



rotork[®]

Keeping the World Flowing
for Future Generations

Green Hydrogen Industry Overview

 **HYDROGEN
ENERGY
STORAGE**



Green Hydrogen

Working within the energy and process industries for more than 60 years, we have partnered with corporations and legislative bodies to improve process efficiency, reduce energy consumption, maximise uptime and minimise pollution.

Our products and flow control solutions are important components in all areas of green hydrogen production, distribution and usage.

- Valve actuators are used throughout renewable energy applications including solar tracking systems and offshore wind farm transformer platforms.
- Electrolysis plants require high accuracy modulating valve operation to control water levels and flow rates
- Fail-safe flow control solutions are specified on safety critical systems such as hydrogen storage tanks, transport and distribution networks
- Distribution stations demand the highest levels of safety from actuators and flow control equipment delivering hydrogen to end users

Rotork products are known for accuracy and reliability, reducing process waste and increasing efficiency. Our reliability delivers longer product lifespans, reducing plant maintenance and increasing profitability. Rotork products pay for themselves many times over during their life cycles.

This is why Rotork is specified as the flow control partner of choice for global industry.

Understanding Your Challenges

Working closely with green hydrogen production partners allows us to understand your business and know the challenges that you face.

We are aware of the environmental, societal and legislative pressures that are forming the framework for green hydrogen production and its operational processes.

Safety first

Equipment used to handle hydrogen must be tested and certified to the highest safety standards and provide safe, reliable operation with no leakage.

Operational efficiency

As a new industry, green hydrogen has the chance to start with an efficient equipment infrastructure and connectivity, maximising long term operational profitability.

Reducing pollution

Green hydrogen producers must eliminate pollution at the outset and use technologies in the production and delivery processes that identify fugitive emissions and stop leaks.

Moving to zero emissions

We can help you eliminate your emissions and achieve your targets. Zero emission targets for industry are fast approaching – The EU (2050), China (2060).

Storage reliability

The high energy requirement of compressed hydrogen storage, due to low specific gravity, requires accurate and reliable valve control for temperature and pressure control.

Quality materials

Hydrogen embrittlement and leakage are primary concerns when specifying flow control equipment. Materials selection must be carefully considered for all equipment.

Refuelling station accuracy

Fine control of hydrogen flow, and temperature control during fast transfers to reduce thermal instability, is essential to minimise evaporation and losses from the system.

Life cycle management

Plant designers and managers can reduce the risk of equipment failure and obsolescence by utilising Rotork's advanced technologies and asset management systems.



CVA control valve actuator

Electric actuator with high accuracy, resolution and repeatability, widely used in process control applications throughout electrolysis systems



The Importance of Flow Control

Correctly specified flow control equipment can provide a safe working environment, increase process efficiency, reduce emissions and increase your profitability.

Whether you are refitting an existing pipeline, installing a new compressor station or establishing a new electrolysis production plant, your flow control solutions should be carefully considered and specified.

Process efficiency

The ability to move quickly and precisely to a set position will make your process more efficient, minimise waste and reduce energy consumption.

Repeatability

Many operations require valves and regulators to move repeatedly between set positions. Rotork actuators provide precise operation, with repeatability and resolution.

Reliability

Flow control equipment should be specified correctly to operate in the chosen process environment. Our hazardous area products are certified for use in potentially explosive environments such as those found in hydrogen production.

Safety

Emergency Shutdown (ESD) systems are required throughout the hydrogen industry to stop chain reactions and safe guard equipment. Rotork products are certified for use within HIPPS, SIL, SIS, EIV, ESD and ROSoV applications.

Reduced maintenance

Installing correctly specified and highly engineered solutions will reduce unplanned maintenance and plant downtime. Our intelligent diagnostics work with asset management systems to maximise plant uptime.

Cost of ownership

Rotork products are designed and engineered to very high performance levels. They pay for themselves many times over during their life cycles.



IQ electric actuator

Used widely in hydrogen distribution for safe and reliable operation in all environments

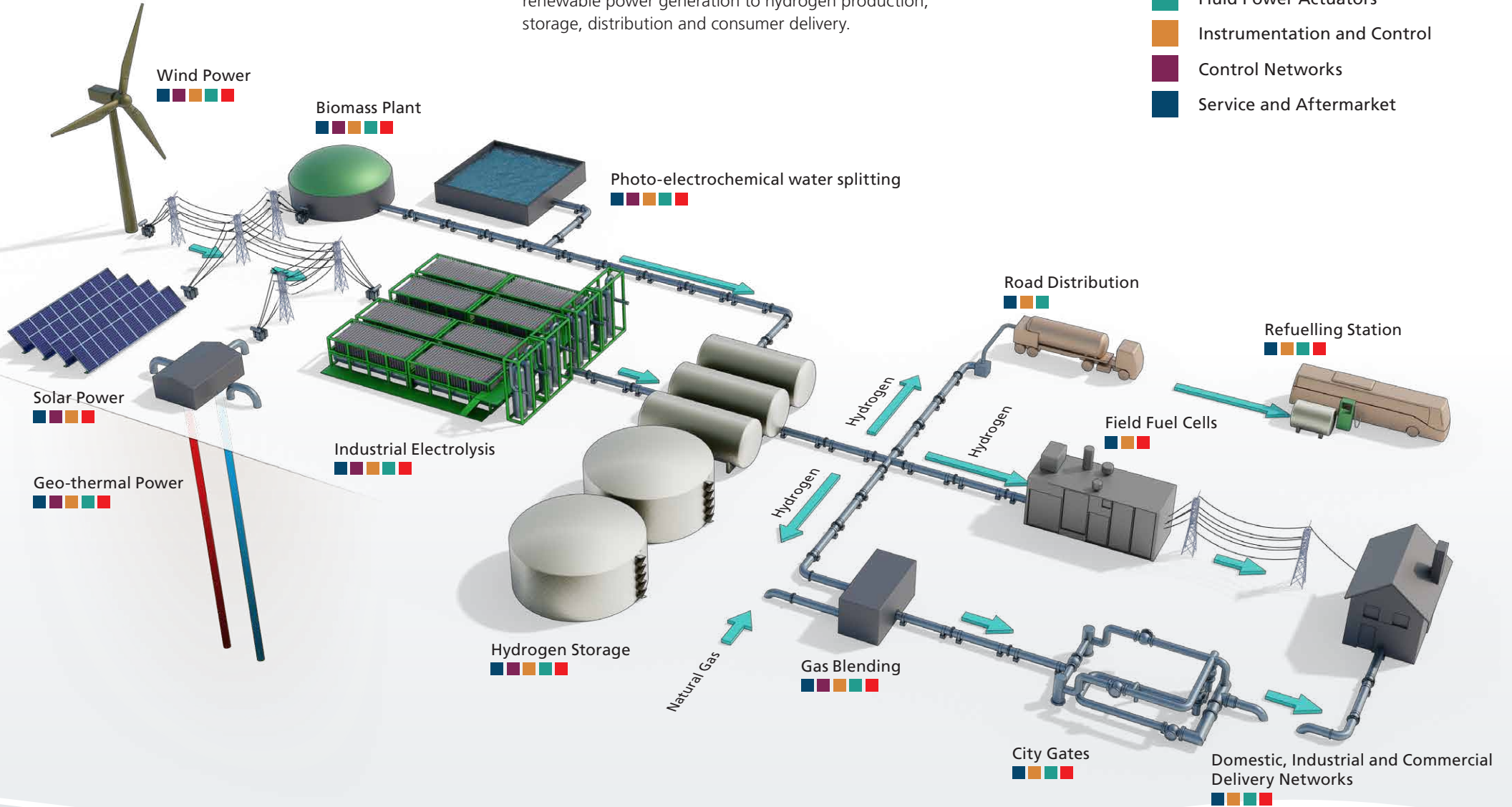


Green Hydrogen Industry Processes

Rotork has extensive knowledge and experience in all aspects of green hydrogen production.

Our products can be found in almost every process control application throughout the green hydrogen industry, from renewable power generation to hydrogen production, storage, distribution and consumer delivery.

- Electric Actuators
- Fluid Power Actuators
- Instrumentation and Control
- Control Networks
- Service and Aftermarket



Product Solutions for the Green Hydrogen Industry

Rotork design engineers work with plant managers, network systems engineers, legislative bodies and government environmental groups to specify and supply the correct solutions for your requirements.

Our extensive product range allows us to meet all your requirements and help you achieve your goals. For detailed application information see our Application Focus documents available on rotork.com

<p>Electric Actuators</p> <p>IQ Range – Multi-turn and part-turn actuators for arduous environments</p> 	<p>Fluid Power Actuators</p> <p>RC Range – Compact scotch yoke actuators</p> 	<p>Instrumentation and Control</p> <p>Filters, regulators, lubricators, pumps, pressure and precision relief valves</p> 	<p>Control Networks</p> <p>Network connectivity</p> <p>Pakscan™, Foundation, HART™ COMMUNICATION PROTOCOL, DeficeNet, PROFIBUS, Modbus®</p>	<p>Service and Aftermarket</p> <p>Lifetime Management</p> 
<p>ExMax Range – Explosionproof part-turn actuators</p> 	<p>GT Range – Rack and pinion actuators</p> 	<p>Piston Actuated Valves (PAV) and Solenoid Operated Valves (SOV)</p> 	<p>Rotork <i>Master Station</i> – Supervisory plant control</p> 	<p>Intelligent Asset Management</p> 
<p>CVA / CMA Ranges – Linear, part-turn and multi-turn precision modulating actuators</p> 	<p>CP / GP Ranges – Scotch yoke actuators</p> 	<p>Isolation Valves – High pressure ball and needle valves and instrument isolation manifolds.</p> 	<p>Rotork <i>Master Station</i> – Supervisory plant control</p> 	<p>Spares</p> 
<p>PAX1 – Valve actuators and motorised pressure regulators</p> 	<p>Limit Switch Boxes – High visibility position indication and control feedback</p> 	<p>Valve Positioners – Precision valve control for pneumatic and hydraulic actuators</p> 	<p>Rotork <i>Master Station</i> – Supervisory plant control</p> 	<p>Life Cycle Services</p> 



Trusted Partner

Rotork is a market-leading provider of flow control and instrumentation solutions. We have served global industrial actuation and flow control markets for more than 60 years, delivering results in all regions and in all environmental situations.

Our reliability record is second to none. Rotork products are designed with safety and performance at their core and are put through vigorous testing by international safety institutes. Our products are certified for use in the world's most dangerous, and hazardous areas.

Partnering with Rotork provides the following:

- Assured safety and reliability
- Industry leading accuracy and efficiency
- Proven technology that works with all control systems
- Product range with solutions to suit every application
- Assistance with plant planning, development and maintenance through our local support services

History shows we are a company to do business with:

- Established in 1957, we have always been innovators and leaders in flow control technology
- Safety is a core value of our business and products
- We have innovative research and development centres throughout the world
- With 3,400 employees globally and 85 sites, we provide local service on a global scale
- We are embracing a more diverse workforce
- We are committed to reducing our own environmental impact, reducing water and power usage year-on-year

Our service engineers work with industrial partners to design, update and maintain their plant and equipment.



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

www.rotork.com

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