

rotork

INDUSTRY LEADING FLOW CONTROL NEWS FROM THE WORLD OF ROTORK

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A Botlek engineer uses the wireless hand-held setting tool on a Rotork Skilmatic SI valve actuator, Botlek Tank Terminal (BTT) Rotterdam. Full story Page 3.



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INDUSTRY LEADING FLOW CONTROL
NEWS FROM THE WORLD OF ROTORK

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The recently opened Botlek Tank Terminal (BTT) at Rotterdam relies on Rotork's latest electric valve actuation technologies for automated flow control and vital safety related duties associated with the import, export and storage of a varied range of liquid bulk products.

Construction of the €70 million first phase of the terminal began in April 2010 and was completed within budget and on time by the Polish company Polimex-Mostostal S.A. BTT has 34 storage tanks, providing a combined storage capacity of 200,000 cubic metres, of which 130,000 cubic metres is earmarked for clean fuels and the rest is for edible oils and biodiesel. The state-of-the-art terminal has deepwater berths including a 420 metre jetty that can simultaneously accommodate two seagoing vessels and two barges, operating 24 hours-a-day.

Over 250 Rotork IQ Pro multi-turn and quarter-turn intelligent electric actuators have been installed to operate the valves that control the routine movement of liquids throughout the site. A further 55 Rotork Skilmatic SI self-contained electro-hydraulic actuators have been installed in strategic areas on valves that provide fail-safe Emergency Shutdown (ESD) protection from potential accidents and spillages. All the Rotork actuators are monitored and controlled on fully redundant Rotork Pakscan digital bus loops, linked by three Pakscan P3 master stations to the site's central SCADA system.

The Skilmatic SI actuators are equipped with integral circuitry designed to receive a separately hardwired discrete ESD alarm signal that will override any other input and move the actuator to the pre-determined safe position, even in the event of electrical power failure. These actuators are situated on the inlet and outlet ports of the storage tanks and on the marine and truck

Rotork provides electric solutions at the Botlek Tank Terminal



Rotork Skilmatic SI electro-hydraulic fail-safe valve actuators on the loading jetty.



Aerial view of the Botlek Tank Terminal.



Rotork IQ Pro and Skilmatic SI valve actuators in a tank manifold area.

loading bays. They are key components in the Safety Instrumented System (SIS) that operates with dedicated level and flow sensors and ESD logic solvers to provide the site's Safety Instrumented Function (SIF).

BTT General Manager Charles Smislaert pointed out that the Rotork Skilmatic electro-hydraulic solution for ESD protection at the site had been selected as a more robust and reliable alternative to air operated actuators, which also require more maintenance.

All Rotork actuators at BTT feature ATEX explosionproof certification and IP68 double-sealed watertight enclosures designed for harsh and exposed environments. They also share Rotork's IQ Pro non-intrusive setting, commissioning and data communication technologies, enabling actuator configuration and Data logger files to be transferred from the field to the office for diagnostics, analysis and storage. In combination with Rotork IQ-Inspire software, this data can help to maximise plant utilisation by identifying potential valve wear problems and facilitating predictive maintenance.

The punctual completion of the tank farm was assisted by the nearby presence of Rotork BV's fully equipped workshop, which provided the facilities to motorise all the valves, encompassing gate and butterfly designs in sizes up to 16 inches, before shipping them to site as complete, factory tested packages. Rotork also assisted with installation and commissioning and will continue to provide local support for all the installed actuators.

Rotork launches 3rd generation IQ range of intelligent non-intrusive electric valve actuators

COVER STORY

Rotork is proud to announce the introduction of the 3rd generation of its flagship IQ range of intelligent non-intrusive heavy duty electric valve actuators.

Benefitting from over 50 years of practical operating experience throughout the world and continuous feedback from all of Rotork's valve actuation markets, the IQ3 now introduces new levels of functionality and asset management abilities combined with further refinements to a well-proven and rugged mechanical design. The 3rd generation intelligent electric actuator strengthens the pedigree of a product that has led the way in actuation technology since its first appearance in the early 1990s.

The large wide viewing angle indication window is the focus of attention for non-intrusive two way wireless communication and multi-functional indication, encompassing user-friendly menus for setting-up, configuration and commissioning, local position indication, valve and actuator status, asset management and diagnostic operating information.



IQ3 actuators are available as three-phase, single-phase and DC variants.



Wireless two-way communication using the non-intrusive hand held setting tool is a secure way of programming the actuator and accessing asset management data.

An LCD segment display provides positional and warning icon information, whilst actuator setup and operating menus along with detailed diagnostic and operational data screens are clearly displayed in dot matrix format. Four selectable Home-screens provide a quick view of operational status and process information in real-time without having to navigate to the diagnostic screens. The four selectable screens include: Position with text status, Torque (analogue scale) & Position, Torque (numerical scale) & Position and Demand & Position.

Diagnostic graphics present a window into the process, showing the valve torque and usage profiles along with service logs, facilitating real time analysis directly at the actuator.

The new hand-held setting tool uses an infrared signal to check that both items (actuator and setting tool) are Rotork devices before pairing them together using *Bluetooth*[®] wireless technology. The security enabled by this technology is further enhanced by the ability to enable or disable the *Bluetooth*[®] link as the method of further communication.

Advanced IQ data logging and communication capabilities have been increased in response to the end users' desire to access more data, both in the field and in the control room.

Continued on page 6

1 Rugged and reliable operation using simple worm and wheel drive train, proven in over fifty years of reliable operation on every continent.

2 Valve position maintained even if the actuator is removed. Separable thrust bases remain in position on the valve across the range.

3 Non-intrusive, wireless communication; actuator can be securely set up, updated and interrogated whilst permanently protected from the ambient environment.

4 Absolute position measurement at all times with or without power through use of the Rotork absolute encoder.

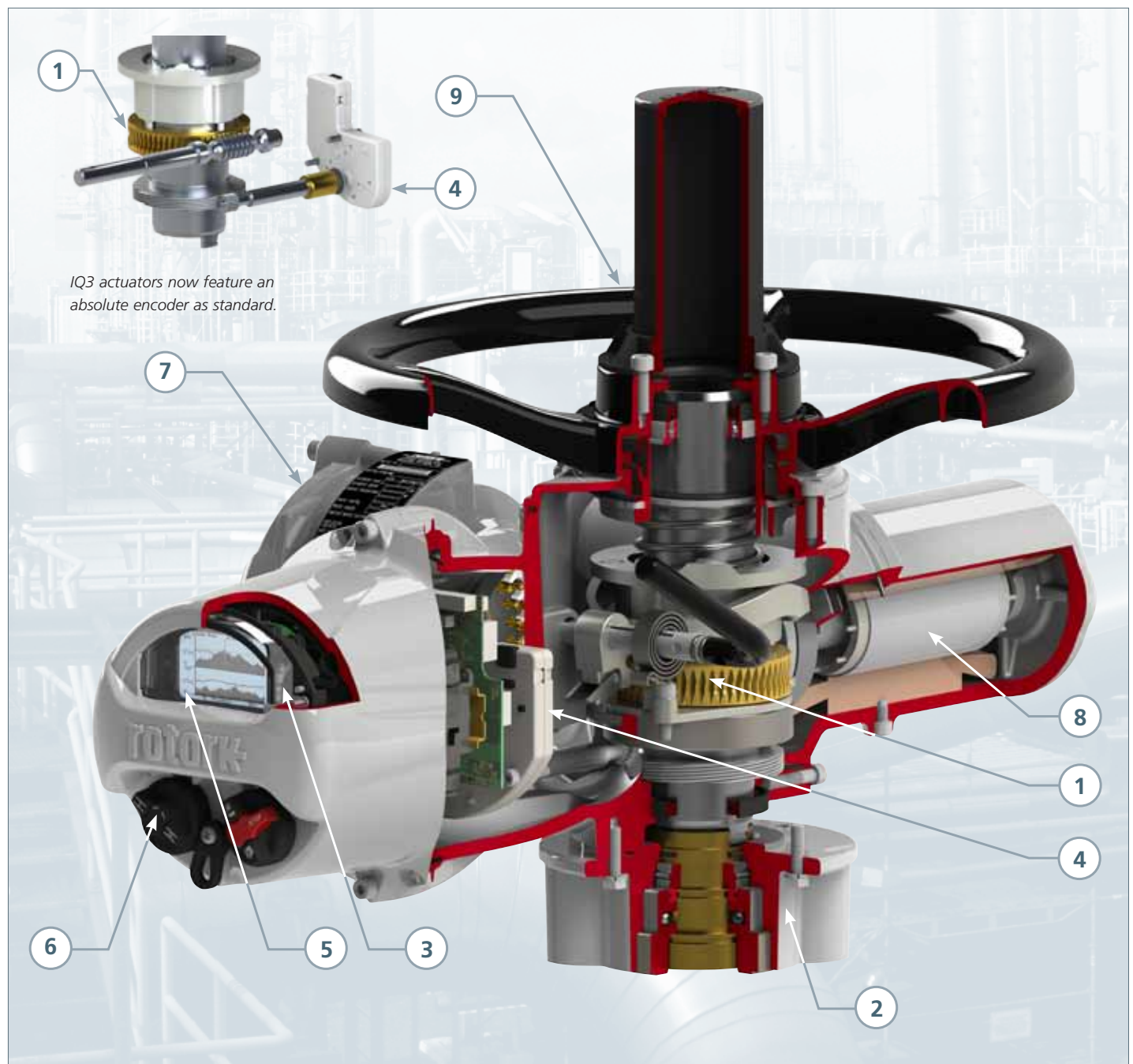
5 Quick and easy commissioning and configuration. Detailed screens provide flexible, at-a-glance views of plant status and remain functional even at very low temperatures.

6 Improved environmental sealing increasing reliability through padlockable local/remote selector switch, operating internal switches without penetrating shafts which would require individual sealing.

7 Enhanced reliability. IP68 watertight and temporarily submersible enclosure with Rotork's legendary double-sealed terminal compartment.

8 Actuators suitable for three-phase, single-phase or DC motors. Isolating, regulating and modulating duty versions.

9 Reliable emergency manual operation via direct drive or geared handwheel, both with lost motion 'hammerblow' effect. Includes padlockable hand/auto clutch for safe operation if the motor is running.



IQ3 actuators now feature an absolute encoder as standard.



Rotork Insight2 software streamlines actuator set-up and facilitates asset management.

Using the setting tool with Bluetooth® wireless technology the data from the actuators can be transferred to a PC for analysis using freely available Rotork Insight2 diagnostic software. Valve maintenance requirements can be identified and anticipated, eliminating unplanned interruptions to the process or over-cautious planned maintenance outages.

A patented absolute encoder with built-in redundancy and self checking mechanically tracks valve positions even if the actuator is manually operated when the power is off. No power is required for the actuator to reliably and accurately measure position. Using the latest technology and following several years of testing, the IQ absolute encoder has only four moving parts and can measure up to 8,000 output turns. Local LCD and remote contact indication is maintained and full configuration of the actuator settings during a power outage is enabled by the standard battery.

Mechanical improvements include new handwheel assemblies, new non-intrusive local control switches and optimised corrosion protection by material and coating selection.

Thrust bases have been re-engineered as separate components on all models in the IQ range, enabling actuators to be removed from the valve without altering the valve position. The IP68 watertight and temporarily submersible double-sealed enclosure is universal to all actuators, including those with explosion-proof certification, ensuring long term reliable performance in the most challenging environments. Rotork 3rd generation IQ3 multi-turn actuators are designed for valves of all types, sizes and description, either by direct attachment or in combination with secondary gearboxes.

A full description can be viewed and downloaded from:
www.iqactuator.com



Rotork's legendary double-sealed terminal compartment.



The IQ3's new smooth rim handwheel design.



Rotork retrofit improves valve actuation efficiency at Amsterdam water treatment plant

An engineer uses the wireless handheld setting tool to download data logger files from one of the Rotork IQTM actuators at Vogelenzang for storage in the asset management programme.

Rotork modulating electric valve actuators have been installed in an efficiency upgrade project at a large water treatment works serving the Dutch capital city of Amsterdam.

The modern and highly automated plant at Vogelenzang, owned by Waternet, has a daily water treatment capacity of 180,000 cubic metres. The treatment regime comprises pre-screening, carbon filtration, ozone injection and sand filtration. Waternet is the only water company in the Netherlands to cover the entire water cycle, from the treatment of waste water and

provision of drinking water to cleaning and maintaining levels of surface water. These services are performed on behalf of the Regional Public Water Authority – Amstel, Gooi and Vecht – and the City of Amsterdam.

Reliability problems had arisen with the electric actuators on the carbon filtration plant at Vogelenzang, which were failing to cope with the modulating valve duties required for efficient filtering and backwashing operations. Rotork's solution has been to remove the old actuators, install IQTM Pro quarter-turn modulating actuators directly onto the affected butterfly valves and connect to the existing power and control cabling. This work has

been performed by Rotork Site Services, Rotork's specialist division for retrofitting, site maintenance and repair activities.

The site wiring interface with the old actuators was by means of plug-and-socket connections. In order to retain these, Rotork engineered a separate plug-and-socket housing, locally sited by each new actuator and connected to the actuator terminal compartment. This has speeded up installation and enabled the new actuators to be retrofitted with minimal modification to site wiring.

On completion of the project, a total of 120 Rotork IQTM 1000 actuators have been installed

on DN350 and DN400 butterfly valves. Rotork has also been awarded a ten-year maintenance contract for the actuators, involving tri-annual inspections and functional testing.

All Rotork IQ actuators incorporate standard features designed for increased functionality, optimum plant utilisation and improved long term asset management. For example, an integral data logger stores historical operating data, including the sequence of valve torque profiles. This information can be downloaded and analysed with Rotork's PC-based IQ-Insight software to establish predictive maintenance schedules or identify potential problems.

Rotork Fairchild - The first company in the new Rotork Instruments division

The Rotork Instruments division has been created to provide services and products in the wider flow control market and in particular products associated with flow and pressure control, diagnostics and information gathering technology.

Rotork Fairchild, a market leading manufacturer of precision pneumatic controls and power transmission products, is the first member of the Rotork Instruments division. From its headquarters in Winston-Salem, North Carolina USA, Fairchild produces a comprehensive range of pneumatic regulators, boosters, relays and transducers, as well as speed and position control transmissions, designed to perform critical duties with precision and reliability.

The products are used for original equipment and capital project applications as well as in maintenance, repair and operations in a wide range of industries including oil & gas, automation, pulp & paper, chemicals and pharmaceuticals.

The company serves the global market through its state-of-the-art engineering, design and assembly facility in North Carolina, well established sourcing relationships and distribution centres in China, India and Brazil, supported by a network of 125 international distributors.

In addition to the expansion of its global sales reach, a key element of Fairchild's growth plan is the development of innovative new products to gain market share and address new markets. Fairchild is well regarded as an industry leader in the provision of custom-engineered solutions to meet customers' developing needs. Continued focus on product development is aimed at future expansion in areas including the medical industry, as illustrated by a recent hyperbaric chamber application.



In this example, the aim is to maintain the tightly controlled flow and pressure of an oxygen-enriched atmosphere into and out of the chamber, which is used for patient injury and therapy treatment. The overall system must be fast, accurate and versatile.

The solution is to use the Fairchild Model T7800 Transducer to provide accurate pressure control to the means of inflation. The Model 4500 Volume Booster can also be incorporated into the system to dramatically boost the air flow and provide a faster response in order to minimise the cycle time.

rotork[®] Instruments

Elsewhere valve operation in remote locations provides more applications for Fairchild products. For example, on plunger lift and gate stations the natural gas industry, gas and water valve control is required in the absence of conventional power sources. The solution has been provided by the use of the Fairchild Model MP2400 Precision M/P Converter in conjunction with a 12-24 Volt solar powered supply.

Rotork Fairchild can be contacted via the Rotork website or via email at: cs@fairchildproducts.com

PPR Series - Pneumatic pressure regulators

These devices provide highly accurate control of output pressure. They are able to handle fluctuating supply pressure, vibration and temperature variations.



EPT Series - Electro-pneumatic transducers

Products in this range generate a pneumatic output, proportional to the voltage or current of an electrical input. Products include high accuracy, high performance and explosion-proof variants.



PVB Series - Pneumatic volume boosters

These products are used to convert low flow pneumatic signals to high flow outputs. They are accurate and fast acting, available in a number of specific variants.



PR Series - Pneumatic relays

This extensive line of products is used to transform pneumatic signals, performing mathematical operations on one or more inputs.

New Rotork Directors appointed

Pamela Bingham - Group Business Development Director

Pamela Bingham joins Rotork as Group Business Development Director, a new position, created in line with Rotork's strategy for the further development of new business, new customers, acquisitions and external relationships.

Pamela has held directorial positions in the engineering industry for the past seven years, working in legal, commercial and business development roles. She joins Rotork from David Brown Gear Systems Limited, where she was a senior executive on the Leadership Team. She qualified as a solicitor in Scotland twenty years ago, having achieved an honours degree in law and a postgraduate diploma in legal practise from the University of Edinburgh. She re-qualified as an English lawyer in 1996.

Pamela has built her career from a strong background in legal roles to one where she has taken on broader executive and strategic responsibilities, focusing on the development and implementation of strategies for business growth through organic growth and acquisition.

Working in legal and directorial positions in companies serving industries that include oil and gas, utilities, railways, mining, defence, water and renewable energy, these duties have provided in-depth experience of competitive global markets including emerging and developing economies.

Speaking about her new appointment, Pamela said: *"I am delighted to be joining Rotork to assist in the execution of its long term strategy of expanding into the wider flow control market, which will undoubtedly provide further opportunities for growth."*



Pamela Bingham, Rotork Group Business Development Director.



Philip Burness - Rotork Site Services Director

As Director of Rotork Site Services, Philip Burness is responsible for Rotork's worldwide after-sales and engineering projects business.

Philip brings to his new position over thirty years' experience in process industry service and maintenance activities, most recently as the Service Director for a leading international manufacturer of instrumentation and control systems.

His previous experience includes instrument and control design, implementation and maintenance

responsibilities in the chemical, plastics and power generation industries.

As Rotork Site Services Director, Philip will work with Rotork's worldwide sales and service company network to continue the growth of after sales support, engineering projects and life of plant services.

In this important role he replaces Grant Wood, who has been appointed Managing Director of Rotork Controls, Rotork's electric valve actuation division.

Andrew Withers - Rotork Controls Technical Director

Andrew Withers has been appointed Technical Director for Rotork Controls, the electric valve actuation division of the global Rotork flow control engineering group. In his new position he will be responsible for new product developments and research functions involving all of Rotork's electric actuator product lines.

Andrew will be taking over from Graham Ogden who, as Rotork Group Research and Development Director, will now focus on developments encompassing all of the Rotork Group divisions – Controls, Fluid Systems, Gears and Instruments – as well as directing specific strategic group programmes.

Andrew joined Rotork in 2002 as a Graduate Electronics Design Engineer following the award of a First Class Honours Degree in Electronic Engineering at the University of Manchester Institute of Science and Technology.



His work has been closely involved with major product developments embracing Rotork's intelligent IQ electric actuators, the S/EH electro-hydraulic actuator ranges and the innovative CVA electric control valve actuator.

Promoted to Senior Engineer in 2009, he became Electronics Design Manager in 2011, where he has played a major part in the introduction of the 3rd generation flagship Rotork IQ range of intelligent electric valve actuators.

Rotork electric modulating actuators have been installed in an upgrade at the RWE npower Fawley Power Station in southern England.

Built in the late 1960s, the oil-fired station is capable of supplying the National Grid with 1,000 megawatts of power to balance supply and demand at times of peak usage. It is therefore essential that the station can respond to the National Grid demands with speed and flexibility. The Rotork actuators have replaced obsolete hydraulic actuators and power packs that were requiring increased levels of costly and time consuming maintenance and presenting ongoing issues involving the use of hydraulic oils. These included high operating pressures and the potential for safety and environmental issues associated with leaks. The power packs also required continuous electrical power to maintain hydraulic pressure. By comparison, the Rotork actuators only use electricity when they are operating and do not require routine maintenance.

The upgrade project was awarded to Exeeco Actuation Projects and Service (APS), a company that specialises in power station maintenance and upgrade services. APS responsibilities encompassed the removal of old equipment, installation of new actuators, wiring into new local junction boxes, commissioning and product training for staff at the station. The retrofitting began on the station's Unit 1 during the 2009 outage period with the installation of Rotork Type LA linear stroke actuators on reheat and super heater dampers and electric feed pump

Actuation upgrade improves power station combustion efficiency



Andrew Millard (right) Control & Instrument Engineer at Fawley Power Station pictured with Mike Dale from EXEECO APS (left) by the Rotork Type SM-6000 actuator.

speed regulators. This was followed by the installation of Rotork Type SM-6000 lever arm actuators on ID (induced draft) and FD (forced draft) fan discharge dampers. Upon completion of the project, a total of sixteen Type LA and four Type SM-6000 actuators have now been installed on Units 1 and 3.

The Rotork Type LA actuators deliver a self-locking linear stroke output of up to 610 mm (24 inches) at the rate of up to 2,000 starts per hour.

Rotork Type SM-6000 actuators deliver a self-locking rotational output ranging from 90° to 313° for continuous, unrestricted modulating duties.

Both types are specifically designed for the high temperatures, challenging environments and arduous duty cycles associated with power station operations. At Fawley the actuators are operated by the station's existing Emerson Ovation DCS system utilising 4-20 mA signals for position demand and feedback.



Rotork wins United Utilities framework agreement

Rotork has been awarded the new framework agreement for the supply of valve actuators to United Utilities, the UK's largest listed water company.

Serving a population of seven million, United Utilities operates 184 reservoirs, more than 700 water and sewage treatment plants and 170,000 kilometres of pipework and sewers in an area bounded by the English Midlands, the Irish Sea, the Scottish Borders, the Pennines and the Peak District.

After a period with another electric actuator manufacturer the move to Rotork follows the revision of the United Utilities specification for valve actuators to include an IP68 watertight and temporarily submersible enclosure, double-sealing and non-intrusive actuator configuration and limit switch setting.

Adele Green, United Utilities Category Buyer with Laurence Kettle, Rotork Frameworks & Contracts Manager.

These requirements, which are recognised by United Utilities as essential for long term environmental resistance, reliable performance and low maintenance, are standard design features of Rotork's IQ and IQT intelligent electric valve actuator ranges.

In addition to contributing to efficient plant operation, they also help to reduce the overall cost of ownership.

In the photograph, Adele Green, United Utilities Category Buyer (Supply Chain & Commercial – Asset Management & Performance Services) is pictured with Laurence Kettle, Rotork Frameworks & Contracts Manager, following the signing of the new agreement.

Commenting on the award, Laurence said: *"Rotork is looking forward to the successful implementation of this new opportunity to serve United Utilities and its business partners."*

Rotork supports innovative offshore wind farm technology

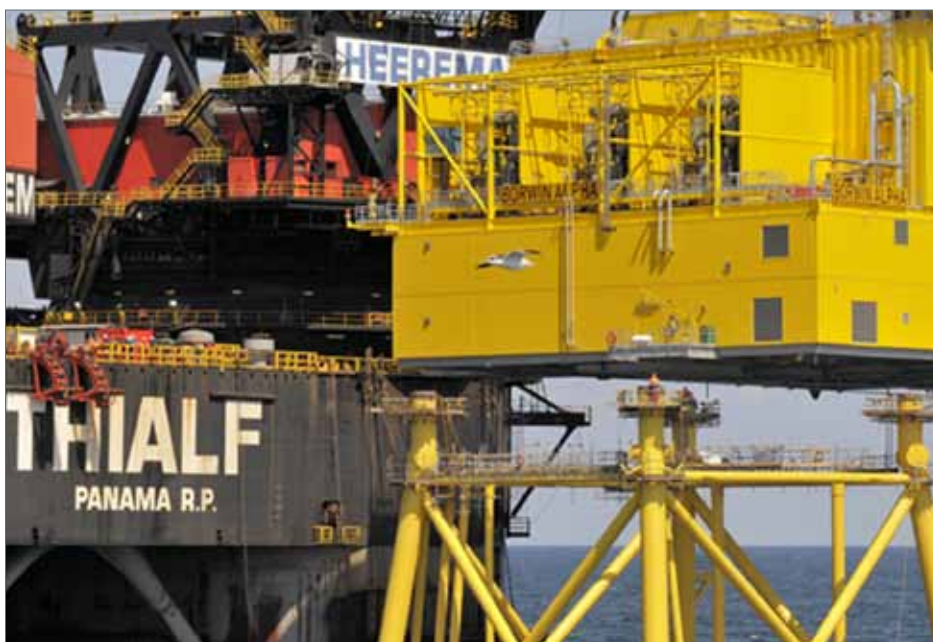
An offshore platform in the North Sea that is the first of its type to serve a power generating wind farm is home to fifty Rotork IQT Pro intelligent electric valve actuators.

The Borwin Alpha platform is the first offshore installation designed to convert AC power into high voltage direct current (HVDC) for onward transmission. Built and designed by the Heerema Fabrication Group on behalf of ABB, the facility can transfer a power of 400 MW at a bipolar voltage of 150 kV. The converted current is carried by a 200 kilometre cable for onshore connection to the European power grid.

The BARD Offshore 1 wind farm that is served by the Borwin Alpha platform is situated 100 kilometres northwest of the German island of Borkum. Eighty wind turbines will be installed when the farm is completed in 2012.

The 200 kilometre cable connection to the mainland is the longest in the world for an offshore wind farm, as well as the first to utilise HVDC transmission.

The majority of the Rotork IQT Pro actuators are controlling the operation of butterfly valves in applications on the cooling system for the power conversion plant and the fuel systems for emergency generators. Some of the valves are installed within the platform superstructure whilst others are outside and exposed to



The Borwin Alpha platform topsides being lowered into position during installation.

the harsh North Sea environment. Reliable operation is enhanced by the double-sealed actuator enclosure design, combined with non-intrusive commissioning and data transfer technologies that permanently eliminate the need to remove any covers once the actuators are wired-up. Rotork IQT Pro actuators also incorporate increased functionality features

as standard for improved long term asset management. For example, an integral data logger stores historical operating data, including the sequence of valve torque profiles. This information can be downloaded and analysed with Rotork's PC-based IQ-Insight software to establish predictive maintenance schedules or identify potential problems.

Rotork Fluid Systems has supplied the specialised hydraulic actuator package for a second subsea safety isolation valve (SSIV) installation on the same offshore gas gathering project off the coast of Egypt.

The single acting, spring-return rack and pinion actuator, model number GSR-2-490-110F/CX, will operate a 16 inch ANSI Class 900 ball valve installed on the 11 kilometre export pipeline from the Seth Platform. This pipeline connects to the Tuna Platform export pipeline end manifold for onward transport to the shore via the TNW2 Platform.

The new actuator will operate an SSIV installed at a depth of 84 metres near to the Seth Platform, which, together with a check valve installed upstream of the ball valve, will prevent any gas backflow in the event of a pipeline or riser rupture in the proximity of the platform. A dedicated electro-hydraulic umbilical from the platform will control the actuator, whilst an integral valve manifold system on the actuator itself will enable local diver operation.

Rotork actuates subsea safety valve installations



This Rotork subsea hydraulic valve actuator package is the second to be supplied for SSIV duty at the same Egyptian gas field.

In addition, an actuator and gearbox declutch mechanism completes the provision of total valve control under all operating conditions, in combination with an ROV (Remotely Operated Underwater Vehicle) interface.

The installation is very similar to the Rotork actuated SSIV package that was previously supplied for the 24 inch export pipeline from the Tuna Platform in the same gas field. Both installations are equipped for pipeline pigging operations and fitted with superstructures for protection against accidental impacts and to prevent any interference with fishing activities.

Rotork has 20 years extensive experience of the design and manufacture of actuators for subsea installations. The company has successfully completed hyperbaric testing of its subsea products at simulated depths of 2,500 metres.

Rotork CVA specified for flow control duty on gas turbine pre-heater plants

The application demands unrestricted modulation of a three-way valve to control the pre-heated temperature of fuel gas for electricity generating turbines.

The Rotork CVA actuators have been installed on seven skid-mounted units supplied to Riyadh PP11, a power plant project serving the capital city of Saudi Arabia. Manufactured by Petrogas Gas Systems in The Netherlands, the units heat the gas on its way to the turbines by passing it through a chamber that is surrounded by an oil bath that is heated to a temperature of 185 °C.

A CVA actuator controls the position of a three-way valve on the inlet side of each unit to ensure that the process does not overheat. Operating from a 4-20 mA control signal, the

actuator moves the valve to control the heat output. Precise and responsive valve positional control, with repeatability and resolution at less than 0.1%, makes an important contribution to the overall high efficiency of the pre-heating performance.

Seven ATEX certified explosionproof CVQ quarter-turn actuators have been supplied to operate 200 mm (8 inch) Class 300 valves. The double-sealed CVA design also provides permanent environmental protection to IP68, with non-intrusive setting and commissioning technology. An integral data-logger facilitates valve diagnostics with predictive maintenance capabilities for efficient long term asset management.

Rotork's innovative CVA electric actuator has been specified for critical valve control duty on high temperature gas turbine pre-heater equipment supplied to the power generation industry.



A completed CVA actuator installation on one of the pre-heater skids at the Petrogas Gas Systems factory.

Failsafe CVA valve control assists efficient mineral grading

Rotork CVA electric control valve actuators have been specified for critical flow control duties on heavy duty mineral processing machinery manufactured by Mineral Engineering Processes Limited (MEP).



A Rotork CVA actuator installed on a TBS Hydrosizer, operated by the control signal from the adjacent density probe.

The MEP TBS Hydrosizer is used in the mining and mineral process industries throughout the world to separate materials, remove contaminants and beneficiate mineral particles that are generally less than 5 mm in size. Applications include coal preparation, the preparation of high-grade sand for concrete products, glass making or foundry use, the removal of silica from iron ore and the separation of a range of minerals such as zircon from sand, plus many others.

The TBS Hydrosizer process utilises an upward current of water to create a hindered settling classifier in which material within a narrow size band can be held in a state of 'teeter'. Smaller or lighter particles entering the classifier are displaced to the overflow, where they can be collected, whilst larger or heavier particles migrate to the bottom and are discharged through spigot valves, fitted in the bottom of the TBS Hydrosizer.

A well defined separation is achieved by maintaining a constant flow of upward current water, even though the level and nature of the mineral content in the water can cause the density to fluctuate. The constant flow of material is achieved by means of a 4-20 mA signal from a hydrostatic density probe within the Hydrosizer Tank, which is used to control the CVA actuator operation. The CVA adjusts the position of a valve, allowing material to discharge at a rate that is determined by the hydrostatic head. With resolution, repeatability and hysteresis performance quoted at less than 0.1% of full scale, the swift response

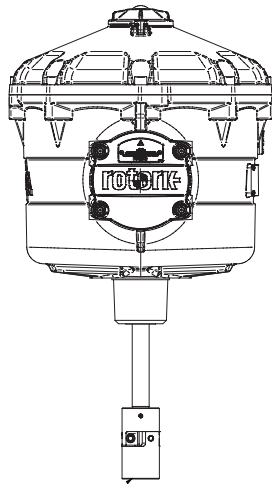
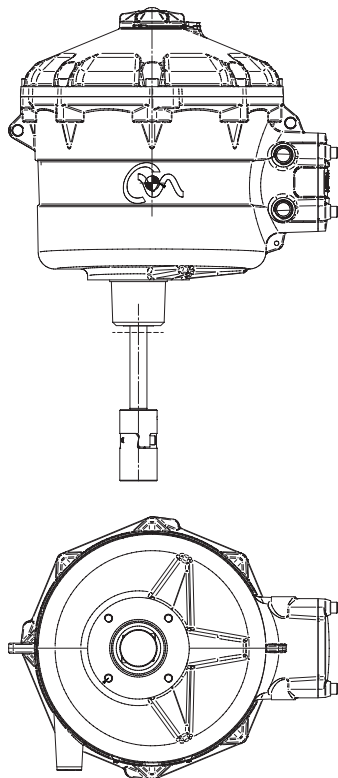
and positional accuracy delivered by the CVA actuator enhances the efficiency of the process. In addition, integral super capacitors enable fail-safe operation of the CVA to close the valve on loss of mains power or loss of control signal to prevent any damage or contamination of the product.

The all-electric CVA actuator is economical to install and easy to set-up using Rotork's non-intrusive Bluetooth® communication technologies. A data logger in the actuator stores operating data in historical order that can be downloaded and diagnosed in order to monitor the condition of the valve and plan for any perceived maintenance requirement in advance, without interruption to production routines. The CVA's rugged construction and double-sealed IP68 watertight enclosure is designed to withstand the harsh and exposed environments often encountered in the mining and mineral industries.



TBS Hydrosizer two-stage lignite removal installation.

CVA range extended to larger control valves



The new Rotork CVL-5000 actuator.



The new CVL-5000 actuator extends the scope of Rotork Process Controls' innovative CVA electric control valve actuator range to enable the automation of larger valves and valves with higher pressure ratings.

Providing a maximum rated thrust of 5,000 lbf (22,241 N) and a linear stroke length of up to 4.5 inches (115 mm), the CVL-5000 retains all the features and benefits of the established Rotork CVA range, providing highly accurate control valve automation combined with advanced, non-intrusive calibration, valve diagnostics and the simplicity and economy of electric operation.

CVA actuators deliver continuous, repeatable modulating control with a programmable fail to position option. Operating on an industry standard 4-20 mA control signal or digital bus, the resolution, repeatability and hysteresis performance is quoted at <0.1% of full scale, offering suitability for the most demanding applications.

Mechanical features include Rotork's well-proven 'double-sealed' enclosure, whereby internal electrical components are permanently protected from the effects of the operating atmosphere.

The IP68 dust-tight, watertight and temporarily submersible (7 metres, 72 hours) enclosure is universal to all models in the CVA range, including those with hazardous area approvals. On loss of mains power, built-in super-capacitors allow the actuator to move the valve to a desired position, programmable as open, close, any intermediate position or stay-put.

Manual operation is available as standard on the CVL-5000 and as an option on other CVA models.

CVA actuators utilise Rotork's innovative and well established 'non-intrusive' communication technology for actuator programming and adjustment. Actuator set-up and configuration is performed using a Bluetooth® enabled PDA or PC running Rotork Enlight software which is freely downloadable from the Rotork website. Every CVA incorporates an onboard data logger, enabling operational data such as valve torque profiles, dwell times, actuator events and statistics to be downloaded for detailed investigation and diagnosis. After analysis, any required configuration changes can be uploaded into to the actuator.

Digital control bus connectivity options include Hart and Foundation Fieldbus protocols, facilitating enhanced installed economy as well as giving the CVA the increased ability to dovetail into existing asset management systems. The all-electric design, which can be specified for single-phase AC or DC supplies, also simplifies the process of retrofitting actuators onto existing valves.

The introduction of the CVL-5000 coincides with the launch of the new Rotork CMA (Compact Modulating Actuator) range (see pages 14 & 15), which brings many of the benefits of CVA electrical actuation to small linear and rotary control valves. The combined performance of the two ranges enables Rotork's innovative electrical control valve actuation technologies to be applied to process control applications of virtually any size and description.

CMA actuator increases the scope of Rotork's advanced electric control valve technology

Rotork Process Controls has launched a new range of compact, robust and reliable electric actuators for control valves, regulators and other continuous modulating applications.

The CMA (Compact Modulating Actuator) extends the scope of Rotork's proven technologies and the benefits inherent in the innovative Rotork CVA electric control valve actuator range. The CMA range increases the areas of flow control that can take advantage of these advanced features.

The Rotork CMA is available in linear, quarter-turn and multi-turn versions and a range of five compact sizes, facilitating the economical operation of numerous types of control valve, damper and pump stroke adjuster applications. Single-phase or DC electrical power supply is all that is required for control valve actuation, saving the on-going costs associated with the operation and maintenance of instrument air supplies. The maintenance-free CMA drive train, permanently lubricated and protected in an IP67

watertight and, where required, explosionproof enclosure, can be mounted in any orientation. Accepting an industry-standard 4-20 mA command signal, the CMA delivers accurate and repeatable positional control. Resolution is 0.25% on linear and quarter-turn applications and 2 degrees on the multi-turn configuration.

Continuous and unrestricted modulating performance is provided by a brushless DC motor, magnetic contactless sensors and a lubricated for life drive train.

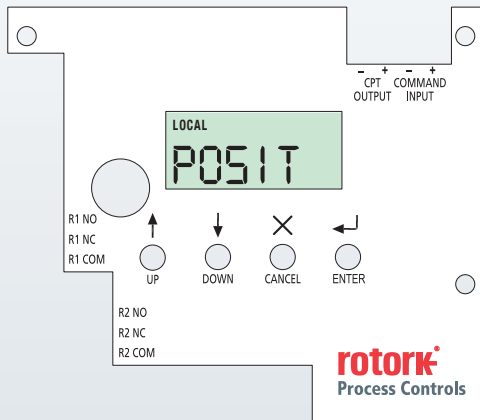
Actuator configuration is performed in a logical, menu driven process using pushbuttons and an LCD display window. User selectable adjustments are provided for speed, dead band, zero and span, command signal type, standard or reverse action and loss of signal position.

Manual operation is available as standard whilst optional extras include local push buttons and selector switch, digital position indicator and digital communication connectivity with HART®, Foundation Fieldbus® and Profibus®.

Building on the success of Rotork's CVA actuation technologies, applications for the CMA are expected to include choke valve, metering pump and associated duties in oil and gas processing and storage, mining and mineral industries, as well as process skids and plant for equipment such as boilers, separators, injectors and heat exchangers.



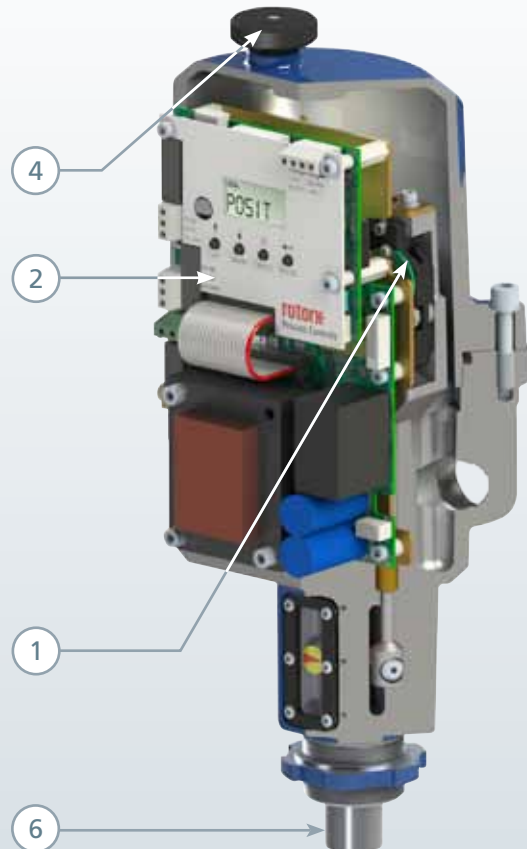
CMA actuator on metering pump duty.



Programmable User Interface

The CMA LCD display is a 6-character, single line display. Two graphic symbols are provided for notification of alarm conditions. The menu style is an intuitive common tree structure similar in function to the menu system used on PCs.

CML Linear Actuator





1 Encoder Technology

The CMA utilises absolute encoder technology where a unique digital code corresponds to the angular position (CMQ), stroke length (CML) or rotary (CMR) position of the actuator.

To achieve high resolution, the position sensor location eliminates any backlash effect in the gearing. The sensor is a 12-bit rotary magnetic encoder, fitted at the output gear stages, removing any internal backlash effect that may exist in the drive train.

2 User Interface

Two relays can be programmed to close upon reaching a desired position or any other available fault condition among the programmable options.

3 DC Brushless Motor

The CMA uses a high efficiency, continuous rated, brushless DC motor. This allows maintenance-free operation even with continuous unrestricted modulation duty.

4 Hand Drive

A hand drive mechanism is provided as standard for all CMA actuators to allow manual operation of the valve. Pressing down on the hand-knob shaft allows it to engage a gear in the upper section of the drive train. Releasing causes the spring to disengage the gear.

5 Geartrain

The simple yet durable high efficiency spur gear drive is lubricated for life. It has proven high reliability.

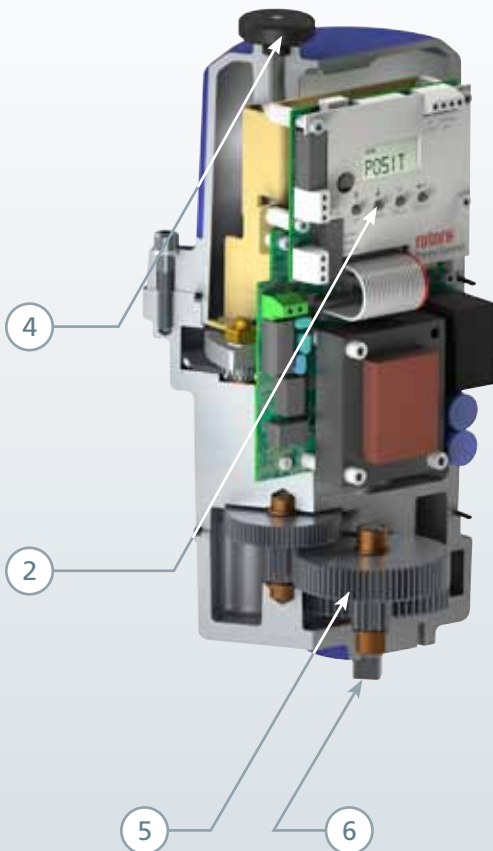
The CML and CMQ standard build is capable of resisting any back drive from the load, up to 125% of the rated thrust or torque of the actuator.

6 Output Drive

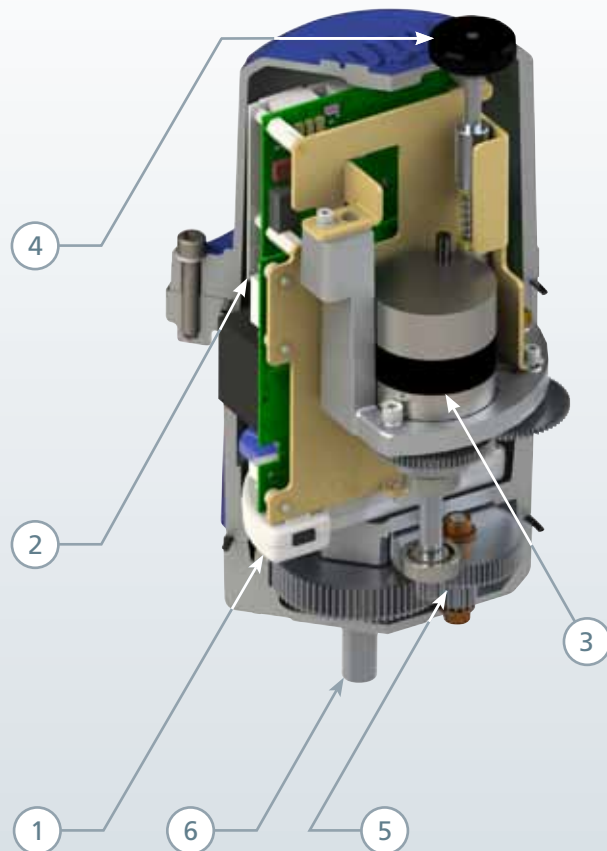
The CMQ and CMR base conforms to MSS SP-101 or ISO 5211. CML may be adapted to suit individual valves.

The new Rotork CMA (Compact Modulating Actuator) provides all-electric control valve operation.

CMQ
Quarter-Turn Actuator



CMR
Rotary Actuator



Gas-over-oil actuators upgraded

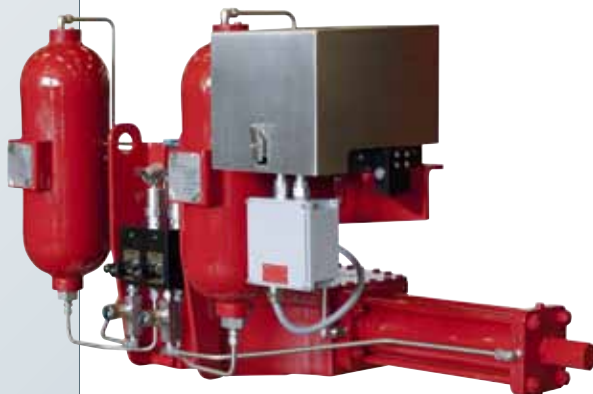
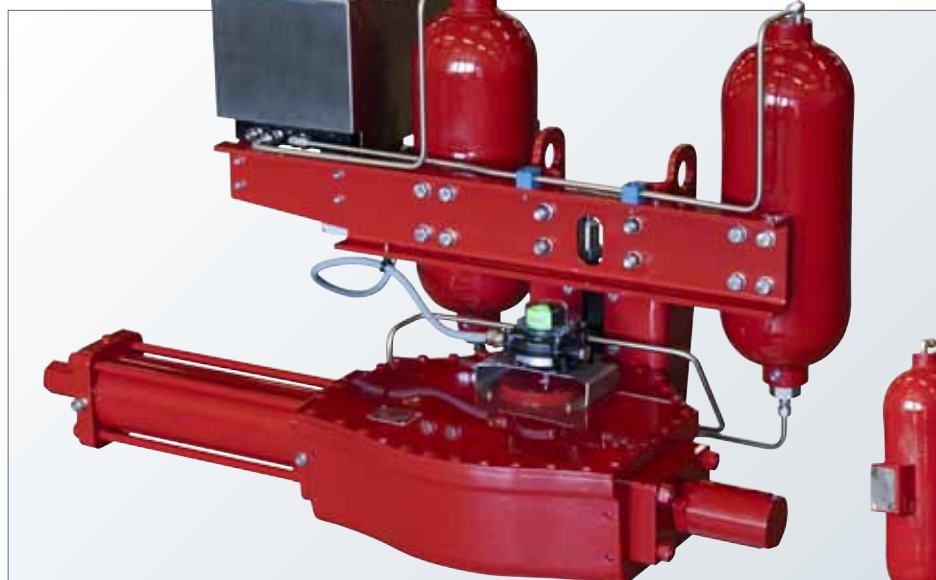
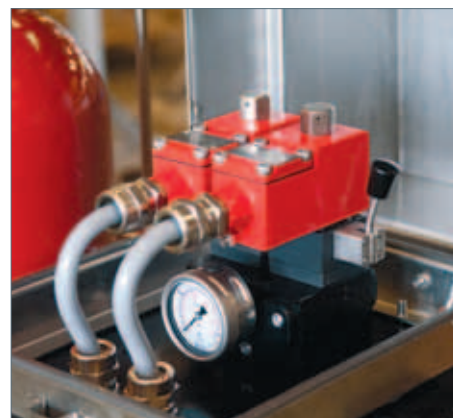
Rotork GO Range gas-over-oil range pipeline actuators are designed to use pipeline gas as the motive power source.

The gas is delivered to oil tanks that convert it to hydraulic pressure. The pressurised hydraulic oil is used to drive Rotork's industry proven scotch yoke and linear actuators. Using pressurised oil as the driving fluid provides powerful and smooth actuator control and isolates the cylinder from the pipeline gas. This prevents contaminants from entering the hydraulic cylinder, eliminating corrosion and seal deterioration and extending actuator life.

The range has undergone an important upgrade, including streamlined manufacturing and product improvements. As a result GO actuators are now lighter, more compact and incorporate advanced changes to functional specifications.

The compact, modular gas control manifolds employ poppet style control valves – a reliable design trusted throughout the pipeline industry – and are available in fail-safe versions. Standard gas control systems are complemented by a range of Rotork designed optional equipment and functions including Line Break, Low Pressure Close and High differential Inhibit. Operation is simple and intuitive.

The design, engineering and materials used in construction ensure optimum performance in even the harshest of environments. The modular design facilitates stocking by allowing a minimal number of components to meet a wide range of valve torque and duty requirements.



Features:

- GO tanks isolate the hydraulic cylinders from contaminants, preventing internal corrosion and extending actuator life.
- Modular and compact integrated multi-function manifold design reduces fittings and potential leakages.
- Quarter-turn or linear output.
- Adjustable stroke time for smooth and precise valve operation.
- Line break, high differential open inhibit and low pressure close control options for pipeline protection.
- Torque limiting devices for valve and drive train protection.
- Manual pump for emergency or local operation.
- Environmental protection certified to IP66M/67M.
- Hazardous area approvals to international standards.
- Working pressure range 10 – 105 barg (145 – 1,520 psig).
- Ambient temperature range -46 °C (-50 °F) to 60 °C (140 °F).

Rotork Fluid Systems has introduced an innovative range of manually energised spring-return actuators to provide an economical solution for fail-safe valves that are infrequently operated.

Manually energised solution for fail-safe valve actuators

The Rotork ManPower range greatly reduces installation time and expense since no external electrical, hydraulic or pneumatic power supply is required.

Suitable for a wide range of ball, butterfly and plug valves, the scotch-yoke actuators are equipped with a compact, self-contained manually operated hydraulic power pack. A hydraulic hand pump on the power pack is used to operate the actuator and compress the fail-safe spring, holding the valve in the desired open or closed position until a fail-safe signal is received, at which point the spring will immediately drive the valve to the safe position.

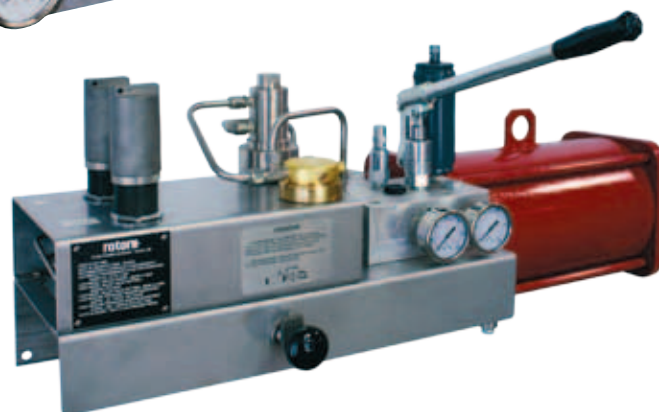
Fail-safe operation of ManPower units can be triggered by electrical signals, high or low pressure pilots or fire sensors, enabling the successful fulfilment of many ESD (Emergency Shutdowns) and pressure related protection duties in the oil, gas, petrochemical and pipeline industries.

Rotork ManPower actuators are available with output torques up to 45,000 Nm, with



explosionproof and watertight certification to international standards. A wide range of options includes local position indication, integral limit switches, speed control, high speed operation, local electrical controls, manual reset and corrosion resistant trims.

Where space is restricted the ManPower hydraulic module can be located separately from the valve. Standard units are suitable for a temperature range from -23 °C to +60 °C and equipped with built-in temperature compensation.



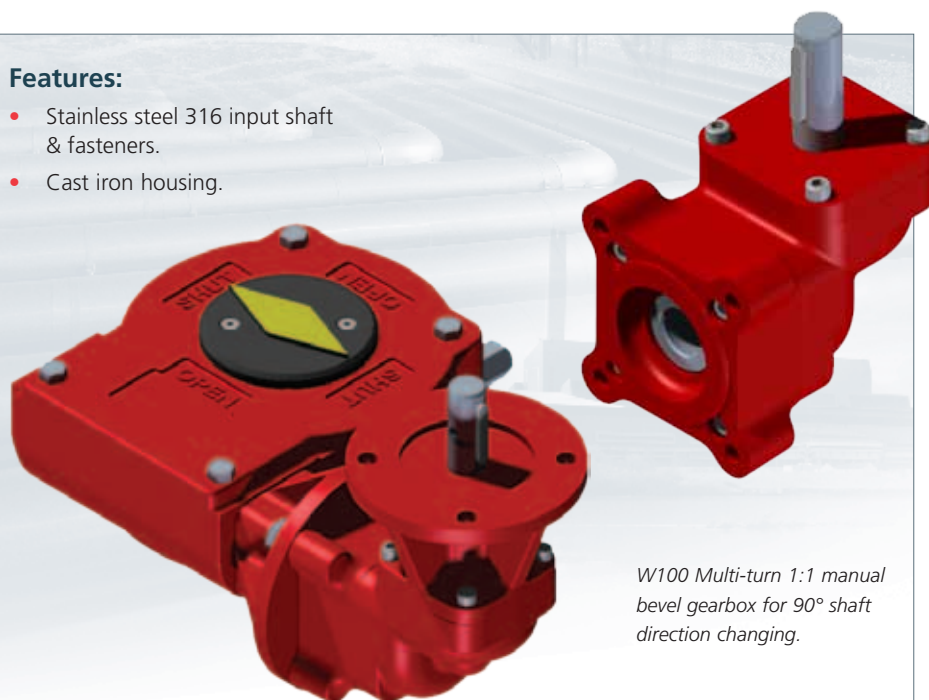
ManPower modules designed for two versions of Rotork scotch-yoke actuators.

Rotork gearboxes provide 90° shaft direction change

The W100 multi-turn bevel gearbox has been introduced by Rotork Gears for applications where the input to a gearbox needs to change direction by 90 degrees to allow manual or motorised operation.

Features:

- Stainless steel 316 input shaft & fasteners.
- Cast iron housing.



Many such applications involve underground installations and the fully sealed IP68 watertight construction of the W100 is designed with this in mind.

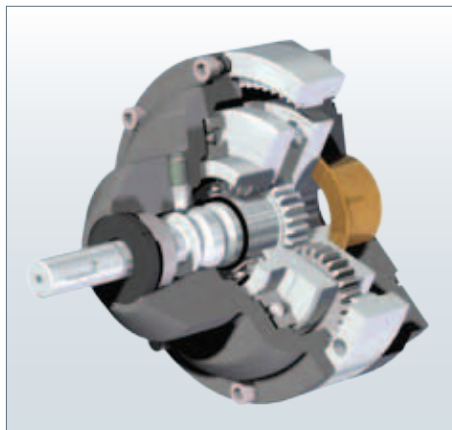
The stainless steel input shaft operates alloy steel bevel gears within an O-ring sealed cast iron gear case secured with stainless steel bolts and fastenings.

Two versions of the gearbox are available. The first can be attached to any gearbox that has an ISO F10 or MSS FA10 input flange, whilst the second is specifically designed for use with Rotork AB and IW range quarter-turn gearboxes.

With a rated torque output of 152 Nm (1,345 lbf.in), W100 gearboxes are suitable for an ambient temperature range of -40 °C to +120 °C.

W100 Multi-turn 1:1 manual bevel gearbox for 90° shaft direction changing.

Rotork DSIR gearbox speeds up manual valve operation



Rotork Gears has developed the innovative Dual Speed Input Reducer (DSIR) for speeding up the manual operation of valves and valve gearboxes by reducing the total number of input turns required.

To achieve this, the DSIR has two gearing ratios. Switching between the ratios is simply a matter of pushing or pulling on the input shaft. The high 4.25:1 ratio gearing is used for the portion of the valve stroke where the torque requirement is high, which is usually at the beginning and the end of the stroke. In mid-travel the valve torque generally drops considerably and therefore the low 1:1 ratio gearing can be used to reduce the

number of input turns required. This can provide a 70% reduction in the number of turns required and the operating time.

Manufactured from cast iron with carbon and alloy steel shafts and gearing, the rugged DSIR is designed for arduous operation in an ambient temperature range of -40 °C to +120 °C. The standard enclosure specification is watertight to IP67, with IP68 optionally available.

Other options include output machining for mounting directly to a valve, flexible drive extensions and a padlockable facility. It is also possible to lock the gearbox drive in either of the two gearing ratios.

Robust and compact manual gear operators for quarter-turn valves

The new 242 Series manual quarter-turn gear operators from Rotork Gears benefit from the latest design technologies to provide optimum robustness and durability with minimal non-structural mass and reduced overall size.

Suitable for the operation of ball, butterfly and plug valves or other quarter-turn devices in most general industrial applications, all 242 Series manual gear operators feature a sturdy cast iron IP67 watertight enclosure, a ductile iron wormwheel, PTFE thrust washers and adjustable end stop screws.

A range of five sizes is available to accept valve stem diameters of up to 70 mm (or 58 mm square

section) and deliver an output torque range of up to 2,100 Nm. Built with standard ISO base dimensions between F05 and F25, simple and rugged 242 Series gear operators are ideally suited for low torque manual applications.

Options include stainless steel input shafts and fasteners, Namur and Westlock mountings, an IP68 temporarily submersible enclosure and a padlock kit.

This rendered CAD image of the 242 has been selected by Siemens for the Solid Edge ST5 design software splashscreen and will appear in rotation whenever users around the world start using Solid Edge ST5.



The 242 Series gearbox range.

Second new production plant opens in India – home to the Rotork Innovation Design and Engineering Centre

It is now two years since the manufacture of electric and fluid power actuators and valve gearboxes started at the brand new Rotork factory at Jigani, as reported in Rotalk 33.

In the intervening time, the Rotork factory at Chennai, which first began manufacturing Rotork actuators over twenty-five years ago, has been the subject of a recently completed multi-million pound investment programme.

The result is a second state-of-the-art manufacturing plant for Rotork products in India, housed in an ultra-modern 3,600 square metre building with features including energy saving lighting, a rainwater recycling system and a staff gym.

In addition to manufacturing new products, the facility is now a *Centre of Excellence* for Rotork Fluid Systems, providing control system packaging for new actuators together with spares and maintenance services tailored to meet the requirements of local industries.



Exterior and interior views of the new Rotork Chennai facility.



The new Chennai plant, which was opened by Rotork Chief Executive Peter France in November 2011, is also home to the Rotork Innovation Design and Engineering Centre (RIDE), the worldwide focus for research and development for all of Rotork's product ranges. Here, a dedicated staff of engineers work with Rotork's global organisation to co-ordinate and facilitate innovation and new product development.



More applications available on Rotork.com

The Customer Portal on the Rotork website provides secure access to a programme of user-friendly interactive areas including:

E-Learning

The latest addition to Rotork's line up of training tools is a series of E-Learning modules aimed at anyone who has requirement to commission and use Rotork actuators and associated equipment in the field. The modules consist of interactive learning solutions that will take around 30 minutes to complete and are equally useful as a refresher course for those who deal with the equipment infrequently.

The range comprises:

- Introduction to IQ Actuators
- Introduction to IQT Actuators
- Introduction to CVA Actuators
- Pakscan Loop Configuration
- IQ Insight Diagnostic Software
- Introduction to Rotork Process Control Actuators

Software for IQ and CVA actuators:

- IQ Insight and IQ Pocket Insight Diagnostics
- CVA Enlight and CVA Pocket Enlight Diagnostics
- IQ Pro Language Modules
- CVA Commissioning Report
- Pakscan Long Term Datalogger Viewer

Sizing Guide

The guide enables the correct type and size of electric actuator to be selected for all valve types and sizes, taking into account power supply, enclosure specification (hazardous/non-hazardous) and mechanical interfaces. Version 3.0 now includes handwheel-gearbox combination sizing for all types and sizes of manually operated valves, ensuring efficient valve operation at user specified handwheel 'rim-pull' values.

For both electric actuator and handwheel sizing, the selected combination details provide comprehensive information for specification, enquiry or quotation. In addition, 30 corporate and instructional videos are available for viewing or downloading from the portal as well as a

comprehensive demonstration of the Pakscan digital bus control system.

Software Downloads

Rotork has a comprehensive range of software downloads to support its intelligent actuation products.

To access the Customer Portal, go to rotork.com and click the 'Login' link in the top right-hand corner of the screen. If you don't yet have an account you can sign up by clicking the 'Click here to register for an account' link on the Login page.



Upcoming exhibitions

WEFTEC – 1st - 3rd October 2012

WEFTEC® is the largest conference of its kind in North America and offers water quality professionals from around the world with the best water quality education and training available today. The 85th annual WEFTEC® is in New Orleans, Louisiana this year.

Come and visit us in Hall C/D, booth 2334. For more information visit www.weftec.org

ADIPEC – 11th - 14th November 2012

The 15th Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC) takes place at the Abu Dhabi National Exhibition Centre (ADNEC). ADIPEC is supported by Abu Dhabi National Oil Company (ADNOC) and the UAE's Ministry of Energy and hosts over 1,500 exhibitions and attracts more than 45,000 attendees.

Come and visit us at stand 4022. For more information visit www.adipec.com

VALVE WORLD EXPO – 27th - 29th November 2012

Valve World Expo, the 8th Biennial Valve World Conference & Exhibition will be held in Düsseldorf, Germany for the second time. This calendar highlight already has 371 exhibitors from 34 countries registered for the event. Leading experts will present papers and host workshops on key flow control topics

Come and visit us in Hall 03, stand E53. For more information visit www.valveworldexpo.com

For more information on ROTALK articles and features contact ROTORK Bath: +44 (0)1225 733200 email: information@rotork.com

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