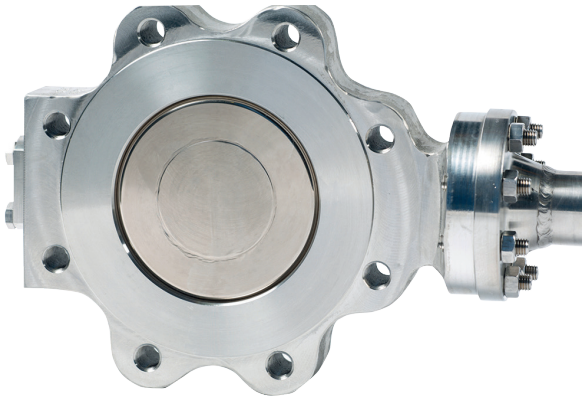
Neles™ high performance butterfly valve
BWX model A

The BWX series butterfly valve has been especially designed for a wide range of industrial applications. It can be used for standard temperature up to +425 ºC with CS-body material as well as in cryogenic applications with high quality CrNi steel. High efficiency with high flow capacity and low torques combined with easy maintenance capabilities, safety and reliable performance are main highlights of this valve series. The compact design of the valve permits rapid temperature balance and minimizes, especially in cryogenic cool down processes, the boil off loss.



Features

- Innovative design with free floating metallic seat
- Protected seat in area of lowest tear and wear
- High flow rates
- Double eccentric design
- Temperature range: -200…+425 °C optional up to +600 °C depending on material selection
- Best for oxygen service
- Oil & grease free assembly and test
- BAM or WHA approved non-metallic parts
- Differential pressure/temperature ratings in accordance with ASME B16.34
- DIN/EN flange drilling available
- Body type Wafer, Lug and Double flange, others as option
- For cryogenic applications with 3 standard extension lengths
- For standard temperature the valve is equipped with a cover plate (instead of an extension)

Body

The valve body is available as wafer, lug, or double flange design as standard. Other body types, such as butt weld end, or special face-to-face dimensions are available optionally. The body is a monolithic design without a clamp ring. This means high safety even under full pressure with open pipe end, no additional parts and no screws in gasket flange face area.
A clamp ring version is also available for more severe applications.

Disc

The standard disc is made of a high-quality stainless steel or a high strength martensitic steel. The disc has an innovative double eccentric design, which brings a perfect and reliable seat performance with long life endurance.

Shaft and drive shaft design

The BWX butterfly valve has a 2-piece shaft design and is full bore, which gives a high flow coefficient. A robust and easy shaft to disc polygon connection requires no additional fasteners inside the flow area and guarantees fast and effective maintenance of the entire valve. The cryogenic BWX Model A is equipped with a reinforced shaft and extension which ensures good control features for low opening signals from positioner even under differential pressure on the disc.
The polygon connection is free of play and exceeds the strength at the top of the shaft. A position indicator on the shaft clearly indicates the position of the disc.
High safety factor has been included to the bearing design. The thrust bearing is protected from the flow as it is located in the body neck. It also ensures the anti-blow out protection of the shaft. The gland packing is live loaded to guarantee minimal fugitive emissions and it is located directly after the upper shaft bearing, which prevents any side forces on the packing and thus a long service life.

Low cost of ownership

- Significantly reduced number of parts reduce stock keeping cost of spares.
- Extremely high cycle life minimizes the need of maintenance and increases Mean Time Between Failure (MTBF).
- Maintenance friendly design allows a very fast dis- and reassembly of the valve without the need for special tools.

Seat

The BWX series is equipped with a floating full metal seat, located in the body. Additionally, the seat is protected in the body, in an area of low wear and tear. This design principle ensures high duration with constant, repeatable, and reliable tightness performance, even during rapid temperature changes within the valve. The innovative design gives low operating torques and clears the disc from seat after a few degrees of opening which extends the service life of the seat.

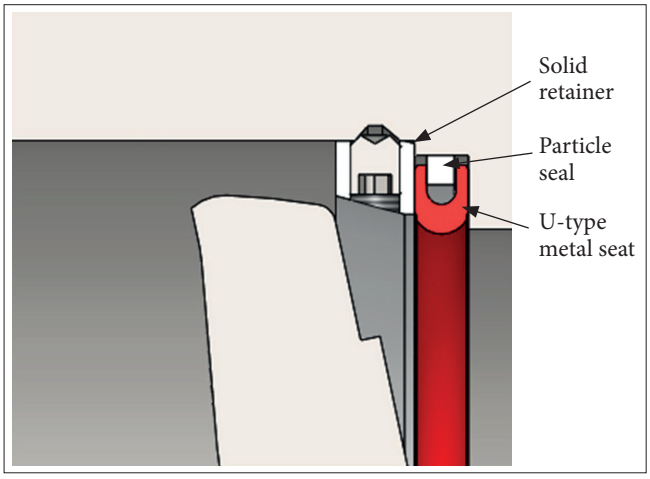
Seat retainer options

As standard, the BWX model A butterfly valve is equipped with a solid inside retainer, which is made from a material equivalent to the body material itself . This allows for the monolithic body design, without fasteners in the flange gasket area. Which is a desirable feature, especially in ASU and cryogenic applications. Due to the way the inside solid retainer is manufactured, it is not possible for its' fasteners to fall into the flow port, and cause damage to the equipment downstream of the valve.
Optionally, a traditional clamp ring version is available as well. The aim is for an even better serviceability of the valve, a feature desirable in more challenging process conditions, where a more frequent servicing of the valve is required. In this configuration, it is possible to replace the seat without dis-assembling the trim, saving time, and reducing the risk of human error during a shutdown.

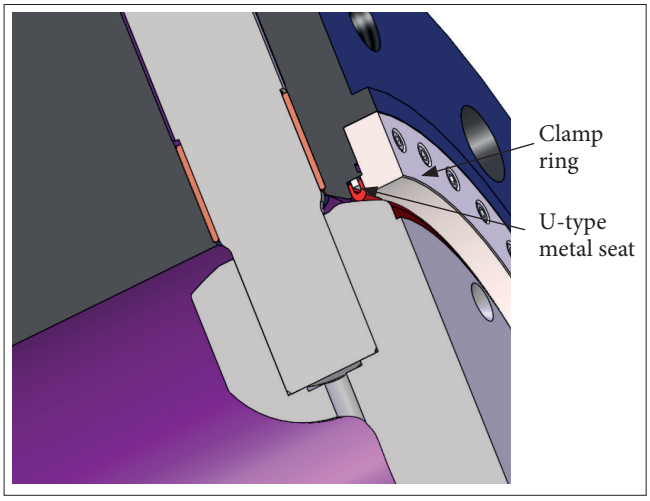
Particle seal

To further enhance the protection of the critical sealing surfaces between the valve body and the seat, an additional particle seal can be ordered. This particle seal is made of stainless steel and is located at the back of the seat, in the U-shaped groove.

Solid inside retainer:



Clamp ring:



Oxygen service

A certified cleaning procedure in a special clean environment guarantees a valve absolutely free of oil and any grease, critical in oxygen applications. The design of the valve does not require any kind of grease during assembling and testing. Additionally, the flow area does neither contain any loose bolts, pins, or nuts nor any sharp edges or corners. All non-metallic parts are BAM or WHA tested under pure gaseous or liquid oxygen up to the rated pressure.

Actuator

The BWX valve is equipped with an ISO 5211 mounting face to the actuator. Neles® pneumatic or manual gear actuators are used as standard. Optionally, positioners can be offered. The following table gives a rough overview for BWX valves equipped with standard B1 actuators at full rated pressure.
A valve sizing with Nelprof X is always recommended, for accurate results.

NPS/DIN	Cl 150 PN10/16		Cl 300 PN25/40		Cl 600 PN63	
4/100	B1C9	B1J10	B1C9	B1J10	B1C13	B1J12
6/150	B1C11	B1J12	B1C11	B1J12	B1C17	B1J16
8/200	B1C13		B1C13	B1J16	B1C25	B1J20
10/250	B1C17	B1J16	B1C17	B1J20	B1C32	B1J25
12/300			B1C20			B1J32
14/350	B1C20	B1J20	B1C25	B1J25	B1C40	
16/400	B1C25					B1J322
18/450			B1C32	B1J32	B1C50	
20/500		B1J25	B1C40			-
24/600	B1C32	B1J32	B1C50	B1J322	B1C60	-

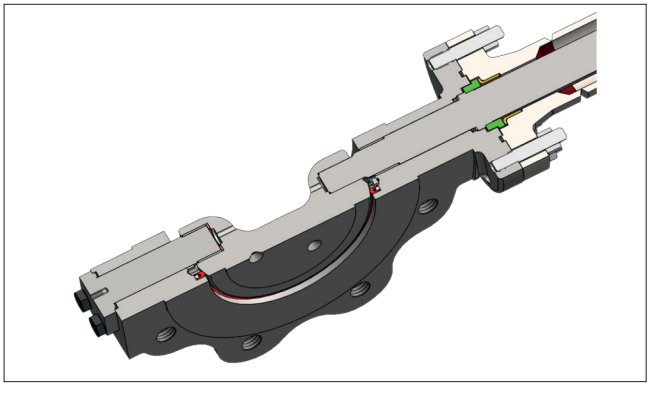
Standard Neles actuators B1 series @ full dp

Flow capacity

NPS/DIN	Cl 150 PN10/16	Cl 300 PN25/40	Cl 600 PN63
	Cv [gal/min]		
4/100	309	309	223
6/150	1313	1021	732
8/200	2816	2204	1622
10/250	4678	3437	2079
12/300	7446	5261	3375
14/350	9904	7664	4851
16/400	12361	10067	6014
18/450	15756	13572	7971
20/500	19151	17076	11886
24/600	29770	24124	18017

BWX flow capacity

Shaft and drive shaft design:



Technical specifications

Valve rating

- Classes 150, 300 and 600 in accordance with ASME B16.34.
- PN10, PN16; PN25, PN40, PN63, PN100 in accordance with EN 12516.

Sizes and end connections

- ASME cl. 150, cl. 300 and cl.600 are available in sizes 3" - 24" (DN80 – DN600)
- Flanges are designed as per ASME B16.5
- Flange drillings are available as per:
  - ASME B16.5: cl. 150, cl. 300. Cl. 600
  - EN 1092: PN10, PN16; PN25, PN40, PN63, PN100

Face to face dimensions

- Lug: API 609 – Category B (all ratings)
- Double flange ASME cl150, PN10, PN16:
  - API 609 Category B (short pattern), EN558 Series 13
- Double flange ASME cl300, PN25, PN40:
  - API 609 Category B (short pattern), EN558 Serie 14
- Double flange ASME cl600, PN63, PN100:
  - API 609 Category B (short pattern), EN558 Serie 14

Valve tightness

Standard U-type metal seat

- Preferred pressure direction:
  - ANSI Class V, ISO 5208 rate C, EN12266 rate C
- Optional tightness in preferred direction:
  - ANSI Class VI, ISO 5208 rate B & AA, EN12266 rate B

In non-preferred direction, the valve can reach ANSI Class IV or ISO 5208 rate D

Control seat

- With step seat option: ANSI Cl. III
- With no-seat option: ANSI Cl. II

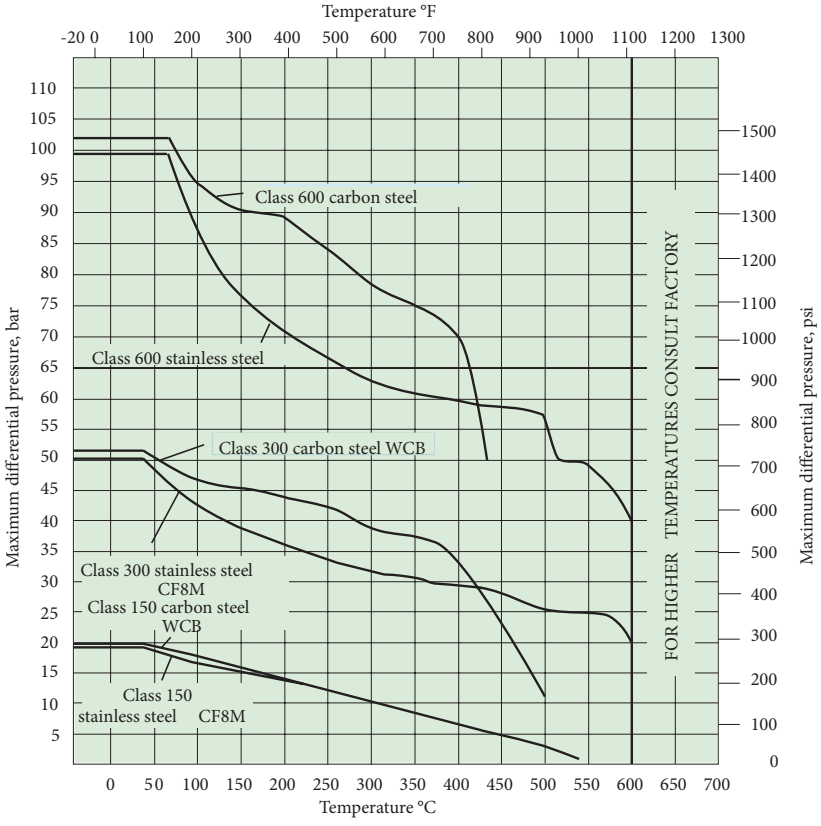
Safety features

- Fire-tested per API 607, 6th ed. in preferred pressure direction
- Fugitive emission with live loaded stem sealing as standard acc. ISO 15848
- Inherent shaft anti-blow out safety
- Oil and grease free assembly and testing for GOX/LOX applications

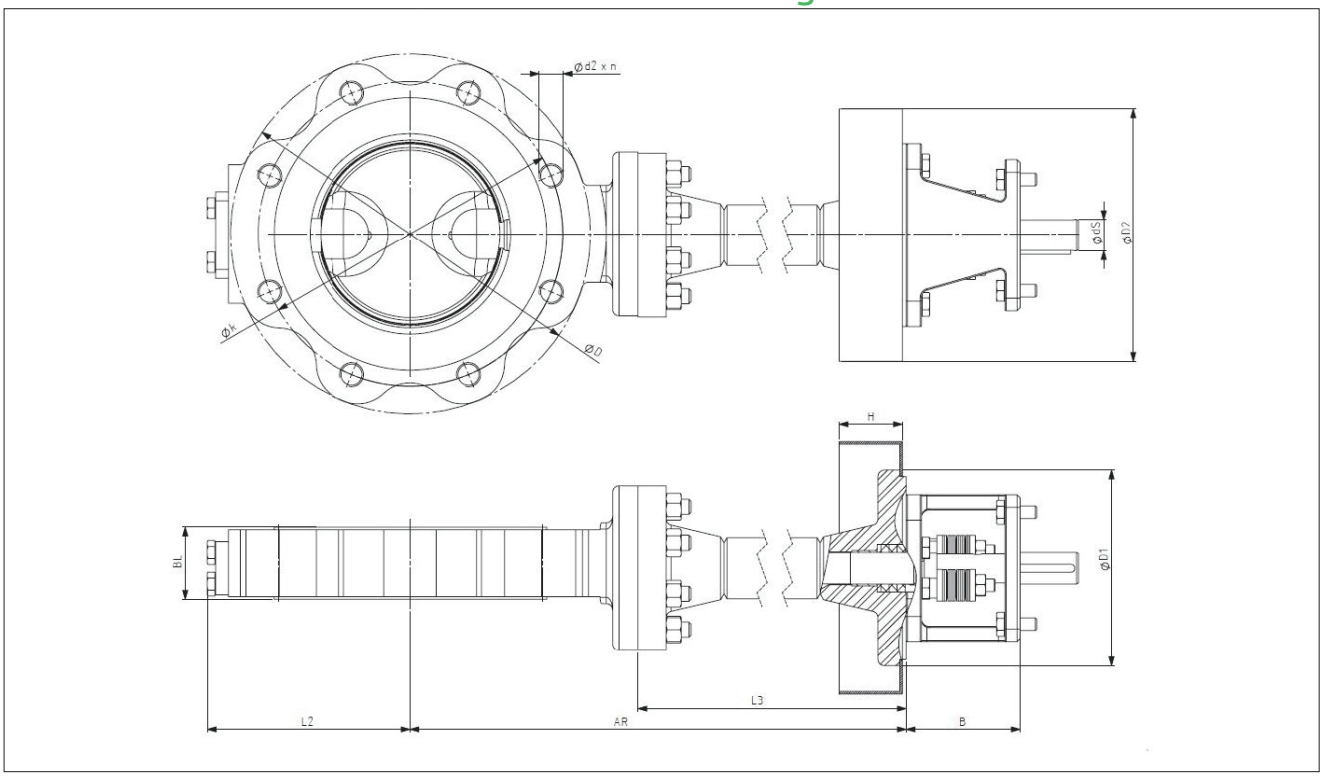
Options

- NACE MR103/MR0175
- Steam jacket
  - Bearing protection
- Double packing with leak off
- Butt welded ends
- Double flange long pattern acc. API609
- Particle protection for the seat

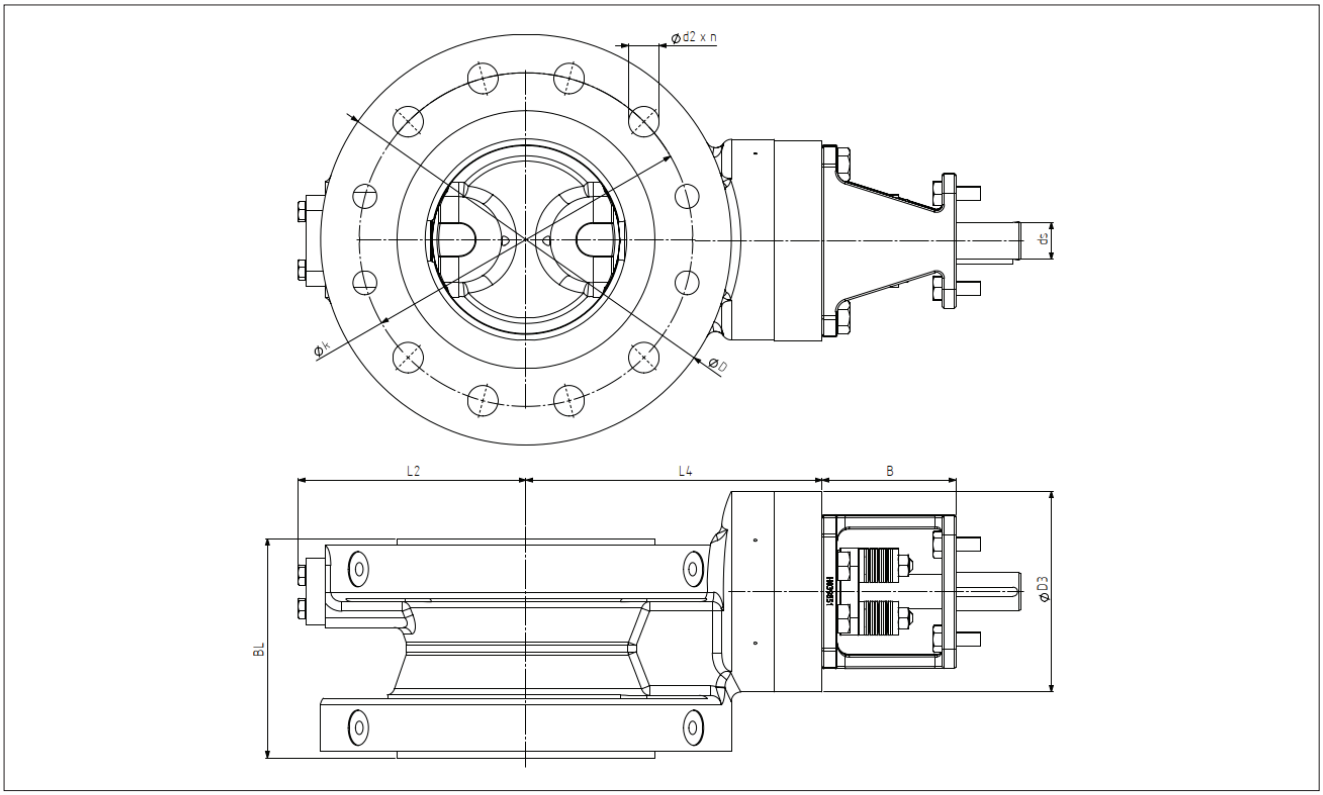
Pressure/temperature ratings for valve body. Other body materials then WCB or CF8M are possible on request.



Dimensions and weights



Main dimensions BWX-cryo version with extension



Main dimensions BWX-warm version

Standard dimensions – Class150, PN10, PN16

CL150 - PN10 - PN16																				
Standard dimensions [mm]													Flange dimensions							
													ASME B16.5 cl.150			EN 1092-PN10			EN 1092-PN16	
NPS/ DIN	AR *)	D2 / H *)	BL *)	L2	L3 *)	L4 **)	B	D1*)	D3 **)	ds	D	weight	k	d2	n	k	d2	n	k	d2	n
4/100	860	200/50	54	136	680		90	155		25	230	30 kg	190.5	5/8"-11UNC	8	180	M16	8	180	M16	8
6/150	860	200/50	57	161	680		90	155		25	285	35 kg	241.3	3/4-10UNC	8	240	M20	8	240	M20	8
8/200	860	200/50	64	187	650		90	155		25	345	49 kg	298.5	3/4-10UNC	8	295	M20	8	295	M20	12
10/250	860	200/50	71	247	600		110	165		30	405	70 kg	362	7/8-9UNC	12	350	M20	12	355	M24	12
12/300	1060	200/50	81	272	760		110	165		30	485	102 kg	431.8	7/8-9UNC	12	400	M20	12	410	M24	12
14/350	1060	260/50	92	300	710		120	210		40	535	137 kg	476.3	1-8UN	12	460	M20	16	470	M24	16
16/400	1060	260/50	102	328	710		120	210		40	595	188 kg	539.8	1-8UN	16	515	M24	16	525	M27	16
18/450	1060	260/50	114	375	630		120	210		50	635	240 kg	577.9	1 1/8-8UN	16	565	M24	20	585	M27	20
20/500	1060	260/50	127	423	630		140	210		50	715	305 kg	635	1 1/8-8UN	20	620	M24	20	650	M30	20
24/600	1060	300/50	154	498	580		180	290		70	840	519 kg	749.3	1 1/4-8UN	20	725	M27	20	770	M33	20

) for cryo version only: Option: +200 mm / +400 mm, BL) valid for lug /wafer type body
**) for warm version only (if empty: not available or no standard)

Standard dimensions – Class300, PN25, PN40

CL300- PN25 - PN40																				
Standard dimensions [mm]													Flange dimensions							
													ASME B16.5 cl.300			EN 1092-PN25			EN 1092-PN40	
NPS/ DIN	AR *)	D2 / H *)	BL *)	L2	L3 *)	L4 **)	B	D1*)	D3 **)	ds	D	weight	k	d2	n	k	d2	n	k	d2	n
4/100	860	200/50	54	136	680		90	155		25	255	31 kg	200	3/4-10UNC	8	190	M20	8	190	M20	8
6/150	860	200/50	59	187	650		90	155		25	320	46 kg	269.9	3/4-10UNC	12	250	M24	8	250	M24	8
8/200	860	200/50	73	224	600		110	165		30	380	73 kg	330.2	7/8-9UNC	12	310	M24	12	320	M27	12
10/250	860	260/50	83	258	600		120	210		40	445	123 kg	387.4	1-8UN	16	370	M27	12	385	M30	12
12/300	1060	260/50	92	283	710		120	210		40	520	161 kg	450.8	1 1/8-8UN	16	430	M27	16	450	M30	16
14/350	1060	260/50	117	341	710		140	210		50	585	235 kg	514.4	1 1/8-8UN	20	490	M30	16	510	M33	16
16/400	1060	260/50	133	399	630		140	210		50	650	319 kg	571.5	1 1/4-8UN	20	550	M33	16	585	M36	16
18/450	1060	300/50	149	429	580		180	290		70	710	422 kg	628.6	1 1/4-8UN	24	600	M33	20	610	M36	20
20/500	1060	300/50	159	458	580		180	290		70	775	547 kg	685.8	1 1/4-8UN	24	660	M33	20	670	M39	20
24/600	1060	360/50	181	567	510		180	350		85	915	874 kg	812.8	1 1/2-8UN	24	770	M36	20	795	M45	20

*) for cryo version only: Option: +200 mm / +400 mm, BL *) valid for lug/wafer type body
**) for warm version only (if empty: not available or no standard)

Standard dimensions – Class600, PN63

CL600- PN63																				
Standard dimensions [mm]														Flange dimensions						
														ASME B16.5 cl.600			EN 1092-PN63		
NPS/ DIN	AR *)	D2 / H *)	BL *)	BL **)	L2	L3 *)	L4 **)	B	D1 *)	D3 **)	ds	D	weight	k	d2	n	k	d2	n
4/100	860	200/50	64	190	165	680	215,5	90	155	160	25	275	39 kg	215.9	7/8-9UNC	8	200	M24	8
6/150	860	200/50	78	210	201	600	313	110	165	190	30	355	77 kg	292.1	1 8UN	12	280	M30	8
8/200	860	260/50	102	230	238	600	310	120	210	210	40	420	134 kg	349.2	1 1/8-8UN	12	345	M33	12
10/250	860	260/50	117	250	323	560	360	180	210	220	50	510	208 kg	431.8	1 1/4-8UN	16	400	M33	12
12/300	1060	300/50	140	270	323	660	458	180	290	290	70	560	340 kg	489	1 1/4-8UN	20	460	M33	16
16/400	1060	360/50	155	310	427	560	590	180	350	350	85	715	680	603,2	1 ½-8UN	20	585	M39	16

*) for cryo version only: Option: +200 mm / +400 mm, BL *) valid for lug/wafer type body
**) for warm version only, BL **) valid for double flange body

Torque

Maximal ETC and BTO torques for **BWX cryo version** with extension, soft bearings and PTFE packing under delta pressure.
Torque values given in [Nm]

NPS DN	Cl 150 PN10/16						Cl 300 PN25/40							Cl 600 PN63						
	delta p [bar]																			
	ETC	0	5	10	16	20	ETC	0	10	20	30	40	50	ETC	0	20	40	60	80	100
4 100	220	161 ±17%	171 ±15%	181 ±12%	192 ±11%	200 ±10%	299	161 ±20%	189 ±16%	218 ±15%	246 ±13%	275 ±11%	303 ±9%	330	233 ±20%	268 ±12%	304 ±11%	339 ±11%	375 ±10%	410 ±10%
6 150	223	170 ±17%	192 ±15%	213 ±12%	239 ±12%	256 ±11%	399	176 ±25%	240 ±16%	305 ±15%	369 ±12%	434 ±8%	498 ±7%	550	360 ±28%	450 ±20%	540 ±13%	585 ±8%	720 ±8%	810 ±7%
8 200	344	254 ±16%	304 ±15%	353 ±12%	415 ±11%	452 ±10%	541	303 ±25%	413 ±16%	522 ±14%	632 ±12%	741 ±8%	851 ±7%	810	570 ±21%	766 ±17%	962 ±10%	1158 ±8%	1354 ±7%	1550 ±6%
10 250	398	328 ±15%	394 ±13%	460 ±10%	539 ±9%	592 ±8%	540	380 ±24%	518 ±16%	656 ±14%	794 ±13%	932 ±10%	1070 ±8%	1490	870 ±16%	1202 ±10%	1534 ±6%	1866 ±6%	2198 ±4%	2530 ±4%
12 300	404	340 ±15%	428 ±12%	515 ±10%	620 ±8%	690 ±7%	600	430 ±21%	622 ±13%	814 ±11%	1006 ±8%	1198 ±6%	1390 ±4%	2540	1640 ±12%	2142 ±9%	2644 ±6%	3146 ±5%	3648 ±4%	4150 ±3%
14 350	441	400 ±13%	533 ±11%	665 ±9%	824 ±7%	930 ±6%	740	630 ±14%	904 ±8%	1178 ±7%	1452 ±6%	1726 ±5%	2000 ±3%							
16 400	456	430 ±14%	600 ±10%	770 ±9%	974 ±7%	1110 ±5%	850	660 ±14%	1030 ±9%	1400 ±7%	1770 ±5%	2140 ±5%	2510 ±4%							
18 450	1030	890 ±11%	1113 ±10%	1335 ±8%	1602 ±6%	1780 ±5%	3290	2630 ±8%	3148 ±6%	3666 ±5%	4184 ±5%	4702 ±4%	5220 ±3%							
20 500	1170	1000 ±11%	1300 ±10%	1600 ±8%	1960 ±6%	2200 ±5%	3620	2800 ±8%	3488 ±5%	4176 ±5%	4864 ±5%	5552 ±3%	6240 ±3%							
24 600	1676	1370 ±11%	1823 ±9%	2275 ±8%	2818 ±6%	3180 ±5%	5640	4020 ±8%	4564 ±5%	6196 ±5%	7284 ±5%	8372 ±3%	9460 ±3%							

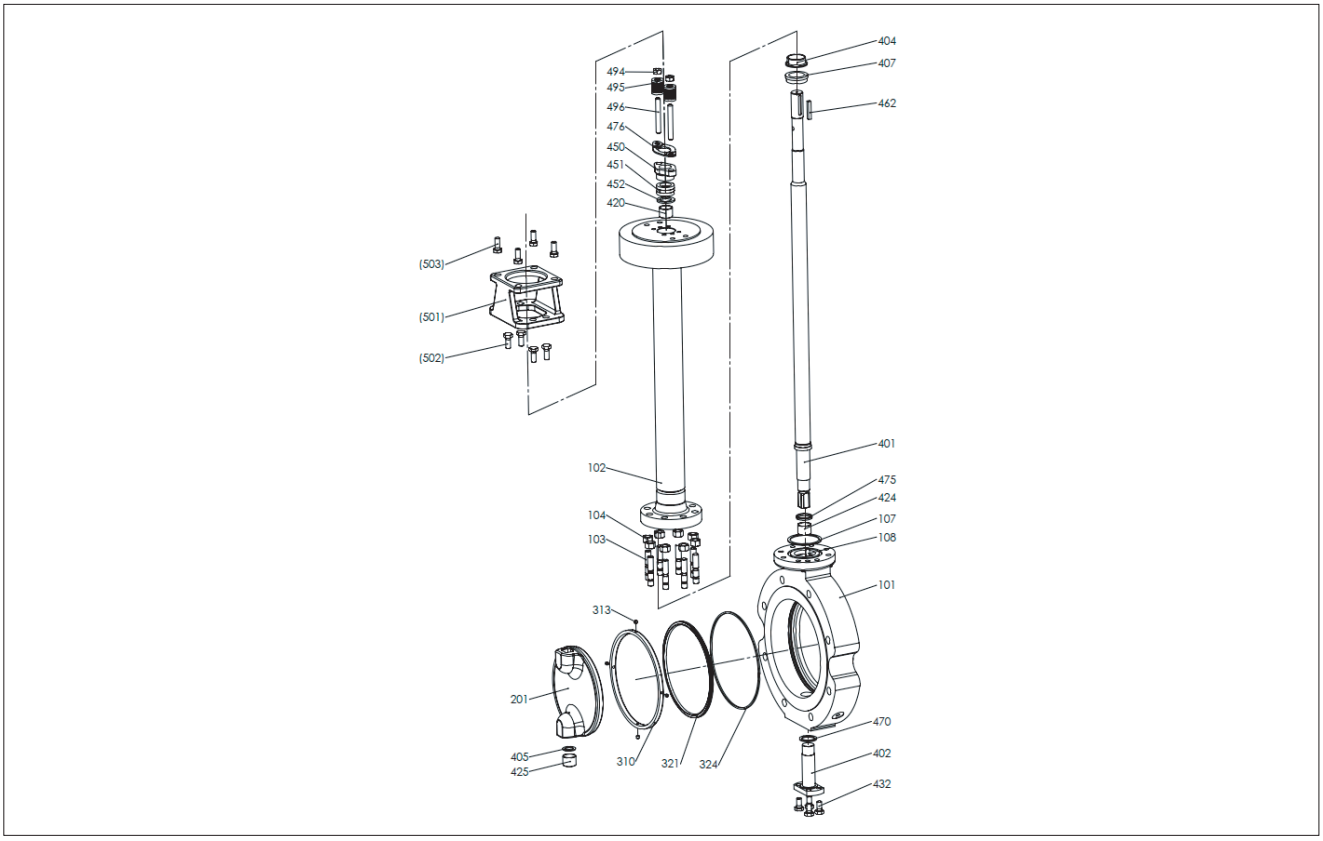
The torque values can vary. The given values represent the standard torques and additionally the range in [%] where the value can vary. This percentage range is an approximate value.

Maximal ETC and BTO torques for **BWX warm version** no extension, metal bearings and graphite packing under delta pressure.
Torque values given in [Nm]

NPS DN	Cl 150 PN10/16						Cl 300 PN25/40							Cl 600 PN63						
	delta p [bar]																			
	ETC	0	5	10	16	20	ETC	0	10	20	30	40	50	ETC	0	20	40	60	80	100
4 100	227	148 ±17%	162 ±15%	176 ±12%	193 ±11%	205 ±10%	305	222 ±22%	240 ±17%	257 ±13%	275 ±12%	292 ±11%	310 ±10%	384	237 ±19%	282 ±16%	328 ±12%	373 ±11%	419 ±10%	464 ±9%
6 150	200	137 ±17%	160 ±15%	184 ±12%	211 ±12%	230 ±11%	328	200 ±25%	249 ±18%	299 ±13%	348 ±11%	398 ±10%	447 ±7%	680	370 ±19%	482 ±15%	594 ±12%	706 ±8%	818 ±8%	930 ±5%
8 200	342	227 16%	283 ±15%	338 ±12%	405 ±11%	449 ±10%	513	306 ±25%	414 ±16%	522 ±13%	630 ±11%	738 ±8%	846 ±7%	1220	890 ±17%	856 ±14%	1122 ±10%	1388 ±8%	1654 ±5%	1920 ±4%
10 250	483	359 ±15%	449 ±13%	539 ±10%	647 ±9%	719 ±8%	760	370 ±24%	556 ±18%	742 ±13%	928 ±12%	1114 ±10%	1300 ±8%	1950	810 ±14%	1246 ±10%	1682 ±8%	2118 ±3%	2554 ±3%	2990 ±3%
12 300	564	427 ±15%	561 ±12%	695 ±10%	856 ±8%	963 ±7%	1150	410 ±20%	1150 ±13%	1720 ±7%	2290 ±7%	2860 ±5%	3430 ±5%	3380	1690 ±8%	2350 ±8%	3010 ±5%	3670 ±2%	4330 ±2%	4990 ±2%
14 350	756	617 ±13%	862 ±11%	1106 ±9%	1399 ±7%	1595 ±6%	2160	580 ±14%	904 ±9%	1178 ±7%	1452 ±6%	1726 ±5%	2000 ±3%	4860	1960 ±8%	2812 ±7%	3934 ±5%	5056 ±2%	6178 ±2%	7300 ±1%
16 400	656	557 ±14%	817 ±10%	1077 ±9%	1388 ±7%	1596 ±5%	1950	590 ±14%	1194 ±9%	1798 ±5%	2402 ±6%	3006 ±4%	3610 ±4%	7280	3060 ±8%	4522 ±6%	5984 ±4%	7446 ±2%	8908 ±2%	10370 ±1%
18 450	1225	953 ±11%	1244 ±10%	1535 ±8%	1885 ±6%	2118 ±5%	4270	1570 ±8%	2498 ±6%	3426 ±5%	4354 ±5%	5282 ±4%	6210 ±3%	8700	3120 ±7%	5002 ±5%	6884 ±4%	8766 ±2%	10648 ±2%	12530 ±1%
20 500	1722	1324 ±11%	1802 ±10%	2280 ±8%	2854 ±6%	3237 ±5%	6550	1770 ±7%	3252 ±6%	4734 ±5%	6216 ±5%	7698 ±3%	9180 ±3%	15470	6660 ±7%	9430 ±4%	12200 ±3%	14970 ±2%	17740 ±2%	20510 ±1%
24 600	2924	2151 ±11%	3000 ±9%	3849 ±8%	4867 ±6%	5547 ±5%	12670	2860 ±6%	5588 ±5%	8316 ±4%	11044 ±4%	13772 ±2%	16500 ±2%	23200	6900 ±7%	11640 ±3%	16380 ±3%	21120 ±2%	25860 ±2%	30600 ±1%

Note: The torque values differ from those of the cryo version mainly because metal bearings with a higher friction coefficient are used.

BWX– cryo version, metal seated & Backside retainer

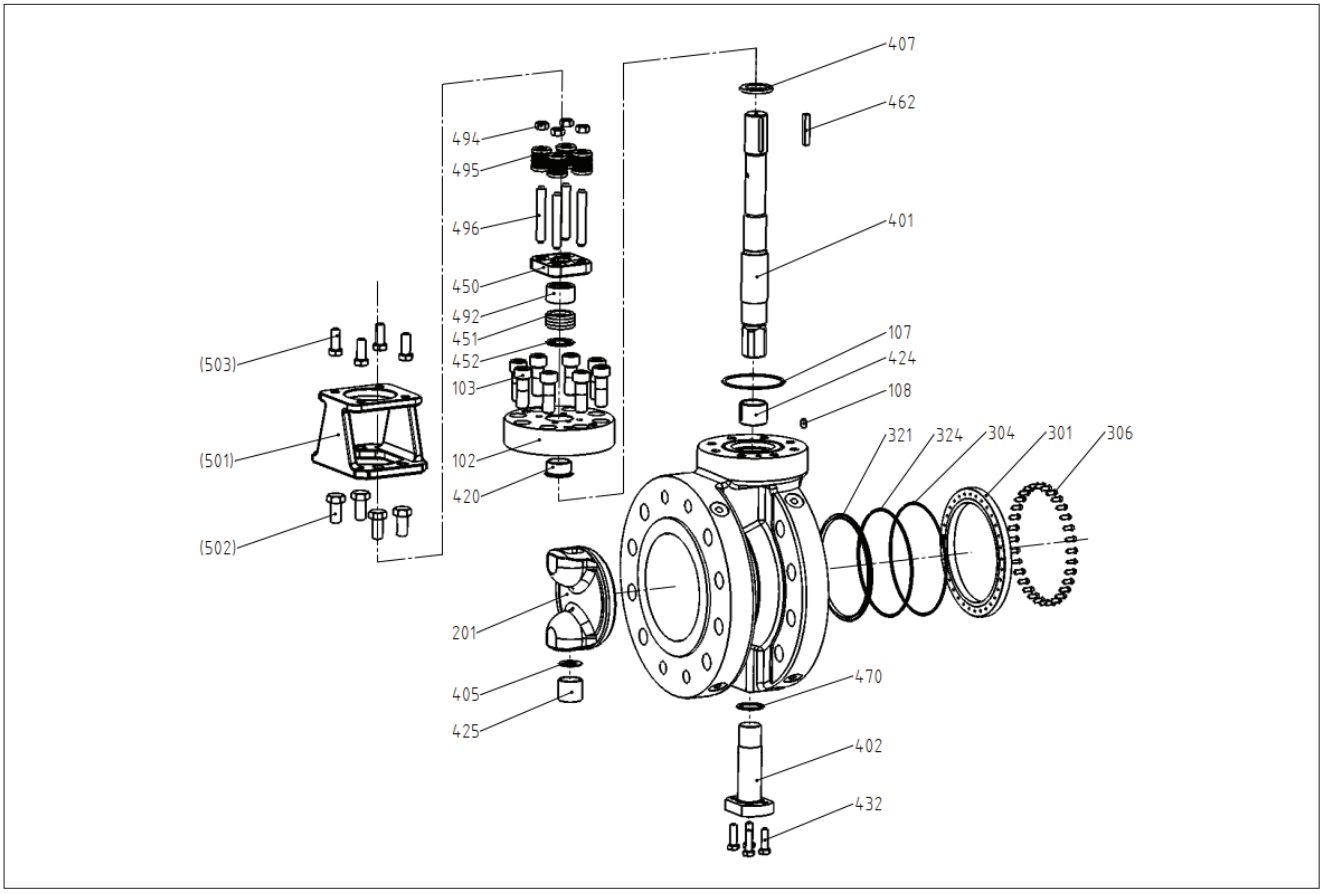


Bill of material – BWX cryo version

Part No	QTY	Description	Material
101	1	BODY	ASTM A351 gr. CF8M
102	1	EXTENSION	AISI 316
103	8	STUD	Stainless steel
104	8	HEXAGON NUT	Stainless steel
107	1	SEAL	Graphite+A316
108	1	WORM SCREW	Stainless steel
201	1	DISC	ASTM A351 gr. CF8M
310	1	RETAINER RING	Stainless steel
313	4	SOCKET HEAD SCREW	Stainless steel
321	1	SEALING ELEMENT	Inconel 706
324 *)	1	SEALING RING	AISI 316
401	1	DRIVE SHAFT	ASTM A470 gr. XM19
403	1	SHAFT	ASTM A470 gr. XM19
404	1	BEARING SLEEVE	Bronze+PTFE
405	1	THRUST WASHER	Bronze+PTFE
407	1	THRUST WASHER	Stainless steel
420	1	BEARING SLEEVE	Bronze+PTFE
424	1	BEARING SLEEVE	Bronze+PTFE
425	1	BEARING SLEEVE	Bronze+PTFE
432	4	HEXAGON SCREW	Stainless steel
450	1	GLAND	Stainless steel
451	4	PACKING RING	Graphite
452	1	BOTTOM RING	Stainless steel
462	1	KEY	Stainless steel
470	1	SEAL	Graphite+A316
475 *)	1	LIP SEAL	PTFE reinforced
476	1	RETAINER PLATE	Stainless steel
494	2	HEXAGON NUT	Stainless steel
495	2	DISC SPRING SET	Stainless steel
496	2	STUD	Stainless steel

*) optional

BWX – warm version, metal seated & clamp ring



Bill of material – BWX warm version

Part No	QTY	Description	Material
101	1	BODY	Carbon steel casted
102	1	COVER	Carbon steel forged
103	8	CYLINDER HEAD SCREW	Stainless steel
107	1	SEALING	Graphite+A316
108	1	WORM SCREW	Stainless steel
201	1	DISC	Carbon steel casted
301	1	SEAL RING	Carbon steel forged
304	1	SEALING	Graphite+A316
306	30	SOCKET HEAD SCREW	Stainless steel
321	1	SEALING ELEMENT	Carbon steel forged
324 *)	1	SEALING RING	AISI 316
401	1	DRIVE SHAFT	Carbon steel forged CrC coated
403	1	SHAFT	Carbon steel forged CrC coated
405	1	THRUST WASHER	Inconel metal bearing
407	1	THRUST WASHER	Carbon steel
420	1	BEARING SLEEVE	Inconel metal bearing
425	1	BEARING SLEEVE	Inconel metal bearing
432	4	HEXAGON SCREW	Stainless steel
450	1	CASTING GLAND	Stainless steel
451	1	PACKING RING	Graphite
452	1	ANTI EXTRUSION RING	Stainless steel
462	1	KEY	Carbon steel forged
470	1	SEALING	Graphite+A316
492	1	COMPRESSION SLEEVE	Stainless steel
494	4	HEXAGON NUT	Stainless steel
495	4	DISC SPRING SET	Stainless steel
496	4	STUD	Stainless steel

*) optional

How to order – type code

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
BWX	4	C	2	A	Z	2	08	A	A	N	D	G1	-	-	-	A

BWX cryogenic valve type for O2 service, lugged, cl 150 full rated, metallic seat, soft bearings, oxygen service, extension: AR=1060, NPS 8, body CF8M, disc CF8M, shafts XM19, seat Inconel, live loaded packing for oxygen service. Face to face according to API609.

1. sign	PRODUCT SERIES / DESIGN
BWX	Butterfly valve, with free floating metal seat, 2-piece shaft design with full bore. Standard FtF length acc. API 609

2. sign	BODY CONSTRUCTION
2	Flanged, long pattern (without threaded holes)
3	Flanged, short pattern (with threaded holes)
4	Lug type
6	Wafer type
Y	Special, to be specified

3. sign Body	BODY PRESSURE RATING
C	ASME class 150
D	ASME class 300
F	ASME class 600
J	PN 10
K	PN 16
L	PN 25
M	PN 40
N	PN 63
P	PN 100

4. sign	SEAT DESIGN
2	U-type metal seat with inside retainer
21	U-type metal seat with inside retainer & backside metal particle seal
3	U-Type metal seat with clamp ring
31	U-Type metal seat with clamp ring & backside metal particle seal
6	Step seat for control applications
7	No seat for control applications with gap between disc and body

5. sign	BEARINGS / BODY
A	Soft bearings, PTFE or eq. on sinter metal. Back material is bronze.
B	Metal bearings for high temperature. Tmax = 600 °C
P	Construction B + bearing protection
S	Construction B + Steam jacket

6. sign	APPLICATION
-	Standard, without sign
N	All wetted parts acc. **NACE**
Z	Oxygen Service for **GOX/LOX** applications all internal non-metallic parts have valid test report from notified body (BAM, WHA, etc.)

7. sign	EXTENSION	
	Standard (without cryo extension)	
0	300	Extension length [mm]
1	860	Extension length "AR" [mm]
2	1060	
3	1260	
4	1460	
5	1660	
8	Cryo extension acc. AL E-DS-5-3-3 with lip seal + boot seal	
Y	Special construction, extension length defined in dimension drawing	

8. sign	SIZE (ASME rating = inch / PN rating = metric)
	Inch: 03, 04, 06, 08, 10, 12, 14, 16, 18, 20, 24
	Metric: 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600

9. sign	BODY MATERIAL	10. sign	DISC MATERIAL	11. sign	SHAFT MATERIAL
A	ASTM A351 CF8M /1.4408	A	ASTM A351 CF8M eq. AISI 316 / 1.4408	N	XM-19 (Nitronic 50 HS)
P	ASTM A216 WCB / A.0619	N2	ASTM A487 CA6NM (Similar to 1.4317)	C	ASTM SA564 Gr. 630 Condition 1150D

12. sign	SEAT MATERIAL
D	U-type metallic seat, Inconel + silver coated T = -200 °C …+850 °C
F	U-type metallic seat, F6NM + silver coated T = -75 °C …+425 °C
Z	Step seat. Seat = body material
X	No seat; swing through

13. sign	PACKING CONSTRUCTION
T3	Live loaded PTFE packing. For emission certificate please contact factory
G1	Live loaded graphite packing, compatible to GOX/LOX
G3	Live loaded graphite packing, **Fire safe** for emission certification, please contact factory
Y	Special, to be specified

14. sign	SPECIAL FLANGE FACING TYPES/FORMS
-	Ra 3.2 - 6.3, standard, without sign covers: • EN 1092-1 Type B1 (Ra 3.2 - 12.5) • ASME B16.5, Ra 3.2 - 6.3 (125 - 250 µin) • DIN 2526 Form E (Ra 4)
05	Ring Joint
Y	Special, to be specified

15. sign	FLANGE
-	Without sign according to valve body pressure rating: PN-rating • EN1092-1 PN10-40 size DN80 – DN600 ASME-rating • ASME B 16.5 #150-#600 size 3 – 24 • Butt weld ends acc. to ASME B16.25, pipe diameter and pipe class to be defined
Y	Special, to be specified

16. sign	Face to Face
-	Without sign according to valve body pressure rating and construction by API 609 category B
Y	Special TBD

17. sign	MODEL CODE
A	Mod A high performance butterfly valve

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