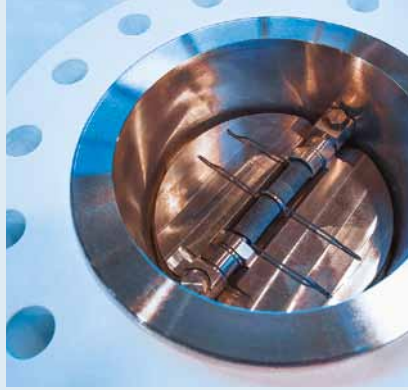


Valve Experience.
Made in Germany.



Ready for your
challenges

Company Profile

Welcome to RITAG

Valve Experience. Made in Germany.

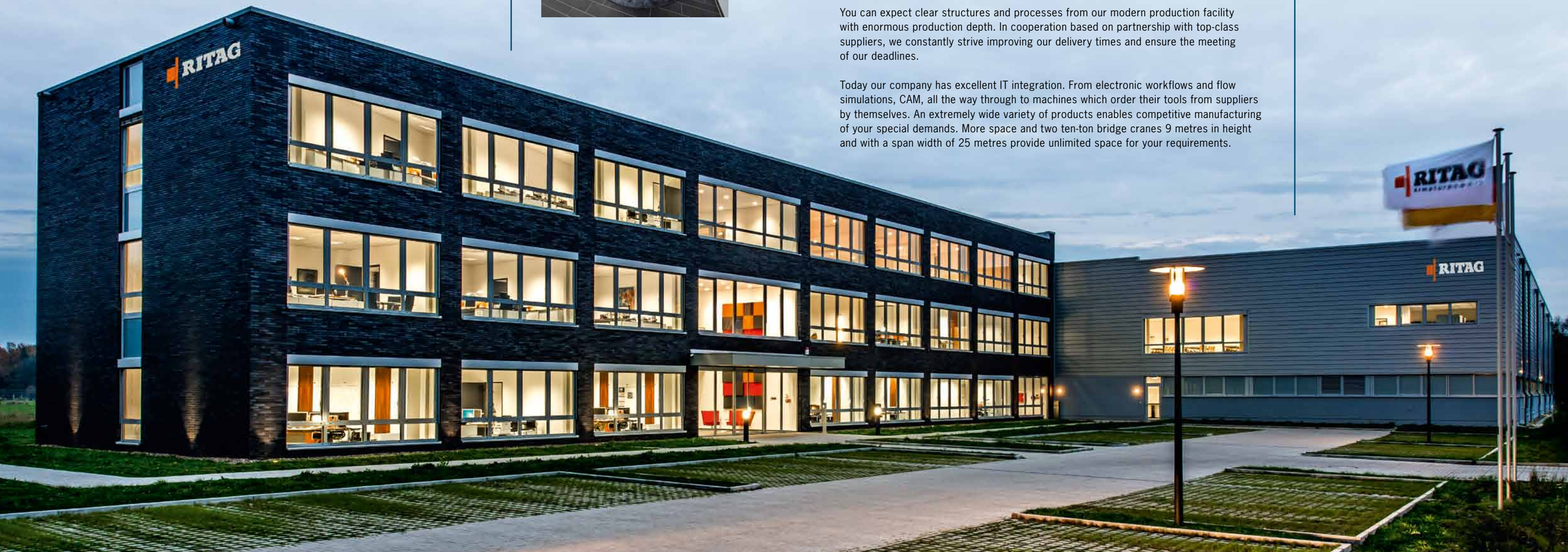
Had our company founder, Subrat Chatterjee, been able to look into the future back in 1974, there's no doubt he would have been very proud of our company's development. Today we would like to welcome you with this company profile in our new building completed in 2014. More than 80 dedicated employees are working with us to meet your demands and requirements on time and within budget to a high "Made in Germany" level of quality. One of the most modern production facilities for industrial valves in Europe is located on some 6,500 m² of office and production space as well as a site of approx. 28,000 m². Our check valves, tank bottom valves and sampling systems are developed, manufactured and tested in Germany and leave our production "Made in Germany" to be installed in plants and applications all over the world.



State-of-the-art Production and Manufacturing

You can expect clear structures and processes from our modern production facility with enormous production depth. In cooperation based on partnership with top-class suppliers, we constantly strive improving our delivery times and ensure the meeting of our deadlines.

Today our company has excellent IT integration. From electronic workflows and flow simulations, CAM, all the way through to machines which order their tools from suppliers by themselves. An extremely wide variety of products enables competitive manufacturing of your special demands. More space and two ten-ton bridge cranes 9 metres in height and with a span width of 25 metres provide unlimited space for your requirements.



RITAG Quality



Testings and Inspections

- PMI Positive Material Identification
- RT Radiographic Test
- UT Ultrasonic Testing
- DPT/LPT Dye Penetrant Test/Liquid Penetrant Test
- MPI Magnetic Particle Inspection
- CRYO Cryogenic Leakage Test
- ST Shell Test
- LPCT Low Pressure Closure Test
- HPCT High Pressure Closure Test
- DC Dimensional Check
- DFT Dry Film Thickness

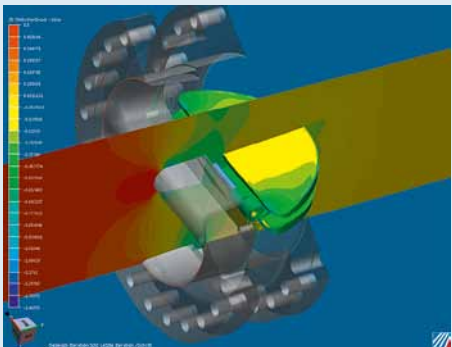
Non-destructive testing is an important component of our professional production.

Special requirements can be met together with accredited specialist laboratories to the highest level of quality.

Engineering and Development

More than 40 years of experience and close cooperation with EPC's and end-users form the basis for our problem-solving expertise.

Equipped with modern tools, such as 3D CAD, FEM, CFD, CAM and much more, we go about meeting your demands and, together with you, we find solutions that go way beyond the norm. In so doing, it is important to us that our solution impresses you; regardless of whether it involves simple maintenance, special materials or particular system conditions.



Integrated Management

Continuous improvement in all aspects is what drives us. We take responsibility for our customers, for our employees and for the environment.

Clear structures, stable processes and a dedicated team guarantee the exceptional quality of our products. And if an error still occurs, our deviation management ensures that it doesn't happen a second time.

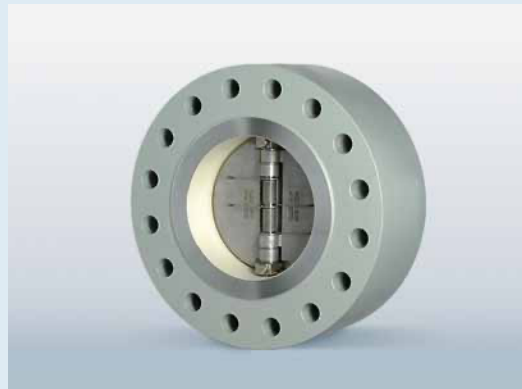


Project Handling

- PIM Pre-Inspection-Meeting
- KOM Kick-Off-Meeting
- BCD Bid Closing Date
- ITP Inspection & Test Plan
- TPI Third Party Inspection
- FAT Factory Acceptance Test
- FINAL Final Acceptance Test
- VDRL Vendor Document Requirement List
- MRB Manufacturer Record Book
- DB Data Book
- VDR Vendor Data Register
- QM Quality Manual
- IM-Manual Integrated Management Manual
- MTC Material & Test Certificates
- IOM Instruction Manual
- GA General Arrangement Drawing
- DS Data Sheet
- IN Inspection Notification
- IRN Inspection Release Note
- SRN Shipping Release Note
- NCR Non-Conformity Report
- PPR Project Progress Report
- PS Project Schedule
- SSL Sub Supplier List
- MOS Material Order Status
- WPS Welding Procedure Specification
- PQR Procedure for Qualification Record
- HTR Forming and Heat Treatment Procedure
- PWHT Post Weld Heat Treatment
- IFS Instructions for Storage
- CRA Corrosion Allowance
- COC Certificate of Compliance
- COO Certificate of Origin
- SPIR Spare Parts Interchangeable Record
- PACK Packing Procedure
- DT Document Transmittal



RITAG Product Range



RITAG Brochures

Wafer Type Check Valves:

- Wafer Type Lift Check Valves
- Wafer Type Swing Check Valves
- Wafer Type Dual Plate Check Valves



■ RITAG Wafer Type Check Valves



■ RITAG Tank Bottom Valves



■ RITAG Sampling Valves



■ RITAG Clean Service

Valve Experience.
Made in Germany.



RITAG Markets and References

Oil and Gas Industry

- ADCO
- ARAMCO
- GASCO
- Gaz de France
- Indian Oil Corporation
- OMV
- Shell
- Statoil
- Total
- Wintershall
- ZADCO

EPC's

- Air Liquide
- Daelim
- Linde
- Lurgi
- NPCC
- Petrofac
- Saipem
- Technip
- ThyssenKrupp Industrial Solutions (Uhde)
- Toyo Engineering

Shipbuilding

- Abeking & Rasmussen
- Daewoo
- Fincantieri
- HDW
- Lürssen
- Meyer-Werft
- Nordic Yards
- Shanghai Edwards Shipyards
- Wadan Yards
- Zhonghua Shipyard Shanghai

Petrochemical-, Chemical- and Pharmaceutical Industry

- BASF
- BAYER
- Boehringer
- CF Industries
- Clariant
- DOW
- Evonik
- Lanxess
- Roche
- SABIC
- Sanofi Aventis

General Industry, Power Plants

- ABB
- ArcelorMittal
- AEL
- Alderley
- Atlas Copco
- GEA
- Kraftanlagen
- MAN
- Mannesmann
- Siemens

RITAG Representatives

- Germany
- Australia
- Austria
- Bahrain
- Belgium
- Brazil
- Chile
- Czechia
- Denmark
- Egypt
- Finland
- France
- Great Britain
- Hong Kong
- Hungary
- India
- Indonesia
- Iran
- Ireland
- Italy
- Japan
- Malaysia
- Mexico
- The Netherlands
- Nigeria
- Norway
- Poland
- Portugal
- PR China
- Qatar
- Russia
- Saudi Arabia
- Singapore
- Slovakia
- South Africa
- South Korea
- Spain
- Sweden
- Switzerland
- Taiwan
- Thailand
- UAE
- USA

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Wafer Type Check Valves

Instruction Manual

SR / HSR

ZRK / ZRL

ZRD



Technical modifications reserved 09/2016
Document no.: BA-1002

Wafer Type Check Valves

Instruction manual

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Wafer Type Check Valves

Instruction manual

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.



Disregarding the following caution advices could evoke dangerous situations which entail an inefficacy of the manufacturers' warranty.
For any questions, please contact the manufacturer and also see chapter 10.

2. Intended Use

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

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

All valid operation data are indicated in appendix II respectively in the technical data sheets of the relevant types.

3. Safety Instructions

3.1 Generaly 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.

3.2 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.

Wafer Type Check Valves

Instruction manual

3.3 Safety Instructions for the Operator

Due to the fact that the following points are not in the responsibility of the valve manufacturer the operator has to ensure when using the valves that

- the valves are solely used in the way described in chapter 2
- 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 valves are properly installed between the flanges.
- an 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 valves are protected against touch when working at a temperature $<0^{\circ}\text{C}$ respectively $>40^{\circ}\text{C}$.



Prevention from misusing the valves:

It has to be particularly ensured that the selected body materials and inner parts of the valve are suited for the medium that is used. The manufacturer assumes no liability for any damages caused by aggressive media.

3.4 Special Dangers



Before disassembling the valve the pipeline has to be depressurized, the pipe has to be totally drained and released. Afterwards the flange screw connections can be unscrewed and the valve can be dismantled. Misusing this precaution means danger to the life of the operating personnel.

Wafer Type Check Valves

Instruction manual

4. Transport and Storage

The valves are provided 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.
- It is recommended to use up any stock items first in order to achieve short storage periods.
- 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. Inner parts may not be misused as „carrying devices“.

5. Conformity in acc. to PED 2014/68/EU article 13

The Certificate of Conformity is available for download on our website www.ritag.com. If you would like us to submit the Certificate of Conformity by e-mail, please contact us.

For information on fluid groups and the corresponding RITAG valves, please refer to our product data sheets.

6. Specification

The sectional drawings shown in this chapter do exemplary illustrate the basic design of the valves. Detailed information can be found in the technical data sheet of the specific valve type.

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. 5.02)	...
CE-marking (starting from category I, see chapter 1 u. 6)	CE
Code of the Notified Body (Module A1 und H)	0525
Stamp of inspector	...

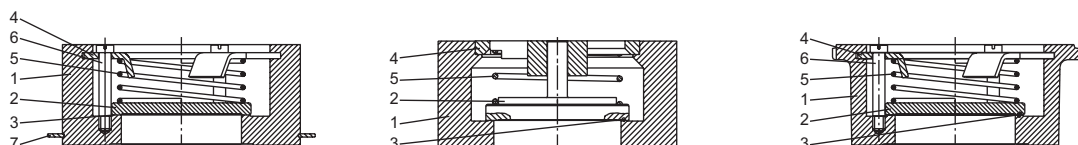
Further special markings, e. g. plant identification code or project name could be additionally affixed on request.

Wafer Type Check Valves

Instruction manual

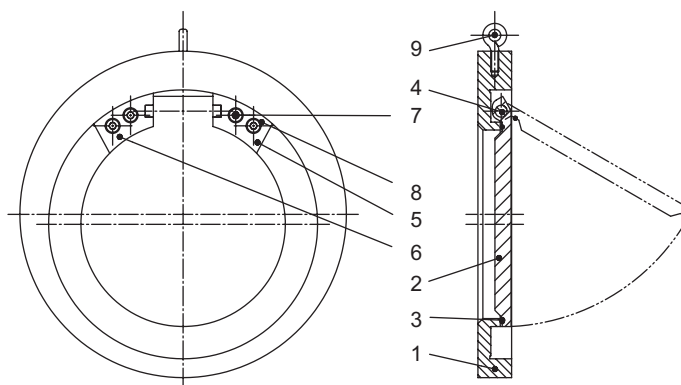
6.2 Drawings and Parts Lists

Lift Check Valves



Item	Denomination	Item	Denomination
1	Body	2	Plate/disc
3	Sealing (spare part)	4	Guiding plate
5	Spring	6	Guiding screw
7	Centering ring		

Swing Check Valves

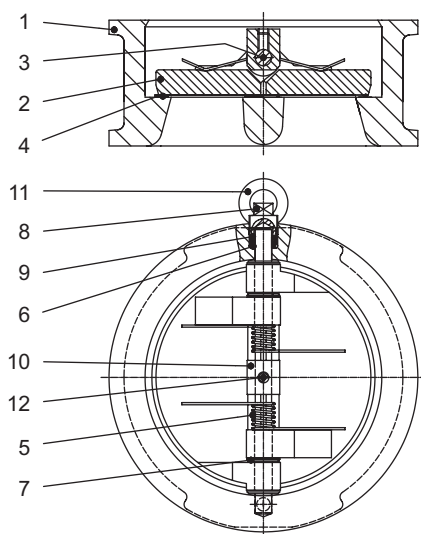


Item	Denomination	Item	Denomination
1	Body	2	Plate
3	Sealing (spare part)	4	Hinge pin
5	Hinge, right	6	Hinge, left
7	Screw	8	Ring
9	Eye screw		

Wafer Type Check Valves

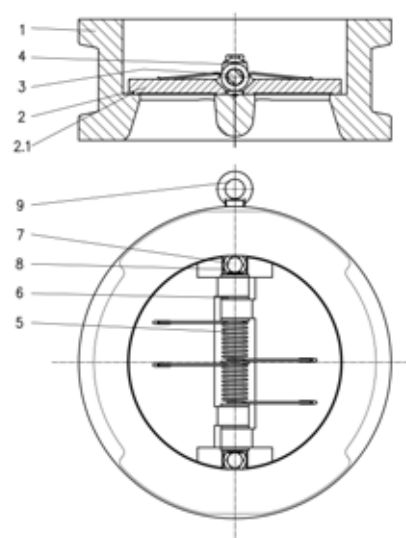
Instruction manual

Dual Plate Wafer Type Check Valves



with retainer

Item	Denomination	Item	Denomination
1	Body	2	Plate
3	Shaft	4	Sealing (spare part)
5	Spring (spare part)	6	Packing (spare part)
7	Ring	8	Pin retainer
9	Ring	10	Stop pin
11	Eye screw	12	Set screw



retainerless

Item	Denomination	Item	Denomination
1	Body	2	Plate
3	Shaft	4	Stop pin
5	Spring (spare part)	6	Ring
7	Screw	8	Safety Plate
9	Eye acrow		

6.3 Functionality

Wafer type non-return 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.

Wafer Type Check Valves

Instruction manual

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 Annex I.

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.

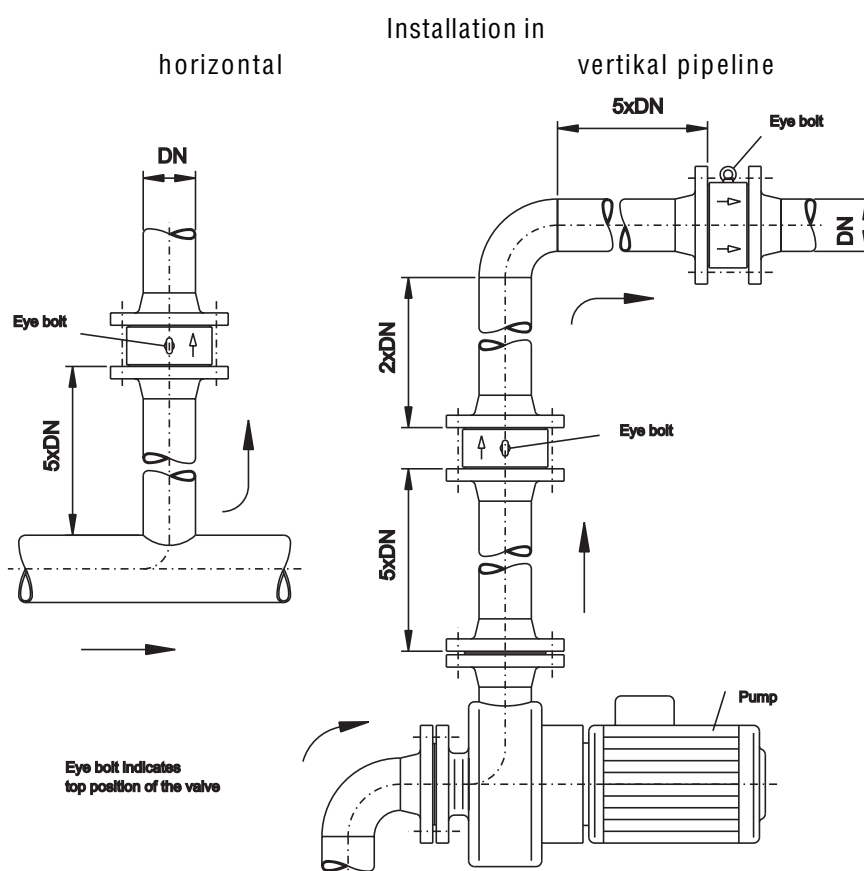
In case of pulsating flow (e.g. caused by piston compressors) the suitability of the selected valve type has to be clarified with RITAG.

Wafer Type Check Valves

Instruction manual

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.



Wafer type non-return valves are designed for installation between two pipeline flanges including appropriate flange sealings. The outer diameter of the valve centres itself by the flange bolts. 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.

Wafer Type Check Valves

Instruction manual

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.
- For further details on cleaning and packaging, please ask us for the RITAG Standard RS0515.
- 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

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 the EX range.

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).

Wafer Type Check Valves

Instruction manual

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. Leakages have to be immediately sealed by retightening all fasteners.

8.3 Shutt-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.

Wafer Type Check Valves

Instruction manual

8.5 Elimination of Failures

Failure definition	Potential reasons	Remedy
High leakage rate	Contaminated seat facings Deformation of disc/cone/ plate by hammer blow Damaged seat ring Disc/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 disc/cone/plate 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 (5-7xDN) Use lighter plates or springs with reduced opening pressure Extend the period of running up the pump
Leaks of stuffing box (ZRL-HG, ZRD)	Stuffing box is inadequately preloaded	Retighten stuffing box Replace stuffing box packings if necessary
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

Wafer Type Check Valves

Instruction manual

9. Spare Parts



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.

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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D 27703 Osterholz-Scharmbeck
Sachsenring 30
D 27711 Osterholz-Scharmbeck
Tel. +49 (0) 4795 55042-0
Fax +49 (0) 4795 55042-850
E-Mail: contact@ritag.com

Wafer Type Check Valves

Instruction manual

Annex I - Pressure/Temperature Classification acc. to DIN EN 12516

Working data for cast iron

Material	Temp. (°C)	max. working pressure (bar)	
		PN10	PN16
EN-JL 1040	RT	10	16
	100	10	16
	200	8	14,4
	300	6	9,6

Working data for bronze

Material	Temp. (°C)	max. working pressure (bar)	
		PN10	PN16
CC483K	RT	10	16
	100	10	16
	200	8	14

Working data for material group 3E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
	RT	10	16	25	40	63	100	160	250
	100	8,5	13,7	21,4	34,2	54	85,7	137,1	214,2
	150	8,3	13,3	20,8	33,3	52,5	83,3	133,3	208,3
	200	7,7	12,4	19,4	31	48,9	77,6	124,1	194
1.0460	250	7	11,3	17,7	28,3	44,7	70,9	113,5	177,3
1.0619	300	6,4	10,2	16	25,7	40,5	64,2	102,8	160,7
1.0425	350	6	9,6	15,1	24,1	38,1	60,4	96,7	151,1
1.0577 *	400	5,7	9,1	14,2	22,8	36	57,1	91,4	142,8
	450	3,2	5,2	8,2	13,1	20,7	32,8	52,5	82,1

* only up to 300°C

Wafer Type Check Valves

Instruction manual

Annex I - Pressure/Temperature Classification acc. to DIN EN 12516

Working data for material group 3E1

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.0426 1.0481	RT	10	16	25	40	63	100	160	250
	100	10	16	25	40	63	100	160	250
	150	10	15,2	23,8	38	60	95,2	152,3	238
	200	10	14,5	22,7	36,3	57,3	90,9	145,5	227,3
	250	9,7	13,3	20,8	33,3	52,5	83,3	133,3	208,3
	300	8,8	12,2	19,1	30,6	48,3	76,6	122,6	191,6
	350	8	11,3	17,7	28,3	44,7	70,9	113,5	177,3
	400	7,3	10,2	16	25,7	40,5	64,2	102,8	160,7
	450	4	6,4	10,1	16,1	25,5	40,4	64,7	101,1

Working data for material group 4E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.5415 1.5419	RT	10	16	25	40	63	100	160	250
	100	10	16	25	40	63	100	160	250
	150	10	16	25	40	63	100	160	250
	200	9,2	14,8	23,2	37,1	58,5	92,8	148,5	232,1
	250	8,5	13,7	21,4	34,2	54	85,7	137,1	214,2
	300	7,6	12,1	19	30,4	48	76,1	121,9	190,4
	350	7	11,2	17,5	28	44,1	70	112	175
	400	6,3	10,1	15,8	25,3	39,9	63,3	101,3	158,3
	450	5,9	9,4	14,7	23,6	37,2	59	94,4	147,6
	500	4,4	7	11	17,7	27,9	44,2	70,8	110,7
	510	3,5	5,6	8,8	14	22,2	35,2	56,3	88
	520	2,8	4,4	7	11,2	17,7	28	44,9	70,2
	530	2,2	3,5	5,5	8,9	14,1	22,3	35,8	55,9

Wafer Type Check Valves

Instruction manual

Annex I - Pressure/Temperature Classification acc. to DIN EN 12516

Working data for material group 5E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.7335 1.7357	RT	10	16	25	40	63	100	160	250
	100	10	16	25	40	63	100	160	250
	150	10	16	25	40	63	100	160	250
	200	10	16	25	40	63	100	160	250
	250	10	16	25	40	63	100	160	250
	300	9,1	14,7	22,9	36,7	57,9	91,9	147	229,7
	350	8,4	13,5	21,1	33,9	53,4	84,7	135,6	211,9
	400	7,9	12,7	19,8	31,8	50,1	79,5	127,2	198,9
	450	7,3	11,8	18,4	29,5	46,5	73,8	118	184,5
	500	6,5	10,4	16,3	26	41,1	65,2	104,3	163
	550	2,3	3,7	5,8	9,3	14,7	23,3	37,3	58,3
	560	1,9	3	4,7	7,6	12	19	30,4	47,6
	570	1,5	2,5	3,9	6,2	9,9	15,7	25,1	39,2

Working data for material group 6E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.7380 1.7383 1.7375	RT	10	16	25	40	63	100	160	250
	100	10	16	25	40	63	100	160	250
	150	10	16	25	40	63	100	160	250
	200	10	16	25	40	63	100	160	250
	250	10	16	25	40	63	100	160	250
	300	10	16	25	40	63	100	160	250
	350	9,7	15,6	24,4	39	61,5	97,6	156,1	244
	400	9,2	14,8	23,2	37,1	58,5	92,8	148,5	232,1
	450	8,8	14	22	35,2	55,5	88	140,9	220,2
	500	6,4	10,2	16	25,7	40,5	64,2	102,8	160,7
	550	3,2	5,1	8	12,9	20,4	32,3	51,8	80,9
	560	2,7	1,4	6,9	11	17,4	27,6	44,1	69
	570	2,4	3,8	6	9,7	15,3	24,2	38,8	90,7
	580	2	3,3	5,2	8,3	13,2	20,9	33,5	52,3
	590	1,8	2,8	4,5	7,2	11,4	18	28,9	45,3
	600	1,6	2,5	4	6,4	10,2	16,1	25,9	40,4

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Working data for material group 10E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.4306 1.4307	RT	10	16	25	40	63	100	160	250
	100	8,6	13,7	21,5	34,4	54,3	86,1	137,9	215,4
	150	7,7	12,3	19,2	30,8	48,6	77,1	123,4	192,8
	200	7	11,2	17,5	28	44,1	70	112	175
	250	6,5	10,4	16,3	26	41,1	65,2	104,3	163
	300	6	9,6	15,1	24,1	38,1	60,4	96,7	151,1
	350	5,7	9,2	14,4	23	36,3	57,6	92,1	144
	400	5,5	8,8	13,8	22	34,8	55,2	88,3	138
	450	5,3	8,5	13,3	21,4	33,7	53,5	85,7	133,9
	500	5,1	8,3	12,9	20,7	32,7	51,9	83	129,7
	550	4,3	7	10,9	17,5	27,6	43,8	70	109,5
	560	4	6,4	10,1	16,1	25,6	40,4	64,7	101,1
	570	3,7	5,9	9,2	14,8	23,4	37,1	59,4	92,8
	580	3,4	5,4	8,5	13,7	21,6	34,2	54,8	85,7
	590	3	4,9	7,7	12,3	19,5	30,9	49,5	77,3
	600	2,8	4,4	7	11,2	17,7	28	44,9	70,2

Working data for material group 11E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.4301 1.4308	RT	10	16	25	40	63	100	160	250
	100	9	14,5	22,7	36,3	57,3	90,9	145,5	227,3
	150	8,1	13,1	20,4	32,7	51,6	81,9	131	204,7
	200	7,4	11,9	18,6	29,9	47,1	74,7	119,6	186,9
	250	6,9	11	17,2	27,6	43,5	69	110,4	172,6
	300	6,4	10,2	16	25,7	40,5	64,2	102,8	160,7
	350	6,1	9,8	15,3	24,5	38,7	61,4	98,2	153,5
	400	5,9	9,5	14,8	23,8	37,5	59,5	95,2	148,8
	450	5,8	9,3	14,5	23,3	36,7	58,3	93,3	145,8
	500	5,7	9,1	14,2	22,8	36	57,1	91,4	142,8
	550	4,3	7	10,9	17,5	27,6	43,8	70	109,5
	560	4	6,4	10,1	16,1	25,5	40,4	64,7	101,1
	570	3,7	5,9	9,2	14,8	23,4	37,1	59,4	92,8
	580	3,4	5,4	8,5	13,7	21,6	34,2	54,8	85,7
	590	3	4,9	7,7	12,3	19,5	30,9	49,5	77,3
	600	2,8	4,4	7	11,2	17,7	28	44,9	70,2

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Annex I - Pressure/Temperature Classification acc. to DIN EN 12516

Working data for material group 12E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.4541 1.4550 * 1.4552 *	RT	10	16	25	40	63	100	160	250
	100	9,9	15,8	24,7	39,6	62,4	99	158,4	250
	150	9,3	14,9	23,3	37,3	58,8	93,3	149,3	233,3
	200	8,8	14,1	22,1	35,4	55,8	88,5	141,7	221,4
	250	8,4	13,4	21	33,7	53,1	84,2	134,8	210,7
	300	7,9	12,7	19,8	31,8	50,1	79,5	127,2	198,8
	350	7,6	12,2	19,1	30,6	48,3	76,6	122,6	191,6
	400	7,4	11,8	18,5	29,7	46,8	74,2	118,8	185,7
	450	7,2	11,6	18,1	29	45,7	72,6	116,1	181,5
	500	7	11,3	17,7	28,3	44,7	70,9	116,5	177,3
	550	6,7	10,8	16,9	27	42,6	67,6	108,1	169
	560	6,1	9,8	15,3	24,5	38,7	61,4	98,2	153,5
	570	5,6	8,9	14	22,4	35,4	56,1	89,9	140,4
	580	5	8,1	12,7	20,3	32,1	50,9	81,5	127,3
	590	4,5	7,3	11,4	18,2	28,8	45,7	73,1	114,2
	600	4	6,5	10,2	16,3	25,8	40,9	65,5	102,3

* max 500°C

Working data for material group 13E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.4404 1.4435 1.4458	RT	10	16	25	40	63	100	160	250
	100	9,4	15,1	23,6	37,9	59,7	94,7	151,6	236,9
	150	8,6	13,7	21,5	34,4	54,3	86,1	137,9	215,4
	200	7,9	12,7	19,8	31,8	50,1	79,5	127,2	198,8
	250	7,4	11,9	18,6	29,9	47,1	74,7	119,6	186,9
	300	6,9	11	17,2	27,6	43,5	69	110,4	172,6
	350	6,6	10,5	16,5	26,4	41,7	66,1	105,9	165,4
	400	6,4	10,2	16	25,7	40,5	64,2	102,8	160,7
	450	6,2	10	15,6	25	39,4	62,6	100,1	156,5
	500	6	9,7	15,2	24,3	38,4	60,9	97,5	152,3

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Annex I - Pressure/Temperature Classification acc. to DIN EN 12516

Working data for material group 14E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.4401 1.4408 1.4436	RT	10	16	25	40	63	100	160	250
	100	10	16	25	40	63	100	160	250
	150	9	14,5	22,7	36,3	57,3	90,9	145,5	227,3
	200	8,4	13,4	21	33,7	53,1	84,2	134,8	210,7
	250	7,9	12,7	19,8	31,8	50,1	79,5	127,2	198,8
	300	7,4	11,8	18,5	29,7	46,8	74,2	118,8	185,7
	350	7,1	11,4	17,8	28,5	45	71,4	114,2	178,5
	400	6,8	10,9	17,1	27,4	43,2	68,5	109,7	171,4
	450	6,7	10,7	16,8	26,9	42,4	67,3	107,8	168,4
	500	6,6	10,5	16,5	26,4	41,7	66,1	105,9	165,4
	550	6,5	10,4	16,3	26	41,1	65,2	104,3	163
	560	6,4	10,3	16	25,7	40,5	64,3	103	160,9
	570	6,3	10,1	15,8	25,4	40	63,5	101,6	158,8
	580	6,2	10	15,6	25	39,5	62,7	100,3	156,7
	590	6,1	9,9	15,4	24,7	39	61,9	99	154,7
	600	5,6	8,9	14	22,4	35,4	56,1	89,9	140,4

Working data for material group 15E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.4571 1.4581	RT	10	16	25	40	63	100	160	250
	100	10	16	25	40	63	100	160	250
	150	9,8	15,6	24,5	39,2	61,8	98	156,9	245,2
	200	9,3	14,9	23,3	37,3	58,8	93,3	149,3	233,3
	250	8,8	14,1	22,1	35,4	55,8	88,5	141,7	221,4
	300	8,3	13,3	20,8	33,3	52,5	83,3	133,3	208,3
	350	8	12,8	20,1	32,1	50,7	80,4	128,7	201,1
	400	7,8	12,4	19,5	31,2	49,2	78	124,9	195,2
	450	7,6	12,2	19,1	30,6	48,3	76,6	122,6	191,6
	500	7,5	12	18,8	30	47,4	75,2	120,3	188
	550	7,4	11,9	18,6	29,9	47,1	74,7	119,6	186,9
	560	7,4	11,8	18,5	29,6	46,6	74	118,5	185,1
	570	7,3	11,7	18,3	29,3	46,2	73,3	117,3	183,3
	580	6,7	10,7	16,7	26,8	42,3	67,1	107,4	167,8
	590	6	9,7	15,2	24,3	38,4	60,9	97,5	152,3
	600	5,5	8,8	13,8	22	34,8	55,2	88,3	138

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Working data for material group 16E0

Material	Temp. (°C)	max. working pressure (bar)							
		PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN250
1.4462	RT	10	16	25	40	63	100	160	250
1.4362	100	10	16	25	40	63	100	160	250
1.4410	150	10	16	25	40	63	100	160	250
1.4517	200	10	16	25	40	63	100	160	250
1.4469	250	10	16	25	40	63	100	160	250

Working temperatures below 0° C can be found in AD 2000-W10

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Annex II - Pressure/Temperature Classification acc. to ASME B16.34

Working data for material group 1.1

Material	Temp. (°C)	max. working pressure (bar)					
		150	300	600	900	1500	2500
A216 WCB A515 Grade70 A105 A350 LF2	-29 to 38	19,6	51,1	102,1	153,2	255,3	425,5
	50	19,2	50,1	100,2	150,4	250,6	417,7
	100	17,7	46,6	93,2	139,8	233	388,3
	150	15,8	45,1	90,2	135,2	225,4	375,6
	200	13,8	43,8	87,6	131,4	219	365
	250	12,1	41,9	83,9	125,8	209,7	349,5
	300	10,2	39,8	79,6	119,5	199,1	331,8
	325	9,3	38,7	77,4	116,1	193,6	322,6
	350	8,4	37,6	75,1	112,7	187,8	313
	375	7,4	36,4	72,7	109,1	181,8	303,1
	400	6,5	34,7	69,4	104,2	173,6	289,3
	425	5,5	28,8	57,5	86,3	143,8	239,7

Working data for material group 1.2

Material	Temp. (°C)	max. working pressure (bar)					
		150	300	600	900	1500	2500
A106 GradeC A216 WCC A352 LC2 * A352 LC3 * A352 LCC *	-29 to 38	19,8	51,7	103,4	155,1	258,6	430,9
	50	19,5	51,7	103,4	155,1	258,6	430,9
	100	17,7	51,5	103	154,6	257,6	429,4
	150	15,8	50,2	100,3	150,5	250,8	418,1
	200	13,8	48,6	97,2	145,8	243,2	405,4
	250	12,1	46,3	92,7	139	231,8	386,2
	300	10,2	42,9	85,7	128,6	214,4	357,1
	325	9,3	41,4	82,6	124	206,6	344,3
	350	8,4	40	80	120,1	200,1	333,5
	375	7,4	37,8	75,7	113,5	189,2	315,3
	400	6,5	34,7	69,4	104,2	173,8	289,3
	425	5,5	28,8	57,5	86,3	143,8	239,7

* not to be used above 345°C

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Annex II - Pressure/Temperature Classification acc. to ASME B16.34

Working data for material group 1.3

Material	Temp. (°C)	max. working pressure (bar)					
		150	300	600	900	1500	2500
A352 LCB * A515 Grade70 A516 Grade65**	-29 to 38	18,4	48	96	144,1	240,1	400,1
	50	18,2	47,5	94,9	142,4	237,3	395,6
	100	17,4	45,3	90,7	136	226,7	377,8
	150	15,8	43,9	87,9	131,8	219,7	366,1
	200	13,8	42,5	85,1	127,6	212,7	354,4
	250	12,1	40,8	81,6	122,3	203,9	339,8
	300	10,2	38,7	77,4	116,1	193,4	322,4
	325	9,3	37,6	75,2	112,7	187,9	313,1
	350	8,4	36,4	72,8	109,2	182	303,3
	375	7,4	35	69,9	104,9	174,9	291,4
	400	6,5	32,6	65,2	97,9	163,1	271,9
	425	5,5	27,3	54,6	81,9	136,5	227,5

* * not to be used above 345°C ** not to be used above 425°C

Working data for material group 1.9

Material	Temp. (°C)	max. working pressure (bar)					
		150	300	600	900	1500	2500
A182 Grade F11 Cl.2 * A217 WC6 *	-29 to 38	19,8	51,7	103,4	155,1	258,6	430,9
	50	19,5	51,7	103,4	155,1	258,6	430,9
	100	17,7	51,5	103	154,4	257,4	429
	150	15,8	49,7	99,5	149,2	248,7	414,5
	200	13,8	48	95,9	143,9	239,8	399,5
	250	12,1	46,3	92,7	139	231,8	386,2
	300	10,2	42,9	85,7	128,6	214,4	357,1
	325	9,3	41,4	82,6	124	206,6	344,3
	350	8,4	40,3	80,4	120,7	201,1	335,3
	375	7,4	38,9	77,6	116,5	194,1	323,2
	400	6,5	36,8	73,3	109,8	183,1	304,9
	425	5,5	35,2	70	105,1	175,1	291,6
	450	4,6	33,7	67,7	101,4	169	281,8
	475	3,7	31,7	63,4	95,1	158,2	263,9
	500	2,8	25,7	51,5	77,2	128,6	214,4
	538	1,4	14,9	29,8	44,7	74,5	124,1
	550	1,4	12,7	25,4	38,1	63,5	105,9
	575	1,4	8,8	17,6	26,4	44	73,4
	600	1,4	6,1	12,2	18,3	30,5	50,9

* not to be use above 595°C

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Annex II - Pressure/Temperature Classification acc. to ASME B16.34

Working data for material group 2.1

Material	Temp. (°C)	max. working pressure (bar)					
		150	300	600	900	1500	2500
	-29 to 38	19	49,6	99,3	148,9	248,2	413,7
	50	18,3	47,8	95,6	143,5	239,1	398,5
	100	15,7	40,9	81,7	122,6	204,3	340,4
	150	14,2	37	74	111	185	308,4
	200	13,2	34,5	69	103,4	172,4	287,3
A182 F304 *	250	12,1	32,5	65	97,5	162,4	270,7
A182 F304H	300	10,2	30,9	61,8	92,7	154,6	257,6
A240 F304 *	325	9,3	30,2	60,4	90,7	151,1	251,9
A240 F304H	350	8,4	29,6	59,3	88,9	148,1	246,9
A351 CF3 **	375	7,4	29	58,1	87,1	145,2	241,9
A351 CF8 *	400	6,5	28,4	56,9	85,3	142,2	237
A479 F304 *	425	5,5	28	56	84	140	233,3
A479 F304H	450	4,6	27,4	54,8	82,2	137	228,4
	475	3,7	26,9	53,9	80,8	134,7	224,5
	500	2,8	26,5	53	79,5	132,4	220,7
	538	1,4	24,4	48,9	73,3	122,1	203,6
	550	1,4	23,6	47,1	70,7	117,8	196,3
	575	1,4	20,8	41,7	62,5	104,2	173,7
	600	1,4	16,9	33,8	50,6	84,4	140,7

* above 538°C only when carbon content is 0,04% or higher ** not to be used above 425°C

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Annex II - Pressure/Temperature Classification acc. to ASME B16.34

Working data for material group 2.2

Material	Temp. (°C)	max. working pressure (bar)					
		150	300	600	900	1500	2500
	-29 to 38	19	49,6	99,3	148,9	248,2	413,7
	50	18,4	48,1	96,2	144,3	240,6	400,9
	100	16,2	42,2	84,4	126,6	211	351,6
	150	14,8	38,5	77	115,5	192,5	320,8
A182 F316 *	200	13,7	35,7	71,3	107	178,3	297,2
A182 F316 H	250	12,1	33,4	66,8	100,1	166,9	278,1
A240 Grade316 *	300	10,2	31,6	63,2	94,9	158,1	263,5
A240 Grade 316H	325	9,3	30,9	61,8	92,7	154,4	257,4
A351 CF3A **	350	8,4	30,3	60,7	91	151,6	252,7
A351 CF3M ***	375	7,4	29,9	59,8	89,6	149,4	249
A351 CF8A **	400	6,5	29,4	58,9	88,3	147,2	245,3
A351 CF8M *	425	5,5	29,1	58,3	87,4	145,7	242,9
A479 F316 *	450	4,6	28,8	57,7	86,5	144,2	240,4
A479 F316H	475	3,7	28,7	57,3	86	143,4	238,9
	500	2,8	28,2	56,5	84,7	140,9	235
	538	1,4	25,2	50	75,2	125,5	208,9
	550	1,4	25	49,8	74,8	124,9	208
	575	1,4	24	47,9	71,8	119,7	199,5
	600	1,4	19,9	39,8	59,7	99,5	165,9

* above 538°C only when carbon content is 0,04% or higher ** not to be used over 345°C

*** not to be used over 425°C

Working data for material group 2.3

Material	Temp. (°C)	max. working pressure (bar)					
		150	300	600	900	1500	2500
	-29 to 38	15,9	41,4	82,7	124,1	206,8	344,7
	50	15,3	40	80	120,1	200,1	333,5
	100	13,3	34,8	69,6	104,4	173,9	289,9
A182 F304L *	150	12	31,4	62,8	94,2	157	261,6
A182 F316L	200	11,2	29,2	58,3	87,5	145,8	243
A240 Grade 304L *	250	10,5	27,5	54,9	82,4	137,3	228,9
A240 Grade316L	300	10	26,1	52,1	78,2	130,3	217,2
A479 Grade304L *	325	9,3	25,5	51	76,4	127,4	212,3
A479 Grade316L	350	8,4	25,1	50,1	75,2	125,3	208,9
	375	7,4	24,8	49,5	74,3	123,8	206,3
	400	6,5	24,3	48,6	72,9	121,5	202,5
	425	5,5	23,9	47,7	71,6	119,3	198,8
	450	4,6	23,4	46,8	70,2	117,1	195,1

* not to be used over 425°C

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Annex II - Pressure/Temperature Classification acc. to ASME B16.34

Working data for material group 2.4

Material	Temp. (°C)	max. working pressure (bar)					
		150	300	600	900	1500	2500
	-29 to 38	19	49,6	99,3	148,9	248,2	413,7
	50	18,6	48,6	97,1	145,7	242,8	404,6
	100	17	44,2	88,5	132,7	221,2	368,7
	150	15,7	41	82	122,9	204,9	341,5
	200	13,8	38,2	76,6	114,9	191,5	319,1
	250	12,1	36	72	108,1	180,1	300,2
A182 F321 *	300	10,2	34,1	68,3	102,4	170,7	284,6
A240 F321 *	325	9,3	33,3	66,6	99,9	166,5	277,6
A479 Grade 321 *	350	8,4	32,6	65,2	97,8	163	271,7
A182 F321H **	375	7,4	32	64,1	96,1	160,2	266,9
A240 F321H **	400	6,5	31,6	63,2	94,8	157,9	263,2
A479 Grade 321H **	425	5,5	31,1	62,3	93,4	155,7	259,5
	450	4,6	30,8	61,7	92,5	154,2	256,9
	475	3,7	30,5	61,1	91,6	152,7	254,4
	500	2,8	28,2	56,5	84,7	140,9	235
	538	1,4	25,2	50	75,2	125,5	208,9
	550	1,4	25	49,8	74,8	124,9	208
	575	1,4	24	47,9	71,8	119,7	199,5
	600	1,4	20,3	40,5	60,8	101,3	168,9

* not to be used above 538°C

** above 538°C only when material is heat treated (über 1095°C)

Valve Experience.
Made in Germany.



Wafer Type Check Valves Price List – April 2022



Quality – Made in Germany

Decades of experience and worldwide project references for the use of our check valves under the extreme operating conditions of the chemical and pharmaceutical industries, refineries and plant construction confirm our company's high performance time and time again. As a world-leading specialist in the planning, design and manufacturing of check valves, bottom valves and sampling valves, RITAG focuses its products and service on achieving maximum customer benefit.

Process reliability through first-class engineering. Flexible and fast in realizing your specifications and requirements. And last but not least: Maximum availability of your plant and systems by means of a global network of service partners. RITAG standard check valves and special designs are available in all nominal dimensions, pressure ratings and materials required for specific processes. Our engineers ensure that RITAG products operate in accordance with all international standards and regulations.

Wafer Type Dual Plate Check Valves Type ZRD/API

Nominal diameters 2" – 60" **03**

Wafer Type Dual Plate Check Valves Type ZRD/DIN

Nominal diameters DN 50 – 300 **04**

Nominal diameters DN 350 – 1400 **05**

Wafer Type Lift Check Valves Type SR

DIN Nominal diameters DN 15 – 200:

Pressure ratings PN 6 – 40 **06**

Pressure ratings PN 63 – 160 and building services **07**

ANSI Nominal diameters ½" – 8":

Pressure ratings Class 150 – 2000 **08**

Special materials and Clean Service:

Nominal diameters DN 15 – 100 / ½" – 4" **09**

Wafer Type Swing Check Valves Type ZRK

Nominal diameters DN 50 – 1200 / 2" – 48" **10**

Wafer Type Swing Check Valves Type ZRL

Nominal diameters DN 50 – 1200 / 2" – 48" **11**

Inspection charges for standard valves

12

Materials

13

Seat rings and certificates

14

General terms and conditions of sale and delivery

15

Entire product range

18

Remark

All prices are gross prices in € without V.A.T., ex works, excluding packing, excluding freight insurance. Rates for works-certificates as well as third party inspections on request. **This price list is valid from April 1, 2022 to March 31, 2023.** All previous price lists are invalid. Technical modifications reserved.

Wafer Type Dual Plate Check Valves Type ZRD/API

Nominal diameters 2" – 60"



Type		ZRD DCI	ZRD CS	ZRD LTCS	ZRD SS	ZRD DSS	ZRD SDSS	ZRD AB	ZRD TI	ZRD HA
Retainerless design										
Material group										
Material		Ductile cast iron	Carbon steel	Low temperature carbon steel	Stainless steel	Duplex stainless steel	Super duplex stainless steel	Aluminium bronze	Titanium	Special materials (High alloy)
Nominal diameter										
		2" – 24"	2" – 60"	2" – 60"	2" – 60"	2" – 60"	2" – 60"	2" – 60"	2" – 24"	2" – 24"
Pressure rating										
Class	Minimum	150	150	150	150	150	150	150	150	150
Class	Maximum	250	2500	2500	2500	2500	2500	300	300	2500
Materials										
Body	Bar	–	A105	A350 LF2	A182 F316L	A182 F51	A182 F53	–	B348 Gr. 2	According to customer demand
	Casting	A536 Gr. 60-40-18	A216 Gr. WCB	A352 Gr. LCB	A351 Gr. CF8M	A995 Gr. 4A	A995 Gr. 6A	B148 C95800	B 367 Gr. 2	
Plate	Bar	–	A182 Gr. F6	A182 F316L	A182 F316L	A182 F51	A182 F53	–	B348 Gr. 2	According to customer demand
	Casting	A217 CA15	A217 CA15	A351 Gr. CF8M	A351 Gr. CF8M	A995 Gr. 4A	A995 Gr. 6A	B148 C95800	–	
Spring		SS	Inconel X750	Inconel X750	Inconel X750	Inconel X750	Inconel X750	Inconel X750	Titanium Gr. 5	According to customer demand
Internals		SS 316 Ti	SS 316 Ti	SS 316 Ti	SS 316 Ti	A182 F51	A182 F53	B148 C95800	B348 Gr. 2	According to customer demand

Prices for all nominal diameters on request

In case of order RITAG reserve the right to install parts of more high-graded materials at no cost impact.



Wafer Type Dual Plate Check Valves Type ZRD/DIN

Nominal diameters DN 50 – 300



Type		ZRD 1	ZRD 2	ZRD 3	ZRD 4	ZRD G	ZRD G-4	ZRD G-4-g
Retainerless design								
Materials								
Body	Bar	1.0460	1.4301	1.4404				
	Casting	1.0619	1.4308	1.4408	CC480K	EN-GJS-400-15	EN-GJS-400-15	EN-GJS-400-15 Rubber lined
Plate	Bar	1.4006	1.4301	1.4404				
	Casting	1.4011	1.4308	1.4408	CC480K	1.4011	CC480K	CC480K
Spring		1.4571	1.4571	1.4571	1.4571	1.4571	1.4571	1.4571
Internals		1.4571	1.4301	1.4571	1.4571	1.4571	1.4571	1.4571

Nominal diameter DN	Pressure rating PN	Prices in € (metal/metal seated)						
50	10/16	637.00	785.00	842.00	722.00	327.00	521.00	850.00
	25/40	637.00	785.00	842.00	–	–	–	–
65	10/16	704.00	928.00	1,009.00	915.00	388.00	623.00	961.00
	25/40	704.00	928.00	1,009.00	–	–	–	–
80	10/16	787.00	1,064.00	1,330.00	990.00	484.00	782.00	1,132.00
	25/40	787.00	1,064.00	1,330.00	–	–	–	–
100	10/16	879.00	1,386.00	1,708.00	1,284.00	538.00	870.00	1,245.00
	25	879.00	1,487.00	1,820.00	–	–	–	–
	40	879.00	1,487.00	1,820.00	–	–	–	–
125	10/16	1,218.00	2,056.00	2,295.00	1,624.00	639.00	1,072.00	1,463.00
	25/40	1,239.00	2,215.00	2,450.00	–	–	–	–
150	10/16	1,268.00	2,504.00	2,834.00	2,136.00	755.00	1,240.00	1,653.00
	25/40	1,340.00	2,724.00	2,979.00	–	–	–	–
200	10/16	1,795.00	4,351.00	4,673.00	3,440.00	1,022.00	1,760.00	2,189.00
	25	1,952.00	4,687.00	5,032.00	–	–	–	–
	40	2,083.00	4,744.00	5,390.00	–	–	–	–
250	10/16	2,450.00	6,069.00	6,701.00	4,878.00	1,430.00	2,360.00	2,848.00
	25	2,655.00	6,558.00	7,199.00	–	–	–	–
	40	2,848.00	6,789.00	7,580.00	–	–	–	–
300	6	3,518.00	8,420.00	9,174.00	6,525.00	2,038.00	3,201.00	3,853.00
	10/16	3,518.00	8,420.00	9,174.00	6,690.00	2,093.00	3,246.00	3,897.00
	25	3,689.00	8,825.00	9,756.00	–	–	–	–
	40	3,855.00	9,209.00	10,137.00	–	–	–	–

Prices for nominal diameters DN 350 – 1400 can be found on the next page.

Nominal diameter DN	Additional charges in €			
	NBR/EPDM	for O-Rings *) FKM	PTFE	for Springs *) Inconel X750
50	44.00	52.00	68.00	135.00
65	46.00	54.00	101.00	148.00
80	47.00	56.00	131.00	154.00
100	58.00	73.00	163.00	173.00
125	116.00	140.00	314.00	205.00
150	145.00	183.00	415.00	213.00
200	209.00	255.00	583.00	249.00
250	270.00	304.00	686.00	300.00
300	368.00	418.00	764.00	303.00

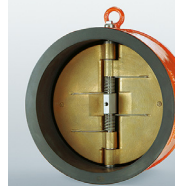
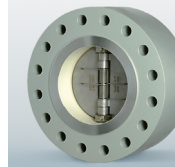
*) Prices are for one set (= 2 pieces)

Nominal diameter DN	Additional charges in €	
	for Overlays Body seat 1.4370	for Overlays Plate seat 1.4370
50	42.00	–
65	46.00	–
80	51.00	–
100	60.00	–
125	75.00	–
150	81.00	–
200	99.00	99.00
250	123.00	123.00
300	146.00	146.00

In case of order RITAG reserve the right to install parts of more high-graded materials at no cost impact.

Furthermore on request:

- Larger sizes/nominal diameters (see also next page)
- Higher pressure ratings PN 63/100/160
- Other designs such as flanged, lug-type or with hub-ends



Wafer Type Dual Plate Check Valves Type ZRD/DIN

Nominal diameters DN 350 – 1400



Type		ZRD 1	ZRD 2	ZRD 3	ZRD 4	ZRD G	ZRD G-4	ZRD G-4-g
Retainerless design								
Materials								
Body	Bar	1.0460	1.4301	1.4404				
	Casting	1.0619	1.4308	1.4408	CC480K	EN-GJS-400-15	EN-GJS-400-15	EN-GJS-400-15 Rubber lined
Plate	Bar	1.4006	1.4301	1.4404				
	Casting	1.4011	1.4308	1.4408	CC480K	1.4011	CC480K	CC480K
Spring		1.4571	1.4571	1.4571	1.4571	1.4571	1.4571	1.4571
Internals		1.4571	1.4301	1.4571	1.4571	1.4571	1.4571	1.4571

Nominal diameter DN	Pressure rating PN	Prices in € (metal/metal seated)						
350	6	4,989.00	10,458.00	11,392.00	7,906.00	2,921.00	4,135.00	4,946.00
	10/16	4,989.00	10,458.00	11,392.00	8,778.00	3,211.00	4,427.00	5,233.00
	25	5,232.00	10,974.00	12,076.00	–	–	–	–
	40	5,414.00	11,333.00	12,521.00	–	–	–	–
400	6	6,837.00	14,331.00	15,383.00	9,819.00	3,715.00	5,226.00	6,453.00
	10/16	6,837.00	14,331.00	15,383.00	10,906.00	4,084.00	5,581.00	6,809.00
	25	7,175.00	14,934.00	16,623.00	–	–	–	–
	40	7,549.00	15,872.00	17,452.00	–	–	–	–
450	6	9,049.00	19,354.00	21,504.00	11,639.00	5,008.00	6,907.00	8,309.00
	10/16	9,049.00	19,354.00	21,504.00	12,923.00	5,490.00	7,164.00	8,572.00
	25	10,516.00	21,151.00	23,490.00	–	–	–	–
	40	10,792.00	23,275.00	24,357.00	–	–	–	–
500	6	11,877.00	27,228.00	30,714.00	16,527.00	6,928.00	9,907.00	11,555.00
	10/16	11,877.00	27,228.00	30,714.00	18,363.00	7,963.00	10,156.00	12,217.00
	25	12,670.00	28,737.00	32,514.00	–	–	–	–
	40	13,329.00	31,054.00	38,356.00	–	–	–	–
600 – 1400		Prices on request						

Prices for nominal diameters DN 50 – 300 can be found on the previous page.

Nominal diameter DN	Additional charges in €			
	NBR/EPDM	for O-Rings *) FKM	PTFE	for Springs *) Inconel X750
350	421.00	503.00	832.00	357.00
400	485.00	581.00	1,047.00	386.00
450	656.00	787.00	1,417.00	500.00
500	785.00	942.00	1,697.00	779.00

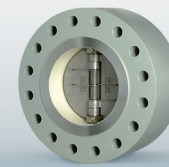
*) Prices are for one set (= 2 pieces)

Nominal diameter DN	Additional charges in €	
	for Overlays Body seat 1.4370	for Overlays Plate seat 1.4370
350	226.00	226.00
400	314.00	314.00
450	376.00	376.00
500	444.00	444.00

In case of order RITAG reserve the right to install parts of more high-graded materials at no cost impact.

Furthermore on request:

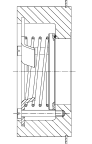
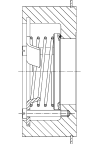
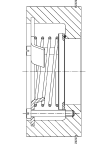
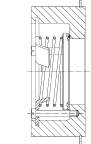
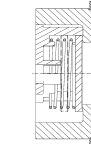
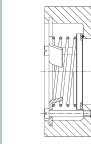
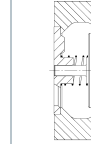
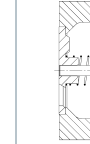
- Larger sizes/nominal diameters
- Higher pressure ratings PN 63/100/160
- Other designs such as flanged, lug-type or with hub-ends



Wafer Type Lift Check Valves Type SR/DIN

Nominal diameters DN 15 – 200



Type	SR 12.16	SR 20.40-St.	SR 20.40	SR 22.40	DIN PN 6 – 40		SR 35.40	SR 40.40	SR 50.40	SR 55.40
										
										

Pressure rating PN

PN	6 – 16	6 – 40	6 – 40	6 – 40	6 – 40	6 – 40	6 – 40	6 – 40	6 – 40	6 – 40
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F/F Dimension

EN	EN 558	EN 558	EN 558	EN 558	EN 558	EN 558	EN 558	EN 558	EN 558	EN 558
Line	Line 49	Line 49	Line 49	Line 49	Line 49	Line 49	Line 52	Line 49	Line 49	Line 52

Materials

Body	CC483K	1.0460/1.0421	1.4006	1.0460	1.4404	1.4301	1.0460	1.0460	1.4404	1.4404
Seat overlay	–	–	–	1.4370	–	–	1.4370	1.4370	–	–
Disc (Plate, Cone)	1.4404	1.4301/1.4006	1.4404/1.4006	1.4404/1.4006	1.4404	1.4301	1.4404	1.4404	1.4404	1.4404
Spring	1.4571	1.4571	1.4571	1.4571	1.4571	1.4310	1.4571	1.4571	1.4571	1.4571

Nominal diameter DN

Prices in € (metal/metal seated)

15 (½")	41.00	35.00	65.00	58.00	89.00	87.00	108.00	80.00	99.00	136.00
20 (¾")	43.00	43.00	74.00	67.00	109.00	108.00	131.00	98.00	123.00	171.00
25 (1")	47.00	52.00	91.00	73.00	123.00	122.00	138.00	104.00	135.00	175.00
32 (1¼")	69.00	65.00	116.00	100.00	150.00	147.00	167.00	124.00	170.00	224.00
40 (1½")	75.00	72.00	135.00	112.00	177.00	175.00	199.00	147.00	195.00	263.00
50 (2")	89.00	91.00	167.00	144.00	199.00	195.00	231.00	174.00	217.00	303.00
65 (2½")	129.00	108.00	256.00	206.00	319.00	314.00	340.00	258.00	355.00	405.00
80 (3")	178.00	128.00	365.00	236.00	376.00	371.00	472.00	357.00	419.00	523.00
100 (4")	232.00	151.00	475.00	317.00	486.00	481.00	576.00	434.00	537.00	700.00
125 (5")	1,444.00	331.00	1,020.00	687.00	1,301.00	1,268.00	1,223.00	687.00	1,391.00	1,532.00
150 (6")	1,691.00	427.00	1,292.00	866.00	1,462.00	1,427.00	1,299.00	866.00	1,676.00	2,125.00
200 (8")	2,538.00	554.00	2,226.00	1,179.00	2,349.00	2,295.00	1,923.00	1,179.00	2,674.00	2,861.00

Additional charges in €

Nominal diameter DN	for O-Rings		
	NBR/EPDM	FKM	PTFE
15 (½")	23.00	27.00	30.00
20 (¾")	23.00	27.00	32.00
25 (1")	25.00	28.00	32.00
32 (1¼")	27.00	30.00	34.00
40 (1½")	27.00	31.00	35.00
50 (2")	27.00	32.00	42.00
65 (2½")	28.00	34.00	59.00
80 (3")	30.00	35.00	76.00
100 (4")	36.00	44.00	96.00
125 (5")	68.00	82.00	186.00
150 (6")	87.00	108.00	246.00
200 (8")	123.00	150.00	344.00

In case of order RITAG reserve the right to install parts of more high-graded materials at no cost impact.

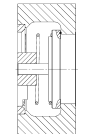
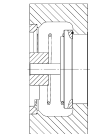
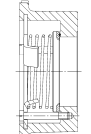
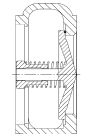
Furthermore on request:

- Special material and/or design in accordance to your specific parameters

Wafer Type Lift Check Valves Type SR/DIN

Nominal diameters DN 15 – 200



Type	DIN PN 63 – 160		Building services				
	HSR 20.160-St.	HSR 30.160	SR 70.06-K	SR 70.16	SR 10.16	SR 10.16 S	TCR
	 	 	 		 		 

Pressure rating PN

PN	63 – 160	63 – 160	6	6 – 16	6 – 16	6 – 10
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F/F Dimension

EN	EN 558	EN 558	EN 558	EN 558	EN 558	–
Line	Line 52	Line 52	Line 49	Line 49	Line 49	–

Materials

Body	1.0460	1.4404	2.0402		EN-GJL-250		2.0402
Seat overlay	1.4370	-	-		-		-
Disc (Plate, Cone)	1.4301	1.4404	PPO-GFK	1.4301	EN-GJL-250	1.4462	1.4404
Spring	2.4632	2.4632	1.4571		1.4571		1.4301

Nominal diameter DN

Prices in € (metal/metal seated)

15 (½")	294.00	311.00	30.00	28.00	–	–	–
20 (¾")	365.00	386.00	30.00	28.00	–	–	–
25 (1")	401.00	445.00	34.00	30.00	–	–	34.00 *)
32 (1¼")	444.00	504.00	46.00	42.00	–	–	49.00 *)
40 (1½")	472.00	552.00	52.00	46.00	–	–	–
50 (2")	533.00	651.00	63.00	60.00	–	–	–
65 (2½")	647.00	785.00	87.00	80.00	–	–	–
80 (3")	744.00	877.00	137.00	126.00	–	–	–
100 (4")	923.00	1,151.00	177.00	162.00	–	–	–
125 (5")	1,608.00	1,857.00	–	–	382.00	648.00	–
150 (6")	2,032.00	2,251.00	–	–	461.00	846.00	–
200 (8")	2,931.00	3,261.00	–	–	672.00	1,158.00	–

Additional charges in €

Nominal diameter DN		for O-Rings		
		NBR/EPDM	FKM	PTFE
15 (½")		23.00	27.00	30.00
20 (¾")		23.00	27.00	32.00
25 (1")		25.00	28.00	32.00
32 (1¼")		27.00	30.00	34.00
40 (1½")		27.00	31.00	35.00
50 (2")		27.00	32.00	42.00
65 (2½")		28.00	34.00	59.00
80 (3")		30.00	35.00	76.00
100 (4")		36.00	44.00	96.00
125 (5")		68.00	82.00	186.00
150 (6")		87.00	108.00	246.00
200 (8")		123.00	150.00	344.00

In case of order RITAG reserve the right to install parts of more high-graded materials at no cost impact.

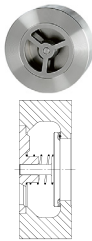
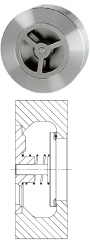
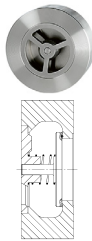
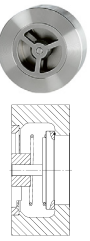
Furthermore on request:

- Special material and/or design in accordance to your specific parameters

Wafer Type Lift Check Valves Type SR/ANSI

Nominal diameters ½" – 8"



Type	ANSI Class 150 – 300				ANSI Class 600 – 2500	
	SR 35.40	SR 40.40	SR 50.40	SR 55.40	HSR 20.160-St.	HSR 30.160
						

Pressure rating

Class	150 + 300	150 + 300 *)	150 + 300 *)	150 + 300	600 – 1500 **)	600 – 1500 **)
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F/F Dimension

EN	EN 558	EN 558	EN 558	EN 558	EN 558	EN 558
Line	Line 52	Line 49	Line 49	Line 52	Line 52	Line 52

Materials

Body	A105	A105	A182 F316L	A182 F316L	A105	A182 F316L
Seat overlay	1.4370	1.4370	–	–	1.4370	–
Disc (Plate, Cone)	A182 F316L	A182 F316L	A182 F316L	A182 F316L	A182 F304	A182 F316L
Spring	1.4571	1.4571	1.4571	1.4571	2.4632	2.4632

Nominal diameter DN

Prices in € (metal/metal seated)

Nominal diameter DN	150 + 300	150 + 300 *)	150 + 300 *)	150 + 300	600 – 1500 **)	600 – 1500 **)
½" (15)	108.00	80.00	99.00	136.00	294.00	311.00
¾" (20)	131.00	98.00	123.00	171.00	365.00	386.00
1" (25)	138.00	104.00	135.00	175.00	401.00	445.00
1¼" (32)	167.00	124.00	170.00	224.00	444.00	504.00
1½" (40)	199.00	147.00	195.00	263.00	472.00	552.00
2" (50)	231.00	174.00	217.00	303.00	533.00	651.00
2½" (65)	340.00	258.00	355.00	405.00	647.00	785.00
3" (80)	472.00	357.00	419.00	523.00	744.00	877.00
4" (100)	576.00	434.00	537.00	700.00	923.00	1,151.00
5" (125)	1,223.00	687.00	1,391.00	1,532.00	1,608.00	1,857.00
6" (150)	1,299.00	866.00	1,676.00	2,125.00	2,032.00	2,251.00
8" (200)	1,923.00	1,179.00	2,674.00	2,861.00	2,931.00	3,261.00

Additional charges in €

Nominal diameter DN	for O-Rings		
	NBR/EPDM	FKM	PTFE
½" (15)	23.00	27.00	30.00
¾" (20)	23.00	27.00	32.00
1" (25)	25.00	28.00	32.00
1¼" (32)	27.00	30.00	34.00
1½" (40)	27.00	31.00	35.00
2" (50)	27.00	32.00	42.00
2½" (65)	28.00	34.00	59.00
3" (80)	30.00	35.00	76.00
4" (100)	36.00	44.00	96.00
5" (125)	68.00	82.00	186.00
6" (150)	87.00	108.00	246.00
8" (200)	123.00	150.00	344.00

In case of order RITAG reserve the right to install parts of more high-graded materials at no cost impact.

Furthermore on request:

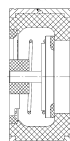
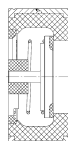
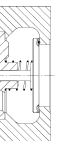
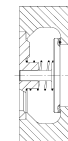
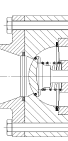
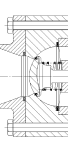
- Special material and/or design in accordance to your specific parameters

*) Class 300 only up to 4" **) Class 2500 on request

Wafer Type Lift Check Valves Type SR/DIN + SR/ANSI

Nominal diameters DN 15 – 100 / ½" – 4"



Type	Special materials						Clean Service		
	SR 60.06	SR 60.10	SR 61.06	SR 61.10	SR 31.40	SR 33.40	SR 99	SR 93.16	HYPOS 100
	 	 	 	 	 	 	 	 	 

Pressure rating

PN	6	10	6	10	6 – 40	6 – 40	6 – 160	16	16
Class	150	150	150	150	150 + 300	150 + 300	150 – 2500	150	150

F/F Dimension

EN	EN 558	EN 558	EN 558	EN 558	EN 558	EN 558	See data sheet	See data sheet
Line	Line 52	Line 52	Line 52	Line 52	Line 52	Line 52		

Materials

Body	PTFE	Conductive PTFE	3.7035	2.4610	Customer specification	1.4435 BN2	1.4435 BN2
Seat overlay	–	–	–	–	–	–	–
Disc (Plate, Cone)	PTFE	Conductive PTFE	3.7035	2.4610	Customer specification	1.4435 BN2	1.4435 BN2
Spring	2.4610	2.4610	3.7165	2.4610	Customer specification	1.4401	1.4401

Nominal diameter DN

		Prices in €				Prices on request	Prices on request
15	½"	337.00	377.00	337.00	377.00		
20	¾"	395.00	442.00	395.00	442.00		
25	1"	441.00	494.00	441.00	494.00		
32	1¼"	562.00	628.00	562.00	628.00		
40	1½"	687.00	769.00	687.00	769.00		
50	2"	915.00	1,025.00	915.00	1,025.00		
65	2½"	1,225.00	1,376.00	1,225.00	1,376.00		
80	3"	1,761.00	1,972.00	1,761.00	1,972.00		
100	4"	2,465.00	2,760.00	2,465.00	2,760.00		

In case of order RITAG reserve the right to install parts of more high-graded materials at no cost impact.

Furthermore on request:

- Special material and/or design in accordance to your specific parameters

Wafer Type Swing Check Valves Type ZRK/DIN + ZRK/ANSI

Nominal diameters DN 50 – 1200 / 2" – 48"



Type	ZRK 1		ZRK 1 - S		ZRK 2		ZRK 3		ZRK 4	
										

Pressure rating

PN	PN 6 – 40	DN 50 – 300	PN 6 – 40	DN 50 – 300	PN 6 – 40	DN 50 – 300	PN 6 – 40	DN 50 – 300	PN 6 – 16
	PN 6 – 25	DN 350 – 500	PN 6 – 25	DN 350 – 500	PN 6 – 25	DN 350 – 500	PN 6 – 25	DN 350 – 500	
	PN 6 – 16	> DN 500	PN 6 – 16	> DN 500	PN 6 – 16	> DN 500	PN 6 – 16	> DN 500	
Class	150		150		150		150		–

Materials

Body	1.0460/1.0425		1.0425		1.4301		1.4404		CC480K
Disc (Plate)	1.4308/1.0425		1.4301		1.4308/1.4301		1.4408/1.4404		1.4408/1.4404

For flanges acc. to

DIN	EN 1092–1 Form B1		EN 1092–1 Form B1		EN 1092–1 Form B1		EN 1092–1 Form B1		EN 1092–1 Form B1
ANSI	ANSI B16.5 RF		ANSI B16.5 RF		ANSI B16.5 RF		ANSI B16.5 RF		ANSI B16.5 RF

Additional

	Galvanizing/Zink Coating, Spring, Overlay/Hard facing		Galvanizing/Zink Coating, Spring, Overlay/Hard facing		Spring		Spring		Spring
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Nominal diameter DN		Prices in € (metal/metal seated)			
50	2"	155.00	–	279.00	261.00
65	2½"	169.00	–	319.00	281.00
80	3"	187.00	–	355.00	317.00
100	4"	218.00	–	437.00	427.00
125	5"	268.00	–	521.00	492.00
150	6"	305.00	–	622.00	640.00
200	8"	394.00	635.00	944.00	1,071.00
250	10"	631.00	1,032.00	1,589.00	1,574.00
300	12"	961.00	1,562.00	2,481.00	2,540.00
350	14"	1,304.00	1,996.00	3,823.00	3,732.00
400	16"	1,703.00	2,821.00	5,353.00	5,366.00
450	18"	2,463.00	4,021.00	6,627.00	6,641.00
500	20"	3,046.00	4,962.00	8,862.00	8,867.00
600 – 1200	24" – 48"	Prices on request			

Additional charges in €

Nominal diameter DN		for O-Rings			for Springs 1.4310
		NBR/EPDM	FKM	PTFE	
50	2"	27.00	32.00	42.00	30.00
65	2½"	28.00	34.00	59.00	32.00
80	3"	30.00	35.00	76.00	32.00
100	4"	36.00	44.00	96.00	34.00
125	5"	68.00	82.00	186.00	35.00
150	6"	87.00	108.00	246.00	38.00
200	8"	123.00	150.00	344.00	41.00
250	10"	159.00	177.00	404.00	161.00
300	12"	216.00	247.00	449.00	170.00
350	14"	249.00	297.00	488.00	178.00
400	16"	284.00	342.00	617.00	236.00
450	18"	386.00	462.00	834.00	253.00
500	20"	461.00	554.00	996.00	298.00

Additional charges in €

Nominal diameter DN		for Galvanizing		for Overlays	
		Body	Plate	Body seat 1.4370	Plate seat 1.4370
50	2"	14.00	–	29.00	–
65	2½"	15.00	–	30.00	–
80	3"	16.00	–	30.00	–
100	4"	17.00	–	35.00	–
125	5"	23.00	–	36.00	–
150	6"	30.00	–	44.00	–
200	8"	49.00	28.00	58.00	58.00
250	10"	82.00	36.00	74.00	74.00
300	12"	112.00	47.00	100.00	100.00
350	14"	195.00	73.00	167.00	167.00
400	16"	271.00	115.00	230.00	230.00
450	18"	392.00	164.00	297.00	297.00
500	20"	476.00	199.00	362.00	362.00

In case of order RITAG reserve the right to install parts of more high-graded materials at no cost impact.



Space for your notes:

Body	All materials	All materials	All materials
Disc (Plate)	All materials	All materials	All materials

DIN	EN 1092-1 Form B1	EN 1092-1 Form B1	EN 1092-1 Form B1
ANSI	ANSI B16.5 RF	ANSI B16.5 RF	ANSI B16.5 RF

	Galvanizing/Zink Coating, Spring, Overlay/Hard facing	Galvanizing/Zink Coating with lever and weight	Galvanizing/Zink Coating with lever, weight and damping (for gases only)
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RITAG Price List – April 2022

Inspection charges for standard valves



Any charges for inspections as well as for documentation to be compiled are indicated below. All inspections are carried out in accordance to the minimum scope of testing that is required by the standard applicable for the relevant material. Requirements beyond this scope: additional charges on request. All testing requirements need to be stated in the purchase order by the customer. After delivery has been effected it is only possible within the framework of the QM-system to issue a certification in acc. to EN10204/2.2 for inspection only (i.e. excluding material testing).

Standard scope of testing

Material testing

These testings are carried out in accordance to the minimum scope of testing that is required by the standard applicable for the relevant material. It applies for all valves with certifications acc. EN 10204 / 2.2 respectively 3.1.

- Analysis
- Heat treatment
- Tensile test
- Impact test
- Corrosion test (for stainless steel)

Inspections

On standard valves inspections in acc. to EN 12266 or rather API 598 are carried out which are documented in a certification acc. EN 10204/2.2 resp. 3.1.

- Checking of purchase order details
 - Checking of marking
 - Visual inspection, dimensional check
 - Shell test
 - Leakage test (cast bodies)
 - Seat leakage test
 - Performance test
- EN 12266 – P10
EN 12266 – P11 (Water)
EN 12266 – P12
EN 12266 – F20

Content of certificates in accordance to EN 10204

Certification acc. 2.2 ¹⁾

This certification is issued on the basis of non-specific testing, i. e. the tested products must not originate from the lot.

Certification acc. 3.1 ¹⁾

This certification is issued on the basis of those testings which are required in the purchase order and/or which are carried out in accordance to any legal regulations incl. the applicable technical rules. These testings have to be carried out on the valve itself or on valves of the probe unit of which the delivery is a part of. In addition it is proved by an independent manufacturer's inspector. The inspection mentioned in paragraph 1 is indicated in the standardized certification incl. a listing of material certificates applicable for the valve bodies.

Certification acc. 3.2 ¹⁾

This certification is issued on the basis of the legal regulations as well as the technical rules required in the purchase order by an official inspector mentioned in these regulations. The inspections are executed on the valves supplied. Confirmation of inspections by independent manufacturer's inspector as well as the inspector determined by the customer.

¹⁾ Description acc. to EN 10204, current edition

Charges

€ 19.00 each quotation or purchase order item

€ 49.00 each quotation or purchase order item, plus testing/inspection charges for each valve (see table beside);
€ 269.00 for valves from bronze (e.g. ZRD 4, SR 12.16, ZRK 4)

Charges in acc. to expenses/ invoice of third party

Testing charges (net each valve)

Type of valve	DN	PN Class	EN 10204/3.1 1)	DIN 3230 Teil 5 2)	DIN 3230 Teil 6 3)	TRD 110 4)	API 598 5)
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Lift Check Valves

Prices in €

SR	15 – 200 ½" – 8"	6 – 40 150 – 300	9.00	18.00	18.00	18.00	9.00
HSR	15 – 200 ½" – 8"	63 – 160 600 – 1500	9.00	18.00	18.00	18.00	9.00

Swing Check Valves

Prices in €

ZRK ZRL ZRL HG	50 – 500 2" – 20"	6 – 40 150 – 300	9.00	–	–	–	9.00
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Dual Plate Check Valves

Prices in €

ZRD	50 – 100 2" – 4"	6 – 40 150 – 300	9.00	18.00	18.00	18.00	9.00
ZRD	125 – 500 5" – 20"	6 – 40 150 – 300	36.00	72.00 ⁶⁾	72.00 ⁶⁾	72.00	36.00
ZRD	600 – 1800 24" – 72"	63 – 160 600 – 2500	Prices on request				

¹⁾ Testing on the valves of the actual shipment carried out by an independent internal surveyor

²⁾ Testing on the valves for gas pipe lines and gas plants (TRGL) except the testing BV and BW for PG3

³⁾ Testing on the valves for flammable fluids (TRbF)

⁴⁾ Testing on the valves for steam boiler

⁵⁾ Testing on the valves in acc. to API rules

⁶⁾ ≥ DN 250: third-party-inspection by external official surveyor

Additional certifications and testings

Prices on request:

- Liquid penetrant test
- Magnetic particle inspection
- Ultrasonic examination
- X-Ray
- Positive material identification (PMI)
- Fire-Safe Test acc. API 6 FD
- Photo / video documentation
- Upload of documents to customer portals
- Testing of surface hardness
- Ferrite content determination of stainless steels
- Additional impact test
- High pressure pneumatic shell test (API 598)
- Proof of surface cleanliness



Material No.	Material Name	DIN EN Standard	ASTM Material	UNS No.	Trade Name
Cast iron					
EN – JL 1040	EN – GJL – 250	1561	A 126 Grade B		Grey cast iron
EN – JS 1030	EN – GJS – 400 – 15	1563	A 536 Grade 60 – 40 – 18		Ductile cast iron
Ferritic steel casting					
1.0619	GP240 GH	10213 – 2	A 216 WCB	J03002	
1.5419	G20Mo5	10213 – 2	A 217 WC1	J12524	
1.7357	G17CrMo5 – 5	10213 – 2	A 217 WC6	J12072	
1.7365	GX15CrMo5	10213 – 2	A 217 C5	J42045	
1.7379	G17CrMo9 – 10	10213 – 2	A 217 WC9	J21890	
			A 352 LCB	J03003	
1.6220 + QT	G20Mn5+QT	10213 – 3	A 352 LCC	J02505	
Austenitic steel casting					
1.4308	GX5CrNi19 – 10	0213 – 4	A 351 CF8	92600	
1.4408	GX5CrNiMo19 – 11 – 2	0213 – 4	A 351 CF8M	J92900	
1.4552	GX5CrNiNb19 – 11	0213 – 4	A 351 CF8C	J92710	
1.4581	GX5CrNiMoNb19 – 11 – 2	0213 – 4			
Ferritic steel					
1.0425	P265GH	10273	A 515 Grade 60		
1.0460	P250GH	10273	A 105		
1.0577	S355J2+N	10025			
1.5415	16Mo3	10273	A 182 F1	K12822	
1.7335	13CrMo4 – 5	10273	A 182 F12 Class 1	K11562	
1.7362	X12CrMo5	10273	A 182 F5	K41545	
1.7380	10CrMo9 – 10	10273	A 182 F22	K21590	
			A350 LF2		
Martensitic stainless steel					
1.4006	X12Cr13	10272	AISI 410	S41000	
1.4057	X17CrNi16 – 2	10272	AISI 431	S43100	
1.4104	X14CrMoS17	10088 – 3	AISI 430	S43020	
1.4122	X39CrMo17 – 1	10088 – 3			
1.4313	X3CrNiMo13 – 4	10272			
Austenitic, ferritic stainless steel (Duplex, Super Duplex)					
1.4462	X2CrNiMoN22 – 5 – 3	10272	A 182 F51	S31803	SAF2205
1.4410	X2CrNiMoN25 – 7 – 4	10272	A 182 F53	S32750	Super Duplex
1.4501	X2CrNiMoCuWN25 – 7 – 4	10272	A 182 F55	S32760	Super Duplex
1.4470	GX2CrNiMoN22 – 5 – 3	10213 – 4	A 995 Gr. 4 A	J92205	Duplex Casting
1.4417	GX2CrNiMoN25 – 7 – 3	10213 – 4	A 995 Gr. 6 A	J93380	Super Duplex Casting

Material No.	Material Name	DIN EN Standard	ASTM Material	UNS No.	Trade Name
Austenitic stainless steel					
1.4301	X5CrNi18 – 10	10272	A 182 F304	S30400	
1.4305	X8CrNiS18 – 9	10272	AISI 303		
1.4307	X2CrNi18 – 9	10272	A 182 F304L	S30403	
1.4401	X5CrNiMo17 – 12 – 2	10272	A 182 F316	S31600	
1.4404	X2CrNiMo17 – 12 – 2	10272	A 182 F316 L	S31603	
1.4429	X2CrNiMoN17 – 13 – 3	10272			
1.4435	X2CrNiMo18 – 14 – 3	10272	A 182 F316 L	S31603	Basler Standard
1.4439	X2CrNiMoN17 – 13 – 5	10272	A 182 F317LN	S31703	
1.4529	X1CrNiMoCuN25 – 20 – 7	10272		N08926	254SMO
1.4539	X1NiCrMoCu25 – 20 – 5	10272	A 182 F904L	N08904	Uranus B6
1.4541	X6CrNiTi18 – 10	10272	A 182 F321	S32100	
1.4550	X6CrNiNb18 – 10	10272	A 182 F347	S34700	
1.4571	X6CrNiMoTi17 – 12 – 2	10272			
High corrosion resistant alloys					
2.0872	CuNi 10 Fe			C70600	Cunifer 10
2.0882	CuNi 30 Fe			C71500	Cunifer 30
2.4066	Ni 99,2	DIN 17751		N02200	Nickel 200
2.4068	LCNi 99	VD TÜV 345		N02201	Nickel 201
2.4360	NiCu 30Fe	VD TÜV 263	B 127 N04400	N04400	Monel 400
2.4602	NiCr 21 Mo 14 W	VD TÜV 479	B 575 N06022	N06022	Hastelloy C22
2.4605	NiCr 23 Mo 16 Al	VD TÜV 505	B 575 N06059	N06059	Alloy 59
2.4610	NiMo 16 Cr 16 Ti	VD TÜV 424	B 622 N06455	N06455	Hastelloy C4
2.4617	NiMo 28	VD TÜV 436	B 622 N10665	N10665	Hastelloy B2
2.4819	NiMo 16Cr 13 W	VD TÜV 400	B 462 N10276	N10276	Hastelloy 276
2.4856	NiCr 22 Mo 9 Nb	DIN 17751	B 564 N06625	N06625	Inconel 625
2.4858	NiCr 21 Mo	VD TÜV 432	B 564 N08825	N08825	Incoloy 825
Titanium					
3.7035		VdTÜV WB230/3	B348 Gr.2	R50400	
3.7165	Ti 6Al – 4V	VdTÜV WB230/3	B348 Gr.5	R56400	
Bronze alloys					
2.1050	CuSn10 / CC480K	1982	B 505 C90700	C90700	
2.1052	CuSn12 / CC483K	1982	B 427 C90800	C90800	
2.0975	CuAl10Fe5Ni5 – C	1982	B 148 C95800	C95800	Aluminium bronze
2.0402	CuZn39Pb2 / CW617N	1982	B 445 C38000	C38000	

Seat rings and certificates



Elastomer

Abbreviation	Chemical Name	Trade Name	Temperature	Resistant to
EPDM	Ethylene propylene diene rubber	Vistalon® / Buna®	-45 °C to 130 °C	Hot water, air, steam, diluted acids, very good resistance to ozone
NBR	Nitrile butadiene rubber	Perbunan®	-25 °C to 90 °C	Butane, propane, methane, ethane, emulsions, petrol, heating oil, mineral oils, mineral oil products, hydraulic fluids
FPM FKM	Fluorocarbon rubber	Viton®	-15 °C to 200 °C	Ozone, oxygen, natural gas, fuels, mineral oils, hydraulic oil, organic solvents
FFPM	Perfluor rubber	Perlast®	-8 °C to 315 °C	Acids, alkaline solutions, hydrocarbons, fuels and lubricants, kerosene, hydraulic fluids

Fluoric plastics

Abbreviation	Chemical Name	Trade Name	Temperature	Resistant to
PTFE	Polytetrafluorethylene	Teflon® / Hostflon®	-200 °C to 250 °C	almost all organic and inorganic chemicals
FEP	Fluorinated ethylene propylene	Teflon® Neoflon®	-200 °C to 200 °C	similar PTFE
PFA	Perfluoralkoxy	Teflon® Neoflon®	-200 °C to 260 °C	similar PTFE
PVDF	Polyvinylidene fluoride	SOLEF® Hylar®	-60 °C to 150 °C	good chemical resistance

The "resistant to" information as well as the temperatures are guide values that do not release the customer from the obligation to ensure the suitability and proper use by own examinations.

It has to be taken into consideration that elastomers have a limited life, e.g. due to ageing and the influence of temperatures. If necessary, inspections have to be carried out and replacement intervals prescribed.

Selected certificates



ISO 9001:2015

Certifies the quality management system according to DIN EN ISO 9001 for the development, construction, production and testing of check valves.



ISO 14001:2015

This certificate underlines the strong commitment of RITAG for compliance with environmental standards.



ISO 45001:2018

Certifies that the RITAG management system has had its focus on and has met the labour protection standards.



PED 2014/68/EU Modules A2 + H

Confirms that the quality assurance system complies with the Modules A2 and H of Pressure Equipment Directive 2014/68/EU.



AD 2000-HPO

Certifies that RITAG has been tested and acknowledged as a manufacturer according to AD 2000-HPO.



DIN EN ISO 3834-2

Certifies that RITAG has been tested and acknowledged as a welding company according to DIN EN ISO 3834-2.



Type Test Certificate (China)
Certifies that RITAG products have been tested and approved in accordance to Chinese Standard TSG D7002-2006 (Pressure Piping Components Type Test Regulation).



DNV-GL Certificate

Confirms the suitability of Wafer Type Check Valves from RITAG for LNG ships according to the DNV-GL requirements.



1. General

- 1.1 Our terms and conditions of sale and delivery apply exclusively; we do not accept any terms and conditions of the purchaser which conflict with or deviate from our terms and conditions of sale and delivery unless we have expressly agreed to their applicability in writing. Our terms and conditions of sale and delivery also apply if we make delivery to the purchaser without reservation although being aware of terms and conditions of the purchaser which conflict with or deviate from our terms and conditions of sale and delivery.
- 1.2 Our terms and conditions of sale and delivery shall only apply to entrepreneurs within the meaning of sec. 310 para. 1 German Civil Code (BGB).

2. Offers

- 2.1 Our offers are without engagement, subject to confirmation and non-binding. The contract is not concluded until the acceptance of the order has been confirmed by us in writing, in electronic form or in text form. The same applies to supplements, amendments or subsidiary agreements.
- 2.2 The prices listed in price lists are subject to change at any time without prior notice if economic changes so require. Subject to paragraph 3 below, the prices stated in our order confirmation in addition to the respective statutory value added tax are decisive. Additional deliveries and services are invoiced separately. Unless otherwise agreed, prices are ex warehouse Osterholz-Scharmbeck excluding packaging.
- 2.3 If there are more than 4 months between the time of the conclusion of the contract and the delivery date, we are entitled to change the agreed price in the same proportion as the actual production or procurement price increased compared to the price we would have had to pay at the time of the conclusion of the contract due to changes in the production or procurement costs which occurred after the conclusion of the contract and which were not yet known to us at the time of the conclusion of the contract. This shall not apply if we are responsible for the change or if we are in default of performance. The purchaser has the right to withdraw from the contract if the price increase leads to an increase of more than 5 percent of the originally agreed contract price.

3. Terms of Payment

- 3.1 Unless otherwise agreed, payment must be made to our payment office free of charge within 30 days of the invoice date in cash without any deduction. If payment is made within 10 days of the invoice date, we grant a discount of 2 %.
- 3.2 A payment shall only be deemed to have been made when we can dispose of the amount. In the case of cheques, payment shall not be deemed to have been made until the cheque has been encashed.
- 3.3 The purchaser shall only have the right to withhold payments or offset them against counterclaims to the extent that his counterclaims are undisputed or have become legally enforceable or arise from the same order under which the relevant delivery was made.

4. Time of Delivery

- 4.1 Periods and dates for deliveries and services announced by us are always only approximate, unless a fixed period or date has been expressly approved or agreed. If shipment has been agreed, delivery periods and delivery dates refer to the time of handover to the forwarding agent, carrier or other third party commissioned with the transport.
- 4.2 We are not liable for the impossibility of delivery or for delays in delivery, if these are caused by force majeure or other events not foreseeable at the time of conclusion of the contract (e.g. operational disruptions of any kind, difficulties in procuring materials or energy, transport delays, strikes, lawful lockouts, shortages of labour, energy or raw materials, difficulties in procuring necessary official permits, official measures or the failure to deliver, incorrectly delivering or not delivering on time by suppliers) for which we are not responsible. Insofar as such events substantially impede or make impossible our delivery or performance and the impediment is not only of a temporary nature, we are entitled to withdraw from the contract. In the event of impediments of a temporary nature, the delivery or performance periods shall be extended or the delivery or performance dates shall be postponed by the period of the impediment plus a reasonable start-up period. Insofar as the purchaser cannot reasonably be expected to accept the delivery or service as a result of the delay, he may withdraw from the contract by immediate written declaration to us.

- 4.3 We shall only be entitled to make partial deliveries if
- the partial delivery can be used by the purchaser within the scope of the contractual purpose,
 - the delivery of the remaining ordered goods is ensured; and
 - the purchaser does not incur any significant additional expense or costs (unless purchaser agrees to pay such costs).
- 4.4 If we are in default with a delivery or service or if a delivery or service becomes impossible for us for whatever reason, our liability is limited to damages in accordance with Section 7 of these terms and conditions of sale and delivery.
- 4.5 If dispatch or acceptance of the delivery item is delayed for reasons for which the purchaser is responsible, the costs incurred as a result of the delay shall be charged to the purchaser, commencing one month after notification of readiness for dispatch or acceptance. Notwithstanding our rights arising from the purchaser's default, we may demand from the purchaser an extension of delivery and performance periods or a postponement of delivery and performance dates by the period in which the purchaser fails to meet his contractual obligations towards us.

5. Transfer of Risk

- 5.1 The risk passes to the purchaser as soon as the delivery item has been handed over to the person carrying out the transport or has left our warehouse for the purpose of shipment. If dispatch or delivery is delayed due to circumstances for which the purchaser is responsible, the risk shall pass to the purchaser from the day on which the delivery item is ready for dispatch and we have notified the purchaser accordingly.
- 5.2 Unless expressly agreed otherwise in writing, we are entitled, but not obliged, to insure the shipments to the extent customary in the trade and to charge the purchaser with the costs incurred thereby.



6. Warranty, Material Defects

- 6.1 The warranty period is one year from delivery or, if acceptance is required, from acceptance. This period does not apply to claims for damages by the purchaser arising from injury to life, body or health or from intentional breaches of duty or from gross negligence committed by us or our vicarious agents. These claims become time-barred in accordance with the statutory provisions.
- 6.2 The delivery item must be diligently inspected immediately after delivery to the purchaser or to the third party designated by the purchaser. With regard to obvious defects or other defects which would have been recognizable in an immediate, careful inspection, it shall be deemed to have been approved by the purchaser if we do not receive a written notice of defect within 7 (seven) working days from delivery. With respect to other defects, the delivery item shall be deemed to have been approved by the purchaser if we do not receive the notice of defect within 7 (seven) working days after the time at which the defect became apparent; if the defect would have been recognizable at an earlier point in time under normal use, this earlier point in time shall, however, be decisive for the commencement of the notice period. At our request, a rejected delivery item shall be returned to us carriage paid. In the event of a justified defect-related complaint, we reimburse the costs of the most inexpensive shipping route from the agreed place of delivery.
- 6.3 In the event of material defects of the delivered goods, we are entitled and obliged, at our option within a reasonable period of time, to rectify the defect or deliver a replacement. In the event of failure, i.e. impossibility, unreasonability, refusal or unreasonable delay of the rectification or replacement delivery, the purchaser may withdraw from the contract or reduce the purchase price accordingly.
- 6.4 If a defect is based on our culpable fault, the purchaser may claim damages under the conditions specified in Section 7.
- 6.5 In the event of defects in components of other manufacturers which we cannot remedy for licensing or actual reasons, we shall, at our discretion, assert our warranty claims against the manufacturers and suppliers for the account of the purchaser or assign them to the purchaser. Warranty claims against us for such defects attributable to manufactures and/or

suppliers only exist under the further prerequisites of and in accordance with these general terms and conditions of sale and delivery and on condition that the judicial enforcement of the aforementioned claims against the manufacturer or supplier was unsuccessful or is futile, e.g. due to insolvency. For the duration of a legal dispute, the statute of limitations of the relevant warranty claims of the purchaser against us is suspended.

- 6.6 The warranty does not apply if the purchaser changes, modifies or alters the delivery item or has it changed, modified or altered by third parties without our consent and the rectification of the defect is thereby made impossible or unreasonably difficult. In any case, the purchaser bears the additional costs of remedying the defect incurred as a result of the change, modification or alteration. If our operating or maintenance instructions are not followed, parts are replaced or expendable materials are used which do not correspond to the original specifications, no warranty or liability is accepted. Any warranty or liability for normal wear and tear shall be excluded.

7. Liability for Damages due to Fault

- 7.1 Our liability for damages, for whatever legal reason or nature, in particular impossibility of performance, delay, defective or incorrect delivery, breach of contract, breach of duties in contract negotiations and tort, is limited in accordance with the provisions of this Section 7.
- 7.2 We are not liable in the event of slight negligence on the part of our executive bodies, legal representatives, employees or other vicarious agents, insofar as this is not a breach of essential contractual obligations. Essential contractual obligations are the obligation to deliver and install the delivery item on time, its freedom from defects of title and material defects which more than insignificantly impair its functionality or usability, as well as obligations to provide advice, protection and care (insofar as the purchaser is threatened with considerable damage, against which the purchaser cannot protect himself with reasonable care, and therefore could rely on the care of the seller), which are intended to enable the purchaser to use the delivery item in accordance with the contract or which are intended to protect the life or body of the purchaser's personnel or to protect the purchaser's property from considerable damage.

- 7.3 Insofar as we are liable for damages in accordance with Section 7.2 above, this liability is limited to damages which we foresaw at the time of conclusion of the contract as a possible consequence of a breach of contract or which we should have foreseen if we had exercised due care. Indirect damages and consequential damages resulting from defects of the delivery item are also only subject to compensation if such damages are typically to be expected when the delivery item is used as intended.
- 7.4 Insofar as the purchaser directly resells the delivery items or integrates them into his products and then delivers them to third parties, any damage caused by delay which may result from agreements between the purchaser and the third parties ("third party agreements") with regard to deliveries to such third parties (e.g. the agreement of contractual penalties or lump-sum compensation/liquidated damages for delay) shall be unforeseeable damage for us, unless we have expressly agreed to assume liability with knowledge of such third party agreements.
- 7.5 The above exclusions and limitations of liability apply to the same extent in favour of our executive bodies, legal representatives, employees and other vicarious agents.
- 7.6 Insofar as we provide technical information or act in an advisory capacity and this information or advice is not part of the contractually agreed scope of services owed by us and the provision of information or advice does not constitute an essential contractual obligation within the meaning of Section 7.2 above, this is done free of charge and excluding any liability.
- 7.7 The limitations of this section 7 do not apply to our liability for willful misconduct, for guaranteed specifications, for injury to life, body or health or liability under the Product Liability Act.



8. Specifications

- 8.1 It is the purchaser's responsibility to ascertain the suitability of the delivery item for the intended use. We shall only be bound by declarations concerning the scope of delivery, performance or quality of the delivery item if these have been expressly included in the contract or the offer, whereby, however, no provision of these terms and conditions of sale and delivery may be interpreted as an attempt to limit the liability of the parties for fraud or fraudulent misrepresentation.
- 8.2 All specifications, drawings, dimensions and weights as well as other information about the delivery item provided by us in our offer are only approximate values. The descriptions and illustrations contained in our catalogues, price lists and other advertising materials are only intended as a general description of the goods described therein and are not part of the contract.
- 8.3 Drawings and documents attached to the offer are for the personal use of the recipient only and may not be reproduced or made accessible to third parties without our express permission.
- 8.4 We reserve the right to make changes to the specifications of the delivery item if
- (i) this is necessary and reasonable in order to comply with the relevant legal provisions, or
 - (ii) we replace materials or components by at least equivalent or higher-quality materials or components on the basis of availability or production requirements, and in both cases, in particular, the quality of the delivery item is not significantly impaired thereby.

9. Retention of Title

- 9.1 The delivery item remains our property until full payment has been made.
- 9.2 The purchaser is obliged to treat the delivery item with care, in particular he is obliged to sufficiently insure it at his own expense at replacement value against fire, water and theft damage. Insofar as maintenance and inspection work becomes necessary, the purchaser must carry it out at his own expense and in a timely manner.

- 9.3 The purchaser is entitled to resell the delivery item in the ordinary course of business as long as he is not in default of payment. However, he may not pledge the delivery item or assign it by way of security. The purchaser's claims for payment against its customers arising from the resale of the delivery item as well as the purchaser's claims with regard to the delivery item arising from any other legal grounds against its customers or third parties (in particular claims arising from unlawful acts and claims for insurance benefits), including all balance claims from current accounts, are hereby assigned to us in full by way of security, irrespective of whether the delivery item has been resold without or after processing. We accept this assignment.

- 9.4 The purchaser may assert the claims assigned to us on his own account in his own name for us as long as we do not revoke this authorization. Our right to assert these claims ourselves shall not be affected thereby; however, we shall not assert the claims ourselves and shall not revoke the authorization as long as the purchaser duly meets his payment obligations. If, however, the purchaser is in breach of contract – in particular if he is in default of payment – we can demand that the purchaser informs us of the assigned claims and the respective debtors, notifies the respective debtors of the assignment and hands over all documents to us as well as provides all information which we require to assert the claims.

- 9.5 The processing or modification of the delivery item by the purchaser is at all times carried out on our behalf. If the delivery item is processed with other items not belonging to us, we acquire joint ownership and property of the new item in the ratio of the value of the delivery item (final invoice amount, including VAT) to the other processed items at the time of processing. The same principle as to the delivery item delivered subject to reservation of title shall apply to any item created by processing.

- 9.6 In the event of pledging of the delivery item by third parties or other interventions by third parties, the purchaser must point out our title and must inform us immediately in writing so that we can enforce our title rights. If the third party is unable to reimburse the court or out-of-court costs incurred by us in this context, the purchaser is liable for these costs.
- 9.7 We undertake to release the securities to which we are entitled at the purchaser's request to the extent that the realizable value of our securities exceeds the claims to be secured by more than 10 %; the choice of the securities to be released is incumbent on us.

10. Miscellaneous

- 10.1 Delivery claims against us may not be assigned in whole or in part without our written consent.
- 10.2 Our terms and conditions of sale and delivery and all business relations between us and the purchaser are governed by the laws of the Federal Republic of Germany to the exclusion of the UN Convention on Contracts for the International Sale of Goods.
- 10.3 If the purchaser is a registered trader within the meaning of the German Commercial Code, a legal entity under public law or a special fund under public law, or if he does not have a general place of jurisdiction in the Federal Republic of Germany, Osterholz-Scharmbeck is an additional place of jurisdiction for all disputes arising directly or indirectly from the contractual relationship, which is exclusive for actions against us. Deviating mandatory legal provisions on exclusive places of jurisdiction remain unaffected by this provision.
- 10.4 Should any provision of these terms and conditions of sale and delivery or any provision within the scope of other agreements be or become invalid, this does not affect the validity of all other provisions or agreements. Instead of the invalid provision, a provision shall be deemed agreed which comes as close as possible to the meaning and economic significance of the invalid provision.



Tank Bottom Valves



Type BA with single acting actuator



Type BAS with heating jacket and double acting actuator



Special Design:
Valve for tank draining
(through the tank)

Sampling Valves



Type BAS-P Defined sampling from vessels, with pneumatic actuation



Type BV-P Sampling of solids from vessels, with linear actuation and pneumatic compactor



Type BV-P Fully automated sampling of solids

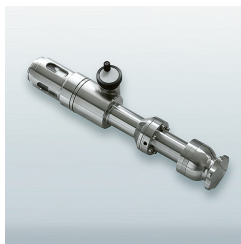
EPOS® Sampling Systems



Sampling of fluids:
Spring-to-close hand wheel



Sampling of fluids:
Safety cabinet with bottle being closed from the outside



Piston injector for sampling of hazardous fluids

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