

Пневматические поршневые приводы PD 10-63

Технические характеристики

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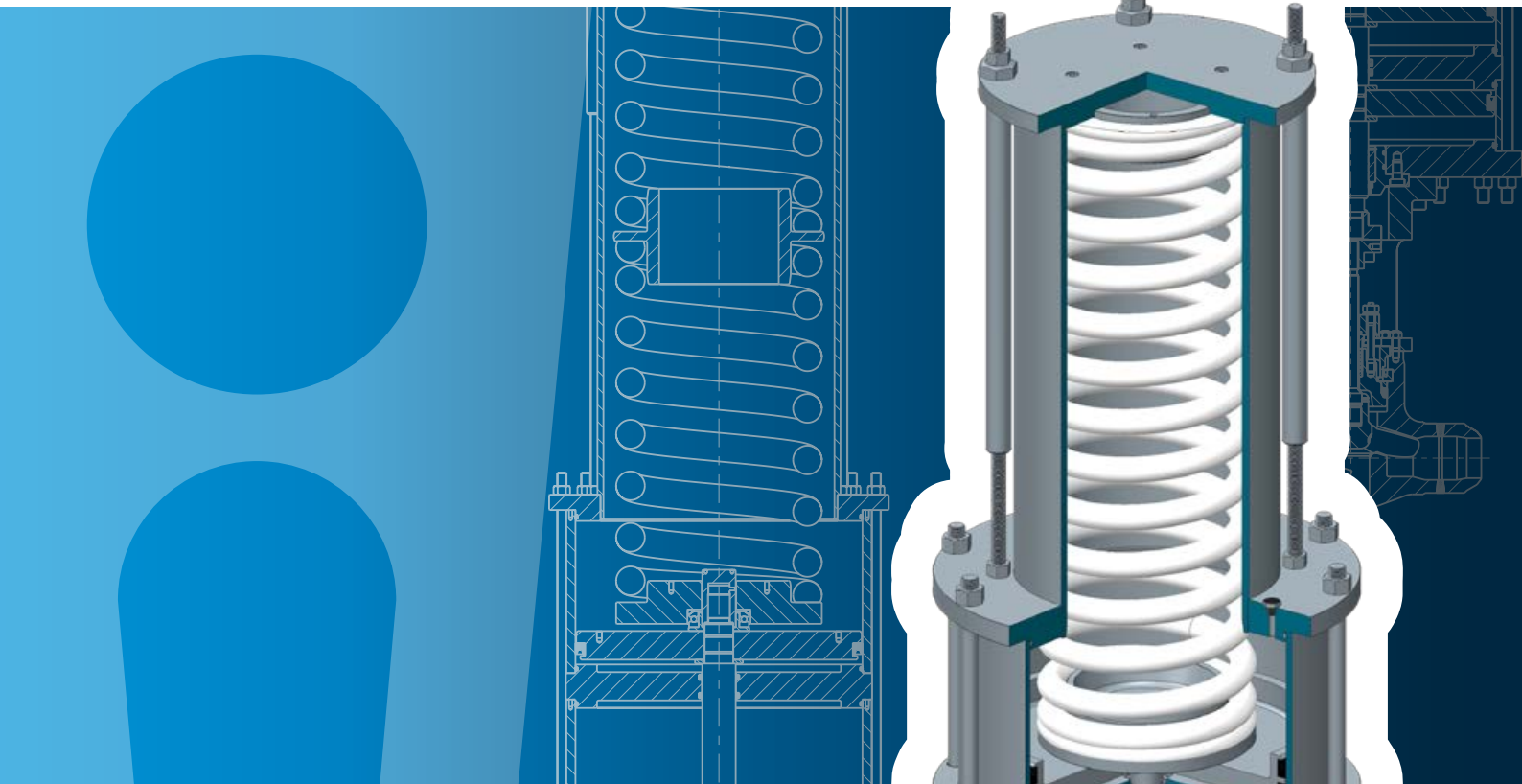
Казахстан +(727)345-47-04

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Узбекистан +998(71)205-18-59

Киргизия +996(312)96-26-47

эл.почта: paw@nt-rt.ru || сайт: <https://persta.nt-rt.ru/>



PERCON PNEUMATIC PISTON ACTUATOR

Design highlights

- Modular system
- Integral grease chambers
- Position indicator
- Mechanical stroke limit stops
- Low friction losses
- Individual version of each valve

Advantages

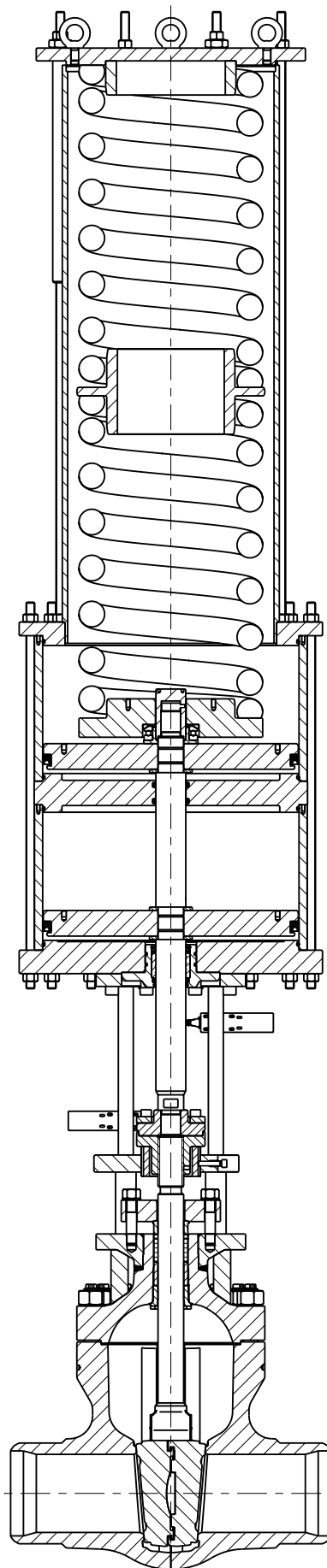
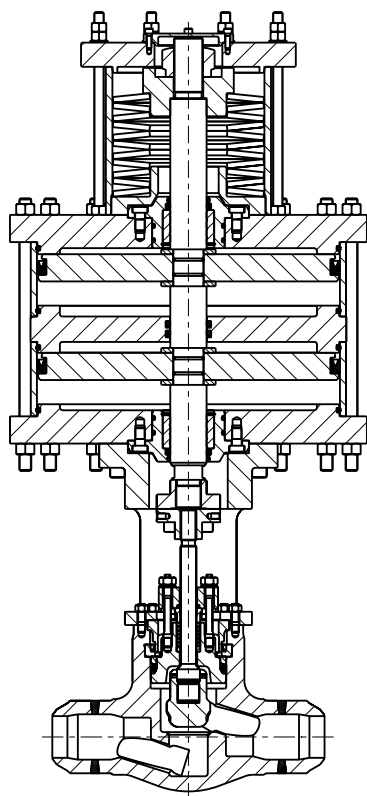
- Easy to adjust the version in terms of stroke, safety end position or manual emergency actuation
- Low maintenance
- With mechanical or inductive switching elements
- Wedging not possible
- Surface coating of cylinder tube, non-metallic guides and roll-polished piston rods guarantee low friction and breakaway forces even with oil-free instrument air and even after longer downtime.
- Individually adjusted piston actuators specially adapted to requirements / interface to PERSTA valve

Version

- Piston diameter 350–710 mm, also in tandem version
- Max. 10 bar supply air pressure
- Double-acting, spring to close or air to close
- Optional manual emergency actuation
- Optional position feedback or positioner
- Optional rapid venting
- Optionally with filter regulator
- Optionally completely piped incl. solenoid valve etc.

Applications

In chemical, industrial, process engineering and power plants.



PRESSURE RATING TABLES

The PERSTA pressure ratings (PD) are developed on the basis of the standardised pressure ratings PN 100 - 630 and apply exclusively to valves with correspondingly designed butt-weld ends. Valves with standard flanges are generally indicated with the corresponding standardised pressure rating and must only be used in the context of this pressure rating. The specified figures refer to all pressure bearing components, including the shut-off element.

Attention: Valve butt-weld ends for different pipeline materials must be checked for sufficient wall thickness for each specific case. The valves are indicated as design pressure valves.

Differential pressure and actuation

PERSTA gate valves can be actuated up to differential pressures that do not exceed 50% of the calculated positive pressure. If actuation takes place at higher pressure differentials, this must be clarified with PERSTA for each individual case. The operating conditions (specified by customer) determine the design of actuation elements like the handwheel and transmission gears. The maximum differential pressures up to which shut-off valves with bodies made of 1.4901, 1.4903 and 1.6368 can be actuated differ from the rule specified here. For this reason, if these materials are used, clarification with PERSTA is always necessary.

PERSTA pressure rating table PD 10-63

Permissible operating pressure [bar(g)] at calculation temperature [°C] ¹⁾

Material	PD	20	120	150	200	250	300	350	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	650
1.0460 P250GH [3E0]	10	100	100	100	94	82	74	64.8	60	57.5	54.9	48.9	42.9	38	34	28	23																	
	16	160	160	160	151	132	118	99	80	76	73	69	65	61	54	45	37																	
	25	250	250	250	235	206	184	155	125	119	113	107	102	96	85	71	58																	
	32	320	320	320	302	264	236	198	160	153	145	138	130	123	109	91	75																	
	40	400	400	400	377	330	295	248	200	191	182	172	163	153	136	113	93																	
1.5415 16Mo3 [4E0]	10	120	120	120	112	103	88	85	82	82	81	81	80	79	79	78	78	68	53	40	32	25.1												
	16	192	192	192	179	165	141	137	132	131	130	129	128	127	126	125	124	109	85	64	51	41												
	25	300	300	300	280	258	221	213	206	205	203	202	200	199	197	196	194	170	132	101	79	64												
	32	385	385	385	358	330	283	273	264	262	260	258	256	255	253	251	249	217	170	129	102	81												
	40	480	480	480	448	413	354	342	330	328	325	323	321	318	316	314	311	272	212	161	127	102												
1.7335 13CrMo4-5 [5E0]	10	120	120	120	120	118	109	103	97	96	95	94	92	91	91	90	89	89	81	68	54	44	35	28	23	18								
	16	192	192	192	192	189	174	165	156	154	152	150	148	146	145	144	143	142	129	109	86	70	57	44	36	29								
	25	300	300	300	300	294	272	258	243	240	237	234	231	228	227	225	224	222	202	170	134	109	88	69	57	46								
	32	385	385	385	385	377	349	330	311	307	304	300	296	292	290	289	287	285	258	217	172	140	113	88	72	59								
	40	481	481	481	481	471	436	413	389	384	380	375	370	365	363	364	358	356	323	272	215	175	141	110	91	74								
1.7383 ²⁾ 11CrMo9-10 [6E0]	10	120	120	120	120	120	118	109	103	102	101	99	98	97	96	95	94	89	81	69	61	53	46	40	34	30	26	22	20					
	16	192	192	192	192	192	189	174	165	163	161	159	157	156	154	152	150	143	127	111	97	85	74	64	55	48	41	36	32					
	25	300	300	300	300	300	294	272	258	255	252	249	246	243	240	237	234	224	199	174	152	132	115	100	85	75	65	56	49					
	32	384	384	384	384	384	377	349	330	326	322	319	315	311	307	304	300	287	255	223	194	170	147	128	109	96	83	72	63					
	40	480	480	480	480	480	471	436	413	408	403	398	384	389	384	379	375	358	318	278	243	212	184	160	137	120	104	90	79					
1.6368	16	263	263	263	263	263	263	263	263																									
	25	410	410	410	410	410	410	410	410																									
	32	525	525	525	525	525	525	525	525																									
	40	657	657	657	657	627	657	657	657																									
1.4903 ²⁾ X10CrMoVNb9-1 [9E0]	16	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	268	245	239	221	203	186	169	153	137	123	108	96	85	74	64	55	48	41
	25	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	418	383	372	344	316	290	263	238	213	191	169	150	132	115	100	85	75	65
	32	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	536	490	477	441	405	371	338	305	273	245	217	192	170	147	128	109	96	83
	40	680	680	680	680	680	680	680	680	680	680	680	680	680	680	680	669	613	596	552	507	464	422	382	342	306	271	240	212	184	160	137	120	104
1.4901 ²⁾	16	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	272	271	254	237	221	205	190	176	161	147	133	119	106	94	81	70	61	52
	25	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	425	423	397	370	345	320	297	275	252	230	208	186	166	147	127	110	95	82
	32	544	544	544	544	544	544	544	544	544	544	544	544	544	544	544	542	508	474	442	410	380	352	323	295	267	239	212	188	163	141	122	105	
	40	680	680	680	680	680	680	680	680	680	680	680	680	680	680	680	677	635	592	552	512	475	440	404	369	334	298	265	235	204	176	152	131	

1) Operating temperature = calculation temperature minus temperature surcharge according to the standard codes.

2) For temperatures > 570 °C, stem material 1.4980, seat armoured with Stellite, and high-temperature packing.

Permissible operating pressure [bar(g)] at calculation temperature [°C] ¹⁾139

Pressure rating table acc. to DIN EN 1092-1 (2018) – materials 1.5415, 1.7357, 1.7335, 1.7383, 1.7380

Permissible operating pressure [bar(g)] at calculation temperature [°C] ¹⁾

Material	PN	V _R [mm]	-60	20	100	150	200	250	300	350	400	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590	600	
1.5415 16Mo3 [4E0]	10	<60		10	10	10	10	9.7	8.5	8	7.4	6.9	6.4	5.9	5.4	4.9	4.4	3.5	2.8	2.2								
		60<v _R <90		10	10	10	10	9.2	8	7.6	6.9	6.4	6	5.6	5.2	4.8	4.4	3.5	2.8	2.2								
		90<v _R <150		10	10	10	9.2	8.5	7.6	7	6.3	5.9	5.6	5.3	5	4.7	4.4	3.5	2.8	2.2								
	16	<60		16	16	16	16	15.6	13.7	12.9	11.9	11	10.2	9.4	8.6	7.8	7	5.6	4.4	3.5								
		60<v _R <90		16	16	16	16	14.8	12.9	12.1	11.1	10.2	9.6	9	8.3	7.7	7	5.6	4.4	3.5								
		90<v _R <150		16	16	16	14.8	13.7	12.1	11.2	10.1	9.4	8.9	8.5	8	7.5	7	5.6	4.4	3.5								
	25	<60		25	25	25	25	24.4	21.4	20.2	18.6	17.2	16	14.7	13.5	12.3	11	8.8	7	5.5								
		60<v _R <90		25	25	25	25	23.2	20.2	19	17.3	16	15	14	13	12	11	8.8	7	5.5								
		90<v _R <150		25	25	25	23.2	21.4	19	17.5	15.8	14.7	14	13.2	12.5	11.8	11	8.8	7	5.5								
	40	<60		40	40	40	40	39	34.2	32.3	29.9	27.6	25.6	23.6	21.6	19.7	17.7	14	11.2	8.9								
		60<v _R <90		40	40	40	40	37.1	32.3	30.4	27.8	25.7	24.1	22.5	20.9	19.3	17.7	14	11.2	8.9								
		90<v _R <150		40	40	40	37.1	34.2	30.4	28	25.3	23.6	22.4	21.2	20	18.9	17.7	14	11.2	8.9								
	63	<60		63	63	63	63	61.5	54	51	47.1	43.5	40.3	37.2	34.1	31	27.9	22.2	17.7	14.1								
		60<v _R <90		63	63	63	63	58.5	51	48	43.8	40.5	37.9	35.4	32.9	30.4	27.9	22.2	17.7	14.1								
		90<v _R <150		63	63	63	58.5	54	48	44.1	39.9	37.2	35.3	33.4	31.6	29.7	27.9	22.2	17.7	14.1								
	100	<60		100	100	100	100	97.6	85.7	80.9	74.7	69	64	59.1	54.2	49.2	44.2	35.2	28	22.3								
		60<v _R <90		100	100	100	100	92.8	80.9	76.1	69.5	64.2	60.2	56.2	52.2	48.2	44.2	35.2	28	22.3								
		90<v _R <150		100	100	100	92.8	85.7	76.1	70	63.3	59	56	53.1	50.2	47.2	44.2	35.2	28	22.3								
	160	<60		160	160	160	160	156.1	137.1	129.5	119.6	110.4	102.5	94.6	86.7	78.8	70.8	56.3	44.9	35.8								
		60<v _R <90		160	160	160	160	148.5	129.5	121.9	111.2	102.8	96.4	90	83.6	77.2	70.8	56.3	44.9	35.8								
		90<v _R <150		160	160	160	148.5	137.1	121.9	112	101.3	94.4	89.7	85	80.3	75.6	70.8	56.3	44.9	35.8								
	250	<60		250	250	250	250	244	214.2	202.3	186.9	172.6	160.1	147.8	135.5	123.2	110.7	88	70.2	55.9								
		60<v _R <90		250	250	250	250	232.1	202.3	190.4	173.8	160.7	150.7	140.7	130.7	120.7	110.7	88	70.2	55.9								
		90<v _R <150		250	250	250	232.1	214.2	190.4	175	158.3	147.6	140.1	132.8	125.5	118.2	110.7	88	70.2	55.9								
	320	<60		320	320	320	320	312.3	274.2	259	239.2	220.9	205	189.2	173.4	157.7	141.7	112.7	89.9	71.6								
		60<v _R <90		320	320	320	320	297.1	259	243.8	222.4	205.7	192.9	180.1	167.3	154.5	141.7	112.7	89.9	71.6								
		90<v _R <150		320	320	320	297.1	274.2	243.8	224	202.6	188.9	179.4	170	160.6	151.3	141.7	112.7	89.9	71.6								
	400	<60		400	400	400	400	390.4	342.8	323.8	299	276.1	256.2	236.5	216.8	197.1	177.1	140.9	112.3	89.5								
		60<v _R <90		400	400	400	400	371.4	323.8	304.7	278	257.1	241.1	225.1	209.1	193.1	177.1	140.9	112.3	89.5								
		90<v _R <150		400	400	400	371.4	342.8	304.7	280	253.3	236.1	224.2	212.5	200.8	189.1	177.1	140.9	112.3	89.5								
1.7357, 1.7335 13CrMo4-5 [5E0]	10	<60		10	10	10	10	10	10	9.5	9	8.4	8	7.6	7.2	6.8	6.5	5.5	4.4	3.7	2.9	2.3	1.9	1.5				
		60<v _R <90		10	10	10	10	10	10	9.7	9	8.3	7.8	7.5	7.2	6.9	6.6	5.5	4.4	3.7	2.9	2.3	1.9	1.5				
		90<v _R <150		10	10	10	10	10	10	9.1	8.4	7.9	7.3	7.1	6.9	6.7	6.5	5.5	4.4	3.7	2.9	2.3	1.9	1.5				
	16	<60		16	16	16	16	16	16	15.2	14.4	13.4	12.8	12.1	11.5	10.8	10.4	8.8	7.1	5.9	4.6	3.7	3	2.5				
		60<v _R <90		16	16	16	16	16	15.6	14.4	13.4	12.5	12	11.5	11	10.5	10.4	8.8	7.1	5.9	4.6	3.7	3	2.5				
		90<v _R <150		16	16	16	16	16	14.7	13.5	12.7	11.8	11.4	11.1	10.7	10.4	10.4	8.8	7.1	5.9	4.6	3.7	3	2.5				
	25	<60		25	25	25	25	25	25	23.8	22.5	21	20	19	18	17	16.3	13.8	11.1	9.2	7.2	5.8	4.7	3.9				
		60<v _R <90		25	25	25	25	25	24.4	22.5	20.9	19.6	18.8	18	17.2	16.5	16.3	13.8	11.1	9.2	7.2	5.8	4.7	3.9				
		90<v _R <150		25	25	25	25	25	22.9	21.1	19.8	18.4	17.9	17.3	16.8	16.3	16.3	13.8	11.1	9.2	7.2	5.8	4.7	3.9				
	40	<60		40	40	40	40	40	40	38	36	33.7	32	30.4	28.8	27.2	26	22	17.9	14.8	11.6	9.3	7.6	6.2				
		60<v _R <90		40	40	40	40	40	40	39	36	33.5	31.4	30.1	28.9	27.6	26.4	26	22	17.9	14.8	11.6	9.3	7.6	6.2			
		90<v _R <150		40	40	40	40	40	36.7	33.9	31.8	29.5	28.6	27.7	26.8	26	26	22	17.9	14.8	11.6	9.3	7.6	6.2				
	63	<60		63	63	63	63	63	63	60	56.7	53.1	50.5	47.9	45.4	42.8	41.1	34.8	28.2	23.4	18.3	14.7	12	9.9				
		60<v _R <90		63	63	63	63	63	61.5	56.7	52.8	49.5	47.5	45.5	43.5	41.5	34.8	28.2	23.4	18.3	14.7	12	9.9					
		90<v _R <150		63	63	63	63	63	57.9	53.4	50.1	46.5	45.1	43.7	42.3	41.1	34.8	28.2	23.4	18.3	14.7	12	9.9					
	100	<60		100	100	100	100	100	100	95.2	90	84.2	80.2	76.1	72	68	65.2	55.2	44.7	37.1	29	23.3	19	15.7				
		60<v _R <90		100	100	100	100	100	97.6	90	83.8	78.5	75.4	72.2	69.1	66	65.2	55.2	44.7	37.1	29	23.3	19	15.7				
		90<v _R <150		100	100	100	100	100	91.9	84.7	79.5	73.8	71.6	69.4	67.2	65.2	65.2	55.2	44.7	37.1	29	23.3	19	15.7				
	160	<60		160	160	160	160	160	160	152.3	144	134.8	128.3	121.8	115.3	108.8	104.3	88.3	71.6	59.4	46.4	37.3	30.4	25.1				
		60<v _R <90		160	160	160	160	160	156.1	144	134	125.7	120.6	115.6	110.6	105.6	104.3	88.3	71.6	59.4	46.4	37.3	30.4	25.1				
		90<v _R <150		160	160	160	160	160	147	135.6	127.2	118																

Pressure rating table acc. to DIN2401 (1966)

 Permissible operating pressure [bar(g)] at calculation temperature [°C] ¹⁾

Material	PN	20	120	200	250	300	350	400	425	450	475	500	510	520	530	540	550
1.0619, 1.0460 P250GH [3E0]	16	16	16	14	13	11	10	8									
	25	25	25	22	20	17	16	13									
	40	40	40	35	32	28	24	21									
	63	63	63	50	45	40	36	32									
	100	100	100	80	70	60	56	50									
	160	160	160	130	112	96	90	80									
	250	250	250	200	175	150	140	125									
	320	320	320	250	225	192	180	160									
1.5415 16Mo3 [4E0]	25	25	25	25	25	22	20	19	18	17							
	40	40	40	40	40	35	31	30	29	28							
	63	63	63	63	63	56	50	47	46	45							
	100	100	100	100	100	87	78	74	72	70							
	160	160	160	160	160	139	125	118	115	112							
	250	250	250	250	250	217	195	185	179	174							
	320	320	320	320	320	278	250	236	230	222							
	400	400	400	400	400	348	312	296	286	278							
1.7357, 1.7335 13CrMo4-5 [5E0]	25	25	25	25	25	25	24	23	22	21	20	18	15	12	9		
	40	40	40	40	40	40	38	36	35	34	33	29	24	19	15		
	63	63	63	63	63	63	61	58	57	56	53	47	40	32	25		
	100	100	100	100	100	100	95	91	89	87	82	74	62	49	38		
	160	160	160	160	160	160	153	146	142	139	132	118	100	79	62	46	35
	250	250	250	250	250	250	238	227	223	217	206	184	154	124	97	73	54
	320	320	320	320	320	320	304	292	285	278	264	237	200	158	124	93	69
	400	400	400	400	400	400	380	364	356	348	330	295	250	198	155	116	87
1.7383 11CrMo9-10 [6E0]	160	160	160	160	160	160	153	146	142	139	132	118	100	79	70	61	52
	250	250	250	250	250	250	238	227	223	217	206	184	154	124	108	95	81
	320	320	320	320	320	320	304	292	285	278	264	237	200	158	139	121	104
	400	400	400	400	400	400	380	364	356	348	330	295	250	198	174	151	130

1) Operating temperature = calculation temperature minus temperature surcharge according to the standard codes.

Pressure rating table acc. to DIN EN 12516-1 (2018) – materials 1.0571, 1.0565, 1.0619, 1.0460, 1.4404

 Permissible operating pressure [bar(g)] at calculation temperature [°C] ¹⁾

Material	PN	-60	-10	20	50	100	150	200	250	300	350	375	380	400	420	425	450	470	475	480	500	510	520	525	530	550	575	600
1.0571, 1.0565 P355QH1 [8E3]	10	10	10	10	10	10	10	10	10	10	9.4	8.7	8.6	8														
	16	16	16	16	16	16	16	16	16	16	15	13.9	13.7	12.8														
	25	25	25	25	25	25	25	25	25	25	23.5	21.8	21.4	20														
	40	40	40	40	40	40	40	40	40	40	37.5	34.9	34.3	32.1														
	63	63	63	63	63	63	63	63	63	63	59.1	54.9	54	50.5														
	100	100	100	100	100	100	100	100	100	100	93.8	87.1	85.7	80.2														
	160	160	160	160	160	160	160	160	160	160	150.2	139.5	137.2	128.3														
	250	250	250	250	250	250	250	250	250	250	234.7	217.9	214.4	200.5														
	320	320	320	320	320	320	320	320	320	320	300.4	278.9	274.5	256.6														
	400	400	400	400	400	400	400	400	400	400	375.5	348.6	343	320.8														
1.0619, 1.0460 P250GH [3E0]	10	10	10	10	9.4	8.9	8.4	7.7	7	6.5	6.2	6.2	6	5.5	5.2	3.7	2.7	2.5	2.2									
	16	16	16	16	15	14.2	13.4	12.3	11.1	10.4	10	9.9	9.6	8.8	8.3	5.9	4.3	3.9	3.6									
	25	25	25	25	23.4	22.2	21	19.2	17.4	16.2	15.6	15.5	15	13.7	13	9.2	6.7	6.1	5.6									
	40	40	40	40	37.4	35.5	33.6	30.7	27.8	25.9	25	24.8	24	22	20.8	14.7	10.7	9.8	9									
	63	63	63	63	59	55.9	52.9	48.4	43.8	40.8	39.3	39	37.8	34.6	32.7	23.2	16.8	15.5	14.1									
	100	100	100	100	93.6	88.8	84	76.8	69.6	64.8	62.4	61.9	60	54.9	51.9	36.8	26.7	24.5	22.4									
	160	160	160	160	149.8	142.1	134.5	122.9	111.4	103.7	99.9	99.1	96	87.9	83.1	58.9	42.7	39.3	35.9									
	250	250	250	250	234.1	222.1	210.1	192.1	174.1	162	156	154.8	150	137.4	129.8	92	66.7	61.4	56									
	320	320	320	320	299.7	284.3	268.9	245.9	222.8	207.5	199.8	198.2	192.1	175.9	166.2	117.8	85.4	78.5	71.7									
	400	400	400	400	374.5	355.3	336.1	307.3	278.5	259.3	249.7	247.8	240.1	219.8	207.7	147.3	106.7	98.2	89.6									
1.4404 X2CrNiMo17-12-2 [13E0]	10	10	10	10	9.8	9	8.1	7.3	6.4	6.2	6		5.9		5.7	5.6	5.5	5.5	5.5	5.5	5.5				5.2		5.2	
	16	16	16	16	15.7	14.3	13	11.7	10.3	9.9	9.6		9.4		9.2	9	8.9	8.9	8.9	8.8	8.8				8.3		8.3	
	25	25	25	25	24.5	22.4	20.3	18.2	16.1	15.4	15.1		14.7		14.4	14	13.9	13.9	13.8	13.7	13.7				13		12.9	
	40	40	40	40	39.2	35.8	32.5	29.1	25.8	24.6	24.1		23.5		23	22.4	22.2	22.2	22.1	22	21.9				20.8		20.7	
	63	63	63	63	61.7	56.4	51.2	45.9	40.6	38.8	37.9		37		36.2	35.3	35	34.9	34.9	34.6	34.5				32.8		32.6	
	100	100	100	100	98	89.6	81.2	72.8	64.4	61.6	60.2		58.8		57.4	56	55.5	55.4	55.3	54.9	54.8				52		51.7	
	160	160	160	160	156.9	143.4	130	116.5	103.1	98.6	96.4		94.1		91.9	89.6	88.9	88.7	88.6	87.8	87.7				83.2		82.8	
	250	250	250	250	245.1	224.1	203.1	182.1	161	154	150.5		147		143.5	140	138.9	138.6	138.4	137.2	137				130		129.4	
	320	320	320	320	313.7	286.8	260	233.1	206.2	197.2	192.7		188.2		183.8	179.3	177.8	177.5	177.1	175.7	175.3				166.5		165.6	
	400	400	400	400	392.1	358.5	324.9	291.3	257.7	246.5	240.9		235.3		229.7	224.1	222.3	221.8	221.4	219.6	219.2				208.1		207	

1) Operating temperature = calculation temperature minus temperature surcharge according to the standard codes.

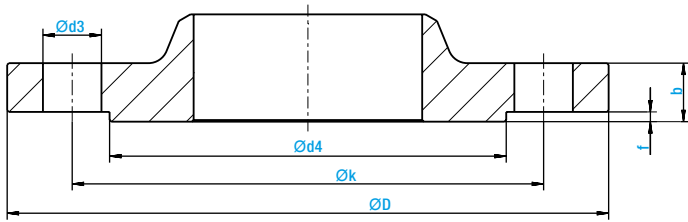
Further materials on page 142 →

Pressure rating table acc. to DIN EN 12516-1 (2018) – materials 1.4571, 1.4903, 1.5415, 1.7357, 1.7335, 1.7383, 1.7380

Permissible operating pressure [bar(g)] at calculation temperature [°C] ¹⁾

Material	PN	-60	-10	20	50	100	150	200	250	300	350	375	380	400	420	425	450	470	475	480	500	510	520	525	530	550	575	600
1.4571 ²⁾ XCrNiMoTi17-12-2 [15EO]	10	10	10	10	10	10	9.7	9	8.5	8.1	7.7	7.5		7.3		7.1	7	6.9	6.9	6.8	6.6	6.4		6		5.8	5.4	3.9
	16	16	16	16	16	16	15.5	14.3	13.7	13	12.3	12		11.7		11.4	11.2	11	11	10.9	10.5	10.2		9.6		9.3	8.6	6.2
	25	25	25	25	25	25	24.2	22.4	21.4	20.3	19.3	18.7		18.2		17.9	17.5	17.2	17.2	17.1	16.5	15.9		15		14.6	13.5	9.7
	40	40	40	40	40	40	38.6	35.8	34.2	32.5	30.8	30		29.1		28.6	28	27.6	27.4	27.3	26.3	25.4		24.1		23.3	21.5	15.6
	63	63	63	63	63	63	60.9	56.4	53.8	51.2	48.5	47.2		45.9		45	44.1	43.4	43.2	43	41.5	40		37.9		36.7	33.9	24.5
	100	100	100	100	100	100	96.6	89.6	85.4	81.2	77	74.9		72.8		71.4	70	68.9	68.6	68.3	65.8	63.5		60.2		58.2	53.9	38.9
	160	160	160	160	160	160	154.6	143.4	136.7	130	123.3	119.9		116.5		114.3	112.1	110.3	109.8	109.4	105.3	101.7		96.3		93.2	86.2	62.3
	250	250	250	250	250	250	241.6	224.1	213.6	203.1	192.6	187.3		182.1		178.6	175.1	172.3	171.6	170.9	164.5	158.9		150.4		145.6	134.7	97.4
	320	320	320	320	320	320	309.3	286.8	273.4	260	246.5	239.8		233.1		228.6	224.1	220.5	219.6	218.7	210.7	203.4		192.6		186.4	172.5	124.6
	400	400	400	400	400	400	386.5	358.5	341.7	324.9	308.1	299.7		291.3		285.7	280.1	275.6	274.5	273.4	263.3	254.3		240.7		232.9	215.5	155.8
	10	10	10	10	10	10	10	10	10	10	9.4	9	8.9	8.5	8.2	8.2	7.9	7.5	7.4	7.2	6.6	6.4		6		5.8	5.6	5
1.4903 ²⁾ X10CrMoVNb9-1 [9EO]	16	16	16	16	16	16	16	16	16	16	15	14.5	14.3	13.7	13.2	13.1	12.6	12	11.8	11.6	10.5	10.2		9.6		9.3	8.9	8
	25	25	25	25	25	25	25	25	25	25	23.5	22.6	22.4	21.3	20.6	20.4	19.7	18.7	18.5	18.1	16.5	15.9		15		14.6	14	12.5
	40	40	40	40	40	40	40	40	40	40	37.5	36.2	35.8	34.1	32.9	32.6	31.5	29.9	29.5	28.9	26.3	25.4		24.1		23.3	22.3	20
	63	63	63	63	63	63	63	63	63	63	59.1	57	56.4	53.8	51.9	51.4	49.7	47.2	46.5	45.5	41.5	40		37.9		36.7	35.2	31.5
	100	100	100	100	100	100	100	100	100	100	93.8	90.5	89.5	85.3	82.4	81.6	78.9	74.9	73.9	72.2	65.8	63.5		60.2		58.2	55.9	50
	160	160	160	160	160	160	160	160	160	160	150.2	144.9	143.2	136.6	131.8	130.7	126.2	119.8	118.2	115.6	105.3	101.7		96.3		93.2	89.4	80
	250	250	250	250	250	250	250	250	250	250	234.7	226.3	223.7	213.4	206	204.1	197.2	187.2	184.7	180.7	164.5	158.9		150.4		145.6	139.7	125
	320	320	320	320	320	320	320	320	320	320	300.4	289.7	286.4	273.2	263.7	261.3	252.5	239.7	236.5	231.3	210.7	203.4		192.6		186.4	178.8	160.1
	400	400	400	400	400	400	400	400	400	400	375.5	362.1	358	341.4	329.6	326.6	315.6	299.5	295.5	289.1	263.3	254.3		240.7		232.9	223.5	200.1
	10	10	10	10	10	10	9.8	9.1	8.5	7.9	7.4	7.3		7.2		6.9	6.7	6.6	6.6	6.5	4.5	3.9	3.1	2.8	2.5			
1.5415 16Mo3 [4EO]	16	16	16	16	16	16	15.7	14.6	13.6	12.7	11.9	11.7		11.5		11.1	10.7	10.5	10.5	10.4	7.3	6.3	5	4.5	4			
	25	25	25	25	25	25	24.5	22.8	21.3	19.8	18.6	18.3		18		17.3	16.7	16.4	16.4	16.3	11.3	9.9	7.9	7.1	6.3			
	40	40	40	40	40	40	39.1	36.5	34.1	31.7	29.8	29.3		28.8		27.7	26.7	26.3	26.2	26.1	18.1	15.8	12.6	11.3	10			
	63	63	63	63	63	63	61.6	57.5	53.7	49.9	46.9	46.1		45.4		43.7	42	41.4	41.3	41.1	28.6	24.9	19.8	17.8	15.8			
	100	100	100	100	100	100	97.8	91.2	85.2	79.2	74.4	73.2		72		69.4	66.7	65.8	65.5	65.3	45.3	39.5	31.5	28.3	25.1			
	160	160	160	160	160	160	156.6	146	136.4	126.8	119.1	117.2		115.3		111	106.8	105.3	104.9	104.5	72.6	63.2	50.4	45.2	40.1			
	250	250	250	250	250	250	244.6	228.1	213.1	198.1	186.1	183.1		180.1		173.5	166.8	164.4	163.8	163.2	113.4	98.7	78.7	70.7	62.7			
	320	320	320	320	320	320	313.1	292	272.8	253.6	238.2	234.3		230.5		222.1	213.6	210.5	209.8	209	145.1	126.4	100.7	90.5	80.2			
	400	400	400	400	400	400	391.3	364.9	340.9	316.9	297.7	292.9		288.1		277.5	267	263.1	262.2	261.2	181.4	157.9	125.9	113.1	100.3			
	10	10	10	10	10	10	10	10	10	10	9.3	9		8.5		8.2	7.9	7.5	7.4	7.2	6.2	5.6		4.6		2.6		
1.7357, 1.7335 13CrMo4-5 [5EO]	16	16	16	16	16	16	16	16	16	16	14.9	14.4		13.7		13.1	12.6	12	11.8	11.6	10	8.9		7.3		4.2		
	25	25	25	25	25	25	25	25	25	25	23.3	22.4		21.3		20.4	19.7	18.7	18.5	18.1	15.6	13.9		11.5		6.5		
	40	40	40	40	40	40	40	40	40	40	37.3	35.9		34.1		32.7	31.5	29.9	29.5	28.9	25	22.3		18.3		10.5		
	63	63	63	63	63	63	63	63	63	63	58.7	56.5		53.8		51.4	49.7	47.2	46.5	45.5	39.3	35.1		28.9		16.5		
	100	100	100	100	100	100	100	100	100	100	93.1	89.8		85.3		81.6	78.9	74.9	73.9	72.2	62.4	55.8		45.9		26.1		
	160	160	160	160	160	160	160	160	160	160	149.1	143.7		136.6		130.7	126.2	119.8	118.2	115.6	99.9	89.3		73.4		41.8		
	250	250	250	250	250	250	250	250	250	250	232.9	224.5		213.4		204.1	197.2	187.2	184.7	180.7	156	139.5		114.7		65.4		
	320	320	320	320	320	320	320	320	320	320	298.1	287.4		273.2		261.3	252.5	239.7	236.5	231.3	199.8	178.6		146.8		83.7		
	400	400	400	400	400	400	400	400	400	400	372.6	359.2		341.4		326.6	315.6	299.5	295.5	289.1	249.7	223.2		183.5		104.6		
	10	10	10	10	10	10	10	10	10	10	9.4	9		8.5		8.2	7.9	7.5	7.4	7.2	6.6	6.4		5.4		3.5	2.7	1.5
1.7383 ²⁾ , 1.7380 ²⁾ 11CrMo9-10 [6EO]	16	16	16	16	16	16	16	16	16	16	15	14.5		13.7		13.1	12.6	12	11.8	11.6	10.5	10.2		8.6		5.6	4.4	2.4
	25	25	25	25	25	25	25	25	25	25	23.5	22.6		21.3		20.4	19.7	18.7	18.5	18.1	16.5	15.9		13.5		8.8	6.8	3.7
	40	40	40	40	40	40	40	40	40	40	37.5	36.2		34.1		32.7	31.5	29.9	29.5	28.9	26.3	25.4		21.5		14.1	10.9	6
	63	63	63	63	63	63	63	63	63	63	59.1	57		53.8		51.4	49.7	47.2	46.5	45.5	41.5	40		33.9		22.2	17.1	9.4
	100	100	100	100	100	100	100	100	100	100	93.8	90.5		85.3		81.6	78.9	74.9	73.9	72.2	65.8	63.5		53.9		35.2	27.2	14.9
	160	160	160	160	160	160	160	160	160	160	150.2	144.9		136.6		130.7	126.2	119.8	118.2	115.6	105.3	101.7		86.2		56.3	43.5	23.9
	250	250	250	250	250	250	250	250	250	250	234.7	226.3		213.4		204.1	197.2	187.2	184.7	180.7	164.5	158.9		134.7		88	68	37.3
	320	320	320	320	320	320	320	320	320	320	300.4	289.7		273.2		261.3	252.5	239.7	236.5	231.3	210.7	203.4		172.5		112.7	87.1	47.8

FLANGE DIMENSIONS



Raised face as per DIN 2526 or EN 1092 (other flange forms possible).

Nominal pressure	DN dimensions	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	500	600	700	800
10	Flange ØD	95	105	115	140	150	165	185	200	220	250	285	340	395	445	505	565	670	780	895	1015
	b	16	18	18	18	18	18	22	24	24	26	22	24	26	26	26	26	28	28	30	32
	k	65	75	85	100	110	125	145	160	180	210	240	295	350	400	460	515	620	725	840	950
	Seal. d4	45	58	68	78	88	102	122	138	158	188	212	268	320	370	430	482	585	685	800	905
	f	2	2	2	2	3	3	3	3	3	3	3	3	3	4	4	4	4	5	5	5
	Qty of screws	4	4	4	4	4	4	8(4)*	8	8	8	8	8	12	12	16	16	20	20	24	24
	Thread d2	M12	M12	M12	M16	M16	M16	M16	M16	M16	M16	M20	M20	M20	M20	M20	M24	M24	M27	M27	M30
16	Flange ØD	95	105	115	140	150	165	185	200	220	250	285	340	405	460	520	580	715	840	910	1025
	b	16	18	18	18	18	18	22	24	24	26	22	24	26	28	30	32	34	36	36	38
	k	65	75	85	100	110	125	145	160	180	210	240	295	355	410	470	525	650	770	840	950
	Seal. d4	45	58	68	78	88	102	122	138	158	188	212	268	320	378	438	490	610	725	795	900
	f	2	2	2	2	3	3	3	3	3	3	3	3	3	4	4	4	4	5	5	5
	Qty of screws	4	4	4	4	4	4	8(4)*	8	8	8	8	12	12	12	16	16	20	20	24	24
	Thread d2	M12	M12	M12	M16	M16	M16	M16	M16	M16	M16	M20	M20	M24	M24	M24	M27	M30	M33	M33	M36
25	Flange ØD	95	105	115	140	150	165	185	200	235	270	300	360	425	485	555	620	730	845	960	1085
	b	16	18	18	18	18	20	22	24	24	26	28	30	32	34	38	40	44	46	46	50
	k	65	75	85	100	110	125	145	160	190	220	250	310	370	430	490	550	660	770	875	990
	Seal. d4	45	58	68	78	88	102	122	138	162	188	218	278	335	395	450	505	615	720	820	930
	f	2	2	2	2	3	3	3	3	3	3	3	3	3	4	4	4	4	5	5	5
	Qty of screws	4	4	4	4	4	4	8(4)*	8	8	8	8	12	12	16	16	16	20	20	24	24
	Thread d2	M12	M12	M12	M16	M16	M16	M16	M16	M20	M24	M24	M24	M27	M27	M30	M33	M33	M36	M39	M45
40	Flange ØD	95	105	115	140	150	165	185	200	235	270	300	375	450	515	580	660	755	890	995	1140
	b	16	18	18	18	18	20	22	24	24	26	28	34	38	42	46	50	52	60	64	72
	k	65	75	85	100	110	125	145	160	190	220	250	320	385	450	510	585	670	795	900	1030
	Seal. d4	45	58	68	78	88	102	122	138	162	188	218	285	345	410	465	535	615	735	840	960
	f	2	2	2	2	3	3	3	3	3	3	3	3	3	4	4	4	4	5	5	5
	Qty of screws	4	4	4	4	4	4	8	8	8	8	8	12	12	16	16	16	20	20	24	24
	Thread d2	M12	M12	M12	M16	M16	M16	M16	M16	M20	M24	M24	M27	M30	M30	M33	M33	M36	M39	M45	M52
63	Flange ØD	105	130	140	155	170	180	205	215	250	295	345	415	470	530						
	b	20	24	24	24	26	26	26	28	30	34	36	42	46	52						
	k	75	90	100	110	125	135	160	170	200	240	280	345	400	460						
	Seal. d4	45	60	68	78	88	102	122	138	162	188	218	285	345	410						
	f	2	2	2	2	3	3	3	3	3	3	3	3	3	4						
	Qty of screws	4	4	4	4	4	4	8	8	8	8	8	12	12	16						
	Thread d2	M12	M16	M16	M20	M20	M20	M20	M20	M24	M27	M30	M33	M33	M33						
100	Flange ØD	105	130	140	155	170	195	220	230	265	315	355	430	505	585						
	b	20	24	24	24	26	28	30	32	36	40	44	52	60	68						
	k	75	90	100	110	125	145	170	180	210	250	290	360	430	500						
	Seal. d4	45	60	68	78	88	102	122	138	162	188	218	285	345	410						
	f	2	2	2	2	3	3	3	3	3	3	3	3	3	4						
	Qty of screws	4	4	4	4	4	4	8	8	8	8	12	12	12	16						
	Thread d2	M12	M16	M16	M20	M20	M24	M24	M24	M27	M30	M30	M33	M36	M39						
160	Flange ØD	105		140		170	195	220	230	265	315	355	430	515	585						
	b	20		24		28	30	34	36	40	44	50	60	68	78						
	k	75		100		125	145	170	180	210	250	290	360	430	500						
	Seal. d4	45		68		88	102	122	138	162	188	218	285	345	410						
	f	2		2		3	3	3	3	3	3	3	3	3	4						
	Qty of screws	4		4		4	4	8	8	8	12	12	12	12	16						
	Thread d2	M12		M16		M20	M24	M24	M24	M27	M30	M30	M33	M36	M39						

* Values in brackets available on request for pipeline flange as per old DIN 2632 or DIN 2633.

DESIGN CHARACTERISTICS

Body

The body and cover or bonnet form the pressure bearing assembly and determine the application area of the valve. The demand for valves for ever higher pressures and temperatures requires special materials and production processes. Pressure ratings, nominal diameters and quantities in the high-pressure range require different manufacturing methods appropriate to the specific conditions. The designs therefore vary according to the specific conditions. Forged PERSTA valve bodies, particularly for power station, are closed or open die forgings, with a machined finish. Systematic rolling and forming processes give the formed parts an impermeable, homogeneous, fine-grained structure without cavities or pores and a fibre orientation that is ideally suited to the intended use.

The modern production methods result in an increased use of forged steel in the high-pressure range. However, there are limits to the development of die-forged bodies, due to the large forming forces involved and thus the size and cost of the dies needed. For this reason, open-die forging is used for large bodies, which are then machined afterwards.

For PERSTA high pressure valves, the following production methods have proven effective:

1. Hollow forging from a single piece is primarily used for the DSK 10, DN 50-350 and DSK 26, DN 65-300/250 series. In the DSK 10 design, the valve flange or butt-weld end connections are welded on with a circumferential weld.
2. Two half shells forged in a die for the gate valve body or swing check valves in the PD 18 / PN 160, DN 50-300 series are joined by means of electron beam welding. Before welding, the seat surfaces are armoured with Stellite, rotated and finished.
3. Body for gate valves and swing check valves in the DSK 16-63, DN 50-600 series are forged solid as open-die parts with machined finish. Valves are strained through:
 - Mechanically by
 - Operating pressure
 - Operating temperature
 - Temperature gradients during start up and shutdown
 - Erosion and cavitation caused by the medium
 - By forces that are applied by the connected pipelines, by fastening equipment and the dead weight of the actuators
 - Chemically by
 - Corrosion

Smooth transitions in the wall thickness limit thermal expansion in PERSTA valve bodies. In the case of gate valves, sealing takes place on the pressure-bearing side of the body. The sealing force required is applied by the medium due to the differential pressure. Rails or grooves guide the disc or the disc fittings in the body after around 10% opening stroke. The forces to be absorbed by the guides are relatively small because the pressures have largely equalised by the time this position is reached. The weld seams are designed to be process-compliant in terms of radiographic or ultrasonic testing. All PERSTA gate valves and swing check valves can be designed with shoed butt-weld ends to adjust to the respective pipeline materials and diameters.

Stem packing

The gland packing seals the stem guide externally. Strains on the seal are caused by movements of the stem, pressure and friction on the packing, thermal fluctuation, and by the medium. The design of the gland and gland flange ensures even pressing of the packing rings, even if the packing bolts are tightened slightly unevenly, thereby preventing jamming of the stem.

Operating principle

A force applied by the stud bolts (462) to the gland (440) is transferred by the gland flange (430) and the chamber ring (421) to the packing rings (420). This presses the packing rings together. The resultant surface pressure against the gland chamber and against the stem surface seals against the medium.

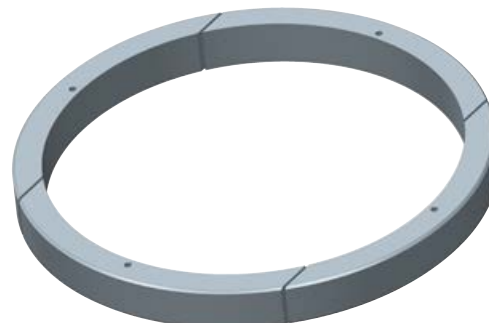
Operating principle

An axial force that increases as the internal pressure increases is applied to the elastic gasket ring (160). This force presses the elastic gasket ring together and deforms it in the radial and axial directions. In the radial direction, it is pressed against the body wall and the cover (270), thus providing the necessary surface pressure and sealing force.

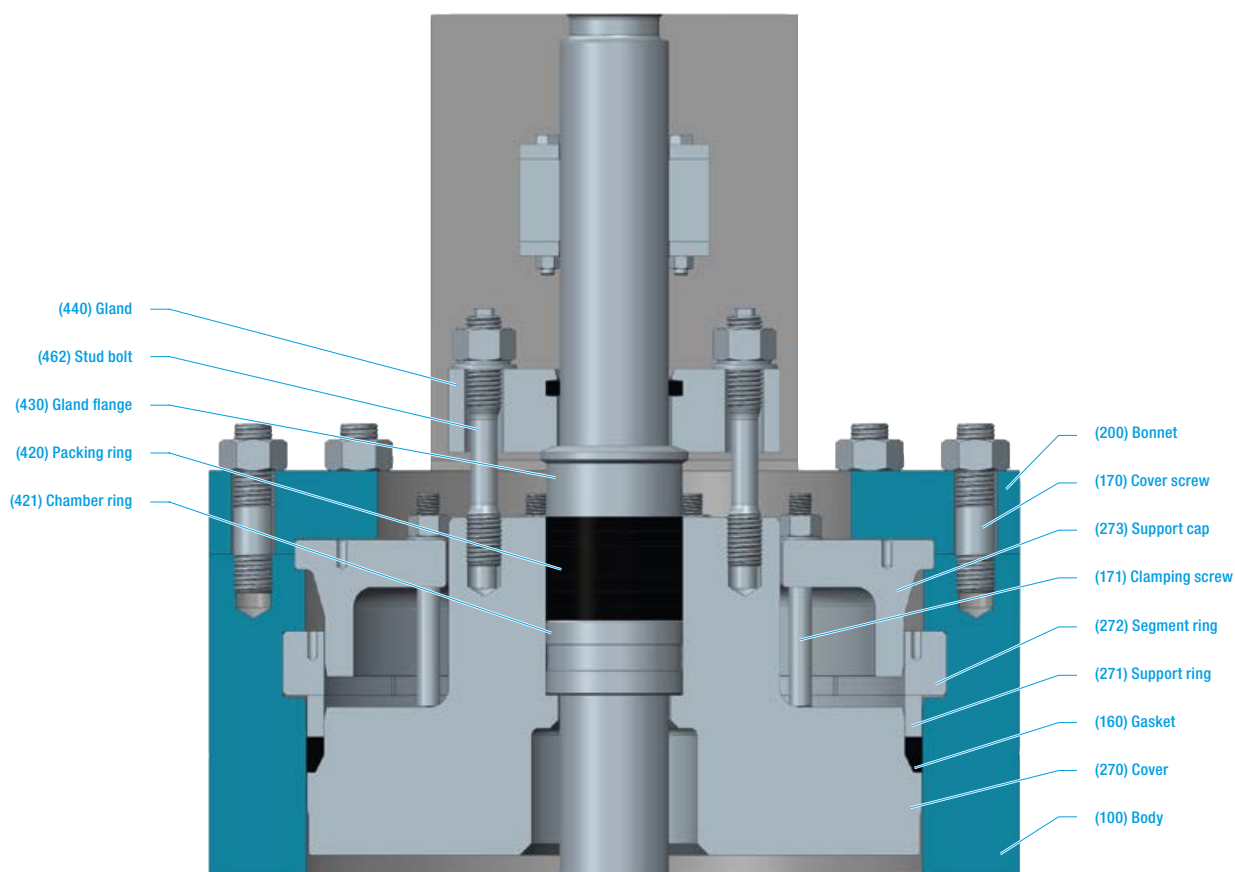
The support ring (271) on the gasket ring absorbs the axial force and transmits it to the segment ring (272). The segment ring is located in a groove in the body (100) and thus transmits the axial force positively locking to the body. The segment ring is made up of multiple parts and it is held in the body groove by the support cap (273). The cover (270) is pretensioned by the clamping screws (171) in order to retain the deformation of the gasket ring (and thus the sealing effect) even when the internal pressure is low.

Unlike valves with a bolted bonnet or cover, in which the internal pressure is absorbed by the cover screws, the gasket ring of the pressure sealing bonnet is subjected to a force proportional to the internal pressure, which increases the sealing effect of the pressure sealing cover.

Segment ring



Attention: Over pressure safety devices may be needed to safeguard against impermissible pressures. See the section on over pressure safety devices



PIPE AND VALVE CONNECTION DIMENSIONS

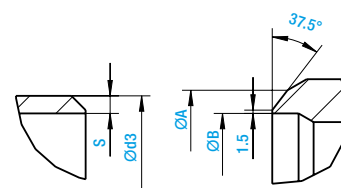
Pipe dimensions (DIN 2448) and valve connection dimensions as per DIN EN 12627

DN		Butt-weld ends							
		Series 1 up to PN 40	Series 2 PN 63	Series 3 PN 100	Series 4 PN 160	Series 5 PN 250	Series 6 PN 320	Series 7 PN 400	Series 8 PN 630
10	A	18	18	18	18	18	18	18	22
	B	13.2	13.2	13.2	13.2	12	12	10	11.3
	d3	17.2	17.2	17.2	17.2	17.2	17.2	17.2	21.3
	s	2	2	2	2	2.6	2.6	3.6	5
15	A	22	22	22	22	22	22	28	35
	B	17.3	17.3	17.3	17.3	16.1	14.9	16.9	17.7
	d3	21.3	21.3	21.3	21.3	21.3	21.3	26.9	33.7
	s	2	2	2	2	2.6	3.2	5	8
20	A	28							
	B	22.3							
	d3	26.9							
	s	2.3							
25	A	35	35	35	35	35	35	44	50
	B	28.5	28.5	28.5	27.3	26.5	23.7	28.2	23.3
	d3	33.7	33.7	33.7	33.7	33.7	33.7	42.4	48.3
	s	2.6	2.6	2.6	3.2	3.6	5	7.1	12.5
40	A	50	50	50	50	50	50	62	77
	B	43.1	43.1	43.1	41.1	38.3	35.7	38.3	41.1
	d3	48.3	48.3	48.3	48.3	48.3	48.3	60.3	76.1
	s	2.6	2.6	2.6	3.6	5	6.3	11	17.5
50	A	62	62	62	62	62	77	77	91
	B	53.9	53.9	53.9	52.3	44.3	58.5	47.7	48.9
	d3	60.3	60.3	60.3	60.3	60.3	76.1	76.1	88.9
	s	3.2	3.2	3.2	4	8	8.8	14.2	20
65	A	77	77	77	77	77	91	117	
	B	68.9	68.9	68.9	64.9	58.5	66.9	79.3	
	d3	76.1	76.1	76.1	76.1	76.1	88.9	114.3	
	s	3.6	3.6	3.6	5.6	8.8	11	17.5	
80	A	91	91	91	91	117	117	117	
	B	80.9	80.9	80.9	76.3	92.3	85.9	79.3	
	d3	88.9	88.9	88.9	88.9	114.3	114.3	114.3	
	s	4	4	4	6.3	11	14.2	17.5	
100	A	117	117	117	117				
	B	104.3	104.3	104.3	98.3				
	d3	114.3	114.3	114.3	114.3				
	s	5	5	5	8				
125	A	144	144	144	144				
	B	130.7	130.7	127.1	119.7				
	d3	139.7	139.7	139.7	139.7				
	s	4.5	4.5	6.3	10				
150	A	172	172	172	172				
	B	157.1	157.1	154.1	143.3				
	d3	168.3	168.3	168.3	168.3				
	s	5.6	5.6	7.1	12.5				
200	A	223	223	223	223				
	B	204.9	204.9	199.1	187.1				
	d3	219.1	219.1	219.1	219.1				
	s	7.1	7.1	10	16				
250	A	278	278	278					
	B	257	255.4	248					
	d3	273	273	273					
	s	8	8.8	12.5					
300	A	329	329	329					
	B	307.9	301.9	295.5					
	d3	323.9	323.9	323.9					
	s	8	11	14.2					
350	A	362	362	362					
	B	338	330.6	323.6					
	d3	355.6	355.6	355.6					
	s	8.8	12.5	16					
400	A	413	413						
	B	384.4	378						
	d3	406.4	406.4						
	s	11	14.2						
500	A	516							
	B	479.6							
	d3	508							
	s	14.2							

Note

For the outer diameters indicated, larger outer diameters may be necessary, depending on the material and the heat treatment diameter.

The assignment of pipe diameter to pressure rating is taken from DIN 3239. Pressure ratings and materials as per DIN 2401. (materials 1.0460; 1.0425; 1.5415; 1.7335; 1.7383) Cast materials were not taken into account.



Ød3 is the outer diameter of the corresponding series 1 steel pipe as per ISO 4200-1985

PRODUCTION AND TESTING EQUIPMENT

Mechanical workshop

- 2 flexible machining centres for turning, drilling, milling and welding by welding robots
- 9 machining centres for drilling, turning and milling

CNC-controlled and conventional horizontal and vertical lathes for max. workpiece weights of approx. 20 kN

Drilling machines, milling machines, CNC-controlled saw, lapping and deburring machines, or grinding machines, lathes

Welding technology

- 2 welding robots for build-up welding
- 1 welding robot for joint welding
- 1 welding robot for build-up and joint welding

manual welding stations for build-up and joint welding:

- For electrode welding: 2.0–6.0 mm electrode diameter
- For TIG welding: 1.6–4.0 mm electrode diameter
- For MAG welding: 1.0–1.6 mm electrode diameter

welding stations for build-up welding

- For plasma arc welding: 50–150 µm powder

mechanical welding stations for joint welding:

- For submerged arc welding: 2.5–4.0 mm electrode diameter
- For electron beam welding: without filler metal

manipulators for welding processing of unit weights up to max. 120 kN

electric annealing furnaces, annealing facilities, induction heating systems, flame cutting systems

Fitting

- 7 assembly and testing facilities for pressure testing (strength testing) of valves up to max. DN 800, with a max. test pressure of 1,000 bar.
- 1 helium leak detector, suitable for detecting leaks to max. 10 to the minus 13 torr by 1/sec.

Transport equipment

- # gantry cranes with max. carrying capacity of 160 kN
- # slewing cranes with max. carrying capacity of 20 kN
- # pallet trucks with max. carrying capacity of 75 kN

Non-destructive and destructive material tests

- Tensile tests (DIN EN 10002-1)
- Beam impact test (DIN EN ISO 148-1)
- Hardness tests
- Metallographic testing
- Etched slice tests

Surface inspections:

- Magnetic particle inspection
- Dye penetrant examination

Tests for mixed-up components:

- Intergranular corrosion test (DIN EN ISO 3651-2)
- Particle-size measurement
- Chemical analysis
- Delta ferrite determination
- Surface roughness measurement

Ultrasonic testing:

- Device type: USM35X, GE, from Krautkrämer

X-ray tests:

- Device types and outputs (all from GE, Seiffert)
- 2 ISO Volt 320, ISO Volt 150

Tightness testing options:

- With foaming liquids
- With vacuum frame
- With air or gases under water
- Helium leak test

Pressure testing options:

- Hydrostatic test
- With air or gases

QUALIFICATION

On the basis of these approvals and the user's expectation of maximum possible functional reliability in line with the latest technology, fulfilling the expectations set for the valves depends largely on the design, production and accompanying tests, as well as seamless documentation by the PERSTA quality department. The tests we carry out include:

- Auditing of our suppliers
- Continuous incoming goods inspections of primary materials
- Checking drawing-compliant execution of the components and purchased parts manufactured in the production department
- Destructive and non-destructive material tests
- Strength and leak tests
- Functional tests

Approvals

Name of testing body or organisation	Specification
TÜV Nord Cert GmbH	DIN EN ISO 9001:2008
TÜV Nord Systems	AD 2000 HP 0 / TRD 201 / ASME B16.34
TÜV Nord Systems	DIN EN ISO 3834-2 (EN 729-2) / DGR L 97 / 23/EG Module H/H1
TÜV Nord Systems	KTA 3201.3 / KTA 3211.3
VGB suitability testing	KTA 1401 and AVS D 100/50
Global Standard Moscow	GOST TR No. C-DE-MM06.B.00156 (Dirt scraper)
Global Standard Moscow	GOST TR No. C-DE-MM06.B.00157 (Div. industrial valves)
Rostehnadzor Russia	RTN
Promatomnadzor Minsk	GOSPROMNADZOR (Belarus)
Bharat Heavy Electricals LTD	24 NRV
Paks Nuclear Power Plant	KM51 / 2011
EDF	EDF
Shell Nederland Raffin. BV	Service group 77DAAB / Service group 77DPBA
Shell Nederland Chemie BV	Service group 77DAAB / Service group 77DPBA
Kuwait Oil Company	VEC / VA / GT / 015 / 16 / 97
Canada	Canadian Registration; CSA B51
ENERGO-ATOM	QA system
Slovenské Elektrárne	QA system
Forsmark Kraftgrupp AB	QA system
GE Energy	QA system
Fire Safe	ISO 10497 / API 607

Procedure tests for joint welding

Norms and standards: AD; TRD; EN 288-1; EN ISO 15614-1+11; ASME IX

Materials acc. to AD-HP 0	Materials acc. to ISO/TR 15608	Base material designation	111 (E)	121 (UP)	135 (MAG)	141 (WIG)	511 (EB)
1	1	1.0460	X	X	X	X	X
1	1	1.5415	X	X	X	X	X
5.1	1	1.0566	X	X	X	X	—
3	4.2	1.6368	X	X	X	X	—
4.1	5.1	1.7335	X	X	X	X	X
4.1	5.2	1.7383	X	X	X	X	X
4.2	6.4	1.4903	X	X	—	X	X
4.2	6.4	1.4901	X	X	—	X	—
6	8.1	1.4571	X	X	X	X	X
Ni	45	2.4858	—	—	—	X	X

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Ярославль (4852)69-52-93

Россия +7(495)268-04-70

Казахстан +(727)345-47-04

Беларусь +(375)257-127-884

Узбекистан +998(71)205-18-59

Киргизия +996(312)96-26-47

эл.почта: paw@nt-rt.ru || сайт: <https://persta.nt-rt.ru/>