

**RATERMANN**  
Cryogenics

**WORLD LEADERS  
IN CRYOGENIC  
VALVES**

Product Brochure



# RATERMANN

Cryogenics

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# WORLD LEADERS IN CRYOGENIC VALVES



### About Herose products

We offer a wide range of top-quality Herose and Ratermann Cryogenics Approved valves and valve packages for cryogenic industrial gas and LNG applications. We also manufacture safety valves for numerous industries and valve packages for the transformer industry. Ratermann Cryogenics are the

North America's distributor for Herose GmbH, world leaders in the manufacture and distribution of exceptionally high quality cryogenic valves. The products in this brochure are used in over 80 countries across the world including all the major countries that use industrial gas and LNG. Welcome to our brochure of world-leading Herose cryogenic valves.

### A cryogenic valve service provider

Our bespoke cryogenic valve packages combine global knowledge and technical expertise of cryogenics to solve our clients' problems. As part of our packages, we advise on and supply the valves needed for every stage of the cryogenic storage and transportation process – from small,

thermal relief valves for pipelines and liquid cylinders; fire-safe ESD valves to protect trailers and storage equipment through to large diameter butterfly valves controlling the flow to your process facility.

# RATERMANN

## Cryogenics

**Quality is our point of difference – it is a quality based on our proven track record of safety, reliability and endurance.**



### Quality of Products

#### Our obsession with quality

Quality is our point of difference – it is a quality based on our proven track record of safety, reliability and endurance. Herose go above and beyond the stringent demands and specifications of the industrial gas industry at every stage of production, from the raw materials we use through to design, assembly, testing and cleanliness of the final product. We exceed industry standards because of the added commercial value this brings to our customers.

#### Herose make valves built to endure

The result of our obsession with quality is valves built to endure. Our exceptionally high standard cryogenic valves consistently deliver under high pressures and low temperatures across many applications and industries, whatever the critical conditions. In our tests and those of our customers, our valves are proven to perform twice and three times as long as similar products. We have an ultra-low failure rate, with only 0.00002% of our products returned in the last 10 years, earning us an unrivalled safety record and reputation for quality.

#### Quality equals safety equals reputation

At Herose we know that selection of the right cryogenic valves and safety are the keys to success because of the fatal impact that accidents can have on people, the environment, the industry and reputation. Cryogenic valves must be fit for purpose and we make your needs our priority, whether that is:

- Pressurisation
- Valve closure
- Fire protection
- Valve material
- Valve size

### Ratermann Cryogenics Approved

Our bespoke cryogenic valve packages include Ratermann Cryogenics Approved products. We use our technical expertise and knowledge of the industry worldwide to identify cryogenic products that operate in conjunction with and complement our own product ranges. These products are sourced and selected from a number of quality manufacturers. Products carrying the Ratermann Cryogenics Approved badge have had their performance proven by Ratermann Cryogenics and meet the high standards the industry expects globally. It also reflects the quality we demand of all Ratermann Cryogenics products in terms of:

- product design, testing, assembly, cleanliness
- proven performance and track record in field installations
- levels of service

We are one of the few global distributors of cryogenic valves that insist on the ISO 9001 standard across all the products in each bespoke package.



**RATERMANN  
CRYOGENICS  
APPROVED**

**Products awarded with the Ratermann Cryogenics Approved badge have had their performance proven by Ratermann Cryogenics and meet the high standards the industry expects worldwide.**

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# GLOBE VALVES



Herose valves have been a global standard in the industrial gas industry for over a decade. They are used in cryogenic applications including installation on processing plants, storage vessels and trailers.

Herose have helped the global industry move from using globe valves mainly made of bronze to stainless steel, in order to benefit from the latter's superior quality, but at no extra cost. Consequently, the industrial gas industry has been able to enhance equipment and extend refurbishing periods. Unique gland packings in globe valves ensure a longer operating life.

Further, flexible seat design has improved valve closure in unforgiving filling valve installations where icing can occur. Herose have developed fill cluster valves in combined assemblies that simplify piping and reduce the vessel manufacturers installation costs. We have applied this technique to other Herose valve designs as we lead the way in developing new products.



**Extended Globe Valve**

**Material:** Bronze / Stainless  
**Size:** 1/4"-2" / 6-50mm  
**Pressure:** 720psi / 50 bar  
**Temperature:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, Socket end, Stubbed, Union



**Non-Extended Globe Valve**

**Materials:** Bronze / Stainless  
**Sizes:** 1/4"-6" / 6-150mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, SW, BW, Stubbed, Union



**Flanged Extended Globe Valve**

**Materials:** Stainless  
**Sizes:** 1"-4" / 25-100mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Flanged



**Cluster Extended Valve**

**Materials:** Bronze / Stainless  
**Sizes:** 1"-1.1/2" / 25-40mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** SW, Stubbed

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## Cryogenics

# SPECIALIST GLOBE VALVES



As a leading supplier to the industrial gas industry, Herose have developed our product range for use in other cryogenic applications.

For manual globe valve packages we have introduced top-entry valves for use in the cold box of air separation plants. Users can remove the internal parts of the valve without having to break into the cold box. It comes complete with a mounting flange that allows users to install the specialist globe valve in extended runs of cryogenic jacketed pipelines.

We have designed a bellow sealed valve for applications where the cryogenic gas or liquid is more searching, expensive or volatile. We have also combined top entry and bellow-sealed valves with actuation and control trim for specialist applications. These valves are used to

control cryogenic liquids in aerospace operating facilities.

This range of globe valves has a fire-safe certified option, which is suitable for LNG installations. To make our packages more comprehensive we have recently introduced a range of offshore and hydrogen valves. By making sure we stay ahead in design and development, you are able to source all your specialist globe valves from a single, highly reputable manufacturer.

You can find more products from our extended range in the control and ESD valve sections of this product brochure.



**Bellow Sealed Globe Valve**

**Materials:** Stainless  
**Sizes:** 3/8"-2" / 10-50mm  
**Pressures:** 720psi / 50bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, SW, BW, Stubbed, Flanged



**Fire-Safe Globe Valve**

**Materials:** Stainless  
**Sizes:** 3/8"-4" / 10-100mm  
**Pressures:** 720psi / 50bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, SW, BW, Stubbed, Flanged



**Hydrogen / Offshore  
Globe Valve**

**Materials:** Stainless  
**Sizes:** 3/8"-6" / 10-150mm  
**Pressures:** 720psi / 50bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, SW, BW, Stubbed, Flanged



**Top Entry Extended  
Globe Valve**

**Materials:** Stainless  
**Sizes:** 3/8"-2" / 10-50mm  
**Pressures:** 720psi / 50bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** SW, BW, Stubbed

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# ACTUATED ESD VALVES



This range of valves includes gate and globe emergency shutdown (ESD) valves that are pneumatically or electrically actuated. The first Herose ESD valve was the trailer gate valve, which is now standard on cryogenic industrial gas and LNG trailers worldwide.

The actuated ESD gate valve allows cryogenic trailers to fill up and discharge their payload much more quickly than those using globe valves. It has simple tyre actuation and is often used in plant installations.

The actuated ESD globe valve option has been adapted using the tyre actuator. Like a gate valve it is lightweight and allows cryogenic trailers to carry extra payload. Having developed fire-safe options, these are now used on LNG trailers.

More recently we have designed electrically actuated ESD valves for trailers, plant and ship fuelling installations. This simplifies installations as they no longer need compressors and their associated costs. ESD actuation options used for cryogenic trailer and plant applications meet global standards for explosion-proof zones. The Herose gate valve continues to give tight closure even when subjected to thousands of cryogenic cycle tests. It allows full-bore flow and has a closing time of less than three seconds even with electric actuation. It is suitable for the highest specification LNG installations.



**ESD Pneumatic Actuated Globe Valve**  
**Materials:** Stainless  
**Sizes:** 1.1/2"-3" / 40-80mm  
**Pressures:** 145psi / 10 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** SW, BW



**ESD Pneumatic Actuated Gate Valve**  
**Materials:** Stainless  
**Sizes:** 1"-4" / 25-100mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** SW, BW



**ESD Pneumatic Actuated Globe Valve**  
**Materials:** Bronze / Stainless  
**Sizes:** 1/2"-6" / 15-150mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, SW, BW, Stubbed, Flanged



**ESD Electrically Actuated Globe Valve**  
**Materials:** Bronze / Stainless  
**Sizes:** 1/2"-6" / 15-150mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, SW, BW, Stubbed, Flanged



# RATERMANN

## Cryogenics

# ESD VALVES



This package of Ratermann Cryogenics Approved valves has been created for the cryogenic industrial gas and LNG markets. Many can be operated without the need for separate air or electronic supply.

The MG-97 over-fill protection valve was designed and introduced following a major industrial gas incident when a cryogenic vessel ruptured in Germany as a result of over pressurisation. The valve is now standard in Germany wherever they need to protect cryogenic storage vessels against high-pressure trailer filling. It is increasingly required in other parts of the world as industries demand faster filling times and pump manufacturers strive to increase the capacity of their equipment.

Our unique solenoid valve package requires an electric supply. A choice of direct acting, pilot or forced pilot

design allows valve closure up to 3,400 psi (230 bar). Solenoid ratings enable use in LNG installations where explosion-proof zones are required to meet global standards and protect plant and personnel.

The latest addition to the Ratermann Cryogenics Approved range is break-away couplings. They play a major safety role in protecting against spillage from filling lines during the transfer of cryogenic liquids from storage vessels to trailers. They are now standard in LNG plants in Asia and a global standard in ship-to-ship and bunkering filling installations where they greatly simplify bunkering.



**Self Acting Breakaway Coupling**

**Materials:** Stainless  
**Sizes:** 1"-16" / 25-400mm  
**Pressures:** 600psi / 40 bar  
**Temperatures:** -321°F to +212°F / -196°C to +100°C  
**Connections:** Threaded, SW, BW, Flanged



**Electrically Actuated Solenoid Valve**

**Materials:** Bronze, Stainless  
**Sizes:** 3/8"-2" / 10-50mm  
**Pressures:** 600psi / 40 bar  
**Temperatures:** -321°F to +140°F / -196°C to +60°C  
**Connections:** Threaded, SW, BW, Flanged



**Self Acting Overfill Protection Valve**

**Materials:** Bronze, Stainless  
**Sizes:** 1"-1.1/2" / 25-40mm  
**Pressures:** 1,160psi / 80 bar  
**Temperatures:** -321°F to +140°F / -196°C to +60°C  
**Connections:** Threaded, SW, BW, Flanged, Union



**Pneumatically Actuated Ball Valve**

**Materials:** Stainless  
**Sizes:** 1/4"-6" / 6-150mm  
**Pressures:** 1,450 / 100 bar  
**Temperatures:** -321°F to +374°F / -196°C to +190°C  
**Connections:** Threaded, SW, BW, Flanged

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# CONTROL VALVES



Herose control valves are supplied with top-range positioners and other ancillaries giving users cost-effective accurate control. Our control valves are used to control cryogenic liquid flow or down-line pressures.

Control valves often replace standard pressure regulators when lines are 2" (50mm) or larger. Available with proportional, linear or bespoke trim, control valves offer a choice of flow characteristics. Alternatively, our manual control valves are ideal for operators starting up a new plant. They use the same base valve trim as actuated valves for extra flow control.

The Ratermann Cryogenics Approved range includes two options that are suitable for larger flow with selection dependent on line size. These are V-sectioned ball valves and butterfly valves with special trim and contoured discs. Both designs have staged opening that ensures the sealing seats are not damaged on opening the valve. This allows you control and shut-off characteristics in the one valve.



**Globe Control Valve**

**Materials:** Bronze / Stainless  
**Sizes:** 1/2"-6" / 15-150mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, SW, BW, Stubbed, Flanged



**Butterfly Control Valve**

**Materials:** Stainless / Others  
**Sizes:** 2"-24" / 50-600mm  
**Pressures:** 1,450 / 100 bar  
**Temperatures:** -321°F to +392°F / -196°C to +200°C  
**Connections:** Wafer, Double Flanged, Lugged, BW



**Ball Control Valve**

**Materials:** Stainless  
**Sizes:** 1/4"-6" / 6-150mm  
**Pressures:** 1,450 / 100 bar  
**Temperatures:** -321°F to +374°F / -196°C to +190°C  
**Connections:** Threaded, SW, BW, Flanged



**Globe Electric Actuated Control Valve**

**Materials:** Stainless  
**Sizes:** 1/2"-6" / 15-150mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, SW, BW, Stubbed, Flanged

# RATERMANN

## Cryogenics

# PRESSURE CONTROL



Herose have introduced a unique, combined pressure build and economiser valve used in the liquid or gas side of a vaporiser on cryogenic storage vessels. This range from Herose was recently conceived in our research and development house in Germany and has many new features. Stainless steel construction makes it suitable for use on LNG storage vessels.

The Ratermann Cryogenics Approved range of valves includes a gas delivery regulator (GDR) valve used after the vaporisation to control the flow of industrial gases to the point of use. With its low droop characteristics, most industrial gas companies now use it as standard across the world.

Included in the package are the HP1000 cryogenic pressure reducing and the model 123 back-pressure regulators, which are leaders in their field. By controlling cryogenic liquids and gas flows, they give an unrivalled level of pressure control. They are also energy efficient as they reduce gas losses and operating costs.



**Pressure Regulating Valve**

**Materials:** Bronze / Stainless  
**Sizes:** 1/2"-2" / 15-50mm  
**Pressures:** 740psi / 51 bar  
**Temperatures:** -321°F to +100°F / -196°C to +38°C  
**Connections:** Threaded, Flanged



**Electrically Actuated Regulating Valve**

**Materials:** Bronze / Stainless  
**Sizes:** 1/2"-6" / 15-150mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, SW, BW, Stubbed, Flanged



**GDR Gas Delivery Regulator**

**Materials:** Bronze  
**Sizes:** 1/2"-1" / 15-25mm  
**Pressures:** 450psi / 31 bar  
**Temperatures:** -60°F to +248°F / -40°C to +450°C  
**Connections:** Threaded



**Regulating PBU + Economiser Valve**

**Materials:** Stainless  
**Sizes:** 1/2"-1" / 15-25mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, Union

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# BALL VALVES



We supply this range of Ratermann Cryogenics Approved valves for cryogenic industrial gas offshore containers, cryogenic pump piping and low-pressure trailer applications. Our top-entry valves are used on many LNG cryogenic projects and pipelines worldwide.

**This package includes:**

- two and three-way valves
- three-piece and top-entry
- reduced and full-bore
- non-extended and extended
- manual and actuated
- bronze ball for oxygen
- fire-safe and emergency shutdown (ESD)
- stainless steel for LNG and flammable gas applications

specifications and simplify pipe fabrication. Our standard ball valves are pneumatic, you can choose from spring or double actuation or electronic to meet most international standards for explosion proof zones. Our ball valve shut-off exceeds users' performance expectations under demanding cryogenic conditions. It has excellent sealing characteristics without an excessive torque when opening or closing.

Our two-way valves are recommended when you need a low-pressure drop. The three-way valves have different porting options to meet flow



**3-Piece Ball Valve**

**Materials:** Stainless  
**Sizes:** 1/4"-6" / 6-150mm  
**Pressures:** 1,450 / 100 bar  
**Temperatures:** -321°F to +374°F / -196°C to +190°C  
**Connections:** Threaded, SW, BW, Flanged



**3-Way Ball Valve**

**Materials:** Stainless  
**Sizes:** 1/4"-2.1/2" / 6-65mm  
**Pressures:** 1,450 / 100 bar  
**Temperatures:** -321°F to +374°F / -196°C to +190°C  
**Connections:** Threaded, SW, BW



**2-Piece Fire-Safe Ball Valve**

**Materials:** Stainless  
**Sizes:** 1/2" -8" / 15-200mm  
**Pressures:** 580psi / 40 bar  
**Temperatures:** -10°F to +330°F / -14°C to +165°C  
**Connections:** Threaded, SW, BW, Flanged



**Top Entry Ball Valve**

**Materials:** Stainless  
**Sizes:** 1/2" -8" / 15-200mm  
**Pressures:** 1,450 / 100 bar  
**Temperatures:** -321°F to +374°F / -196°C to +190°C  
**Connections:** Threaded, SW, BW, Flanged

# RATERMANN

## Cryogenics

# BUTTERFLY VALVES



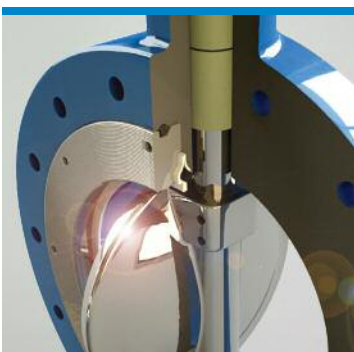
Our range of 'Next Epoch' Ratermann Cryogenics Approved butterfly valves are highly sought after. They are used worldwide in LNG, oxygen, industrial gas plants and other applications involving extremely low temperatures. This range of double eccentric, high-performance valves provide unparalleled performance for cryogenic applications.

The range includes 3" - 48" (80 - 1200mm), 150/300/600# classes and is suitable for operation in cryogenic temperatures from -196 °C to process temperatures at 1,200 °C.

'Next Epoch' valves include as standard wafer and flanged designs. Each valve is made with an extended bonnet to dissipate extremely cold cryogenic temperatures and ensure extended gland-packing life.

Standard valves boast polytetrafluoroethylene (PTFE) coated bearings for enhanced performance and reliability. This and the special O-ring seal ensure efficient and long-life stem sealing. The Next Epoch range has above average life between maintenance with fire-safe being an option for LNG plants.

A comprehensive catalogue of Herose butterfly valves complements this range.



**Cryogenic Butterfly Valve**

**Materials:** Stainless  
**Sizes:** 2"-24" / 50-600mm  
**Pressures:** 1,450 / 100 bar  
**Temperatures:** -321°F to +392°F / -196°C to +200°C  
**Connections:** Wafer, Double Flanged, Lugged, BW



**Fire-Safe Butterfly Valve**

**Materials:** Stainless / Others  
**Sizes:** 2"-24" / 50-600mm  
**Pressures:** 1,450 / 100 bar  
**Temperatures:** -321°F to +392°F / -196°C to +200°C  
**Connections:** Wafer, Double Flanged, Lugged, BW



**Caged Trim Butterfly Valve**

**Materials:** Stainless / Others  
**Sizes:** 2"-24" / 50-600mm  
**Pressures:** 1,450 / 100 bar  
**Temperatures:** -321°F to +392°F / -196°C to +200°C  
**Connections:** Wafer, Double Flanged, Lugged, BW



**Process Butterfly Valve**

**Materials:** Stainless / Others  
**Sizes:** 2"-48" / 50-1,200mm  
**Pressures:** 1,450 / 100 bar  
**Temperatures:** -321°F to +2,192°F / -196°C to +1,200°C  
**Connections:** Wafer, Double Flanged, Lugged, BW

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# GATE VALVES



Herose lead the way in gate valve design. Thanks to the proven reliability of Herose manual gate valves, they are now used on trailer applications worldwide transporting cryogenic industrial gas, LNG and other flammable liquids. They are available in bronze for transformers and stainless steel actuated valves for mobile cryogenic LNG trailers.

By introducing wedges with improved soft sealing technologies we have created a hardwearing and durable valve that is proven to be reliable even during heavy use on trailer applications and regular shut-off. Our gate valve's flow is three to five times greater than that of the same size globe valve, significantly reducing filling time for cryogenic trailers.

Thanks to their high flow and shut-off performance, our manual gate

valves are used on cryogenic plant installations. The rubber tyre actuated gate valve has the same shut-off performance as the manual valve and is now a standard emergency shutdown (ESD) valve used on cryogenic trailers globally (see ESD section).

The final valves in this group are the Ratermann Cryogenics Approved transformer valves. Also used worldwide, the package includes cryogenic globe valves and three-way valves.



**Manual Gate Valve**

**Materials:** Stainless  
**Sizes:** 1"-4" / 25-100mm  
**Pressures:** 720psi / 50bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** SW, BW



**ESD Pneumatically Actuated Gate Valve**

**Materials:** Stainless  
**Sizes:** 1"-4" / 25-100mm  
**Pressures:** 720psi / 50bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** SW, BW



**ESD Electrically Actuated Gate Valve**

**Materials:** Bronze / Stainless  
**Sizes:** 1/2"-6" / 15-150mm  
**Pressures:** 720psi / 50bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, SW, BW, Stubbed, Flanged



**Transformer Valve**

**Materials:** Bronze  
**Sizes:** 1/2"-3" / 15-80mm  
**Pressures:** 230psi / 16 bar  
**Temperatures:** -10°F to +356°F / -14°C to +180°C  
**Connections:** Threaded, Flanged

# RATERMANN

## Cryogenics

# CHECK VALVES AND STRAINERS



This package includes lift, swing, plunger and double door designs for cryogenic storage, trailer, yard and process plant applications. While selecting the right valve depends on the particular application you need it for, lift check valves are standard for many cryogenic applications.

Guided discs ensure bubble tight closure. Swing check valves are ideal when you need to minimise pressure drops, or the double door wafer valve for larger process applications. Soft-seated or stellite trim valve options ensure long operating life for the most demanding applications.

Our Herose range of "T" strainers are fast becoming an industry standard and have many cryogenic applications. They can be fitted with needle valves for blow down on plant applications. Various basket materials are available for oxygen applications.



**Cryogenic Strainer**

**Materials:** Bronze / Stainless  
**Sizes:** 1/4"-6" / 6-150mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F /  
 -196°C to +120°C  
**Connections:** Threaded, Socket  
 End, Stubbed, Union, Flanged



**Bronze Check Valve**

**Materials:** Bronze  
**Sizes:** 1/4"-2" / 6-50mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F /  
 -196°C to +120°C  
**Connections:** Threaded, Socket  
 End, Stubbed, Union



**Cryogenic Check Valve**

**Materials:** Stainless  
**Sizes:** 1/4"-6" / 6-150mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F /  
 -196°C to +120°C  
**Connections:** Threaded, Socket  
 End, Stubbed, Union, Flanged



**High-Flow Check Valve**

**Materials:** Brass / Stainless  
**Sizes:** 1/8"-2" / 3-50mm  
**Pressures:** 4,500psi / 310 bar  
**Temperatures:** -321°F to +450°F /  
 -196°C to +232°C  
**Connections:** Threaded

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Cryogenics

# CRYOGENIC SAFETY VALVES



Innovation and good design are core Herose principles and our range of safety valves show why we are industry leaders.

Our Herose full-lift safety valve operation enables operators to increase valve change-out intervals by at least 50%. Following their success in the industrial safety valve market, we were the first manufacturer and supplier to introduce them into the industrial cryogenic market. With a 0.00002% return rate, more than one million Herose safety valves have been installed on equipment and processing plants all over the world. Their exceptional performance makes us the service provider of choice for cryogenic storage vessels worldwide. Our safety valves are approved for

use in most countries and meet international industry specifications. Options with lifting levers allow inspection of the valve opening when on line. This feature is a standard requirement for our customers in France, for example.

The 06472 range of valves is used frequently in Europe and meets the flow requirements of smaller vessels. The 06386 valve option is metal seated and designed for use in extreme conditions. Choose from our package of high-performing safety valves.



**Stainless Safety Valve**

**Materials:** Stainless  
**Sizes:** 1/2"-2" / 15-50mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +365°F / -196°C to +185°C  
**Connections:** Threaded



**Bronze Full-Lift Safety Valve**

**Materials:** Bronze  
**Sizes:** 1/2"-2" / 15-50mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +365°F / -196°C to +185°C  
**Connections:** Threaded



**Bronze Proportional Safety Valve**

**Materials:** Bronze  
**Sizes:** 1/2"-2" / 15-50mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +365°F / -196°C to +185°C  
**Connections:** Threaded



**Bronze Safety Valve c/w Lifting Lever**

**Materials:** Bronze  
**Sizes:** 1/2"-2" / 15-50mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +365°F / -196°C to +185°C  
**Connections:** Threaded



# RATERMANN

## Cryogenics

# SPECIALIST SAFETY VALVES



We supply specialist safety valves for general industry, cryogenic industrial gas and LNG applications. You will find our valves in processing, electronics and the petrochemical industries amongst others.

The 06800 range of stainless steel bellow-sealed valves is used in processing plant applications to help contain liquefied gas. We recently developed the 06850 range of stainless steel high-pressure safety valves suitable for numerous uses including high-pressure hydrogen applications up to 10,500 psi (700 bar).

The 459 and 462 range of Ratermann Cryogenics Approved valves complement our 06800 Herose range. Available in stainless steel, this range

includes safety valves for use in high-pressure nitrogen and oxygen installations up to 3,625 psi (250 bar).

The package of Ratermann Cryogenics Approved 441 flanged valves includes DIN and ANSI valves. They are available in various materials and used in many industries. Our stainless steel valve package is used in the cryogenic industrial gas and LNG industries globally. Valves are available up to 16" (400mm) and meet many international standards. This is one of the most comprehensive specialist safety valve packages on the market.



**HP Safety Valve**

**Materials:** Stainless  
**Sizes:** 1/2"-2" / 15-50mm  
**Pressures:** 12,325psi / 850 bar  
**Temperatures:** -321°F to +752°F / -196°C to +400°C  
**Connections:** Threaded



**Flanged Safety Valve**

**Materials:** Stainless  
**Sizes:** 3/4"-8" / 20-200mm  
**Pressures:** 740psi / 51 bar  
**Temperatures:** -454°F to +1,000°F / -270°C to +538°C  
**Connections:** Flanged



**Bellow Sealed Safety Valve**

**Materials:** Stainless  
**Sizes:** 1/2"-1.1/4" / 15-32mm  
**Pressures:** 363psi / 25 bar  
**Temperatures:** -454°F to +437°F / -270°C to +225°C  
**Connections:** Threaded



**Cryogenic HP Safety Valve**

**Materials:** Stainless  
**Sizes:** 1/2"-1" / 15-25mm  
**Pressures:** 3,625psi / 250 bar  
**Temperatures:** -454°F to +752°F / -270°C to +400°C  
**Connections:** Threaded

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# CHANGEOVER VALVES



This package has a proven safety record and is the valve of choice for the industrial gas industry. It includes ball and globe options in bronze, carbon or stainless steel. Changeover valves enable you to change one of two safety valves without interrupting the operating system. Bronze valves are mainly used in the industrial gas industry particularly with oxygen.

We can supply changeover valve assemblies with two safety valves and two rupture discs. The valve is uniquely designed to make sure at least one port is open regardless of the handle position. An interlocking device ensures that the ball cannot be installed in the wrong position nor restrict flow. It also has a unique disc loaded system for positive closure allowing you to remove the safety valve while the changeover valve is still on line.

CO<sup>2</sup> 4 safety valve option and a globe bellow sealed valve complete the Herose range. These valves have been used on thousands of cryogenic storage vessels globally.

The Ratermann Cryogenics Approved flanged stainless steel globe 12" (300mm) completes the range for use in LNG and other flammable liquid installations.



**Stainless Globe Changeover Valve**

**Materials:** Stainless  
**Sizes:** 1/2"-1" / 15-25mm  
**Pressures:** 3,625psi / 250 bar  
**Temperatures:** -321°F to +365°F / -196°C to +185°C  
**Connections:** Threaded, Flanged, Stubbed



**Stainless Ball Changeover Valve**

**Materials:** Stainless  
**Sizes:** 1" / 25mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +248°F / -196°C to +120°C  
**Connections:** Threaded, Stubbed



**Ball Changeover Safety Package**

**Materials:** Bronze  
**Sizes:** 1/2"-1.1/2" / 15-40mm  
**Pressures:** 720psi / 50 bar  
**Temperatures:** -321°F to +365°F / -196°C to +185°C  
**Connections:** Threaded, Stubbed



**Flanged Changeover Valve**

**Materials:** Stainless  
**Sizes:** 1"-20" / 25-500mm  
**Pressures:** class 900  
**Temperatures:** -450°F to +1,000°F / -268°C to +538°C  
**Connections:** Flanged

# RATERMANN

## Cryogenics

# THERMAL RELIEF VALVES



Our top-performing range of Herose thermal valves are primarily installed on cryogenic applications to protect pipes and other components from over pressure from thermal expansion. They are also used as safety valves on smaller 200 litre cryogenic liquid cylinders.

Over the years we have developed a wide range of thermal relief valves including the outstanding 06000 range. Designed to the same specification as our 06388 range of safety valves, this full-lift safety valve has become the industry standard for thermal and safety valve applications in the cryogenic industrial gas industry. We have now developed the 06012 stainless steel valve to enable the LNG industry and others to benefit from the range.

The Ratermann Cryogenics Approved range is a comprehensive valve package used in diverse industries. Again, this range of proportional valves for liquid cylinder applications are industry leading. Thanks to the range of material and seat options they can be used in all thermal and safety applications using cryogenic industrial gas and LNG.



**Bronze Thermal Relief Valve**

**Materials:** Brass  
**Sizes:** 1/4"-1/2" / 6-15mm  
**Pressures:** 652psi / 45 bar  
**Temperatures:** -321°F to +365°F / -196°C to +185°C  
**Connections:** Threaded



**Stainless Thermal Relief Valve**

**Materials:** Stainless  
**Sizes:** 1/4"-1/2" / 6-15mm  
**Pressures:** 652psi / 45 bar  
**Temperatures:** -321°F to +365°F / -196°C to +185°C  
**Connections:** Threaded



**Cryogenic Relief Valve**

**Materials:** Brass / Stainless  
**Sizes:** 1/4"-1/2" / 6-15mm  
**Pressures:** 750psi / 51 bar  
 2,400psi / 165 bar  
**Temperatures:** -321°F to +400°F / -196°C to +203°C  
**Connections:** Threaded



**HP Relief Valve**

**Materials:** Brass / Stainless  
**Sizes:** 1/8"- 3/4" / 3-20mm  
**Pressures:** 750psi / 51 bar  
 2,400psi / 165 bar  
**Temperatures:** -321°F to +400°F / -196°C to +203°C  
**Connections:** Threaded

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# INSTRUMENTATION



Our Ratermann Cryogenics Approved instrumentation range features differential pressure (DP) gauge and needle valve packages.

This range of tank level gauges includes switch and transmitter options that are produced with over 50 year's experience in instrumentation. They are the only instrumentation products in the world to offer inaccuracies as low as 0.5%. They have simple 5% go/no-go indicators with working pressures up to 10,000 psi (690 bar) in many materials and elastomers to meet industry standards.

This package of robust gauges is suitable for installation on cryogenic industrial gas, hydrogen and LNG trailers, and is able to withstand the impact of rough road surfaces during transportation. The range also includes gauges for hydrogen, CO<sub>2</sub> and liquid oxygen storage vessels and we have options suitable for processing plants

and compressors where differential pressure measurement is critical. The Ratermann Cryogenics Approved range of needle valves is used to protect equipment when you need to open valves and restrict flow. This is a versatile package including various sealing options from soft to stelled trim, making the valves suitable for cryogenic and other process applications.

We recommend the Ratermann Cryogenics Approved range of sealing pastes to protect sealing threaded connections in gauges and valves from the vibration of cryogenic trailers and the impact of transportation. The homogenous paste penetrates convolutions more effectively and more safely than other sealing option.



6" DP Gauge

**Materials:** Brass / Stainless  
**Sizes:** 6" / 150mm  
**Pressures:** 1,000psi / 69 bar  
**Temperatures:** -40°F to +200°F / -40°C to +93°C  
**Connections:** Threaded



4" DP Gauge

**Materials:** Aluminium / Brass / Stainless  
**Sizes:** 2.1/2" - 4.1/2" / 65-100mm  
**Pressures:** 2,000psi / 138 bar  
**Temperatures:** -40°F to +200°F / -40°C to +93°C  
**Connections:** Threaded



PTFE Pastes

**Materials:** Aqueous Based PTFE  
**Temperatures:** -321°F to +450°F / -196°C to +232°C



Needle Valve

**Materials:** Brass / Stainless  
**Sizes:** 1/8" - 1/2" / 3-15mm  
**Pressures:** 5,000psi / 345 bar  
**Temperatures:** -65°F to +450°F / -53°C to +232°C  
**Connections:** Threaded

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# INDUSTRIAL SAFETY VALVES



The ultra-reliable industrial safety valve is Herose's signature product. Herose have been developing this industrial safety valve range since 1946. Used for gases, vapours and liquids, these valves have been preventing excess pressure in containers and boilers for well over half a century.

We have developed an open discharge option for use in silo trailer applications. A leading valve for vehicle equipment throughout Europe, it ensures tight closure and protects pressurised storage vessels and compressors from high temperatures. It is used in transport applications because it withstands the extreme vibration and high temperatures generated by increased

flow rates. Conversely, RUS high-speed trains in Russia use our industrial safety valves because of their ability to withstand the extremely cold climate in winter as well as the extreme vibration.

Our industrial safety valve package is the international standard for many applications in the compressor and trailer markets.



**Brass Closed Bonnet Safety Valve**

**Materials:** Brass  
**Sizes:** 1"-2" / 25-50mm  
**Pressures:** 65psi / 4.5 bar  
**Temperatures:** -13°F to +302°F / -25°C to +150°C  
**Connections:** Threaded



**Brass Open Bonnet Safety Valve**

**Materials:** Brass  
**Sizes:** 1/2"-2" / 15-50mm  
**Pressures:** 362psi / 25 bar  
**Temperatures:** -40°F to +392°F / -40°C to +200°C  
**Connections:** Threaded



**Bronze Safety Valve c/w Lifting Device**

**Materials:** Bronze  
**Sizes:** 1/2"-1.1/4" / 15-32mm  
**Pressures:** 362psi / 25 bar  
**Temperatures:** -14°F to +437°F / -10°C to +225°C  
**Connections:** Threaded



**HP Safety Valve c/w Lifting Device**

**Materials:** Steel  
**Sizes:** 1/4"-1.1/2" / 6-40mm  
**Pressures:** 2,900psi / 200 bar  
**Temperatures:** -14°F to +556°F / -10°C to +280°C  
**Connections:** Threaded

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# APPLICATIONS

## Storage applications



Ratermann Cryogenics are global suppliers of top quality valves to manufacturers of storage vessels for cryogenic industrial gases and LNG. We supply valves for a wide range of industrial gas storage vessels, from 180 litres to 500,000 m<sup>3</sup>, and larger LNG vessels built on site.

## Processing applications



Ratermann Cryogenics have an established global reputation for supplying high-performing cryogenic valve packages for industrial gas and LNG processing. For many years we have provided industrial gas users with products such as globe and safety valves for use in air separation plants.

## Transport applications



Industrial Gas and LNG trailers are the most worked pieces of equipment in their sectors. They are filled at least once or twice a day before discharging their load to numerous users in a wide variety of industries.

## Shipping applications



Using LNG to fuel ships has significant environmental and cost benefits. The Baltic States and Scandinavia have led the way in choosing LNG for shipping in order to minimise the carbon footprint in one of the most scenic areas of the globe.



# **RATERMANN**

## Cryogenics

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