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Instruction Manual
Wafer Type Check Valves
Type SR - ZRK - ZRD

Instruction Manual - Wafer Type Check Valves Type SR - ZRK - ZRD

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1. General Notes

This instruction manual applies to the above mentioned valves which are subject to the Quality Management System Standard acc. to DIN/ISO9001 in both the manner of manufacturing as well as testing and which do meet the basic safety requirements of Annex I of the Pressure Equipment Directive 2014/68/EU. This instruction manual is intended to support the user of above mentioned valves in installation, operation and maintenance.

Depending on the plant and medium, certain rules and regulations apply. These rules and regulations must be observed. In addition to the information in these operating instructions, the generally applicable safety and occupational health and safety regulations must be applied and the applicable operating instructions for purchased parts must be observed. The environmental protection regulations must also be observed.

2. Safety and warning notes

Safety and warning notes identify safety-relevant information.

In these operating instructions, a distinction is made between the following danger levels:



Indicates the highest danger situation.

If the instructions are not followed, serious injury or death will result.



Indicates a hazardous situation.

If the instructions are not followed, minor or moderate injuries may occur.



Indicates warnings against property damage.

If the instructions are not followed, property damage may occur.

3. Intended Use

Wafer type check valves are solely destined for installation within a pipeline system in consideration to avoid a backflow of the media.

The operating conditions (pressure and temperature) must not exceed the maximum permissible pressure and temperature loads on the inlet and outlet connections.

The maximum allowable operating pressure depends on several factors, including:

- the material of the Check Valve,
- the temperature of the medium,
- the design pressure,
- the pressure rating of the flanges

It is the operators' responsibility to examine the chemical resistance in relation to the specified operation data.

Check Valves work directly medium controlled. They do not offer any possibility of operation (handwheel or similar) from the outside.

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The permissible operating data can be found in the data sheets of the types mentioned.

Improper sizing and selection of the nozzle check valve can lead to malfunctions and hazards.

When handling dangerous or hazardous media, the relevant regulations and rules must be observed.

Hazardous media includes:

- toxic media,
- corrosive media,
- alluring media,
- environmentally hazardous media
- hot media,
- explosive Medien,
- flammable media.

Safety and warning instructions must be observed.

4. Safety Instructions

4.1 General safety instructions

Those safety regulations applying to the pipeline system apply to the valves itself accordingly, i. e. any national or international rules for accident prevention as well as possibly existing operators' working-, production- and safety regulations have to be considered. This instruction manual only points to those safety instructions which have to be considered additionally.

4.2 Qualification of Personnel

Only qualified staff is permitted to install and maintain the valves. The operator is obliged to coordinate the competencies, the responsibilities and the surveillance of his staff. Should the staff not have the necessary knowledge, the operator must provide adequate additional training. The operator has to ensure that the content of this instruction manual is comprehended in all its particulars.

4.3 Safety Instructions for the Operator

Due to the fact that the following points are not in the responsibility of RITAG, during operation the user has to ensure that:

- the Wafer Type Check Valves are solely used in the way described in chapter 3.
- the pipeline system is installed in a professional manner. The wall thickness of the valve body is designed in a way that tensions which do exist within the pipeline system are considered in a usual order of magnitude.
- the Wafer Type Check Valves are properly installed between the flanges.
- a usual flow rate within the pipeline system is not exceeded during a continuous operation. For abnormal service conditions, e. g. oscillation, water shock, cavitation or a medium that contains larger solid particles, please contact RITAG for clarification.
- the Wafer Type Check Valves are protected against touch when working at a temperature $<0^{\circ}\text{C}$ respectively $>40^{\circ}\text{C}$.

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5. Transport and Storage

The valves are supplied ready for installation. They need to be treated, conveyed and stored carefully.

- Those valves that are delivered with a protecting packing need to be stored within this packing up to the moment of installation.
- In case of a direct storage at the installation location the valve has to be stored in a closed room and has to be protected against any damaging impacts.
- Those valves that are equipped with a soft sealing need to be protected against sunlight that might hit this soft sealing or any other UV-radiation in order to avoid ageing.
- Lifting tools for transport are only to be fastened on the valve body.

6. Specification

The sectional drawings shown in this chapter do exemplary illustrate the basic design of the valves.

6.1 Marking

All valves are marked in acc. to PED 2014/68/EU, TRB 801 No. 45 or EN19.

General Marking:

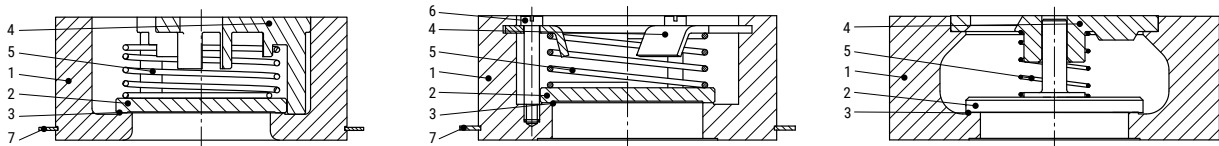
Manufacturer	RITAG
Valve type	...
Nominal diameter DN	...
Nominal pressure PN	...
Material	...
Batch no (retraceability of the material)	...
Year of manufacture(month, year, e.g. 10.23)	...
Stamp of inspector	...

Further special markings, e. g. plant identification code or project name could be additionally affixed on request.

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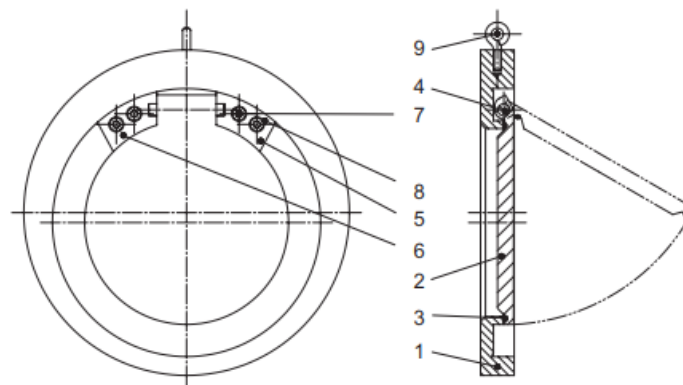
6.2 Drawings and Part List

Lift Check Valves Type SR/HSR



Item	Denomination	Item	Denomination
1	Body	2	Plate/disc
3	O-Ring	4	Guiding plate
5	Spring	6	Guiding screw
7	Centering ring		

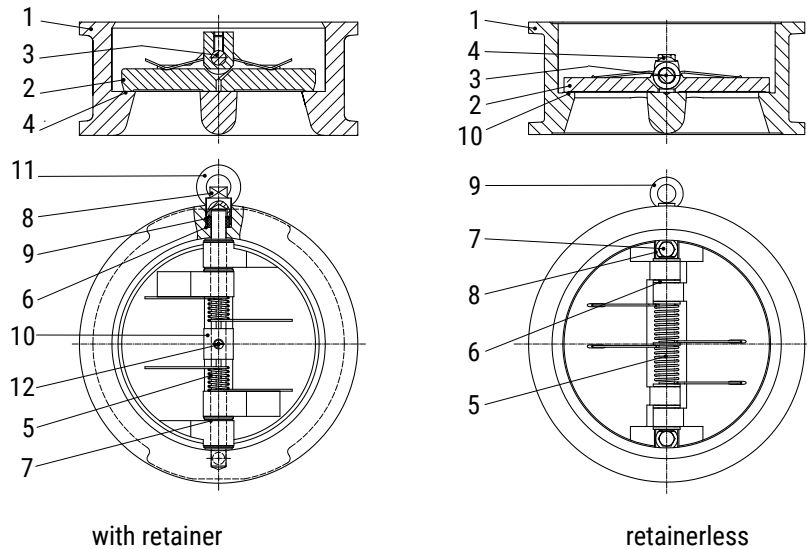
Swing Check Valves Type ZRK/ZRL



Item	Denomination	Item	Denomination
1	Body	2	Plate
3	O-Ring	4	Hinge pin
5	Hinge, right	6	Hinge, left
7	Screw	8	Ring
9	Eye screw		

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Dual Plate Wafer Type Check Valves Type ZRD



Item	Denomination	Item	Denomination
1	Body	2	Plate
3	Shaft	4	O-Ring
5	Spring	6	Packing
7	Ring	8	Pin retainer
9	Ring	10	Stop pin
11	Eye screw	12	Set screw

Item	Denomination	Item	Denomination
1	Body	2	Plate
3	Shaft	4	Stop pin
5	Spring	6	Ring
7	Screw	8	Safety plate
9	Eye screw		

6.3 Functionality

Wafer Type Check Valves are valves which are controlled by the backflow of the medium. The obturator (disc, cone, plate) is first lifted and then opened by the flow. In the event of an incipient backflow (e. g. failure of a pump) the obturator closes self-controlled by its dead weight. This closing process can optionally be supported by using a spring.

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7. Installation

7.1 General Information

Positioning within the isometry of the pipeline as well as a proper installation of the valves is basically the responsibility of the engineer or the operator. Any faults in engineering or installation could cause malfunction of the valves and constitute a significant danger. For the installation of the valves the same safety regulations are to be considered as for connecting pipelines and its components.



Pipelines have to be laid in such a manner that shearing strain and bending stress are not able to affect the valve body. The flange facings have to be in a parallel position to each other. The facings need to be clean and undamaged.



Valve bodies in material cast iron EN-JL1040, EN-JS1030 must not be treated by sudden pressure (e. g. hammer blow) because components may be destroyed. Valves working at temperatures $<0^{\circ}\text{C}$ respectively $>40^{\circ}\text{C}$ need to be protected against touch.

7.2 Operation Characteristics (Pressure/Temperature-Rating)

For maximum permissible operating data in relation to pressure/temperature rating, please refer to our separate data sheets.

7.3 Range of Applications

Industrial plants, heating systems, fluids, gases and vapour (see also fluid groups in table of article 6), hot water heating systems DIN4751 / DIN4752, heat transmission plants DIN4754, steam boiler plants TRD110, pressure vessel plants TRB801 No. 45. Fluid groups I+II acc. to PED 2014/68/EU.

Potential restrictions by any technical body of legislation are to be considered.

The materials of the valves have to be applicative for the medium.

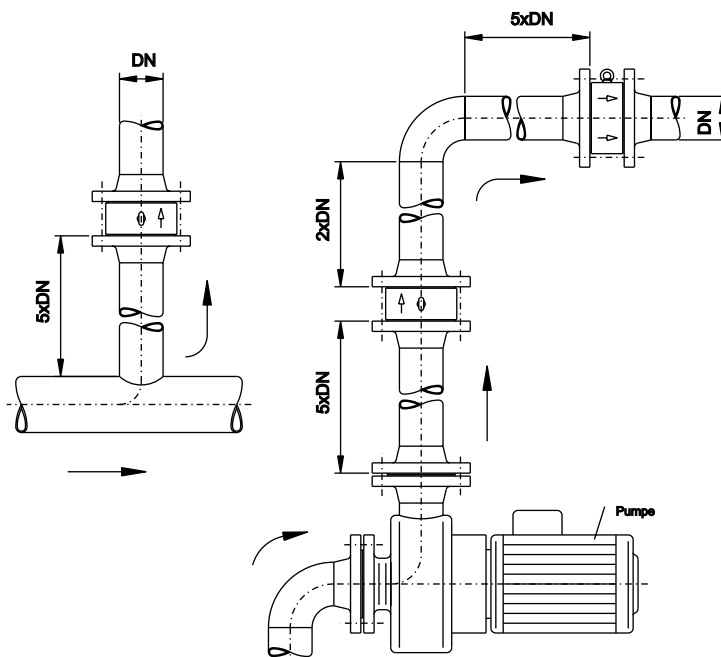
In case of pulsating flow (e.g. caused by piston compressors) the suitability of the selected valve type has to be clarified with RITAG.

7.4 Installation Instructions

The arrow indicating the flow direction and the flow direction itself need to run in the same direction. For the valve to open a minimum dynamic pressure is required.

Valves without spring can only be installed in vertical lines with upward flow. Exception: ZRK type. Here, operation without spring is also possible in horizontal piping.

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WARNING

Wafer type non-return valves are designed for installation between two pipeline flanges including appropriate flange sealings. The fasteners require a technical applicability in accordance to the service conditions. They have to comply with the regulations and have to be tightened with the permissible torque. Screws, nuts or flange sealings are not covered by the valve manufacturers' scope of supply. Exception: Swing type check valves model ZRK have to be manually center-lined.

For check valves of the ZRD series, when installed in a horizontal pipeline, the valve must be aligned so that the axis is in a vertical position. For check valves of the ZRK series, the eye screw must point vertically upwards.

Inlet and outlet runs of the fitting shall to be observed.

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7.5 Additional instructions for oxygen valves

- All RITAG valves intended for oxygen service are sealed or wrapped in PE foil to ensure that they are safely protected against internal contamination.
- Such valves are identifiable by a label marked „Öl- und fettfrei für Sauerstoffanwendung / Free of oil and grease for oxygen service“ which is affixed outside on the packaging. In addition there can be a customized marking such as DN, PN and Tag number.
- For heavy valves it is ensured that the lifting lug will be accessible for handling with a crane.
- The valves should be handled with care to avoid any damage of the protective foil.
- When storing the valves in the warehouse do not pull them over rough surfaces which could damage the protective foil.
- The protective foil is only to be removed right before installation.
- During assembly, take care that only tools are used which are clean and free of oil and grease.
- During assembly a clean and free of oil and grease environment has to be ensured.
- The valves should only be touched with clean and free of oil and grease gloves.
- Do not use lubricants during assembly.
- Use only oxygen-compatible materials during maintenance.
- For further details on cleaning and packaging, please ask us for the RITAG Standard RS0515.

7.6 Directive 2014/34/EU (ATEX)

The check valves do not have an own potential source of ignition and therefore the Directive 2014/34/EU is not applicable to these valves. A manufacture declaration can be downloaded at our website www.ritag.com or send by e-mail on request.

The valves may be used in potentially explosive area.

In case of the possibility for electrostatic charges, the valves can be optionally equipped with an earth connection (e.g. stud bolt and nut M6).

8. Initial Operation, Shut-down, Maintenance

8.1 Initial Operation

Materials and service conditions have to be compared with the pipeline system data before pressure test and initial operation in order to check resistance and load.

For new plants or repairs the pipeline system has to be thoroughly rinsed in order to clean it from potential welding residues or any other damaging solid particles.

8.2 Pressure tests of pipeline sections

Since non-return valves are always in a closed position within a filled pipeline section a testing overpressure value of $1,1 \times PS$ must not be exceeded ($PS = NP = \text{max. permissible working pressure}$).

Throughout the pressure test process the valve and the flange connections have to be examined regarding any leaks. Leakes have to be immediately sealed by retightening all fasteners.

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8.3 Shut-down

If the system is out of operation for a lasting period all media which might change its condition (i. e. polymerisation, crystallisation, solidification) have to be drained off the piping system. Rinse the system if necessary.

8.4 Maintenance

The valves are maintenance-free. For safety reasons and in order to avoid unnecessary periods of interruption the operator is advised to examine functionality and reliability of the valves within reasonable and regular intervals (periods to be defined by the operator).

Safety instructions in chapter 4 are to be considered.

8.5 Elimination of Failures

Failure definition	Potential reasons	Remedy
High leakage rate	Contaminated seat facings Deformation of cone/plate by hammer blow Damaged seat ring Cone/plate does not close, cone is hanging High activity rate causes a seizing due to friction	Clean the seat facings, regrind if necessary. Replace cone/plate (Manufacturer). Replace seat ring. Recheck operating data. Reengineer all parts.
Inappropriate noises	Insufficient flow rate. Turbulent flow. Decelerated starting of the pump.	Select reduced sizes. Recheck the distance between pipe bend and pump (5xDN). Extend the period of running up the pump.
No flow	Valve is installed in the wrong way.	Arrow of flow direction has to run in the same direction as the flow itself.
Leaks of flange sealings	Connection flanges are not wired.	Retighten fasteners

9. Spare Parts



WARNING

For repair work any valve parts must only be replaced by spare parts from the original supplier. Unauthorised conversion as well as spare parts production cause an expiry of the declaration of conformity and may also invalidate any warranty claims.

Any springs or o-rings (relevant for valves equipped with a soft sealing) can be ordered as spare parts. The full marking of the valve body has to be specified in the purchase order.

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10. Further Information

For further information such as RITAG technical data sheets, repair instructions, certificates etc. please contact us at www.ritag.com or send your mail to:

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