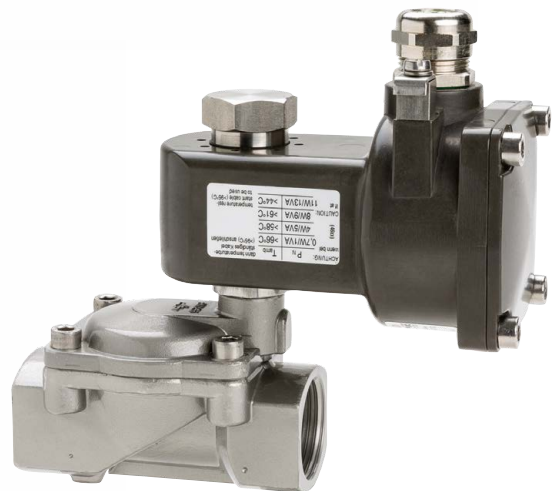


# Green Hydrogen Production Electrolysis Solutions



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# Breakthrough Engineering for a Better World

**Norgren is part of global engineering organisation IMI plc. IMI is at the forefront of delivering the solutions we need in a changing world and is focused on **creating tremendous value by solving key industry problems** in attractive markets and employing the best.**

Norgren has a proud history of creating innovative engineering solutions in precise motion control and fluid technology, and we collaborate with our customers across more than 50 countries in critical areas such as Factory Automation, Material Handling, Rail, Energy, Process Control, Life Science and Commercial Vehicles.

From improving speed, productivity, reliability and efficiency of equipment, to generating significant energy and cost savings, or lowering total cost of ownership across many industries, Norgren's high-quality solutions are designed to help customers pursue progress, achieve new goals and overcome problems.

With market-leading industry expertise, we offer the capability, resources, engineering intelligence and global support infrastructure to tackle the largest project demands.

Our world-class portfolio of fluid and motion control products include Norgren, Bimba, Buschjost, FAS, Herion, Kloehn and Maxseal. Supplied either individually or combined into powerful customised solutions to meet customer needs.

**Breakthrough engineering you can count on.**

# Expertise in Electrolysis Solutions

**Norgren offers an extensive range of high quality components and complete system solutions to tackle the biggest challenges currently facing hydrogen infrastructure development.**

Norgren has extensive expertise in hydrogen and low-pressure applications. The Norgren portfolio for electrolysis applications includes a complete range of fluid and process control components specifically designed with hydrogen in mind.

Norgren offers standardised modular solutions that meet your system requirements to help you reduce complexity and costs while improving safety and reliability over the system lifetime.

- » Helping to reduce complexity
- » Simplified assembly by reduction of parts and modular solutions
- » Improving the safety, reliability and performance of fluid and process control sub-systems
- » Reduction of fittings and therefore potential leakage points

**Our market leading products combine to create an extensive range of proven valve and pressure control solutions including:**

- » Pressure regulators (spring, dome, proportional pressure reducers, back pressure valves)
- » Solenoid operated valves
- » Manual stop valves
- » Filters - inline and tee-type
- » Check valves
- » Valve island
- » Safety and relief valves
- » Angle seat valve



# Solenoid Diaphragm Valves

At Norgren, we understand that you may have issues with leakage when handling hydrogen and oxygen in your electrolyser fluidic loops. The usual solution involves over-engineering your system with tubing, components and standard pneumatic valves.

**What if you could remove the complexity but retain world-class safety in your system?**

Norgren's solenoid diaphragm and indirect valves can reduce leakage points in hydrogen generation applications, whether installed in the anode and cathode draining system (with 30% KOH fluid) or in the Hydrogen to Oxygen/Oxygen to Hydrogen supplying loops.



86740/86750  
2/2-way diaphragm valve



82610/84620  
2/2-way solenoid valve

## 86740/86750 2/2-way diaphragm valve

- » Material: Stainless steel (1.4408)
- » Max. inlet pressure: 40 bar
- » Port size: DN 8 to 50 / G1/4 to 2
- » Orifice: 8 to 50 mm
- » Ambient temperature: -20°C to +50°C
- » Hydrogen temperature: -20°C to +90°C
- » Flow (Kv): 2.2 to 41 m³/h

## 82610/84620 2/2-way solenoid valve

- » Material: Stainless steel (1.4408)
- » Operating pressure :
  - 1.5 mm - 0 ... 70 bar
  - 2.5 mm - 0 ... 40 bar
  - 3.0 mm - 0 ... 20 bar
  - 4.0 mm - 0 ... 12 bar
  - 5.0 mm - 0 ... 6 bar
- » Port size: DN 1.5 ... 5 , G1/8 ... 3/8
- » Orifice: 1.5 to 5.0 mm
- » Ambient temperature: -10°C to +50°C
- » Hydrogen temperature: -10°C to +110°C
- » Flow (Kv): 0.07 to 0.5 m³/h





## Series 6215 Indirect solenoid and air actuated spool valve

- » Material: Stainless steel
- » Max. pressure: 8 bar
- » Port size: Solenoid pilot: G1/4, 1/4 NPT or NAMUR interface
- » Air pilot: G1/2, 1/2 NPT
- » Temperature: -40°C to +60°C
- » Flow 1200 l/min

## Series 82730 2/2-way valve

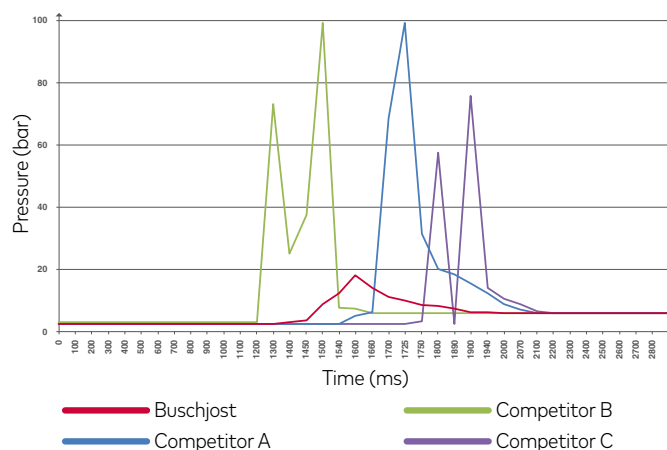
### Water hammer technology:

Water hammer, also called fluid hammer or hydraulic shock, creates a pressure spike in a pipe system that can damage seals, gauges, pipes and fittings – virtually anything upstream.

Norgren addresses the problem of water hammer at the source – the valve. Our superior solenoid valves are proven to reduce pressure spikes by more than 80 %, compared to the competition.

### Product highlights:

- » 2/2-way valves – Normally closed and open
- » Brass and stainless steel
- » International approvals available
- » Compact design
- » Maximum pressure ratings up to 16 bar (232 psi)
- » 1/4 ... 2 (ISO G/NPT) port size options
- » Options:
  - NBR, FKM, EPDM seat seals
  - Manual override
  - Latching coil options
  - Customised solutions



# Valve Islands

**Are you struggling to find standardized solutions that can be copied and pasted in all your systems worldwide? And when you do, you fear that maintenance and parts availability will be a nightmare?**

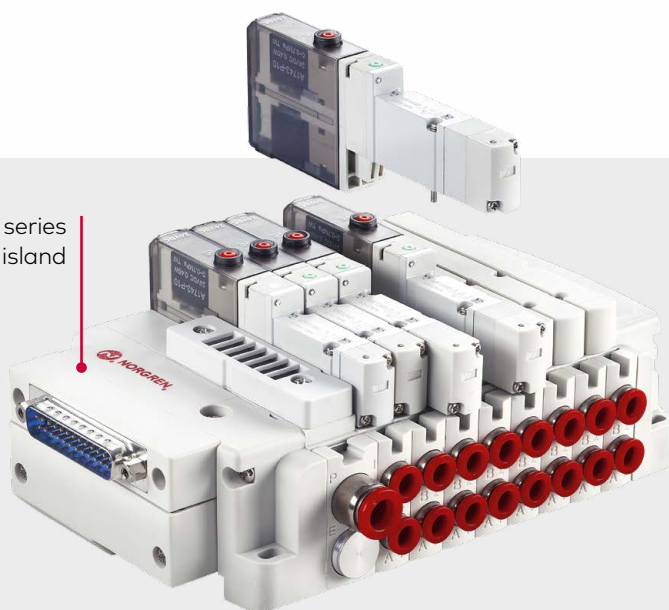
Valve islands are a collection of valves mounted into one unit, reducing pipework, electrical connections and complexity. Our valve island ranges are configured individually to suit your needs and application.

Norgren valve islands guarantee a simple plug-and-play experience, reducing complexity in the electrolyser system

thanks to their modular characteristics. Available up to 40 valves with different ranges and functions, once installed they are highly reliable (over 30 million cycles) and easy to maintain thanks to the interruption-free valve replacement option.

- » Highly flexible
- » Connected
- » Easy to configure online at [www.norgren.com](http://www.norgren.com)

VR series  
valve island

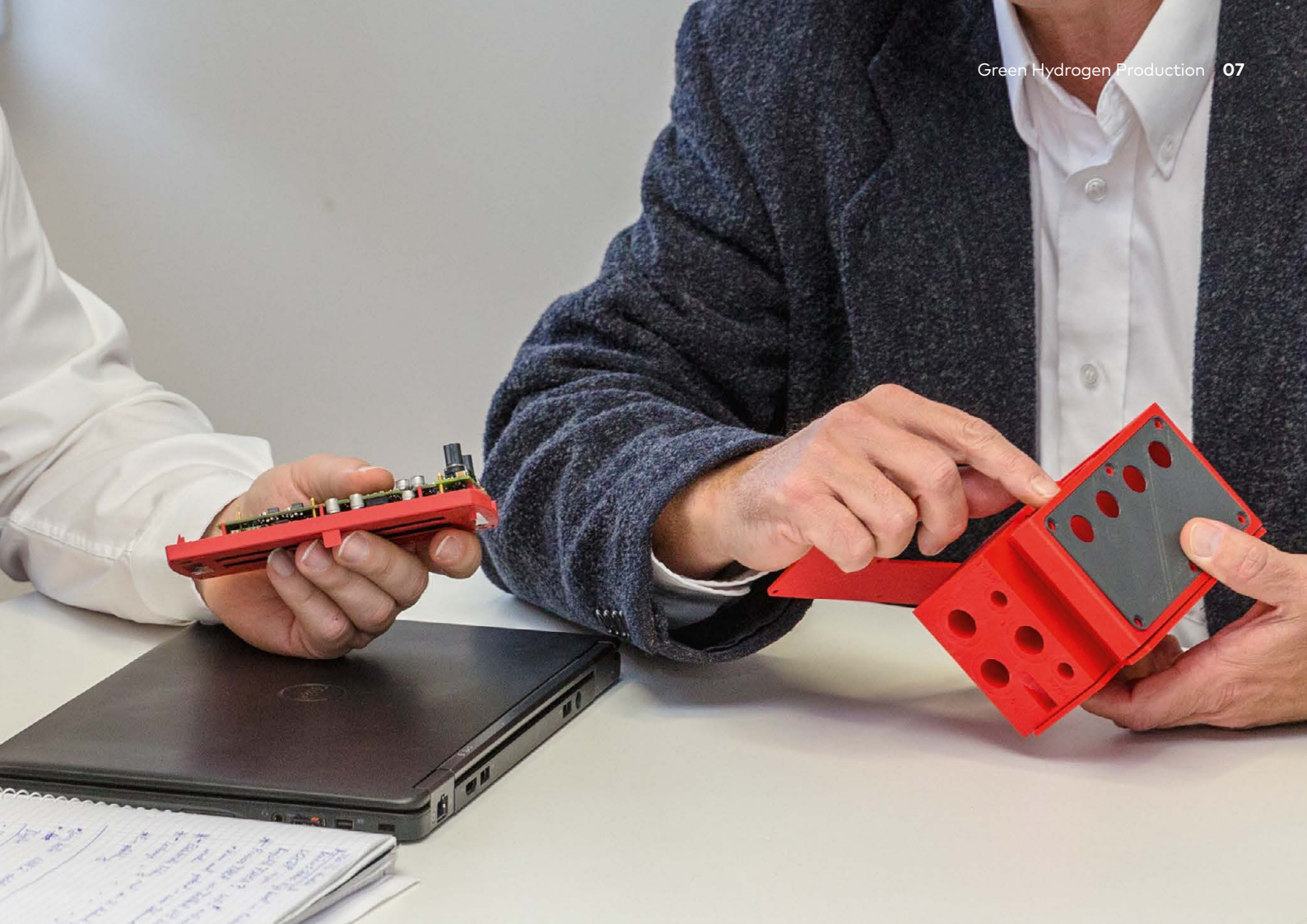


VS series  
valve island



VM series  
valve island





## Plug-in technology

### Pneumatics

- » Two sizes, 18 mm and 26 mm width
- » Up to 20 stations (40 solenoids) depending on protocol
- » VS18 and VS26 comply with ISO 15407-2 standard
- » Simple multi-pressure functionality
- » 2 x 3/2 valves in one body
- » 2 x 2/2 valves in one body (VS18/VS26)

### Multipole

- » 24 V DC and 115 V AC voltage options
- » Wide range of electrical connections
- » Field expandable up to four additional stations
- » One universal 24 V DC PCB for both PNP/NPN

### Fieldbus

- » Compact size through integrated electronics
- » Field expandable up to four additional stations
- » Wide range of protocols offered

### Industrial ethernet

- » Ultimate flexibility in machine design
- » Standardised platform for networking of devices
- » Real-time data transmitted simultaneously over a common medium
- » Large network coverage and almost unlimited number of users
- » Large amounts of data transferable
- » Equal bus access authorisation
- » Quick and easy commissioning



# Angle Seat Valves

**Are you designing world-class safety loops in your hydrogen, oxygen and nitrogen circuits but need to reduce the total cost of ownership?**

Norgren angle seat valves are designed for serviceability and are suitable for applications in electrolyser systems. These valves make unpleasant water hammering a thing of the past as the medium flow itself is used for a damped closing of the valve. The inclined position of the valve seat to the flow direction allows superior flow characteristics. The pneumatically operated angle seat valves have a maintenance-free piston actuator.

Norgren angle seat valves demonstrate a distinctly high closing force, can realize short switching cycles and are approved for Ex-area.



Stainless steel body suitable for aggressive gases and liquids

## **Series 84520/84530 Angle seat valve**

- » Material: Stainless Steel
- » Max operating pressure: 0 to max. 25 bar
- » Orifice: 15 mm to 50 mm
- » Port size: G1/2 to G2
- » Ambient temperature: -10 to +60 °C
- » Media temperature: -10 to +180 °C
- » Flow: 4.8 m<sup>3</sup>/h to 37 m<sup>3</sup>/h

**CE EAC**



# Pressure Regulators

Norgren offers proven solutions for gas control on the outlet for safety systems, as well as in downstream pressure reduction applications. Our spring-loaded pressure regulators (also called reducers or controllers) control the outlet pressure over a range of varying inlet pressures and flows with precision tolerance of 10%.

With a robust, corrosion resistant, sealed spring housing design our regulators are built to last, offering product lifetime up to 35 years with stable pressure precision for up to 10 years without adjustment.

## B903 Back pressure regulator

- » Material: Stainless steel
- » Max. pressure: 35 bar
- » Outlet pressure range: 0.5 bar up to 6 to 35 bar
- » Port size: 1/4 inch BSPP
- » Internal diameter: 1 mm to 3 mm
- » Temperature: -20°C to +50°C
- » Flow (Kv): 0.23 m³/h



B903



B38P

## B38P Pressure regulator

- » Material: 316 Stainless steel
- » Max. inlet pressure: 31 bar
- » Port size : 1/4 to 1" (NPT, ISO G)
- » Element: 5, 25, 40 µm
- » Temperature : -40°C to +80°C
- » Flow 100 dm³/s



J45



J50

## J45 Spring loaded regulator

- » Material: 316 Stainless steel
- » Max. inlet pressure: 250 bar
- » Outlet pressure range: 0.1 bar to 1 bar up to 7 to 70 bar
- » Port size : 1 inch
- » Leakage: Bubble tight (He leak test on request)
- » Ambient temperature: -40°C to +150°C
- » Hydrogen temperature: -40°C to +150°C
- » Flow: 2.9 m³/h

## Series J50 high pressure regulator

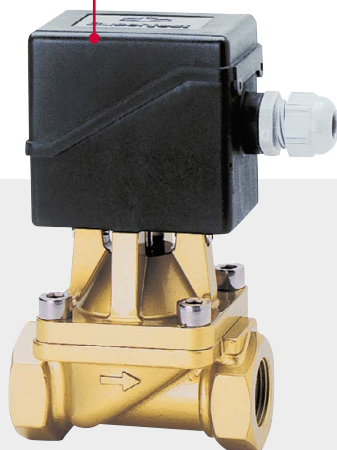
- » Material: Stainless steel
- » Max. inlet pressure : 400 bar
- » Outlet pressure range: 0 to 400 bar
- » Port size : 3/8 inch
- » Leakage: Bubble tight (He leak test on request)
- » Ambient temperature: -40°C – +150°C
- » Hydrogen temperature: -40°C – +150°C
- » Flow (Kv): 0.95 m³/h

# Auxiliary Products

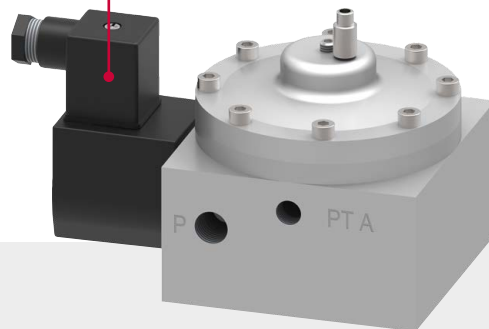
84190  
piston valve



82880  
2-way proportional  
valve



Low pressure  
regulator  
8592121.9151.02400

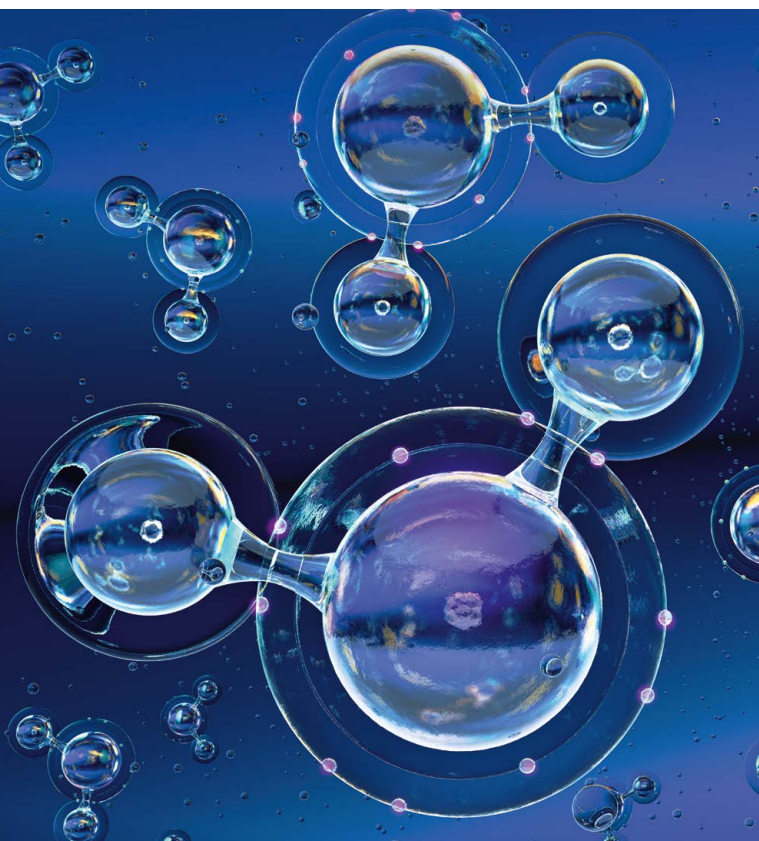


N08 check  
valve



**Need a clever, custom way to combine individual components?**

Contact our hydrogen experts to learn about our modular manifold solutions.





# Breakthrough Engineering for a Better World

**IMI**  
Precision Engineering





Norgren operates four global centres of technical excellence and a sales and service network in 50 countries, as well as manufacturing capability in Brazil, China, Czech Republic, Germany, India, Mexico, UK and the USA.

For information on all Norgren companies visit

**[www.norgren.com](http://www.norgren.com)**

**Supported by distributors worldwide.**

For further information, scan this QR code or visit **[www.norgren.com](http://www.norgren.com)**



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Incorporating



**IMI**