

Automation for green hydrogen

Festo at the Hydrogen Expo in Hamburg

Generating energy sustainably is one of the great challenges of our time - and green hydrogen is a building block of the solution. Hydrogen will play a key role in the future energy landscape and in the decarbonization of energy-intensive industries. Festo offers comprehensive automation solutions along the entire hydrogen value chain - on show at Hydrogen Expo in Hamburg from October 21 to 23, 2025 (hall B6, booth 6J40).

At the beginning of the hydrogen value chain is the production of hydrogen by means of electrolysis. In order to produce hydrogen with zero emissions, electrolysis using sustainable electricity is already used as an established technology. An automation concept that is perfectly matched to the electrolyzer is the key to its efficient, safe and long-term operation. Festo offers an extensive portfolio for this purpose, which covers the entire automation pyramid from the control level to the field level. Festo provides its own remote I.O. modules (CPX-E, CPX-AP) and valve terminals (VTUG) for control and communication between the controller and process valves. All components are modular and freely configurable. This means that both input/output modules (digital, analog) and the fieldbus module can be adapted to the field devices and PLC.

Controlling processes with a positioner or proportional valve

Various types of process valves are used to control flow rates, gases and liquids, temperature, etc. In the classic case, the actuators – and thus indirectly the process valves – are controlled by means of a positioner. These use different methods to measure the position of the actuator or valve and control it to the position desired by the main controller. Festo offers the CSMH positioner for this purpose. Another control device is the I/P transducer, a current/pressure transducer. This is used primarily in linear systems – but only when the position of the valve plays a subordinate role for the safety-related consideration. Proportional valves such as the VPPM from Festo can take over the function of an I/P transducer. In doing so, they usually exceed the control quality and ease of use of the transducer.

Safety is paramount

Hydrogen is a colorless, volatile and non-toxic gas that is highly flammable and must be handled at high pressure. Numerous safety regulations must therefore be observed when setting up production and the necessary infrastructure. To get the green hydrogen produced to where it is to be used, it must be made transportable. This can be done, for example, by compressing it in a compressor station. The safety of a plant is also important in the event of malfunctions or faults. Festo's portfolio includes numerous products that are specially designed for use in potentially explosive atmospheres and are certified according to the IEC 61508 SIL standard, such as the VOFC and VOFD valves. The functional safety of electrolyzers is therefore essential to making industrial processes safe, efficient and environmentally friendly.

Customer-specific and ready to install

Festo also offers control cabinet solutions that meet the SIL standard. These protect components against environmental influences and foreign bodies. Regardless of whether

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pneumatic, electric or electro-pneumatic components are used, the end result is a fully designed control cabinet that centrally controls the actuators and sensors in the container. For applications in explosion-prone areas, the control cabinets can be planned, assembled and certified according to regional and international regulations.

Press Images



Electrolyzer for green hydrogen

View inside an electrolyzer with control cabinet that controls the automated process valve units

About Festo

Festo is a global player and an independent family-owned company with headquarters in Esslingen am Neckar, Germany. Festo has set standards in industrial automation technology and technical education ever since its establishment, thereby making a contribution to sustainable development of the environment, the economy and society. The company supplies pneumatic and electrical automation technology to 300,000 customers of factory and process automation in over 35 industries. Digitalization, AI and the LifeTech sector with medical technology and laboratory automation are becoming increasingly important. The products and services are available in 176 countries. With about 20,600 employees in over 250 branch offices in around 60 countries worldwide, Festo achieved a turnover of around €3.45 billion in 2024. More than 8% of this turnover is invested in research and development. In this learning company, 1.5 % of turnover is invested in basic and further training. Festo Didactic SE is a leading provider of technical education and training and offers its customers worldwide comprehensive digital and physical learning solutions in the industrial environment.