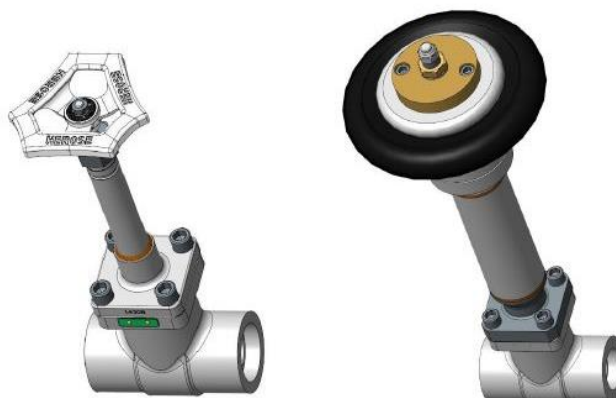

Operating instructions

Cryogenic gate valve

093xx / 094xx



IMPORTANT

Read carefully before use.

Retain for later use.

© 2020 HEROSE GMBH
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
Web: www.herose.com

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1 About these instructions

1.1 Principles

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




1.2 Applicable documents

Document	Contents
Catalogue page	Description of the gate 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 use

The gate 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 gate 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

- ▶ Never exceed the permissible usage limits specified in the data sheet or in the documentation with regard to pressure, temperature, etc.
- ▶ 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 gate 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 gate 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 gate valve

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

- They are physically capable of controlling the gate valve.
- They can safely carry out the work with the gate valve within the scope of these operating instructions.
- They understand the operating principles of the gate 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 gate 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 gate valve and cause accidents.

- ▶ In order 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 gate valve are not adhered to, the gate 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 gate valve".

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.

Slippage of the gate valve out of its suspension.

Danger to life from falling parts!

- ▶ Do not suspend gate valves by the handwheel.
- ▶ Note the weight specifications and the centre of gravity.
- ▶ Only use suitable and approved load handling equipment.

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.

⚠️ WARNING

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 gate valves.

Risk of injury due to thermal influences!

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

Medium escaping at high speed and high/low temperature.

Risk of injury!

- ▶ Wear the prescribed protective equipment

NOTICE

Impermissible stresses arising from operating conditions and extensions / added structures.

Leakage or rupture of the gate valve body!

- ▶ 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 gate valve with diffusion-tight material

Improper handling.

Leaking gate valve or damage to the gate valve!

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

Painting of gate valves and pipelines.

Functional impairment of the gate valves / 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 gate valve as a foothold.

Exceeding the maximum permissible operating conditions.

Damage to the gate valve!

- ▶ The maximum permissible working pressure must not be exceeded, and the minimum and maximum allowable working temperatures must be observed.
- ▶ Create the welding/soldering seam stepwise so that the warming in the middle of the body does not exceed the maximum permissible operating temperature.

Welding beads, scale and other contaminants.

Damage to the gate valve!

- ▶ Take appropriate measures against contamination.
- ▶ Remove contaminants from the pipes.

Incorrect earthing during welding work in the pipeline.

Damage to the gate valve (burned spots)!

- ▶ Remove bonnet during welding.
- ▶ When carrying out electric welding work, do not use functional parts of the gate valve for earthing.

3 Transport and storage

3.1 Inspection of condition on delivery

- ▶ Inspect the gate 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 gate valve in the packaging supplied.
The gate valve is delivered ready to operate with lateral connections protected by cover caps.
- ▶ Protect the gate valve against hammering, impacts, vibrations and dirt.
- ▶ Adhere to a transport temperature range of -20 °C to +65 °C.

3.3 Storage

- ▶ Store the gate 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 gate valve

- ▶ See catalogue page.

4.1 Structure




Design

Non-automatic opening and closing gate valve, with handwheel or actuator depending on the model

Component	Design
Body	Straight-type
Bonnet	Flanged, internal stem thread, Flanged, without stem thread
Operating mechanism	Rising stem
Obturator	multi-part obturator with seal
Stem bushing	Non self-sealing, packing gland
Body end	with soldering end with welding end with threaded end (G; R; NPT; M) with flanged connection with welded-in/soldered-in pipes

4.2 Valving marking

The gate valve is provided with an individual valving marking for identification.

Symbol	Explanation
DN.....	Nominal diameter
PN.....	Rated working pressure (max. permissible working pressure)
-.....°C +.....°C	Temperature min. / max.
	Manufacturer's mark "HEROSE"
01/18	Year of construction MM/YY
12345	Type
01234567	Serial no.
EN1626	Standard
 0045	CE-mark and number of the notified body
 0045	PI-mark and number of the notified body
e.g. CF8 / 1.4308	Material

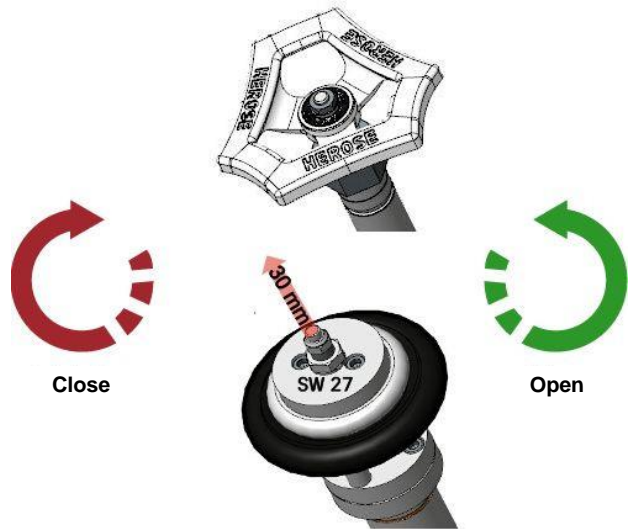
4.3 Intended use

The gate valves are one-sided sealing valves that shut off the media in the flow direction. The gate valve is closed or opened by turning the handwheel.

Gate valves with an actuator are driven by a compressed air supply, e.g. via an 8.0 mm hose, with a recommended working pressure of 6.0 bar, max. 10.0 bar. The gate valve is opened by the supply air and closed by the spring. A reverse mode of operation is not possible.

Emergency actuation:

The gate valve is opened by 30.0 mm by turning the 27 AF adjusting screw directly above the actuator in the counter clockwise direction; turning it clockwise closes the gate valve.



4.4 Operational data

Valve	Nominal pressure	Temperature	Actuator working pressure	Max. actuator working pressure
093xx	PN 50	-196 °C to +120 °C	6 bar	10 bar
094xx				

4.5 Media

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

Name
Argon,
Chlorotrifluoromethane,
Nitrous oxide,
Ethane,
Ethylene,
Helium,
Carbon dioxide,
Carbon monoxide,
Liquid krypton, deep-cooled,
LNG,
LPG,
Air,
Methane,
Neon,
Oxygen,
Nitrogen,
Trifluoromethane,
Hydrogen,
Xenon,

4.6 Scope of delivery

- Valve
- Operating instructions

4.7 Dimensions and weights

► See catalogue page.

4.8 Lifetime

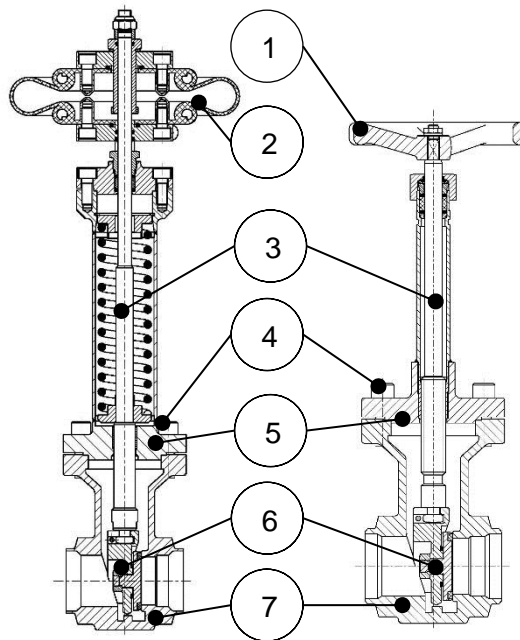
The user is obligated to use Herose products for their intended purpose.

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.

4.9 Materials



Part no.	Name	Material
1	Handwheel	Aluminium alloy
2	Actuator	Rubber
3	Stem	1.4301
4	Screws	A2-70
5	Bonnet	1.4308; 1.4541; 1.4301; 1.4306
6	Obturator	1.4571; PTFE/carbon CW614N; 1.4305; Hostafon TF4215, TFM 1600, TFM 1700
7	Body	1.4308

5 Assembly

5.1 Installation position

With regard to the installation position, pay attention to the arrow showing the flow direction. When installing the gate valve in a horizontal pipeline, a vertical position of the stem is recommended with the handwheel at the top or an inclination of up to 45° from the vertical.

5.2 Notices regarding the mounting

- ▶ Use suitable tools.
 - Allen keys of sizes 6, 8, 10, 14, 19;
 - Open-ended spanners;
 - Torque wrench;
 - Pipe wrench;
 - TIG welding machine;
 - Oxy-fuel welding machine;
- ▶ Clean tools before the mounting.
- ▶ 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). Gate valves for oxygen are permanently marked with "O₂". Take note of the HEROSE information sheet "O₂ instructions".
- ▶ Only install the gate valve if the working pressure and operating conditions of the plant correspond to the valving marking on the gate valve.
- ▶ Remove protective caps or covers before mounting.
- ▶ Check the gate valve for dirt and damage. DO NOT install damaged or dirty gate valves.
- ▶ Avoid damaging the connections. The sealing surfaces must remain clean and intact.
- ▶ Seal the gate valve with suitable seals. No sealant (sealing tape, liquid sealing tape) may enter the gate valve. Respect the suitability for use with O₂.
- ▶ Connecting flanges must line up with each other.
- ▶ Tighten the screws crosswise to the permissible torque. Use all of the flange holes provided for the flange connection.
- ▶ 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 gate valve. Observe reaction forces.
- ▶ Temperature-dependent changes in length in the pipework system must be compensated with expansion joints.
- ▶ The gate valve is supported by the pipework system.
- ▶ The gate valve must be protected against dirt and damage during construction work.
- ▶ Remove any transport locks such as blocking bushing (optional).
- ▶ Check the leak-tightness.

5.3 Welding / soldering

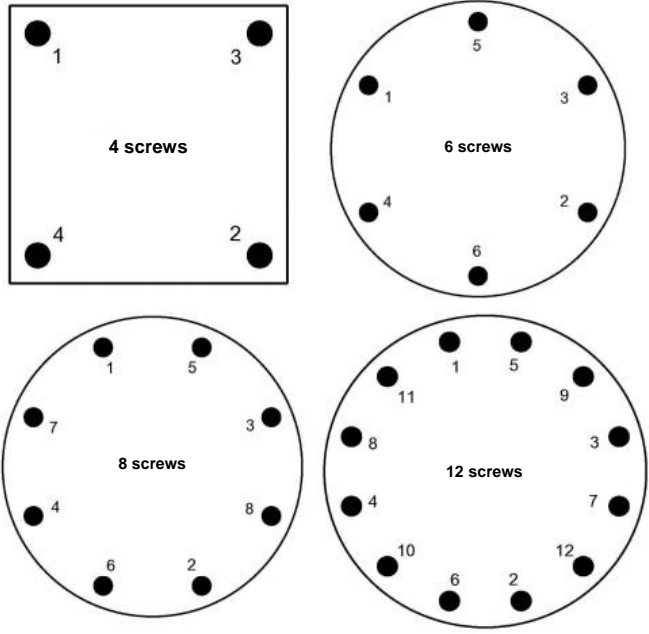


Welding / soldering of the gate valves and any heat treatment that may be required are the responsibility of the contracting construction company or operating company.

■ Before welding / soldering

		<ul style="list-style-type: none"> ▶ Lifting screw, AF 27, loosen to the stop Direction of rotation: counter clockwise
		<ul style="list-style-type: none"> ▶ Loosen the screws Direction of rotation: counter clockwise
		<ul style="list-style-type: none"> ▶ Remove the screws
		<ul style="list-style-type: none"> ▶ Remove bonnet and seal
		<ul style="list-style-type: none"> ▶ Dispose of the seal
		<ul style="list-style-type: none"> ▶ Weld / solder in the body

■ After welding / soldering

		<p>▶ Insert a new seal</p>
		<p>▶ Assemble the bonnet ⚠ Do not damage the seal</p>
		<p>▶ Assemble the screws</p>
		<p>▶ Tighten the screws to the specified tightening torque in a criss-cross pattern Direction of rotation: clockwise</p>

	<p>► Assembly sequence for the screws</p>																					
<table border="1" data-bbox="316 929 904 1256"> <thead> <tr> <th>Nominal diameter</th> <th>Tightening torque [Nm]</th> <th>Cheesehead screws</th> </tr> </thead> <tbody> <tr> <td>DN 25</td> <td>50</td> <td>M10</td> </tr> <tr> <td>DN 40</td> <td>70</td> <td>M12</td> </tr> <tr> <td>DN 50</td> <td>70</td> <td>M12</td> </tr> <tr> <td>DN 65</td> <td>90</td> <td>M12</td> </tr> <tr> <td>DN 80</td> <td>110</td> <td>M16</td> </tr> <tr> <td>DN 100</td> <td>130</td> <td>M16</td> </tr> </tbody> </table>	Nominal diameter	Tightening torque [Nm]	Cheesehead screws	DN 25	50	M10	DN 40	70	M12	DN 50	70	M12	DN 65	90	M12	DN 80	110	M16	DN 100	130	M16	<p>► Bonnet / body tightening torques</p>
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	<p>► Lifting screw, AF 27, screw in to the stop. Direction of rotation: clockwise</p>																					
	<p>► Check the leak-tightness</p>																					

6 Operation

6.1 Prior to start-up

- Check the following points prior to start-up:
 - All mounting and installation work are completed.
 - If fitted: The blocking bushing was removed prior to start-up.
 - The safety guards are in place.
 - Compare the material, pressure, temperature and installation position with the layout plan for the pipework system.
 - Remove dirt and residues from the pipeline and gate valve in order to prevent leaks.

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 gate valves are given in the table below and are based on the national standards of the country of manufacture.

Inspection and maintenance intervals

Recommended intervals		
Description	Interval	Scope
Inspection	▶ During start-up	<ul style="list-style-type: none"> ■ Visual inspection <ul style="list-style-type: none"> <input type="checkbox"/> of the gate valve for damage; <input type="checkbox"/> of the valving marking for legibility; <input type="checkbox"/> Installation position; ■ Leak-tightness <ul style="list-style-type: none"> <input type="checkbox"/> at the packing gland; <input type="checkbox"/> between bonnet and body; <input type="checkbox"/> of the valve seat; ■ Test the opening and closing functions of the gate valve.
Functional testing	▶ Annually	<ul style="list-style-type: none"> ■ Test the opening and closing functions of the gate valve including a visual inspection.
External inspection	▶ Every 2 years	<ul style="list-style-type: none"> ■ Function and tightness test including visual check.
Internal inspection	▶ Every 5 years	<ul style="list-style-type: none"> ■ Replacement of all sealing elements, including a function and tightness test as well as a visual inspection.
Hydraulic test	▶ Every 10 years	<ul style="list-style-type: none"> ■ Replacement of all sealing elements, including a function, leak and pressure test as well as an inspection.

7.3 Fault table

Fault	Cause	Remedial action
<ul style="list-style-type: none"> ■ Leak at the stem 	<ul style="list-style-type: none"> Gland nut loose Packing gland defective Fit on the stem damaged 	<ul style="list-style-type: none"> ▶ Retighten the gland nut ▶ Replace the packing gland ▶ Replace the stem
<ul style="list-style-type: none"> ■ Leak between bonnet and body 	<ul style="list-style-type: none"> Bonnet loose Seal damaged 	<ul style="list-style-type: none"> ▶ Tighten the screws to the specified tightening torque ▶ Replace seal
<ul style="list-style-type: none"> ■ Leak in the seating 	<ul style="list-style-type: none"> Foreign body between cone and seating Seating damaged Cone seal damaged 	<ul style="list-style-type: none"> ▶ Remove foreign body / flush the system ▶ Replace the body ▶ Replace the cone
<ul style="list-style-type: none"> ■ Body leaking 	<ul style="list-style-type: none"> Discontinuity/gas cavity open 	<ul style="list-style-type: none"> ▶ Replace the body
<ul style="list-style-type: none"> ■ Gate valve does not open / close 	<ul style="list-style-type: none"> Gland nut overtightened Thread seized Actuator not working 	<ul style="list-style-type: none"> ▶ Loosen the gland nut Tightness must still be ensured ▶ Replace bonnet ▶ Check supply of energy to the actuator

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 › Product service › Complaints
 E-mail: service@herose.com
 Fax: +49 4531 509 – 9285

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 gate 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 gate 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.

