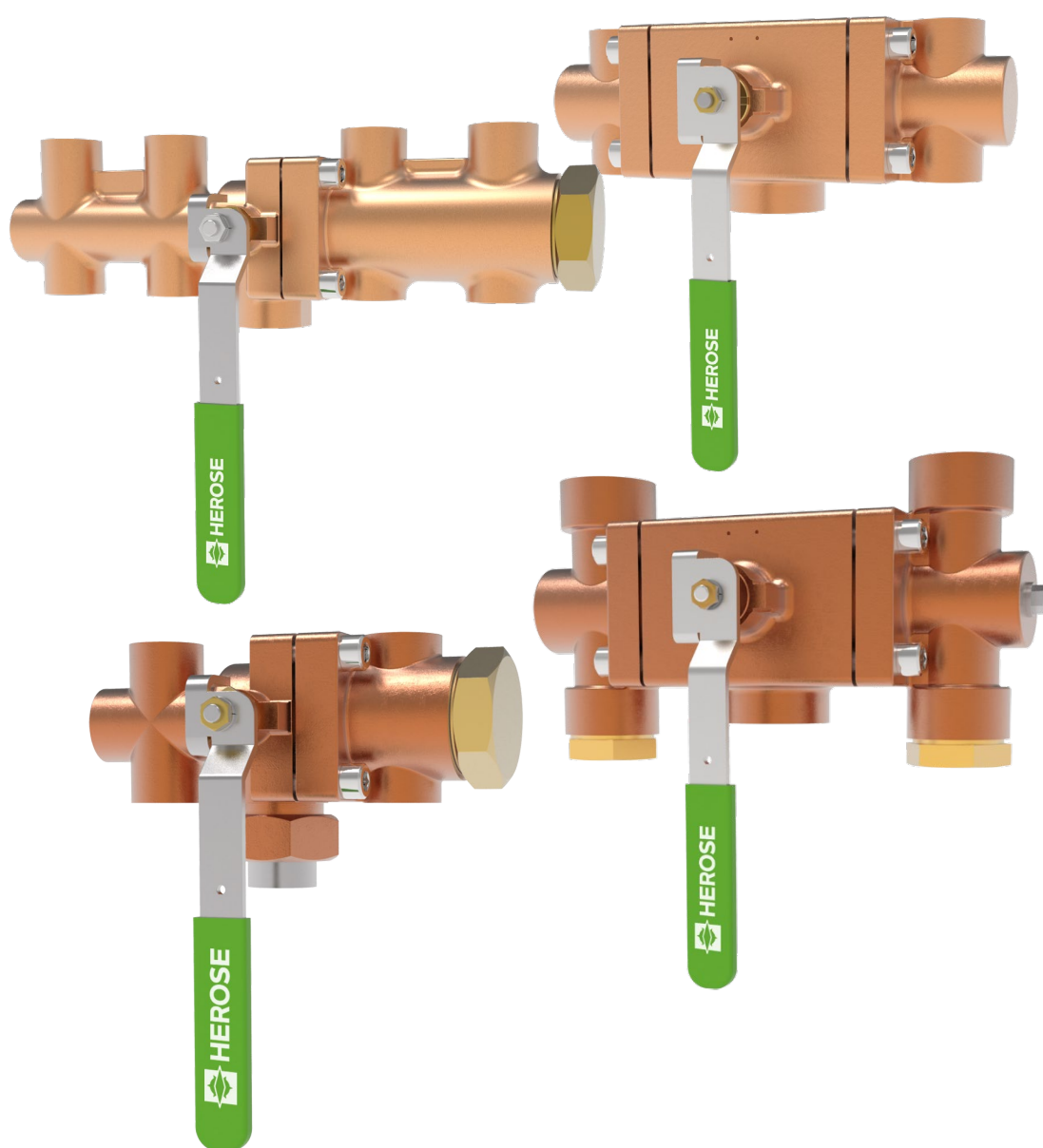


Operating instructions

Diverter Valve 0651X / 0652X / 0653X



IMPORTANT

Read carefully before use.

Retain for later use

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1 About these instructions

1.1 Principles

The operating instructions are part of the diverter valve named on the front page.

1.2 Applicable documents

Document	Contents
Catalogue page	Description of the diverter valve

For accessories, refer to the respective manufacturer's documentation.

1.3 Hazard levels

The warning notes are marked and classified according to the following hazard levels:

Symbol	Explanation
 DANGER	Identifies a hazard with a high risk level that will result in death or serious injury.
 WARNING	Identifies a hazard with a moderate risk level that will result in death or serious injury.
 CAUTION	Identifies a hazard with a low risk level that will result in a minor or moderate injury.
NOTICE	Identifies a risk to property. Damage to property may occur if this notice is ignored.

2 Safety

2.1 Intended application

The diverter valve is intended for installation in a pipeline or pressure tank system in order to block media or allow them to pass through within the permissible operating conditions. The permissible operating conditions are specified in these operating instructions.

The diverter valve is suitable for the media listed in these operating instructions; see section 4.5 "Media". Operating conditions and applications deviating from these require the approval of the manufacturer.

Only media may be employed to which the materials used for the valve body and seals are resistant. Contaminated media or usage outside of the pressure and temperature specifications can lead to damage to the valve body and seals.

Avoidance of foreseeable incorrect use

- Follow all safety instructions and operating procedures in these operating instructions.

2.2 Meaning of the operating instructions

The operating instructions are to be read and followed by the responsible technical personnel before mounting and start-up. As part of the diverter valve the operating instructions must be available close to it. People could be seriously injured or killed if the operating instructions are not followed.

- Read and observe the operating instructions before using the diverter valve.
- Retain the operating instructions and make sure they are available.
- Pass on the operating instructions to subsequent users.

2.3 Requirements for persons who work with the diverter valve

Persons could be seriously injured or killed if the diverter valve is used improperly. In order to avoid accidents, all persons who work with the diverter valve must meet the following minimum requirements.

- They are physically capable of controlling the diverter valve.
- They can safely carry out the work with the diverter valve within the scope of these operating instructions.
- They understand the operating principles of the diverter valve within the scope of their work and are able to recognise and avoid the hazards of the work.
- They have understood the operating instructions and are able to implement the information of the operating instructions accordingly.

2.4 Personal protective equipment

Missing or unsuitable personal protective equipment increases the risk of damage to health and injuries to people.

- ▶ The following protective equipment is to be provided and worn during work:
 - ☐ Protective clothing
 - ☐ Safety shoes
- ▶ Define and use additional protective equipment depending on the application and the media:
 - ☐ Safety gloves
 - ☐ Eye protection
 - ☐ Ear protection
- ▶ Wear the specified personal protective equipment for all work on the diverter valve.

2.5 Additional equipment and spare parts

Additional equipment and spare parts not conforming to the manufacturer's requirements can negatively affect the operational safety of the diverter valve and cause accidents.

- ▶ To ensure operational safety, use original parts or parts that conform to the manufacturer's requirements. If in doubt, have these confirmed by the dealer or manufacturer.

2.6 Adhere to the technical thresholds

If the technical threshold values for the diverter valve are not adhered to, the diverter valve may sustain damage, accidents may be caused and people may be seriously injured or killed. Adhere to the thresholds.

- ▶ See section "4. Description of the diverter valve".
- ▶ This product is designed for ≤ 500 loading cycles at pressure differences from zero to PN and any number of loading cycles at pressure differences not exceeding $0.1 \times \text{PN}$.

2.7 Safety instructions

DANGER

Hazardous medium.

Escaping operating medium can lead to poisoning, burns and caustic burns!

- ▶ Wear the prescribed protective equipment.
- ▶ Provide suitable collecting containers.

WARNING

Harmful and/or hot/cold conveyed media, lubricants and fuels

Hazardous for persons and the environment!

- ▶ Collect and dispose of rinsing medium and any residual media.
- ▶ Wear protective clothing and a protective mask.
- ▶ Observe legal regulations regarding the disposal of harmful media.

Risk of injury if maintenance work is done incorrectly!

Incorrect maintenance can lead to serious injury and considerable material damage.

- ▶ Before the start of work, ensure there is sufficient room for doing the work.
- ▶ Ensure the space around the work is tidy and clean! Parts and tools in loose piles or lying around are hazard sources.
- ▶ If parts have been removed, take care to assemble correctly and re-install all attachment items.
- ▶ Before putting back into service, ensure:
 - ☐ All maintenance work has been carried out and completed.
 - ☐ There are no persons in the hazard area.
 - ☐ All covers and safety devices are installed and operating correctly.

CAUTION

Cold/hot pipelines and/or diverter valve.

Risk of injury due to thermal influences!

- ▶ Insulate the diverter valve.
- ▶ Attach warning signs.

Medium escaping at high speed and high/low temperature.

Risk of injury!

- ▶ Wear the prescribed protective equipment.

NOTICE

Impermissible stress due to operating conditions and extensions / added structures.

Leakage from or breakage of the body of the diverter valve!

- ▶ Provide suitable support.
- ▶ Additional loads, such as traffic, wind or earthquakes, are not explicitly taken into account by default and require separate sizing.

Condensation in air conditioning, cooling and refrigeration plants.

Icing!

Blocking of the actuation mechanism!

- ▶ Damage due to corrosion.
- ▶ Insulate the diverter valve with diffusion-tight material.

Improper mounting.

Damage to the diverter valve!

- ▶ Remove cover caps before mounting.
- ▶ Clean the sealing surfaces.
- ▶ Protect the body against hammering.

Improper handling.

Leakage from or damage to the diverter valve!

- ▶ Do not store tools and/or other objects on the diverter valve.
- ▶ Do not use tools to increase the torque of the handwheel.

Painting of diverter valve and pipelines.

Functional impairment of the diverter valve / loss of information!

- ▶ Protect stem, plastic parts and type plate against the application of paint.

Impermissible stress.

Damage to the control mechanism!

- ▶ Do not use the diverter valve as a foothold.

Exceeding the maximum permissible operating conditions.

Damage to the diverter valve!

- ▶ The maximum permissible working pressure must not be exceeded, and the minimum and maximum allowable working temperatures must be observed.

Particles and other contaminants in the conveyed medium.

Damage to the diverter valve / internal leak!

- ▶ Remove particles/contaminants from the conveyed medium.
- ▶ It is recommended to install strainers / dirt filters in the pipework system.

Safety instructions for installed safety valves

DANGER

Hazardous medium.

Escaping operating medium can lead to poisoning, burns and caustic burns!

- ▶ Wear the prescribed protective equipment.
- ▶ Provide suitable collecting containers.
- ▶ Stand to the side of or behind the valve during lifting.
- ▶ The outlet must be free.

Flammable media and dusts.

Risk of sustaining burns!

- ▶ Avoid potential sources of ignition in the immediate vicinity of the safety valve.
- ▶ Attach warning signs.

Risk of injury due to pressure.

Injury due to the safety valve being flung away!

- ▶ Depressurise and empty all supply lines before dismantling the safety valve.
- ▶ Make sure that the system is depressurised.
- ▶ Secure against being pressurised again.
- ▶ Do not bend over the safety valve when dismantling.

3 Transport and storage

3.1 Inspection of condition on delivery

- ▶ Inspect the diverter valve for damage upon receipt.
In case of transport damage, determine and document the precise extent of the damage, and report it immediately to the supplying dealer/carrier and the insurer.

3.2 Transportation

- ▶ Transport the diverter valve in the packaging supplied.
The diverter valve is delivered ready to operate with body ends protected by cover caps.
- ▶ Protect the diverter valve against shocks, impacts, vibrations and dirt.
- ▶ Adhere to a transport temperature range of -20 °C to +65 °C.

3.3 Storage

- ▶ Store the diverter valve in a clean and dry place.
- ▶ Make use of a desiccant or heating in damp storerooms to prevent the formation of condensation.
- ▶ Adhere to a storage temperature range of -20 °C to +65 °C.

4 Description of the diverter valve

Refer to the respective catalogue page for further detailed information.

4.1 Structure

Design

Non-automatically opening and closing multiport ball valve with hand lever.

Component	Design
Body	Multiport form, divided body flanged, without spindle thread
Operating mechanism	Control shaft
Obturator	Self-sealing ball with seal made of non-metallic materials
Stem bushing	Non self-sealing, packing gland

4.2 Marking

The diverter valves are provided with an individual marking for identification.

Symbol	Explanation
DN	Nominal diameter
PN	Rated working pressure (max. permissible operating pressure)
-..... °C +..... °C	min / max. temperature
	Manufacturer's mark "HEROSE"
01/16	Date of manufacture, MM/YY
12345	Type
01234567	Serial no.
EN 1626	Standard
 0045	CE mark, number of notified body
e.g. CC491K	Material

4.3 Intended application

Diverter valve for the installation of two or more safety valves in a possible combination with bursting discs for protecting gas storage tanks. The requirements of the pressure equipment directive for redundant or different types of safety devices are fulfilled with this diverter valve and in combination with safety valves with the same setting pressure.

In the case of servicing the safety valves or replacement of the bursting discs, the side to be serviced is isolated from the vessel.

In the end position one outlet is open and the other is closed. It is not possible to shut off both outlets at the same time.

4.4 Operational data

Valve	Nominal pressure	Temperature	Max. working pressure
06510 06511	PN50	−196 °C to +120 °C	50 bar
06512 06513	PN50	−196 °C to +120 °C	50 bar
06520 06521	PN50	−196 °C to +120 °C	50 bar
06530 06531	PN50	−196 °C to +120 °C	50 bar

4.5 Media

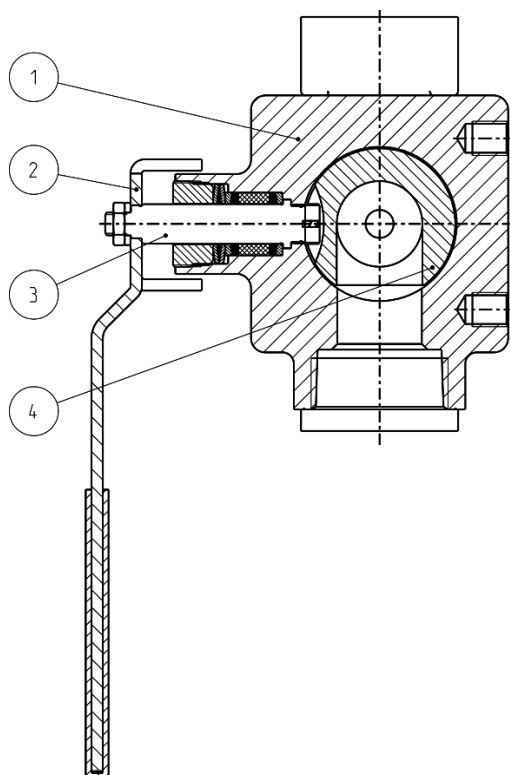
Gases, cryogenic liquefied gases and their gas mixtures, such as:

Name		
Argon	Chlorotrifluoromethane	Nitrous oxide
Ethane	Ethylene	Carbon dioxide
Carbon monoxide	Krypton	LPG
LNG	Methane	Oxygen
Nitrogen	Trifluoromethane	

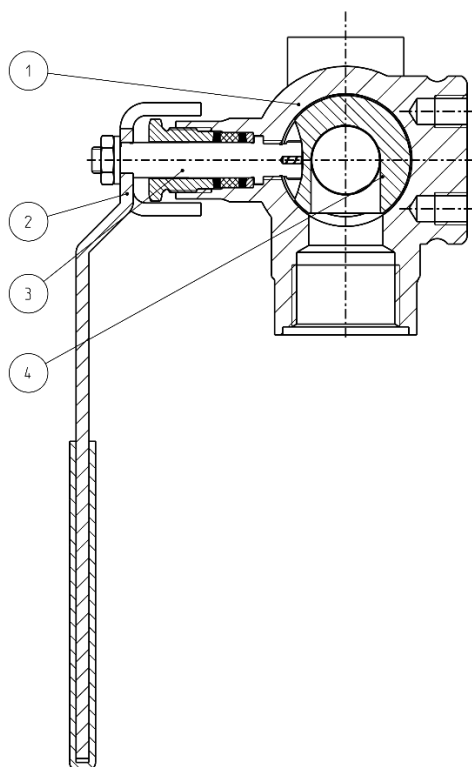
The use of other media is only permitted after consultation with the manufacturer

4.6 Materials

0651X



Part no.	Name	Material
1	Body	CC491K
2	Lever	1.4404
3	Control shaft	1.4301
4	Obturator	1.4571

0653X

Part no.	Name	Material
1	Body	1.4308
2	Lever	1.4404
3	Control shaft	1.4301
4	Obturator	1.4571

4.7 Scope of delivery

- Diverter valve
- Operating instructions

4.8 Dimensions and weights

- See catalogue page.

4.9 Lifetime

The user is obligated to use HEROSE products only for their intended purpose.

In this case, a technical service life may be assumed in accordance with the underlying product standards (e.g. EN1626 for shut-off valves and EN ISO 4126-1 for safety valves).

The technical service life can be restarted several times through the exchange of wearing parts within the context of the maintenance intervals, and lifetimes of more than 10 years can be achieved.

If products are stored for a period exceeding 3 years, then the synthetic material components and elastomer sealing elements fitted to the product should be replaced as a precautionary measure before mounting and use.

5 Assembly**5.1 Installation position**

Attention must be paid to the direction of flow.

The installation position is arbitrary.

The preferred installation position should be with the control shaft horizontal.

5.2 Fitting Notice

- ▶ Use suitable tools.
- ▶ Clean tools before fitting
- ▶ Use suitable transport and lifting equipment for the mounting.
- ▶ Open the packaging only directly before the mounting. Free of oil and grease for oxygen (O₂)
Diverter valves for oxygen are permanently marked with "O₂".
Take note of the HEROSE information sheet "O₂ instructions".
- ▶ Only install the diverter valve if the maximum working pressure and operating conditions of the plant correspond to the marking on the diverter valve.
- ▶ Remove protective caps or covers before mounting.
- ▶ Inspect the diverter valve for dirt and damage.
DO NOT install damaged or dirty diverter valves.
- ▶ Remove dirt and residues from the pipeline and diverter valve in order to prevent leaks.
- ▶ Avoid damaging the connections.
The sealing surfaces must remain clean and intact.
- ▶ Seal the diverter valve with suitable seals.
No sealant (sealing tape, liquid sealing tape) may enter the diverter valve.
Respect the suitability for use with O₂.
- ▶ Connect pipelines in a force-free and torque-free manner.
Stress-free mounting.
- ▶ In order to ensure trouble-free operation, no impermissible static, thermal or dynamic stresses may be transmitted to the diverter valve. Observe reaction forces.
- ▶ Temperature-dependent changes in length in the pipework system must be compensated with expansion joints.
- ▶ Fasten the diverter valve with the existing threads in the body.
- ▶ The diverter valve must be protected against dirt and damage during construction work.
- ▶ Check the leak-tightness.

Tightening torques

Type	Nominal size [G; Rc; NPT]	Tightening torque G	Tightening torque						Number of layers of PTFE tape	
			Tightening torque NPT		Tightening torque SV with double nipple and clamping sleeve in diverter valve		Tightening torque SV with copper washer in diverter valve		NPT thread	Length
06510 06511	1/2	50 Nm	30 Nm	50 Nm	40 Nm	60 Nm	40 Nm	60 Nm	3	20–25 cm
	3/4	50 Nm	40 Nm	60 Nm	40 Nm	70 Nm	40 Nm	70 Nm	5	40–45 cm
	1	50 Nm	50 Nm	80 Nm	50 Nm	80 Nm	50 Nm	80 Nm	6	55–60 cm
	1.1/4	55 Nm	50 Nm	100 Nm	50 Nm	100 Nm	50 Nm	100 Nm	6	80–85 cm
	1.1/2	60 Nm	70 Nm	100 Nm	60 Nm	100 Nm	60 Nm	100 Nm	6	90–95 cm
06512 06520 06530	1/2	50 Nm	30 Nm	50 Nm	30 Nm	50 Nm	40 Nm	60 Nm	3	20–25 cm
06513 06521 06531	3/4	50 Nm	40 Nm	60 Nm	40 Nm	60 Nm	40 Nm	70 Nm	5	40–45 cm

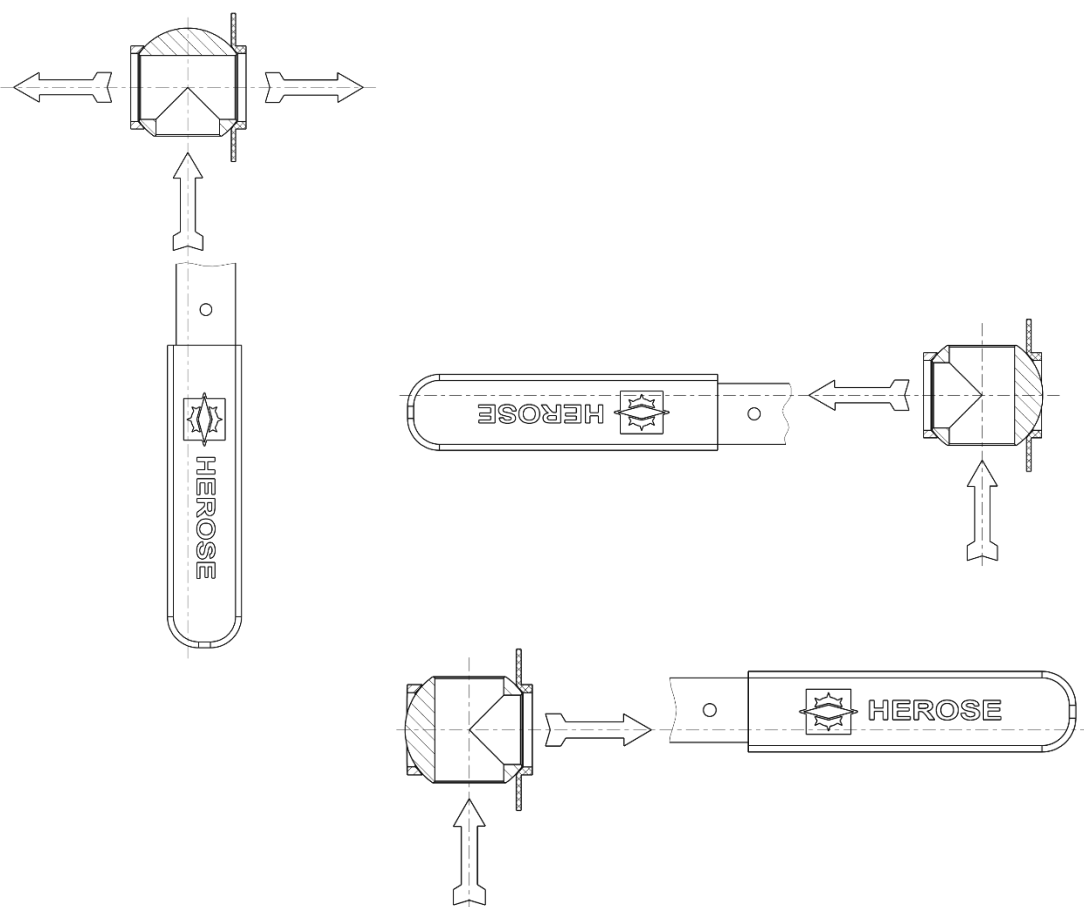
Nominal size [G; Rc; NPT]	Tightening torque	Screw plug Test thread		
		Number of layers of PTFE tape		
		NPT thread	Rc thread	Length
1/4	20 Nm	2	2	10–15 cm
1/2	50 Nm			

6 Operation

6.1 Prior to start-up

- Check the following points prior to start-up:
 - ☐ All mounting and installation work are completed.
 - ☐ The safety guards are in place.
 - ☐ Compare the material, pressure, temperature and installation position with the layout plan for the pipework system.
 - ☐ Dirt and residues have been removed from the pipeline and diverter valve in order to prevent leaks.

6.2 Lever position



7 Maintenance and service

7.1 Safety during cleaning

- ▶ Take note of the specifications in the safety data sheet, the general occupational health and safety rules and the HEROSE information sheet "Use with oxygen" if degreasers are used for process-related reasons for the cleaning of bearing parts, unions and other precision parts.

7.2 Maintenance

The maintenance and inspection intervals must be defined by the operating company according to the operating conditions and the national regulations.

The manufacturer's general recommendations for the maintenance and inspection of the valve are given in the table below and are based on the national standards of the country of manufacture.

Inspection and maintenance intervals

Description	Recommended intervals	
	Interval	Scope
Inspection	During start-up	▶ Visual inspection ☐ of the diverter valve for damage ☐ of the valving marking for legibility; ▶ Leak-tightness ☐ at the packing gland; ☐ between body I and body II; ☐ of the valve seat; ☐ at the connections; ☐ at the plug screw; ▶ Test the opening and closing functions of the diverter valve.
Functional testing	Inspection and maintenance in accordance with the respective legal regulations. In Germany, for example, according to the Operational Safety Ordinance	▶ Test the opening and closing functions of the diverter valve including a visual inspection.
External inspection	Inspection and maintenance in accordance with the respective legal regulations. In Germany, for example, according to the Operational Safety Ordinance	▶ Function and tightness test including visual inspection.
Internal inspection	Every 5 years or ≥ 500 loading cycles	▶ Replacement of all sealing elements, including a function and tightness test as well as a visual inspection.
Strength test	Every 10 years	▶ Replacement of all sealing elements, including a function and tightness test as well as an inspection.

7.3 Fault table

Fault	Cause	Remedy
Leak at the stem	Gland nut loose	► Retighten the gland nut
	Packing gland defective	► Replace the diverter valve
	Fit on the stem damaged	► Replace the diverter valve
Leak between body I and body II	Body I loose	► Tighten the bolts
	Seal damaged	► Replace the diverter valve
Leaking lateral connections	Inadequate seals	► Seal with suitable sealants
	Blind plug / bolted-on safety valves loose	► Tighten to the specified torques
	Lateral connections cracked	► Replace the diverter valve
Body leaking	Discontinuity/gas cavity open	► Replace the diverter valve
Diverter valve cannot be switched over	Gland nut overtightened	► Loosen gland nut ► Tightness must still be ensured
	Thread seized	► Replace the diverter valve
	Lever lock not removed	► Remove lever lock

7.4 Spare parts

We require the following details for your spare part orders:

- ☐ article no. of the spare part package,
- ☐ desired delivery quantity,
- ☐ dispatch and delivery address,
- ☐ desired method of dispatch.

7.5 Returns / complaints

Use the Service form in case of returns/complaints.



Contact in case of service:
 Herose.com → Service → Complaints
 E-mail: service@herose.com

8 Disassembly and disposal

8.1 Notices regarding the disassembly

- Take note of all national and local safety requirements.
- The pipework system must be depressurised.
- The medium and the diverter valve must be at ambient temperature.
- Aerate / flush the pipework system in the case of corrosive and aggressive media.

8.2 Disposal

1. Dismount the diverter valve.
Collect greases and lubricating fluids during dismantling.
2. Separate the materials:
 - ☐ Metal
 - ☐ Synthetic material
 - ☐ Electronic scrap
 - ☐ Greases and lubricating fluids
3. Carry out a sorted disposal of the materials.