

rotork®



helping the
power generation industry

rotork



Rotork specialise in producing actuators and related equipment for every part of the power generation industry, including coal, oil and gas.

We have over 50 years experience in serving the power industry, and we understand the challenges you face.

We have a full range of actuators, all designed to meet the stringent requirements of the power generation industry, and to provide the exacting levels of durability and reliability that you require.

At Rotork, we provide actuators for new build projects, and we also provide complete support programmes, including retrofit and maintenance.

We operate worldwide, backed by huge resources, and our service is exceptional, always meeting our customers' deadlines whatever the circumstances.

rotork®

Puts you in control of your power plant

Actuators help control everything that happens in a power plant.

So they're vital.

Rotork actuators are accurate, robust and efficient. Backed by full service support.

So you have precise control, lower costs, lower emissions, and a safe environment.

That's why power stations worldwide specify Rotork.

www.rotork.com

rotork





Helping to meet your challenges

Whether you are managing a power generation company, or operating an individual plant, you face many challenges

We understand what they are, and we are here to help you

Durability and reliability

We understand that power stations are tough places to be, and all your equipment must be tough too

Flexibility and efficiency

We understand that tiny changes have massive results. Running a power station is a delicate business. Especially for your actuators

Operational costs

We understand that driving down costs is vital. But without compromising safety or emissions. Again efficiency is the key

Safety

We understand that to be safe you must be in control, all the time. You must make the environment safe, and protect your staff

Protecting the environment

We understand that you must keep emissions down to an absolute minimum, through the systems you install and the way you control them

Information and management

We understand that your plant control systems must work faultlessly with every piece of equipment, so you know exactly what's happening

Maintenance and support

We understand that your suppliers must keep caring, and your equipment must keep working

Let's look at these core needs



Meeting your challenges

As a specialist in the power generation industry, Rotork is dedicated to meeting these 7 core needs with the actuators that we design and manufacture, and the services we provide.

1 Durability and reliability

- All our actuators are designed to withstand the harsh environments and operating regimes of the power industry
- Designed to survive extreme conditions of temperature, vibration and dust
- Long operating life with very low maintenance requirements. Depending on their usage, many of our actuators are still operational after 30 years or more, even in the most demanding environments and with minimal or no maintenance
- IP68 environmentally sealed from the factory
- Non-intrusive settings mean the covers do not ever need to be removed, even for commissioning

Providing you with... **robust, long lasting equipment with minimal maintenance even in extreme environments**

2 Flexibility and Efficiency

- Fast, fine and accurate changes to the feedwater and steam circuits, to quickly achieve the desired output with minimal wastage
- Fine control of fuel and air flows enhances the combustion efficiency and reduces power losses
- Very fine controls result in less thermal shocks and a reduction in downtime

Providing you with... **efficient operation, fast changes and perfect control**

3 Operational Costs

- Our self contained actuators require less maintenance, and are more power efficient, than traditional pneumatic or hydraulic systems.
- Integral diagnostics enable planned maintenance and avoid unplanned emergencies.
- Costs reduced through reliable and accurate operation, increasing efficiency and reducing downtime

Providing you with... **strict control of costs, and reduced expenditure on maintenance**

4 Safety

- Information on status of valves and actuators is available centrally and locally
- Full data capture of history of valve and actuator, for diagnosis and management
- Valve torque profiles and events log to help diagnose valve and control problems
- Valve and actuator information to guide maintenance plans

Providing you with... **safe operation of every part of your plant**



5 Protecting the environment

- Very fine very fast control of dampers reduces gas emissions
- Accurate control of valves to reduce process waste
- Our actuators provide accurate control for all environmental applications including flue gas desulphurisation and similar systems

Providing you with... **reduced emissions and waste**

UN Press Release

The need to reduce emissions

Under the Kyoto Protocol, industrialised countries are to reduce their combined emissions of six major greenhouse gases during the five-year period 2008-2012 to below 1990 levels

The European Union, for example, is to cut its combined emissions by eight percent, while Japan should reduce emissions by six percent. For many countries, achieving the Kyoto targets will be a major challenge that will require new policies and new approaches.

6 Information and Management

- Our actuators interface with any plant control system
- Accurate data is readily available from our actuators
- Our easily accessible diagnostics provide full management information
- Full information on settings, operational accuracy, feedback and history
- New actuators can easily be incorporated into existing systems
- Password protection of all information

Providing you with... **complete information, secure yet easy to access**

7 Maintenance and Support

- We can install and commission, and provide complete integration into your systems
- We can provide a full service during your plant outage, including inspection of all actuators, removal, overhaul and replacement
- We can support all of your legacy actuators
- We have a full asset management programme, including health checks and preventative maintenance

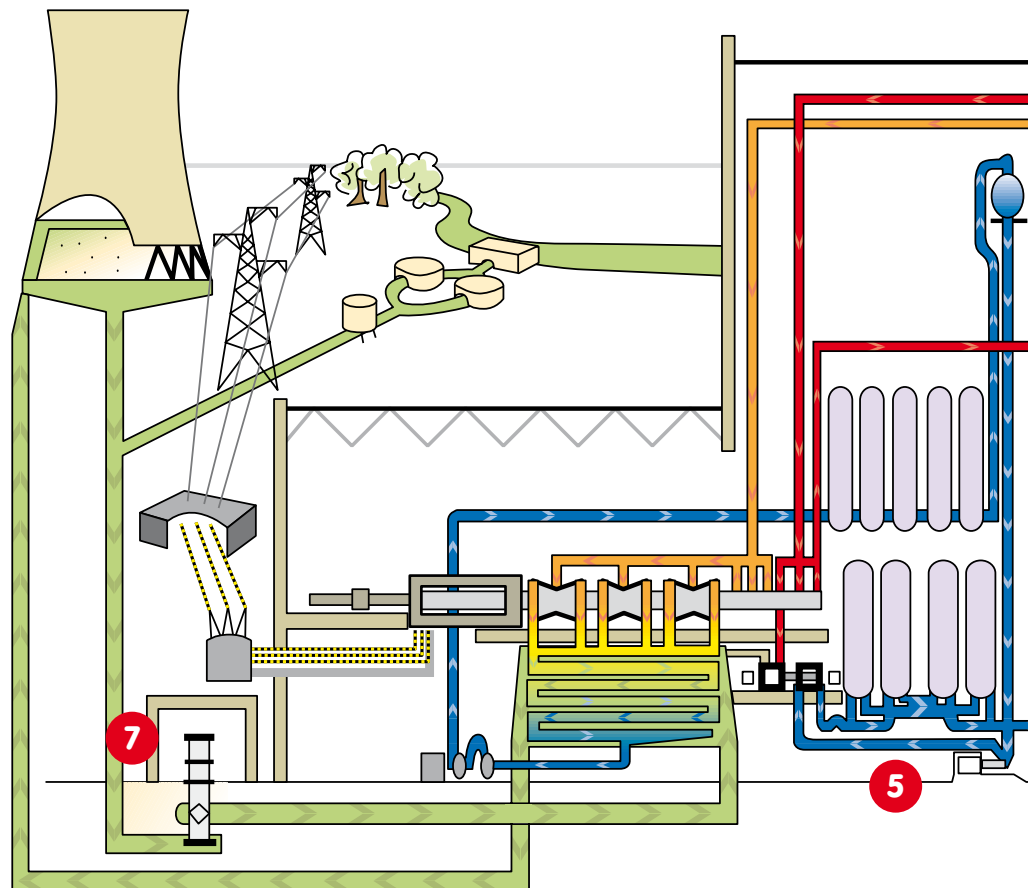
Providing you with... **complete technical support, backed by expert staff**

Controlling critical activities

Here's a diagram of a typical coal fired power station. Similar principles apply for oil and gas fired stations.

At the most critical parts of any power plant there are actuators, controlling every operation, minimising every danger, often in the toughest environments.

It's vital that the right actuators are installed in every location. So first, we must look at the hazards and risks, and then see how Rotork actuators meet the special needs of each key area.



1

Coal Mill

Hazards and Risks

- Heavy vibration
- Very hot
- Dust in the atmosphere
- Risk of explosion

Rotork actuators

- Withstand the vibration, heat and dust
- Explosion proof
- Accurately control the fuel and air supplies
- Accurately control the flow from the primary air fan
- Immediate failsafe operation in an emergency

2

Burners and Furnace Air Flow

Hazards and Risks

- Flame out
- Inefficient burn, and wastage of fuel
- Destabilised boiler
- Extremely high temperatures
- Excess emissions

Rotork actuators

- Accurate control of the fuel and air streams
- Precise regulation of supplementary air
- Operate at high temperatures
- Immediate failsafe operation

3

Induced Draught Fans

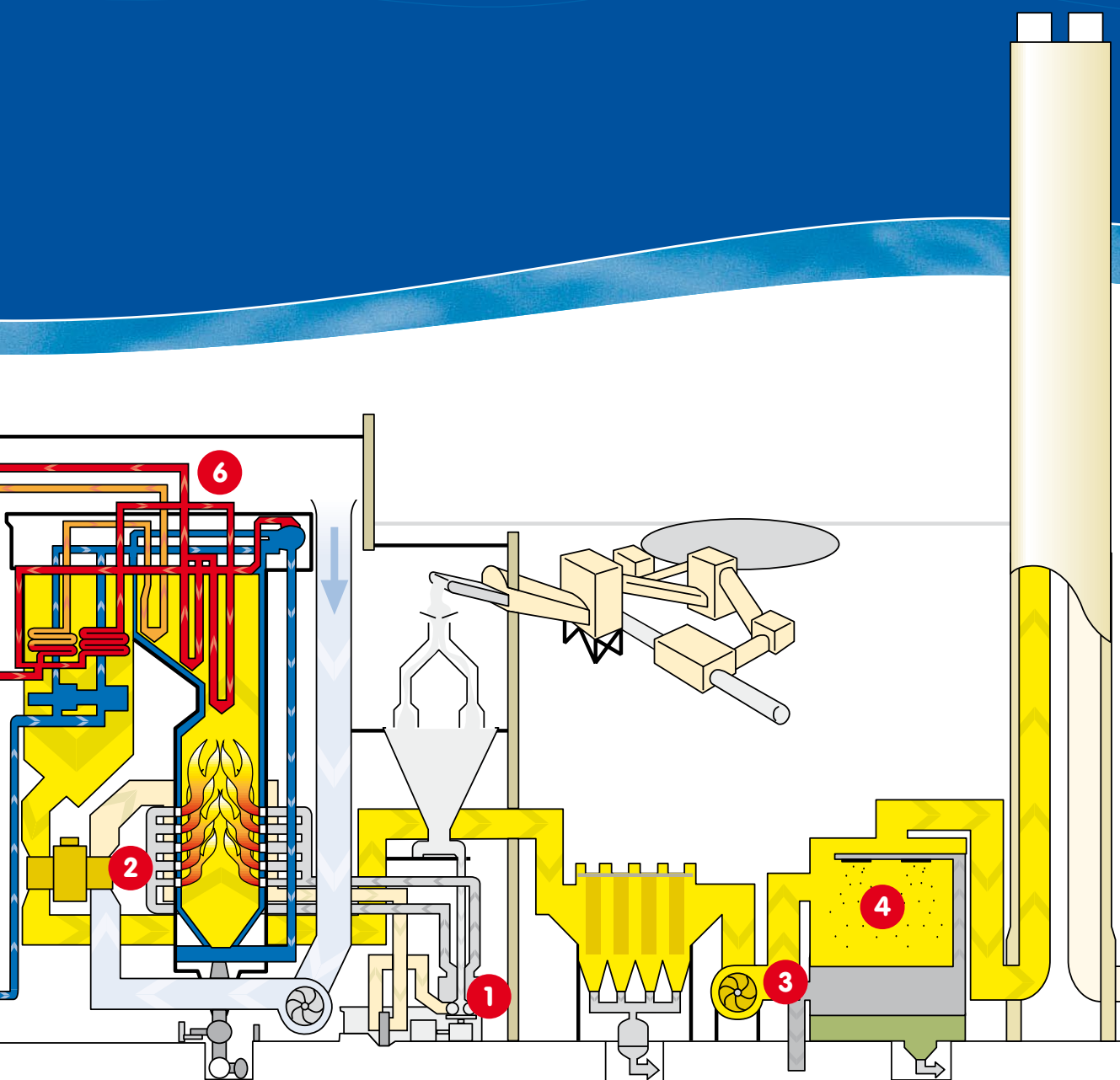
Hazards and Risks

- Instability in the whole plant
- Excessive emissions

Rotork actuators

- Continuous modulation of gas flow
- Precise positioning of fan vanes
- Very fast reaction speed

5



4

Flue Gas Desulphurisation

Hazards and Risks

- Excess emissions of gas
- Blockages in slurry removal

Rotork actuators

- Reliable and durable in harsh conditions
- Accurate control of valves and dampers
- Non-intrusive setting

5

Boiler Feedwater

Hazards and Risks

- Excess pressure in boiler
- Thermal shocks
- Poor steam temperature control

Rotork actuators

- Fast and precise response
- High thrust
- Withstand heat and vibration

6

Steam Circuit

Hazards and Risks

- Pressure too high or too low
- Temperature too high or too low
- Inefficiency or failure in turbine
- Extremely high temperatures

Rotork actuators

- Very accurate control
- Fast positioning
- Withstand heat and dust

7

Circulating Water System

Hazards and Risks

- Leaks in cooling system
- Cross contamination between condensate and cooling water

Rotork actuators

- Automation of extremely large valves
- Emergency shut-off of large valves
- Immediate response after long periods of inactivity
- Partial stroking to test operation of actuator and valve

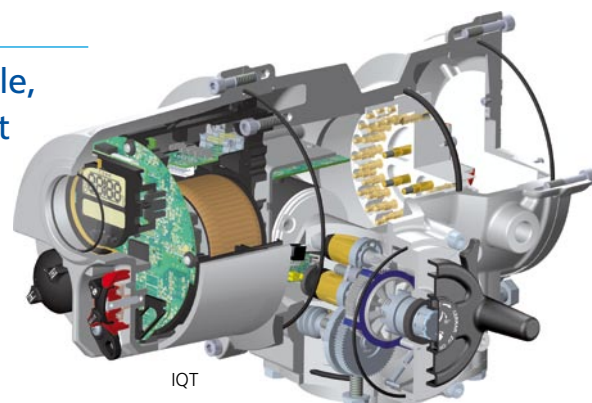
Look at our product range

Our range of products is designed to fulfil all the requirements of the power generation industry

Electric actuators

Our range of actuators are all robust and durable, and there's a wide range of specifications to suit many different types of application.

IQ/IQT Range



1 Models for every application

- Multi-turn or quarter-turn
- Isolating duty, regulating or modulating duty
- Range of sizes
- Wide range of torques, using gearboxes for larger applications

2 Easy to Install

- Power supply options – single phase, three phase or DC
- 2 wire digital system simplifies control cabling
- Actuator can be mounted in any orientation
- Rotatable display

3 Accurate and reliable

- Accurate setting of open-close limits
- Digital control using contactless torque and position sensing provides reliable, accurate and repeatable valve operation
- Double sealed to IP68 (7days, 45metres)

4 Easy to monitor and operate locally

- Non-intrusive infra-red setting tool for local monitoring
- Actuator screen shows current status and recent alarms
- Hand wheel size is optimised between speed of operation and force required

5 Easy to commission

- Simple commissioning set-up using hand held setting tool
- On screen text instructions
- No need to remove any covers
- Future proof Rotork firmware
- Dry working conditions not required
- Electrical safety for operators
- Easy storage of commissioning settings for future reference
- Language options

6 Easy diagnosis and predictive maintenance

- On-board data logger stores historical operating data including valve torque profiles, starts and alarms
- On-board help screens
- Information can be downloaded using setting tool
- Events log can be analysed and presented using Rotork's free IQ-Insight software
- Data can help to optimise plant performance by identifying potential problems and guiding predictive maintenance

7 Operation of tight valves

- Torque can be controlled to protect valve and actuator, including hammer-blow effect and variations in torque levels



The infra red setting tool provides full control without removing the access covers

8 Tough and durable in all environments

- Double sealed with spigot and O ring to prevent ingress of water, dirt or chemicals
- Tough polyester powder coated finish
- Non-intrusive set up
- Local controls operate via non-penetrating magnetic connections
- Completely sealed for life
- Withstands water and humidity
- Withstands chemicals, including chlorine and ozone
- Withstands temperatures from -30°C to +70°C
- Oil lubrication for life
- Tested in extreme environments
- Bearings are sealed for life, and do not require periodic maintenance

9 Safety and security

- Explosion proof
(certified models available for working in hazardous areas)
- Hand wheel can operate valve in event of power failure
- Food grade oil available for specified applications
- Self test diagnostics at every power up
- Highway termination module allows removal of actuator without disrupting the highway
- Detachable thrust base allows removal of actuator without disturbing valve (IQ model only)
- Vandal proof kit to prevent unauthorised operation

10 Central control

- Compatible with network protocols
 - Rotork Pakscan
 - Profibus
 - DeviceNet
 - Foundation Fieldbus
 - Modbus

Look at our product range

Our range of products is designed to fulfil all the requirements of the power generation industry

Electric actuators



AWT Range

For integration into existing remote switchgear systems or where excessive plant induced vibration is present
For isolating/regulating duty

- Separate motor control available
- Multi-turn



Q Range

For small isolating valves

- Quarter-turn
- Isolating duty
- Single phase



ROM Range

For small isolating or regulating valves

- Quarter-turn
- Modulating option
- Compact and lightweight



SM Range

For large quarter-turn valve and damper applications requiring precise positioning

- Quarter-turn
- Continuously modulating option
- High torque, high speed
- Precise positioning
- High temperature option



LA Range

For modulating valve and damper applications

- Linear
- Modulating option
- High thrust, high speed
- Accurate positioning
- High temperature option



MV Range

For control valve applications

- Linear or quarter-turn
- Continuously modulating option
- High accuracy, high speed



Gears



IB Range

For general valve applications

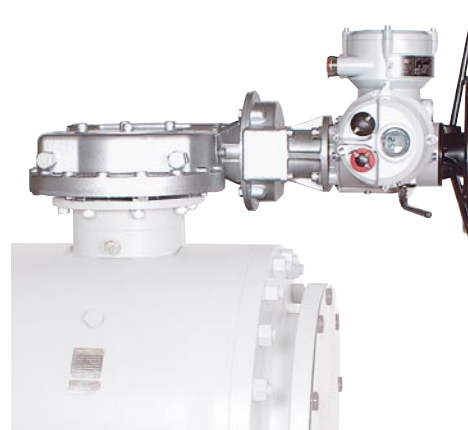
- Bevel gearbox
- Manual handwheel option
- Ratios from 1:1 to 120:1
- Modulating option



IS Range

For general valve applications

- Spur gearbox
- Manual handwheel option
- Ratios from 1:1 to 360:1
- Modulating option



IW Range

For quarter-turn valve and damper applications

- Worm gearbox
- Manual handwheel option
- Ratios from 40:1 to 25200:1
- Modulating option
- Multi-turn option
- Lever drive arm option

Look at our product range

Our range of products is designed to fulfil all the requirements of the power generation industry

Pneumatic and hydraulic actuators



GP/GH Range

For large quarter-turn valve and damper applications

- Scotch yoke actuators
- Double acting or spring return
- Corrosion resistant cylinders
- High torque

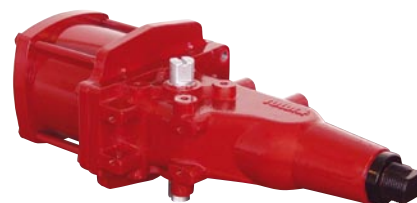


LP/LH Range

For up to 5,500,000 N on double acting hydraulics

For up to 1,800,000 N on double acting pneumatics

- Double acting or spring return linear actuators
- Corrosion resistant cylinders
- High thrust



CP/RH Range

For small to medium size valve and damper applications

- Scotch yoke actuators / rack and pinion
- Double acting or spring return
- Corrosion resistant cylinders



SI Range

For critical small to medium size valve and damper applications (remotely operated shut-off valves)

- Self contained electro-hydraulic failsafe actuator
- Linear or quarter-turn
- Non-intrusive set-up and interrogation
- LCD position and diagnostics display
- Isolating or modulating duty



EH Range

For critical large control valve and damper applications

- Self contained electro-hydraulic failsafe actuator
- Linear or quarter-turn
- Non-intrusive set-up and interrogation
- LCD position and diagnostics display
- Isolating or modulating duty
- High thrust

helping the power industry



Working with network control systems



All our actuators are designed to work with the major process control systems, and can be fitted with the relevant network connectivity cards.

We have been producing certified network products for over 10 years and have a large number of installations worldwide. Rotork has independent test house certification for its open system network products, thus ensuring interoperability. This means that you can use different types of equipment in the same installation, which is ideal for the power generation industry.



Rotork actuators and Open Systems working together – easy to set up, easy to operate, and highly efficient.

Here are the reasons ...

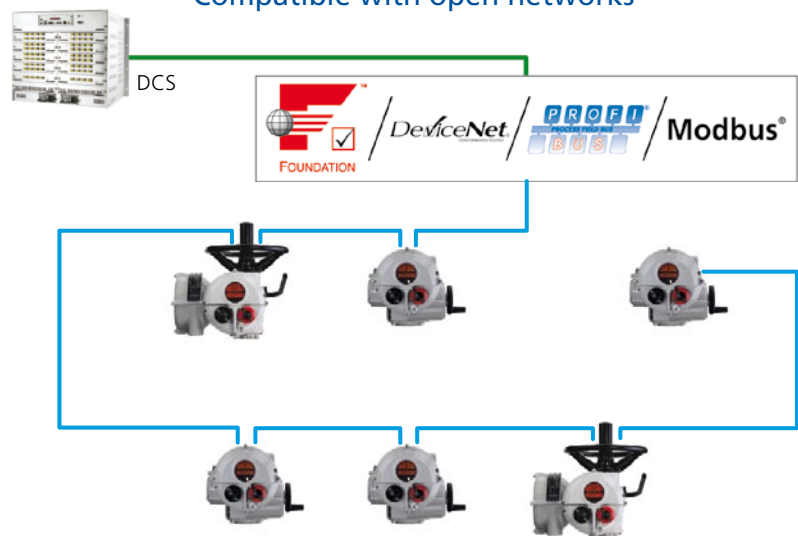
- The digital communications are more **versatile** than analogue, and allow for additional functionality in the future
- The twisted pair cable is **cheaper** than multicore, and is connected simply from device to device, reducing the installation costs
- With Rotork, additional devices can be hard wired through the actuators enabling the devices to be **controlled and monitored**
- Using Rotork's device descriptor files and integral interface cards, network commissioning is **quick and easy**
- The IQ infra-red setting tool makes it **easy** to set up the actuator, without needing to remove the access covers
- **Additional devices** can easily be added to the system, with minimal wiring
- It is **easy to access** the data required for maintenance and asset management, using the IQ infra-red setting tool, without disrupting host communications
- Rotork provides **full control and monitoring** of the actuators, and enables remote re-tuning
- High speed communications provide **faster response** for large and complex operations
- Asset management **data** is available for every actuator

Rotork are continually monitoring ongoing network developments to give you the maximum benefits.

Rotork and Profibus

- Rotork's Profibus interface has a **zero stub length**, so preventing signal reflection and data distortion when operating at high speeds
- Using Rotork's DP_VI capabilities, asset management data is visible via standard **FDT** or **PDM** tools

Compatible with open networks



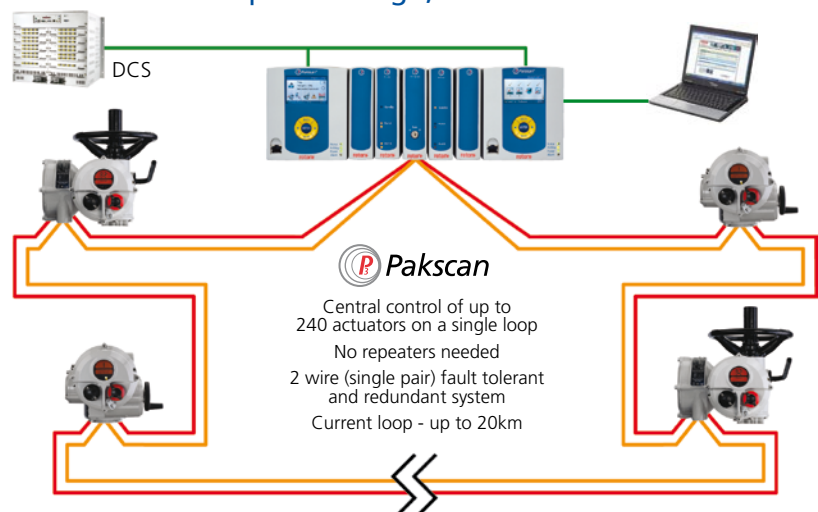
Rotork Pakscan

Includes many of the Open Systems features (see opposite)

plus

- Designed exclusively for **actuator control**
- **Fault tolerant** redundancy as standard
- Uses **low cost** twisted pair cable loop
- Provides **easy access** to asset management data and configuration via the **built-in web pages**
- The master station **communicates directly** with a PLC or DCS system
- Master station display shows system **status** and allows system **configuration**

Simple to design, install and use



Working with you

We'll help you at every stage, to fulfil your business and operational needs, and provide you with reliability, efficiency and safety.

1 During the planning

We can work closely with you and your partners, to discuss your objectives and your overall plans for the future

- We can look at your **existing installation**, advise you on any problems, and make recommendations
- We will give you information and advice on **specifications**, and recommendations of the right actuator for each application
- We can offer a long term **supply agreement**
- We can offer a comprehensive **service agreement**
- We can prepare our proposals based on the whole life **ownership and operating costs** of the equipment



2 During installation

Having built your actuators to the agreed specifications, we will then test them and deliver them to site

- We can provide **installation and commissioning** services worldwide, together with training on installation, commissioning, operation and maintenance
- We can **integrate** with your existing systems
- You can access a complete technical support network on www.rotork.com
- We will provide all the necessary **documentation** for every actuator

3 During outage

We provide a full outage service, wherever you are in the world, always completing the work on time and to budget

- We remove and inspect actuators from valves that are being overhauled
- We return actuators to our workshops where we provide a full overhaul
- We undertake a torque test and provide a certificate
- We refit the actuator to the overhauled valve
- We commission locally and in your control room
- We will also do a visual inspection of all the actuators on your site, and provide a report



4 Regular maintenance and service

Once everything's up and running, we'll ensure your equipment remains in top condition. Our customer base is global, and so too is our service and support network from Rotork offices and representative companies worldwide. Dedicated support teams ensure a quick response and fast efficient resolution should problems occur.

Planned maintenance

Depending on your needs, our engineers can check, maintain and certify your equipment regularly or on request. Every Rotork actuator is covered by our standard warranty programme, but we can design bespoke maintenance plans if necessary.

Field service – worldwide

We provide a worldwide field service response for our customers for all types of actuator. Our support can be planned or in response to an emergency situation.

Our field technicians perform a number of different tasks for our customers:

- Installation and commissioning of actuators to ensure they are correctly set up
- Upgrading actuators such as the installation of additional cards
- The installation and commissioning of network/bus systems
- The inspection and repair of damaged actuators

Training

We can train your plant operators and maintenance staff. And whatever language your staff speak, so will your Rotork engineer.

Availability of parts

We stock a full inventory of spare parts, and our worldwide delivery service ensures you receive them quickly and efficiently – wherever you are. So you can minimise your own parts inventories and cost.



Managing your assets



Rotork actuators are designed to work for many years in every type of environment. This can be helped by an active programme of asset management...

Health checks and preventative maintenance

We undertake a health check, especially of your older equipment in key areas, opening each actuator and reporting back to you on their condition. Then if you wish, we will repair or upgrade them to the required standard. Based on the serial numbers, we can also give you a detailed inventory of all your actuators.

Tailored service agreements

We can review your exact requirements and your plans for the future, and then provide a tailored service agreement with fixed prices for our products and services. We can even hold stocks of actuators for immediate replacement.

Retrofit solutions

We have a wealth of experience in fitting actuators to valves and dampers that are already installed as part of existing plant. Whether you are replacing obsolete actuators, changing power source or motorising manual valves we are able to offer tailor-made solutions designed to comply with your exact requirements.

Workshop overhaul

The installed base of Rotork's actuator products around the world stretches back over 50 years. A large portion of these actuators are still in service. However, depending on the environment and application some actuators may be in need of refurbishment. To satisfy this demand, we offer a certified workshop overhaul capability to bring Rotork products back to full functionality and capability.

Information and support

Whatever your enquiry, we can provide technical information and advice on all applications for actuators and control systems, and we can send you regular product updates. Rotork's website www.rotork.co.uk contains a detailed library of information on current equipment and services available.



Keeping ahead



**We continue to lead the way
in every aspect of our business...**

Developing our products

We continually monitor market trends and listen to our power customers' needs, so as to improve the quality, value and performance of our products for the power generation industry.

Committed to quality

We are dedicated to providing world class quality in our products and services, and we are independently assessed and approved to ISO9001:2000 standard.

Certified for Health and Safety

The health and safety of our staff, and of those with whom we work, is of the utmost importance.

The design of our working practices and the training of our staff are all planned to achieve a safe working environment. We are assessed and certified for health and safety by the nationally recognised authorities, both in our factories and on your sites.

Protecting the environment

We are committed to protect the environment in every way we can, and to help our customers to achieve their own environmental objectives.

- At least 80% of the materials used to manufacture our current actuators are recyclable
- We give instructions on recycling, and mark components accordingly
- We design energy efficiency into our products.
- We can give you guidance on environmentally friendly disposal
- We have independent certification to ISO14001
- We monitor our carbon footprint very closely and reduce it wherever we can

We publish a full annual environmental report.

We are listed on the FTSE 4 Good index and we are a signatory to the Global Compact.



A complete team

Working with end users, designers,
plant constructors, manufacturers
and distributors

Having good relationships with all of our partners and customers is vital to our success. As an independent organisation, Rotork works effectively with all related manufacturers. We understand the way they work, and the pressures they face and can help them honour their customer commitments.

Feedback from around the world shows that our partners and customers enjoy working with us too – a company with a high reputation for **service quality** and **product reliability**. What's more, our technological lead allows us to offer them the versatility they need for every application.

Our global, commercial and technical **support services** ensure that our partners and customers are totally supported.

Our **fast quotation service**, **back-up warranties** and **international documentation** make our partners' and customers' lives easier. And our manufacturing facilities around the world ensure we can always produce our actuator and control systems within your project timescales.

We understand our customers

“ We have to be efficient at managing our daily fluctuations. It's where we make or lose money ”

power company manager

“ I need to adjust our output quickly, and keep control of my budget ”

power plant manager

“ I just want everything to work, and I want to know what's going on, and I don't want emergencies – ever ”

power plant engineering manager

“ I need expert technical advice, so I'm certain we've got the right actuators to the right spec throughout the plant. And I need maximum support ”

power plant engineer

About Rotork



rotork

Providing actuators and site service
around the world

As the world's largest independent valve actuator manufacturer, we specialise in actuation and nothing else. And because it's all we do, we can focus fully on delivering the totally reliable products and services that our diverse customers and worldwide markets demand of us.

At Rotork we firmly believe our reputation is based on **reliability**, backed by a proven and successful track record over more than 50 years.

And as an **independent company**, we are able to work freely with every valve, damper and fan manufacturer without any constraints.

As a major manufacturer, we operate in **every sector** – power, water, sewage, petro-chemical and marine. And we're involved in all the key areas of the actuator field – **electrical, hydraulic and pneumatic** – as well as manual and automated gearboxes, mounting kits, control systems and other related services.

We don't mass produce actuators to meet potential market needs; rather, we manufacture them to satisfy our customers' **individual specifications** and requirements. As a result, our range includes products that are simple and functional through to those with the latest sophisticated technology. Large or small, every actuator is designed to the very highest standards of **reliability**. Whatever you need, you have all the expertise available from one source.

Manufacturing sites
and head offices

Controls

Electric actuators and control systems

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Gears

Gearboxes and gear operators and adaptation kits

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Bramley, Leeds LS13 4ET

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We look forward to helping you



Controls

Electric Actuators and Control Systems

Fluid Systems

Fluid Power Actuators and Control Systems

Gears

Gearboxes and Gear Operators

Site Services

Projects, Services and Retrofit

Latest product information and a full listing of our worldwide sales and service network is available on our website

www.rotork.com



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