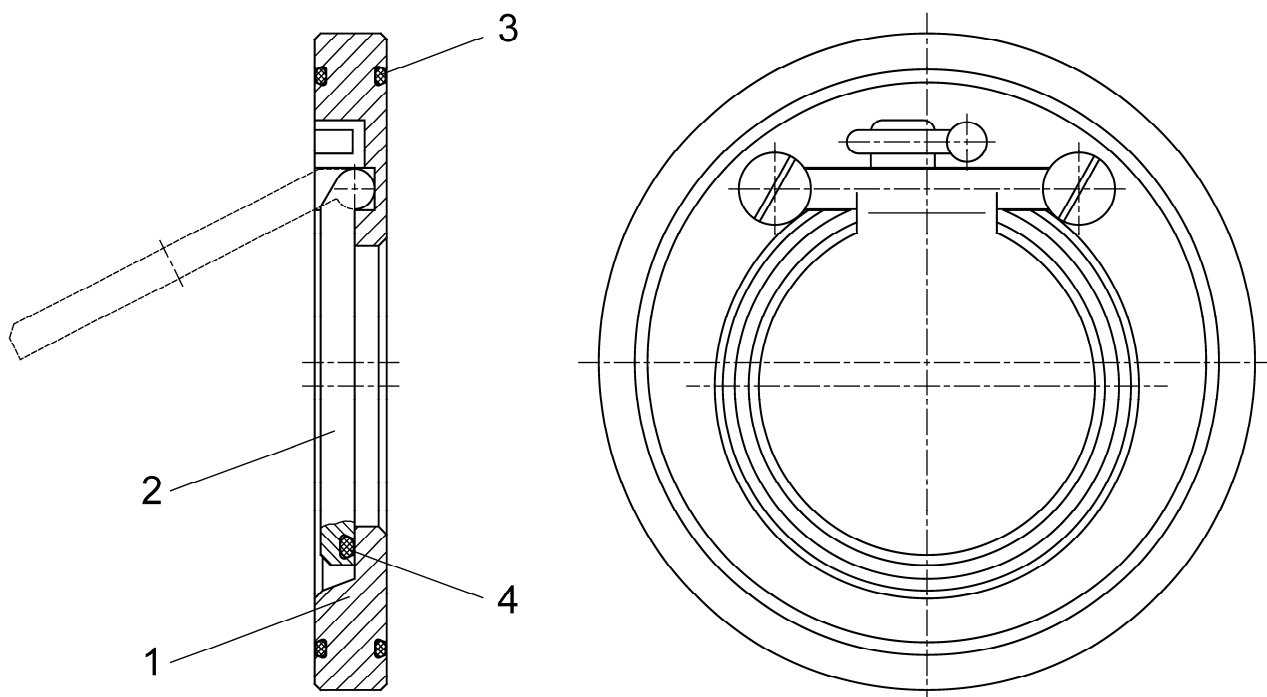


Technical documentation

Metal swing check valves

series C / CF corresponds to series ZRK / ZRKF



Part no.	Description	Material		
		C 4444 E	C 4466 E	C 6666 E
1	Body	Steel	Steel	Stainless steel
2	Disc	Steel	Stainless steel	Stainless steel
3+4	O-Ring	EPDM (E), NBR (B) FPM (V), PTFE (T) FPM + PTFE (TV)	EPDM (E), NBR (B) FPM (V), PTFE (T) FPM + PTFE (TV)	EPDM (E), NBR (B) FPM (V), PTFE (T) FPM + PTFE (TV)



SWING CHECK VALVES WAFER TYPE

SERIES
ZRK | ZRKF

AWS
APPARATEBAU

GENERAL DESCRIPTION

SWING CHECK VALVES WAFER TYPE



Description and intended purpose

AWS swing check valves wafer type are characterized by their simple and robust design. A key feature is their particularly narrow FTF length - a major advantage compared to other designs in many installation situations in piping systems in industrial and building services. They can be installed directly between flanges (PN 6 - PN 40 or Class 150 - Class 300).

Function

AWS swing check valves wafer type require a low opening pressure. The resulting opening force pushes the disc against its self-weight and, if necessary, also an additional spring, so that the medium can flow. If the inlet pressure drops or if the backpressure exceeds the inlet pressure, the valve closes and seals against the medium by means of the soft seat or the metal seat.

AWS swing check valves wafer type are maintenance-free.

WHY CHOOSE AWS

SWING CHECK VALVES WAFER TYPE?

IN BRIEF:

Many years of experience in the production of check valves

In-house assembly department with maximum flexibility and expertise

Advice and technical design via in-house design and engineering team

High availability ensuring short delivery times of standard articles

QUALITY AND TESTING AT AWS:

Own test benches for pressure and leak tests in accordance with EN 12266-1, API 598 and other common standards

Experience and routine in the preparation of works and acceptance test certificates in accordance with DIN EN 10204 (2.2, 3.1 or 3.2 certificate)

Regular auditing of processes and quality mechanisms by TÜV Süd, discerning customers and other external bodies

In-house spectral analyses for metallic materials

Additional quality assurance measures (external and internal), for example corrosion testing, dye penetrant testing, X-ray testing, preparation of QCPs, etc.

OVERVIEW MATRIX

SWING CHECK VALVES WAFER TYPE

DESCRIPTION

		ZRK	ZRKF	920	925.1
NOMINAL SIZES*1		DN 32 - DN 1000	DN 32 - DN 400	DN 32 - DN 600	DN 50 - DN 200
FLANGE CONNECTION*2		PN 6 / PN 10 / PN 16 / PN 25 / PN 40 Class 150 / Class 300 JIS 10K	PN 6 / PN 10 / PN 16 / PN 25 / PN 40 Class 150 / Class 300 JIS 10K	PN 6 / PN 10 Class 150 JIS 10K	PN 10
MAX. PRESSURE		16 to 50 bar*3	16 to 50 bar*3	10 bar	6 bar
TEMPERATURE RANGES		-273 °C to +500 °C	-200 °C to +450 °C	-20 °C to +120 °C	0 °C to +50 °C
MATERIALS AVAILABLE*5	Steel	x	x	-	-
	Stainless steel	x	x	-	-
	Alu-Bronze	x	x	-	-
	Superduplex	x	x	-	-
	PVC	-	-	x	x
	PP	-	-	x	-
	PVDF	-	-	x	-
SEALS AVAILABLE		Metal, NBR, EPDM, FKM, PTFE	Metal, NBR, EPDM, FKM, PTFE	NBR, EPDM, FKM, PTFE	EPDM

*1 other nominal sizes on request

*2 other flange connections on request

*3 depending on nominal size and design

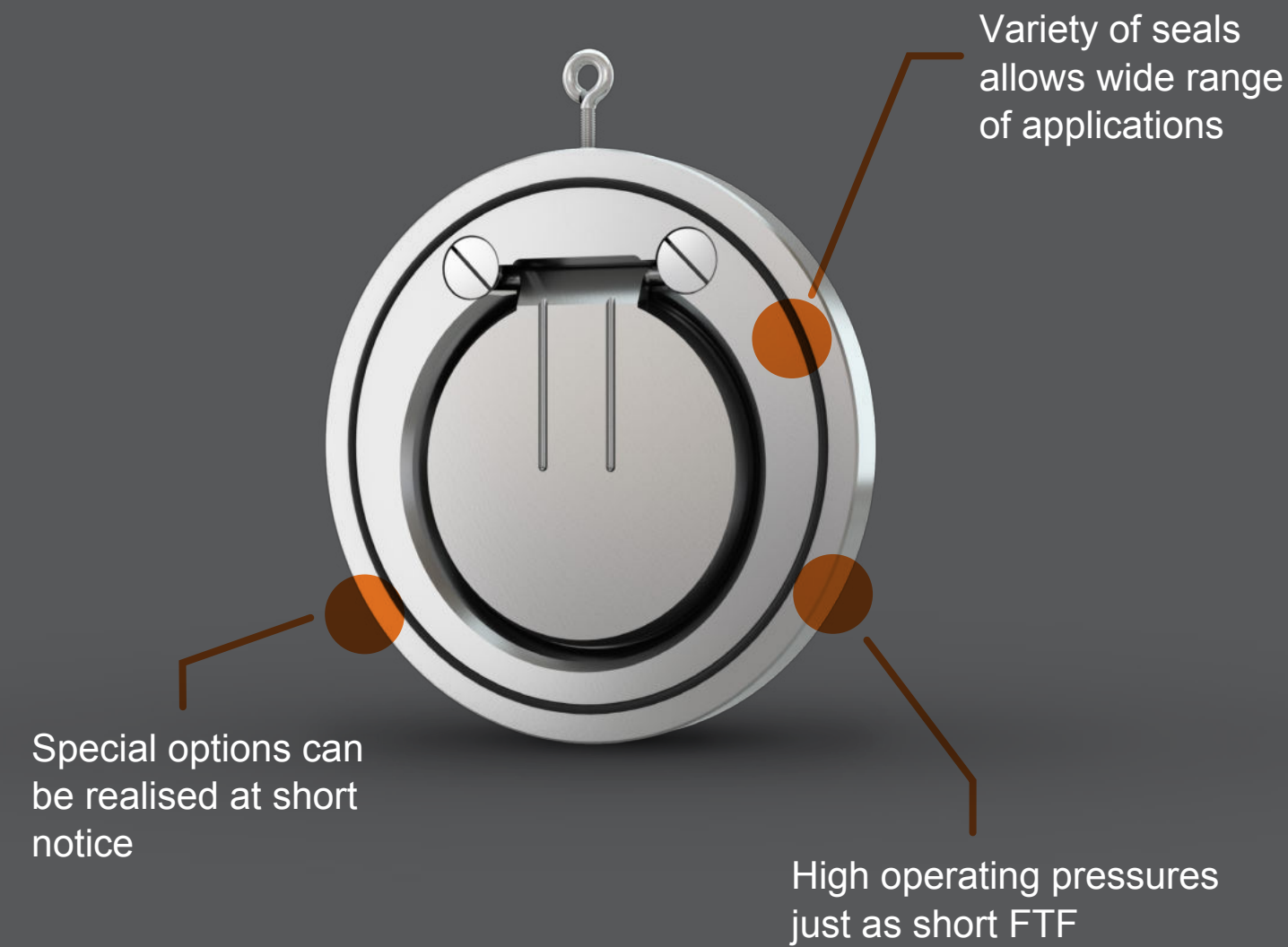
*4 other materials on request

... AND BECAUSE WE KNOW

WHAT MATTERS IN YOUR INDUSTRY!



TECHNICAL DATA
SWING CHECK VALVE WAFER TYPE | SERIES ZRK



Nominal sizes
DN 32 - DN 1000

Flange connection
PN 6 - PN 40 | Class 150 - 300 | JIS 10K

Max. pressure:
16 to 50 bar

Temperature range
-273 °C to +500 °C

TECHNICAL DATA
SWING CHECK VALVE WAFER TYPE | SERIES ZRK



- 1. Body
- 2. Disc
- 3. Disc holder
- 4. Seals

Design	Body	Disc	Max. allowable pressure*1				
ST-ST	1.0460, zinc plated	1.0619 / 1.0460, zinc plated	DN 32 - 40 40 bar		DN 50 25 bar	DN 65 - 1000 16 bar	
ST-VA	1.0460, zinc plated	1.4408	DN 32 - 40 40 bar		DN 50 25 bar	DN 65 - 1000 16 bar	
VA-VA	1.4408	1.4408	DN 32 - 50 40 bar	DN 65 30 bar	DN 80 -100 20 bar	DN 125 - 1000 16 bar	
VA1-VA1	1.4571	1.4571	DN 32 - 50 50 bar	DN 65 40 bar	DN 80 30 bar	DN 100 -150 25 bar	DN 200 - 1000 20 bar
AB-DU	CC333G (2.0975)	1.4469 (Superduplex)	DN 32 - 50 40 bar	DN 65 - 125 30 bar	DN 150 - 300 20 bar	DN 350 - 1000 10 bar	
DU-DU	1.4469 (Superduplex)	1.4469 (Superduplex)	DN 32 - 65 50 bar	DN 80 - 100 40 bar	DN 125 - 150 30 bar	DN 200 - 1000 20 bar	

*1 max. allowable pressure is dependent on the temperature

Seal	Design	Temperature	Leckage rate*2
Metal seated*3	ST-VA	-10 °C to +400 °C	G
	VA-VA	-196 °C to +400 °C	
	VA1-VA1	-273 °C to +500 °C	
	AB-DU	-10 °C to +250 °C	
	DU-DU	-10 °C to +250 °C	
NBR*4	-	-30 °C to +100 °C	A
EPDM*4	-	-65 °C to +150 °C	A
FKM*4	-	-30 °C to +230 °C	A
PTFE*4	-	-200 °C to +250 °C	A

*2 acc. to EN 12266-1

*3 metal seated valves are supplied without O-rings
in body as standard

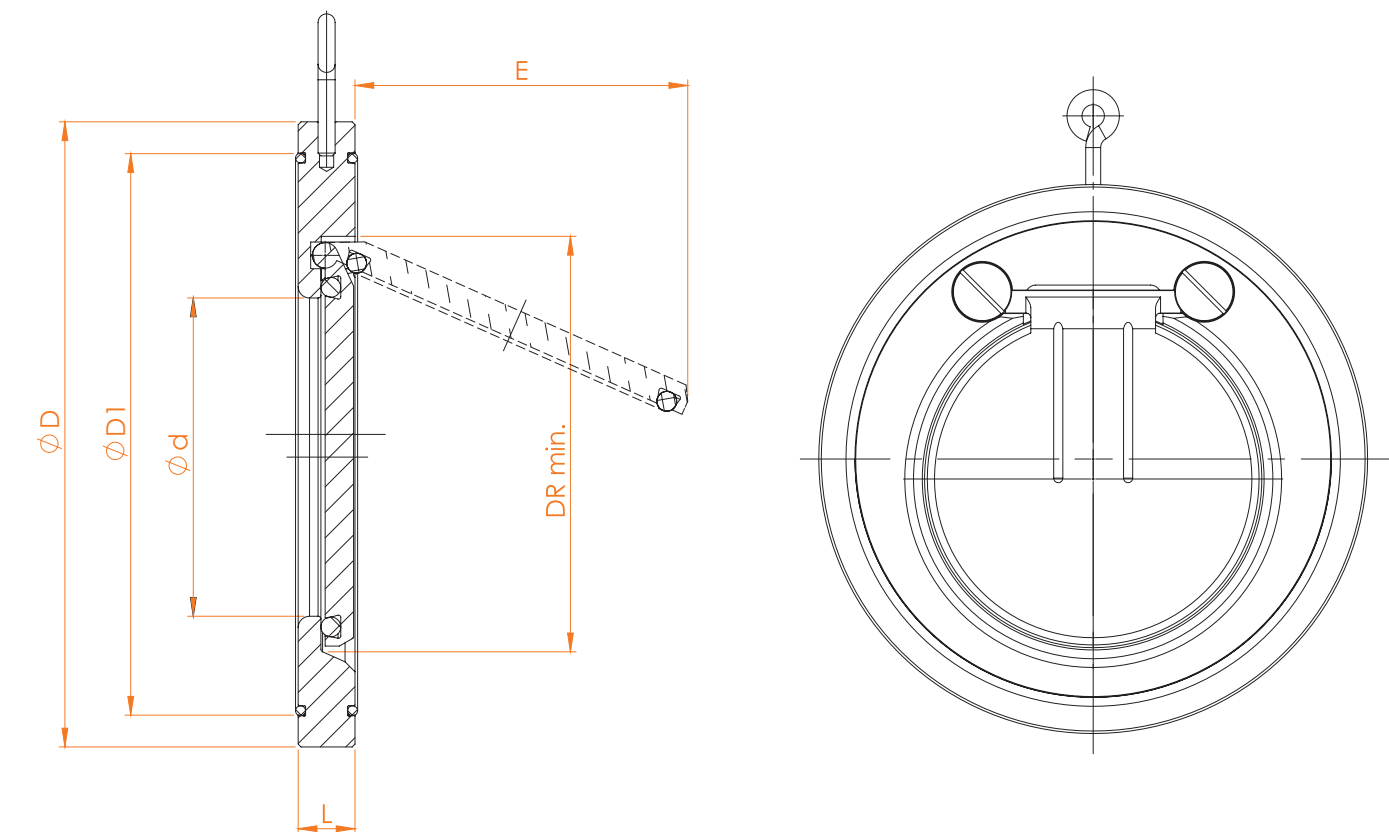
*4 for some designs, the temperature range is additionally
limited by the temperature range of the metallic parts
(see temperature range for metal seated)

Seals for valves up to and including DN 300 comply with the following approvals / conformities:

NBR: DIN EN 549, BAM, REACH, RoHS etc.
EPDM: KTW UBA, DVGW W 270, WRAS, NSF, FDA, BfR XXI Kat. 4, ADI-free, 3A, USP Cl. 6, BAM, REACH, RohS etc.
FKM: DIN EN 549, ADI-free, REACH, RoHS etc.
PTFE: KTW UBA, DVGW W 270, WRAS, FDA, BfR, ADI-free, EU 10/2011, 3A, USP Cl. 6, REACH, RoHS etc.

TECHNICAL DATA

SWING CHECK VALVE WAFER TYPE | SERIES ZRK



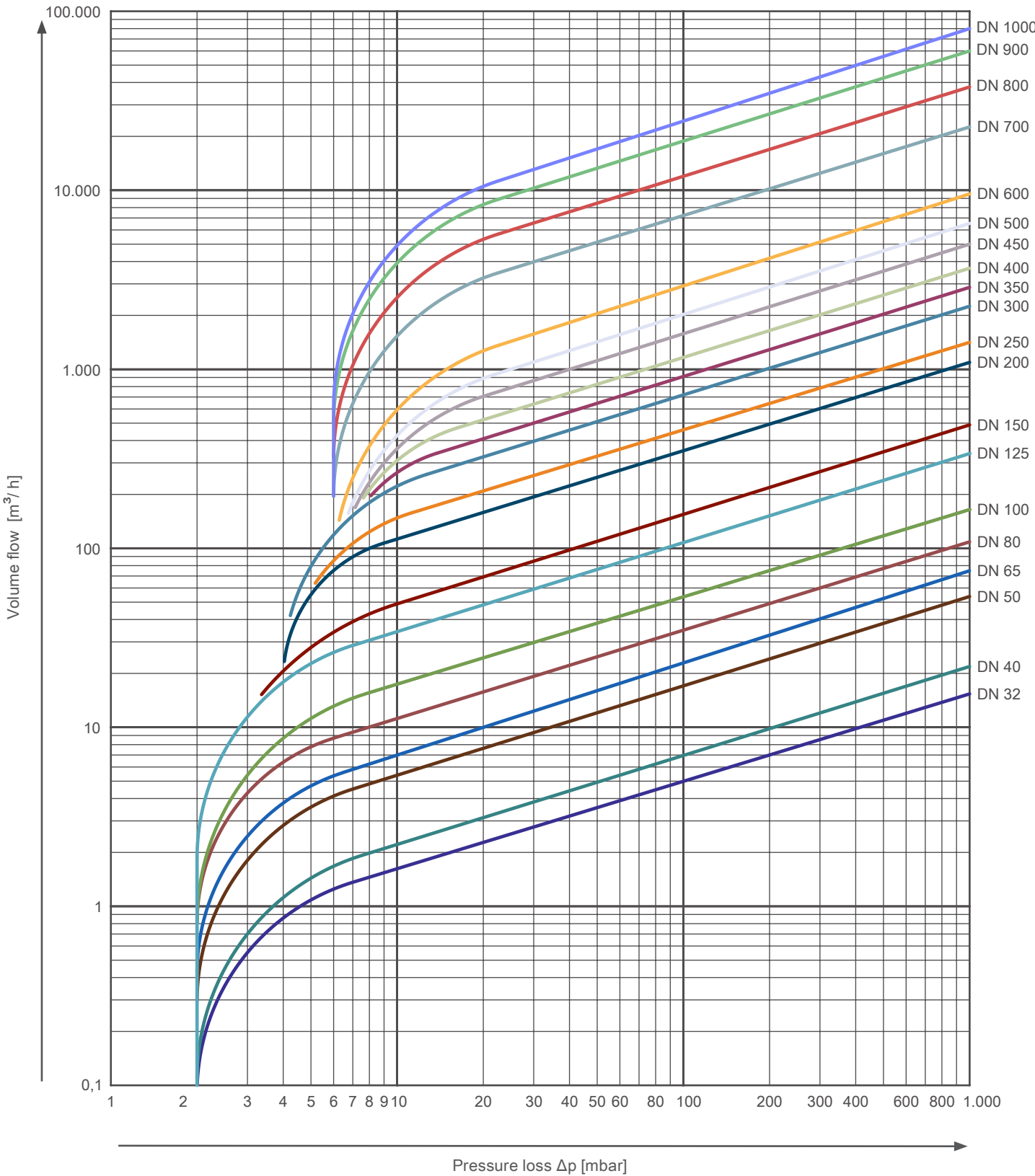
Nominal size	Ø D*5								L	Ø d	Ø D1	E	DR	Kv value [m³/h]	Opening pressure [mbar]		Weight*6 [kg]
	PN 6	PN 10	PN 16	PN 25	PN 40	ANSI 150	ANSI 300	JIS 10K							↔	↑	
DN 32	79	85	85	85	85	74	85	85	15	18	59	22	37	16,2	~ 2	~ 10	0,67
DN 40	89	95	95	95	95	83	95	91	16	22	72	25	43	22,2	~ 2	~ 10	0,85
DN 50	98	109	109	109	109	105	112	105	14	32	86	37	54	54	~ 2	~ 10	0,91
DN 65	118	129	129	129	129	124	129	124	14	40	109	50	70	75	~ 2	~ 10	1,2
DN 80	134	144	144	144	144	137	150	135	14	54	119	61	82	112	~ 2	~ 10	1,5
DN 100	154	164	164	170	170	175	181,5	160	18	70	146	77	106	172	~ 2	~ 10	2,4
DN 125	184	195	195	196	196	197	216,5	191	18	92	173	98	131	342	~ 2	~ 10	3,4
DN 150	209	220	220	226	226	222	251,5	220	20	112	197	120	159	490	~ 2	~ 10	4,7
DN 200	264	275	275	286	294	279	308	271	22	154	255	160	207	1128	~ 4	~ 14	7,7
DN 250	319	330	331	344	356	340	362	330	26	192	312	190	260	1500	~ 4	~ 14	13
DN 300	375	380	386	404	421	410	423	380	32	227	363	220	309	2290	~ 4	~ 14	21
DN 350	425	440	446	461	478	451	487	424	38	266	416	250	341	2890	~ 6	~ 18	33
DN 400	475	491	499	518	550	514	541	487	44	310	467	290	392	3700	~ 6	~ 18	46
DN 450	530	541	558	568	575	549	598	541	52	350	520	340	442	5000	~ 6	~ 18	67
DN 500	580	596	621	628	632	606	655	596	58	400	550	390	493	6550	~ 6	~ 24	89
DN 600	681	698	738	735	751	718	775	698	62	486	660	470	594	9550	~ 6	~ 26	128
DN 700	785	813	807	836	-	-	-	-	67	588	770	563	693	23000	~ 6	~ 26	190
DN 800	893	920	914	945	-	-	-	-	78	622	-	680	795	38000	~ 6	~ 30	292
DN 900	993	1020	1014	1045	-	-	-	-	95	720	-	750	889	60000	~ 6	~ 32	412
DN 1000	1093	1127	1131	1159	-	-	-	-	105	810	-	840	991	80000	~ 6	~ 36	550

*5 in order to realise the flange connection diameters, flange center-rings may be used
*6 weight refers to valve suitable for PN 10 flanges and may vary slightly, depending on the design

TECHNICAL DATA

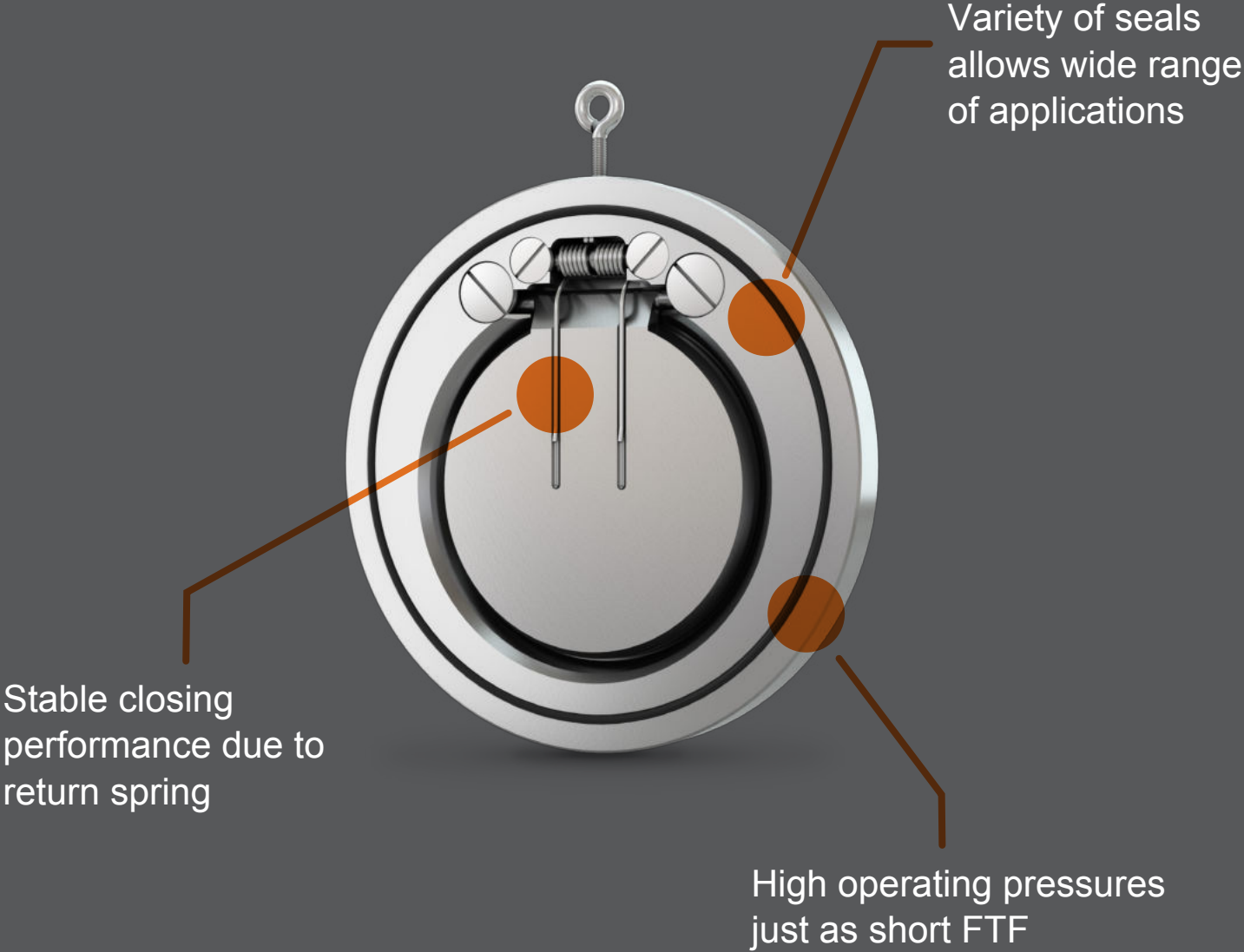
SWING CHECK VALVE WAFER TYPE | SERIES ZRK

Pressure-Loss Diagram Type ZRK
The diagram values are valid for water at a temperature of 20 °C and for valves with face-to-face dimensions in accordance with DIN EN 558, suitable for flanges in accordance with PN 10 - PN 40. At the opening of the valve, the curves apply to operation in horizontal pipelines. For calculations for other fluids or temperatures, please contact us.



TECHNICAL DATA

SWING CHECK VALVE WAFER TYPE | SERIES ZRKF



Nominal sizes

DN 32 - DN 400

Flange connection

PN 6 - PN 40 | Class 150 - 300 | JIS 10K

Max. Pressure

16 to 50 bar

Temperature range

-200 °C to +450 °C

TECHNICAL DATA

SWING CHECK VALVE WAFER TYPE | SERIES ZRKF



Design	Body	Disc	Spring	Max. allowbale pressure*1				
ST-ST	1.0460, zinc plated	1.0619 / 1.0460, zinc plated	1.4571	DN 32 - 40 40 bar		DN 50 25 bar	DN 65 - 400 16 bar	
ST-VA	1.0460, zinc plated	1.4408	1.4571	DN 32 - 40 40 bar		DN 50 25 bar	DN 65 - 400 16 bar	
VA-VA	1.4408	1.4408	1.4571	DN 32 - 50 40 bar	DN 65 30 bar	DN 80 -100 20 bar	DN 125 - 400 16 bar	
VA1-VA1	1.4571	1.4571	1.4571	DN 32 - 50 50 bar	DN 65 40 bar	DN 80 30 bar	DN 100 -150 25 bar	DN 200 - 400 20 bar
AB-DU	CC333G (2.0975)	1.4469 (Superduplex)	Hastelloy C4 (2.4610)	DN 32 - 50 40 bar	DN 65 - 125 30 bar	DN 150 - 300 20 bar	DN 350 - 400 10 bar	
DU-DU	1.4469 (Superduplex)	1.4469 (Superduplex)	Hastelloy C4 (2.4610)	DN 32 - 65 50 bar	DN 80 - 100 40 bar	DN 125 - 150 30 bar	DN 200 - 400 20 bar	

*1 max. allowable pressure is dependent on the temperature

Seal	Design	Temperature	Leakage rate*2
Metal seated*3	ST-VA	-10 °C to +300 °C*4	G
	VA-VA	-196 °C to +300 °C*5	
	VA1-VA1	-200 °C to +300 °C*6	
	AB-DU	-10 °C to +250 °C	
	DU-DU	-10 °C to +250 °C	
NBR*7	-	-30 °C to +100 °C	A
EPDM*7	-	-65 °C to +150 °C	A
FKM*7	-	-30 °C to +230 °C	A
PTFE*7	-	-200 °C to +250 °C	A

*2 acc. to EN 12266-1

*3 metal seated valves are supplied without O-rings in body as standard

*4 optional with spring made of Hastelloy C4: -10 °C to +450 °C

*5 optional with spring made of Hastelloy C4: -100 °C to +400 °C

*6 optional with spring made of Hastelloy C4: -100°C to +450 °C

*7 for some designs, the temperature range is additionally limited by the temperature range of the metallic parts (see temperature range for metal seated)

Seals for valves up to and including DN 300 comply with the following approvals / conformities:

NBR: DIN EN 549, BAM, REACH, RoHS etc.

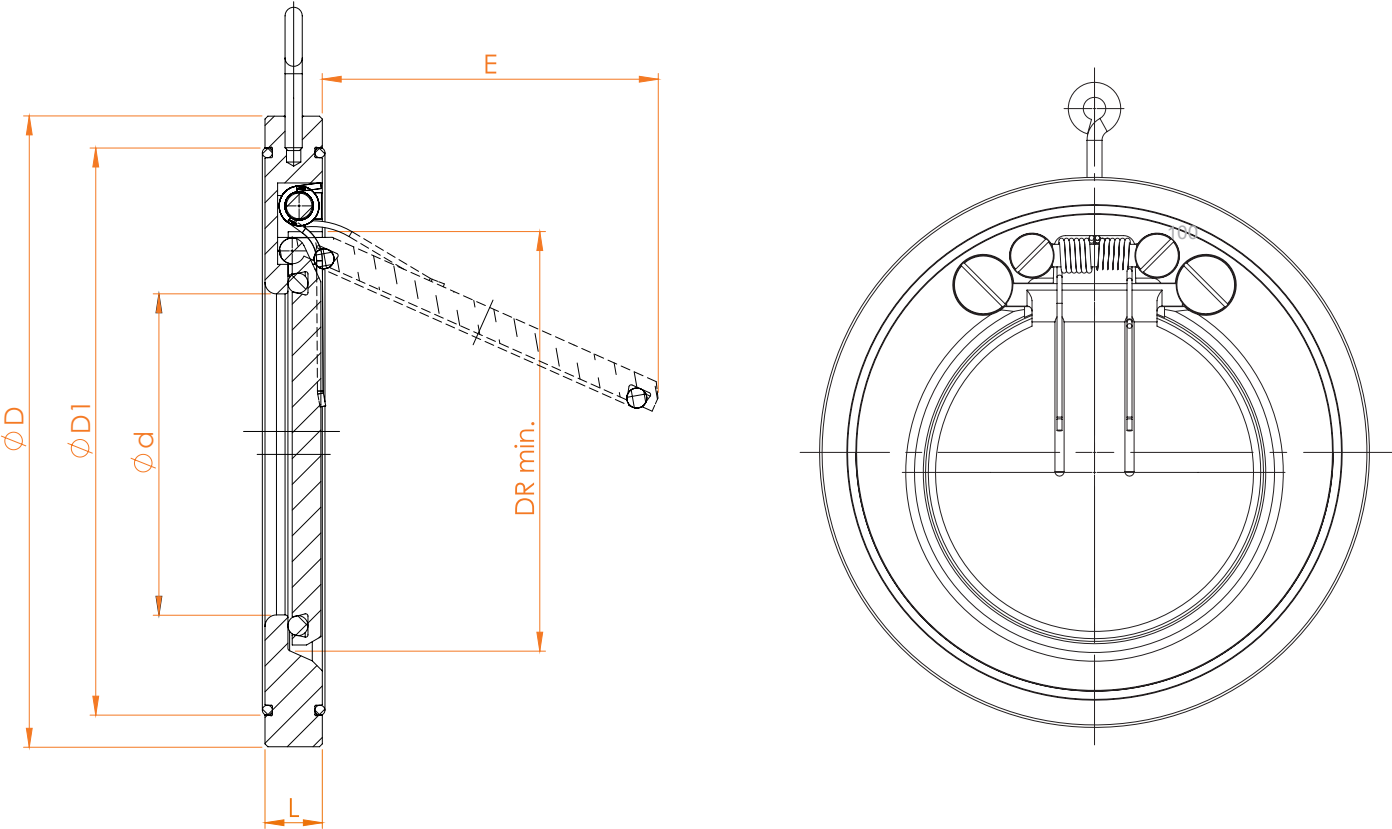
EPDM: KTW UBA, DVGW W 270, WRAS, NSF, FDA, BfR XXI Kat. 4, ADI-free, 3A, USP Cl. 6, BAM, REACH, RohS etc.

FKM: DIN EN 549, ADI-free, REACH, RoHS etc.

PTFE: KTW UBA, DVGW W 270, WRAS, FDA, BfR, ADI-free, EU 10/2011, 3A, USP Cl. 6, REACH, RoHS etc.

TECHNICAL DATA

SWING CHECK VALVE WAFER TYPE | SERIES ZRKF



Nominal size	Ø D*8								L	Ø d	Ø D1	E	DR	Kv value [m³/h]	Opening pressure [mbar]		Weight*9 [kg]
	PN 6	PN 10	PN 16	PN 25	PN 40	ANSI 150	ANSI 300	JIS 10K							↔	↑	
DN 32	79	85	85	85	85	74	85	85	15	18	59	22	37	16,2	~ 15	~ 25	0,67
DN 40	89	95	95	95	95	83	95	91	16	22	72	25	43	22,2	~ 15	~ 25	0,85
DN 50	98	109	109	109	109	105	112	105	14	32	86	37	54	54	~ 15	~ 25	0,91
DN 65	118	129	129	129	129	124	129	124	14	40	109	50	70	75	~ 15	~ 25	1,2
DN 80	134	144	144	144	144	137	150	135	14	54	119	61	82	112	~ 15	~ 25	1,5
DN 100	154	164	164	170	170	175	181,5	160	18	70	146	77	106	172	~ 15	~ 25	2,4
DN 125	184	195	195	196	196	197	216,5	191	18	92	173	98	131	342	~ 15	~ 25	3,4
DN 150	209	220	220	226	226	222	251,5	220	20	112	197	120	159	490	~ 15	~ 25	4,7
DN 200	264	275	275	286	294	279	308	271	22	154	255	160	207	1128	~ 17	~ 25	7,7
DN 250	319	330	331	344	356	340	362	330	26	192	312	190	260	1500	~ 17	~ 25	13
DN 300	375	380	386	404	421	410	423	380	32	227	363	220	309	2290	~ 17	~ 25	21
DN 350	425	440	446	461	478	451	487	424	38	266	416	250	341	2890	~ 18	~ 27	33
DN 400	475	491	499	518	550	514	541	487	44	310	467	290	392	3700	~ 18	~ 28	46

*8 in order to realise the flange connection diameters, flange center-rings may be used

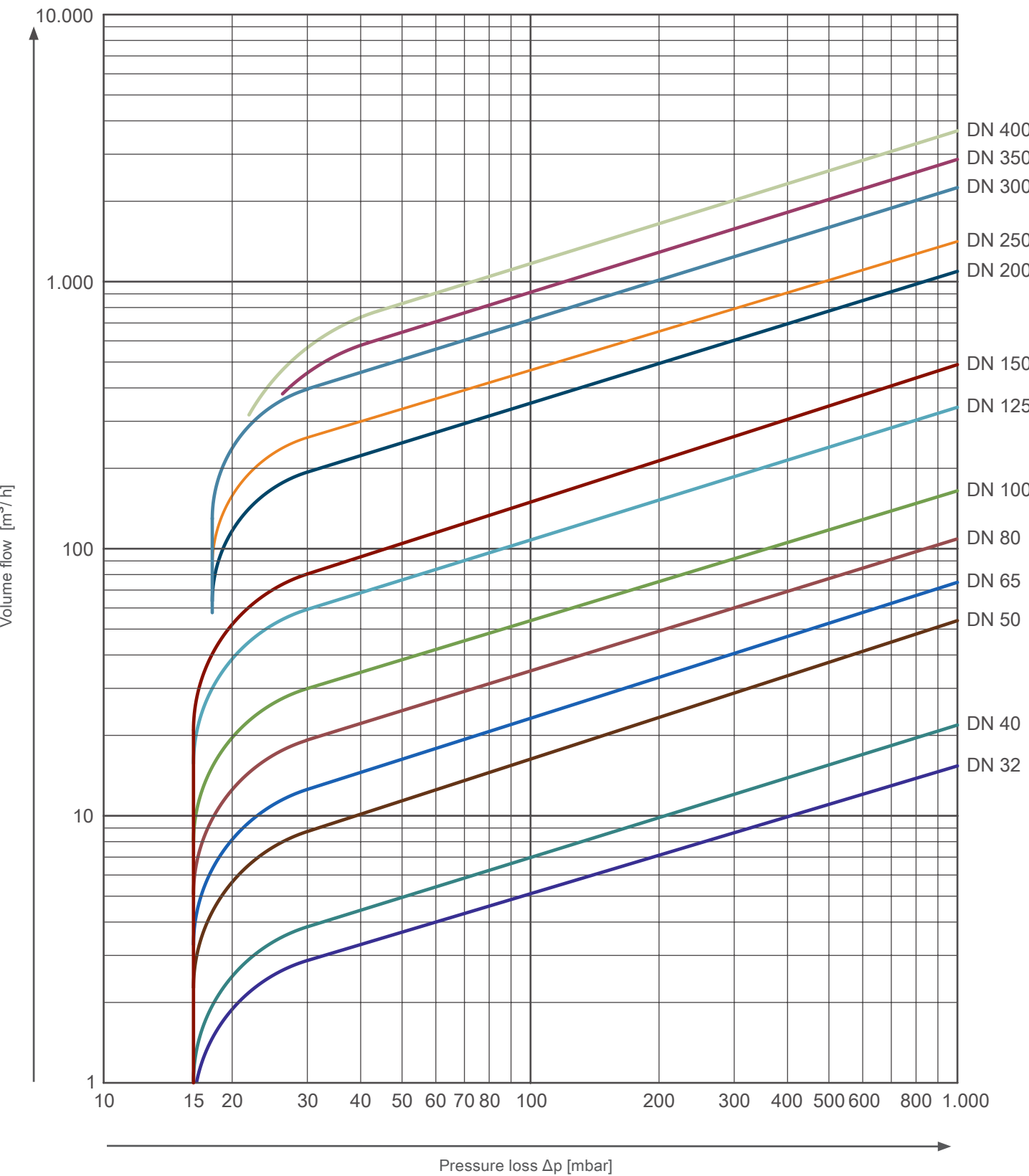
*9 weight refers to valve suitable for PN 10 flanges and may vary slightly, depending on the design

TECHNICAL DATA

SWING CHECK VALVE WAFER TYPE | SERIES ZRKF

Pressure-Loss Diagram Type ZRKF

The diagram values are valid for water at a temperature of 20 °C and for valves with face-to-face dimensions in accordance with DIN EN 558, suitable for flanges in accordance with PN 10 - PN 40. At the opening of the valve, the curves apply to operation in horizontal pipelines. For calculations for other fluids or temperatures, please contact us.



SPECIAL OPTIONS

SWING CHECK VALVES WAFER TYPE

With our many years of experience, and our understanding of the demands of the market and the constantly rising expectations of our customers, we always strive to develop and implement solutions that go well beyond the standard. Here are just a few examples of special designs that we have created either in-house, based on our standard models, or with the help of our long-standing pool of partners. Here we adhere to the criteria of technical and economic feasibility combined with a healthy dose of pragmatism.



With mounting holes



Lug type body



With manual override



With attached ground cable



Reinforced design with holding plates



Disc with integrated pressure relief valve

Oher special options:

- Cleaned free of oil and grease
- Cleaned free of silicone
- Cleaned free of PWIS
- Seals with additional approvals which go beyond the standard
- With seal that is glued in for vacuum applications
- Other materials on request
- Other flange dimensions on request
- Other special options on request



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info@aws-apparatebau.de
www.aws-apparatebau.de

Nennweite DN 32 - 1000 / größere Nennweiten auf Anfrage
Nominal sizes 1 1/2" - 40" / bigger nominal sizes on request

Flanschanschluss DIN EN 1092-1 B1, PN 6 - 63
flange connection ASME B16.5 / ANSI Class 150 - 300
JIS B2220, 10K

Baulänge Kurze Baulänge
FTF (face-to-face) Short installation length

Temperaturbereich -273 °C bis +500 °C (werkstoffabhängig)
Temperature range -273 °C to +500 °C (depending on the materials)

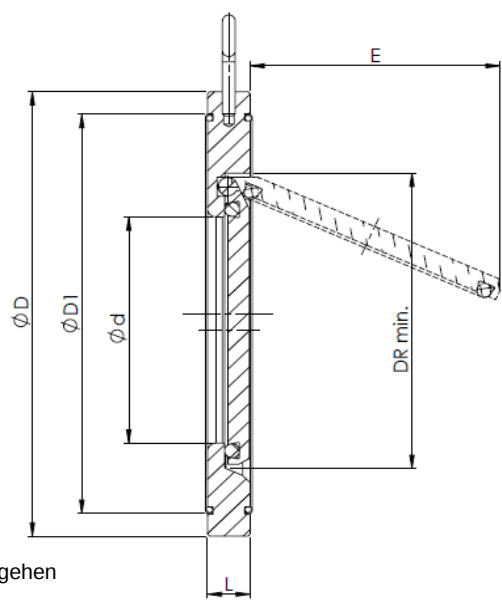
Sonderoptionen* Reinigung: öl- und fettfrei / silikonfrei / LABS-frei
*Special options** Cleaning: free of oil and grease / silicone / PWIS

Mit angebrachtem Erdungskabel
With attached ground cable

Verstärkte Klappenführung "heavy duty" (mit Halteplatten)
Reinforced disc guide "heavy duty" (with holding plates)

Dichtungen mit zusätzlichen Zulassungen, die über den Standard hinausgehen
Seals with additional approvals which go beyond the standard

Eingeklebte Dichtung für Vakuumanwendungen (empfohlen für Absolutdruck < 0,1 bar)
Seal glued in for vacuum applications (recommended for absolute pressure < 0,1 bar)



Ausführung <i>Design</i>	Gehäuse <i>Body</i>	Klappe <i>Disc</i>	Max. zulässiger Druck* ¹ <i>Max. allowable pressure*¹</i>				
ST-ST	1.0460, verzinkt <i>A 105, zinc plated</i>	1.0619 / 1.0460, verzinkt <i>A 216 WCB / A 105, zinc plated</i>	DN 32 - 40 40 bar		DN 50 25 bar	DN 65 - 1000 16 bar	
ST-VA	1.0460, verzinkt <i>A 105, zinc plated</i>	1.4408 <i>A 351 CF8M</i>	DN 32 - 40 40 bar		DN 50 25 bar	DN 65 - 1000 16 bar	
VA-VA	1.4408 <i>A 351 CF8M</i>	1.4408 <i>A 351 CF8M</i>	DN 32 - 50 40 bar	DN 65 30 bar	DN 80 - 100 20 bar	DN 125 - 1000 16 bar	
VA1-VA1	1.4571 <i>AISI 316 Ti</i>	1.4571 <i>AISI 316 Ti</i>	DN 32 - 50 50 bar	DN 65 40 bar	DN 80 30 bar	DN 100 - 150 25 bar	DN 200 - 1000 20 bar
AB-DU	CC333G (2.0975) <i>C958</i>	1.4469 (Superduplex) <i>A 890 Grade 5A</i>	DN 32 - 50 40 bar	DN 65 - 125 30 bar	DN 150 - 300 20 bar	DN 350 - 1000 10 bar	
DU-DU	1.4469 (Superduplex) <i>A 890 Grade 5A</i>	1.4469 (Superduplex) <i>A 890 Grade 5A</i>	DN 32 - 65 50 bar	DN 80 - 100 40 bar	DN 125 - 150 30 bar	DN 200 - 1000 20 bar	

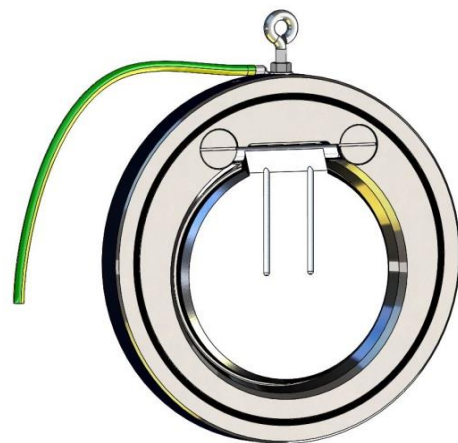
*1 max. zulässiger Druck hängt von der Temperatur ab / *max. allowable pressure is dependent on the temperature*

Nennweite <i>Nominal size</i>	Ø D* ² (Flanschanschluss / <i>Flange connection</i>)									L	Ø d	Ø D1	E	DR	Gewicht* ³ [kg] <i>Weight [kg]</i>
	PN 6	PN 10	PN 16	PN 25	PN 40	PN 63	ANSI 150	ANSI 300	JIS 10K						
DN 32	79	85	85	85	85	91	74	85,9	85	15	18	59	22	37	0,67
DN 40	89	95	95	95	95	106	83	98,6	91	16	22	72	25	43	0,85
DN 50	98	109	109	109	109	115	105	114,4	105	14	32	86	37	54	0,91
DN 65	118	129	129	129	129	140	124	133,7	124	14	40	109	50	70	1,24
DN 80	134	144	144	144	144	150	137	152,4	135	14	54	119	61	82	1,51
DN 100	154	164	164	170	170	176	175	184,5	160	18	70	146	77	106	2,44
DN 125	184	195	195	196	196	214	197	219,3	191	18	92	173	98	131	3,36
DN 150	209	220	220	226	226	251	222	254	220	20	112	197	120	159	4,71
DN 200	264	275	275	286	294	313	279	311,2	271	22	154	255	160	207	7,73
DN 250	319	330	331	344	356	368	340	365	330	26	192	312	190	260	13,3
DN 300	375	380	386	404	421	428	410	423	380	32	227	363	220	309	21
DN 350	425	440	446	461	478	490	451	489	424	38	266	416	250	341	33
DN 400	475	491	499	518	550	547	514	543,1	487	44	310	467	290	392	46,3
DN 450	530	541	558	568	575	-	549	600,3	541	52	350	520	340	442	67,3
DN 500	580	596	621	628	632	-	606	657,4	596	58	400	550	390	493	88,5
DN 600	681	698	738	735	751	-	718	777,7	698	62	486	660	470	594	128
DN 700	785	813	807	836	-	-	-	-	-	67	564	770	563	693	190
DN 800	893	920	914	945	-	-	-	-	-	78	622	-	680	795	292
DN 900	993	1020	1014	1045	-	-	-	-	-	95	720	-	750	889	412
DN 1000	1093	1127	1131	1159	-	-	-	-	-	105	810	-	840	991	550

*2 zur Realisierung der Flanschanschlussmaße können Flansch-Zentrierringe zum Einsatz kommen
in order to realise the flange connection diameters, flange center-rings may be used

*3 Gewicht bezieht sich auf Armatur passend für PN 10 - Flansche und kann je nach Ausführung geringfügig variieren.
weight refers to valve suitable for PN 10 flanges and may vary slightly, depending on design

Nennweite <i>Nominal size</i>	Kv-Wert <i>Kv value [m³/h]</i>	Öffnungsdruck [mbar] <i>Opening pressure</i>	
		↔	↑
DN 32	16,2	~ 2	~ 10
DN 40	22,2	~ 2	~ 10
DN 50	54	~ 2	~ 10
DN 65	75	~ 2	~ 10
DN 80	112	~ 2	~ 10
DN 100	172	~ 2	~ 10
DN 125	342	~ 2	~ 10
DN 150	490	~ 2	~ 10
DN 200	1128	~ 4	~ 14
DN 250	1500	~ 4	~ 14
DN 300	2290	~ 4	~ 14
DN 350	2890	~ 6	~ 18
DN 400	3700	~ 6	~ 18
DN 450	5000	~ 6	~ 18
DN 500	6550	~ 6	~ 24
DN 600	9500	~ 6	~ 26



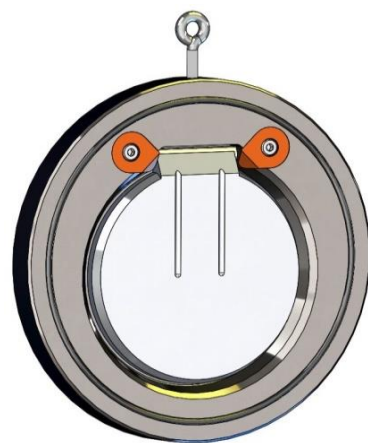
Mit angebrachtem Erdungskabel
With attached ground cable

Dichtung <i>Seal</i>	Ausführung <i>Design</i>	Temperaturbereich <i>Temperature range</i>	Leckrate* ⁴ <i>Leakage rate*⁴</i>
Metallisch* ⁵ <i>Metal seated*⁵</i>	ST-VA	-10 °C ... +400 °C	G
	VA-VA	-196 °C ... +400 °C	
	VA1-VA1	-273 °C ... +500 °C	
	AB-DU	-10 °C ... +250 °C	
	DU-DU	-10 °C ... +250 °C	
NBR* ⁶	-	-30 °C ... +100 °C	A
EPDM* ⁶	-	-65 °C ... +150 °C	A
FKM* ⁶	-	-30 °C ... +230 °C	A
PTFE* ⁶	-	-200 °C ... +250 °C	A

*⁴ nach EN 12266-1 / zum Erreichen der angegebenen Leckrate ist ein Gegendruck von mindestens 0,3 bar erforderlich
acc. to EN 12266-1 / in order to achieve the specified leakage rate, a back pressure of at least 0.3 bar is required

*⁵ metallisch dichtende Armaturen standardmäßig ohne O-Ringe im Gehäuse
metal seated valves are supplied without O-rings in body as standard

*⁶ Temperaturbereich ist bei einigen Ausführungen durch den Temperaturbereich der metallischen Teile zusätzlich eingeschränkt (s. Temperaturbereich für metallisch dichtend)
for some designs, the temperature range is additionally limited by the temperature range of the metallic parts (see temperature range for metal seated)



Verstärkte Klappenführung
"heavy duty"



Handnot (längere Baulänge)
Manual override (longer FTF)

Dichtungen für Armaturen bis einschließlich DN 300 standardmäßig mit folgenden Zulassungen / Konformitäten:

Seals for valves up to and including DN 300 comply with the following approvals / conformities:

NBR: DIN EN 549, BAM, REACH, RoHS, u.a.

EPDM: KTW UBA, DVGW W 270, WRAS, NSF, FDA, BfR XXI Kat. 4, ADI-frei, 3A, USP Cl. 6, BAM, REACH, RoHS, u.a

FKM: DIN EN 549, ADI-frei, REACH, RoHS, u.a

PTFE: KTW UBA, DVGW W 270, WRAS, FDA, BfR, ADI-frei, EU 10/2011, 3A, USP Cl. 6, REACH, RoHS, u.a

Druck-Temperatur-Zuordnung / Pressure-Temperature Ratings

ST-ST	Temperatur / Temperature [°C]				
	20	100	150	200	250
DN 32	40	40	40	40	40
DN 40	40	40	40	40	38,7
DN 50	25	25	22,8	20	17,9
DN 65	16	16	14,6	12,9	11,5
DN 80	16	14,4	13,2	12	10,8
DN 100	16	14,4	13,1	12	10,8
DN 125	16	16	14,9	13,1	11,7
DN 150	16	16	14,6	12,8	11,5
DN 200	16	16	14,9	13,1	11,7
DN 250	16	15,1	13,8	12,1	10,8
DN 300	16	16	16	15	13,4
DN 350	16	16	16	16	15,8
DN 400	16	16	15,8	13,9	12,4
DN 450	16	16	16	16	16
DN 500	16	16	16	16	16
DN 600	16	16	16	15,2	13,6

Druck / Pressure [bar]

ST-VA	Temperatur / Temperature [°C]							
	20	100	150	200	250	300	350	400
DN 32	40	40	40	40	40	40	40	40
DN 40	40	40	40	40	38,7	34,1	29,6	25
DN 50	25	25	22,8	20	17,9	15,8	13,7	11,6
DN 65	16	16	14,6	12,9	11,5	10,2	8,8	7,4
DN 80	16	15,6	14,2	12,5	11,2	9,9	8,6	7,2
DN 100	16	16	16	16	15,6	13,8	11,9	10,1
DN 125	16	14,3	12,7	11,4	10,4	9,7	9	7,6
DN 150	16	15	13,3	11,9	10,9	10,1	8,8	7,4
DN 200	16	16	11,6	10,4	9,5	8,8	8	7,6
DN 250	16	15,1	13,3	12	10,8	9,6	8,3	7
DN 300	16	13,2	11,6	10,4	9,5	8,9	8,5	8,1
DN 350	16	13,6	12	10,8	9,8	9,2	8,7	8,4
DN 400	16	13,2	11,7	10,5	9,6	8,9	8,5	8,2
DN 450	16	16	16	16	14,6	13,7	13	12,5
DN 500	16	16	16	16	16	16	16	16
DN 600	16	16	16	16	16	16	16	16

Druck / Pressure [bar]

VA-VA	Temperatur / Temperature [°C]							
	20	100	150	200	250	300	350	400
DN 32	40	40	40	40	40	40	40	40
DN 40	40	40	40	40	40	40	40	40
DN 50	40	40	39,9	35,9	32,7	30,6	29,1	27,9
DN 65	30	26,9	23,7	21,3	19,4	18,2	17,3	16,6
DN 80	20	18,5	16,4	14,7	13,4	12,5	11,9	11,4
DN 100	20	20	20	18,1	16,5	15,4	14,7	14,1
DN 125	16	14,3	12,7	11,4	10,4	9,7	9,2	8,8
DN 150	16	12,9	11,4	10,2	9,3	8,7	8,3	8
DN 200	16	13,1	11,6	10,4	10	8,8	8,4	8,1
DN 250	16	13,1	11,5	10,4	9,5	8,8	8,4	8,1
DN 300	16	13,2	11,6	10,4	9,5	8,9	8,5	8,1
DN 350	16	13,6	12	10,8	9,8	9,2	8,7	8,4
DN 400	16	13,2	11,7	10,5	9,6	8,9	8,5	8,2
DN 450	16	16	16	16	14,6	13,7	13	12,5
DN 500	16	16	16	16	16	16	16	16
DN 600	16	16	16	16	16	16	16	16

Druck / Pressure [bar]

VA1-VA1	Temperatur / Temperature [°C]								
	20	100	150	200	250	300	350	400	500
DN 32	50	50	50	50	50	50	50	50	50
DN 40	50	50	50	50	50	50	50	50	50
DN 50	50	50	50	50	50	49,9	49,9	49,9	47,9
DN 65	40	34,8	32,6	31	30,5	29,7	29,7	29,7	28,5
DN 80	30	30	29,6	28,2	27,7	27	27	27	25,9
DN 100	25	25	25	25	25	25	25	25	25
DN 125	25	25	25	25	25	24,3	24,3	24,3	23,4
DN 150	25	25	20,1	19,2	18,8	18,3	18,3	18,3	17,6
DN 200	20	19,7	18,4	17,6	17,2	16,8	16,8	16,8	16,1
DN 250	20	20	16,1	15,3	15	14,7	14,7	14,7	14,1
DN 300	20	20	19,1	18,2	17,9	17,4	17,4	17,4	16,7
DN 350	20	20	21,8	20,7	20,4	19,8	19,8	19,8	19
DN 400	20	18,2	17,1	16,2	16	15,5	15,5	15,5	14,9
DN 450	20	20	20	20	20	20	20	20	20
DN 500	20	20	20	20	20	20	20	20	19,8
DN 600	20	19,1	17,8	17	17	16,2	16,2	16,2	15,6

Druck / Pressure [bar]

AB-DU	Temperatur / Temperature [°C]				
	20	100	150	200	250
DN 32	40	40	40	40	40
DN 40	40	40	40	40	40
DN 50	40	40	40	40	40
DN 65	30	30	30	30	30
DN 80	30	30	30	30	30
DN 100	30	14,4	13,1	12	10,8
DN 125	30	30	30	27,9	25,4
DN 150	20	20	20	20	20
DN 200	20	20	20	20	20
DN 250	20	20	20	20	20
DN 300	20	20	20	20	20
DN 350	10	10	10	10	10
DN 400	10	10	10	10	10
DN 450	10	10	10	10	10
DN 500	10	10	10	10	10
DN 600	10	10	10	10	10

Druck / Pressure [bar]

DU-DU	Temperatur / Temperature [°C]				
	20	100	150	200	250
DN 32	50	50	50	50	50
DN 40	50	50	50	50	50
DN 50	50	50	50	50	50
DN 65	50	50	50	50	47,5
DN 80	40	40	39,3	36	32,8
DN 100	40	40	40	40	40
DN 125	30	30	30	27,9	25,4
DN 150	30	30	27	25,1	22,8
DN 200	20	20	20	20	20
DN 250	20	20	20	20	20
DN 300	20	20	20	20	20
DN 350	20	20	20	20	20
DN 400	20	20	20	20	20
DN 450	20	20	20	20	20
DN 500	20	20	20	20	20
DN 600	20	20	20	20	20

Druck / Pressure [bar]

Nennweite DN 32 - 400 / größere Nennweiten auf Anfrage
Nominal sizes 1 1/2" - 16" / bigger sizes on request

Flansanschluss DIN EN 1092-1 B1, PN 6 - 63
Flange connection ASME B16.5 / ANSI Class 150 - 300
JIS B2220, 10K

Baulänge Kurze Baulänge
FTF (face-to-face) Short installation length

Temperaturbereich -200 °C bis +450 °C (werkstoffabhängig)
Temperature range -200 °C to +450 °C (depending on the materials)

Sonderoptionen Reinigung: öl- und fettfrei / silikonfrei / LABS-frei
Special options Cleaning: free of oil and grease / silicone / PWIS

Höhere Temperaturen auf Anfrage

Higher temperature on request

Handnotbetätigung

Manual override

Vverbesserte Klappenführung (heavy duty)

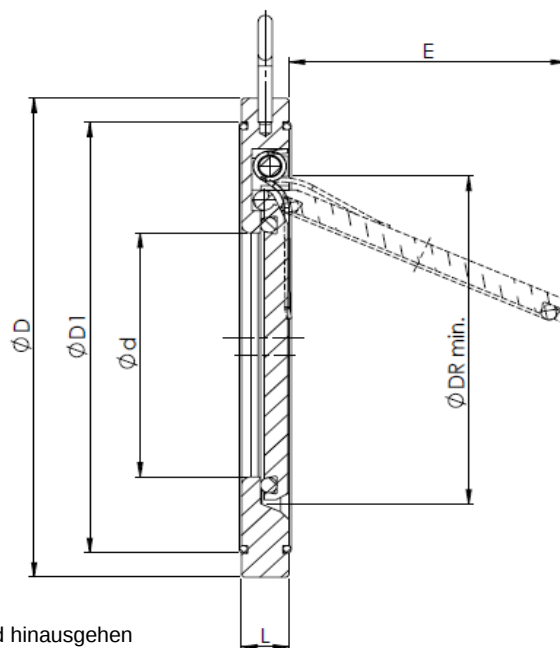
Strengthened disc support (heavy duty execution)

Dichtungen mit zusätzlichen Zulassungen, die über den Standard hinausgehen

Seals with additional approvals which go beyond the standard

Vakuumausführung (ab <0,1 bar absolut empfehlen wir, das Dichtelement einzukleben)

Vacuum version (from <01, bar absolute we recommend to glue in the sealing element)



Ausführung <i>Design</i>	Gehäuse <i>Body</i>	Klappe <i>Disc</i>	Feder <i>Spring</i>	Max. zulässiger Druck* ¹ <i>Max. allowable pressure*¹</i>				
ST-ST	1.0460, verzinkt <i>A 105, zinc plated</i>	1.0619 / 1.0460, verzinkt <i>A 216 WCB / A 105, zinc plated</i>	1.4571 <i>AISI 316 Ti</i>	DN 32 - 40 40 bar		DN 50 25 bar	DN 65 - 400 16 bar	
ST-VA	1.0460, verzinkt <i>A 105, zinc plated</i>	1.4408 <i>A 351 CF8M</i>	1.4571 <i>AISI 316 Ti</i>	DN 32 - 40 40 bar		DN 50 25 bar	DN 65 - 400 16 bar	
VA-VA	1.4408 <i>A 351 CF8M</i>	1.4408 <i>A 351 CF8M</i>	1.4571 <i>AISI 316 Ti</i>	DN 32 - 50 40 bar	DN 65 30 bar	DN 80 - 100 20 bar	DN 125 - 400 16 bar	
VA1-VA1	1.4571 <i>AISI 316 Ti</i>	1.4571 <i>AISI 316 Ti</i>	1.4571 <i>AISI 316 Ti</i>	DN 32 - 50 50 bar	DN 65 40 bar	DN 80 30 bar	DN 100 - 150 25 bar	DN 200 - 400 20 bar
AB-DU	CC333G (2.0975) <i>C958</i>	1.4469 (Superduplex) <i>A 890 Grade 5A</i>	Hastelloy C4 <i>(2.4610)</i>	DN 32 - 50 40 bar	DN 65 - 125 30 bar	DN 150 - 300 20 bar	DN 350 - 400 10 bar	
DU-DU	1.4469 (Superduplex) <i>A 890 Grade 5A</i>	1.4469 (Superduplex) <i>A 890 Grade 5A</i>	Hastelloy C4 <i>(2.4610)</i>	DN 32 - 65 50 bar	DN 80 - 100 40 bar	DN 125 - 150 30 bar	DN 200 - 400 20 bar	

*1 max. zulässiger Druck hängt von der Temperatur ab / max. allowable pressure depends on temperature

Nennweite <i>Nominal size</i>	Ø D* ² (Flansanschluss / <i>Flange connection</i>)									L	Ø d	Ø D1	E	DR	Gewicht* ³ [kg] <i>Weight [kg]</i>
	PN 6	PN 10	PN 16	PN 25	PN 40	PN 63	ANSI 150	ANSI 300	JIS 10K						
DN 32	79	85	85	85	85	-	74	85	85	15	18	59	22	37	0,67
DN 40	89	95	95	95	95	106	83	98,6	91	16	22	72	25	43	0,85
DN 50	98	109	109	109	109	115	105	114,4	105	14	32	86	37	54	0,91
DN 65	118	129	129	129	129	140	124	133,7	124	14	40	109	50	70	1,23
DN 80	134	144	144	144	144	150	137	152,4	135	14	54	119	61	82	1,5
DN 100	154	164	164	170	170	176	175	184,5	160	18	70	146	77	106	2,42
DN 125	184	195	195	196	196	214	197	219,3	191	18	92	173	98	131	3,34
DN 150	209	220	220	226	226	251	222	254	220	20	112	197	120	159	4,61
DN 200	264	275	275	286	294	313	279	311,2	271	22	154	255	160	207	7,68
DN 250	319	330	331	344	356	368	340	365	330	26	192	312	190	260	13,4
DN 300	375	380	386	404	421	428	410	423	380	32	227	363	220	309	21
DN 350	425	440	446	461	478	490	451	489	424	38	266	416	250	341	33
DN 400	475	491	499	518	550	547	514	543,1	487	44	310	467	290	392	46

*2 Zur Realisierung der Flansanschlussmaße können Flansch-Zentrierringe zum Einsatz kommen.

In order to realise the flange connection diameters, flange center-rings may be used.

*3 Gewicht bezieht sich auf Armatur passend für PN 10 - Flansche und kann je nach Ausführung geringfügig variieren.

Weight refers to valve suitable for PN 10 flanges and could vary slightly, depending on design.

Nennweite Size	KV-Wert Kv-value [m³/h]	Öffnungsdruck [mbar] Opening pressure	
		↔	↑
DN 32	16,2	~ 15	~ 25
DN 40	22,2	~ 15	~ 25
DN 50	54	~ 15	~ 25
DN 65	75	~ 15	~ 25
DN 80	112	~ 15	~ 25
DN 100	172	~ 15	~ 25
DN 125	342	~ 15	~ 25
DN 150	490	~ 15	~ 25
DN 200	1.128	~ 17	~ 25
DN 250	1.500	~ 17	~ 25
DN 300	2.290	~ 17	~ 25
DN 350	2.890	~ 18	~ 27
DN 400	3.700	~ 18	~ 28

Dichtung Seal	Ausführung Design	Temperaturbereich Temperature range	Leckrate ^{*4} Leakage rate ^{*4}
Metallisch ^{*5} Metal seated ^{*5}	ST-VA	-10 °C ... +300 °C ^{*6}	G
	VA-VA	-196 °C ... +300 °C ^{*7}	
	VA1-VA1	-200 °C ... +300 °C ^{*8}	
	AB-DU	-10 °C ... +250 °C	
	DU-DU	-10 °C ... +250 °C	
NBR ^{*9}	-	-30 °C ... +100 °C	A
EPDM ^{*9}	-	-65 °C ... +150 °C	A
FKM ^{*9}	-	-30 °C ... +230 °C	A
PTFE ^{*9}	-	-200 °C ... +250 °C	A

*4 nach EN 12266-1 / zum Erreichen der angegebenen Leckrate ist ein Gegendruck von mindestens 0,3 bar erforderlich
acc. to EN 12266-1 / in order to achieve the specified leakage rate, a back pressure of at least 0.3 bar is required

*5 Bei metallisch dichtender Ausführung wird die Armatur standardmäßig ohne O-Ringe im Gehäuse geliefert.
Metal seated valves are supplied without O-rings in body as standard.

*6 optional mit Feder aus Hastelloy C4: -10 °C bis +450 °C
optional with spring made of Hastelloy C4: -10 °C to +450 °C

*7 optional mit Feder aus Hastelloy C4: -100 °C bis +400 °C
optional with spring made of Hastelloy C4: -100 °C to +400 °C

*8 optional mit Feder aus Hastelloy C4: -100 °C bis +450 °C
optional with spring made of Hastelloy C4: -100 °C to +450 °C

*9 Der Temperaturbereich ist bei einigen Ausführungen durch den Temperaturbereich der metallischen Teile zusätzlich eingeschränkt (s. Temperaturbereich für metallisch dichtend).
For some designs, the temperature range is additionally limited by the temperature range of the metallic parts (see temperature range for metal seated).

Dichtungen für Armaturen bis einschließlich DN 300 standardmäßig mit folgenden Zulassungen / Konformitäten:
Seals for valves up to and including DN 300 comply with the following approvals / conformities:

NBR: DIN EN 549, BAM, REACH, RoHS, u.a.

EPDM: KTW UBA, DVGW W 270, WRAS, NSF, FDA, BfR XXI Kat. 4, ADI-frei, 3A, USP Cl. 6, BAM, REACH, RoHS, u.a

FKM: DIN EN 549, ADI-frei, REACH, RoHS, u.a

PTFE: KTW UBA, DVGW W 270, WRAS, FDA, BfR, ADI-frei, EU 10/2011, 3A, USP Cl. 6, REACH, RoHS, u.a



Standard
Standard



Verstärkte Klappenführung
"heavy duty"



Handnot (längere Baulänge)
Manual override (longer FTF)

Druck-Temperatur-Zuordnung / Pressure-Temperature Ratings

ST-ST	Temperatur / Temperature [°C]				
	20	100	150	200	250
DN 32	40	40	40	40	40
DN 40	40	40	40	40	38,7
DN 50	25	25	22,8	20	17,9
DN 65	16	16	14,6	12,9	11,5
DN 80	16	14,4	13,2	12	10,8
DN 100	16	14,4	13,1	12	10,8
DN 125	16	16	14,9	13,1	11,7
DN 150	16	16	14,6	12,8	11,5
DN 200	16	16	14,9	13,1	11,7
DN 250	16	15,1	13,8	12,1	10,8
DN 300	16	16	16	15	13,4
DN 350	16	16	16	16	15,8
DN 400	16	16	15,8	13,9	12,4

Druck / Pressure [bar]

ST-VA	Temperatur / Temperature [°C]							
	20	100	150	200	250	300	350* ⁷	400* ⁷
DN 32	40	40	40	40	40	40	40	40
DN 40	40	40	40	40	38,7	34,1	29,6	25
DN 50	25	25	22,8	20	17,9	15,8	13,7	11,6
DN 65	16	16	14,6	12,9	11,5	10,2	8,8	7,4
DN 80	16	15,6	14,2	12,5	11,2	9,9	8,6	7,2
DN 100	16	16	16	16	15,6	13,8	11,9	10,1
DN 125	16	14,3	12,7	11,4	10,4	9,7	9	7,6
DN 150	16	15	13,3	11,9	10,9	10,1	8,8	7,4
DN 200	16	16	11,6	10,4	9,5	8,8	8	7,6
DN 250	16	15,1	13,3	12	10,8	9,6	8,3	7
DN 300	16	13,2	11,6	10,4	9,5	8,9	8,5	8,1
DN 350	16	13,6	12	10,8	9,8	9,2	8,7	8,4
DN 400	16	13,2	11,7	10,5	9,6	8,9	8,5	8,2

Druck / Pressure [bar]

VA-VA	Temperatur / Temperature [°C]							
	20	100	150	200	250	300	350* ⁷	400* ⁷
DN 32	40	40	40	40	40	40	40	40
DN 40	40	40	40	40	40	40	40	40
DN 50	40	40	39,9	35,9	32,7	30,6	29,1	27,9
DN 65	30	26,9	23,7	21,3	19,4	18,2	17,3	16,6
DN 80	20	18,5	16,4	14,7	13,4	12,5	11,9	11,4
DN 100	20	20	20	18,1	16,5	15,4	14,7	14,1
DN 125	16	14,3	12,7	11,4	10,4	9,7	9,2	8,8
DN 150	16	12,9	11,4	10,2	9,3	8,7	8,3	8
DN 200	16	13,1	11,6	10,4	10	8,8	8,4	8,1
DN 250	16	13,1	11,5	10,4	9,5	8,8	8,4	8,1
DN 300	16	13,2	11,6	10,4	9,5	8,9	8,5	8,1
DN 350	16	13,6	12	10,8	9,8	9,2	8,7	8,4
DN 400	16	13,2	11,7	10,5	9,6	8,9	8,5	8,2

Druck / Pressure [bar]

VA1-VA1	Temperatur / Temperature [°C]								
	20	100	150	200	250	300	350*7	400*7	500*7
DN 32	50	50	50	50	50	50	50	50	50
DN 40	50	50	50	50	50	50	50	50	50
DN 50	50	50	50	50	50	49,9	49,9	49,9	47,9
DN 65	40	34,8	32,6	31	30,5	29,7	29,7	29,7	28,5
DN 80	30	30	29,6	28,2	27,7	27	27	27	25,9
DN 100	25	25	25	25	25	25	25	25	25
DN 125	25	25	25	25	25	24,3	24,3	24,3	23,4
DN 150	25	25	20,1	19,2	18,8	18,3	18,3	18,3	17,6
DN 200	20	19,7	18,4	17,6	17,2	16,8	16,8	16,8	16,1
DN 250	20	20	16,1	15,3	15	14,7	14,7	14,7	14,1
DN 300	20	20	19,1	18,2	17,9	17,4	17,4	17,4	16,7
DN 350	20	20	21,8	20,7	20,4	19,8	19,8	19,8	19
DN 400	20	18,2	17,1	16,2	16	15,5	15,5	15,5	14,9

Druck / Pressure [bar]

*7 Bei Temperaturen über 300°C Druckfeder aus Hastelloy C4 erforderlich (Tieftemperaturgrenze: -100°C).

Temperatures above 300°C require spring material Hastelloy C4 (low temperature limit: -100°C).

AB-DU	Temperatur / Temperature [°C]				
	20	100	150	200	250
DN 32	40	40	40	40	40
DN 40	40	40	40	40	40
DN 50	40	40	40	40	40
DN 65	30	30	30	30	30
DN 80	30	30	30	30	30
DN 100	30	14,4	13,1	12	10,8
DN 125	30	30	30	27,9	25,4
DN 150	20	20	20	20	20
DN 200	20	20	20	20	20
DN 250	20	20	20	20	20
DN 300	20	20	20	20	20
DN 350	10	10	10	10	10
DN 400	10	10	10	10	10

Druck / Pressure [bar]

DU-DU	Temperatur / Temperature [°C]				
	20	100	150	200	250
DN 32	50	50	50	50	50
DN 40	50	50	50	50	50
DN 50	50	50	50	50	50
DN 65	50	50	50	50	47,5
DN 80	40	40	39,3	36	32,8
DN 100	40	40	40	40	40
DN 125	30	30	30	27,9	25,4
DN 150	30	30	27	25,1	22,8
DN 200	20	20	20	20	20
DN 250	20	20	20	20	20
DN 300	20	20	20	20	20
DN 350	20	20	20	20	20
DN 400	20	20	20	20	20

Druck / Pressure [bar]

Operating instruction

Swing check valve

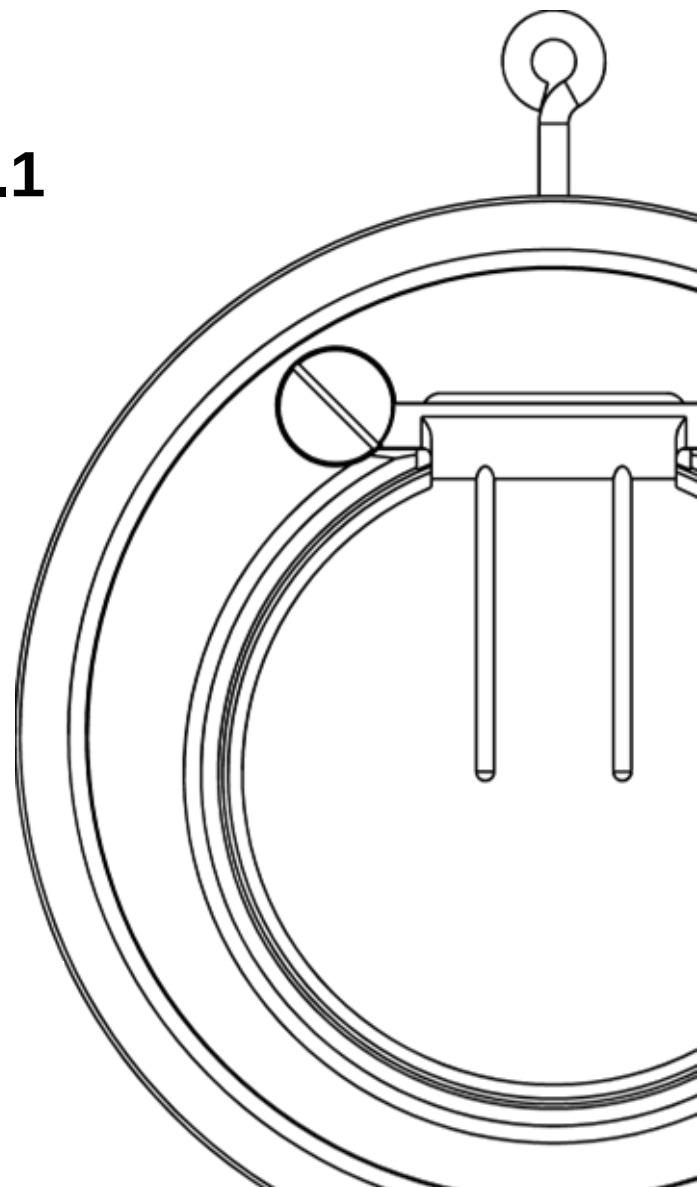
Product line

ZRK / ZRKF / 920 / 925.1

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Read carefully before use.
Keep for future use.
We reserve the right to make technical changes.



EN
Englisch

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Swing check valve

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1 PREFACE

This operating instruction supports the user in the appropriate, safe and economical use of the following valves:

- Swing check valves of the product line ZRK, ZRKF, 920 and 925.1

1.1 General

These operating instructions apply to all the above-mentioned valves. To guarantee safe and smooth use, the entire manual must be read and understood before installation and commissioning. These instructions are intended to assist the user during installation, operation, maintenance and removal. In addition to the instructions in this manual, all applicable accident prevention regulations, safety rules, country-specific or system-specific regulations and instructions must be observed. These operating instructions are an essential part of the valve and must be kept available by the operator at the place of use, also for a later use.

1.2 Target group

This instruction is intended for any person who is involved in work of any kind on the valve. In particular, the operating instructions are intended for trained and qualified personnel.

1.2.1 Personnel qualification

All work on the valve must be carried out by qualified personnel only. If the personnel do not have the required qualifications, they have to be trained. This must be ensured by the operator. Persons without the required knowledge and skills are not permitted to work on the valve.

1.3 Applicable documents

This includes the corresponding data sheet and the declaration of conformity of the above mentioned valves. If necessary, these are to be requested from the manufacturer or downloaded from the website.

1.4 Warranty

AWS Apparatebau Arnold GmbH does not assume any warranty in case the operator or third parties:

- disregard this document.
- do not use the valve properly.
- should carry out interventions of any kind (conversions, modifications, etc.) on the valve.

Malfunctions due to pollution or wear of the valve as well as wearing parts (e.g. seals) are not covered by the warranty.

2 SAFETY INSTRUCTIONS

2.1 Warnings

The following warnings are used in this manual. In order to protect you from accidents, injuries and damage to property, it is important to read and observe these warnings.

	DANGER High risk Indicates an immediate danger. If not avoided, death or serious injury will result.
	WARNING Medium risk Indicates a potentially dangerous situation. If not avoided, death or serious injury may result.
	CAUTION Low risk Indicates a potentially dangerous situation. If it is not avoided, minor or slight injuries may result.
	NOTICE Commandment Indicates a potentially harmful situation. If not avoided, property damage may result.

2.2 Intended use

AWS valves may only be used within the approved pressure and temperature limits, considering chemical and corrosive influences. The valves are not suitable for fluids containing solids. Intended use includes observing and following the instructions in this manual. Modifications, conversions or any use of the valve other than the intended use are considered to be improper use.

2.3 Requirements of the user

It is the responsibility of the planner/installer and operator to ensure that:

- the valve is used as described in chapter 2.2 *Intended use*.
- the piping system is properly installed and its proper functioning is regularly checked.
- only qualified personnel are used for installation, removal and maintenance.
- the valve is only professionally installed if it is in perfect condition.
- the operating instruction are taken into account by the personnel.
- personnel receive regular instruction in industrial safety and environmental protection (especially for pressurized pipes).

2.4 General safety instructions

The same regulations apply to all valves as to pipeline systems in which they are installed. The national and international regulations with regard to accident prevention as well as safety regulations must be observed by the operator.

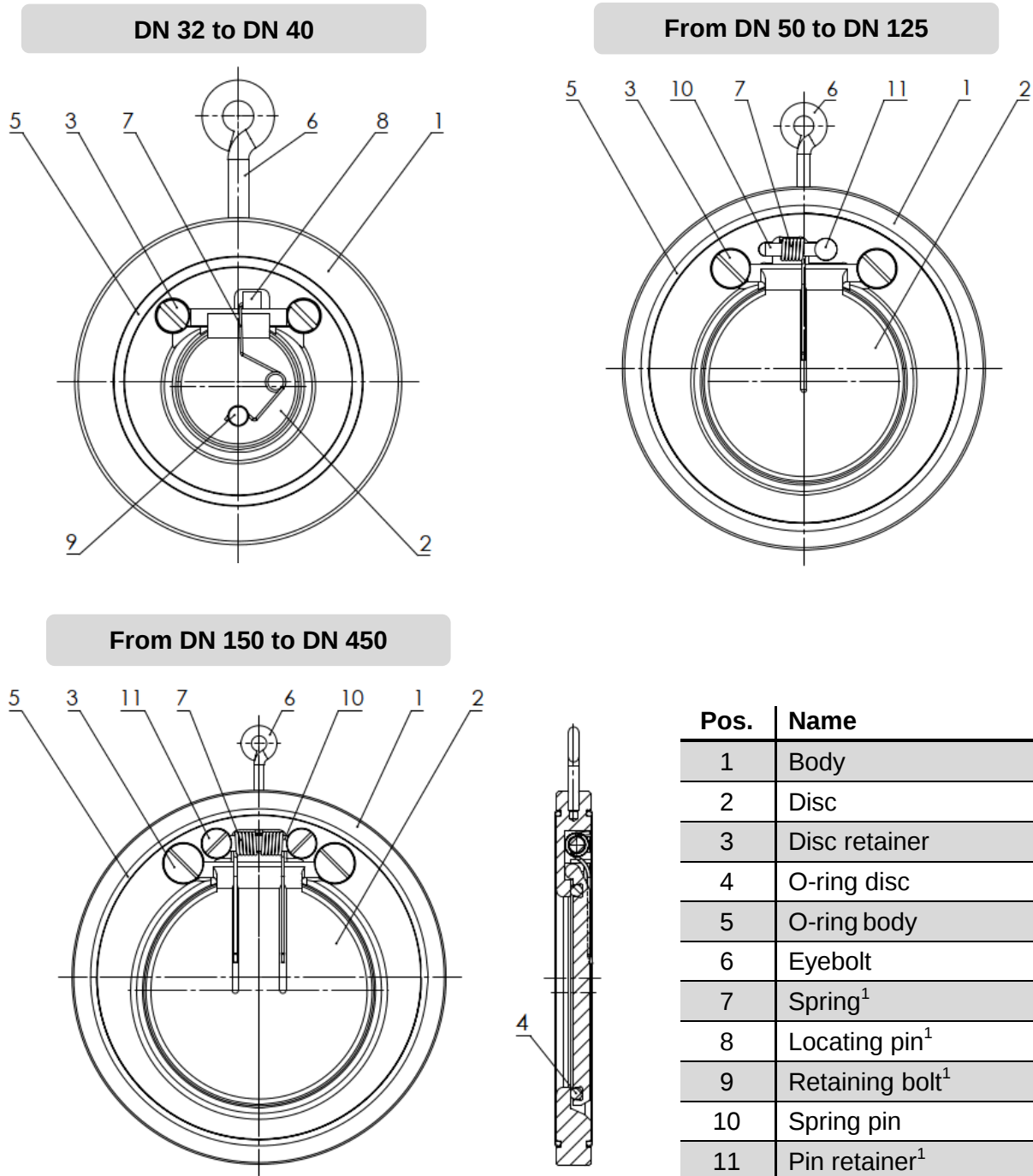
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	CAUTION
	Risk of minor injuries ▪ Wear protective gloves during installation, removal and maintenance to avoid injuries from cuts on sharp-edged components. ▪ Always secure the valve adequately during transport, installation and removal.
	NOTICE
	Notice of property damage ▪ The valve and the system can be damaged if the valve is not installed correctly. ▪ Do not subject the valve to pressure surges; otherwise the valve may be damaged.

3 VALVE DESCRIPTION

The illustrations are exemplary for the design of the valves. All further information can be found in the data sheets of the relevant product line.

The following illustration describes the product line ZRKF:



¹ Components only available in the product lines ZRKF and 920-with spring return.

² Only available in soft-sealing version.

The design of the specified product series (ZRK/ZRKF/920/925.1) differs only slightly from each other. The illustration lists all components of the valves.

3.1 Product lines

Product line	Characteristics
ZRK 	- From DN 32 to DN 1000. - Without spring return. Centering via the outer diameter of the valve.
ZRKF 	- From DN 32 to DN 600. - With spring return. - Centering via the outer diameter of the valve.
920 	- From DN 32 to DN 600. - Plastic version. - With and without spring return. - Centering via the outer diameter of the valve.
925.1 	- From DN 50 to DN 200. - Plastic version. - Centering via the outer diameter of the valve.

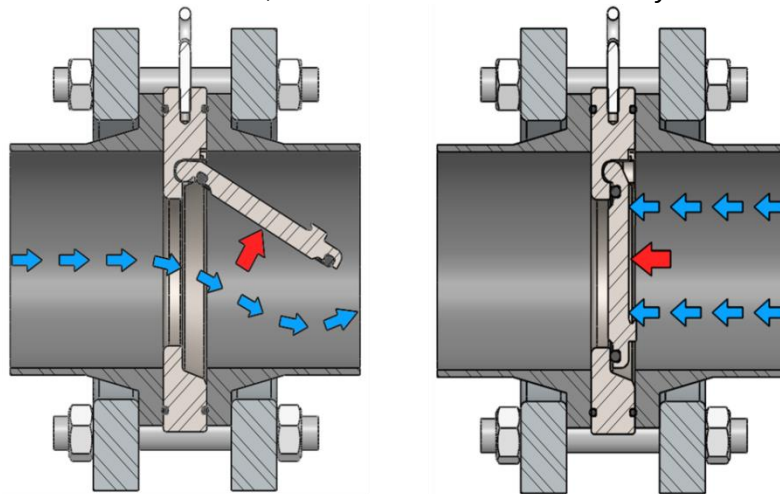
3.2 Intended use

Check valves are valves used for backflow prevention in piping systems. AWS check valves are characterized by their simple design as well as their short construction. They are designed for direct installation between connecting flanges.

The mentioned swing check valves are suitable for industrial use in pipeline systems for the transport of liquid and gaseous fluids. The valves are not suitable for solids. According to directive 2014/68/EU (Pressure Equipment Directive) they are suitable for all fluids of group 1 and 2.

3.3 Description of function

Swing check valves are medium-controlled backflow preventers and open when the opening force of the medium is greater than the closing force of the disc. In case of failure (e.g. pump failure) or backflow of the medium, the valve closes automatically.



Intermediate flange - check valve in fully opened and closed condition

3.4 Pressure test of the valve

The valve is leak-tested at the factory with air or water. Therefore the following warnings must be observed:

	CAUTION
	Residues on the valve ▪ Residues of the test medium may still be left on the contact surfaces of the valve. ▪ Be aware of possible reactions with the operating medium.

During a system pressure test of the system, the following warning must be observed:

	WARNING
	Excess pressure of the valve ▪ In a system pressure test of the system, the pressure must not exceed 1.5 times the max. permissible pressure PS of the valve.

3.5 Scope of delivery

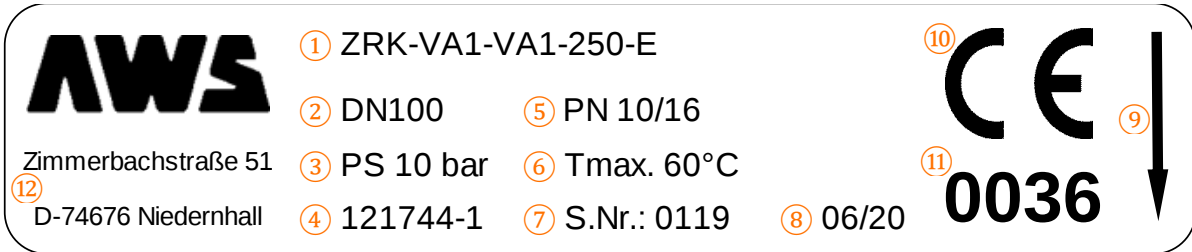
The valve is supplied ready for installation.

For valves with the add-on option S79, an additional grounding cable is included in the scope of delivery.

4 TYPE PLATE

A type plate is attached to each valve. The characteristics of the valve are listed on it. The following figure shows the structure of such a type plate.

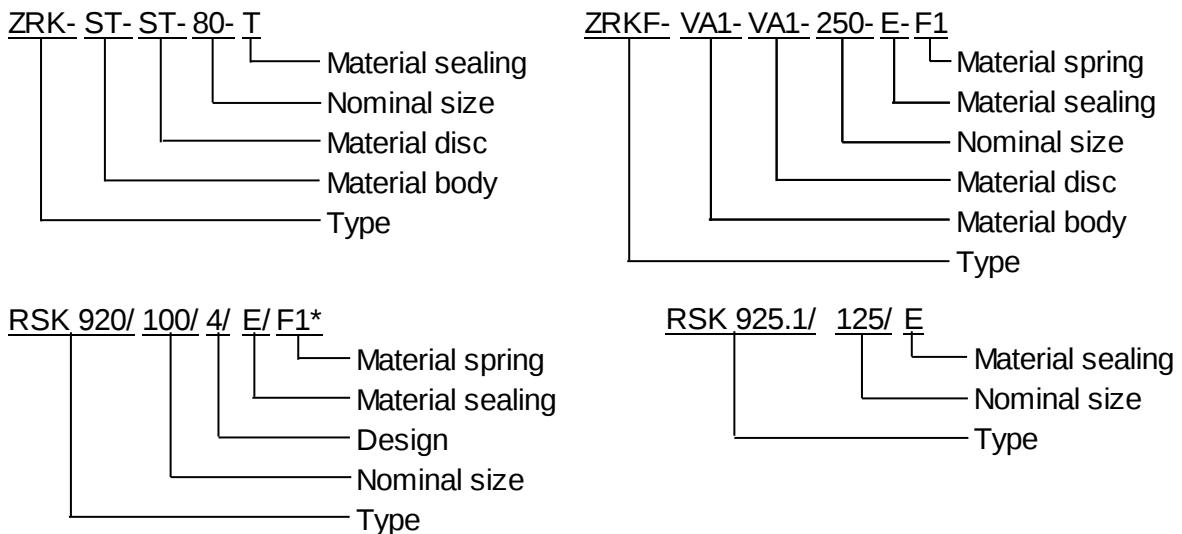
Structure of a type plate of the ZRK product line:



- | | |
|---------------------------|------------------------------------|
| ① Article description | ⑦ Serial number |
| ② Nominal size | ⑧ Manufacturing Date |
| ③ Pressure range | ⑨ Flow direction |
| ④ Commission number | ⑩ CE-marking |
| ⑤ Flange connection | ⑪ Number of the notified authority |
| ⑥ Max. medium temperature | ⑫ Address of the manufacturer |

4.1 Article description breakdown

The following breakdown is an example of a standard valve for illustrative purposes.



*Spring only included in RSK 920 with spring return.

4.2 Type code

The type code of the valves is structured as follows:

	DN		Material			
Type	Nominal size	Design	Body	Disc	Spring*	Sealing
ZRK	32 – 1000	ST-ST	ST = 1.0619, zinc plated	ST = 1.0619, zinc plated	F1 = 1.4571	M = Metal seated N = NBR E = EPDM F = FKM (Viton) T = PTFE
ZRKF	32 – 600	VA-VA	VA = 1.4408	VA = 1.4408	F2 = Hastelloy C4	
		VA1-VA1	VA1 = 1.4571	VA1 = 1.4571		
		AB-DU	AB = 2.0975	DU = 1.4469		
		DU-DU	DU = 1.4469	DU = 1.4469		

	DN		Material			
Type	Nominal size	Design	Body	Disc	Spring*	Sealing
920	32 – 600	4	PVC-U	PVC-U	F1 = 1.4571	M = Metal seated N = NBR E = EPDM F = FKM (Viton) T = PTFE
		4.1	PVC-C	PVC-C	F2 = Hastelloy C4	
		5	PP-H	PP-H		
		8	PVDF	PVDF		

Type	DN	Material		
	Nominal size	Body	Disc	Sealing
925.1	50 – 200	PVC-U	PVC-U	E = EPDM

*Spring only available in ZRKF / 920 with spring return

5 STORAGE AND TRANSPORT

The valve is delivered in a ready-to-use condition. When storing and transporting the valve, there are some guidelines that the user must follow to guarantee proper functioning of the valve.

Storage:

- The valve must be stored in the original packaging in closed rooms.
- During storage, the valve must be protected from harmful influences (e.g. moisture or dirt).
- Valves with sealing elements made of organic materials (e.g. EPDM) must be stored away from sunlight and UV light to prevent faster aging.
- During storage the valve must be protected against mechanical damage. Special attention must be paid to the protection of the connection and sealing surfaces.
- To achieve short storage times, existing stocks should be used first (first in - first out).
- In the case of long storage periods, the seals may have aged considerably, which can lead to malfunctions.

Transport:

- During transport, the same guidelines apply as for storage.
- When transporting over long periods, the valve must be transported in a suitable packaging to protect it from mechanical damage and corrosion.
- For valves with a large nominal size, which cannot be moved manually, the appropriate sling must be used.
- Only use slings on the body or on the eyebolt of the valve, not on the internal parts.

	NOTICE Transport of large swing check valves Especially with large swing check valves (>DN100), care during unpacking and transport must be taken to ensure that the swing check valve is held horizontally. It should only be possible to open the disc upwards. This prevents the disc from opening quickly due to its weight and being damaged in the process.
---	--



Correct handling



Incorrect handling

6 INSTALLATION

The operator of the system is generally responsible for the dimensioning of the piping and the installation of the valve. The function can be affected by planning and installation errors.

6.1 Prepare installation

Before installation, the following steps must be followed:

- Remove the valve from the packaging.
- Check complete valve for transport damage.
- Check the mobility of the discs.
- In case of damage contact the manufacturer.
- Damaged valves / components must not be installed.

	DANGER
	Accident prevention measures before installation ▪ Pipelines of the system must be pressureless. ▪ Ensure that pipelines and valve have cooled down to lukewarm. ▪ System must be free of hazardous media. ▪ System must be switched off and secured against switching on again. ▪ If necessary, use the suitable protective equipment.

	DANGER
	Incorrectly connected valve ▪ Installation of the valve may only be carried out by qualified personnel. ▪ Flow direction arrow of the valve must match the flow direction of the pipeline. ▪ Only valves whose pressure class, chemical resistance, connection and dimensions correspond to the operating conditions may be installed. ▪ Valve may only be used within the intended operating limits. ▪ Pipelines must be emptied and cleaned if necessary.

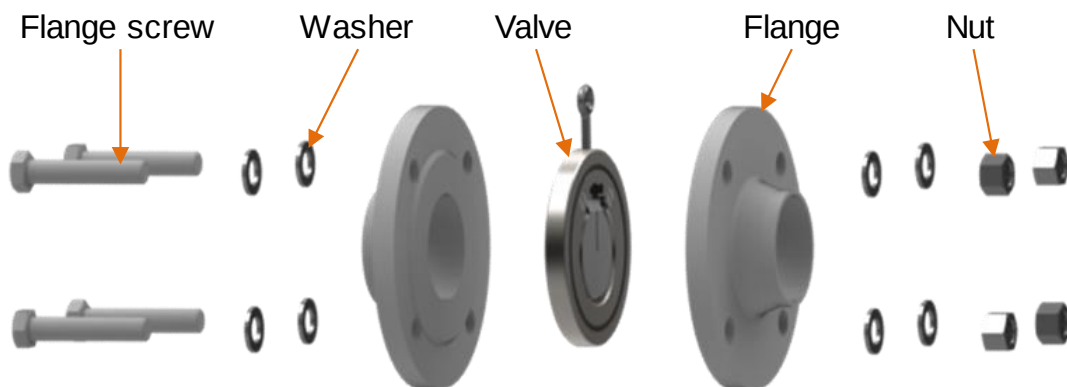
	WARNING
	Hoist for moving large valves ▪ Lifting equipment may only be used by the personnel instructed in it. ▪ The appropriate sling must be used for the valve. ▪ The lifting capacity of the hoist and sling must be designed for at least the total weight of the valve. ▪ Ensure that there are no persons under suspended load.

	NOTICE
	Instructions for installing the valve
	▪ The system must be clean and free of contaminants at the point of installation (flanges). Special attention must be paid to the sealing surfaces. ▪ It must be ensured that a calming distance of 5 x DN (see 6.2 <i>Installation instruction; calming distance</i>) is available before and after the valve. ▪ Do not install directly on the pump flange. ▪ For large valves that can no longer be moved manually, use a hoist.

6.2 Installation instruction

When installing the valve, the following steps must be observed:

- Place one washer on each of the flange screws.
- Insert two flange screws through the lower flange holes; these can serve as a support in the installation position with horizontal flow. From the other side, place one washer on each flange bolt and fasten one nut on each of them.
- For metal seated valves (without body O-rings), the operator is responsible for providing a suitable flange sealing. This must be centered with the valve between the flanges.
- Insert the valve between the flanges using the eyebolt. Observe the installation instruction according to the flow direction, see following page.
- When installed in a horizontal pipeline, the valve can be placed on the two flange screws.
- Insert remaining flange screws into the flange holes.
- Place remaining washers on the flange screws from the other side.
- Place the remaining nuts on the flange screws and tighten them lightly.
- Center the valve between the flanges using the eyebolt.
- Tighten the flange screws crosswise with the appropriate tightening torque (for guide values, see table: *Tightening torques of the flange connection*).



Tightening torques of the flange connection

The tightening torques given below are to be understood as guide values, as they depend on various factors, such as the material and strength class of the screws or the used flange sealing (for metal-seated valves).

Screw	Tightening torque [Nm]	
	Plastic* ¹	Metallic* ²
M12	20	50
M16	35	130
M20	60	250
M24	100	420
M27	165	600

*¹ Refers to swing check valves or piping made of plastic.

*² Refers to swing check valves or piping made of metallic materials.

The valve can be installed for flow directions in horizontal as well as vertical direction. Observe the following instruction, which apply to horizontal and vertical flow directions, to guarantee an optimal function.

Installation instruction for horizontal flow direction

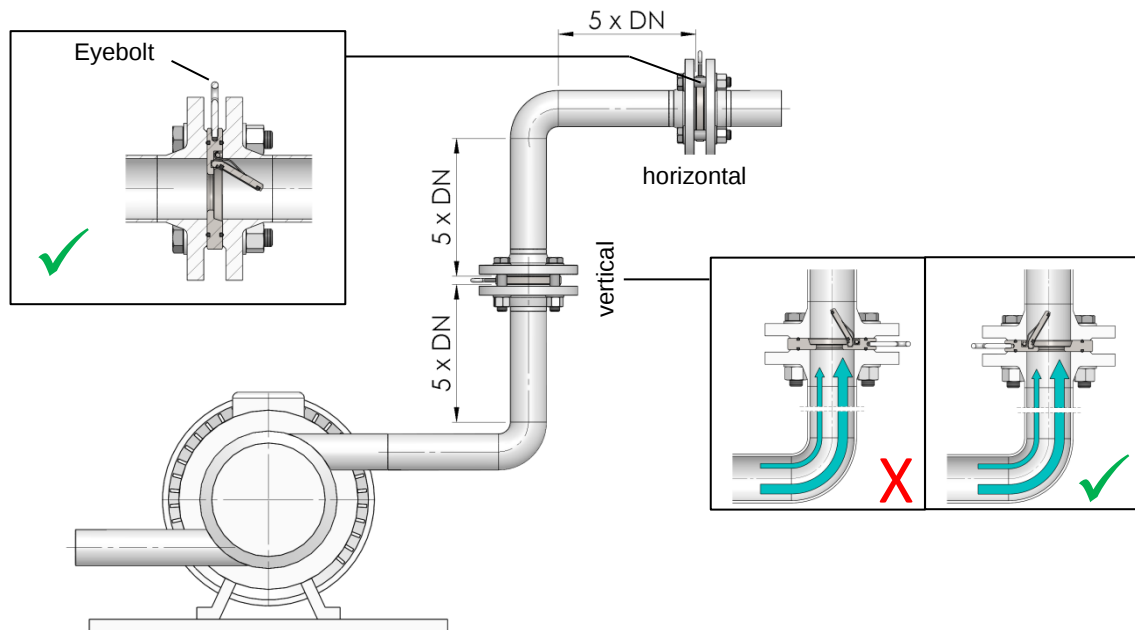
	NOTICE
	 Malfunctions/damage due to incorrect installation position ▪ The valve must be installed in the correct installation position and properly centered between the two pipelines. ▪ The correct installation position can be seen from the position of the eyebolt as well as the flow direction arrow on the type plate. ▪ Eyebolt of the valve must point upwards (see previous illustration).

Installation instruction for vertical flow direction

	NOTICE
	 Malfunctions/damage due to incorrect installation position ▪ Valve must be installed in correct installation position and properly centered between the two pipelines. ▪ The correct installation position can be seen from the flow direction arrow on the type plate. ▪ Flow direction arrow of the valve must point upwards.

Calming distance

The illustration shows options how the valve should be installed in vertical and horizontal flow direction. It shows how the calming distance of $5 \times \text{DN}$ must be realized in order to guarantee a proper function of the valve.



7 COMMISSIONING, DECOMMISSIONING, MAINTENANCE

7.1 Commissioning

Before commissioning, compare the operating data and materials of the valve with those of the piping system. This allows the durability of the system to be checked. In the case of new systems or repairs, the entire piping system must be rinsed to remove foreign substances from the system. Ensure that the valve is properly installed and all connections are properly connected. No work may be carried out on the valve during its operation.

7.2 Decommissioning

During decommissioning and long downtimes, media that change their aggregate state must be drained or removed from the system. If necessary, the system must be flushed out.

7.3 Maintenance

AWS swing check valves are maintenance-free. However, they can be checked for function and safety to avoid unforeseen downtimes. The interval time is to be determined by the operator.

	DANGER
	Danger due to work on the system ▪ During operation, no work (e.g. maintenance work) may be carried out on the valve.

7.4 Remove pollutants

When working on the valve, there is a risk of coming into contact with hazardous substances.

The following warnings must be observed:

	DANGER
	Danger from contaminants on the valve due to use in contaminated areas ▪ Work on contaminated valves is only permitted for qualified personnel. ▪ The valve must be completely decontaminated before any work is performed on it. ▪ The required protective equipment must always be worn in the contaminated area. In addition, all safety measures must be followed when handling the respective hazardous substances. ▪ Plastic parts may be so heavily contaminated that cleaning is no longer sufficient.

7.5 Correct malfunctions and defects

Malfunctions or defects may occur during operation. The following table shows possible causes and the appropriate solution. If malfunctions/defects are not listed, please contact the manufacturer.

Malfunction/Defect	Cause	Solution
High noise emission	Calming distance too low/not respected	Install the valve at a suitable position in order to be able to maintain the calming distance
	Flow rate too low	Select smaller nominal size
No flow present	Valve and flange not matched to each other	Match or replace valve and flange
	Valve installed the wrong way round	Align flow direction arrow with flow direction
	Pressure too low	Increase pressure or flow rate
	Disc too heavy	Use other disc material
		Use suitable valve for the pipeline
		Change installation position from vertical to horizontal
Leakage rate too high	Closing spring too strong	Use a weaker closing spring
	O-ring damaged	Replace O-ring
	Disc deformed	Replace disc
	Sealing surface damaged	Rework sealing surface, replace affected component if necessary
	Sealing surface dirty	Clean the sealing surface
	Wear	Replace affected components
	Closing spring worn/defective	Replace closing spring
Flange leakage	Flanges not sufficiently braced	Check fasteners and retighten if necessary
	Sealing surface/seal damaged	Rework sealing surface, replace body if necessary
	Sealing surface/seal dirty	Clean sealing surface/seal

8 REMOVAL

When removing the valve from the pipeline, all previously mentioned warnings and instructions apply. Pay special attention to chapter 6 *Installation* and chapter 7 *Commissioning, decommissioning, maintenance*.

8.1 Prepare removal

Before removal, the following steps must be observed:

- Pipelines must be emptied and cleaned if necessary.
- Provide collection container if there is a residue of the medium in the pipeline.
- Observe applicable warnings and instructions to ensure safe and successful work.

8.2 Removal instructions

The following aspects must be observed during removal:

- Loosen nuts of all flange screws.
- Completely remove all nuts and washers from the flange screws.
- Pull the flange screws out of the flange holes.
- For horizontal flow, the lower flange screws can remain inserted to facilitate removal.
- Secure valve against falling down.
- Remove the valve from the flange using the eyebolt. For large valves, use a hoist and suitable sling.
- Remove the remaining flange screws from the flange holes.
- Place the valve on a suitable surface.

9 STORE / REUSE THE VALVE

After the removal, the valve can be stored or used in another system.

The following guidelines must be observed:

- There must be no residues of the medium in the valve.
- Make sure that the valve is in perfect condition before reusing it.
- Valve must be designed for the given operating conditions when reused.
- In case of storage, the information in chapter 5 *Storage and transport* must be observed.

	NOTICE
	Environmental pollution due to residues ▪ Ensure that the valve is free of residues of the medium before disposal or storage. ▪ All materials are to be disposed of properly in accordance with applicable regulations.

10 DISPOSAL

The following regulations must be observed when disposing the valve:

	NOTICE
	Disposal of the valve ▪ All valve parts must be disposed of in accordance with the disposal regulations / environmental protection regulations. ▪ Pay attention to any residual buildup and outgassing of the flow media.

11 DECLARATION OF CONFORMITY

The valves are compliant with Directive 2014/68/EU (Pressure Equipment Directive). The declaration of conformity can be accessed and downloaded from the website www.aws-apparatebau.de.