ORBINOX

VALVE SOLUTIONS IN MORE THAN 70 COUNTRIES

HIGH PERFORMANCE BUTTERLY VALVE

SERIES 121 AND 122

MODEL HPBV

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GENERAL DESCRIPTION

ORBINOX High Performance Butterfly Valve is ideally suited for on-off and regulating control of gas and liquid media. The valves provide a bi-directional bubble-tight shutoff (zero leakage), high flow capacity and long service life.

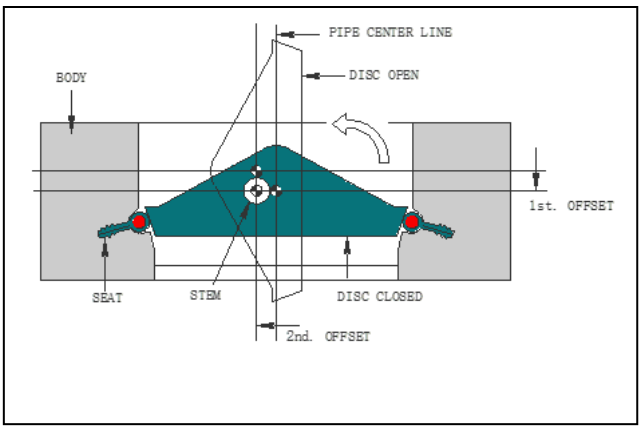
DOUBLE OFFSET DESIGN

The double offset butterfly valve has a double disc/stem design.

1. The shaft is offset from its disc centerline: this offset will make the valve has a continuous sealing surface on the disc when it's fully closed

2. The shaft is offset from pipe centerline: this offset will make the disc don't touch the seat at all when it's in fully open position

This double eccentric design produces a cam-like action as the disc swings into and out of the seat. The disc pulls out of seat immediately and this eliminates wear points at the top and bottom of the seat. The elimination of friction increases seat service life, reduces operation torque and improves throttling



GENERAL APPLICATIONS

- Chemical and Petrochemical Industry
- Pulp and Paper Plant
- Water Treatment
- District Heat Supply
- Power and Utilities
- Vacuum System
- Shipbuilding
- Food Industry
- Desalination Industry
- Heavy duty service

Standard valve line has been specifically developed to meet most applications. For specific services, ORBINOX offers appropriate valves and materials to meet these needs.

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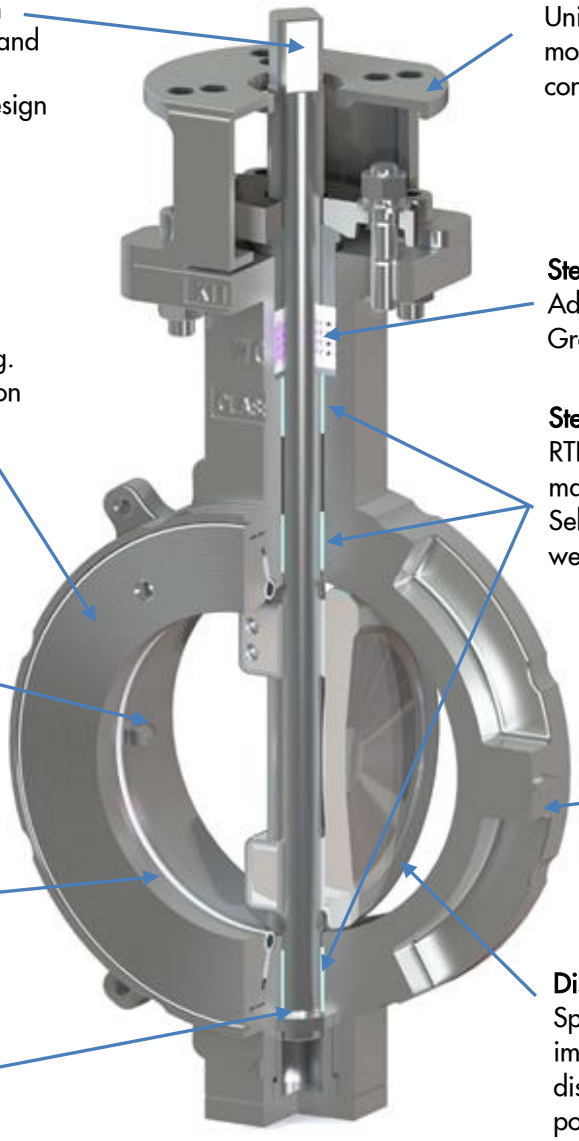
FEATURES AND ADVANTAGES

Blow-out Proof Stem
Large diameter, single piece high strength shaft provide alignment and rigid support for disc.
Square or Double D type stem design simplify adaption to manual or automatic actuation.

ISO Bracket
Universal and replaceable mounting bracket meets ISO5211 connection standard.



Seat Retainer
The seat retainer with less screws reduces leakage paths and facilitates replacement of seat ring. Protects the seat ring from abrasion and erosion.

Stem Packing
Adjustable V-ring type TFE or Graphite offers positive sealing.

Stem Bearings
RTFE/SS or Graphite/SS bearings maintain shaft alignment. Self-lubricant bearings reduce wear and friction.

Disc Stop in Body
Prevents disc over travel and minimize possible seat damage.

Body
One-piece casting of high quality with standard availability in carbon steel, stainless steel and alloy steel for services in wide variety of applications and abrasive service.

Seat
An advanced two-part seal design provides reliable sealing performance and extends cycle life with less maintenance.

Disc
Spherical sealing surface on disc improves sealing capacity. The disc edge is fully machined and polished for minimum

Stem Retainer
Provides positive stem retention to prevent movement of the stem.

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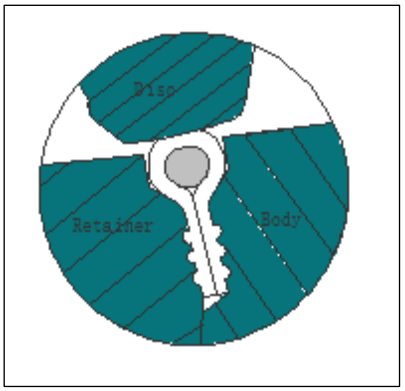
ORBINOX HIGH PERFORMANCE BUTTERFLY VALVE SEAT DESIGNS

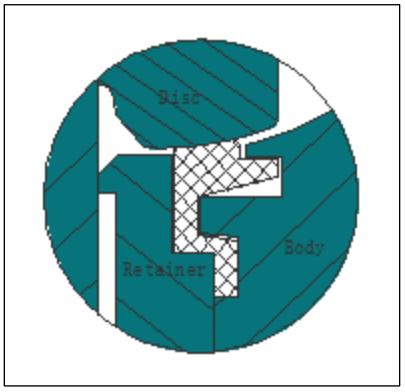


R type: Unique Soft Seat design

The unique seat consists of a resilient energizer which is completely encapsulated by the seat, is also isolated from all contact with process fluid.

The o-ring energizer is of fluoroelastomer material. This provides excellent resilience and it is able to flex and deform under loads and return to original shape after removal of the load. The o-ring energizer increases the elasticity of seat as well as seat life and improves the leak-free performance.

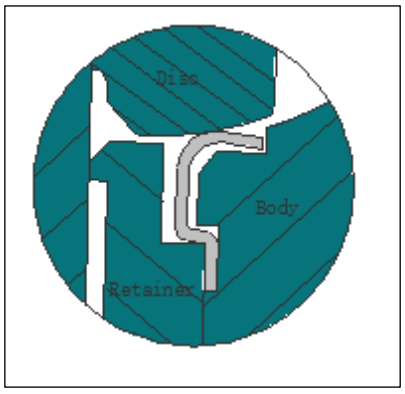
The advanced seat design offers a self-energized seal in vacuum and low temperature applications.



P type: Soft Seat design

This is standard resilient seat design, constructed of PTFE, Filled PTFE or TFM PTFE, utilizes a flexible lip which will slightly deflects the disc when it bears flow pressure. This movement makes the sealing surface of the seat is constantly pushing against the edge of the disc.

The sealing force is amplified by increasing line pressure.

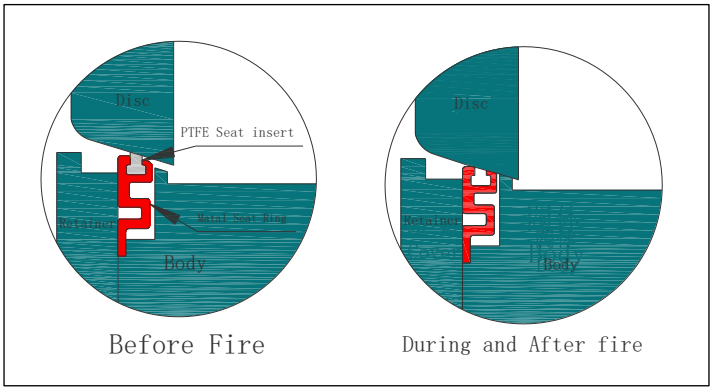


M Type: Metal Seat design for high temperature

Metal-to-Metal seat is suitable for high temperature applications up to 450°C.

Machined metal seat extends seal performance.

Metal-to Metal sealing is archived by "line sealing" between a spherical surface disc and conical surface seat. This produces minimum wear and seating torque.



F Type: Fire-safe Seat design:

Fire-safe seat is designed for applications where effective shutoff during and after a fire is a concern.

The primary PTFE seat is backed up by a secondary metal seat ring.

In a fire event, when the primary PTFE seat is destroyed, the secondary metal seat provides a positive seal of metal-to-metal contact with the disc.

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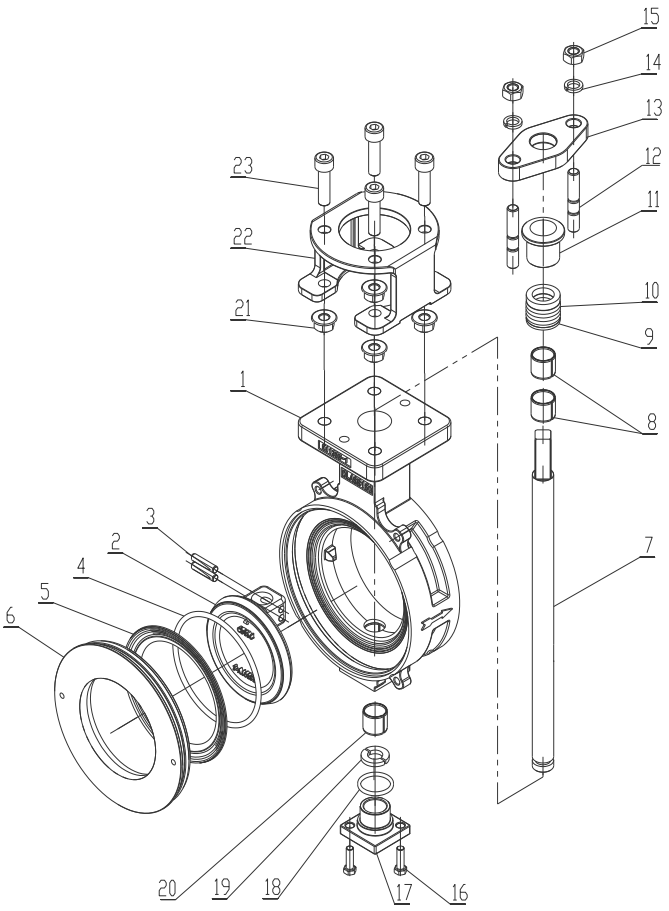
STANDARD MATERIAL LIST

	PART	MATERIAL
1	Body	A216-WCB, A351-CF8/CF8M
2	Disc	A351-CF8/CF8M
3	Disc Pin	Stainless Steel 304/316
4	*O-ring	EPDM or FKM
5	Seat	Soft / Metal / Firesafe
6	Retainer	A216-WCB, A351-CF8/CF8M
7	Stem	AISI 304 / 316/17-4 PH
8	Top Stem Bearing	Stainless Steel & PTFE
9	Packing Retainer	Stainless Steel 304
10	Stem Packing	PTFE / Graphite
11	Packing Gland	Stainless Steel 304/316
12	Stud	Stainless Steel 304/316
13	Gland Flange	Stainless Steel 304/316
14	Washer	A351-CF8/CF8M
15	Nut	Stainless Steel 304/316
16	Screw	Stainless Steel 304/316
17	End Cover	Stainless Steel 304/316
18	O-ring	EPDM or FKM
19	Retainer Ring	Stainless Steel 304
20	Bottom Stem	Stainless Steel 304/316
21	Nut	Stainless Steel 304/316
22	Bracket	A351-CF8/CF8M
23	Bolts	Stainless Steel 304/316
24	Bolts	Stainless Steel 304/316

*Seat O-ring only for R type soft seat



Available Materials:

- Ductile Iron
- Hastelloy
- Duplex 2205
- Alloy 20
- SMO 254
- Monel
- Inconel

Other materials are available on request

Seat Materials:

- Soft Seat:
  PTFE, RTFE, PPL, PEEK, TFM1600
- Metal Seat:
  SS316, SS316L, Inconel

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STANDARD SPECIFICATIONS

Valve Design: MSS SP-68, API 609, ANSI B16.34

Face to Face: API 609, MSS SP-68, ISO5752

Flange: ANSI B16.5, EN1092, JIS B2220

Inspection & Testing: API 598, EN12266

Mounting Flange: ISO 5211

CE MARKED VERSIONS AVAILABLE

CE marked and documented valves that conform to the EUROPEAN Pressure Equipment Directive PED 97/23/EC are available in ANSI Class 150/300.

PRODUCT RANGE

Body Configurations: Wafer and Lug

Valve Size: 2" ~ 24" (DN50 ~ 600)

Rating:

- Fig. 121 Class 150
- Fig. 122 Class 150, Class 300

OPERATOR AVAILABLE

- Lever Handle
- Gear Operator
- Pneumatic
- Electric Actuators

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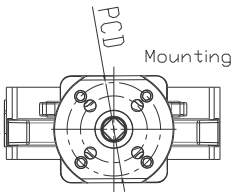
121 WAFER AND LUG TYPE



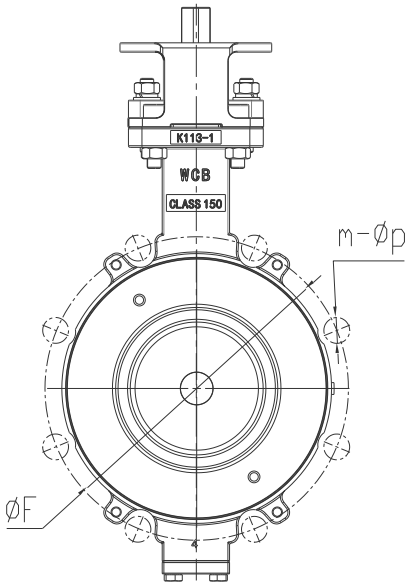
Seat Options:

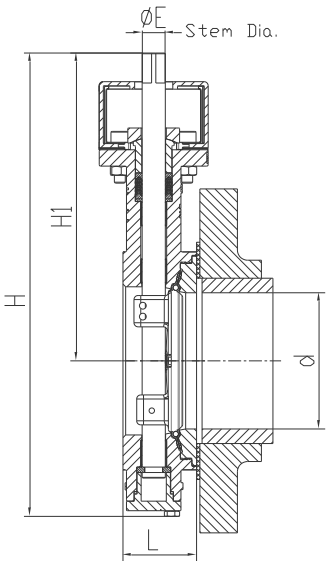
Sorft seat:

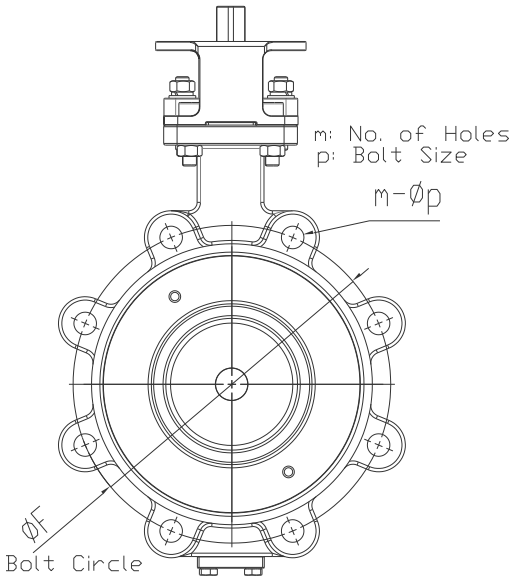
- R type
- P type

Metal seat:

- M type







121W Wafer Body

121L Lugged Body Style

ASME CLASS 150										
SIZE		d	L	H	H1	ØE	ISO 5211	ØF	m-Øp(inch)	
INCH	DN								WAFER	LUG
2	50	58	44	265	186	11	F05/F07	120.7	4-3/4	4-5/8
2-1/2	65	62	46.5	268	186	11	F05/F07	139.7	4-3/4	4-5/8
3	80	75	47.8	295	205	11	F05/F07	152.4	4-3/4	4-5/8
4	100	100	54.1	347	233	14	F05/F07	190.5	8-3/4	8-5/8
5	125	118	56.5	373	242	14	F05/F07	215.9	8-7/8	8-3/4
6	150	150	56.5	418	261	17	F07/F10	241.3	8-7/8	8-3/4
8	200	198	61.3	472	301	17	F07/F10	298.5	8-7/8	8-3/4
10	250	246	69.5	540	329	22	F07/F10	362.0	12-1	12-7/8
12	300	296	79.0	623	370	27	F10/F12	431.8	12-1	12-7/8
14	350	336	92.0	738	428	27	F12/F14	476.3	12-1 1/8	12-1
16	400	387	101.8	783	453	36	F14/F16	539.8	16-1 1/8	16-1
18	450	438	114	877	527	36	F14/F16	577.9	16-1 1/4	16-1 1/8
20	500	489	127	948	558	46	F14/F16	635.0	20-1 1/4	20-1 1/8
24	600	565	154	1110	660	46	F16/F25	749.3	20-1 3/8	20-1 1/4

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122W WAFER TYPE

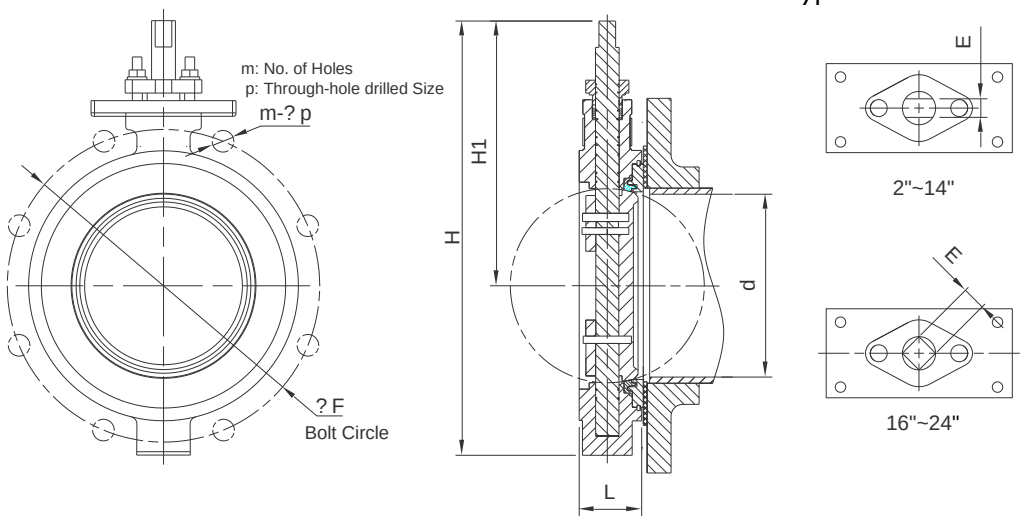
Seat Options:

Sorft seat:

- R type

Fire-safe seat:

- M type



ASME CLASS 150									
SIZE		d	L	H	H1	E	ØF	m-Øp(inch)	WEIGHT (KGS)
INCH	DN								
2	50	38	43.3	186.3	124.3	7	120.5	4-19	3.2
2-1/2	65	59	49	275	194	11.2	139.5	4-19	5
3	80	73	49	316	203	11.2	152.5	4-19	6
4	100	95	54	341	216	11.2	190.5	8-19	8
5	125	111	64	362	217	11.2	216	8-22	12
6	150	142	57	378	235	14	241.5	8-22	13
8	200	188	64	441	270	15.9	298.5	8-22	20
10	250	236	71	530.6	329	20.6	362	12-25	35
12	300	282	81	595.5	357	23.8	432	12-25	51
14	350	314	92	710	425	28.5	476	12-30	82
16	400	363	102	767	444	33.5	540	16-30	115
18	450	414	114	812	466	41.5	578	16-33	156
20	500	455	127	879	492	41.5	635	20-33	199
24	600	549	154	1094	610	51	749.5	20-35	333

ASME CLASS 300									
SIZE		d	L	H	H1	E	ØF	m-Øp(inch)	WEIGHT (KGS)
INCH	DN								
2	50	38	43.3	186.3	124.3	7	127	8-19	3.2
2-1/2	65	59	49	275	194	11.2	149	8-22	5
3	80	73	49	316	203	11.2	168	8-22	6
4	100	95	54	341	216	11.2	200	8-22	8
5	125	111	64	362	217	11.2	235	8-22	12
6	150	142	59	413	257	15.9	270	12-22	15
8	200	188	73	495	306	20.6	330	12-25	27
10	250	236	83	592	353	23.8	387	16-29	48
12	300	282	92	675	389	28.7	451	16-32	66
14	350	314	118	738	427	41.4	514	20-33	167
16	400	363	133	791	452	41.4	572	20-35	195
18	450	414	149	955	542	51	629	20-35	324
20	500	455	162	1075	576	51	686	24-35	406
24	600	549	184	1151	646	51	813	24-35	631

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VALVE FLOW COEFFICIENT

Cv values (US gallons per minute) represent the flow of 60°F water through a 100% open valve at a pressure drop of 1 psi.
The metric equivalent, Kv, is the flow of water at 16°C through the valve in cubic meters per hour at a pressure drop of 1kg/cm2.
convert Cv to Kv, multiply the Cv by 0.8569.

SIZE		Class	Angle of Opening								
INCH	DN		10°	20°	30°	40°	50°	60°	70°	80°	90°
2"	50	150	3	7	17	27	41	63	85	106	128
		300	-	-	-	-	-	-	-	-	-
2-1/2	65	150	4	9	21	35	55	80	104	135	149
		300	-	-	-	-	-	-	-	-	-
3	80	150	7	19	40	62	97	134	166	194	206
		300	5	14	25	36	51	74	114	145	165
4	100	150	9	30	62	98	147	223	308	368	386
		300	13	35	60	88	123	178	276	351	400
5	125	150	15	50	96	162	260	384	500	637	736
		300	-	-	-	-	-	-	-	-	-
6	150	150	38	93	163	267	415	607	813	1047	1175
		300	34	92	157	232	323	468	726	923	1050
8	200	150	75	135	305	510	750	1110	1537	2006	2290
		300	60	157	270	397	554	802	1245	1582	1800
10	250	150	92	250	495	770	1125	1670	2346	2980	3558
		300	104	275	472	695	970	1404	2178	2769	3150
12	300	150	135	367	734	1134	1653	2600	3700	4867	5767
		300	156	415	712	1049	1463	2117	3285	4175	4750
14	350	150	192	477	924	1422	2083	3140	4307	5578	6700
		300	171	455	780	1148	1601	2318	3596	4570	5200
16	400	150	220	570	985	1700	2450	3700	5400	7450	9100
		300	228	604	1035	1523	2125	3076	4772	6065	6900
18	450	150	335	705	1425	2470	3670	5280	7486	9330	10588
		300	307	814	1395	2053	2864	4146	6432	8175	9300
20	500	150	397	960	1800	3233	4688	7130	9415	11980	13900
		300	373	989	1695	3495	3880	5037	7815	9932	11300
24	600	150	455	1042	2496	4470	6582	10000	13645	17437	20520
		300	610	1618	2775	4085	5698	8247	12795	16261	18500

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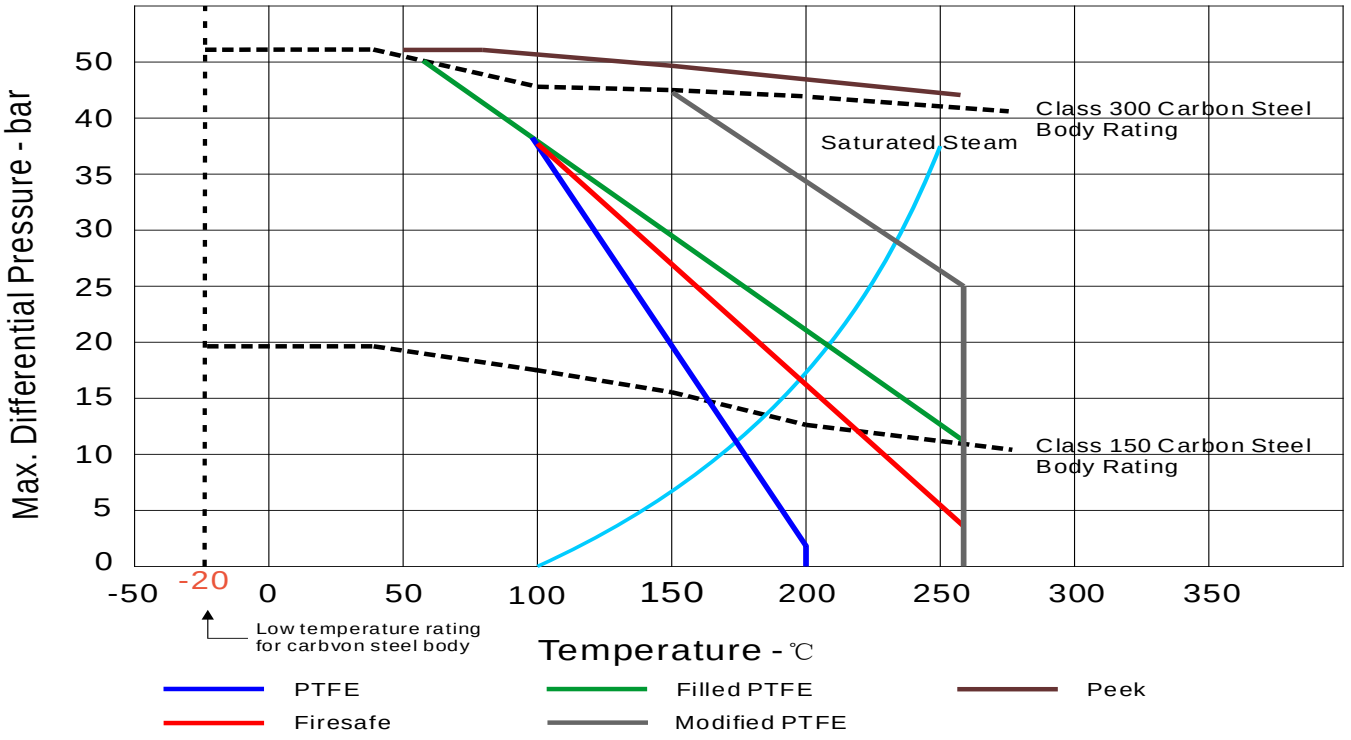
PRESSURE /TEMPERATURE RATING



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VALVE TORQUE DATA

Torque Charts for **ORBINOX** High Performance Butterfly Valve

(All torques in N-m.)

Series		Fig. 121 ANSI Class 150									Fig. 122 ANSI Class 150					
Seat Type		R type			P type			M type			P type			F type		
Valve Size		Shut-off Differential Pressure														
inch	DN	6.9 bar	13.8 bar	19.7 bar	6.9 bar	13.8 bar	19.7 bar	10 bar	16 bar	25 bar	6.9 bar	13.8 bar	19.7 bar	6.9 bar	13.8 bar	19.7 bar
2	50	18	20	26	18	19	20	84	86	88	-	-	-	-	-	-
2-1/2	65	21	25	32	20	25	26	92	98	100	29	31	33	57	61	64
3	80	23	27	34	22	30	31	100	106	108	34	37	39	72	77	81
4	100	33	39	49	32	35	46	110	116	128	47	53	58	91	100	108
5	125	62	84	111	46	51	69	160	175	188	65	76	86	132	155	174
6	150	84	100	128	68	76	101	220	235	260	97	113	126	178	206	230
8	200	161	178	223	118	133	174	310	340	385	164	193	217	296	347	391
10	250	285	346	436	166	193	254	410	460	550	222	274	318	452	550	635
12	300	397	525	692	236	288	380	650	820	1050	290	390	475	589	862	1010
14	350	647	776	1011	413	512	679	1050	1500	2150	491	684	849	819	1028	1205
16	400	857	1186	1597	537	657	870	1600	2250	3000	628	876	1087	963	1247	1489
18	450	1367	1784	2343	694	863	1138	2000	2750	4200	816	1144	1423	1315	1857	2318
20	500	1827	2235	2875	936	1166	1541	2600	3400	7200	1098	1546	1926	1885	2685	3364
24	600	2910	3630	4684	1444	1807	2386	3900	5100	10000	1673	2384	2983	2779	3661	4983

The above torque values are for normal liquid applications. For other service conditions, unusual fluids or slurries, please consult manufacturer.

Series		Fig. 122W ANSI Class 300											
Seat Type		P type						F type					
Valve Size		Shut-off Differential Pressure											
inch	DN	20.7 bar	27.6 bar	34.5 bar	41.4 bar	48.3 bar	51 bar	20.7 bar	27.6 bar	34.5 bar	41.4 bar	48.3 bar	51 bar
3	80	42	46	51	55	60	62	77	79	81	83	85	86
4	100	70	79	88	97	106	110	117	127	138	149	160	164
5	125	-	-	-	-	-	-	-	-	-	-	-	-
6	150	161	188	214	241	267	278	256	287	319	350	381	394
8	200	313	368	422	477	532	554	424	480	536	591	647	669
10	250	480	572	664	756	848	885	629	708	786	865	944	975
12	300	667	790	913	1035	1158	1207	1119	1302	1485	1668	1851	1924
14	350	1117	1372	1627	1882	2137	2239	1250	1459	1668	1877	2085	2169
16	400	1340	1643	1946	2248	2550	2671	1586	1885	2183	2481	2779	2899
18	450	1734	2118	2520	2885	3269	3422	2685	3308	3932	4556	5179	5429
20	500	2314	2842	3369	3897	4424	4635	3796	4691	5586	6481	7376	7734
24	600	3131	3840	4549	5258	5967	6251	5966	7321	8677	10033	11389	11931

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INSTALLATION & MAINTENANCE MANUAL

1- USE

1. ORBINOX High Performance Butterfly Valve is available in lug and wafer body styles and is compatible with ANSI 150 and 300 flanges

2. Maximum results and optimum valve life can be maintenance under normal service conditions and in accordance with pressure/temperature ratings and corrosion data chart

3. ORBINOX High Performance Butterfly Valves come in two series, 121 & 122. These two types are covered in this manual

2- PRECAUTIONS

1. For your safety read this manual completely before installation or servicing

2. Be sure the line pressure has been relieved, and any hazardous fluids have been drained from the system

3. Never remove the operator from the valve while the valve is in the pipeline under pressure

4. Ensure that all Lockout / Tagout procedures for the system have been properly implemented

3- GENERAL INFORMATIONS FOR INSTALLATION

1. Every valve has a metal identification tag attached to the valve body. Check the tag to ensure that the valve's specifications are suitable for the application

2. he valve can be mounted in any position, vertical, horizontal or other intermediate position.

   However, if the process media has a tendency to buildup, contains solids, or is an abrasive material, it is recommended to mount the valve with the stem in the horizontal position. This may enhance valve performance and service life

3. The operator should be installed on the valve prior to installation to facilitate proper alignment of the disc in the valve seat. Also make sure that the valve is in the closed position when operating the valve clockwise and is in the open position when operating counter-clockwise

4. Before installation, the pipe must be flushed clean of dirt, burrs and welding residues that could damage the seat and disc sealing surfaces

5. The valve should be installed in the pipeline in the closed position to prevent damage to the disc

4- INSTALLATION PROCEDURE

All ORBINOX valves are bi-directional and can be mounted in the pipeline in either flow direction; however, the preferred flow direction for all seat styles and materials is with the seat retainer ring located upstream to provide maximum seat protection.

1. Check to ensure the valve is in the closed position, place the valve and flange gaskets between the pipe flanges
2. Loosely the flange bolts, shifting the valve as necessary to permit the bolts to pass by or through the valve body
3. Cycle the valve to the fully open position, then back to the fully closed position, checking the actuator travel stop settings proper disc alignment
4. Tighten the flange bolts evenly to assure uniform gasket compression

   Caution: the ORBINOX valve should be centered between the flanges and gaskets to prevent damage to the disc edge and shaft as a result of the disc striking the flange, gasket, or pipe

5. The valve now is now ready for operation

5- REPLACEMENT

ORBINOX High Performance Butterfly Valve is designed for less maintenance and easy replace-ment. We provide repair kits and follow some easy steps of replacement; the customer can fix it in house to eliminate unscheduled downtime.

1. Drain and make sure there is no pressure in the pipeline and take necessary precautions for the media inside

2. Set valve to closed position and remove it from the pipeline

3. Lay the valve flat on a clean and smooth surface. Be sure not to damage the disc when opening and closing the valve
   SEAT DISASSEMBLY AND ASSEMBLY PROCEDURE. Please see enclosure

6- STORAGE INSTRUCTIONS

1. Check the packing list against the valve received to verify that the quantities, sizes, and materials are correct
2. Check to make sure that the valve and operator were not damaged during shipment
3. If the valve is to be stored before being installed, it should be protected from harsh environmental conditions
4. Store the valve with the disc in the closed position to protect the sealing edge and the seat
5. Keep the valve in a clean location, away from dirt, debris and corrosive materials
6. Keep the valve in a dry area with the flange protectors attached
7. Keep the valve in a cool location if possible, out of direct sunlight

REMARK: For any further information of use, please consult factory