

# JOINING FORCES FOR A GREEN TOMORROW

Hydrogen's promise: Elevating our valves to new heights



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„I believe that water will one day be employed as fuel, that hydrogen and oxygen which constitute it, used singly or together, will furnish an inexhaustible source of heat and light, of an intensity of which coal is not capable.“

Jules Verne, French writer 1875

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WHO WE ARE

## More than **150 years** speak volumes

Quality made in Germany by HEROSE: when it comes to the safety and performance of our valves, the numbers send a clear message. More than 150 years of HEROSE – that means **more than 150 years of know-how and experience.**

Year after year, more than half a million valves are shipped from our plants, almost 80 percent of which are exported to customers in more than 90 countries. For cryogenic liquefied technical gases or LNG, for steam, compressed air or liquids, powdered or granular media – customers from a **huge variety of industries rely on HEROSE every day.**

Behind the numbers are the people at HEROSE: worldwide more than 550 highly qualified employees and more than 100 partners work hand in hand to deliver on our quality promise – around the clock, with a high level of motivation and no ifs or buts.



More than  
**150**  
years  
of experience



Owner-managed  
company

More than  
**500** k.  
valves produced  
per year

More than  
**42**  
sales partners  
worldwide



Six  
production facilities

More than  
**65**  
authorised service  
partners

More than  
**550**  
employees  
worldwide



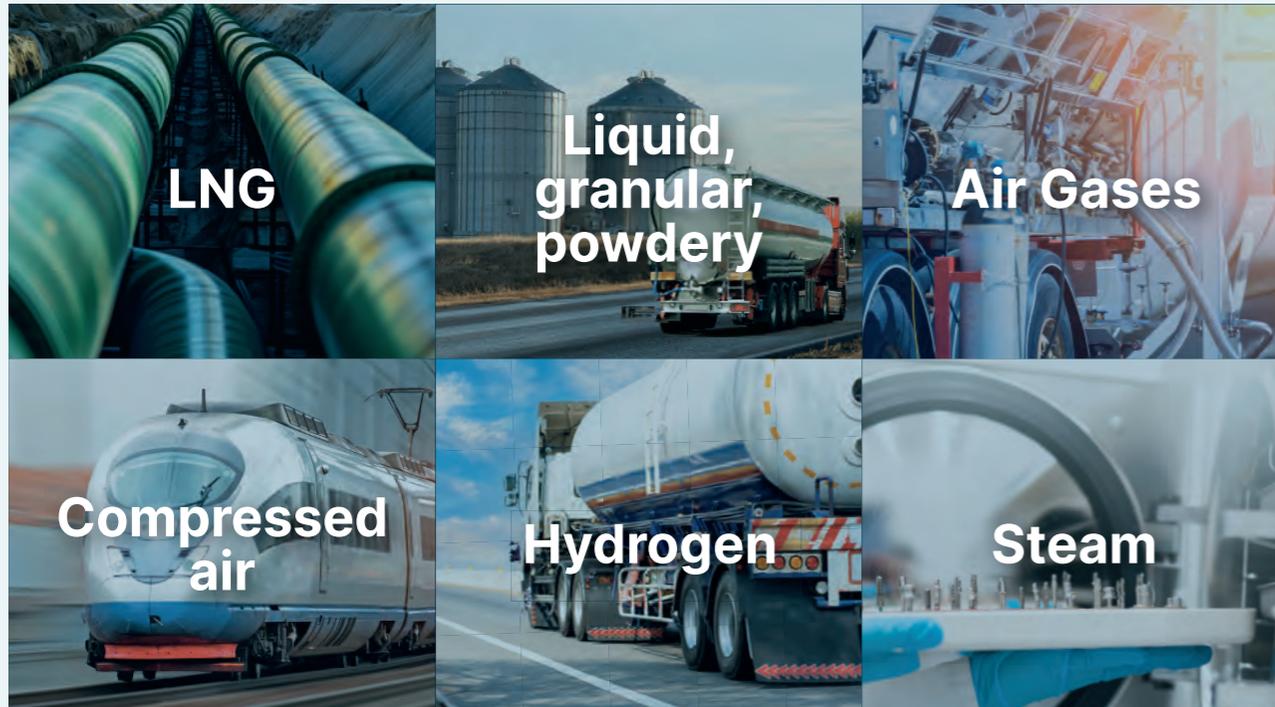
Global sales  
network

More than  
**100** m  
annual  
turnover

## APPLICATIONS

### Warm or cold: we are right there

Safety, durability and ease of maintenance are top priorities for our valves and their areas of application. Whether in the low temperature range, where extreme conditions must be withstood, or in industrial applications, where the safety of people and machines is paramount, you can rely on us.



## HYDROGEN

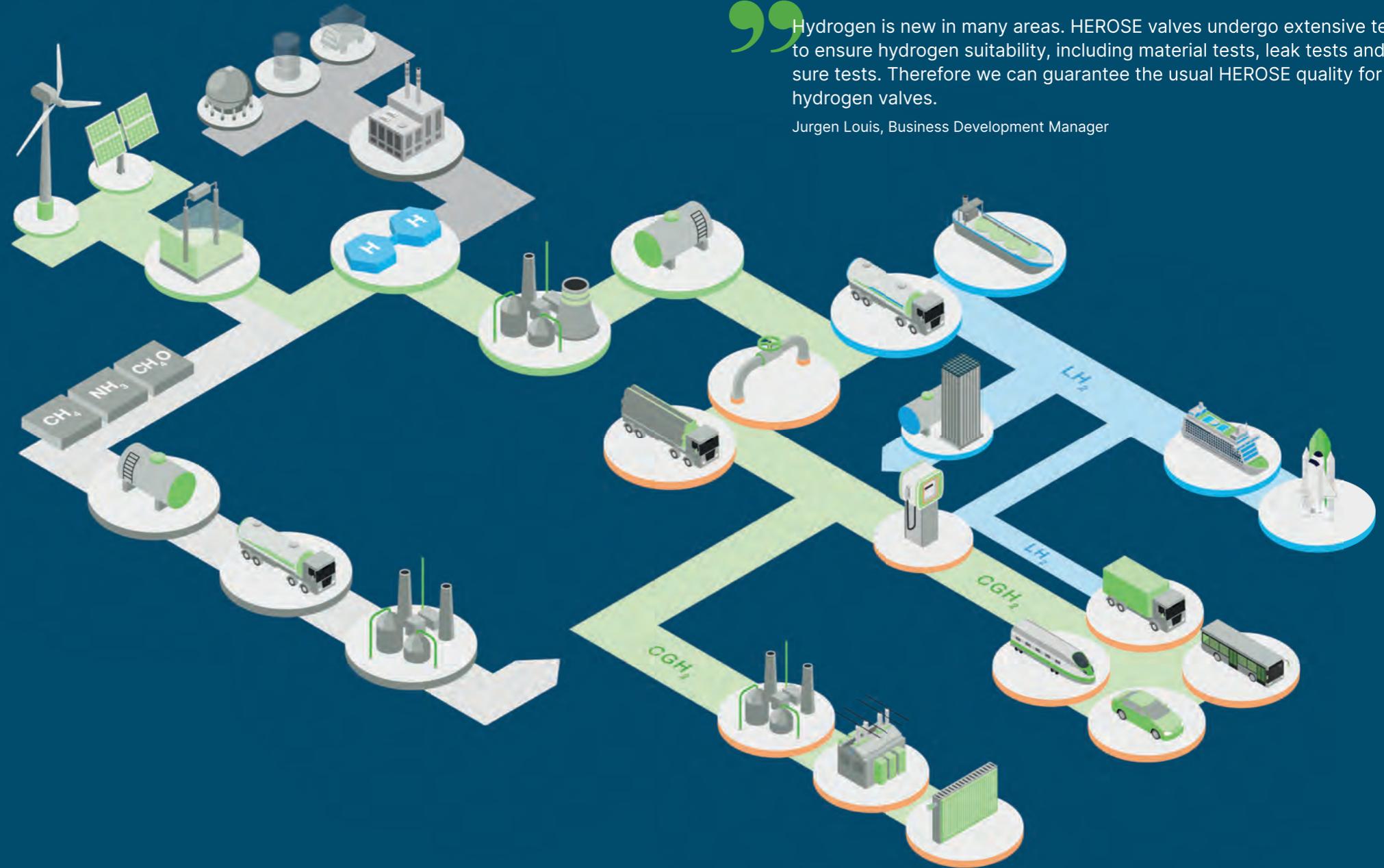
### Energy source of the future

For the future of energy supply, we focus on the highest quality and safety. As the most common chemical element in the universe, hydrogen is playing an increasingly important role in sustainable energy supply. The requirements for the production, distribution, and use of hydrogen are challenging and the demands on quality and safety are extremely high. You are on the safe side for the most diverse areas of application of hydrogen use with HEROSE high-performance valves.



## Supply chain

- Hydrogen (H<sub>2</sub>) is a carbon-free energy carrier that provides the opportunity to reduce worldwide greenhouse gas emissions, energy security for countries with high demand, and profitable export of energy by countries with excess of renewable electricity.
- To fulfil this promise hydrogen can be produced from renewable power (solar, wind, hydro-power, biomass), but also from nuclear electricity or from biomass and fossil energy sources when carbon is sequestered (CCS/CCU: Carbon Capture and Storage or Use).
- Through electrolysis, the water is split into its components hydrogen and oxygen.
- To enable efficient storage and transport, the volumetric energy content of the hydrogen must be increased. This can be done by compression or liquefaction, but also by attaching hydrogen to other substances, for example using liquid organic hydrogen carriers (LOHC), ammonia (NH<sub>3</sub>) or metal hydride storage materials (MH<sub>x</sub>).
- Finally, at the point of use, hydrogen (or the hydrogen carrier) can be used directly or converted back to electricity.
- HEROSE offers hydrogen compatible valves for all steps of the value chain.



“Hydrogen is new in many areas. HEROSE valves undergo extensive testing to ensure hydrogen suitability, including material tests, leak tests and pressure tests. Therefore we can guarantee the usual HEROSE quality for our hydrogen valves.

Jurgen Louis, Business Development Manager

OUR SOLUTIONS

# High nickel content make our valves ready for hydrogen

## We have something against instability

Due to their small size, hydrogen can penetrate metal and lead to hydrogen embrittlement: hydrogen enters the structure through the smallest openings and collects at lattice boundaries. This changes the strength or ductility of the metal. This can lead to instability, cracks and brittle fractures. How can this be prevented?

## The right material ensures safety

Due to its chemical composition and microstructure, stainless steel resists hydrogen embrittlement and is therefore the material of choice for hydrogen applications. By increasing the nickel content, the structure of the steel can be further improved and thus also the hydrogen resistance. In HEROSE valves, cast bodies with a high nickel content ensure maximum safety.



Globe Valves

Check Valves

Globe Valves for vacuum insulated pipings

Actuated Valves

Strainers

Safety Valves

Changeover Valves

## VALVES WITH BELLOWS

# Bellows: a solution for particularly high tightness

Media that must not be allowed to escape to the outside and into the environment require special sealing technology and place high demands on valves. By integrating a bellows, HEROSE valves can achieve an exceptionally high external tightness  $10^{-6}$  mbar\*l/s up to  $10^{-9}$  mbar\*l/s. This tightness is important for safely handling hydrogen molecules. The HEROSE cryogenic globe valves with bellows for extremely high tightness requirements.



### 01272 – with bellows

Orifice: DN10 up to DN50  
Pressure: up to 50 bar  
up to 725 psi  
Temperature:  $-255^{\circ}\text{C}$  up to  $+120^{\circ}\text{C}$   
 $-427^{\circ}\text{F}$  up to  $+248^{\circ}\text{F}$   
Connections: Welded  
Material: Stainless steel

## FIRESAFE VALVES

# Safety in case of fire

Even under extreme conditions, valves must still function, for example in the event of a fire. During the Firesafe test, the valves must withstand a fire for 30 minutes and then be able to be opened completely at least once. Despite the heat stress, they must only have minimal leaks and must still be operable. To achieve this, they contain fewer soft seals, as these can melt in high heat. HEROSE offers a wide range of firesafe valves.

The operability of valves can determine the safety of lives and property in an emergency.



### 01851

Orifice: DN10 up to DN100  
Pressure: up to 50 bar  
up to 725 psi  
Temperature:  $-255^{\circ}\text{C}$  up to  $+120^{\circ}\text{C}$   
 $-427^{\circ}\text{F}$  up to  $+248^{\circ}\text{F}$   
Connections: Welded  
Material: Stainless steel



### 01841

Orifice: DN10 up to DN200  
Pressure: up to 50 bar  
up to 725 psi  
Temperature:  $-255^{\circ}\text{C}$  up to  $+120^{\circ}\text{C}$   
 $-427^{\circ}\text{F}$  up to  $+248^{\circ}\text{F}$   
Connections: Welded  
Material: Stainless steel

## CHECK VALVES

# Direct protection of the backflow

By preventing backflow, i.e. regulating one-way flow, check valves are crucial to ensuring the integrity of pipelines, pump systems and other flow systems.

HEROSE check valves reliably regulate one-way flow to prevent reverse flow.



### 05714

Orifice: DN10 up to DN150  
Pressure: up to 50 bar  
up to 725 psi  
Temperature: -255 °C up to +120 °C  
-427 °F up to +248 °F  
Connections: Welded  
Material: Stainless steel

### 05C02

Orifice: DN25  
Pressure: up to 63 bar  
up to 913.7 psi  
Temperature: -269 °C up to +80 °C  
-452 °F up to +176 °F  
Connections: Welded  
Material: Stainless steel  
Body: Bar, cast material



## STRAINERS

# No chance for contamination

Strainers play an important role in maintaining the purity of media and the safety of systems. Purity is also an important issue when storing, transporting and using hydrogen. Strainers with mesh sizes in the tenth of a millimeter or micrometer range reliably remove contaminants and particles so that the performance of systems or the quality of the medium is not impaired. Protection for systems and processes with suitable strainers from HEROSE.



### 08717

Orifice: DN10 up to DN150  
Pressure: up to 50 bar  
up to 725 psi  
Temperature: -255 °C up to +120 °C  
-427 °F up to +248 °F  
Connections: Welded  
Material: Stainless steel

## FULLX AND VACUUM INSULATION

# When heat input leads to losses FullX is required

During transportation and storage of cryogenic media, any heat input leads to evaporation and thus to losses. The HEROSE FullX is a globe valve for low-temperature applications that can be completely covered with a vacuum jacket. This reduces heat input to a very low value.

The insulation does not even have to be removed for maintenance or repairs due to the valve's top entry design. FullX saves space because it can be installed in any position. Even overhead installation is possible thanks to the bellows in bottom position.

FullX – the completely vacuum-insulated valve in a modular system with many installation options.

### 11C01

Orifice: DN10 up to DN50  
Pressure: up to 63 bar  
up to 913.7 psi  
Temperature: -269 °C up to +80 °C  
-452.2 °F up to +176 °F  
Connections: Welded  
Material: Stainless steel  
Operation: actuated, manual



## Flexibility with many possibilities

Our FullX can be installed in any position thanks to the integration of a bellows.

The options are as versatile as your application:

- Various body variants (straight, angle and y-pattern)
- Bellows
- Check, control, and throttle function
- Purge port
- and many more...

### EXCELLENT INSULATION EFFECT

The vacuum insulation allows for easy installation of the valve into the piping system. The excellent thermal insulation, including the insulating foil (MLI), guarantees minimal heat loss.



### Discover also our other top entry valve series.

The first choice for all nominal sizes from DN65: Type 01470

All technical details can be found at [herose.com](https://www.herose.com).



## ACTUATED VALVES

### Reliable and precise remote control

Valves are often installed in places that are difficult to access – due to structural conditions or because they are located in safety areas. HEROSE offers several actuators to control valves remotely. Actuated valves enable precise control of the flow or pressure in the system and can improve energy efficiency. Remote control enables automation and reduces the need for manual intervention. An additional handwheel can also be used to manually open or close the valve in the event of a compressed air failure.

Actuated HEROSE valves offer advantages for performance and efficiency in processes.



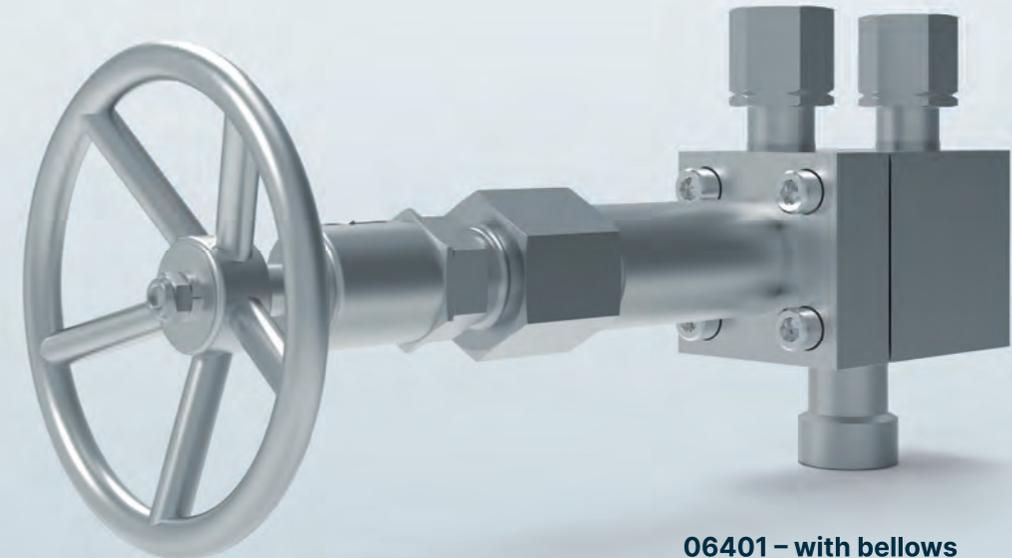
#### 01843

Orifice: DN10 up to DN200  
Pressure: up to 50 bar  
up to 725 psi  
Temperature: -255 °C up to +120 °C  
-427 °F up to +248 °F  
Connections: Welded  
Material: Stainless steel

## CHANGEOVER VALVES

### For maintenance in running systems

Every safety valve must be checked and maintained at least once a year. The valves are often installed in systems whose processes can only be interrupted or stopped with great effort. Changeover valves are the solution. Two safety valves allow maintenance, repairs or replacement to be carried out on one valve, while the other takes over the protection of the system. HEROSE changeover valves ensure safety and uninterrupted processes.



#### 06401 – with bellows

Orifice: DN15 and DN25  
Pressure: up to 63 bar  
up to 913.7 psi  
Temperature: -255 °C up to +185 °C  
-427 °F up to +365 °F  
Connections: Locking sleeve, female thread, flange  
Material: Stainless steel

SAFETY VALVES

# Safety valves protect systems from overpressure

Safety valves play a crucial role in the hydrogen environment. Pressure and pressure differences can be very high for many hydrogen applications. Safety valves protect systems against overpressure and prevent damage to people and equipment.

The detailed design, taking into account the medium as well as pressure and temperature range, is the basis for good functioning of the valve, especially at pressures of up to 1,200 bar and in cryogenic environments where thermal expansion can occur. At HEROSE, you will find the right safety valve solutions for smooth and safe processes.



**06382**

Orifice  $d_0$ : 10.5 mm  
 Pressure: 6 up to 60 bar  
 87 up to 870 psi  
 Temperature: -196 °C up to +185 °C  
 -320.8 °F up to +365 °F  
 Connections: Thread  
 Material: Stainless steel



**06011**

Orifice  $d_0$ : 6 mm  
 Pressure: 5 up to 55 bar  
 73 up to 798 psi  
 Temperature: -255 °C up to +65 °C  
 -427 °F up to +149 °F  
 Connections: Thread  
 Material: Stainless steel



**06383 – Full lift safety valve**

Orifice  $d_0$ : 7 up to 23 mm  
 Pressure: 2 up to 50 bar  
 29 up to 725 psi  
 Temperature: -255 °C up to +185 °C  
 -427 °F up to +365 °F  
 Connections: Thread  
 Material: Stainless steel



**06800 – with bellows**

Orifice  $d_0$ : 12 up to 23 mm  
 Pressure: 3 up to 25 bar  
 43.5 up to 362.6 psi  
 Temperature: -270 °C up to +225 °C  
 -454 °F up to +437 °F  
 Connections: Thread  
 Material: Stainless steel



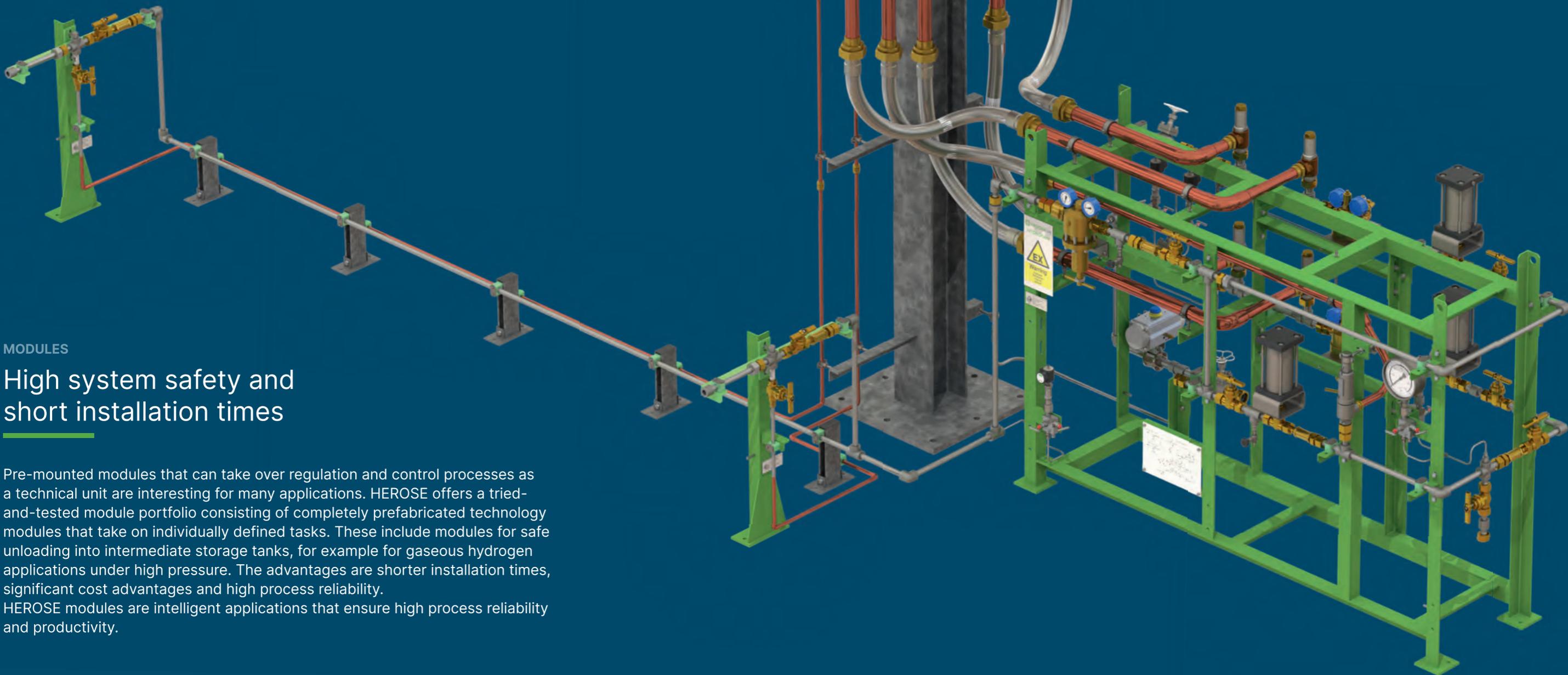
**06440**

Orifice  $d_0$ : 7 up to 23 mm  
 Pressure: 0.4 up to 50 bar  
 5.8 up to 725 psi  
 Temperature: -255 °C up to +185 °C  
 -427 °F up to +365 °F  
 Connections: Thread  
 Material: Stainless steel



**06810 | 06820**

Orifice  $d_0$ : 6 up to 10 mm  
 Pressure: 0.5 up to 1,200 bar  
 7.3 up to 17,405 psi  
 Temperature: -270 °C up to +400 °C  
 -454 °F up to +752 °F  
 Connections: Thread  
 Material: Stainless steel



## MODULES

# High system safety and short installation times

Pre-mounted modules that can take over regulation and control processes as a technical unit are interesting for many applications. HEROSE offers a tried-and-tested module portfolio consisting of completely prefabricated technology modules that take on individually defined tasks. These include modules for safe unloading into intermediate storage tanks, for example for gaseous hydrogen applications under high pressure. The advantages are shorter installation times, significant cost advantages and high process reliability. HEROSE modules are intelligent applications that ensure high process reliability and productivity.

APPROVED WORLDWIDE

## Over 170 approvals and certificates confirm our quality

In systems and technical facilities, our products are just a small gear in the machine of the bigger picture. But an important gear because the function and safety usually depend on them. That's why we pursue a very simple strategy: the highest quality. We document this with over 170 certifications and classifications for worldwide use.



All approvals can also be found on our website.



WE ARE CLOSE TO YOU

## Our locations

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