pneumatic and hydraulic system controlling valves, Rotork Midland offers a host of ancillary valves for directional flow control, quick exhaust, switch valves, and assorted other functional valve components for the control panel.

- Working pressures up to 12 bar
- -20 to +70°C (-4 to +158 °F) standard ranges
- 3/2 (1.0 Cv) and 5/2 (1.2 Cv) switches
- Uni and bi-directional flow regulators
- Needle and quick exhaust valves up to 11 Cv
- Thermal fuses and visual indicators
- Breathers and silencers

For further details see [www.rotork.com/midland](http://www.rotork.com/midland)

## Valve Gear Operators and Accessories

# 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 an extensive range of valve gearboxes, designed to withstand the harsh challenges of valve operating 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.

Rotork Gears delivers the following product ranges:

- Manual and motorised multi-turn gearboxes
- Manual and motorised quarter-turn gearboxes
- Worm gear quarter-turn gear operators
- Subsea quarter-turn gear operators
- Override quarter-turn gear operators
- Mounting kits and accessories

A full listing of our worldwide sales and service network is available on our website at [www.rotork.com](http://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.

### 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 environmental testing in-house.

### 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.

#### Rotork Gears is committed to:

- Building business success through customer satisfaction
- The promotion and full understanding of customer needs within the organisation
- Continuous improvement of products and customer service operations
- 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.

# Valve Gear Operators and Accessories

## IB motorised multi-turn gearboxes

### IB bevel gear operator



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

- Torque range up to 8,135 Nm (6,000 lbf.ft)
- Thrust range up to 1,320 kN (296,750 lbf)
- Totally enclosed gearing
- Grease filled for life
- Removable output sleeve
- **IBN gearbox – Tested for nuclear applications**

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

## Bevel gear operators

### HOB/MPR range



Cost effectively designed commodity hand operated bevel gears suited for sluice gates, gate, and globe valves.

- Torque range up to 8,018 Nm (5,914 lbf.ft)
- Thrust range up to 1,557 kN (350,028 lbf)
- 11 sizes, ratios from 2:1 to 81:1
- Cast iron body
- Maintenance free
- IP67

**Options:** All types of environment. Position indicators. IP68.

## 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



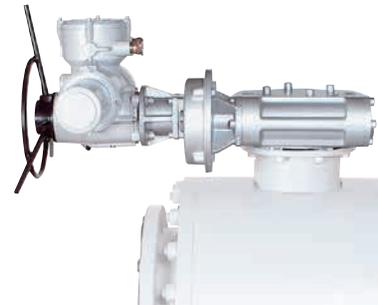
Complete range of manual declutchable sandwich override quarter-turn gearboxes for double-acting (D) and spring-return (S) pneumatic actuators.

- 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 3000:1
- 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.

See PUB085-006 (metric data) and PUB085-007 (imperial data) for further details.

### 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 2,200 to 500,000 Nm (1,623 to 368,800 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° ( $\pm 5^\circ$  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.

### 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

See PUB093-001 for further details.

### 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: visit [www.rotork.com/gears](http://www.rotork.com/gears)

### 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

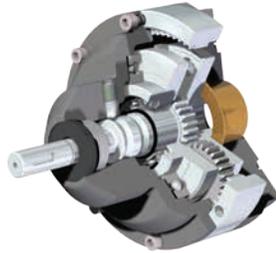
**Options:** Travelling nut for applications requiring mechanical stops. Lever arms. AWWA. All types of environment.

See PUB087-005 for further details.

# 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.

## 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 m, 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

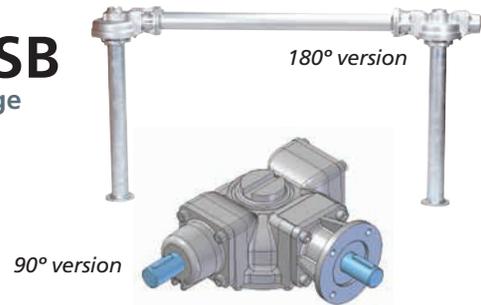
Mechanical remote position indicators for buried service and shaft extension applications. 3 sizes. Ratios: ECL1 up to 35:1, ECL2 up to 120:1, ECL3 up to 394:1.

#### 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.

## Dual shaft bevel gear operators

### DSB range

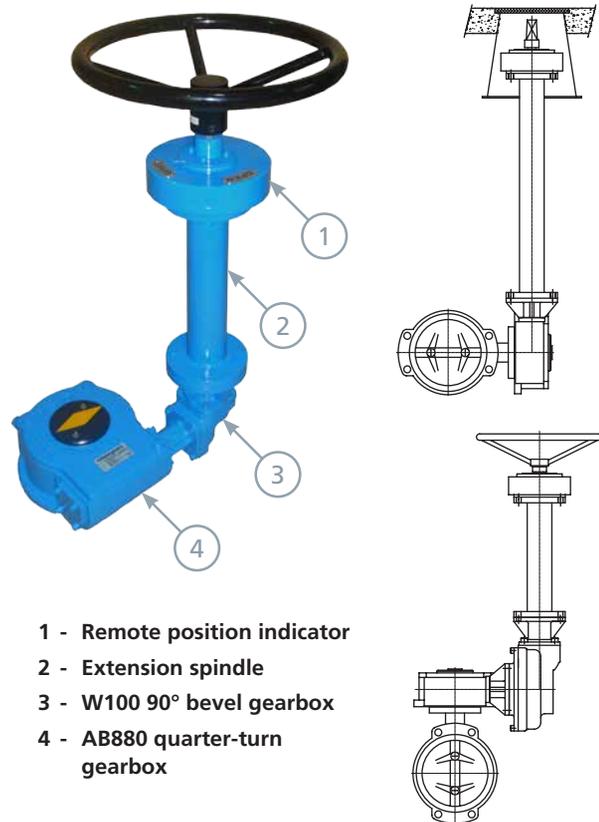


Complete range of multi-turn bevel gearboxes with two shafts for use with dual stem sluice gates and penstocks.

- Torque range up to 8,135 Nm (6,000 lbf.ft)
- Thrust range up to 1,320 kN (296,750 lbf)
- 13 sizes, ratios from 1:1 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.

See PUB027-001 for further details.



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

# Valve Gear Operators and Accessories

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 supply 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, switchboxes and positioners

See PUB063-040 for further details.



## Locking levers - secure and tamper proof designs

- Locking plates, for quarter-turn ball and butterfly valves
- Multi-turn locking flanges for valves and gearboxes
- Interlocked valves

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 1/4" 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.

See PUB063-030 for further details.



## Network Control Systems

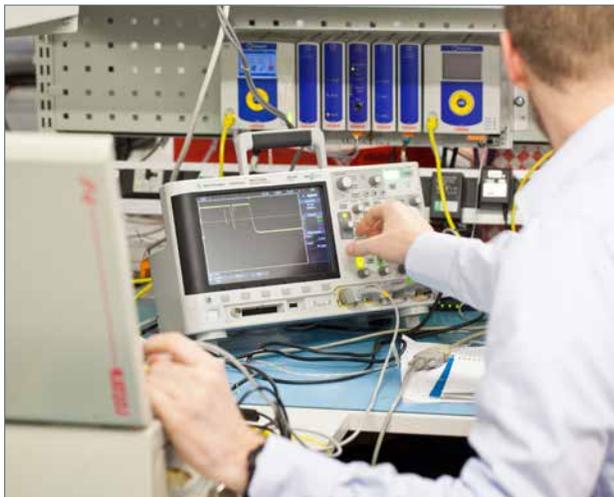
# rotork®

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®, HART® and DeviceNet®. See page 32 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](http://www.rotork.com)



## Bus Control System

# Pakscan™

The Rotork *Pakscan*™ system is a world leader in actuation control automation and has been at the forefront of network technology since 1986. *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
- Built-in web server for full systems diagnostics

See *PUB059-030* for further details.

# 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. The *Pakscan* 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

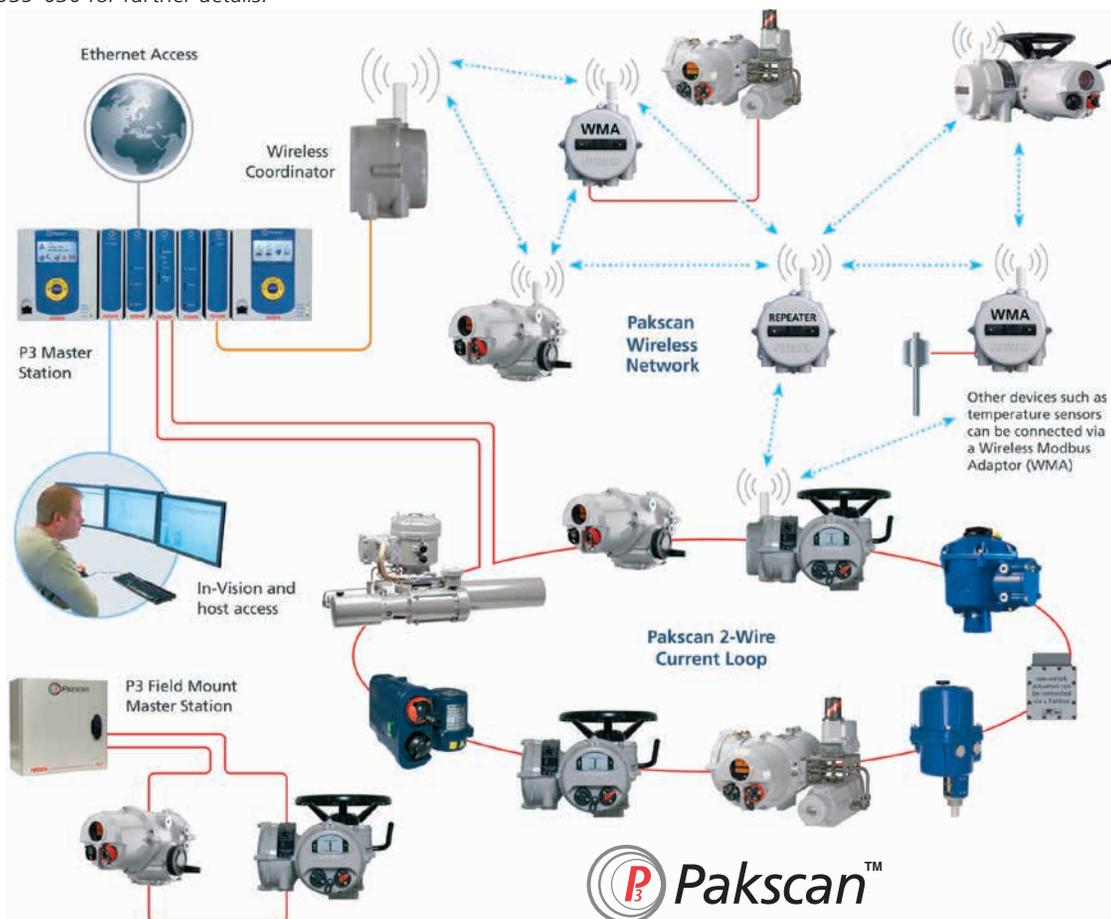
The *Pakscan* P3 Field Mount (P3F) Master Station enhances the P3 range by allowing the Master Station to be mounted close to the process. Enclosed in an environmentally protected IP65 box, it provides (via a DCS or PLC) control and monitoring of 32 field units utilising serial or TCP / IP Modbus communications. 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.



### 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 PUB088-001 for further details.



### 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 PUB089-001 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 (EDS) 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 PUB090-001 for further details.

## Multiple Bus Connectivity

# 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 PUB091-001 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 PUB092-001 for further details.

## Projects, Services and Retrofit

# rotork® Site Services

Rotork staff are dedicated to providing client support across all Rotork divisions with the aim of maximising the client production cycle. 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.

We provide a full range of flow control services:

- Emergency and planned service
- Actuator overhauls
- Health checks
- Preventative maintenance
- Retrofitting actuators to existing valves
- Shutdown outages
- Certified inspection and safety checks
- Factory fitting of actuators to new valves
- Plant optimisation
- Repairs and upgrades
- Loan actuator service
- System Integration projects
- Automation projects

Visit [www.rotork.com](http://www.rotork.com) to identify your nearest Rotork Site Services centre.



### Client Support Programme

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



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

### Features of the CSP 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 CSP include but are not limited to:

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



# 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.

## Automation 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.

## 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.

## 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.



## 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.

## 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.

## 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.



# rotork®

Keeping the World Flowing

[www.rotork.com](http://www.rotork.com)

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

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



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As part of a process of on-going product development, Rotork reserves the right to amend and change specifications without prior notice. Published data may be subject to change. For the very latest version release, visit our website at [www.rotork.com](http://www.rotork.com)

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