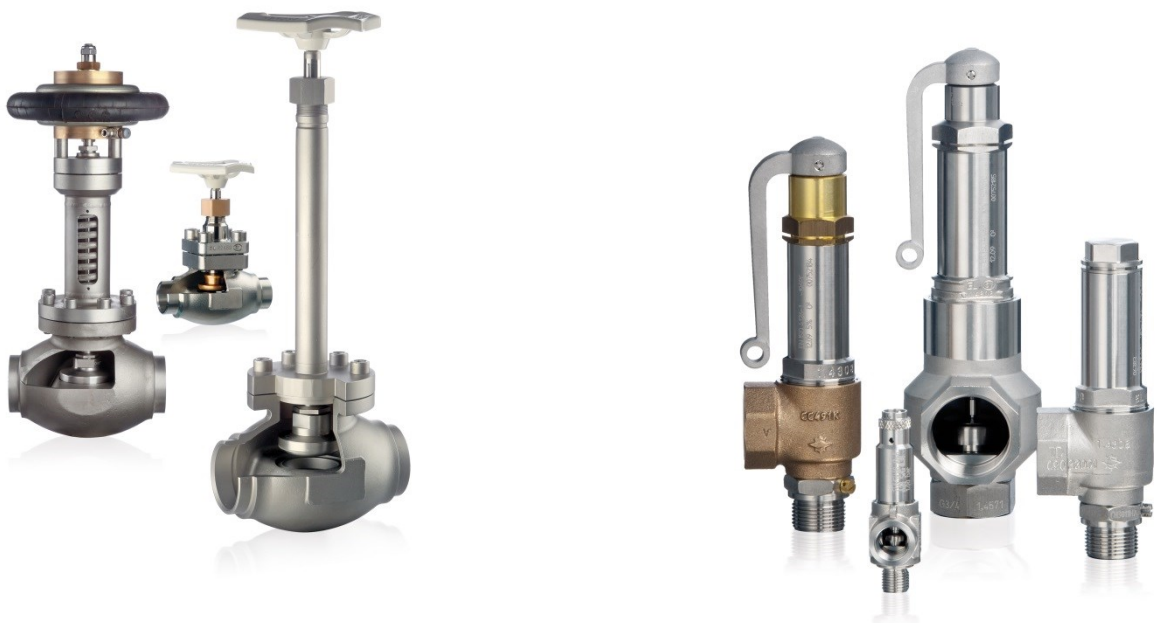


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**HEROSE information sheet**

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**HEROSE O2 - Instructions**





**READ CAREFULLY BEFORE USE! RETAIN FOR FUTURE REFERENCE!**

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**ARMATUREN UND METALLE**  
Elly-Heuss-Knapp-Straße 12  
23843 Bad Oldesloe  
Germany  
Phone: +49 4531 509 – 0  
Fax: +49 4531 509 – 120  
E-mail: [info@herose.com](mailto:info@herose.com)  
Web: [www.herose.com](http://www.herose.com)

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## 1 About this HEROSE information sheet

### 1.1 Principles

This HEROSE information sheet describes the requirements for the transport, storage, operation, maintenance and service of HEROSE valves in oil and grease-free versions for use with oxygen. These requirements must be observed in addition to the requirements described in the HEROSE operating instructions.

### 1.2 Applicable documents

Document	Contents
Catalogue page	Description of the valve
Operating instructions	Cryogenic Safety Valve, angle type Shut-off valves for cryogenic use
EIGA Doc 200/17	Design, Manufacture, Installation, Operation and Maintenance of Valves Used in Liquid Oxygen and Cold Gaseous Oxygen Systems
EN ISO 23208	Cryogenic vessels – Cleanliness for cryogenic service

### 1.3 Scope

The information contained in this HEROSE information sheet applies to third parties, e.g. to customers, persons authorised by customers and works representatives who carry out the transport, storage, operation and maintenance of HEROSE valves in oil and grease-free versions for oxygen applications.

## 2 Safety

### 2.1 Potential risks of oxygen applications

Oxygen itself is not combustible, but it supports combustion. If not handled carefully, accidents can occur with extreme consequences for man and the environment. The particular risks that can be caused by oxygen are attributable to the following points:

- **Increased risk of fire through oxygen enrichment**  
Oxygen reacts with most elements. The extent of this reaction primarily depends on:
  - concentration, temperature and pressure of the reagents.
  - ignition energy and type of combustion.
- **Increased flammability of materials**  
Materials that do not normally burn in air – including fireproof materials – may burn intensively or even spontaneously in case of an increased oxygen concentration.
- **Oils and greases made of hydrocarbons**  
Oils and greases have a particularly high hazard potential in combination with pure oxygen as they can burn spontaneously and with explosive intensity. Only special lubricants that are compatible with oxygen may be used (chapter 3.1.3).

### 3 Delivery condition, transport and storage

#### 3.1 Delivery condition of HEROSE valves

With regard to execution, cleaning, cleanliness, materials, lubricants and seals, HEROSE valves in oil and grease-free versions for use with oxygen meet the special requirements of the technical gas industry, especially from the air separation sector.

Chapters 3.1.1 to 3.1.3 briefly summarise the most important requirements. These requirements are met in the delivery state by HEROSE valves in oil and grease-free versions for oxygen applications. Care must be taken when performing maintenance work that this delivery condition is always restored!

##### 3.1.1 Thresholds for cleanliness

All HEROSE valves are cleaned for oxygen use in accordance with DIN EN ISO 23208 and meet the requirements of this standard. Conformity to this standard is indicated by the marking "ISO 23208 – O2 systems" on the label on the protective packaging.

Contaminants such as:

- swarf, extraneous materials, loose particles, scaling and welding beads
- particles that are visible in daylight or white light without magnification
- water
- hydrocarbons, coating materials, adhesives, sealants, protective coatings <sup>1)</sup>

are not permitted.

Maximum permissible contamination with hydrocarbons (oil, grease) 500 mg/m<sup>2</sup>.

The **EIGA** (EUROPEAN INDUSTRIAL GASES ASSOCIATION) guidelines for the cleaning of products for oxygen use distinguishes the maximum permissible contamination with hydrocarbons in relation to the pressure.

Less than 500 mg/m<sup>2</sup> up to 30 bar and less than 200 mg/m<sup>2</sup> over 30 bar.

The EIGA standard meets the requirements of DIN EN ISO 23208 and even exceeds them in the range above 30 bar. Consequently, actuators cleaned in accordance with this standard can be used without hesitation.

The internal HEROSE GmbH standard, which applies to all cryogenic valves, exceeds both standards, EIGA and DIN EN ISO 23208.

The values determined may not exceed a threshold of 100 mg/m<sup>2</sup>.

The threshold of < 20 mg/m<sup>2</sup> is desirable.

The goal is to maintain a threshold of < 15 mg/m<sup>2</sup>.

These thresholds of < 15 mg/m<sup>2</sup> are maintained through the processes introduced with the HEROSE GmbH cryogenic products.

<sup>1)</sup> Exception: approved according to DIN EN 1797

##### 3.1.2 Materials

Valves for oxygen use are subject to special technical requirements on account of the usage case.

1. The valves for this usage case must be manufactured from carefully selected materials,
  - For example synthetic materials, as sealing materials, must be subjected to a test of usability, which is carried out by the BAM (German Federal Institute for Materials Research and Testing), C.T.E (Air Liquide) or WHA (Wendell Hull & Associates, Inc.). The BAM has compiled a list of non-metallic materials containing the materials that have been found to be suitable for use in plant sections for oxygen. This list has been published in document M 034-1 by the Employer's Liability Insurance Association of the Raw Materials and Chemical Industry.

Overview of non-metallic materials in HEROSE products

Component	Product name	Manufacturer	Material
Seal	Neoflon / KEL-F81	Daikin	PCTFE
Seal	TFM1600 TFM1700	Dyneon	PTFE
Seal	HeCo 794036	Herflon	PTFE
Seal	TFM4215	Dyneon	PTFE/25% carbon
Seal	FT-CARR25FM-6S	PTFE compounds	PTFE/25% carbon
Seal	Mica		Mica

- For example, metals must be selected carefully with regard to their usability and if necessary tested for usability at the BAM, C.T.E or WHA. The EIGA (EUROPEAN INDUSTRIAL GASES ASSOCIATION) published a list of usable metallic materials in the edition of Doc 200/17 (Design, Manufacture, Installation, Operation and Maintenance of valves used in liquid oxygen and cold gaseous oxygen systems). Typical metallic materials for valve components in cryogenic use with oxygen are:
  - brass, bronze
  - cobalt alloys, copper and copper alloys
  - copper/nickel alloys, nickel, nickel alloys and
  - austenitic stainless steel

*Source: Doc 200/17, chapter 6.1 Selection of metallic materials*
- 2. These valves and their individual parts are to undergo appropriate cleaning processes in order to guarantee freedom from oil and grease in accordance with the applicable rules and customer specifications. The HEROSE GmbH valves and metals are conceived for oxygen use and are manufactured from materials that are suitable for this use.

### 3.1.3 Lubricants

All lubricants used in the valves have their own suitability verification for use with oxygen issued by the BAM, C.T.E or WHA.

	Product name	Manufacturer	Remark
Lubricant	Fomblin M60	Solvay Solexis	Not in contact with medium
Lubricant	Klüberalfa YV93-203	Klüber Lubrication	

## 3.2 Transport and storage

When transporting and storing valves, care must be taken that the sealed plastic bag in which the valve is delivered is not damaged. The packaging may only be removed immediately prior to installing the valve in order to prevent contamination with oil, grease or particles during transport and storage.

## 4 Assembly

Other assembly steps may be necessary depending on the plant and type of valve. The gasket manufacturer's data must be observed. Valves that are subject to special cleaning regulations may only be unpacked shortly before assembly. When unpacking, it must be ensured that the packaging is intact up to this point and that the valve is not contaminated. In addition, it must be ensured that the cleanliness requirements are also met during the assembly and that the valve is not contaminated.

### 4.1 Notes on assembly

- ▶ Clean tools before the mounting.
- ▶ Open the packaging only directly before the mounting. Freedom from oil and grease for oxygen (O<sub>2</sub>)  
Valves for oxygen are permanently marked with "O<sub>2</sub>".
- ▶ Remove protective caps or covers before mounting.
- ▶ Check the valves for dirt and damage.  
DO NOT install damaged or dirty valves.
- ▶ Remove dirt and residues from the pipeline and valve in order to prevent leaks.
- ▶ Avoid damaging the connections.  
The sealing surfaces must remain clean and intact.
- ▶ Seal the valves with suitable seals.  
No sealant (sealing tape, liquid sealing tape) may enter the valves.  
Respect the suitability for use with O<sub>2</sub>.
- ▶ The valves must be protected against dirt and damage during construction work.

## 5 Operation

For the normal operation of the valve in the plant there are no special requirements for oxygen applications that go beyond the general HEROSE operating instructions.

## 6 Maintenance and service

As a rule, the valve has to be dismantled for maintenance work. Dismantling always means the possibility of contamination (oil, grease or particles) of the surfaces that are in contact with the medium.

Prior to the assembly of the valve, suitable cleaning and testing procedures must be employed to ensure that the requirements for cleanliness in accordance with 3.1.1 are met.

When replacing components, only original spare parts from HEROSE may be used. These must be ordered from HEROSE with the express note "free from oil and grease for use with oxygen" (refer also to chapter 3.1.2).

After cleaning the components it must be ensured through suitable protective measures that no parts in contact with the medium can be contaminated with oil, grease or particles until assembly.

The valves must always be assembled in an area for oil and grease-free fittings that is separate from other assembly areas. The condition of all tools and in particular of the test benches employed must ensure that recontamination is avoided (oil and grease-free test medium).

Only lubricants specified by HEROSE may be used (see chapter 3.1.3).

## 7 Packaging

Following the assembly and adjustment, the valves are immediately protected against contamination by sealing the valve openings with oil and grease-free sealing caps and placing the valve in a plastic bag.

## 8 Summary

HEROSE safety valves may be maintained and repaired only by HEROSE or by specialist workshops authorised by HEROSE and monitored by the regulatory authorities, using only original spare parts and with tools and jigs specially intended for the purpose.

The maintenance and repair of all other valves in oil and grease-free versions for oxygen applications may only be carried out by specially trained personnel using tools and jigs specially intended for the purpose.

The instructions described in the above chapters only describe the minimum requirements and cannot be claimed to be complete.

This document does not release the responsible persons from their duty of care when carrying out maintenance or repair work. There may be further special customer requirements that need to be taken into account.