

**tyco**

Flow Control

KEYSTONE

The OptiSeal is a further development of previous, successful resilient seated valve designs. The range incorporates several features, even further enhancing the valve's lifetime and performance.

#### Features

- Top bushing absorbs actuator side thrust loads.
- Dirtscraper prevents moisture penetrating into the shaft area.
- Actuator flange acc. ISO 5211.
- High solid, glossy, silicone free, paint system ensuring excellent corrosion resistance.
- Extended body neck allows pipe insulation.
- Body locating holes ease installation and centering between the flanges.
- Sealed body splits prevent moisture from penetrating behind the seat (up to DN300).
- Rounded polished disc edge gives full concentric sealing, lower torques, longer seat life and bubble-tight shut-off.
- The seat is field replaceable and fully isolates the body and stem from the flow.
- Primary stem sealing exceeds the pressure rating of the valve and prevents leakage through shaft area to atmosphere.
- A secondary shaft sealing provides back-up safety.
- A molded-in O-ring in the seat for flange sealing eliminates the need for gaskets.
- The thin disc provides the very minimum obstruction to flow (up to DN300).
- Top and bottom shaft bearings for optimized support and minimum friction in all body materials up to DN300, except cast iron.
- Relief hole drains possible fluids from the top plate recess space (up to DN300).
- Wafer and lugged body design, acc. ISO 5752/5 short. (DIN 3202, Part 3/K1).
- All valves comply to Pressure Equipment Directive (97/23/EU) Module H – CE Marking.
- Available approvals: FDA, KTW/DVGW, KIWA, DGS, ABS, DNV, WRAS.

OptiSeal with investment cast body



#### Technical data

Pressure (bar)	: 10-16
End of line (bar)	: 6-10-16
Temperature (°C)	: -40 + 160
Sizes (mm)	: 40-900
Flange accommodation	: PN 6/10/16 ANSI 150 JIS 5K/10K

#### General application

Food and beverage processing, dry bulk conveying, paper mills, slurry handling etc. These valves are for any service where a bubble-tight shut-off with maximum flow area is required.

It has smooth flow characteristics and excellent abrasion, erosion and corrosion resistance and a crevice free internal contour. For drinking water applications a certified EPDM compound is available. Grease or silicone free valves are available for special applications such as paint or oxygen systems.

The XP-EPDM seat has been developed especially for brewery applications. OptiSeal with PTFE lined seat and PTFE covered disc stem is ideally suited to applications where excellent chemical resistance and non-toxic properties are required, as are commonly encountered in the chemical, petrochemical and pharmaceutical industries. The lugged versions are designed to handle all pressure testing applications during erection and commissioning phases.

Figure 14 wafer  
DN40 – DN300

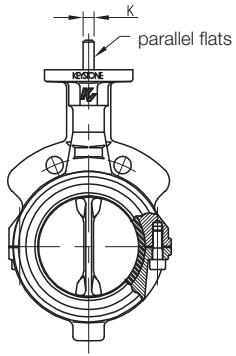


Figure 15 wafer  
DN350 – DN900

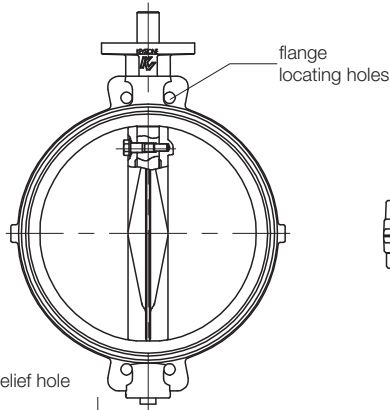


Figure 16 lugged  
DN40 – DN300

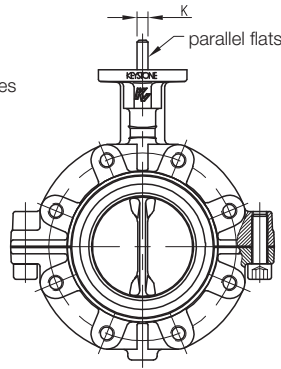


Figure 17 lugged  
DN350 – DN900

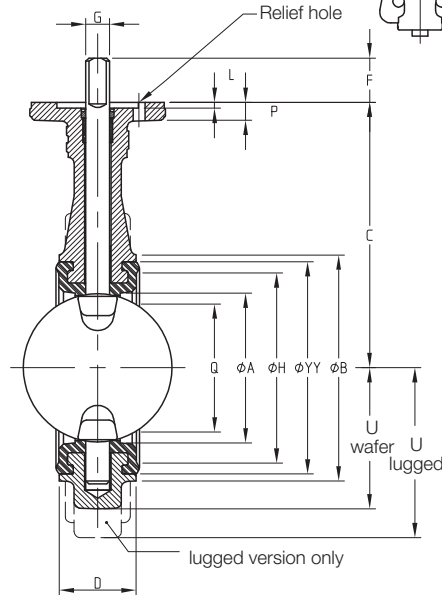
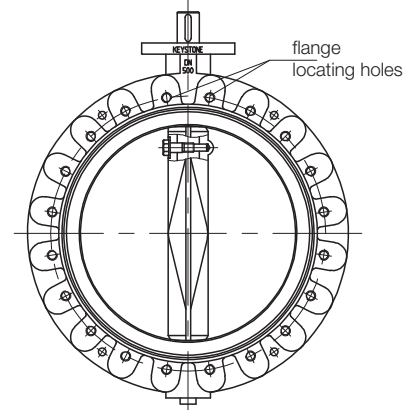


Figure 14 and 16

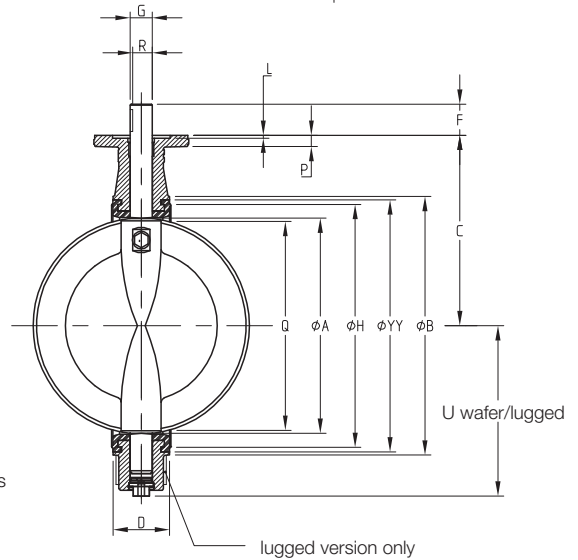
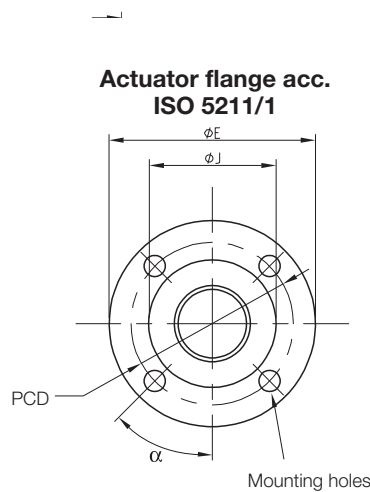


Figure 15 and 17

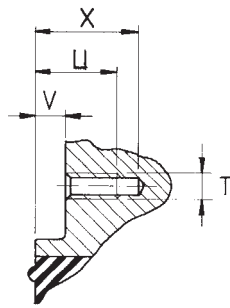
Valve dimensions in mm

Size	U		D	H	Q	YY	F	Shaft			Actuator flange acc. ISO 5211/1							Wafer Mass (kg)	Lugged Mass (kg)						
	Wafer	Lugged						G <sub>h9</sub>	K <sup>0.05</sup>	R	Keysize width x height	Type	E	J	L	P	PCD			Hole ø	No holes	α			
40	40	78	130	56	68	33	49	24	64	25	12	8	-	-	F-05	65	35	4	9	50	6,6	4	45.0	1,5	2,7
50	50	94	135	61	73	43	66	27	80	25	12	8	-	-	F-05	65	35	4	9	50	6,6	4	45.0	2,1	3,7
65	62	109	150	76	80	46	78	43	93	30	16	11	-	-	F-07	90	55	4	12	70	9,0	4	45.0	3,2	5,0
80	78	126	160	84	103	46	97	64	112	30	16	11	-	-	F-07	90	55	4	12	70	9,0	4	45.0	3,6	5,9
100	99	156	180	97	117	52	129	87	144	30	16	11	-	-	F-07	90	55	4	12	70	9,0	4	45.0	5,2	8,3
125	124	189	195	120	133	56	160	113	175	30	20	14	-	-	F-07	90	55	4	12	70	9,0	4	45.0	7,6	11,5
150	151	214	210	132	144	56	181	141	196	30	20	14	-	-	F-07	90	55	4	12	70	9,0	4	45.0	8,5	13,0
200	195	267	240	164	180	60	233	188	248	50	25	18	-	-	F-12	150	85	4	18	125	13,5	4	45.0	16,0	22,2
250	245	321	275	200	220	68	290	237	305	50	30	22	-	-	F-12	150	85	4	18	125	13,5	4	45.0	23,5	33,5
300	292	375	310	227	245	78	340	283	355	50	30	22	-	-	F-12	150	85	4	18	125	13,5	4	45.0	32,0	51,0
350	325	413	325	274	274	78	378	319	398	70	35	-	30,0	10 x 8	F12	150	85	4	18	125	13,5	4	45.0	42	60
400	380	470	360	312	312	102	435	369	455	70	40	-	35,0	12 x 8	F16	210	130	6	25	165	22,0	4	45.0	64	120
450	434	530	395	348	348	114	495	422	515	70	40	-	35,0	12 x 8	F16	210	130	6	25	165	22,0	4	45.0	85	144
500	486	584	430	385	385	127	549	472	569	70	50	-	44,5	14 x 9	F16	210	130	6	25	165	22,0	4	45.0	107	173
600	585	685	500	456	456	154	650	569	670	70*	50*	-	44,5*	14 x 9*	F16	210	130	6	25	165	22,0	4	45.0	147	250
700	685	795	570	518	518	165	755	669	775	100	70	-	62,5	20 x 12	F25	300	200	6	30	254	17,5	8	22.5	247	321
750	735	855	605	551	551	190	816	715	835	100	70	-	62,5	20 x 12	F25	300	200	6	30	254	17,5	8	22.5	300	360
800	785	900	640	583	583	190	860	766	880	100	70	-	62,5	20 x 12	F25	300	200	6	30	254	17,5	8	22.5	330	425
900	855	1000	715	659	659	203	960	865	980	100	80	-	71,0	22 x 14	F25	300	200	6	30	254	17,5	8	22.5	448	800

Notes

- Flange accommodation must be specified when ordering.
- Q is the disc chordal dimension at face of valve for disc clearance into pipe fitting or equipment.
- Specify size, figure number, part name, material and flange accommodation when ordering spareparts.
- Valve sizes shown are the DN100 and DN500.
- Valve size DN900 has no separate lugs, but a double flange design.
- \* in case of super seat F = 100, G = 60, R = 53, keysize 18 x 11
- For valves with composite discstem, the mass shown is ± 3% till 20% lower, depending on size and wafer- or lugged type. For investment cast bodies, the mass is ± 30% lower.

Figure 15 & Figure 17



Dimensions of flange locating holes (in mm)

Size	PN 10				PN 16			
	T	U	V	X	T	U	V	X
700	M27				M33	55.5	22.5	62.5
750	M30				M33	63.0	30.0	70.0
800	M30				M36	61.0	25.0	70.0
900	M30	56.5	6.5	76.5	M36	60.5	6.5	76.5

**Notes**

1. T = thread type, U = full thread + V, X = max. bore depth.
2. All holes in lugged version are through threaded, except the holes closest to top and bottom shaft.

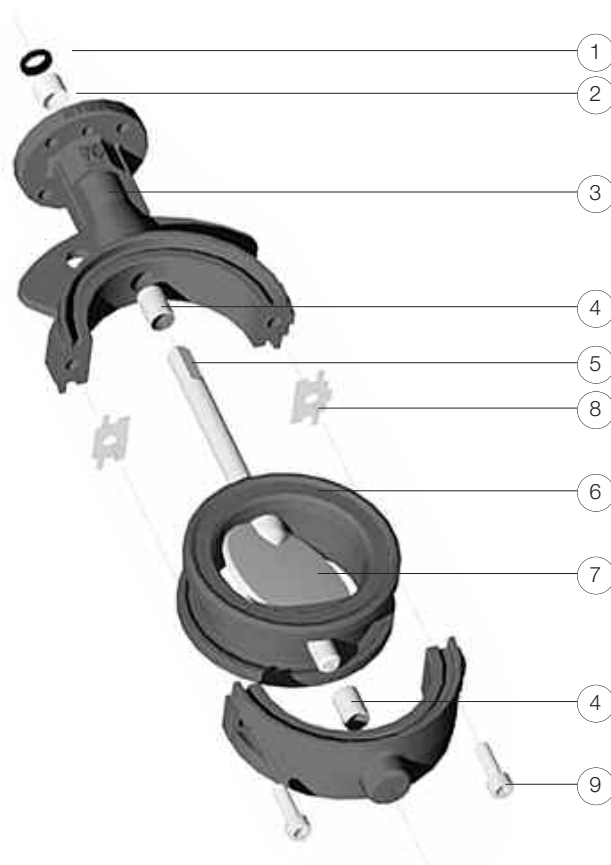


Figure 14/16 exploded view (Ductile- and Carbon Steel bodies)

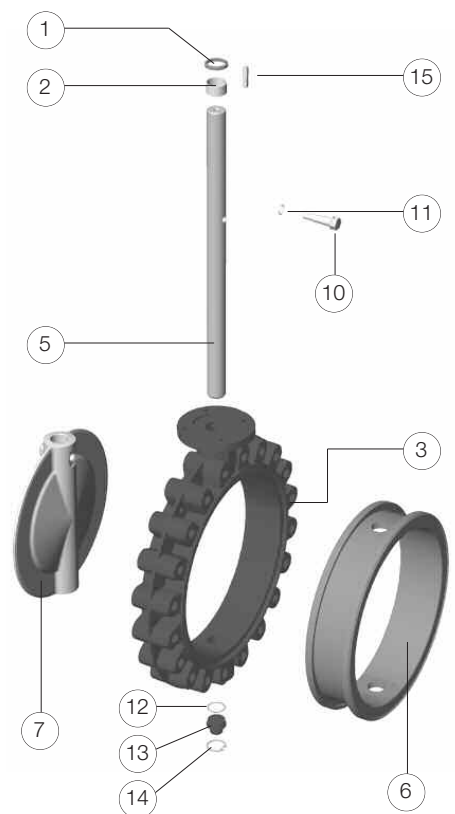


Figure 17 exploded view

**Part name**

1. Dirtscraper	6. Seat	11. O-ring
2. Shaft bushing	7. Disc	12. O-ring
3. Body	8. Split seal	13. Plug
4. Bearing	9. Body screws	14. Circlip
5. Shaft	10. Disc screw	15. Key

**Note**

For other actuators and selection, please contact your local sales outlet.

**Actuator selection**

Actuator type	Figure	Remark
Handle	F412	Leverlock
	F413	Continuous adjustable
Gear	F455	CM or WM
Pneumatic	F79E	-
Gear/Pneumatic	ILG/D / F79E	Declutchable gearunit provides manual override for the Keystone pneumatic actuator
Electric	F778	-

### K<sub>v</sub> values

disc opening	size in mm																			
	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900	
10°	-	-	-	-	-	-	-	-	-	19,5	47,3	119	155	196	242	349	475	545	620	785
20°	0,6	0,9	2,4	5,0	9,2	14,8	22,4	53	151	314	304	397	503	621	894	1216	1396	1589	2011	
30°	3,8	5,9	11,1	20,4	37,6	66,8	108	204	300	369	637	832	1053	1300	1871	2547	2924	3327	4211	
40°	9,2	14,3	26,2	47,4	84,8	143	221	392	572	718	1142	1492	1888	2331	3357	4569	5245	5968	7553	
50°	18,1	28,3	49,7	87,9	154	254	381	657	956	1212	1936	2529	3200	3951	5689	7744	8890	10114	12801	
60°	33,5	51,6	87,4	151	260	420	621	1050	1540	1993	3110	4062	5141	6347	9140	12440	14281	16248	20564	
70°	54,2	88,6	156	274	471	743	1062	1731	2628	3624	5010	6544	8288	10224	14723	20040	23005	26174	33127	
80°	57,6	111	232	442	789	1261	1802	2946	4616	6613	8969	11714	14826	18303	26357	35875	41183	46857	59303	
90°	58,5	112	249	492	895	1444	2099	3715	6883	11343	10407	13592	17203	21238	30583	41626	47785	54369	68811	

### Notes

1. Rated Kv = the volume of water in m<sup>3</sup>/hr that will pass through a given valve opening at a pressure drop of 1 bar.

$$2. K_v = Q \sqrt{\frac{R.D.}{\Delta P}} \text{ (liquid)}$$

Q = flow through valve (m<sup>3</sup>/hr)

R.D. = relative density of liquid (water = 1)

3. Values for composite discstem, indication only. For details: contact factory.

### Dynamic torque factors F<sub>T</sub> for metric units

disc opening	size in mm																			
	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900	
10°	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20°	0,1	0,1	0,2	0,5	0,9	1,8	3,0	7,2	14,1	24,3	21,4	32,0	45,6	62,5	108,0	171,5	210,9	256,0	364,5	
30°	0,1	0,3	0,6	1,1	2,1	4,1	7,1	16,8	32,8	56,7	64,3	96,0	136,7	187,5	324,0	514,5	632,8	768,0	1093,5	
40°	0,3	0,5	1,1	2,1	4,1	8,0	13,8	32,8	64,1	110,7	124,3	185,6	264,3	362,5	626,4	994,7	1223,4	1484,8	2114,1	
50°	0,4	0,9	1,9	3,6	7,0	13,7	23,6	56,0	109,4	189,0	235,8	352,0	501,2	687,5	1188,0	1886,5	2320,3	2816,0	4009,5	
60°	0,8	1,5	3,3	6,1	12,0	23,4	40,5	96,0	187,5	324,0	415,9	620,8	883,9	1212,5	2095,2	3327,1	4092,2	4966,4	7071,3	
70°	1,3	2,5	5,5	10,2	20,0	39,1	67,5	160,0	312,5	540,0	733,2	1094,4	1558,2	2137,5	3693,6	5865,3	7214,1	8755,2	12465,9	
80°	2,0	3,9	8,5	15,9	31,0	60,5	104,6	248,0	484,4	837,0	1346,3	2009,6	2861,3	3925,0	6782,4	10770,2	13246,9	16076,8	22890,6	
90°	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

### Notes

1. Dynamic operating torque formula:

$$T_D = F_T \times \Delta P$$

T<sub>D</sub> = Dynamic torque (Nm)

ΔP = Pressure drop across disc at desired disc-opening (bar)

F<sub>T</sub> = Dynamic torque factor (see table)

2. The above mentioned dynamic torque includes all frictional resistances.

3. The dynamic torque is tending to close the disc.

4. ΔP to be determined with K<sub>v</sub> formula.

### Maximum allowable shaft torques in Nm

valve size in mm	valve size in mm																			
	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900	
SS 1.4401	65	65	160	160	160	320	320	545	970	970	-	-	-	-	-	-	-	-	-	-
SS 1.4408	32	32	80	80	80	160	160	327	580	580	-	-	-	-	-	-	-	-	-	-
SS 1.4057/1.4122	90	90	230	230	230	460	460	935	1660	1660	1760	2012	3472	3858	6587	7685	8234	8782	8782	
SS 1.4057 *	65	65	110	160	160	320	320	935	1660	1660	-	-	-	-	-	-	-	-	-	-
SS 1.4462	70	70	170	170	170	345	345	700	1215	1215	-	-	-	-	-	-	-	-	-	-
Titanium	45	45	105	105	105	210	210	430	760	760	-	-	-	-	-	-	-	-	-	-
Carbon Steel	-	-	-	-	-	-	-	-	-	-	1632	2012	3311	3858	6587	7685	8234	8782	8782	

\* for Composite disc

### Notes

1. In ISO 5211/2 a table is listed representing the maximum torques which can be transmitted through the actuator flange. These values are based upon specific criteria and can be lower than the maximum allowable shaft torques. In this case the criteria can be changed in order to reach the maximum allowable shaft torques.

## Sizing torques in Nm

		Standard & Lined seat																		
ΔP in bar	size in mm	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	800	900
	<b>Application I</b>																			
3,5	10	13	19	26	37	58	81	148	241	345	492	672	889	1146	1789	2625	3123	3679	4654	
7	10	13	20	27	40	63	88	164	271	387	559	773	1032	1342	2128	3164	3786	4482	5672	
10	11	14	21	30	44	70	99	188	315	451	660	923	1247	1636	2637	3972	4779	5688	7198	
14	11	15	23	33	49	80	113	219	374	536										
16	12	15	25	36	51	85	120	235	403	578										
<b>Application II</b>																				
3,5	11	14	21	29	42	66	93	169	274	392	555	755	994	1276	1976	2880	3416	4011	5076	
7	11	14	22	31	45	71	100	185	303	434	623	856	1138	1472	2315	3419	4078	4815	6093	
10	11	15	23	33	49	78	111	208	347	498	724	1007	1352	1766	2824	4226	5072	6021	7619	
14	12	16	26	36	54	88	125	240	406	583										
16	12	17	27	38	56	93	132	255	436	626										
<b>Application III</b>																				
3,5	12	15	23	32	48	74	105	190	306	439	619	839	1100	1406	2163	3135	3708	4344	5497	
7	12	16	24	34	50	79	112	206	336	481	686	939	1243	1602	2502	3673	4371	5148	6514	
10	12	16	26	36	54	86	122	229	380	545	787	1090	1457	1896	3011	4481	5364	6354	8040	
14	13	17	28	40	59	96	136	261	439	629										
16	13	18	29	41	61	101	143	276	468	672										

## Sizing torques in Nm

		Super seat *														
ΔP in bar	size in mm	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
	<b>Application I</b>															
10	-	18	28	40	59	95	134	250	412	591	851	1173	1563	2026	3198	
14	-	19	30	43	64	104	148	281	471	676	986	1374	1849	2419	3876	
16	-	19	31	44	67	109	155	297	501	719	1053	1474	1992	2615	4216	
<b>Application II</b>																
10	-	20	31	45	67	107	152	281	461	662	947	1298	1721	2221	3879	
14	-	21	33	48	72	117	166	313	520	746	1081	1499	2007	2614	4157	
16	-	21	34	49	74	121	173	328	549	789	1149	1599	2150	2810	4496	
<b>Application III</b>																
10	-	27	43	63	96	151	216	396	640	919	1297	1755	2300	2936	4509	
14	-	28	45	66	101	161	230	427	699	1004	1432	1956	2586	3329	5187	
16	-	28	46	68	103	166	237	443	728	1046	1499	2057	2729	3525	5526	

## Notes

- Application I** : Water, seawater, lubricating types of hydrocarbons.  
Temp.: 0-80°C; Valve opens at least once a month.
  - Application II** : All other liquid applications and lubricating gasses.
  - Application III** : Non lubricating and dry media.
- The charted maximum sizing operating torque is the sum of all friction and resistance for opening and closing of the disc against the indicated pressure differential.
  - The effect of dynamic torque is not considered in tabulation.
  - In sizing operators it is not necessary to include safety-factors.
- \* For limited shaft material selection only.



## Superseat

Suitable for:

- severe vacuum applications
- high line velocities up to 12 m/s for liquids
- Bördel and slip-on flanges
- full rated end-of-line service
- pressure testing during erection and commissioning

Seat	Disc	Shaft	Available trim numbers						
			Body						
			Cast Iron	Cast Steel	Ductile Iron	Ductile Iron HT	Stainless Steel		
EPDM	Ductile Iron CTD	Stainless Steel	<b>677</b>	<b>686</b>	<b>648</b>	<b>692</b>			
	Stainless Steel		<b>102</b>	<b>141</b>	<b>112</b>	<b>351</b>	<b>059</b>		
	Stainless Steel PP		<b>550</b>		<b>578</b>	<b>554</b>			
	Stainless Steel SF		<b>104</b>		<b>114</b>	<b>353</b>			
	Stainless Steel MP		<b>239</b>		<b>243</b>	<b>373</b>	<b>060</b>		
	SS Duplex		<b>339</b>						
	NiAlBz		<b>131</b>	<b>140</b>	<b>135</b>	<b>359</b>			
	EPDM covered		<b>103</b>	<b>311</b>	<b>113</b>	<b>352</b>			
	Hastelloy		<b>593</b>	<b>306</b>	<b>273</b>	<b>383</b>			
	Uranus		<b>287</b>		<b>315</b>	<b>393</b>			
	Composite		<b>430</b>		<b>432</b>				
	Titanium		<b>253</b>	<b>569</b>	<b>257</b>	<b>377</b>			
Superseat EPDM	Ductile Iron CTD	Stainless Steel	<b>697</b>		<b>690</b>	<b>695</b>			
	Stainless Steel		<b>343</b>		<b>346</b>	<b>395</b>			
	Stainless Steel PP			<b>679</b>		<b>557</b>			
	Stainless Steel SF								
	Stainless Steel MP		<b>344</b>						
	SS Duplex								
	NiAlBz				<b>347</b>	<b>396</b>			
	Hastelloy		<b>349</b>		<b>348</b>	<b>397</b>			
EPDM-A	Stainless Steel	Stainless Steel	<b>594</b>						
NBR	Ductile Iron CTD	Stainless Steel	<b>678</b>	<b>687</b>	<b>673</b>	<b>693</b>			
	Stainless Steel		<b>106</b>	<b>145</b>	<b>116</b>	<b>355</b>			
	Stainless Steel PP		<b>551</b>			<b>555</b>			
	Stainless Steel SF		<b>107</b>		<b>117</b>	<b>356</b>			
	Stainless Steel MP		<b>240</b>		<b>244</b>	<b>374</b>			
	SS Duplex		<b>338</b>						
	NiAlBz		<b>133</b>	<b>144</b>	<b>137</b>	<b>360</b>			
	Hastelloy		<b>431</b>	<b>286</b>	<b>328</b>				
	Composite		<b>431</b>		<b>433</b>				
	Titanium		<b>254</b>		<b>258</b>	<b>378</b>			
NBR White	Stainless Steel	Stainless Steel	<b>169</b>	<b>181</b>	<b>177</b>	<b>361</b>			
	Stainless Steel SF		<b>185</b>		<b>189</b>	<b>362</b>			
	Stainless Steel MP		<b>241</b>		<b>245</b>	<b>375</b>			
NBR-DVGW	Ductile Iron CTD	Stainless Steel				<b>696</b>			
	Stainless Steel					<b>683</b>			
Superseat NBR	Ductile Iron CTD	Stainless Steel			<b>691</b>				
	Stainless Steel		<b>595</b>	<b>596</b>	<b>672</b>	<b>671</b>			
	Stainless Steel PP					<b>558</b>			
	Stainless Steel SF								
	Stainless Steel MP								
	SS Duplex								
	NiAlBz				<b>573</b>	<b>399</b>			
Fluorelastomer	Ductile Iron CTD	Stainless Steel	<b>685</b>	<b>688</b>	<b>689</b>	<b>694</b>			
	Stainless Steel		<b>222</b>	<b>230</b>	<b>226</b>	<b>367</b>			
	Stainless Steel PP		<b>552</b>			<b>556</b>			
	Stainless Steel SF		<b>223</b>	<b>231</b>	<b>227</b>	<b>368</b>			
	Stainless Steel MP		<b>242</b>		<b>246</b>	<b>376</b>			
	SS Duplex								
	NiAlBz		<b>224</b>	<b>232</b>	<b>228</b>	<b>369</b>			
	Titanium		<b>278</b>		<b>291</b>	<b>384</b>			
PTFE/EPDM	Stainless Steel	Stainless Steel	<b>186</b>	<b>272</b>	<b>190</b>	<b>363</b>	<b>061</b>		
	Stainless Steel PP		<b>553</b>	<b>580</b>	<b>587</b>	<b>559</b>			
	Stainless Steel SF		<b>187</b>	<b>581</b>	<b>191</b>	<b>364</b>			
	Stainless Steel MP		<b>585</b>	<b>582</b>	<b>588</b>	<b>591</b>	<b>879</b>		
	Hastelloy		<b>299</b>	<b>579</b>	<b>586</b>	<b>590</b>			
	Uranus		<b>323</b>	<b>584</b>	<b>589</b>	<b>592</b>			
	PTFE lined		<b>188</b>	<b>132</b>	<b>120</b>	<b>365</b>	<b>865</b>		
	Titanium		<b>256</b>	<b>583</b>	<b>260</b>	<b>379</b>			
	XP EPDM		Stainless Steel	Stainless Steel	<b>730</b>		<b>732</b>	<b>734</b>	
			Stainless Steel PP		<b>731</b>		<b>733</b>	<b>735</b>	
Stainless Steel SF									
Stainless Steel MP									
Stainless Steel cast			Stainless Steel cast		<b>850</b>				
Stainless Steel MP			Stainless Steel cast		<b>851</b>				
SS Duplex									
EPDM-WA3	Stainless Steel	Stainless Steel			<b>884</b>				

### Notes

- All trims, except cast iron bodies, are equipped with two PTFE lined, steel bearings (lead-free; DN40-300).
- HT = Heat Treated      MP = Mirror Polished
- PP = Pickled & Passivated      CTD = Epoxy Coated
- SF = Satin Finished
- If trim number is not listed, contact your local sales outlet.
- For other material combinations, contact your local sales outlet.
- Trims 850 and 851 are 'BrewSeal' trims.

**Pressure-Temperature Diagram (DN40-DN300)**

Seat material ***	Disc material	Body material	Size range DN (mm)	Valve function Wafer/End of Line	Temperature in °C											Notes	
					-40	-30	-20	-15	0	50	100	120	130	150	160		
EPDM, EPDM-A and EPDM-WA3	SS - SF/MP **	all	all	W / EOL					10 Bar / 6 Bar								1
	EPDM cover	all	all	W / EOL					10 Bar / 6 Bar								3
	Titanium	all	all	W / EOL					10 Bar / 6 Bar								4
	Composite	all	all	W / EOL					10 Bar / 6 Bar								46
	other materials	CI	all	W / EOL					10 Bar / 6 Bar								5
	other materials	CI	40-150 *	W / EOL					16 Bar / 10 Bar								6
	other materials	DI/CS/SS	all	W / EOL					16 Bar / 10 Bar								7
Superseal EPDM	SS - SF/MP **	all	all	W / EOL					10 Bar / 10 Bar								2
	other materials	CI	all	W / EOL					10 Bar / 10 Bar								8
	other materials	CI	40-150 *	W / EOL					16 Bar / 16 Bar								9
	other materials	DI/CS/SS	all	W / EOL					16 Bar / 16 Bar								10
NBR and White NBR	SS - SF/MP **	all	all	W / EOL					10 Bar / 6 Bar								11
	Titanium	all	all	W / EOL					10 Bar / 6 Bar								13
	Composite	all	all	W / EOL					10 Bar / 6 Bar								47
	other materials	CI	all	W / EOL					10 Bar / 6 Bar								14
	other materials	CI	40-150 *	W / EOL					16 Bar / 10 Bar								15
	other materials	DI/CS/SS	all	W / EOL					16 Bar / 10 Bar								16
Superseal NBR	all	CI	all	W / EOL					10 Bar / 10 Bar								17
	all	CI	40-150 *	W / EOL					16 Bar / 16 Bar								18
	all	DI/CS/SS	all	W / EOL					16 Bar / 16 Bar								19
Fluorelastomer	SS - SF/MP **	all	all	W / EOL					10 Bar / 6 Bar					6 Bar / 4 Bar			20
	Titanium	all	all	W / EOL					10 Bar / 6 Bar					6 Bar / 4 Bar			21
	other materials	CI	all	W / EOL					10 Bar / 6 Bar					6 Bar / 4 Bar			22
	other materials	CI	40-150 *	W / EOL					16 Bar / 10 Bar					10 Bar / 6 Bar			23
	other materials	DI/CS/SS	all	W / EOL					16 Bar / 10 Bar					10 Bar / 6 Bar			24
PTFE/EPDM	PTFE lined	CI	all	W / EOL					6 Bar / 4 Bar				4/2 Bar	2/1 Bar			25
	PTFE lined	all	all	W / EOL					10 Bar / 6 Bar				6/4 Bar	4/2 Bar			26
	SS - SF/MP **	all	all	W / EOL					10 Bar / 6 Bar				6/4 Bar	4/2 Bar			27
	Titanium	all	all	W / EOL					10 Bar / 6 Bar				6/4 Bar	4/2 Bar			28
	other materials	CI	all	W / EOL					10 Bar / 6 Bar				6/4 Bar	4/2 Bar			29
	other materials	all	all	W / EOL					16 Bar / 10 Bar				10/6 Bar	6/4 Bar			30
XP EPDM	SS	CI	all	W / EOL					10 Bar / 6 Bar								31
	SS	CI	40-150 *	W / EOL					16 Bar / 10 Bar								32
	SS	DI/CS/SS	all	W / EOL					16 Bar / 10 Bar								33

\* with manual operator only  
\*\* size DN300 max 6 bar  
\*\*\* all seat materials bubble tight, PTFE/EPDM drop tight

**Pressure-Temperature Diagram (DN40-DN300)**

Notes	Trims	Notes	Trims
1	060 104 114 239 243 353 373	18	342 595
2	344	19	399 558 573 596 671 672 691
3	103 113 311 352	20	223 227 231 242 246 368 376
4	253 257 377 569	21	278 291 384
5	102 131 287 339 550 593 594 677	22	222 224 552 685
6	102 131 287 339 550 593 594 677	23	222 224 552 685
7	059 112 135 140 141 273 306 315 351 359 383 393 554 578 648 686 692 884	24	226 228 230 232 367 369 556 688 689 694
8	343 349 697	25	188
9	343 349 697	26	120 132 365 865
10	346 347 348 396 397 557 679 690 695	27	187 191 364 581 582 585 588 591 879
11	107 117 185 189 240 244 374 241 245 356 362 375	28	256 260 379 583
13	254 258 378	29	186 299 323 553
14	106 133 169 338 551 678	30	061 190 272 363 559 579 580 584 586 587 589 590 592
15	106 133 169 338 551 676	31	730 731 850 851
16	116 137 144 145 177 181 286 328 355 360 361 555 673 683 687 693 696	32	730 731 850 851
17	342 595	33	732 733 734 735 850 851
		46	430 432
		47	431 433

### Material specification DN40-DN300

Part name	Material	Designation	EN/DIN mat.no	Remark
Body	Cast Iron	GJL-250	EN JS-1040	Max. pressure 10 bar
	Cast Steel	GP240GH	EN 1.0619	
	Ductile Iron	GJS-400-15	EN JS-1030	
	Ductile Iron Heat Treated	GJS-400-18U-LT	EN JS-1049	
Disc	Stainless Steel	GX5CrNiMo19-11-2	EN 1.4408	With heat treatment certificate and Charpy V-notch test
	Ductile Iron CTD	GJS-400-15	EN JS-1030	Wafer style DN50-300 investment cast
	Duplex	GX2CrNiMoN22-5-3	EN1.4470	CTD = Epoxy coated max temp 120°C
	Hastelloy C4C	G-NiMo17Cr	DIN 2.4686	Shaft connection by welded pins
	NiAlBz	CuAl10Fe5Ni5	EN CC333G	Comparable with BS 1400 AB2
	Stainless Steel	GX5CrNiMo19-11-2	EN 1.4408	Comparable with CF8M
	Stainless Steel PP	GX5CrNiMo19-11-2	EN 1.4408	All sizes
	Stainless Steel MP	GX5CrNiMo19-11-2	EN 1.4408	DN40-250 max 10 bar, DN300 max. 6 bar
	Stainless Steel SF	GX5CrNiMo19-11-2	EN 1.4408	DN40-250 max 10 bar, DN300 max. 6 bar
	EPDM covered steel			Max. 10 bar 120°C
	PTFE covered steel			Max. 10 bar
	Composite			DN40-DN300 Engineered composite XP1620
	Titanium	Ti3	DIN 3.7055	Comparable with ASTM B265/ASTM B348 grade 2, max. 10 bar
	Uranus (B6)	G-X 2 NiCrMoCuN 25 20	DIN 1.4536	Casting quality (SEW 410) or 1.4539
Shaft	Stainless Steel	X5CrNiMo17-12-2	EN 1.4401	Standard shaft material
	Stainless Steel	X17CrNi16-2	EN 1.4057	Similar to ASTM A276/Gr. 431. Used for DI, DI-CTD and Composite disc
	Stainless Steel	GX5CrNiMo19-11-2	EN 1.4408	Comparable with CF8M for mirror polished and satin finished disc
	Duplex	X2CrNiMoN22-5-3	EN 1.4462	For EPDM, PTFE covered, Hastelloy, Uranus disc
	Duplex	GX2CrNiMoN22-5-3	EN 1.4470	For Duplex disc
Seat	Titanium	Ti3	DIN 3.7055	Comparable with ASTM B348 grade 2
	EPDM			FDA approved
	EPDM-DGS			FDA approved
	EPDM - A			KIWA/KTW approved
	Superseat EPDM			Seat reinforced with metal insert FDA approved
	NBR			FDA approved
	NBR-DVGW			DVGW approved
	Superseat NBR			Seat reinforced with metal insert FDA approved
	NBR White			FDA approved
	Fluorelastomer			
	PTFE lined EPDM			
XP EPDM			FDA approved	
EPDM WA-3			WRAS (optional)	
EPDM WA-2			DVGW water approved (optional)	
Body screws	Steel			Quality 8.8
	Stainless Steel			Optional
Bushing	Polyactetal			
Dirt scraper	NBR/Steel			
Bearing	PTFE lined			Standard in CS, SS, DI and DI HTC body
Split-seal	Graphite			



### Pressure-Temperature Diagram (DN350-DN900)

Seat material *	Disc material	Body material	Size range DN (mm)	Valve function Wafer/End of Line	Temperature in °C											Notes	
					-40	-30	-20	-15	0	50	100	120	130	150	160		
EPDM	all	CI	all	W / EOL													34
	all	DI/CS	all	W / EOL													35
Superseat EPDM	all	CI	350-600	W / EOL													36
	all	DI/CS	350-600	W / EOL													37
NBR and White NBR	all	CI	all	W / EOL													38
	all	DI/CS	all	W / EOL													39
Superseat NBR	all	CI	350-600	W / EOL													40
	all	DI/CS	350-600	W / EOL													41
PTFE/EPDM	SS	CI	350-400	W / EOL													44
	SS, Hastelloy	DI/CS	350-400	W / EOL													45
XP EPDM	all	CI	all	W / EOL													42
	all	DI/CS	all	W / EOL													43

\* all seat materials bubble tight, PTFE/EPDM drop tight

### Pressure-Temperature Diagram (DN350-DN900)

#### Notes Trims

34	102	131						
35	112	135	139	140	141	633	646	
36	343							
37	346	347						
38	106	133	169					
39	116	137	143	144	145	634	649	
40	342	595						
41	573	672						
42	730							
43	732							
44	186							
45	190	586						
46	430	432						
47	431	433						

### Material specification DN350-DN900

Part name	Material	Designation	EN/DIN mat.no	Remark
Body	Cast Iron	GJL-250	EN JS-1040	Max. pressure 10 bar
	Cast Steel	GP240GH	EN 1.0619	
	Ductile Iron	GJS-400-15	EN JS-1030	With heat treatment certificate and Charpy V-notch test
	Ductile Iron Heat Treated	GJS-400-18U-LT	EN JS-1049	
Disc	Stainless Steel	GX5CrNiMo19-11-2	EN 1.4408	CTD = Epoxy coated max temp 120°C
	Ductile Iron CTD	GJS-400-15	EN JS-1030	
	Ductile Iron	GJS-400-15	EN JS-1030	Comparable with BS 1400 AB2 Comparable with CF8M
	NiAlBz	CuAl10Fe5Ni5	EN CC333G	
	Stainless Steel	GX5CrNiMo19-11-2	EN 1.4408	Optional Optional Max. 10 bar 120°C. Optional up to DN400 Ductile Iron disc with Ebonite hard rubber lining Duplex, Hastelloy, Uranus on request
	Stainless Steel PP	GX5CrNiMo19-11-2	EN 1.4408	
	Stainless Steel MP	GX5CrNiMo19-11-2	EN 1.4408	
	Stainless Steel SF	GX5CrNiMo19-11-2	EN 1.4408	
	EPDM covered steel			
	Ebonite covered DI			
Other materials				
Shaft	Stainless Steel	X17CrNi16-2	EN 1.4057	Similar to ASTM A276/Gr. 431. Standard shaft material for DN350-600
	Stainless Steel	X39CrMo17-1	EN 1.4422	Standard shaft material for DN700-900
	Duplex	X2CrNiMoN22-5-3	EN 1.4462	For EPDM, PTFE covered, Hastelloy, Uranus or Duplex disc
Seat	EPDM			FDA approved
	EPDM-DGS			FDA approved
	EPDM - A			KIWA/KTW approved
	Superseat EPDM			Seat reinforced with metal insert FDA approved, max DN600
	NBR			FDA approved
	NBR-DVGW			DVGW approved
	Superseat NBR			Seat reinforced with metal insert FDA approved, max DN600
NBR White			FDA approved	
PTFE lined EPDM			DN300, DN400, DN500 (DN600 on request)	
XP EPDM			FDA approved	
Disc screw	Stainless Steel	X2CrNiMoN22-5-3	EN 1.4462	
Disc screw O-ring	NBR			
Plug	Carbon Steel	C45-QT	EN 1.0503QT	
Plug O-ring	NBR			
Circlip	Springsteel			According DIN 472
Bushing	Polyactetal			
Dirt scraper	NBR/Steel			