



# FX FLOW

## Professional Valve Manufacturer

[www.fxflow.nl](http://www.fxflow.nl)

## FX FLOW

### FX FLOW CONTROL BV

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## FX FLOW CONTROL BV

# About us

FX FLOW CONTROL BV has been focusing on the design and manufacture of various industrial valves for many years. It is well-known for its high quality, competitive price and diligent service in foreign markets. Starting with manufacturing, distribution and after-sales service, GFE operates a multi-brand system to create customer convenience and enjoy a one-stop shopping experience.

FX FLOW provides various valves conforming to API 6D, API 6A, API 607, API 608, EN, GB, ISO and other international standards. Our products provide customers with a high degree of reliability, sustainability, durability and higher standards throughout these process. The products can be used in industries such as natural gas, petroleum, oil refining, chemical industry, power generation and pipeline transportation.

Honor comes from the heart, each recognized qualification certificate embodies the crystallization of the hard work of the FX FLOW people, each honor is our gold brand and passport, That is our road signs, that is our journey again and again. To provide customers with the best quality products is the ultimate goal of FX FLOW people.

Leading by technology and backed by quality

In addition, our products have been exported to more than 40 countries, like USA, UK, Germany, Italy, Iran, UAE, Singapore, Brazil, South Africa, etc. We have strong technical capabilities, advanced production and inspection equipment, scientific management, high-quality products and perfect after-sales service.

Our Goals:

- Ensure that our products comply with the quality assurance system;
- Ensure timely delivery of products and product quality assurance;
- Provide customers with comprehensive after-sales service;
- Lean our product design and manufacturing level.

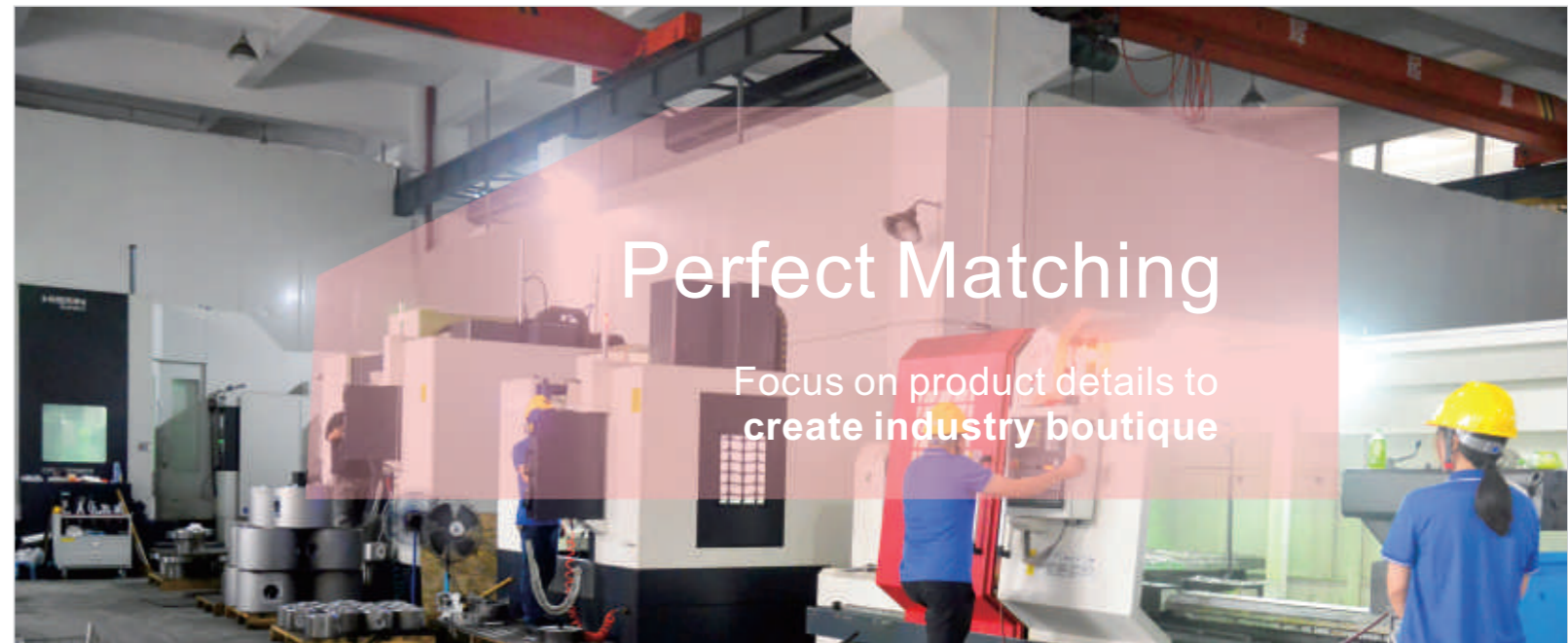




# Production Equipment

Advanced equipment, perfect matching Focus on product details to create industry boutique.

FX FLOW has advanced processing equipment, a variety of professional levels of technical persons; To meet customer needs as the center of enterprise development, To "continuous innovation, customer satisfaction, continuous improvement" as the basic quality policy; Let high-quality products flow out, effectively meet the different needs of customers.



# Perfect Matching

Focus on product details to create industry boutique

We have advanced production equipment, the use of new industrial concepts and strong technical force, to produce in line with international standards of high quality ultimate products.

Create the future with innovation Cast brilliant with first-class equipment.



# COMPANY HONOR

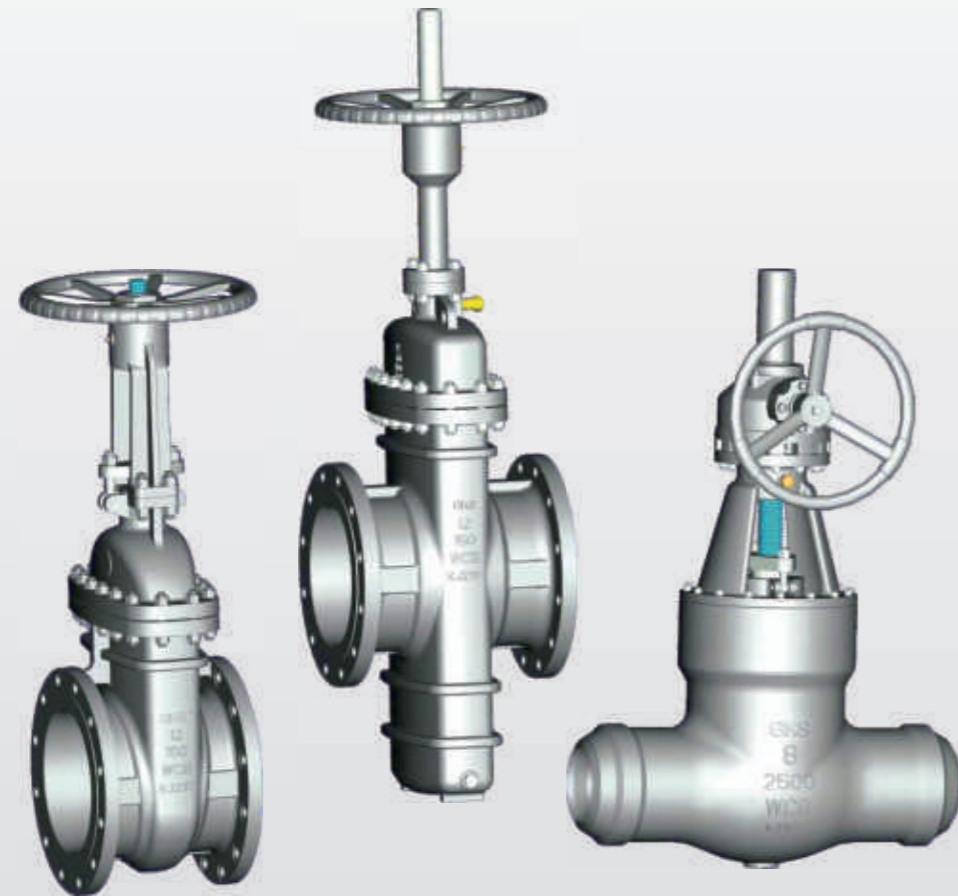


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Professional valve manufacturer



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Gate Valves, Cast Steel, Type: Wedge  
Parallel seat, Through Conduit Pressure Seal

**Design**

Cast steel gate valves are designed and manufactured to provide maximum service life and dependability. All gate valves are full ported and meet the design requirements of American Petroleum Institute standard API 600&API 6D, British standard Bs1414& BS EN 1984 and generally, conform to American Society of Mechanical Engineers standard ASME B16.34. Valves are available in a complete range of body/bonnet materials and trims.

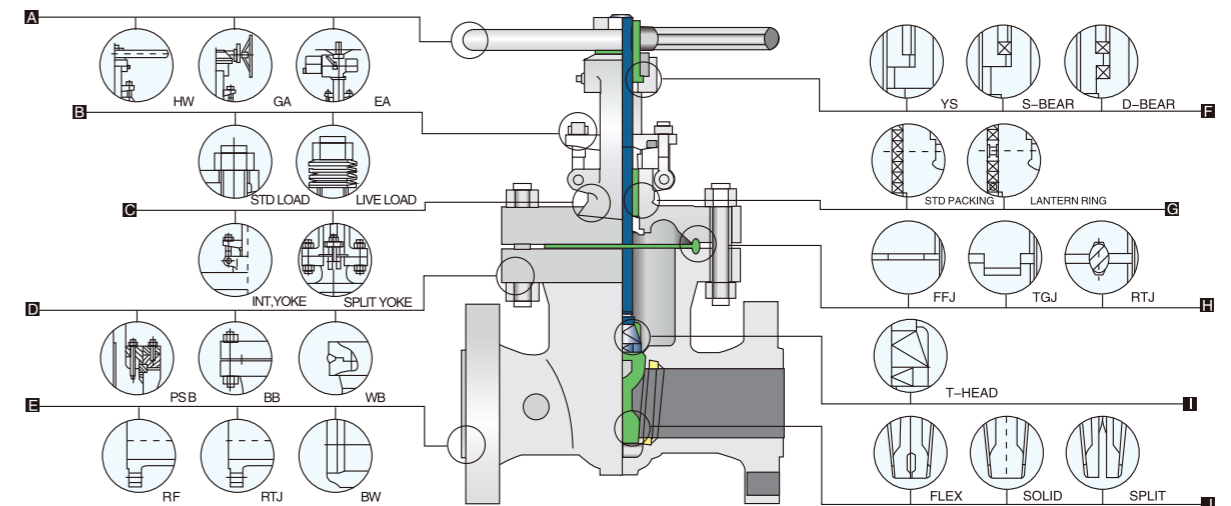
**Ranges of materials**

Standard body/bonnet materials include nine grades of carbon, low alloy and stainless steels. For special applications they can be supplied in other grades of alloy and stainless steel. There's a full range of trim materials to match any service. optional packing and gasket materials are available for a full range of service conditions.

**Available Modifications**

- Trim Changes
- End Connection Modifications
- Packing and Gasket Change
- Operator Mounting
- Handwheel Extensions

- Pressure Equalizing
- By-Pass
- Customer Specified Coatings
- Weld End Bore Changes
- Oxygen & Chlorine Clearing & Packaging



**A Operation**

Large handwheels for easy operation. also available with gearing, motor actuators, pneumatic or hydraulic actuators for more difficult services.

**B Live Load Packing**

In services requiring frequent cycling or with high pressure/temperature variations, live loading extends the service life between maintenance periods by requiring less stents. Belleville springs are employed to provide constant packing gland stress.

**C OS&Y**

Outside screw and yoke. Cast steel gate valve yoke integral with bonnet for 150Lb-8", 600Lb-6", 900Lb-4"& small.

**D BB**

bolted bonnet. welding bonnet and pressure seal bonnet in services requiring frequent cycling or with high pressure/temperature variations.

**E End Connections**

A choice of flanged, RTJ flanged or buttwelding end for piping flexibility.

**F Yoke sleeve**

Extra long thread engagement between yoke sleeve and stem provide long thread life. valves of sizes larger than 150Lb-12", 300Lb-10", 600Lb-6", 900Lb/1500Lb/2500Lb-4" are regular.

**G Lantern Ring And Double Packing Set**

lantern ring leak-off fitting connection and double packing stack is optionally available for critical services.

**H Body-to-Bonnet Joint**

A flat face gasket joint is used in the 150lb valves. A male and female joint is used in 300lb to 600lb valves. ring joint is used in the body to bonnet connections in 900lb & higher.

**I Stem**

All wedge gate valves are provided with upset forged T-head stems. By forging the T-head, the stem at the stem-wedge connection is strengthened, this design also allows.

**J Wedge**

Integral guide rib faces assure self-centering of wedge. flexible wedge gate valve has a one-piece, twin-disc wedge, which is designed so that each half flexes independ.



**Applicable Standards:**

- STEEL GATE VALVES API 600/API6D
- STEEL GATE VALVES ISO 10434/ISO 14313
- STEEL VALVES, ASME B16.34
- FACE TO FACE, ASME B16.10
- END FLANGES, ASME B16.5
- BUTTWELDING ENDS, ASME B16.25
- INSPECTION AND TEST API 598/API 6D

**Design descriptions:**

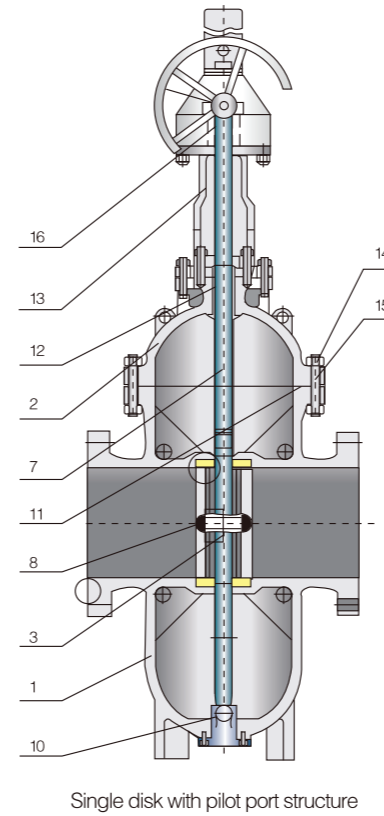
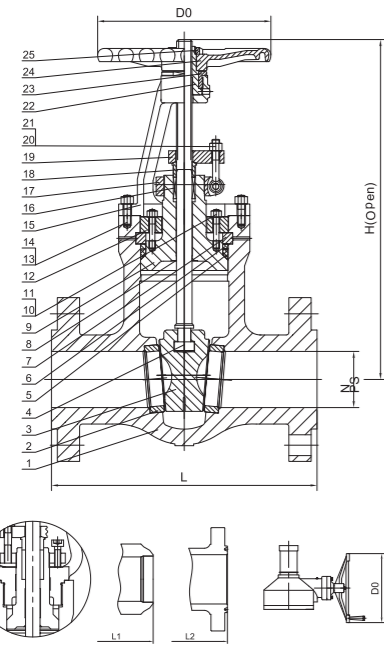
- FULL PORT DESIGN
- OS&Y OUTSIDE SCREW AND YOKE
- BB, BOLTED BONNET
- FLEXIBLE WEDGE, FULLY GUIDED
- CHOICE OF SOLID OR SPLIT WEDGE
- RENEWABLE SEAT RINGS
- FORGED T-HEAD STEM
- RISING STEM AND NON-RISING HANDWHEEL
- FLANGED OR BUTTWELDING ENDS
- AVAILABLE WITH BG OPERATOR

**Materials of parts**

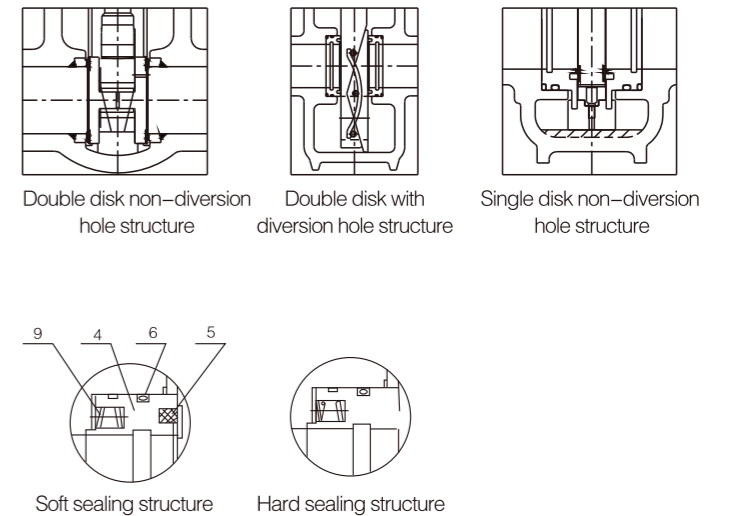
NO	PART NAME	MATERIAL	MATERIAL	MATERIAL
1	Body	ASTM A216 WCB	ASTM A217 WC6	ASTM A352 LCB
2	Seat Ring	ASTM A105N+HF	ASTM A182 F11+HF	ASTM A350 LF2+HF
3	Wedge	ASTM A216 WCB+13Cr	ASTM A217 WC6+13Cr	ASTM A352 LCB+13Cr
4	Stem	ASTM A182 F6a	ASTM A182 F6a	ASTM A182 F6a
5	Sealing Ring	Flexible graphite	Flexible graphite	Flexible graphite
6	Ring Gasket	ASTM A182 F304	ASTM A182 F304	ASTM A182 F304
7	Snap Ring	ASTM A182 F6a	ASTM A182 F6a	ASTM A182 F6a
8	Backseat	HF Overlay	HF Overlay	HF Overlay
9	P.S. Bonnet	ASTM A105N	ASTM A182 F11	ASTM A350 LF2
10	Bonnet Bolt	ASTM A193 B7	ASTM A193 B16	ASTM A320 L7
11	Bonnet Nut	ASTM A194 2H	ASTM A194 7	ASTM A194 7
12	Bonnet Cover	ASTM A105N	ASTM A182 F11	ASTM A350 LF2
13	Yoke Bolt	ASTM A193 B7	ASTM A193 B16	ASTM A320 L7
14	Yoke Nut	ASTM A194 2H	ASTM A194 7	ASTM A194 7
15	Yoke	ASTM A216 WCB	ASTM A217 WC6	ASTM A352 LCB
16	Packing	Flexible graphite	Flexible graphite	Flexible graphite
17	Supporting Bra	ASTM A216 WCB	ASTM A217 WC6	ASTM A352 LCB
18	Gland	ASTM A276 410	ASTM A276 410	ASTM A276 410
19	Gland Flange	ASTM A216 WCB	ASTM A217 WC6	ASTM A352 LCB
20	Gland Bolt	ASTM A193 B7	ASTM A193 B16	ASTM A320 L7
21	Gland Nut	ASTM A194 2H	ASTM A194 7	ASTM A194 7
22	Stem Nut	Copper Alloy	Copper Alloy	Copper Alloy
23	Lock Nut	AISI 1035	AISI 1035	AISI 1035
24	Handwheel	Ductile Iron	Ductile Iron	Ductile Iron
25	H.W. Nut	AISI 1035	AISI 1035	AISI 1035

**Applicable Standards:**

- DESIGN & MANUFACTURE CONFORM WITH: API 6D/ISO 14313、ASME B16.34
- CONNECTION DIMENSION CONFORMS WITH: ASME B16.5 DIN EN 1092
- FIRE RESISTANCE DESIGN CONFORMS WITH: API 607/ISO 10497
- INSPECTION & TEST CONFORMS WITH: API 6D、ISO 5208、API 598
- MATERIAL CONFORMS WITH: ISO 15156



No	Part Name	No	Part Name
1	Body	9	Spring
2	Bonnet	10	Blowdown valve
3	Disc	11	Gasket
4	Seat	12	Packing
5	Sealing ring	13	Yoke
6	O-ring	14	Nut
7	Stem	15	Bolt
8	Seat grease injection valve	16	Stem nut



**Dimensional datas of ANSI Class 1500#**

NPS DN	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	in
L/L1 (RF/BW)	14.50	16.50	18.50	21.50	27.75	32.75	39.00	44.50	49.50	54.50	60.50	65.50	76.50	in
	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	1943	mm
L2 (RTJ)	15.50	16.62	18.62	21.62	28.00	33.12	39.38	45.12	50.25	55.38	61.38	66.38	77.62	in
	371	422	473	549	711	841	1000	1146	1276	1407	1559	1686	1972	mm
H (open)	24.25	26.00	30.00	34.12	39.50	45.00	54.00	61.00	74.88	80.50	93.75	101.50	114.75	in
	615	658	760	868	1005	1145	1370	1550	1900	2050	2380	2580	2915	mm
Do	10	12	18	20	24	18	18	24	24	24	24	24	24	in
	250	300	450	500	600	460	460	600	600	600	600	600	600	mm
wt(kg)	116	166	209	296	510	920	1910	3145	4100	6200	8965	13100	15860	RF
	105	150	188	265	412	760	1640	2755	3200	5300	8070	11790	14275	BW

**Dimensional datas of ANSI Class 2500#**

NPS DN	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	in
L/L1 (RF/BW)	17.75	20.00	22.75	26.50	36.00	40.25	50.00	56.00	-	-	-	-	-	in
	451	508	578	673	914	1022	1270	1422	-	-	-	-	-	mm
L2 (RTJ)	17.88	20.50	23.00	26.88	36.50	40.88	50.88	56.88	-	-	-	-	-	in
	454	514	584	683	927	1038	1292	1445	-	-	-	-	-	mm
H (open)	24.88	29.00	35.00	41.50	57.00	63.38	81.75	89.75	-	-	-	-	-	in
	631	736	890	1055	1450	1610	2075	2280	-	-	-	-	-	mm
Do	12	18	20	20	24	24	24	24	-	-	-	-	-	in
	300	450	500	500	600	600	600	600	-	-	-	-	-	mm
wt(kg)	155	210	310	580	1600	2450	4570	7150	-	-	-	-	-	RF
	124	160	245	460	1310	2010	3800	6000	-	-	-	-	-	BW

**Product Features**

- 1、 Valve seat adopts the structure of O-ring seals and pretightening float valve seat, the soft sealing inlays fluoroplastic, it provides the function of double sealing: fluoroplastic to metal and metal to metal. And at the same time, the fluoroplastic can remove the dirt of the gate disk.
- 2、 Of the metal to metal sealing, there is a grease injection structure outside the valve, grease injects the sealing part through the seat, in this way achieves the aim of zero leakage.
- 3、 Through conduit gate valve always coincide with the sealing surface, whether the disc is full open-or full-closed; sealing surface to be protected from scouring by media directly, thereby extending the service life. In full-time, smooth channel for the direct and flow resistance coefficient is extremely small, no pressure loss, leading to Fig.

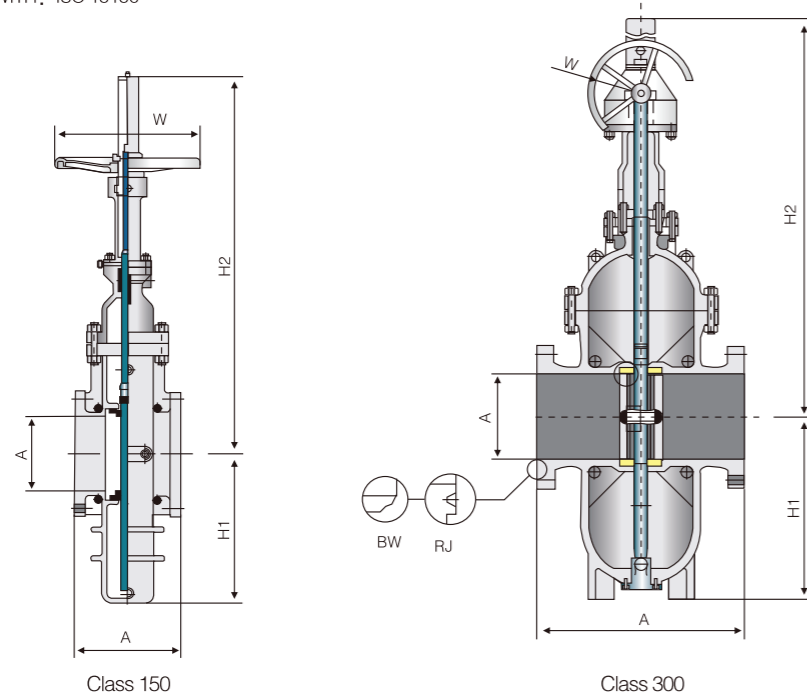
**Materials of parts**

Body	WCB/LCB/CF8M/CF8/CF3M/CF3/WC6/WC9/CD3MN
Bonnet	WCB/LCB/CF8M/CF8/CF3M/CF3/WC6/WC9/CD3MN
Disc	A105+ENP/LF2+ENP/F304/F316/F304L/F316L/F51
Seat	A105+ENP/LF2+ENP/F304/F316/F304L/F316L/F51
Stem	F6a/F304/F316/F304L/F316L/F51
Seal ring	PTFE/NYLON/PEEK/TEFLON
Sealing surface material	1~12 Trim material
O-ring	VITON/NBR
Bolt	B7M/B8M/L7M/B16M
Nut	2HM/8M/7M/4M
Spring	17-4PH/Inconel
Stem nut	C95200/D2/A536
Gasket	Flexible graphite+304/Flexible graphite+316
Packing	Flexible graphite/PTFE

Materials could be choosed according to customers' requirement & working condition.

**Applicable Standards:**

- DESIGN & MANUFACTURE CONFORM WITH: API 6D/ISO 14313、ASME B16.34
- CONNECTION DIMENSION CONFORMS WITH: ASME B16.5 DIN EN 1092
- FIRE RESISTANCE DESIGN CONFORMS WITH: API 607/ISO 10497
- INSPECTION & TEST CONFORMS WITH: API 6D、ISO 5208、API 598
- MATERIAL CONFORMS WITH: ISO 15156



**Dimensional datas**

NPS inch	DN	A mm	B mm	H1 mm	H2 mm	W mm	WT kg	T N.m	NPS inch	DN	A mm	B mm	H1 mm	H2 mm	W mm	WT kg	T N.m
<b>ANSI Class 150#</b>																	
2	50	178	51	125	452	200	25	23	16	400	406	385	685	1854	560	630	572
3	80	203	76	175	605	250	43	50	18	450	432	436	790	2088	650	836	728
4	100	229	100	202	680	280	65	60	★20	500	457	487	880	2420	460	1190	910
6	150	267	150	282	890	300	95	78	★24	600	508	589	1050	2688	460	1580	1313
8	200	292	201	355	1128	350	146	143	★28	700	610	684	1192	3078	460	2400	2028
10	250	330	252	445	1296	400	245	211	★30	750	610	735	1268	3252	600	3200	2305
12	300	356	303	518	1483	450	343	289	★32	800	711	779	1355	3495	600	3700	2795
14	350	381	334	606	1668	500	480	403	★36	900	711	874	1515	3898	600	4600	3783

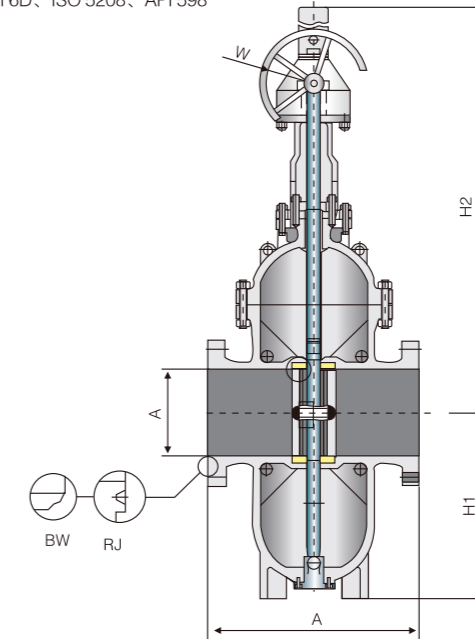
**Dimensional datas**

NPS inch	DN	A mm	B mm	H1 mm	H2 mm	W mm	WT kg	T N.m	NPS inch	DN	A mm	B mm	H1 mm	H2 mm	W mm	WT kg	T N.m
<b>ANSI Class 300#</b>																	
2	50	292	51	135	456	200	30	25	16	400	902	385	730	1884	650	1280	735
3	80	356	76	182	618	250	48	71	★18	450	978	436	802	2163	460	1665	988
4	100	406	100	216	713	280	78	95	★20	500	1054	487	935	2420	460	2168	1235
6	150	495	150	315	903	350	152	117	★24	600	1232	589	1103	2810	460	2980	1963
8	200	597	201	382	1133	400	240	185	★28	700	1397	684	1262	3203	460	4060	2990
10	250	673	252	480	1403	450	420	292	★30	750	1524	735	1342	3412	600	4980	3566
12	300	762	303	545	1582	500	525	366	★32	800	1651	779	1422	3646	600	5800	4121
14	350	826	334	645	1688	560	810	576	★36	900	1880	874	1513	4055	600	7790	5785

Note: ★ Worm-gear actuator

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- MATERIAL CONFORMS WITH: ISO 15156



**Dimensional datas**

NPS inch	DN	A mm	B mm	H1 mm	H2 mm	W mm	WT kg	T N.m	NPS inch	DN	A mm	B mm	H1 mm	H2 mm	W mm	WT kg	T N.m
<b>ANSI Class 600#</b>																	
2	50	292	51	160	466	250	60	32	★14	350	889	334	654	1745	460	1680	1453
3	80	356	76	228	622	280	106	117	★16	400	991	385	740	1978	460	2230	2103
4	100	432	100	258	724	350	160	169	★18	450	1092	436	812	2268	600	2700	2808
6	150	559	150	332	913	450	395	234	★20	500	1194	487	1040	2509	600	3100	3653
8	200	660	201	411	1148	560	605	319	★24	600	1397	589	1160	2820	600	5100	4953
10	250	787	252	493	1412	600	960	737	★28	700	1549	684	1288	3233	1000	7050	6253
12	300	838	303	577	1596	650	1520	1274	★30	750	1651	735	1330	3442	1000	8200	7163

**Dimensional datas**

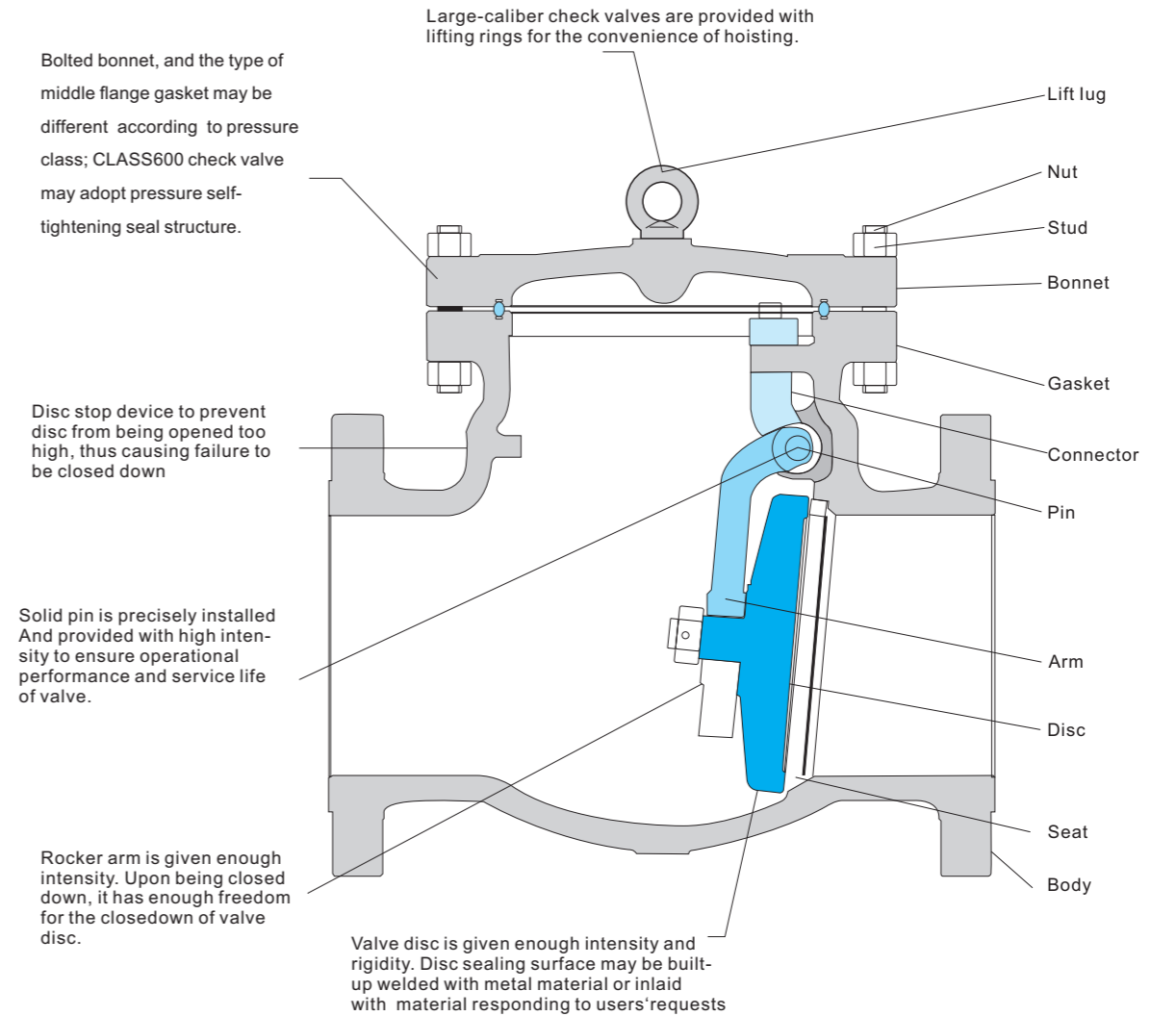
NPS inch	DN	A mm	B mm	H1 mm	H2 mm	W mm	WT kg	T N.m	NPS inch	DN	A mm	B mm	H1 mm	H2 mm	W mm	WT kg	T N.m
<b>ANSI Class 900#</b>																	
2	50	368	49	162	476	300	133	71	12	300	965	303	577	1600	460	1850	1296
3	80	381	74	230	638	350	198	150	14	350	1029	322	660	1755	460	2580	1482
4	100	457	100	262	730	400	260	181	16	400	1130	373	750	2028	600	3500	2139
6	150	610	150	336	920	560	565	413	18	450	1219	423	822	2288	600	4400	2919
8	200	737	201	415	1152	600	965	767	20	500	1321	471	1058	2525	600	5560	4486
★10	250	838	252	496	1418	460	1280	1021	24	600	1549	589	1176	2850	1000	7480	5195

**Dimensional datas**

NPS inch	DN	A mm	B mm	H1 mm	H2 mm	W mm	WT kg	T N.m	NPS inch	DN	A mm	B mm	H1 mm	H2 mm	W mm	WT kg	T N.m
<b>ANSI Class 1500Lb</b>																	
2	50	368	49	162	476	300	133	107	★6	150	705	144	338	930	460	830	618
3	80	470	74	230	638	400	235	225	★8	200	832	192	420	1160	460	1380	1151
4	100	546	100	270	745	500	398	272	★10	250	991	239	500	1428	460	2230	1532



## Check Valve



(GB Standard Material)

No.	Part Name	Carbon Steel	Stainless Steel	Alloy Steel	Low Temperature Steel
1	Body	WCB	CF8	WC6	LCB
2	Seat	25#	0Cr18Ni9(304)	0Cr18Ni9(304)	0Cr18Ni9(304)
3	Disk	WCB	CF8	WC6	LCB
4	Arm	WCB	CF8	WC6	LCB
5	Pin	1Cr13	0Cr18Ni9(304)	0Cr18Ni9(304)	0Cr18Ni9(304)
6	Connector	WCB	CF8	WC6	LCB
7	Gasket	flexible graphite +SS304	flexible graphite+SS304	flexible graphite+SS304	flexible graphite+SS304
8	Bonnet	WCB	CF8	WC6	LCB
9	Stud	35CrMoA	0Cr18Ni9(304)	35CrMoA	0Cr18Ni9(304)
10	Nut	35#	0Cr18Ni9(304)	35CrMoA	0Cr18Ni9(304)

(ASTM Standard Material)

No.	Part Name	Carbon Steel	Stainless Steel	Alloy Steel	Low Temperature Steel
1	Body	ASTMA216 GR WCB	ASTMA351 GR CF8	ASTMA217 GR WC6	ASTMA352 GR LCB
2	Seat	ASTMA105	ASTMA105	ASTMA182 GR F304	ASTMA182 GR F304
3	Disk	ASTMA216 GR WCB	ASTMA351 GR CF8	ASTMA217 GR WC6	ASTMA352 GR LCB
4	Arm	ASTMA216 GR WCB	ASTMA351 GR CF8	ASTMA217 GR WC6	ASTMA352 GR LCB
5	Pin	ASTMA182 GR F6a	ASTMA276 TYPE 304	ASTMA182 GR F304	ASTMA182 GR F304
6	Connector	ASTMA216 GR WCB	ASTMA351 GR CF8	ASTMA217 GR WC6	ASTMA352 GR LCB
7	Gasket	flexible graphite +SS304	flexible graphite+SS304	flexible graphite+SS304	flexible graphite+SS304
8	Bonnet	ASTMA216 GR WCB	ASTMA351 GR CF8	ASTMA217 GR WC6	ASTMA352 GR LCB
9	Stud	ASTMA193 GR B7	ASTMA194 GR B8	ASTMA193 GR B7	ASTMA194 GR B8
10	Nut	ASTMA194 GR 2H	ASTMA193 GR 8	ASTMA194 GR 4	ASTMA193 GR 8

Technical Specification

Design Standard	GB/T12235	BS1868
Pressure-Temperature Rating	GB/T12224	ASME B16.34
Face-Face	GB/T12221, GB/T 15188.1	ASME B16.10
Flange Ends	GBT9113, JBT 79	ASME B16.5 ASME B16.47
Buttwelding Ends	GBT12224	ASME B16.25
Inspection Test	JB/T9092, GB/T 13927	API598
Normal Pressure	PN1.6 PN2.5 PN4.0 PN6.4 PN10.0 PN16.0 CL150 CL300C L400C L600C L900C L1500	
Test Pressure	Shell Test	2.4 3.75 6.0 9.6 15.0 24.0 2.93 7.58 10.0 15.0 22.4 37.5
	High Pressure Seal Test	1.76 2.75 4.4 7.04 11.0 17.6 2.07 5.52 7.31 11.03 16.54 27.5
	Low Pressure Seal Test	
Applicable Temperature	-196°C~550°C (Different raw material for different work temperature)	
Applicable Medium	Water, oil, gas and other causticity medium(Different raw material for different medium)	

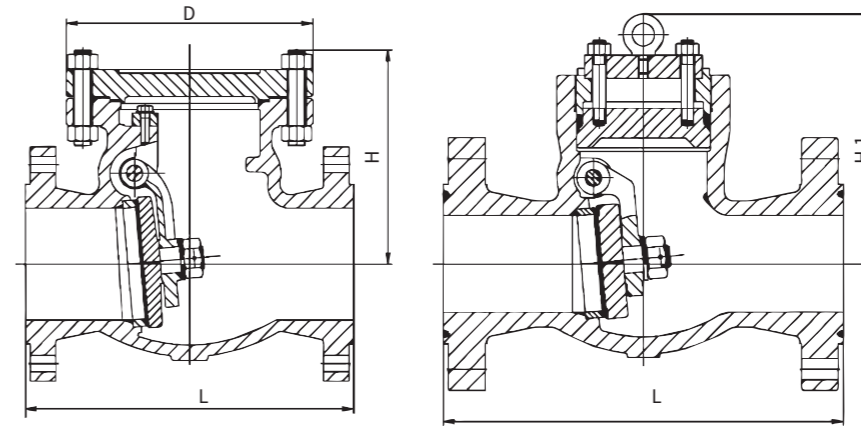


Fig.HRF4

Fig.HRJ4

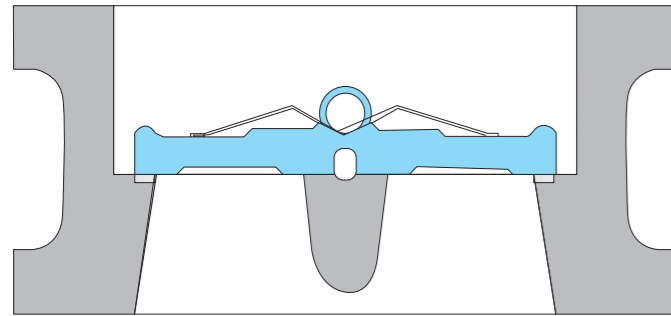
GB series  
 Pressure:PN1.6~25  
 ●≤PN10.0 Bolted Bonnet  
 ●>PN10.0 Pressure sealed bonnet

Main Dimensions Weight

Pressure	Size	mm	50	65	80	100	125	150	200	250	300	350	400	500
PN1.6	Main Dimension	L	230	290	310	350	400	480	550	650	750	850	950	1150
		D	160	180	195	215	245	280	335	405	460	520	580	705
		H	160	177	187	202	227	263	293	330	382	430	480	560
	Weight (kg)		22	26	33	39	57	80	95	175	260	360	496	588
	Cv		-	-	300	510	-	1229	2246	3514	5248	6750	8859	14590
PN2.5	Main Dimension	L	230	290	310	350	400	480	550	650	750	850	950	1150
		D	160	180	195	215	245	300	360	425	485	550	610	730
		H	160	177	187	202	227	263	293	330	382	430	480	560
	Weight (kg)		22	30	35	52	73	103	135	196	286	389	495	641
	Cv		-	-	300	510	-	1229	2246	3514	5248	6750	8859	14590
PN4.0	Main Dimension	L	230	290	310	350	400	480	550	650	750	850	950	1150
		D	185	210	235	260	295	330	385	445	545	570	625	730
		H	177	192	192	217	259	270	340	401	423	460	490	618
	Weight (kg)		22	30	38	57	91	129	212	297	362	450	585	640
	Cv		-	-	300	510	-	1229	2246	3514	5248	6750	8859	14590
PN6.4	Main Dimension	L	300	340	380	430	500	550	650	775	900	1025	1150	1400
		D	200	225	250	315	365	410	480	565	600	615	675	735
		H	192	207	207	235	265	297	357	405	465	514	568	620
	Weight (kg)		30	41	48	72	108	155	217	341	472	627	882	1027
	Cv		-	-	300	510	-	1229	2246	3514	5248	6750	8859	14590
PN10.0	Main Dimension	L	300	340	380	430	500	550	650	775	-	-	-	-
		D	200	225	260	295	335	425	450	535	-	-	-	-
		H	192	207	235	265	313	360	420	480	-	-	-	-
	Weight (kg)		30	41	52	78	119	161	216	473	-	-	-	-
	Cv		-	-	300	510	-	1229	2246	3514	-	-	-	
PN16.0	Main Dimension	L	300	340	380	430	500	550	650	750	-	-	-	-
		H1	250	283	320	356	362	430	470	515	-	-	-	-
		Weight (kg)		49	58	110	162	214	267	318	370	-	-	-
		Cv		-	-	300	510	-	1229	2246	3514	-	-	-
PN25.0	Main Dimension	L	368	419	470	546	673	705	832	991	-	-	-	-
		H1	310	346	385	406	534	560	618	673	-	-	-	-
		Weight (kg)		63	78	92	168	220	270	320	390	-	-	-
		Cv		-	-	300	510	-	1229	2246	3514	-	-	-



Design Of Wafer Type Check Valve



Double-plate Wafer Type Check Valve Product Line

Size	DN	NPS	Pressure(CLASS)															
			GB series(PN)											API series(CLASS)				
			1.0	1.6	2.5	4.0	6.4	10.0	16.0	20.0	25.0	150	300	600	900	1500	2500	
50	2		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
65	2 1/2		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
80	3		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
100	4		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
125	5		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
150	6		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
200	8		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
250	10		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
300	12		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
350	14		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
400	16		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
450	18		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
500	20		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
600	24		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
650	26		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
700	28		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
750	30		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
800	32		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
900	36		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
1000	40		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
1050	42		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
1200	48		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	

Material List Of Check Valve

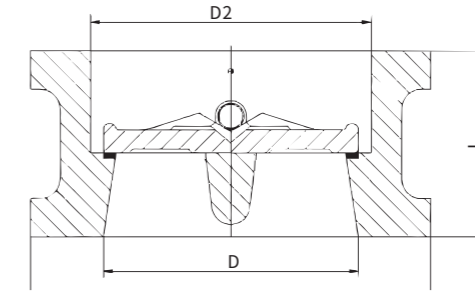
No.	Part Name	GB Material		
		Carbon Steel	Stainless Steel	Alloy Steel
1	Body	WCB	CF8	WC6
2	Disc	CF8	CF8	CF8
3	Spring	0Cr18Ni9	0Cr18Ni9	0Cr18Ni9
4	Shaft	1Cr13	0Cr18Ni9	0Cr18Ni9

No.	Part Name	Astm Material		
		Carbon Steel	Stainless Steel	Alloy Steel
1	Body	A216 WCB	A351 CF8	A217 WC6
2	Disc	A351 CF8	A351 CF8	A351 CF8
3	Spring	A182F304	A182F304	A182F304
4	Shaft	A182F6a	A182F304	A182F304

Technical Specification

Design Standard	GB/T 12221	API6D, API594
Pressure-temperature Rating	GB/T 12224	ASME B16.34
Face-face	Factory Standard	API6D, API594
Flange Ends	GB/T9113, JB/T79	ASME B16.5, ASME B16.47
Inspection & Test	JB/T9092, GB/T13927	API598, API6D
Norminal Pressure	1.0 1.6 2.5 4.0 6.4 10.0 16.0 20.0 25.0 150 300 600 900 1500 2500	
Test Pressure	Shell Test	2.0 2.4 3.75 6.0 9.6 15.0 24.0 30.0 37.5 2.93 7.55 10.0 15.0 37.5 63.0
	High Pressure Seal Test	1.1 1.76 2.75 4.4 7.04 11.0 17.6 22.0 27.5 2.07 5.52 7.31 11.03 27.5 46.2
	Low Pressure Seal Test	0.6
Applicable Temperature	-196°C~550°C Different raw material for different work temperature	
Applicable Medium	Water, oil, gas and other causticity medium (Different raw material for different medium)	

GB series Pressure: PN1.0~10.0



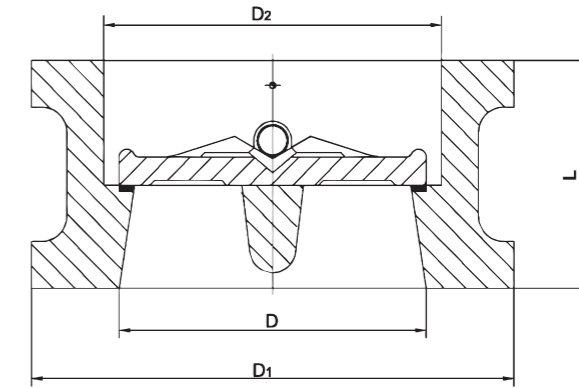
Main Dimensions & Weight

Pressure	Size		Valve Main Dimension				Weight	Cv
	mm	in	L	D	D1	D2		
PN1.0	50	2	60	51	108	56	2	49
	65	2 1/2	67	65	128	73	3	130
	80	3	73	80	142	88	4	158
	100	4	73	102	162	108	6	386
	125	5	86	127	192	132	8	817
	150	6	98	152	218	160	13	888
	200	8	127	203	273	210	24	1566
	250	10	146	254	328	266	37	3248
	300	12	181	305	378	310	50	3862
	350	14	184	350	438	355	76	5627
	400	16	191	400	489	405	110	8489
	450	18	203	450	539	455	135	10763
	500	20	219	500	594	505	158	14572
	600	24	222	600	696	605	320	27006
	700	28	305	695	811	700	380	34136
	800	32	305	796	918	800	560	48669
900	36	368	898	1018	903	640	56777	
1000	40	432	1050	1124	1055	900	81395	
1200	48	524	1200	1340	1205	1400	115388	
PN1.6	50	2	60	51	108	56	2	49
	65	2 1/2	67	65	128	73	3	130
	80	3	73	80	142	88	4	158
	100	4	73	102	162	108	6	386
	125	5	86	127	192	132	8	817
	150	6	98	152	218	160	13	888
	200	8	127	203	273	210	24	1566
	250	10	146	254	329	266	37	3248
	300	12	181	305	384	310	50	3862
	350	14	184	350	444	355	76	5627
	400	16	191	400	496	405	110	8489
	450	18	203	450	556	455	135	10763
	500	20	219	500	618	505	158	14572
	600	24	222	600	732	605	320	27006
	700	28	305	695	802	700	380	34136
	800	32	305	796	912	800	560	48669
900	36	368	898	1012	903	640	56777	
1000	40	432	1050	1126	1055	900	81395	
1200	48	524	1200	1340	1205	1400	115388	

Main Dimensions & Weight

Pressure	Size		Valve Main Dimension				Weight	Cv	
	mm	in	L	D	D1	D2			
PN2.5	50	2	60	51	108	56	2	49	
	65	2 1/2	67	65	128	73	3	130	
	80	3	73	80	142	88	4	158	
	100	4	73	102	168	108	6	386	
	125	5	86	127	194	132	8	817	
	150	6	98	152	224	160	14	888	
	200	8	127	203	284	210	27	1566	
	250	10	146	254	341	266	42	3248	
	300	12	181	305	401	310	54	3862	
	350	14	184	350	458	355	86	5627	
	400	16	191	400	515	405	120	8489	
	450	18	203	450	565	455	148	10763	
	500	20	219	500	622	505	165	14572	
	600	24	222	600	732	605	340	27006	
700	28	305	695	831	700	400	34136		
800	32	305	796	942	800	580	48669		
900	36	368	898	1040	903	660	56777		
1000	40	432	1050	1155	1055	960	81395		
1200	48	524	1200	1365	1205	1440	115388		
PN4.0	50	2	60	51	108	58	3	49	
	65	2 1/2	67	65	128	73	4	130	
	80	3	73	80	142	88	6	158	
	100	4	73	102	168	108	8	386	
	125	5	86	127	194	132	13	817	
	150	6	98	152	224	160	16	888	
	200	8	127	203	291	210	28	1566	
	250	10	146	254	353	266	49	3248	
	300	12	181	305	418	310	76	3862	
	350	14	222	350	475	355	114	5627	
	400	16	232	400	547	405	190	8489	
	450	18	264	450	572	455	200	10763	
	500	20	292	500	626	505	260	14572	
	600	24	318	600	745	608	404	27006	
PN6.3	50	2	60	51	114	58	4	49	
	65	2 1/2	67	65	138	73	5	130	
	80	3	73	80	148	88	7	158	
	100	4	79	102	174	108	10	386	
	125	5	105	127	211	132	16	817	
	150	6	136	152	248	160	20	888	
	200	8	165	200	310	210	38	1566	
	250	10	213	250	362	266	62	3248	
	300	12	229	305	422	310	100	3862	
	350	14	273	350	487	355	160	5627	
	400	16	305	400	541	405	260	8489	
	PN10.0	50	2	60	51	120	58	5	49
		65	2 1/2	67	65	144	73	7	130
		80	3	73	80	154	88	10	158
100		4	79	102	181	108	12	386	
125		5	105	127	218	132	19	817	
150		6	136	152	258	160	25	888	
200		8	165	200	324	210	56	1566	
250		10	213	250	392	266	94	3248	
300		12	229	305	456	310	142	3862	
350		14	273	350	510	355	230	5627	
400	16	305	400	570	405	366	8489		

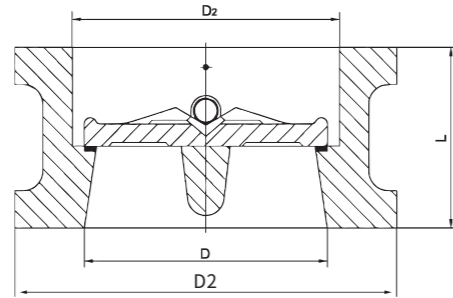
Pressure: PN16.0~25.0



Main Dimensions & Weight

Pressure	Size		Valve Main Dimension				Weight	Cv
	mm	in	L	D	D1	D2		
PN16.0 JB FLANGE	50	2	70	51	142	56	8	49
	65	2 1/2	83	65	162	73	11	130
	80	3	83	80	176	90	16	158
	100	4	102	102	208	108	19	386
	125	5	110	127	247	136	33	817
	150	6	159	150	280	162	40	888
	200	8	206	203	356	212	84	1566
PN16.0 GB, HG FLANGE	250	10	241	250	435	266	146	3248
	300	12	292	305	520	312	230	3862
	50	2	70	51	120	56	7	49
	65	2 1/2	83	65	144	73	10	130
	80	3	83	80	154	90	14	158
	100	4	102	102	181	108	17	386
	125	5	110	127	218	136	28	817
PN20.0	150	6	159	152	258	162	36	888
	200	8	206	203	325	212	78	1566
	250	10	241	254	389	266	130	3248
	300	12	292	305	459	312	210	3862
	50	2	70	51	136	56	8	49
	65	2 1/2	83	65	174	73	16	130
	80	3	83	80	198	90	22	158
PN25.0	100	4	102	102	254	108	35	386
	125	5	110	127	280	136	50	817
	150	6	159	152	316	162	78	888
	200	8	206	203	390	212	120	1566
	250	10	248	254	518	266	220	3248
	50	2	70	51	124	56	8	49
	65	2 1/2	83	65	154	73	14	130
80	3	83	80	171	90	20	158	
PN25.0	100	4	102	102	203	108	28	386
	125	5	110	127	243	136	44	817
	150	6	159	152	285	162	70	888
	200	8	206	203	359	212	110	1566
	250	10	248	254	443	266	200	3248
	300	12	305	305	540	312	350	3862

API series Pressure: CLASS150~2500



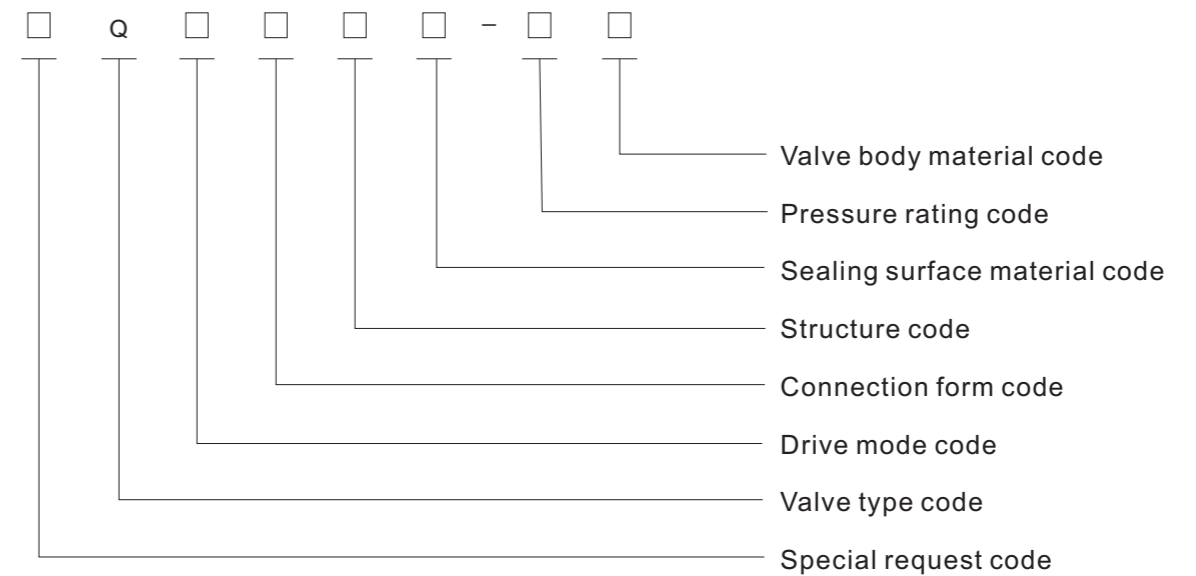
Main Dimensions & Weight

Pressure	Size		Valve Main Dimension				Weight	Cv	
	mm	in	L	D	D1	D2			
CLASS150	50	2	60	51	103	56	2	48	
	65	2 1/2	67	65	122	73	3	128	
	80	3	73	80	135	88	4	150	
	100	4	73	102	173	108	6	394	
	125	5	86	127	195	132	8	830	
	150	6	98	152	220	160	13	900	
	200	8	127	203	277	210	25	1589	
	250	10	146	254	337	266	39	3300	
	300	12	181	305	407	310	54	3926	
	350	14	184	350	448	355	80	5418	
	400	16	191	400	512	405	117	8256	
	450	18	203	450	547	455	138	10452	
CLASS300	500	20	219	500	604	505	163	14251	
	600	24	222	600	715	605	331	26511	
	700	28	305	700	773	700	380	33600	
	750	30	305	746	824	750	425	48000	
	800	32	305	796	878	800	560	55200	
	900	36	368	898	983	910	640	84000	
	1050	42	432	1050	1142	1055	960	96000	
	1200	48	524	1200	1302	1205	1400	117600	
	CLASS600	50	2	60	51	110	58	3	48
		65	2 1/2	67	65	128	73	4	128
		80	3	73	80	147	88	6	150
		100	4	73	102	179	108	8	394
125		5	86	127	214	132	15	830	
150		6	98	152	249	160	18	900	
200		8	127	203	305	210	31	1589	
250		10	146	254	359	266	51	3300	
300		12	181	305	420	310	77	3926	
350		14	222	350	483	355	117	5418	
400		16	232	400	537	405	190	8256	
450		18	264	450	594	455	200	10452	
CLASS900	500	20	292	500	652	505	265	14251	
	600	24	318	600	772	608	410	26511	
	750	30	368	735	882	740	660	48000	
	900	36	483	873	1044	880	1020	84000	
	1050	42	568	1035	1196	1045	1540	96000	
	1200	48	629	1179	1365	1190	2260	117600	

Main Dimensions & Weight

Pressure	Size		Valve Main Dimension				Weight	Cv
	mm	in	L	D	D1	D2		
CLASS600	50	2	60	51	110	58	4	48
	65	2 1/2	67	65	128	73	5	128
	80	3	73	80	147	88	8	150
	100	4	79	102	191	108	11	394
	125	5	105	127	239	136	20	830
	150	6	136	152	264	162	26	900
	200	8	165	200	318	212	55	1589
	250	10	213	250	398	266	95	3300
	300	12	229	305	455	312	140	3926
	350	14	273	337	490	355	223	5418
	400	16	305	387	562	400	360	8256
	450	18	362	438	610	450	395	10452
CLASS900	500	20	368	489	680	500	518	14251
	600	24	438	591	786	600	836	26511
	50	2	70	51	140	58	8	48
	65	2 1/2	83	65	162	73	11	128
	80	3	83	80	165	88	14	150
	100	4	102	102	204	108	20	394
	125	5	110	127	245	136	30	830
	150	6	159	150	286	162	42	900
	200	8	206	200	356	212	84	1589
	250	10	241	250	432	266	145	3300
	300	12	292	305	495	312	220	3926
	350	14	356	337	518	355	350	5418
CLASS1500	400	16	384	387	572	400	470	8256
	450	18	451	438	635	450	605	10452
	500	20	451	487	695	500	820	14251
	600	24	495	591	835	600	1050	26511
	50	2	70	51	140	58	8	48
	65	2 1/2	83	65	162	73	11	128
	80	3	83	80	172	88	19	150
	100	4	102	102	207	108	26	394
	125	5	110	127	252	136	51	830
	150	6	159	150	280	162	68	900
	200	8	206	200	350	212	130	1589
	250	10	248	254	433	266	210	3300
CLASS2500	300	12	305	305	518	312	384	3926
	350	14	356	337	576	355	550	5418
	400	16	384	387	639	400	635	8256
	50	2	70	42	143	48	10	48
	65	2 1/2	83	52	166	58	18	128
	80	3	86	62	194	68	26	150
	100	4	105	88	232	94	40	394
	125	5	110	100	277	106	59	830
	150	6	159	150	315	162	90	900
	200	8	206	180	385	186	150	1589
	250	10	254	225	474	232	240	3300
	300	12	305	266	547	272	440	3926

## Ball Valve, Floating



#### Special request code

- K-Sulfur resistant
- D-Low temperature type
- EX-Extension rod type
- M-Buried type
- B-Insulation
- H-Slow closing
- P-Slagging

#### Valve type code

- FB-Floating Ball Valve;
- TB-Fixed ball valve

#### Drive mode code

- 3-Worm Gear operator
- 5-Bevel gear drive
- 6-Pneumatic
- 6A-Pneumatic adjustment
- 65-Pneumatic spring return
- 7-Hydraulic
- 8-Gas-liquid linkage
- 8H-Gas-liquid linkage with emergency cut-off
- 9-Electric

#### Special request code

- RF-Raised Face Flange
- FF-Full face flange
- FM-Concave
- M-Convex
- MFM-Concave and convex flange
- TG-Tongue and groove flange
- RJ-Ring Face Flange
- BW-Butt Welding
- SW-Socket welding
- NPT-Threaded connection

#### Structure code

- 1-Straight through
- 2-Reduced diameter straight
- 3T-T-shaped tee
- 3L-L-shaped tee
- 4-Four-way
- 5-Overall top-mounted type (full diameter)
- 5A-Overall top-mounted type (reduced diameter)
- 6-Orbital ball valve (full diameter)
- 6A-Orbital ball valve (reduced diameter)
- 7H-Eccentric hemisphere
- 7F-Eccentric Global
- 8-Fully welded (full diameter)
- 8A-Fully welded (reduced diameter)

Sealing surface material code

- Y-Cemented carbide
- F-Reinforced polytetrafluoroethylene
- N-Nylon
- PPL-Para-Polyphenylene
- G-Carbon fiber
- E-PEEK
- M-MOLON
- H-Alloy steel
- Q-Enamel
- T-Copper alloy
- X-Rubber

Valve body material code

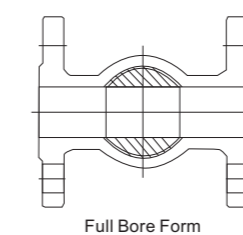
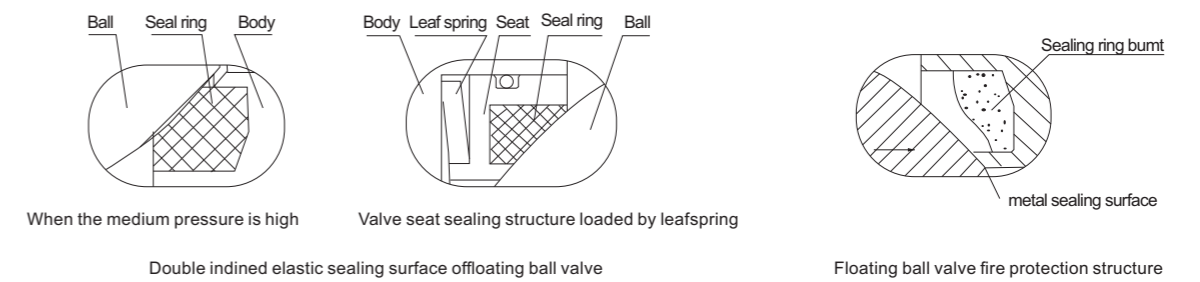
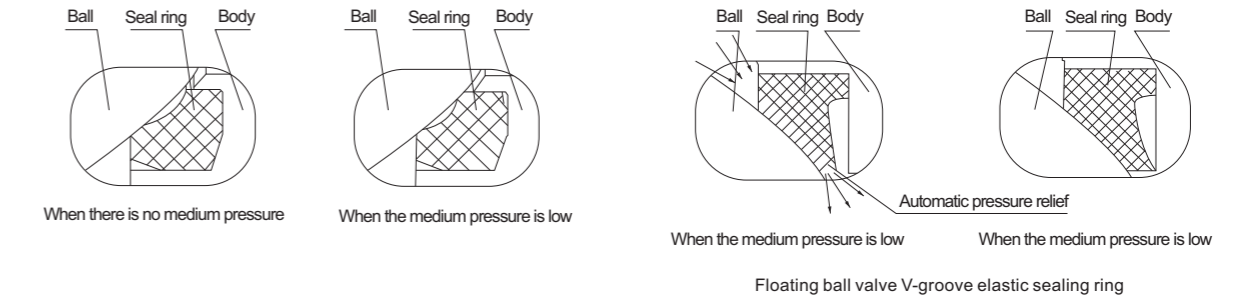
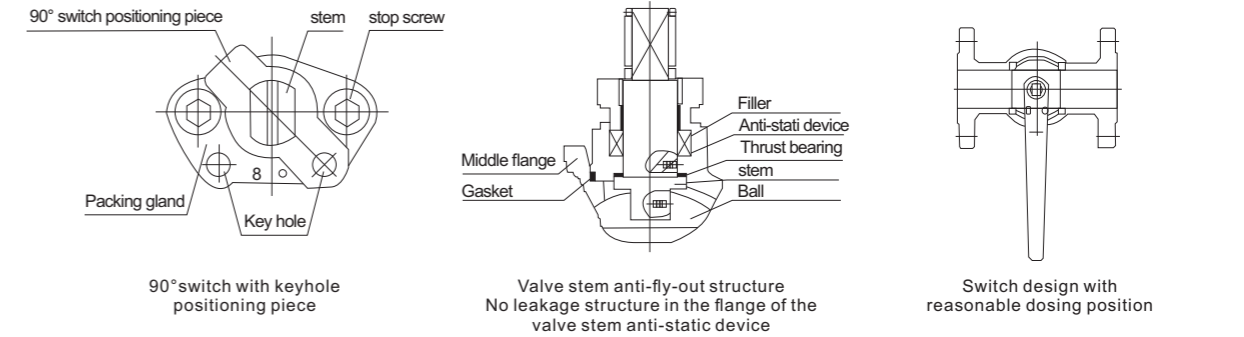
- C-WCB (A105)
- C5-C5
- C6 WC6
- C9 WC9
- L-LCB
- P8-CF8(304)
- R8-CF8M(316)
- P3-CF3(304L)
- R3-CF3M(316L)

Pressure rating code

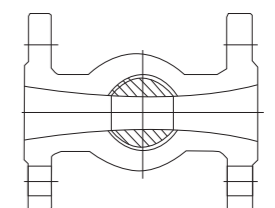
- 1-PN16 Class 150
- 2-PN25
- 3-Class 300
- 4-PN40 Class 400
- 5-PN64 Class 600
- 8-class 900
- 9-PN100
- 15-Class 1500
- 16-PN160
- 20-PN200
- 25-Class 2500

Ball valve Technical Specifications

Specifications	API series	GB series
Design specification	API 6D, API 608, BS5351	GBT12237, JB/T7745
Pressure temperature rating	ASME B16.34	GBT12224
Structure length	ASME B16.10	GBT12221, GBT15188.1
Flange type size	ASME B16.5, ASME 16.47	GB/T9113, JB/T79
Butt welding end connection	ASME B16.25	GB/T 9124
Socket welding connection	ASME B16.11	GBT12224
Threaded end connection	ASME B16.1.20	GBT12224
Inspection and testing	API 598, API 6D	JBT9092, GBT13927



Full Bore Form



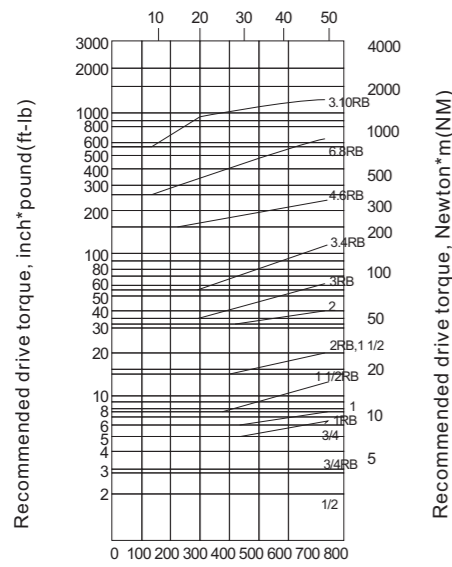
Reduced Bore Form



**Reference Torque Of Floating Ball Valve**

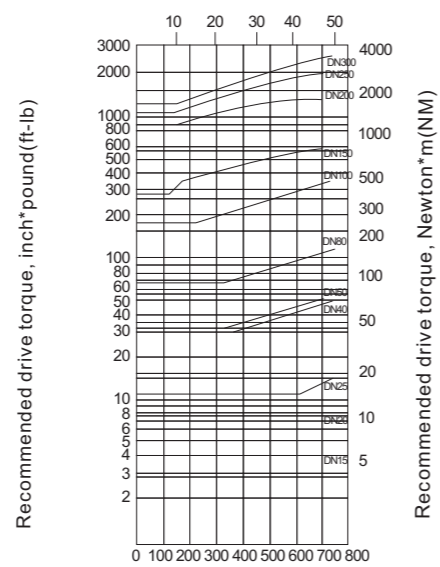
The following torques and graphs are for reference when selecting a drive unit. According to the characteristics of the medium the opening frequency of the internal parts and the valve need to be considered separately. Valves with anticorrosive internal parts are used to clean the lubricating medium, and the torque can be reduced by 20%. For harsh media, such as slurry, granular media, and for oxygen, the torque may be increased by 50% .

Maximum pressure difference of PTFE sealing Seal bar (bar)



Maximum pressure difference, lb/in² (psi)

Reinforced(M)the maximum pressure difference of the seal seat seal, bar(bar)



Maximum pressure difference, lb/in² (psi)

**Torque Table(n.m)**

Pressure / Size(mm)	15	20	25	40	50	65	80	100	125	150	200
PN1.6MPa	3	5	10	16	25	50	65	125	250	340	485
PN2.5MPa	3	5	11	18	30	60	80	140	300	400	680
PN4.0MPa	5	10	24	35	50	100	150	250	450	585	996
PN6.4MPa	15	30	50	80	100	200	300	400	/	/	/
PN10.0MPa	19	35	68	130	190	360	460	770	/	/	/

Note: The data listed in the table have not been actually measured and are for reference only

Pressure / Size(mm)	1/2	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8
Class150	3	5	11	16	25	50	65	125	250	410	700
Class300	7	12	26	38	60	120	160	280	600	950	1550
Class400	15	30	50	90	140	240	350	540	/	/	/
Class600	19	35	68	130	190	360	460	770	/	/	/

Note: The data listed in the table have not been actually measured and are for reference only

**Flow Data Sheet**

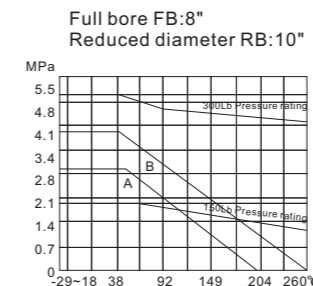
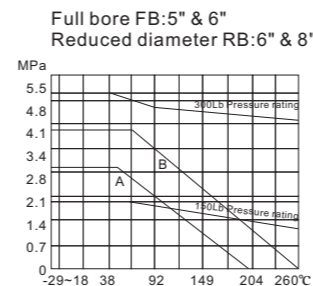
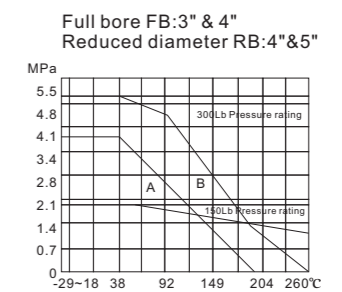
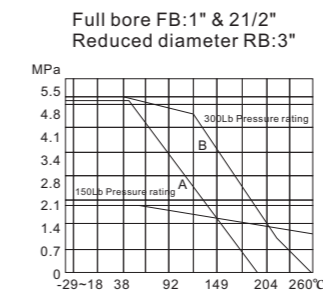
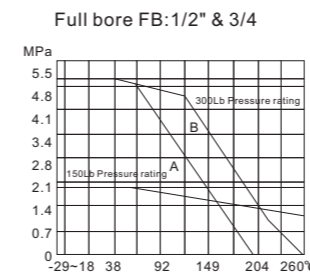
The flow coefficient of a valve is a measure of the flow capacity of the valve. The larger the value of the flow coefficient the smaller the pressure loss when the fluid flows through the valve. The value of the flow coefficient varies with the size type and structure of the valve. Valves of different types and specifications must be tested separately to determine the value of the flow coefficient of the valve. For the valve of the same structure, the flow coefficient value will also change if the direction of the fluid flowing through the valve is different. This change is generally caused by different pressure recovery. The following table shows the flow coefficient of the floating ball valve. The Cv value represents the number of US gallons per minute that +60°F(+16°C) water flows through the valve under a pressure drop of 1lb/in² (0.006894757MPa) .

**CV Valve**

Nominal diameter	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
	mm		15	20	25	32	40	50	65	80	100	125	150
Reduced diameter		9	19	45	-	125	16	270	350	550	670	765	1890
Full path		25	50	100	-	270	490	950	1160	2200	3800	5100	9300

**Pressure-temperature Rating**

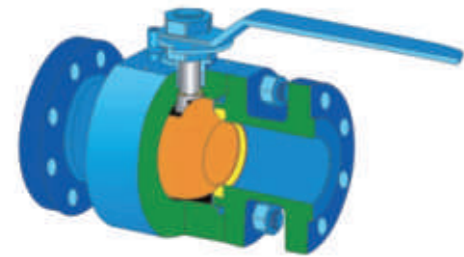
The pressure and temperature rating of the ball valve is not only related to the material of the valve body, but also related to the seat packing, gasket and other seals. The seal can be polymer material, graphite asbestos or rubber, etc; the choice of seal material depends on the medium composition, working temperature working pressure and flow rate of the valve. For various unpredictable working conditions, it is extremely difficult to accurately determine the valve pressure and temperature ratings. Based on our company's long-term valve manufacturing experience and user feedback, we provide you with the pressure and temperature ratings of the valve under stable working conditions.



A: Pure PTFE  
 B: Reinforced PTFE  
 The pressure-temperature curve of the valve body in the figure is WCB material, and the other shell materials please refer to the latest version of ASME B16.34 for pressure temperature curve.

**Specification**

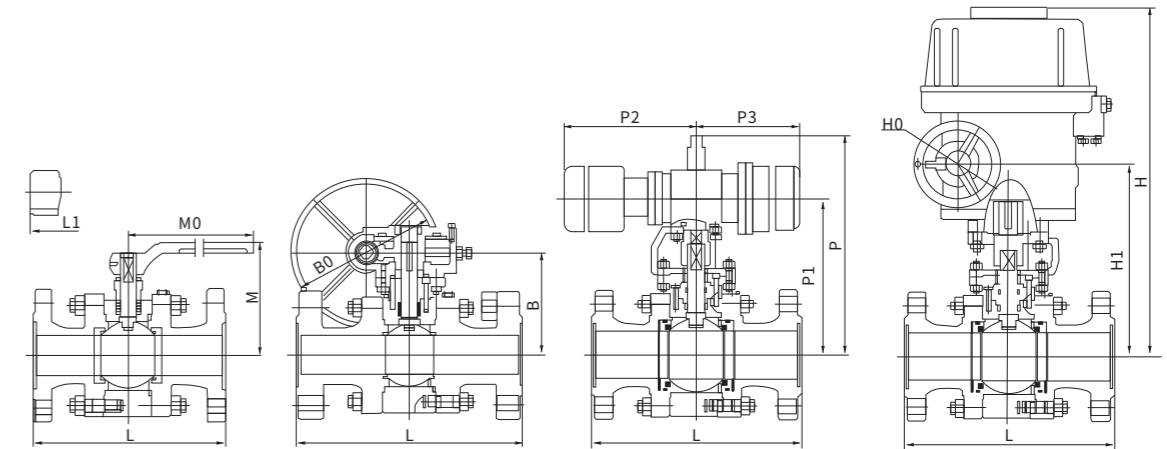
Design basis:API 6D/BS 5351/API 608  
 Structure length:ASME B16.10  
 Flange size:ASME B16.5  
 Test and inspection:API 598  
 Note:The size of the series valve connecting flange and butt welding end can be designed and manufactured according to user requirements.



**Material Table Of Main Parts**

No.	Part name	Material
		ASTM
1	Gasket	Flexible graphite+stainless steel
2	Seat	PTFE
3	Right body	A105
4	Nut	A194-2H
5	Stud	A193-B7
6	Body	A105
7	Ball*	A105+ENP
8	Stem**	A182-F6a
9	Gasket	PTFE
10	Padding	A276-410
11	Packing	Flexible graphite
12	Packing gland	A216-WCB
13	Bolt	A193-B7
14	Positioning pieces	Carbon steel
15	Retaining ring	A1S1566
16	Handle	A47-66732510

Note:\*The material of this part of the anti-sulfur valve is ASTM(A 182-304+Ni.P);  
 The material of this part of the anti-sulfur valve is ASTM (A276-321);the material of the main parts and sealing surface of the series valve can be designed and selected according to the actual working conditions or the special requirements of users.



Hand operation      Worm gear operation      Pneumatic operation      Electric operation

**Main Shape And Connection size**

PN1.6MPa Class 150

DN	mm	15	20	25	40	50	65	80	100	125	150	200
NPS	in	1/2	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8
Flange	L	130(108)	130(117)	140(127)	165	178	190	203	229	356	394	457
Butt welding	L1	140	152	165	190	216	241	283	305	381	403	419
Manual	H	73	78	86	102	130	142	191	200	226	242	285
	W	130	130	160	180	230	400	400	460	750	750	900
	kg	3	4	6	12	15	19	22	46	65	85	127
Worm gear drive	H	/	/	/	/	/	/	/	/	/	260	300
	W	/	/	/	/	/	/	/	/	/	400	600
	Model	/	/	/	/	/	/	/	/	/	A	B
Pneumatic	kg	/	/	/	/	/	/	/	/	/	110	175
	H	203	234	242	326	354	366	415	485	607	623	742
	H1	125	139	147	195	223	235	284	328	398	414	498
	L1	326	326	347	420	426	426	590	523	610	610	885
	L2	136	136	181	181	257	257	257	287	378	378	530
Electric	Model	AG06	AG09	AG09	AG13	AG13	AG13	AG13	AW13	AW17	AW17	AW20
	kg	6.1	6.3	8.1	14.1	16.6	38.0	42.1	53.0	93.5	105.2	207.8
	H	/	/	/	/	432	443	454	493	574	646	678
	H1	/	/	/	/	337	348	359	398	424	496	528
	W	/	/	/	/	190	190	190	190	400	400	400
Electric	Model	/	/	/	/	Q60-1	Q60-1	Q60-1	Q60-1	Q120-1	Q120-1	Q120-1
	kg	/	/	/	/	23	25	60	75	97	162	226

The size in the table is Class 150.

Main shape And Connection size

PN2.5/4.0MPa Class 300

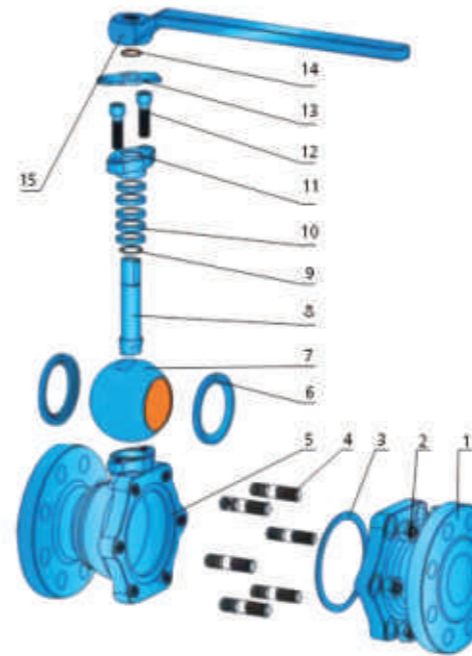
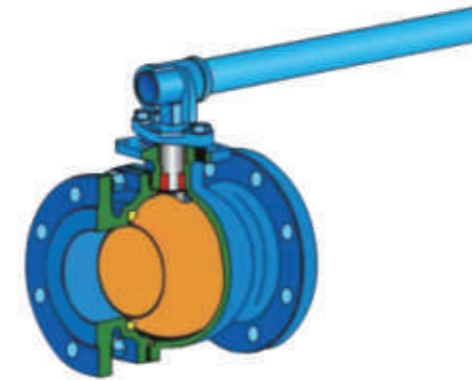
DN	mm	15	20	25	40	50	65	80	100	125	150	200	
NPS	in	1/2	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8	
Flange	L	140	152	165	190	216	241	283	305	381	403	502	
Butt welding	L1	140	152	165	190	216	241	283	305	381	457	521	
Manual	H	73	80	86	102	136	164	191	223	240	253	307	
	W	140	140	180	230	240	400	400	750	750	900	1000	
	kg	4	6	6.8	11.2	18.3	32	38	78	85	102	125	
Worm geardrive	H	/	/	/	/	/	/	/	/	/	325	387	
	W	/	/	/	/	/	/	/	/	/	400	600	
	Model	/	/	/	/	/	/	/	/	/	A	B	
	kg	/	/	/	/	/	/	/	/	/	148	196	
Pneumatic	H	204	236	242	326	359	388	415	508	621	675	824	
	H1	126	141	147	195	228	257	284	351	412	466	580	
	L1	326	326	347	420	426	426	590	523	610	610	885	
	L2	136	136	181	181	257	257	257	287	378	378	530	
	Model	AG06	AG09	AG09	AG13	AG13	AG13	AG13	AW13	AW17	AW17	AW20	
	kg	6.2	6.4	8.5	16.9	20.6	42.5	52.7	77.9	107.0	130	220	
Electric	H	/	/	/	/	432	443	454	493	574	646	678	
	H1	/	/	/	/	337	348	359	398	424	496	528	
	W	/	/	/	/	190	190	190	190	400	400	400	
	Model	/	/	/	/	Q60-1	Q60-1	Q60-1	Q60-1	Q120-1	Q120-1	Q120-1	
	kg	/	/	/	/	23	35	60	75	100	170	245	

Main Shape And Connection Size

PN6.4/10.0MPa Class 600

DN	mm	15	20	25	40	50	65	80	100	
NPS	in	1/2	3/4	1	1 1/2	9	2 1/2	3	4	
Flange	L	165	190	216	241	292	330	356	406 (432)	
Butt welding	L1	165	190	216	241	292	330	356	406 (432)	
Manual	H	73	80	86	110	142	171	185	220	
	W	160	160	230	400	400	650	650	800	
	kg	4.5	6.2	7.5	12.5	26.1	38	44	65	
Worm geardrive	H	/	/	/	/	/	/	182	217	
	W	/	/	/	/	/	/	280	400	
	Model	/	/	/	/	/	/	0	A	
	kg	/	/	/	/	/	/	50	95	
Pneumatic	H	229	236	242	266	366	395	470	601	
	H1	134	141	147	171	235	264	313	392	
	L1	283	283	283	350	590	590	523	610	
	L2	136	181	181	181	257	257	287	378	
	Model	AG09	AG09	AG09	AG09	AG13	AG13	AG13	AW17	
	kg	6.5	6.8	9.3	17.8	33.6	45.1	55.3	81.3	
Electric	H	/	/	/	/	500	520	545	558	
	H1	/	/	/	/	350	370	395	408	
	W	/	/	/	/	190	190	190	190	
	Model	/	/	/	/	Q120-1	Q120-1	Q120-1	Q120-1	
	kg	/	/	/	/	26	41	72	92	

The size in the table is PN10.0MPa Class 600.



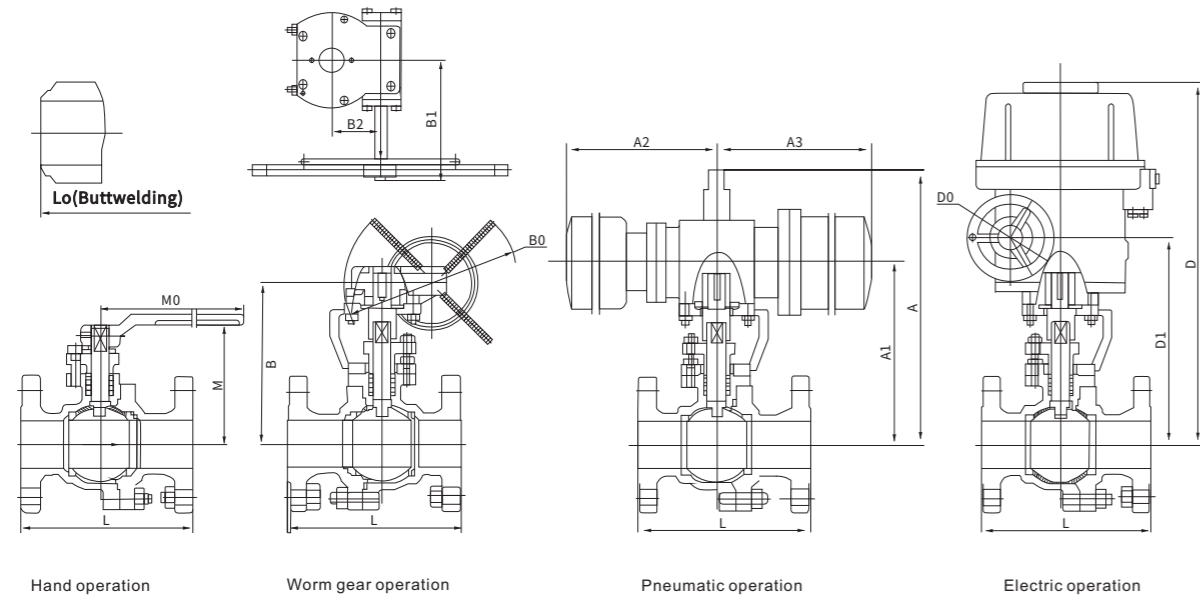
**Specification**

Design basis: API 6D/BS 5351/API 608  
 Structure length: ASME B16.10  
 Flange size: ASME B16.5  
 Test and inspection: API 598  
 Note: The size of the series valve connecting flange and butt welding end can be designed and manufactured according to user requirements.

**Materialtable Of Mainparts**

No.	Part name	Material		
		Carbon steel series	Stainless steel series	Low temperatureseries
1	Right body	A216 WCB	A351-CF8 CF8M CF3, CF3M	A352LCB, LCC
2	Nut	A1942H	A1948M	A1944
3	Plasticsheet	Flexible graphite stainless steel		
4	Stud	A193-B7A193-B8A320L7M		
5	Body	A216 WCB	A351-CF8 CF8M CF3, CF3M	A352LCB, LCC
6	Seat	PTFE, RPTFE, Sintering carbonfibre, Metal+Rubber groupware		
7	Ball	A105+HCr/ENP	A182F304 A182F316	A350 LF2 A350 LF3+ENP
8	Stem	A182 F6a	A182F304316	A182 F6a
9	Plastic sheet	CS	SS	CS
10	Filling plasticsheet	Flexible graphite		
11	Packing gland	A216 WCB	A351 CF8, CF8M	A351 CF8
12	Screw	A193B7	A193 B8, B8M	A320L7
13	Positioning pieces	GB/T700 Q235A+Zn (Cr)		
14	Retaining ring	A216 WCB		
15	Handle	GB/T 1222 65Mn		

Note:\*The material of this part of the anti-sulfur valve is ASTM (A182-304+Ni.P);  
 The material of this part of the anti-sulfur valve is ASTM (A276-321);the  
 material of the main parts and sealing surface of the series valve can be  
 designed and selected according to the actual working conditions or the  
 special requirements of users.



Main Shape And Connection Size

PN1.6MPa Class 150

DN	mm	15	20	25	40	50	65	80	100	125	150	200
NPS	in	1/2	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8
L	RF	130(108)	130(117)	140(127)	165	178	190	203	229	356	394	457
Lo	BW	140	152	165	190	216	241	283	305	381	457	521
Manual	M	59	63	75	95	107	142	152	178	252	272	342
	MO	130	130	160	230	230	400	400	650	1050	1050	1410
Worm gear	B	/	/	/	/	/	/	/	/	/	292	398
	BO	/	/	/	/	/	/	/	/	/	400	600
	B1	/	/	/	/	/	/	/	/	/	350	350
	B2	/	/	/	/	/	/	/	/	/	115.5	115.5
Pneumatic	A	200	204	257	264	340	370	389	594	646	646	781
	A1	122	126	162	169	209	239	258	337	437	437	537
	A3	326	326	347	420	426	426	590	523	610	610	885
	A4	136	136	181	181	257	257	257	287	378	378	530
Electric	D	/	/	/	/	472	486	579	595	650	739	799
	D1	/	/	/	/	377	391	484	500	500	589	649
	DO	/	/	/	/	190	190	190	190	400	400	400
weight kg (RF)	Manual	2.5	3	5	7	10	15	19	33	58	93	160
	Pneumatic	10	15.7	19.5	42.8	46.9	50.5	70	92.7	160.7	183.5	276
	Electric	/	/	/	/	32	35.6	44	55	93	128	195

Main Shape And Connection Size

PN2.5/4.0MPa Class 300

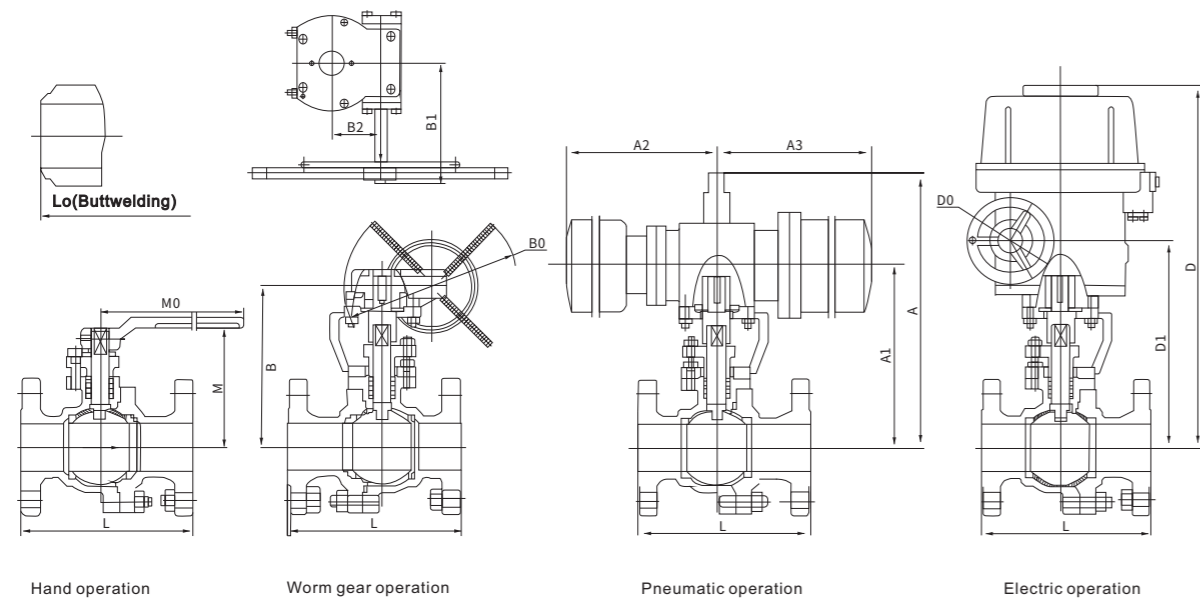
DN	mm	15	20	25	40	50	65	80	100	125	150	200
NPS	in	1/2	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8
L	RF	140	152	165	190	216	241	283	305	381	403	502
Lo	BW	140	152	165	190	216	241	283	305	381	457	521
Manual	M	59	63	75	95	107	142	152	178	252	272	342
	MO	130	130	160	230	230	400	400	650	1050	1050	1410
Worm gear	B	/	/	/	/	/	/	/	/	/	292	398
	BO	/	/	/	/	/	/	/	/	/	400	600
	B1	/	/	/	/	/	/	/	/	/	350	421
	B2	/	/	/	/	/	/	/	/	/	115.5	171
Pneumatic	A	200	204	257	264	340	379	452	594	646	744	920
	A1	122	126	162	169	209	248	295	375	437	500	615
	A3	326	326	347	420	426	426	590	523	610	610	885
	A4	136	136	181	181	257	257	257	287	378	378	530
Electric	D	/	/	/	/	472	486	579	595	650	739	799
	D1	/	/	/	/	377	391	484	500	500	589	649
	DO	/	/	/	/	190	190	190	190	400	400	400
Weight kg (RF)	Manual	/	4	6	11	15	24	30	55	81	118	200
	Pneumatic	10	15.7	20	40.9	43.9	51.9	68	99.4	177.5	207.5	381
	Electric	/	/	/	/	29	37	42	77	116	143	235

Main Shape And Connection Size

PN6.4/10.0MPa Class 600

DN	mm	15	20	25	40	50	65	80	100
NPS	in	1/2	3/4	1	1 1/2	2	2 1/2	3	4
L	RF	165	190	216	241	292	330	356	406(432)
Lo	BW	165	190	216	241	292	330	356	406(432)
Manual	M	59	63	75	95	142	154	184	209
	MO	160	160	230	400	400	650	650	1050
Worm gear	B	/	/	/	/	/	/	292	398
	BO	/	/	/	/	/	/	400	600
	B1	/	/	/	/	/	/	350	421
	B2	/	/	/	/	/	/	115.5	171
Pneumatic	A	200	204	241	264	340	379	452	584
	A1	122	145	146	169	209	248	295	375
	A3	283	283	283	350	590	590	523	610
	A4	136	136	181	181	257	257	287	378
Electric	D	/	/	/	/	472	599	599	632
	D1	/	/	/	/	377	491	449	472
	DO	/	/	/	/	190	190	190	190
Weight kg (RF)	Manual	8	11	15	19	25	32	48	76
	Pneumatic	17.2	21	24	32	68	75	101.3	177.5
	Electric	/	/	/	/	60	67	83	111

(Note: The dimensions in brackets in the table are the structural length of PN10.0(Class 600), and the dimensions of the connecting flange and the dimensions of the welding end are shown in the appendix A).



Main Shape And Connection Size

PN1.6MPa Class 150

DN	mm	20	25	40	50	65	80	100	125	150	200
NPS	in	3/4×1/2	1×3/4	1 1/2×1 1/4	2×1 1/2	2 1/2×2	3×2 1/2	4×3	5×4	6×4	8×6
do		15	20	32	40	50	65	80	100	100	150
L	RF	130 (117)	140 (127)	165	178	190	203	229	356	394	457
Lo	BW	152	165	190	216	241	283	305	381	457	521
Manual	M	59	63	75	95	107	142	152	178	178	272
	MO	130	130	160	230	230	400	400	650	650	1050
Worm gear	B	/	/	/	/	/	/	/	/	/	292
	Bo	/	/	/	/	/	/	/	/	/	400
	B1	/	/	/	/	/	/	/	/	/	350
	B2	/	/	/	/	/	/	/	/	/	115.5
Pneumatic	A	200	204	257	264	340	379	452	594	594	744
	A1	122	126	162	169	209	248	295	375	375	500
	A3	326	326	347	420	426	426	590	523	523	610
	AA	136	136	181	181	257	257	257	287	287	378
Electric	D	/	/	/	/	472	486	579	595	595	739
	D1	/	/	/	/	377	391	484	500	500	589
	Do	/	/	/	/	190	190	190	190	190	400
Weight kg (RF)	Manual	3	4	7	9	14	19	25	32	40	84.0
	Pneumatic	10	15.7	21	40.9	45.9	50.9	68	87.4	95.4	186.5
	Electric	/	/	/	/	31	36	42	49	57	119

(Note: See the attached appendix A for the dimensions of the connecting flange and the dimensions of the welding end).

Fixed Ball Valve



Structural Characteristics Of Fixed Ball Valve

1. Automatic pressure relief structure

When the pressure in the middle cavity rises abnormally, the single-sealed ball valve has an automatic pressure relief function while the double-sealed ball valve is relieved by an additional pressure relief device on the valve body.

2. Sealed emergency rescue

The valve is designed with an auxiliary valve seat emergency sealing system, as shown in the figure. Once the soft seal is damaged or cannot be sealed in an emergency situation, emergency sealing can be performed by injecting corresponding sealant into the auxiliary sealing system. The emergency sealing device can also be used to flush and lubricate the valve seat area when necessary to keep it clean. Similarly, the valve stem can also be designed with an emergency sealing system with auxiliary functions.

3. Fireproof structure

According to the working conditions and the needs of users the ball valve can be designed as a fire proof structure. The fire-resistant design of the ball valve complies with the standards of API 607 and GB/T 6899. Once a fire occurs and the soft sealing ring is burned, the fire-resistant structure of the ball valve can prevent a large amount of medium leakage and prevent further expansion of the fire.

4. Anti-static structure

The electrostatic charge accumulates on the sphere. In order to prevent the generation of static sparks, an anti-static device is specially installed on the valve, and the charge accumulated on the sphere is led out through the electrostatic passage between the sphere and the valve stem, and between the valve stem and the valve body.

5. Locking device

The manual ball valve is designed with a lockable structure at the fully open and fully closed positions of the manual ball valve, so as to prevent misoperation and unpredictable line vibrations and undesirable switching phenomena, especially in the flammable medium of petroleum. The advantages and actual effects of this design are particularly good when the production line of chemical and chemical drugs and the valve are piping outdoors.

6. Full diameter structure and reduced diameter structure

In order to meet the different needs of users, the company's ball valve products have two series of full bore and reduced bore (as shown in the figure). The channel inner diameter of the full bore ball valve is the same as the pipe inner diameter, which is convenient for pipe cleaning. The reduced bore series ball valve is relatively light but the fluid resistance is only about 1/7 of the same diameter ball valve, so the application prospect of the reduced diameter series ball valve more expansive.

7. Relief device of valve body

According to user requirements or device system requirements, a drain valve is installed on the valve body of the ball valve. Once the two ends of the valve are dosed, the backlog in the valve cavity can be discharged through the drain valve of the valve body, which has the function of double stop and discharge (DBB). Another function of the relief valve of the valve body is to flush and discharge the long-term sludge in the valve body through it.

8. Anti-corrosion

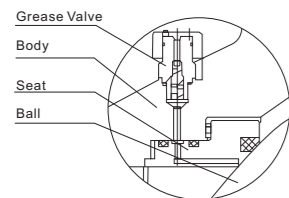
The wall thickness of the valve body is designed with a certain amount of corrosion allowance. The carbon steel valve stem, fixed shaft ball valve seat and bottom cover are all chemically plated on the surface according to ASTM B733 and B656. In addition, there are a variety of anti-corrosion materials for users to choose. The exterior of the valve uses G "international standard" paint which meets the requirements of various environmental conditions.

9. Resistance to vulcanization stress cracking

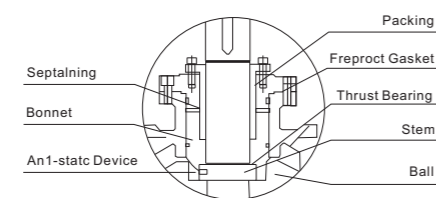
Our company produces a series of anti-sulfur ball valves. The materials (including fasteners) of the valve contacting medium are selected according to the requirements of the American Society of Corrosion Engineers standard NACE MR3175, and strict quality control and quality inspection are performed during the manufacturing process to ensure completeness. It meets the requirements of the standard and meets the process requirements of the vulcanization environment.

10. Extension rod device

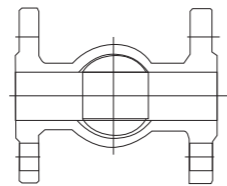
For buried earth valves, extension devices can be provided, including extensions for valve stems, grease injection valves, drain valves, etc. The user should specify the extension requirements and length in the order (length generally refers to the distance from the center of the valve channel to the center of the operating device).



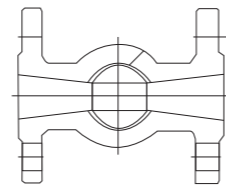
Seat auxiliary seal



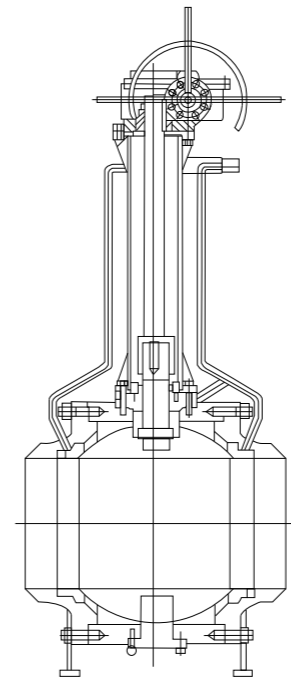
Stem anti-flying structure /stem anti-static device/ bonnet no leakage structure



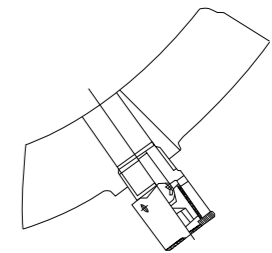
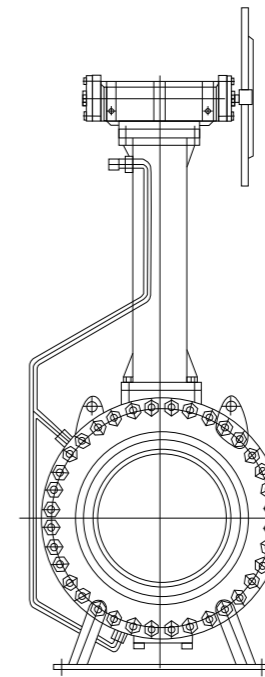
Full Bore Form



Reduced Bore Form



Extension rod device



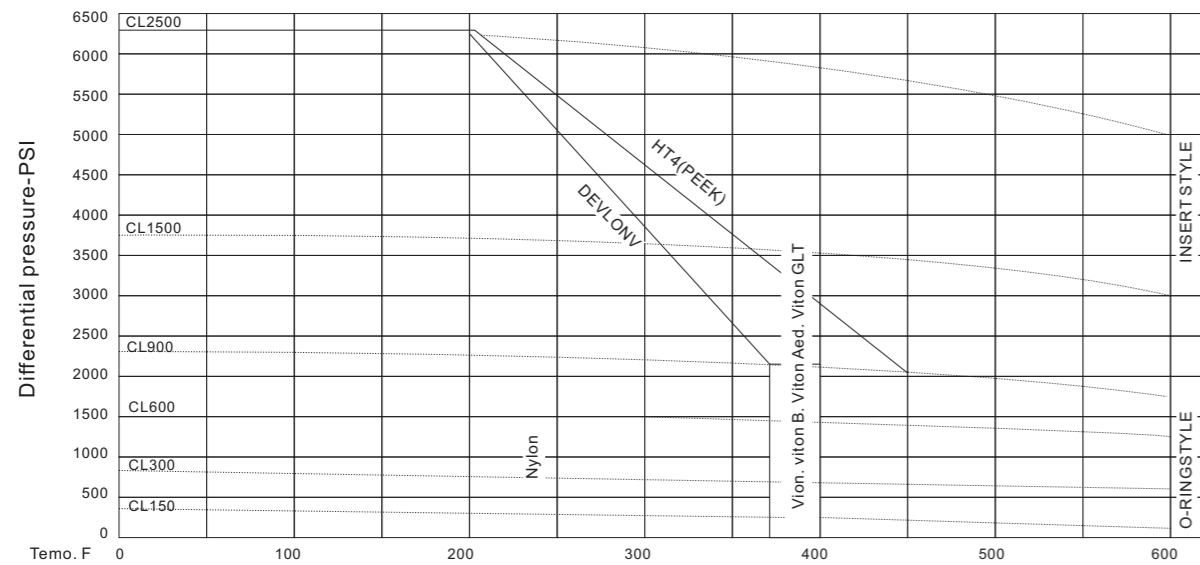
Relief device



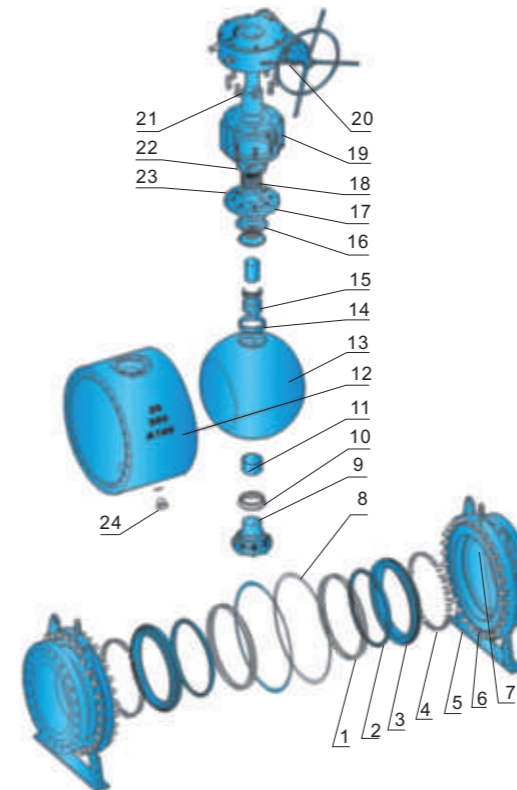
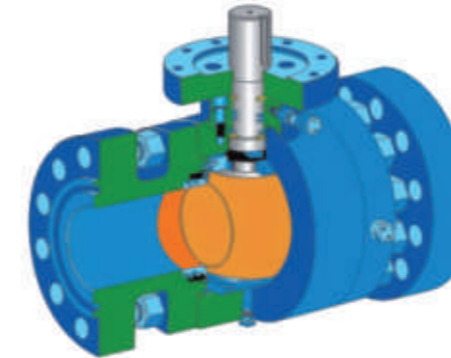
Sealing Valve Seat Material Performance Data Sheet

Teststandard	Test items	Unit	PEEK	NOLON	DEVLON	PPL	PTFE	PTFE+graphite	PTFE+graphite	NYLON66
D638	Tensile strength 23°C/-40°C	MPa	93.08	75/100	79.92/ 109.52	72	24.82	25	24.5	60/80
D638	Elongation at break 23°C	%	50	10/30	5.37	6/8	300	150	105	60
D785	Hardness	Shore D Shore R	/ 120	78 110/120	78/80 114	80 /	56 /	58 /	65 /	78 118
D790	Bending strength	MPa	166.71	140	121.55	176	/	/	23.7	117
D621	Conform to the deformation	%	0	1.2	1.0/2.0	0.78	14/48	8.8	5.5	1.4
E831	Linear expansion coefficient expansion	1/K	0.48×10 <sup>-4</sup>	0.6×10 <sup>-4</sup>	1.1×10 <sup>-4</sup>	0.43×10 <sup>-4</sup>	1.2×10 <sup>-4</sup>	1×10 <sup>-4</sup>	1×10 <sup>-4</sup>	0.7×10 <sup>-4</sup>
E648	Heat distortion temperature 1.82MPa/0.46MPa	°C	160 /	150/190 /	93 209	163 /	55 132	63 /	78 /	90 235
D792	Density	G/cm <sup>3</sup>	1.34-1.36	1.15	1.14	1.48	2.20	2.22	2.1	1.12
D570	24 hours water absorption	%	0.13	0.7	0.1	0.2	0.01	0.015	0.015	1.2
D695	Tensile strength	MPa	142	140	140	117	35	45	52	/
D695	Compressive strength	MPa	/	120	88.9	/	11.7	/	/	75.8

Pressure-temperature Characteristic Value Of The Sealing Valve Seat



The temperature and pressure values of nylon devlony, PEEK, viton and other materials are given in the above table. Among them, the temperature and pressure values of 150Lb, 300Lb, and 600Lb are also applicable to the valve seat design of O-ring seal.



Specification

Design standard: API 6D  
 Structure length: API 6D ASME B16.10  
 Connection size: ASME B16.5 ASME B16.47  
 Test and inspection: API 598

Material Table Of Main Parts

No.	Part name	Material
		ASTM
1	o-ring	Viton
2	Sealing ring	PTFE
3	Seat*	A105+ENP
4	Spring	Inconel X-750
5	Stud	A193-B7
6	Flange	A105
7	Grease valve	Assembled
8	Plastic sheet	Flexible graphite +stainless steel
9	Lower stem*	Flexible graphite +stainless steel
10	Plastic sheet	A182-F6a
11	Bushing	F304+PTFE
12	Body	A105
13	Ball*	A105+ENP
14	Bushing	F304+PTFE
15	Upper stem*	A182-F6a
16	Upper stem	Flexible graphite +stainless steel
17	Bonnet	A105
18	Packing	Flexible graphite stainless steel
19	Bractet	A216-WCB
20	Drive device	Assembled
21	Connecting sleeve	A1S1C1045
22	Packing gland	A216-WCB
23	Positioning pin	A276-410
24	Drain plug	A105+ZN

Note:

- The size of the flange end of the series valve connection can be designed and manufactured according to user requirements.
- DN>1000 (40") valve design standard is in accordance with "Technical Conditions for Long-distance Pipeline Valves".

Note:\*The material of this part of the anti-sulfur valve is ASTM (A276-321); The material of this part of the anti-sulfur valve is ASTM (A182-304 CF&Ni.P); The materials of the main parts and sealing surfaces of the series valves can be designed and selected according to the actual working conditions or the special requirements of users.



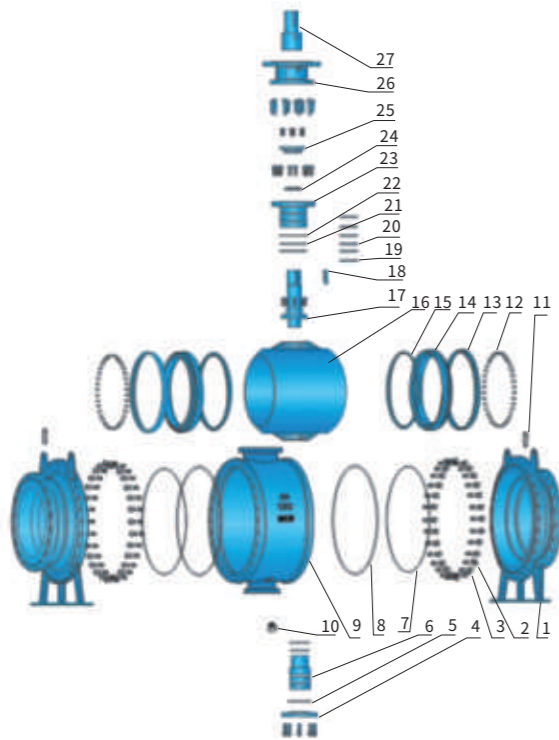
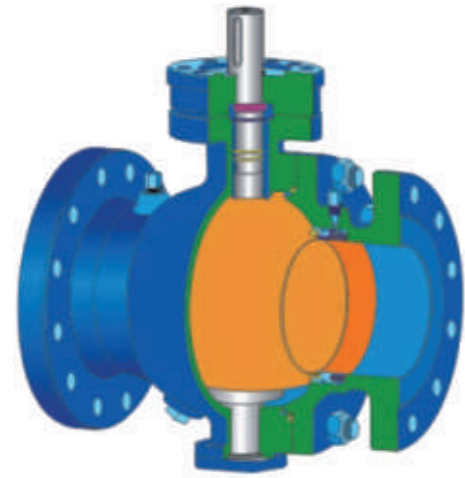
**Specification**

Design standard: API 6D  
 Structure length: API 6D ASME B16.10  
 Connection size: ASME B16.5 ASME B16.47  
 Test and inspection: API 598

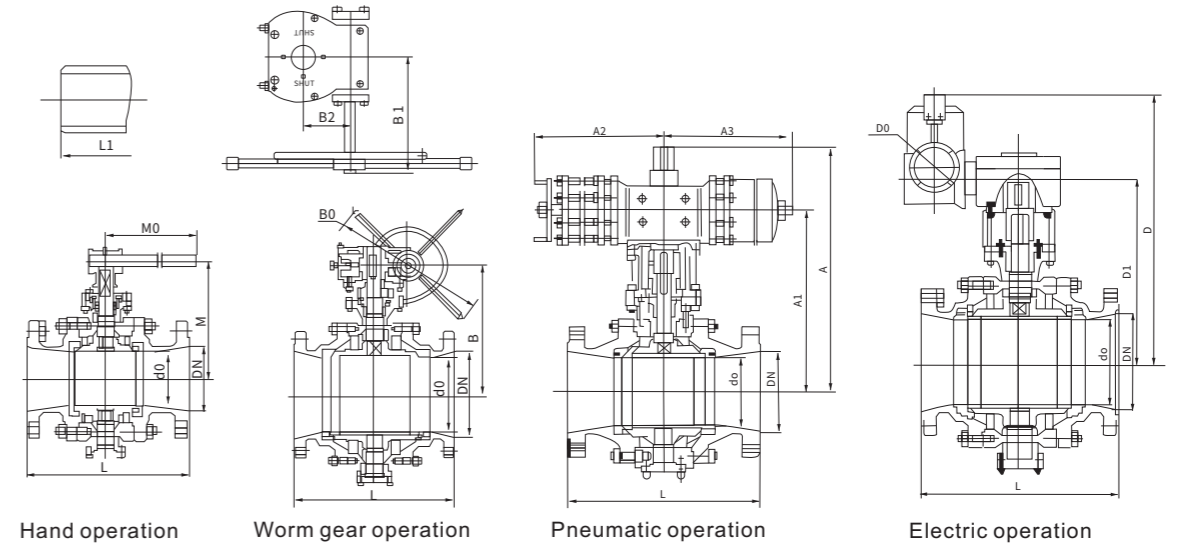
**Material Table Of Main Parts**

No.	Part name	Material
		ASTM
1	Flange	A216-WCB
2	Bolt	A193-B7
3	Nut	A194-2H
4	Bottom cover	A105
5	Gasket	Flexible graphite +stainless steel
6	Lower stem*	A182-F6a
7	O-ring	Viton
8	Gasket	Flexible graphite stainless steel
9	Body	A216-WCB
10	Drain plug	A105+ZN
11	Grease valve	Assembled
12	Spring	Inconel X-750
13	O-ring	Viton
14	Seat	A105+ENP
15	Seal ring	PTFE
16	Ball*	A105+ENP
17	Upper stem**	A182-F6a
18	key	A1S1C1045
19	Plasticpacking	A276-420
20	Padding	Flexible graphite
21	O-ring	Viton
22	Gasket	Flexible graphite +stainless steel
23	Bonnet	A216+WCB
24	O-ring	Viton
25	Packing gland	A216-WCB
26	Bractet	A216-WCB
27	Connecting sle eve	AISI C1045

Note:\*The material of this part of the anti-sulfur valve is ASTM (A276-321);  
 The material of this part of the anti-sulfur valve is ASTM (A182-304 CF&+Ni.P);  
 The materials of the main parts and sealing surfaces of the series valves can be designed and selected according to the actual working conditions or the special requirements of users.



Note:  
 1. The size of the flange end of the series valve connection can be designed and manufactured according to user requirements.  
 2. DN>1000 (40") valve design stan dardis in accordance with "Technical Conditions for Long-distance Pipeline Valves".



**Main Shape And Connection Size**

PN1.6MPa Class 150

Size	L				d	Manual				Worm gear				Pneumatic				Electric			Wt (kg)	
	DN	NPS	RF	BW		RJ	M	M0	B	B0	B1	B2	A	A1	A3	A4	D	D1	D0	RF	WE	
50	2	178	216	191	49	107	230	/	/	/	/	217	174	89	181	/	/	/	12	11		
65	2 1/2	191	241	203	62	125	400	/	/	/	/	308	248	148	257	/	/	/	16	15.3		
80	3	203	283	216	74	152	400	/	/	/	/	318	258	148	257	/	/	/	22	21.3		
100	4	229	305	241	100	178	650	/	/	/	/	407	322	287	287	/	/	/	35	34		
125	5	356	381	406	125	252	1050	/	/	/	/	480	395	287	287	/	/	/	58	55.4		
150	6	394	457	470	150	272	1050	378	400	200	106	562	457	378	378	554	337	508	74	72		
200	8	457	521	546	201	/	/	421	400	200	108	700	595	378	378	606	421	508	205	201		
250	10	533	559	622	252	/	/	482	400	200	108	735	630	378	378	667	482	508	322	310		
300	12	610	635	699	303	/	/	549	600	330	144	858	728	530	530	734	549	508	460	447		
350	14	686	762	775	334	/	/	582	600	330	144	1013	883	530	530	784	582	508	576	536		
400	16	762	838	876	385	/	/	687	800	370	220	1319	1154	680	680	889	687	508	864	814		
450	18	864	914	927	436	/	/	730	800	370	220	1389	1224	680	680	981	730	305	1280	1210		
500	20	914	991	1080	487	/	/	772	800	370	220	1459	1294	680	680	1023	772	305	1600	1500		
600	24	1067	1143	/	589	/	/	995	800	515	279	1060	915	1455	1455	1268	995	305	3540	3000		
650	26	1143	1245	/	633	/	/	1022	800	515	279	1234	1089	1455	1455	1334	1071	305	3930	3240		
700	28	1245	1346	/	684	/	/	1088	800	515	279	1140	980	1665	1665	1459	1155	305	4500	3710		
750	30	1295	1397	/	735	/	/	1153	800	515	279	1195	1035	1665	1665	1515	1211	305	5370	4530		
800	32	1372	1524	/	779	/	/	1223	800	570	368	1338	1149	1960	1960	1649	1316	458	5940	4870		
850	34	1473	1626	/	830	/	/	1307	800	570	368	/	/	/	/	1694	1361	458	6615	5305		
900	36	1524	1727	/	874	/	/	1374	800	570	368	/	/	/	/	1766	1433	458	7540	6010		
1000	40	1753	1956	/	976	/	/	1468	960	575	220	/	/	/	/	1854	1521	458	9320	7400		
1050	42	1855	2083	/	1020	/	/	1532	960	575	220	/	/	/	/	2036	1586	610	14450	12150		
1200	48	2134	2388	/	1166	/	/	1670	960	575	220	/	/	/	/	2185	1735	610	19200	16000		

Note: Therefore means the length of the raised face flange structure, Bw means the length of the welded structure, and RJ means the length of the ring connection form.





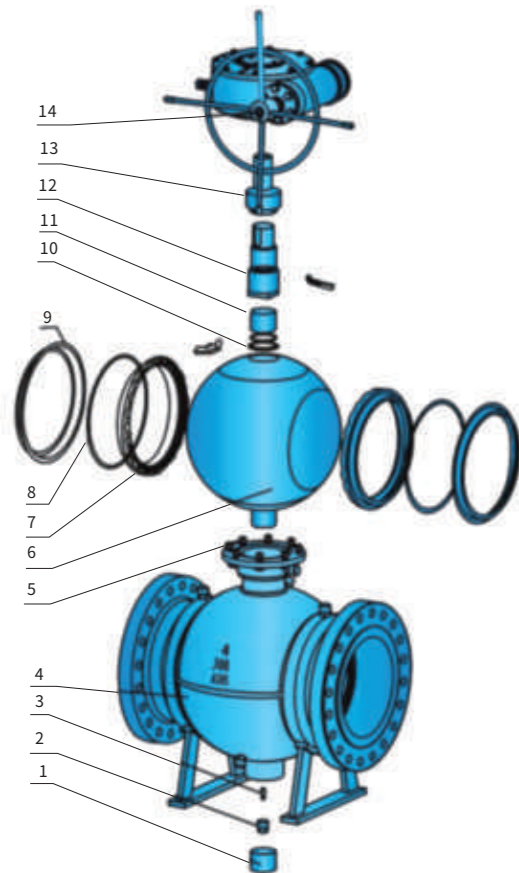


**Specification**

Design standard:API 6D  
 Structure length:API 6D ASME B16.10  
 Connection size:ASME B16.5 ASME B16.47  
 Test and inspection:API 598, API 6D

**Material Table Of Mainparts**

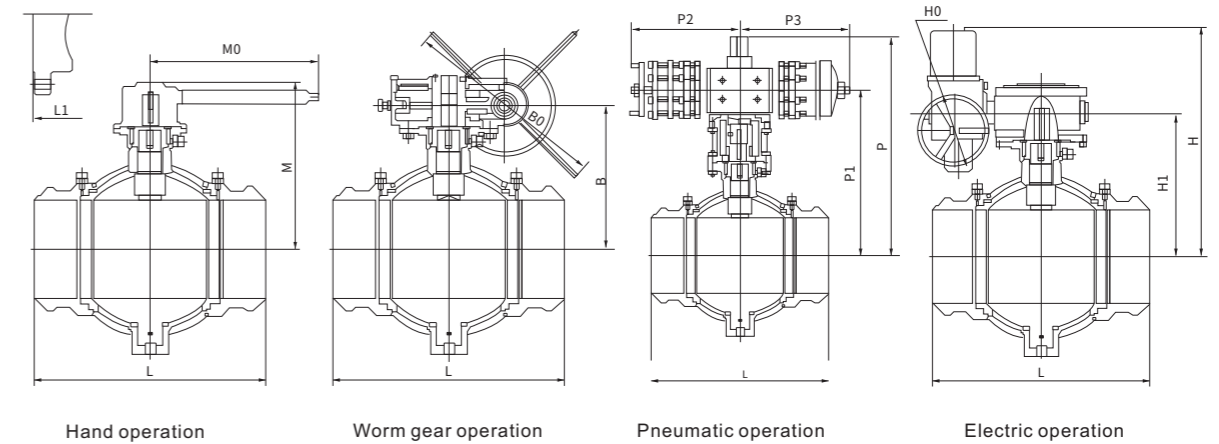
No.	Part name	Material
		ASTM
1	Bushing	Nikealium+PTFE
2	Gasket	A105
3	Spring	InconelX-750
4	Body	A105
5	Stud	A193-B7
6	Ball	A105+ENP
7	Seat	A105+ENP
8	Sealing ring	PTFE
9	Leaf spring	AISI 9260
10	Stem seal	PTFE
11	Bushing	Nikealium+PTFE
12	Stem	A182-F6a
13	Connecting sleeve	A1S1C1045
14	Drive device	GW/PA/EA



Note:\*The material of this part of the anti-sulfur valve is ASTM (A276-321);  
 The material of this part of the anti-sulfur valve is ASTM (A182-304 CF&+Ni.P);  
 The materials of the main parts and sealing surfaces of the series valves can be designed and selected according to the actual working conditions or the special requirements of users.

**Note:**

- 1.The size of the flange end of the series valve connection can be designed and manufactured according to user requirements
- 2.DN>1000 (40") valve design standard is in accordance with "Techni cal Conditions for Long-distance Pipeline Valves".



**Main Shape And Connection Size**

PN1.6MPa Class 150

DN	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1050	1200	1400	1500
NPS	in	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20	24	28	32	36	40	42	48	56	60
Flange	L	216	241	283	305	381	457	521	559	635	762	838	914	991	1143	1346	1524	1727	1930	1829	2180	2300	2400
Butt welding	L1	178	191	203	229	356	394	457	533	610	686	762	864	914	1067	1245	1372	1524	1721	1689	2100	2250	2400
Manual	H	107	125	152	178	300	330	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	W	230	350	400	450	700	750	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	kg	23	42	50	65	70	82	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Worm gear drive	H	/	/	/	/	/	/	337	385	414	447	510	538	585	665	730	930	990	1070	1260	1370	1480	1550
	W	/	/	/	/	/	/	600	600	800	800	800	800	800	800	800	800	800	800	800	800	800	800
	Type	/	/	/	/	/	/	B	B	C	C	D	D	D	DA	DA	DB	DB	DC	DC	DD	DH	HD
	kg	/	/	/	/	/	/	133	208	312	413	577	780	1028	1706	2534	3644	4986	6800	8500	11173	12300	15300
Pneumatic	H	269	379	389	479	552	666	804	839	972	1127	1495	1529	1599	1645	1160	1460	1510	1610	/	/	/	/
	H1	174	248	258	322	395	457	595	630	728	883	1154	1224	1294	915	930	1100	1150	1250	/	/	/	/
	L1	89	148	148	287	287	378	378	378	530	530	680	680	680	1455	1455	1665	1665	1960	/	/	/	/
	L2	181	257	257	287	287	378	378	378	530	530	680	680	680	1455	1455	1665	1665	1960	/	/	/	/
	Type	AG09	AG13	AG13	AW13	AW13	AW17	AW17	AW17	AW20	AW20	AW28	AW28	AW28	AW28	C1-355	C1-355	C2-490	C2-490	C3-600	/	/	/
kg	40	50	72	80	110	130	180	300	350	450	610	820	1100	1900	2600	4000	5100	7200	/	/	/	/	
Electric	H	/	/	/	/	/	435	480	532	600	610	670	760	763	903	982	1108	1445	1655	1954	2064	2174	2244
	H1	/	/	/	/	/	215	262	315	320	360	420	510	590	630	725	835	880	970	1230	1340	1450	1520
	W	/	/	/	/	/	200	200	200	280	280	280	305	305	305	400	400	460	460	600	600	600	600
	Type	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
	kg	/	/	/	/	/	145	196	310	360	475	625	880	1200	2100	2750	4230	6000	7800	9000	12500	14000	17000



## Top-mounted Ball Valve



### Structure Features

Top-mounted ball valve is a new product developed by our company after digesting and absorbing foreign advanced technology and integrating our company's years of design and manufacturing experience. The technical level has reached the domestic first-class level, and the products are comparable to international counterparts. In addition to the features of side-mounted fixed ball valves (see fixed ball valves), it also has the following features:

1. Integral valve body design, top-mounted trunnion fixed support flange or butt welding structure.
2. Inconel corrugated spring makes the sealed metal valve seat move to the ball, which has the function of two-way sealing of inlet and outlet.
3. The unique valve seat retractable technology is adopted, the ball rod can be replaced online, the metal valve of the valve stem seal ring and the corrugation are longer; the torque is reduced to a minimum, which is convenient for valve operation.

4. Easy maintenance, easy installation and long service life. The valve does not need to be removed from the pipeline, and the internal parts can be repaired and replaced; the service life is prolonged.
5. The torque is small and the sealing is reliable. The valve seat of the spherical structure is different from the ordinary ball valve, and the sealing position can be automatically adjusted.
6. The drive device platform and screw holes are preset, and meet the requirements of ISO 5211. The drive device can be assembled at any time according to the different requirements of users.
7. The valve has the function of DBB double blocking and bleeding.
8. The manual top-mounted ball valve adopts a high-strength integral ball rod structure to ensure the precise positioning of the ball.
9. The valve stem adopts an anti-blowout protection structure to improve the safety of valve operation.

### Ball Valve Technical Specifications

Specifications	API series
Design specification	API 6D, API 608 BS5351
Pressure temperature rating	ASME B16.34
Structural length	ASME B16.10
Flange connection	ASME B16.5, ASME 16.47
Butt welding end connection	ASME B16.25
Inspection and testing	API 598/API 6D
Firetest	API 6FA
Steel casting quality inspection	MSS-SP-55

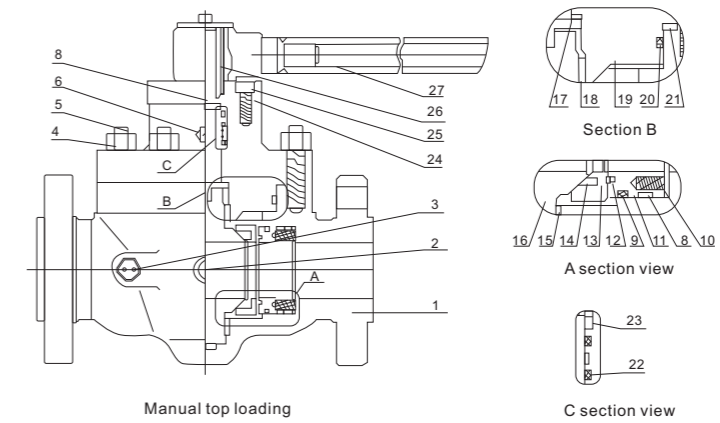
## Torque Table(N.M)

The torque values listed in the following table are for reference when selecting the drive device. The characteristics of the medium, the internal parts and the opening frequency of the valve still need to be considered for additional factors. The use of anti-corrosion internal parts, used to clean the valve of the lubricating medium, the torque can be reduced by 20%. For splitting harsh media, such as slurry, granular media, and for oxygen the torque may increase by 50%. The operating torque of the reduced-diameter valve is selected according to the valve operating torque of the corresponding diameter of the reduced-diameter valve. (The specific choice is subject to actual conditions).

Size		Class						
DN	in	150	300	400	600	900	1500	2500
50×40	1 1/2	61	81	85	102	149	238	382
50	9	68	108	97	136	203	333	562
80×50	3×2	68	108	97	136	203	333	562
80	3	149	244	204	305	422	811	1460
100×80	4×3	149	244	204	305	422	811	1450
100	4	244	407	422	453	583	1505	1923
150×100	6×4	244	407	422	453	583	1505	5840
150	6	323	544	647	1006	1299	2940	5840
200×150	8×6	323	544	647	1006	1299	2940	12181
200	8	647	955	1157	2532	2766	6489	12181
250×200	10×8	647	955	1157	2532	2766	6489	15281
250	10	882	1822	2178	3941	5446	12181	15281
300×250	12×10	882	1822	2178	3941	5446	12181	15281
350×250	14×10	882	1822	2178	3941	5446	12181	19834
300	12	1577	2591	3064	6893	7909	15564	/
350×300	14×12	1577	2591	3064	6893	7909	15564	/
400×300	16×12	1577	2591	3064	6893	7909	15564	/
350	14	1873	3224	3853	3205	10948	23512	/
400×350	16×14	1873	3224	3853	3205	10948	23512	/
400	16	3050	5447	6529	8817	13682	27039	/
450×400	18×16	3050	5447	6529	8817	13682	27039	/
500×400	20×16	3050	5447	6529	8817	13682	27039	/
450	18	3819	6197	7461	11231	17705	37085	/
500	20	4508	7830	9348	14919	29866	40309	/
550	22	5490	9453	11302	16058	39324	/	/
600×500	24×20	4508	7830	9348	15140	29866	40309	/
600	24	6723	11457	15535	21840	40810	64671	/
650	26	9289	15139	17869	24889	51322	/	/
700	28	11647	18067	21063	28767	53515	/	/
750×600	30×24	6723	11457	15535	21840	40810	/	/
750	30	13558	19207	24966	34398	57057	/	/
800	32	15224	24095	28235	38880	61123	/	/
850	34	17846	30249	33291	41789	70277	/	/
900×750	36×30	13558	19207	24966	34398	57057	/	/
900	36	22032	33331	36277	51521	81349	/	/
1000	40	25972	36490	45269	60368	/	/	/
1050	42	27034	40425	53515	70277	/	/	/
1200	48	42606	64985	79311	112293	/	/	/

## Product Performance Specifications

Performance specification	Class							
	150	300	400	600	900	1500	2500	
Test pressure(MPa)	Strength test	2.93	7.58	10.0	150	22.5	37.5	63.0
	Sealing test	2.07	5.52	7.31	11.03	16.5	27.5	46.2
	Air pressure test	0.6MPa						
Applicable temperature	-196°C~550°C (Note:Different working conditions temperature, different materials are used)							
Applicable medium	Water, steam, petroleum, liquefied gas, natural gas, etc.							
Size range	DN50-1200 (NP2"-48") .Can be manufactured according to customer requirements							
Body/inner body material	Carbon steel, stainless steel, duplex stainless steel, nickel alloy, titanium alloy, etc.							
End connection	Flange connection, butt welding connection							
Driving device	Manual, worm gear drive, electric pneumatic							



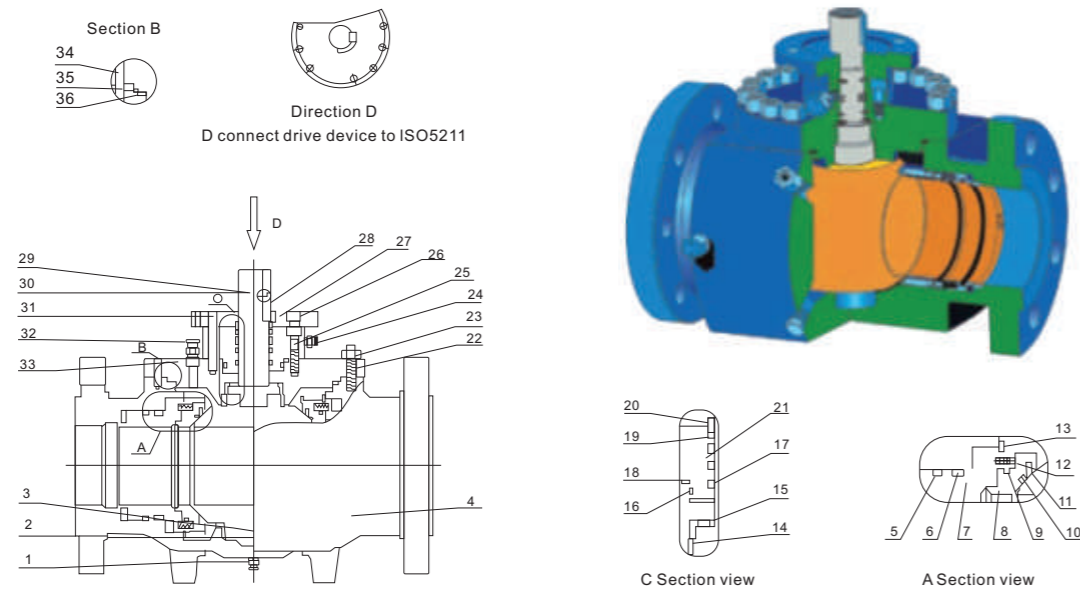
## Material Of Main Parts

NO.	Part name	Material		
		Carbon steel	Stainless steel	Low temperature steel
1	Body	A216 WCB	A351 CF8M	A352 LCC
2	Drain valve	A105+ENP	A182F316	A350 LF2
3	Grease valve	A105+ENP	A182F316	A350 LF2
4	Nut	A1942H	A1948	A1947
5	Stud	A193B7	A193B8	A320L7
6	Grease valve	A105+ENP	A182F316	A350 LF2
7	Stem	A182 F6a	A182F316	A182F316
8	Fire proof	Flexible graphite		
9	O-ring	Fluororubber		
10	Spring	Incone 600		
11	Supporting	A105+ENP	A182F316	A350 LF2
12	Gasket			
13	Seat	A105+ENP	A182F316	A350 LF2
14	Seal ring	PTFE, NYLON, PEEK, PCTFE		

NO.	Part name	Material		
		Carbon steel	Stainless steel	Low temperature steel
15	Lower bushing	PTFE+CS	PTFE+SS	PTFE+SS
16	Ball	A105+ENP	A182F316	A350 LF2
17	Flat bushing	PTFE+CS	PTFE+SS	PTFE+SS
18	Upper buhing	PTFE+CS	PTFE+SS	PTFE+SS
19	Bonnet	A216 WCB	A351 CF8M	A352 LCC
20	O-ring	Fluororubber		
21	Gasket	Flexible graphite+SS		
22	O-ring	Fluororubber		
23	Filler	Flexible graphite		
24	Gland	A105+ENP	A182F316	A350 LF2
25	Screw	A193B7	A193B8	A320L7
26	Key	ANSI 1045	ANSI 1045	ANSI 1045
27	Handle	Q235A		

Note:Different materials can be selected according to different working conditions and user requirements.

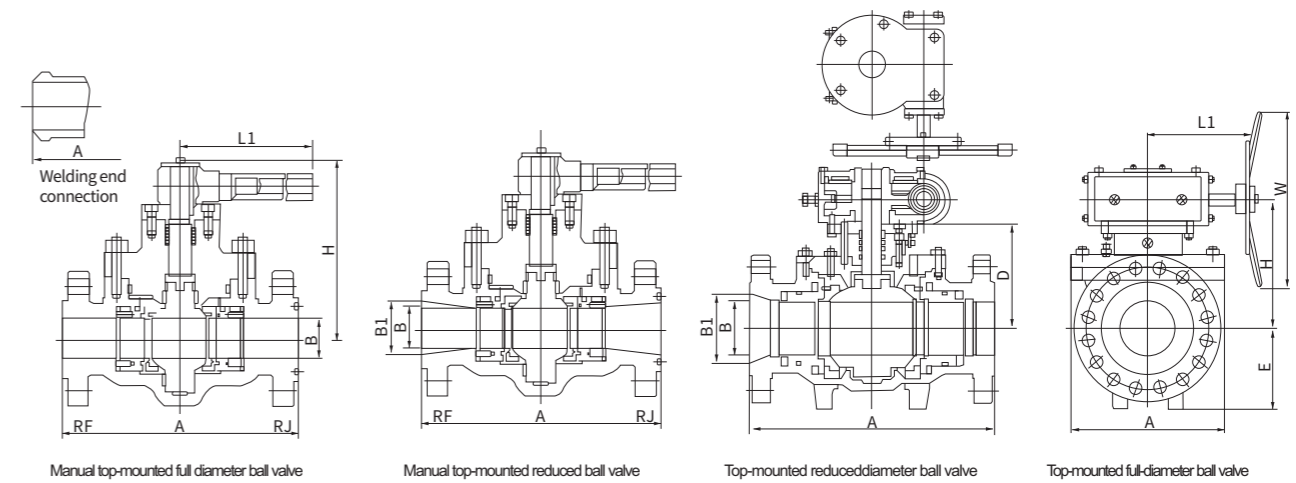
Schematic Diagram Of Valve Structure(top-mounted Ball Valve)



Material Of Main Parts

NO.	Part name	Material			NO.	Part name	Material		
		Carbon steel	Stainless steel	Low temperature steel			Carbon steel	Stainless steel	Low temperature steel
1	Drain valve	A105+ENP	A182F316	A350 LF3	19	Filler	Flexible graphite		
2	Lower bushing	PTFE+CS	PTFE+SS	PTFE+SS	20	Pressing sleeve	A182F6a	A182F316	A182 F6a
3	Ball	A105+ENP	A182F316	A350 LF3	21	Upper stem seat	A105+ENP	A193B8	A350 LF3
4	Stem	A216WCB	A351 CF8M	A352 LCC	22	Stud	A193B7	A1948	A320L7
5	O-ring	Fluoro rubber			23	Nut	A1942H	A182F316	A1947
6	Fireproof mat	Flexible graphite			24	Grease valve	A105+ENP	A182F316	A350 LF3
7	Supportring	A105+ENP	PTFE+SS	A350 LF3	25	Screw	A193B7	A193B8	A320L7
8	Seat	A105+ENP	PTFE+SS	A350 LF3	26	Screw	A193B7	A193B8	A320L7
9	o-ring	Fluoro rubber			27	Land	A105+ENP		
10	O-ring	Fluoro rubber			28	Key	ANSI 1045		
11	Sealing ring	PTFE, NYLON, PCTFE, MOLON			29	Screw	A193B7		
12	Spring	Incone1600			30	Stem	A182F6a	A182F316	A182F316
13	C type spring	17-4			31	Locating pin	A182F6a		
14	Upper bushing	PTFE+CS	PTFE+SS	PTFE+SS	32	Drain valve	A105+ENP	A182F316	A350 LF3
15	Flat bushing	PTFE+CS	PTFE+SS	PTFE+SS	33	Bonnet	A216 WCB	A351 CF8M	A352 LCC
16	O-ring	Fluoro rubber			34	Positioning pin	A182 F6a		
17	o-ring	Fluoro rubber			35	Gasket	Flexible graphite+SS		
18	Gasket	Flexible graphite+SS			36	O-ring	Fluoro rubber		

Note:1. Choose different sealing ring materials according to the temperature and pressure of the industrial and mining medium.  
 2. In addition to the materials listed in the table, villages can be selected according to user requirements.  
 3. It can provide materials that meet the NACEMR-01-75 standard, the latest version, and are suitable for acid gas mining.

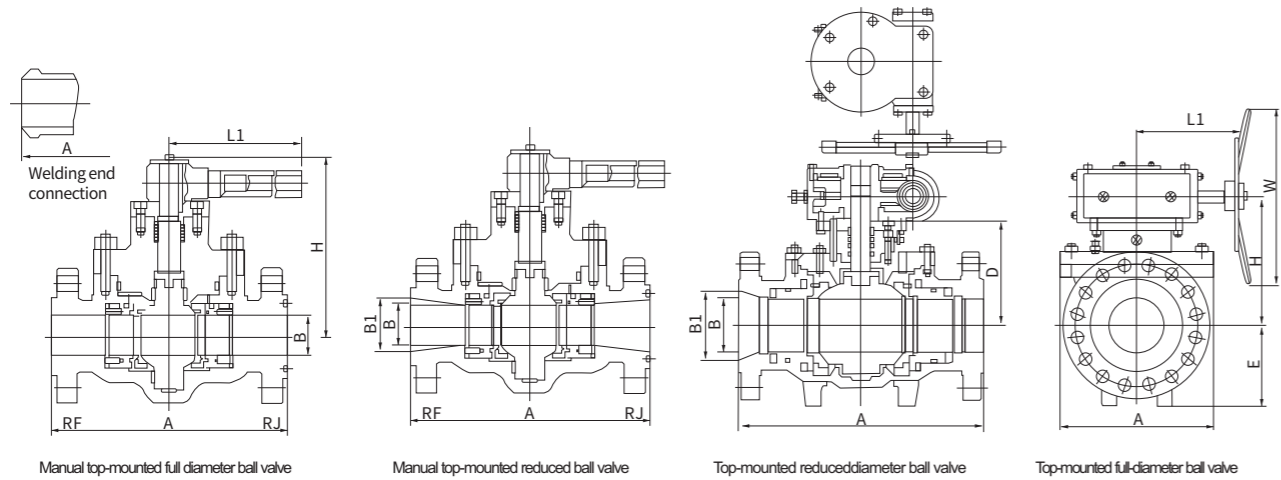


Main Shape And Connection Size

Class 150

DN	NPS	A			B	B1	D	E	F	H	L1	W
		FR	RJ	BW								
50×40	2×1 1/2	292	295	292	38	49	/	85	180	212	450	/
50	2	292	295	295	49	49	/	85	180	212	450	/
80×50	3×2	356	395	356	49	74	/	85	180	212	450	/
80	3	356	395	356	74	74	/	112	230	228	600	/
100×80	4×3	432	435	432	74	100	/	112	230	228	600	/
100	4	432	435	432	100	100	/	145	283	272	600	/
150×100	6×4	559	562	559	100	150	/	145	283	272	600	/
150	6	559	562	559	150	150	281	220	325	333	297	350
200×150	8×6	660	664	660	150	201	281	220	325	333	297	350
200	8	660	664	660	201	201	320	260	405	384	360	500
250×200	10×8	787	791	787	201	252	320	260	405	384	360	500
250	10	787	791	787	252	252	360	311	490	424	360	500
300×250	12×10	838	841	838	252	303	360	311	490	424	360	500
350×250	14×10	889	892	889	252	334	360	311	490	424	360	500
300	12	838	841	838	303	303	403	366	570	467	340	700
350×300	14×12	889	892	889	303	534	403	366	570	467	340	700
400×300	16×12	991	994	991	303	385	403	366	570	467	340	700
350	14	889	892	889	334	334	453	428	660	517	340	700
400×350	16×14	991	994	991	385	334	453	428	660	517	340	700
400	16	991	994	991	385	385	459	450	700	549	545	700
450×400	18×16	1092	1095	1092	385	436	450	450	700	549	545	700
500×400	20×16	1194	1200	1194	385	487	459	450	700	549	545	700
450	18	1092	1095	1092	436	436	502	473	755	577	575	700
500×450	20×18	1194	1200	1194	436	487	502	473	755	577	575	700
500	20	1194	1200	1194	487	487	551	580	870	626	575	700
600×500	24×20	1397	1407	1397	487	589	551	580	870	626	575	700
550	22	1295	1305	1295	538	538	578	590	955	653	575	700
600	24	1397	1407	1397	589	589	606	600	1030	696	579	700
750×600	30×24	1651	1664	1651	589	735	606	600	1030	696	579	700
650	26	1448	1461	1448	633	633	675	635	1075	765	570	700
700	28	1549	1562	1549	684	684	735	700	1165	825	579	700
750	30	1651	1664	1651	735	735	795	775	1250	865	579	700
900×750	36×30	2083	2099	2083	735	874	795	775	1250	865	579	700



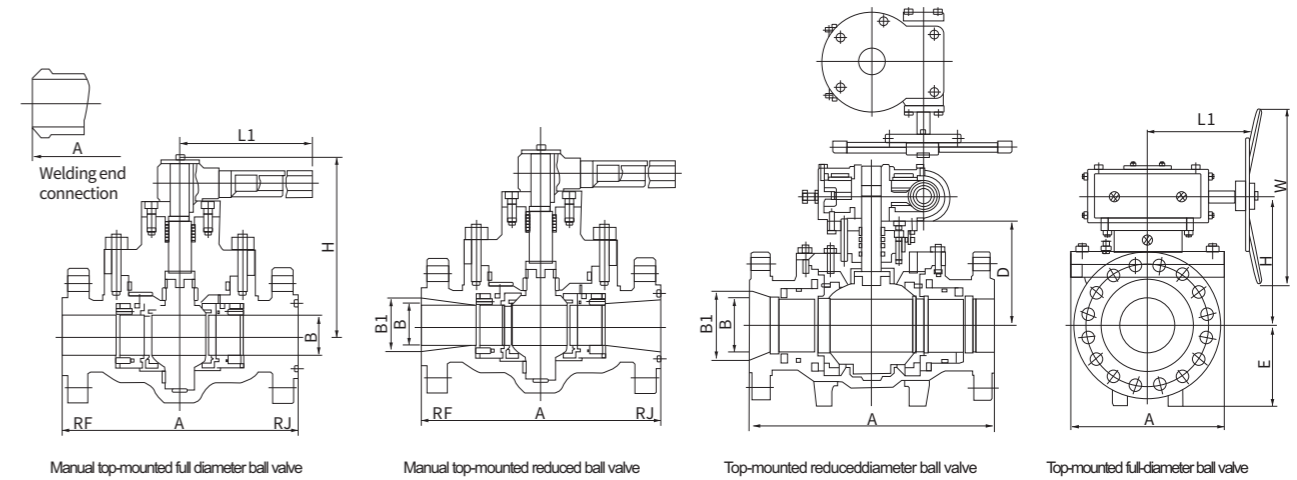


Manual top-mounted full diameter ball valve    Manual top-mounted reduced ball valve    Top-mounted reduced diameter ball valve    Top-mounted full-diameter ball valve

#### Main Shape And Connection Size

#### Class 300

DN	NPS	A			B	B1	D	E	F	H	L1	W
		FR	RJ	BW								
50×40	2×1/2	292	295	292	38	49	/	85	180	212	450	/
50	2	292	295	292	49	49	/	85	180	212	450	/
80×50	3×2	356	359	356	49	74	/	85	180	212	450	/
80	3	356	359	356	74	74	/	112	230	228	600	/
100×80	4×3	432	435	432	74	100	/	112	230	228	600	/
100	4	432	435	432	100	100	/	145	283	272	1000	/
150×100	6×4	559	562	559	100	150	/	145	283	272	1000	/
150	6	559	562	559	150	150	281	220	325	345	360	500
200×150	8×6	660	664	660	150	201	281	220	325	345	360	500
200	8	660	664	660	201	201	330	260	405	385	340	700
250×200	10×8	787	791	787	201	252	330	260	405	385	340	700
250	10	787	791	787	252	252	371	311	490	426	340	700
300×250	12×10	838	841	838	252	303	371	311	490	426	340	700
350×250	14×10	889	892	889	252	334	371	311	490	426	340	700
300	12	838	841	838	303	303	418	366	570	473	340	700
350×300	14×12	889	892	889	303	534	418	366	570	473	340	700
400×300	16×12	991	994	991	303	385	418	366	570	473	340	700
350	14	889	892	889	334	334	470	428	660	530	545	700
400×350	16×14	991	994	991	385	334	470	428	660	530	545	700
400	16	991	994	991	385	385	477	450	700	537	545	700
450×400	18×16	1092	1095	1092	385	436	477	450	700	537	545	700
500×400	20×16	1194	1200	1194	385	487	477	450	700	537	545	700
450	18	1092	1095	1092	436	436	522	473	755	597	575	700
500×450	20×18	1194	1200	1194	436	487	522	473	755	597	575	700
500	20	1194	1200	1194	487	487	573	580	880	663	579	700
600×500	24×20	1397	1407	1397	487	589	573	580	880	663	579	700
550	22	1295	1305	1295	538	538	600	590	965	690	579	700
600	24	1397	1407	1397	589	589	631	600	1040	721	579	700
750×600	30×24	1651	1664	1651	589	735	631	600	1040	721	579	700
650	26	1448	1461	1448	633	633	702	635	1085	874	605	700
700	28	1549	1562	1549	684	684	764	700	1175	919	950	700
750	30	1651	1664	1651	735	735	827	775	1265	982	950	700
900×750	36×30	2083	2099	2083	735	874	827	775	1265	982	950	700

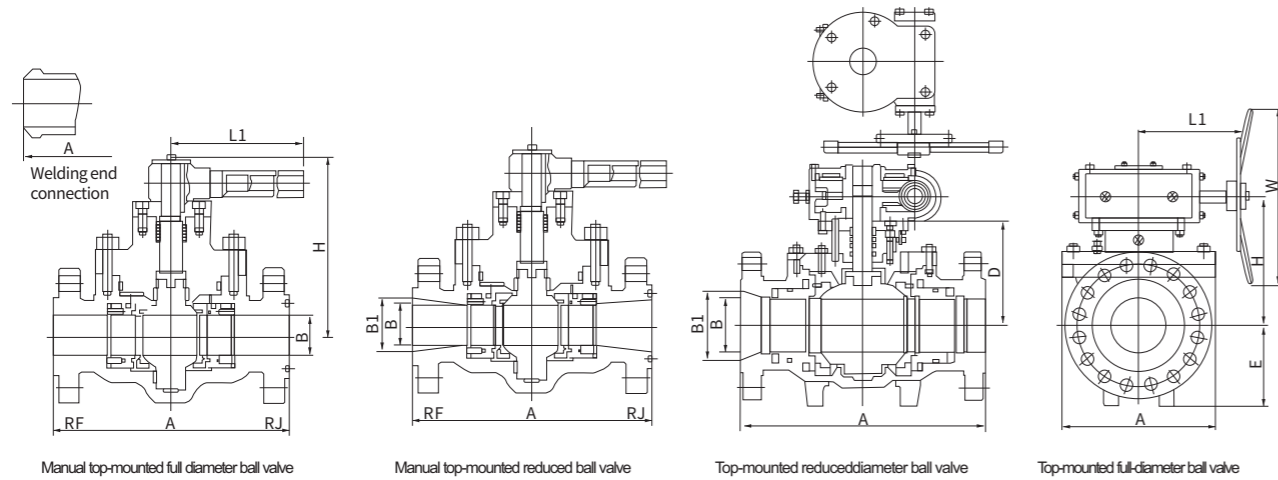


Manual top-mounted full diameter ball valve    Manual top-mounted reduced ball valve    Top-mounted reduced diameter ball valve    Top-mounted full-diameter ball valve

#### Main Shape And Connection Size

#### Class 600

DN	NPS	A			B	B1	D	E	F	H	L1	W
		FR	RJ	BW								
50×40	2×1/2	292	295	292	38	49	/	85	180	212	450	/
50	2	292	295	295	49	49	/	85	180	212	600	/
80×50	3×2	356	395	356	49	74	/	85	180	212	600	/
80	3	356	395	356	74	74	/	112	230	228	1000	/
100×80	4×3	432	435	432	74	100	/	112	230	228	1000	/
100	4	432	435	432	100	100	/	145	283	250	1000	/
150×100	6×4	559	562	559	100	150	/	145	283	250	1000	/
150	6	559	562	559	150	150	281	220	325	336	340	700
200×150	8×6	660	664	660	150	201	281	220	325	336	340	700
200	8	660	664	660	201	201	340	260	425	395	340	700
250×200	10×8	787	791	787	201	252	340	260	425	395	340	700
250	10	787	791	787	252	252	355	311	505	415	545	700
300×250	12×10	838	841	838	252	303	355	311	505	415	545	700
350×250	14×10	889	892	889	252	334	355	311	505	415	545	700
300	12	838	841	838	303	303	401	366	585	461	545	700
350×300	14×12	889	892	889	303	534	401	366	585	461	545	700
400×300	16×12	991	994	991	303	385	401	366	585	461	545	700
350	14	889	892	889	334	334	451	428	680	526	575	700
400×350	16×14	991	994	991	385	334	451	428	680	526	575	700
400	16	991	994	991	385	385	493	450	730	568	575	700
450×400	18×16	1092	1095	1092	385	436	493	450	730	568	575	700
500×400	20×16	1194	1200	1194	385	487	493	450	730	568	575	700
450	18	1092	1095	1092	436	436	539	473	784	629	579	700
500×450	20×18	1194	1200	1194	436	487	539	473	784	629	579	700
500	20	1194	1200	1194	487	487	592	580	900	682	579	700
600×500	24×20	1397	1407	1397	487	589	592	580	900	682	579	700
550	22	1295	1305	1295	538	538	621	590	890	711	579	700
600	24	1397	1407	1397	589	589	653	600	1070	808	950	1400
750×600	30×24	1651	1664	1651	589	735	653	600	1070	808	950	1400
650	26	1448	1461	1448	633	633	725	635	1115	880	950	1400
700	28	1549	1562	1549	684	684	790	700	1210	945	950	1400
750	30	1651	1664	1651	735	735	850	775	1300	1005	950	1400
900×750	36×30	2083	2099	2083	735	874	850	775	1300	1005	950	1400

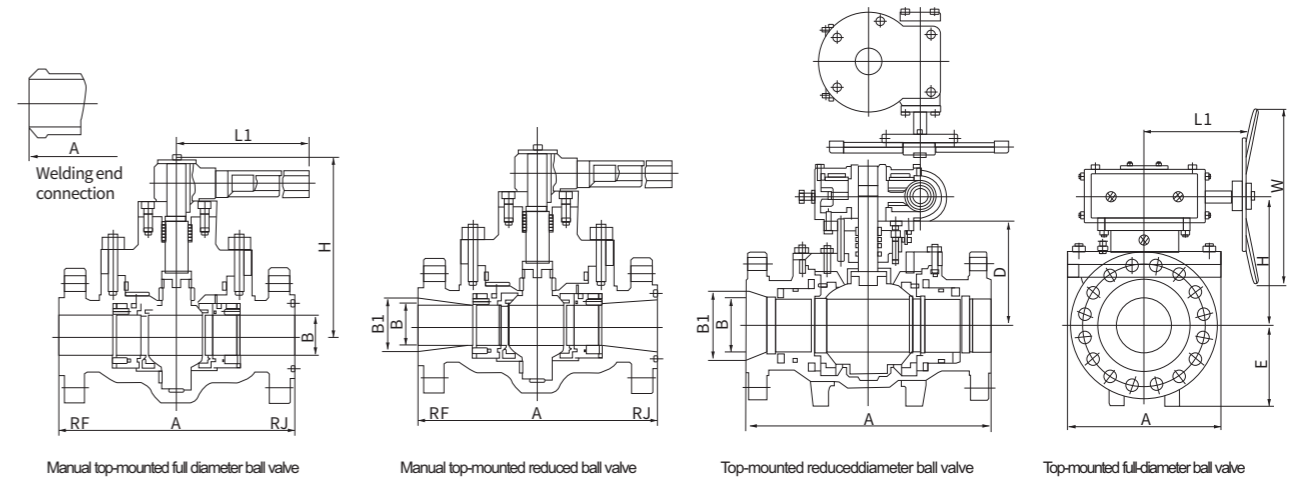


Manual top-mounted full diameter ball valve    Manual top-mounted reduced ball valve    Top-mounted reduced diameter ball valve    Top-mounted full diameter ball valve

Main Shape And Connection Size

Class 900

DN	NPS	A			B	B1	D	E	F	H	L1	W
		FR	RJ	BW								
50×40	2×1/2	368	371	368	38	49	/	85	195	215	450	/
50	2	368	371	368	49	49	/	85	195	215	600	/
80×50	3×2	381	384	381	49	74	/	85	195	215	600	/
80	3	381	384	381	74	74	/	112	240	193	1000	/
100×80	4×3	457	460	457	74	100	/	112	240	193	1000	/
100	4	457	460	457	100	100	227	145	295	291	360	500
150×100	6×4	610	613	610	100	150	227	145	295	291	360	500
150	6	610	613	610	150	150	258	225	330	313	340	700
200×150	8×6	737	740	737	150	201	258	225	330	313	340	700
200	8	737	740	737	201	201	318	260	425	378	545	700
250×200	10×8	838	841	838	201	252	318	260	425	378	545	700
250	10	838	841	838	252	252	370	320	525	430	545	700
300×250	12×10	965	968	965	252	303	370	320	525	430	545	700
350×250	14×10	1029	1038	1029	252	322	370	320	525	430	545	700
300	12	965	1140	965	303	303	418	375	600	493	575	700
350×300	14×12	1029	1038	1029	322	303	418	375	600	493	575	700
400×300	16×12	965	1140	1130	303	373	418	375	600	493	575	700
350	14	1029	1038	1029	322	322	470	440	695	545	575	700
400×350	16×14	1130	1140	1130	322	373	470	440	695	545	575	700
400	16	1130	1140	1130	373	373	515	465	750	605	579	700
450×400	18×16	1219	1232	1219	373	423	515	465	750	605	579	700
500×400	20×16	1321	1334	1321	373	471	515	465	750	605	579	700
450	18	1219	1232	1219	423	423	560	485	800	650	579	700
500×450	20×18	1321	1334	1321	423	471	560	485	800	650	579	700
500	20	1321	1334	1321	471	471	620	600	925	775	950	1400
600×500	24×20	1549	1568	1549	471	570	620	600	925	775	950	1400
600	24	1549	1568	1549	570	570	680	620	1095	835	950	1400
750×600	30×24	1880	1902	1880	570	712	680	620	1095	835	950	1400
650	26	1651	1673	1651	617	617	760	655	1145	915	950	1400
700	28	1753	1775	1753	665	665	824	720	1240	979	950	1400
750	30	1880	1902	1880	712	712	886	800	1335	1157	950	1400
900×750	36×30	2286	2315	2286	712	855	886	800	1335	1157	950	1400



Manual top-mounted full diameter ball valve    Manual top-mounted reduced ball valve    Top-mounted reduced diameter ball valve    Top-mounted full diameter ball valve

Main Shape And Connection Size

Class 1500

DN	NPS	A			B	B1	D	E	F	H	L1	W
		FR	RJ	BW								
50×40	2×1/2	368	371	368	38	49	/	85	205	179	450	/
50	2	368	371	368	49	49	/	85	205	179	600	/
80×50	3×2	470	473	470	49	74	/	85	205	179	600	/
80	3	470	473	470	74	74	/	120	250	201	1000	/
100×80	4×3	546	549	546	74	100	/	120	250	201	1000	/
100	4	546	549	546	100	100	240	155	310	295	340	700
150×100	6×4	705	711	705	100	144	240	155	310	295	340	700
150	6	705	711	705	144	144	273	240	370	333	545	700
200×150	8×6	832	841	832	144	192	273	240	370	333	545	700
200	8	832	841	832	192	192	335	280	455	410	575	700
250×200	10×8	991	1000	991	192	239	335	280	455	410	575	700
250	10	991	1000	991	239	239	385	340	565	460	575	700
300×250	12×10	1130	1146	1130	239	287	385	340	565	460	575	700
350×250	14×10	1257	1276	1257	329	315	385	340	565	460	575	700
300	12	1130	1146	1130	287	287	436	400	670	511	575	700
350×300	14×12	1257	1276	1257	315	315	436	400	670	511	575	700
400×300	16×12	1384	1407	1384	287	360	436	400	670	511	575	700
350	14	1257	1276	1257	315	315	485	467	730	575	579	700
400×350	16×14	1384	1407	1384	315	360	485	467	730	575	579	700
400	16	1384	1407	1384	360	360	530	495	790	620	579	700
450	18	1537	1559	1537	406	406	585	520	840	740	950	1400
500	20	1664	1686	1664	454	454	640	639	965	795	950	1400
600	24	1943	1972	1943	546	546	708	640	1145	979	1045	1400

## Cryogenic Ball Valve



### Use

Series cryogenic ball valves are mainly used in chemical plants such as ethylene and liquefied natural gas and output liquid cryogenic media such as ethylene, liquid oxygen and liquid hydrogen. This kind of medium is not only flammable and explosive, but also vaporizes when the temperature rises and the volume

expands hundreds of times when it vaporizes. Moreover, these media have strong penetrating power, are easy to leak, and are difficult to process and manufacture.

### Structural Characteristics

1. The material of the pressure-bearing part can withstand the expansion and contraction caused by the change of the temperature of the medium, and the structure of the sealing part will not be permanently deformed when the temperature changes. When used in working conditions below  $-100^{\circ}\text{C}$ , the valve parts should be cryogenically processed before finishing, that is the parts should be immersed in a liquid oxygen tank for cooling. When the temperature of the parts reaches  $-196^{\circ}\text{C}$ , the temperature will start for 1 to 2 hours, and then take it out. The outside of the box is naturally processed to room temperature, and the cycle is repeated 2 times.
2. The valve cover adopts a long-necked structure, the purpose of which is to protect the stuffing box keep the stuffing box far away from the low temperature, and ensure the sealing effect of the packing. At the same time, cold insulation materials can be wound to prevent loss of cold energy. The length of the long neck (H, see the left picture) can be selected according to the use temperature and the thickness of the cold insulation

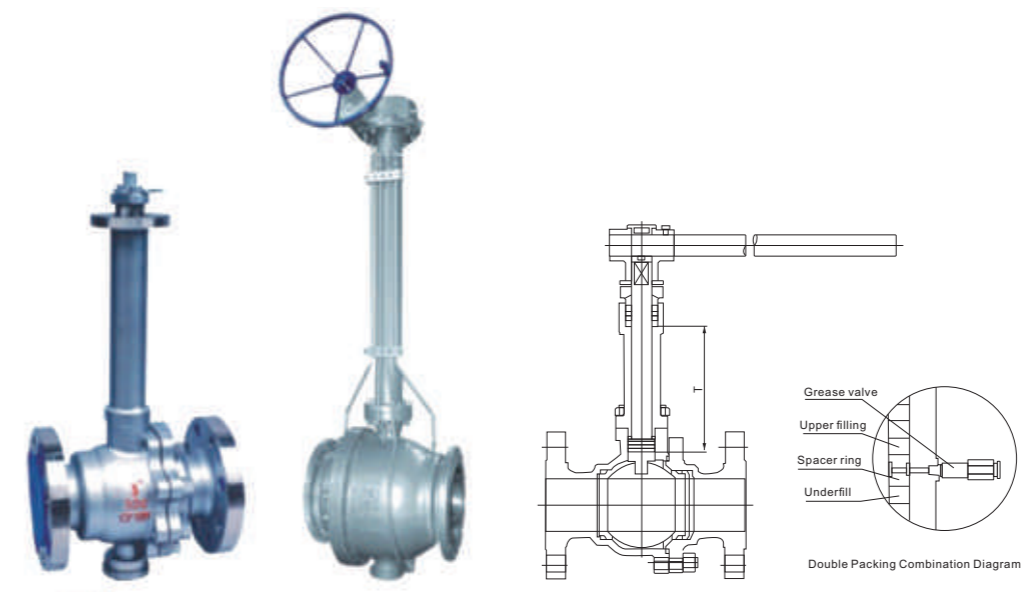
material. When the packing sealing effect is reduced the pressure difference of the stuffing box can be used to improve the sealing performance.

3. When the operating temperature is lower than  $-100^{\circ}\text{C}$ , the stem material is chromeplated or nitrided to increase the surface hardness of the stem and improve the reliability of the packing seal.

4. The cryogenic ball valve has a structure to prevent abnormal pressure rise. After the medium of the cryogenic valve is vaporized, its volume expands sharply, and the pressure rises abnormally. When the pressure in the valve cavity rises, the valve cavity and the inlet side are connected, or in the valve A pressure relief valve is installed at the inlet to ensure the safe use of the valve.

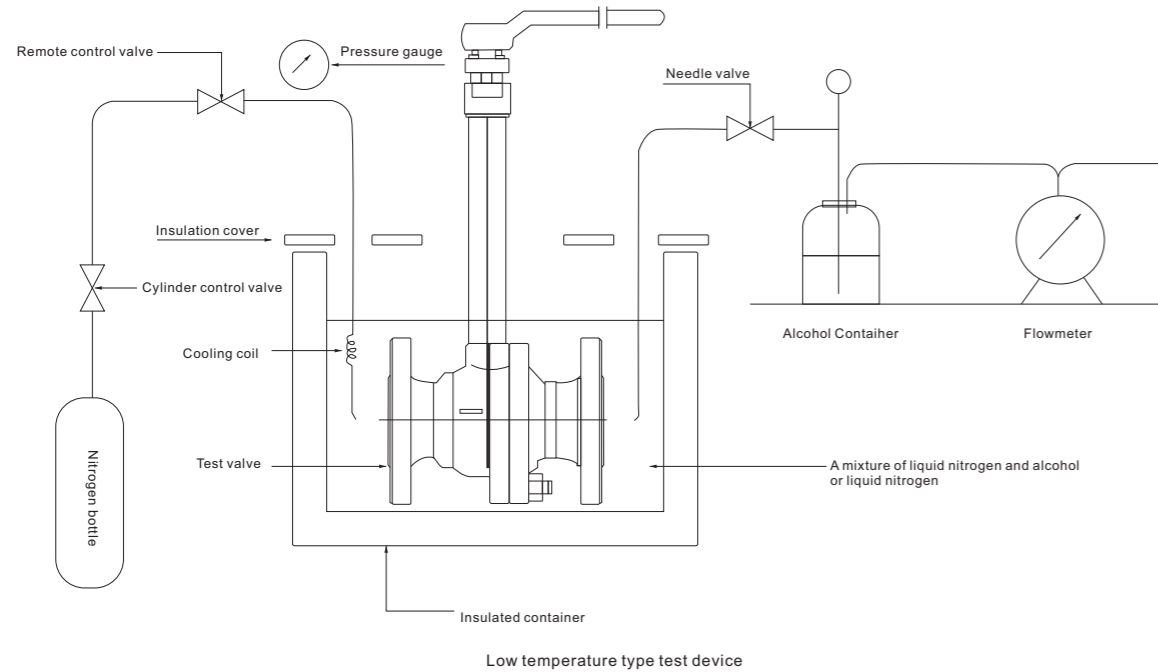
5. Gaskets for cryogenic ball valves have reliable sealing and restorability at room temperature, low temperature conditions and temperature changes.

### Products Structure Type



**Cryogenic Ball Valve Type Test**

According to the requirements of relevant standards, after the cryogenic ball valve test has passed the normal temperature pressure test, a low temperature pressure test is also required. The schematic diagram is as follows:



**Main External Connection Dimensions of Cryogenic Ball Valve**

The main external connection dimensions of the cryogenic ball valve refer to the side-mounted floating ball valve and the fixed ball valve. The height of the valve is based on the height of the long neck, so the size table is no longer listed.

**Technical Specification for Cryogenic Ball valve**

Specifications	API series	GB series
Basic design specification	ANSI B 16.34, JB/T7749	
Pressure temperature class	ASME B16.34	GB/T12224
Structural length	ASME B16.10 GB/T 12221	
Flange connection	ASME B16.5 ASME B16.47	GB/T 9113 HG/T 20592
Inspection and testing	API 598*	JB/T 9092*

\*After the cryogenic ball valve has passed the pressure test at room temperature, a low-temperature pressure test is required. The principle is shown in the cryogenic valve type diagram.

**Cryogenic Ball Valve Bonnet With Extended Necklength (reference)**

Nominal diameter		Neck length (mm)		
DN	in	≥-60°C	≥-100°C	<-100°C
15	1/2	90	110	130
20	3/4	100	110	140
25	1	100	120	150
32	1¼	110	120	150
40	1½	110	130	160
50	2	110	130	170
65	2½	120	140	180
80	3	120	150	190
100	4	130	160	200
125	5	130	160	200
150	6	140	170	220
200	8	140	170	220
250	10	150	180	240
300	12	150	180	240
350	14	160	190	250
400	16	160	190	250

**Scope Of Supply**

Nominal diameter		Pressure level
DN	in	150Lb, 300b, PN1.6~10.0MPa
15	1/2	△/●
20	3/4	△/●
25	1	△/●
32	1¼	△/●
40	1½	△/●
50	2	△/★/●
65	2½	△/★/●
80	3	△/★/●
100	4	△/★/●
125	5	△/★/●
150	6	△/★/●
200	8	△/★/●
250	10	△/★/●
300	12	△/★/●
350	14	△/★/●
400	16	△/★/●

Note: △ means electric operated valve; ● means pneumatic operated valve;

★ means handle operated valve; - means that there is no such option, which means that the unrelated products can be manufactured according to user's requirements.

**Low Temperature Material Of Ball Valve Body Minimum Use Temperature**

Forging		Casting	
Standards, material grades	Lowest temperature °C	Standards, material grades	Lowest temperature °C
ASTM A350 LF2	-45.6°C	ASTM A352 LCB LCC	-46°C
ASTM A350 LF5	-59.4°C	ASTM A352 LC1	-59°C
ASTM A350 LF9	-73.3°C	ASTM A352 LC2	-73°C
ASTM A350 LF3	-101.1°C	ASTM A352 LC3	-101°C
ASTM A182 F304	-254°C	ASTM A351 CF8	-254°C
ASTM A182 F316	-254°C	ASTM A351 CF8M	-254°C
ASTM A182 F304L	-254°C	ASTM A351 CF3	-254°C
ASTM A182 F316L	-254°C	ASTM A351 CF3M	-254°C





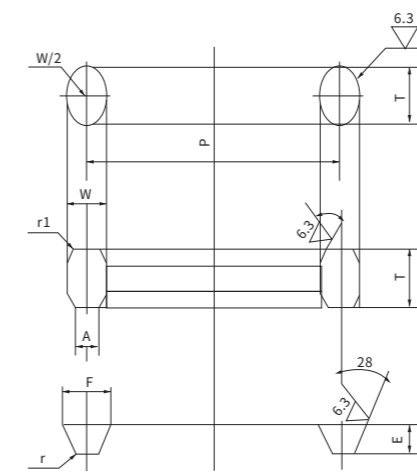
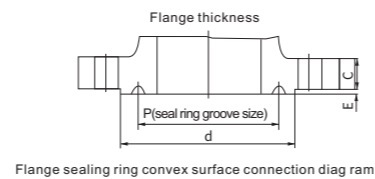
Main Dimensions

Class 2500

size		D		K		d		n-L		C		Bolt diameter	Stud length (mm)	
DN	NPS	mm	in	mm	in	mm	in	mm	in	mm	in	in	Convex7mm	Ring connection
15	1/2"	135	5.25	88.9	3.5	34.9	1.38	4-22	4-7/8	30.2	1.19	3/4	120	120
20	3/4"	140	5.5	95.2	3.75	42.9	1.69	4-22	4-7/8	31.8	1.25	3/4	125	125
25	1"	160	6.25	108	4.25	50.8	2	4-25.5	4-1	35	1.38	7/8	140	140
32	1 1/4"	185	7.25	130.2	5.12	63.5	2.5	4-25.5	4-1 1/8	38.1	1.5	1	150	150
40	1 1/2"	205	8	146	5.75	73	2.88	4-32	4-1 1/4	44.5	1.75	1 1/8	170	170
50	2"	235	9.25	171.4	6.75	92.1	3.62	8-28.5	8-1 1/8	50.9	2	1	180	180
65	2 1/2"	265	10.5	196.8	7.75	104.8	4.12	8-32	8-1 1/4	57.2	2.25	1 1/8	195	205
80	3"	305	12	228.6	9	127	5	8-35	8-1 3/8	66.7	2.62	1 1/4	220	230
100	4"	355	14	273	10.75	157.2	6.19	8-41	8-1 5/8	76.2	3	1 1/2	255	260
125	5"	420	16.5	323.8	12.75	185.7	7.31	8-48	8-1 7/8	92.1	3.62	1 3/4	300	310
150	6"	485	19	368.3	14.5	215.9	8.5	8-54	8-2 1/8	108	4.25	2	345	355
200	8"	550	21.75	438.2	17.25	269.9	10.62	12-54	12-2 1/8	127	5	2	380	395
250	10"	675	26.5	539.8	21.25	323.8	12.75	12-66.5	12-2 5/8	165.1	6.5	2 1/2	490	510
300	12"	760	30	619.1	24.38	381	15	12-73	12-2 7/8	184.2	7.25	2 3/4	540	560

Main Dimensions

size		150Lb		600Lb		900Lb		1500Lb		2500Lb	
DN	NPS	d	E	d	E	d	E	d	E	d	E
15	1/2"	/	/	51	5.54	60.5	6.35	60.5	6.35	65	6.35
20	3/4"	/	/	63.5	6.35	66.5	6.35	66.5	6.35	73	6.35
25	1"	63.5	6.35	70	6.35	71.5	6.35	71.5	6.35	82.5	6.35
32	1 1/4"	73	6.35	79.5	6.35	81	6.35	81	6.35	102	7.92
40	1 1/2"	82.5	6.35	90.5	6.35	92	6.35	92	6.35	114	7.92
50	2"	102	6.35	108	7.92	124	7.92	124	7.92	133	7.92
65	2 1/2"	121	6.35	127	7.92	137	7.92	137	7.92	149	9.53
80	3"	133	6.35	146	7.92	156	7.92	168	7.92	168	9.53
100	4"	171	6.35	175	7.92	181	7.92	194	7.92	203	11.13
125	5"	194	6.35	210	7.92	216	7.92	229	7.92	241	12.7
150	6"	219	6.35	241	7.92	241	7.92	248	9.53	279	12.7
200	8"	273	6.35	302	7.92	308	7.92	318	11.13	340	14.27
250	10"	330	6.35	356	7.92	362	7.92	371	11.13	425	17.48
300	12"	406	6.35	413	7.92	419	7.92	438	14.27	495	17.48
350	14"	425	6.35	457	7.92	467	11.13	489	15.88	/	/
400	16"	483	6.35	508	7.92	524	11.13	546	17.48	/	/
450	18"	546	6.35	575	7.92	594	12.7	613	17.48	/	/
500	20"	597	6.35	635	9.53	648	12.7	673	17.48	/	/
550	22"	648	6.35	686	11.13	/	/	/	/	/	/
600	24"	711	6.35	749	11.13	772	15.88	794	20.62	/	/
650	26"	/	/	810	12.7	832	17.48				
700	28"	/	/	861	12.7	889	17.48				
750	30"	/	/	917	12.7	946	17.48				
800	32"	/	/	984	14.27	1003	17.48				
850	34"	/	/	1035	14.27	1067	20.62				
900	36"	/	/	1092	14.27	1124	20.62				



Note: 1. When  $w < 22.2$ ,  $r1 = 1.59$   
 2. When  $W > 25.4$ ,  $r1 = 2.38$   
 3. The roughness of the rest of the processed surface without injection is



Main Dimensions

Ring number	Applicable flange					p ( $\pm 0.177$ )	Gasket		A ( $\pm 0.203$ )	E ( $\pm 0.3-0$ )	F ( $\pm 0.203$ )	r (max)	
	150Lb	300Lb		900Lb	1500Lb		2500Lb	Height( $\pm 0.39$ )					
		400Lb	600Lb					Oval					Octagon
R11		15(1/2)				34.14	6.35	11.2	9.7	4.32	5.54	7.14	0.8
R12				15(1/2)	15(1/2)	39.70	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R13		20(3/4)				42.88	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R14				20(3/4)	20(3/4)	44.45	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R15	25(1)					47.63	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R16		25(1)	25(1)	25(1)	20(3/4)	50.80	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R17	32(1 1/4)					57.15	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R18		32(1/4)	32(1/4)	32(1/4)	20(1)	60.33	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R19	40(1 1/2)					65.10	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R20		40(1 1/2)	40(1 1/2)	40(1 1/2)		68.28	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R21					32(1 1/4)	72.24	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R22	50(2)					82.55	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R23		50(2)				82.55	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R24			50(2)	50(2)		95.25	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R25	65(2 1/2)					101.60	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R26		65(2 1/2)			50(2)	101.60	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R27			65(2 1/2)	65(2 1/2)		107.95	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R28					65(2 1/2)	111.13	12.70	19.1	17.5	8.66	9.52	13.49	1.5
R29	80(3)					114.30	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R30						117.48	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R31		80(3)	80(3)			123.83	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R32					80(3)	127.00	12.70	19.1	17.5	8.66	9.53	13.49	1.5
R33	31/2					131.78	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R34		31/2				131.78	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R35				80(3)		136.53	11.13	17.5	16.0	7.75	7.92	11.91	0.8

Main Dimensions

Ring number	Applicable flange					p (±0.177)	Gasket		A (±0.203)	E (±0.3-0)	F (±0.203)	r (max)	
	150Lb	300Lb	900Lb	1500Lb	2500Lb		Height(±0.39)						
		400Lb					Oval	Octagon					
R36	100(4)					149.23	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R37		100(4)	100(4)			149.23	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R38					100(4)	157.18	15.88	22.4	20.6	10.49	11.13	16.66	1.5
R39				100(4)		161.93	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R40	125(5)					171.45	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R41		125(5)	125(5)			180.98	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R42					125(5)	190.50	19.05	25.4	23.9	12.32	12.7	19.84	1.5
R43	150(6)					193.68	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R44				125(5)		193.68	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R45		150(6)	150(6)			211.15	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R46				150(6)		211.15	12.70	19.1	17.5	8.66	9.53	13.49	1.5
R47					150(6)	228.60	19.05	25.4	23.9	12.32	12.7	19.84	1.5
R48	200(8)					247.65	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R49		200(8)	200(8)			269.88	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R50				200(8)		269.88	15.88	22.4	20.6	10.49	11.13	16.66	1.5
R51					200(8)	279.40	22.23	28.7	26.9	14.81	14.27	23.01	1.5
R52	250(10)					304.80	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R53		250(10)	250(10)			323.85	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R54				250(10)		323.85	15.88	22.4	20.6	10.49	11.13	16.66	1.5
R55					250(10)	342.90	28.58	36.6	35.1	19.81	17.48	30.18	2.4
R56	300(12)					381.00	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R57		300(12)	300(12)			381.00	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R58				300(12)		381.00	22.23	28.7	26.9	14.81	14.27	23.01	1.5
R59	350(14)					396.88	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R60					300(12)	406.40	31.75	39.6	38.1	22.33	17.48	33.32	2.4
R61		350(14)				419.10	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R62			350(14)			419.10	15.88	22.4	20.6	10.49	11.13	16.66	1.5
R63				350(14)		419.10	25.40	33.3	31.8	17.30	15.88	26.97	2.4
R64	400(16)					454.03	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R65		400(16)				469.90	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R66			400(16)			469.90	15.88	22.4	20.6	10.49	11.13	16.66	1.5
R67				400(16)		469.90	28.58	36.6	35.1	19.81	17.48	30.18	2.4
R68	450(18)					517.53	7.95	14.2	12.7	5.23	6.35	8.74	0.8
R69		450(18)				533.40	11.13	17.5	16.0	7.75	7.92	11.91	0.8
R70			450(18)			533.40	19.05	25.4	23.9	12.32	12.7	19.84	1.5

Main Dimensions

Valve size		API6D Class						
		150	300	400	600	900	1500	2500
DN	NPS	mm	mm	mm	mm	mm	mm	mm
50	2	49	49	49	49	49	49	42
65	2 1/2	62	62	62	62	62	62	52
80	3	74	74	74	74	74	74	62
100	4	100	100	100	100	100	100	87
150	6	150	150	150	150	150	144	131
200	8	201	201	201	201	201	192	179
250	10	252	252	252	252	252	239	223
300	12	303	303	303	303	303	287	265
350	14	334	334	334	334	322	315	292
400	16	385	385	385	385	373	360	333
450	18	436	436	436	436	423	406	374
500	20	487	487	487	487	471	454	419
550	22	538	538	538	538	522	500	/
600	24	589	589	589	589	570	546	/
650	26	633	633	633	633	617	594	/
700	28	684	684	684	684	665	641	/
750	30	735	735	735	735	712	686	/
800	32	779	779	779	779	760	730	/
850	34	830	830	830	830	808	775	/
900	36	874	874	874	874	855	819	/
950	38	925	925	925	925	904	/	/
1000	40	976	976	976	976	956	/	/
1050	42	1020	1020	1020	1020	1006	/	/
1100	44	1069	1069	1069	1069	/	/	/
1150	46	1116	1116	1116	1116	/	/	/
1200	48	1166	1166	1166	1166	/	/	/
1250	50	1215	1215	1215	1215	/	/	/
1300	52	1265	1265	1265	1265	/	/	/
1350	54	1312	1312	1312	1312	/	/	/
1400	56	1360	1360	1360	1360	/	/	/
1450	58	1410	1410	1410	1410	/	/	/
1500	60	1458	1458	1458	1458	/	/	/



Main Dimensions

ASTM Specifications	Chemical composition %											Mechanical property					
	C ≤	Mn ≤	P ≤	S ≤	Si ≤	Cr ≤	Mo ≤	Ni ≤	Cu ≤	V ≤	Nb ≤	Tensile strength MPa <sub>a</sub> ≥	Yield strength MPa <sub>a</sub> ≥	Elongation % ≥	Shrinkage % ≥	Brinell hardness HB <sub>b</sub> ≤	Impact force J <sub>c</sub> ≥
A105	0.35	0.60 -1.05	0.035	0.040	0.10 -0.35	0.30	0.12	0.4	0.40	0.08	0.02	485	250	30	30	187	
A182 F11	0.05 -0.15	0.30 -0.60	0.030	0.030	0.50 -1.00	1.00 -1.50	0.44 -0.65					415	205	20	45	121 -174	
A182 F22	0.05 -0.15	0.30 -0.60	0.040	0.040	0.50	2.00 -2.50	0.87 -1.13					415	205	20	35	170	
A182 F304	0.08	2.00	0.045	0.030	1.00	18.0 -20.0		8.0 -11.0				515	205	30	50		
A182 F304L	0.030	2.00	0.045	0.030	1.00	18.0 -20.0		8.0 -13.0				485	170	30	50		
A182 F316	0.08	2.00	0.045	0.030	1.00	16.0 -18.0	2.00 -3.00	10.0 -14.0				515	205	30	50		
A182 F316L	0.030	2.00	0.045	0.030	1.00	16.0 -18.0	2.00 -3.00	10.0 -15.0				485	170	30	50		
A182 F51	0.030	2.00	0.030	0.020	1.00	21.0 -23.0	2.5 -3.5	4.5 -6.5				620	450	25	45		
A182 F6A	0.15	1.00 -0.65	0.040	0.030	1.00	11.5 -13.5		0.50				585	380	18	35	167 -229	
A193 B7	0.37 -0.49	1.00 -0.65	0.035	0.040	0.15 -0.35	0.75 -1.20	0.15 -0.25					860	720	16	50	321	
A193 B7M	0.37 -0.49	1.10	0.035	0.040	0.15 -0.35	0.75 -1.20	0.15 -0.25					690	550	18	50	235	
A193 B8	0.08	2.00	0.045	0.030	1.00	18.0 -20.0		8.0 -11.0				515	205	30	50	223	
A193 B8M	0.08	2.00	0.045	0.030	1.00	16.0 -18.0	2.00 -3.00	10.0 -14.0				515	205	30	50	223	
A193 B16	0.36 -0.47	0.45 -0.70	0.035	0.040	0.15 -0.35	0.80 -1.15	0.50 -0.65		0.25 -0.35			860	720	18	50	321	
A194 2H	≥0.40	1.00	0.040	0.050	0.04											248 -352	
A194 2HM	≥0.40	1.00	0.040	0.050	0.04											159 -237	
A194 8	0.08	2.00	0.045	0.030	1.00	18.0 -20.0		8.0 -11.0								126 -300	
A194 8	0.08	2.00	0.045	0.030	1.00	16.0 -18.0	2.00 -3.00	10.0 -14.0								126 -300	
MA216WCB	0.30	1.00	0.04	0.045	0.60	0.50	0.20	0.50	0.30	0.03		485 -655	250	22	35		
A216 WCC	0.25	1.20	0.04	0.045	0.60	0.50	0.2	0.50	0.30	0.03		485 -655	275	22	35		
A217 C5	0.20	0.40 -0.70	0.04	0.045	0.75	4.00 -6.50	0.45 -0.65	0.50	0.50			620 -795	415	18	35		
A217 Ca15	0.15	1.00	0.040	0.040	1.50	11.5 -14.0	0.50	1.00				620 -795	450	18	30		

Main Dimensions

ASTM Specifications	Chemical composition %											Mechanical property					
	C ≤	Mn ≤	P ≤	S ≤	Si ≤	Cr ≤	Mo ≤	Ni ≤	Cu ≤	V ≤	Nb ≤	Tensile strength MPa <sub>a</sub> ≥	Yield strength MPa <sub>a</sub> ≥	Elongation % ≥	Shrinkage % ≥	Brinell hardness HB <sub>b</sub> ≤	Impact force J <sub>c</sub> ≥
A217WC6	0.05 -0.20	0.50 -0.80	0.04	0.040	0.60	1.00 -1.50	0.45 -0.65	0.50	0.50			485 -655	275	20	35		
A217WC9	0.05 -0.18	0.40 -0.70	0.04	0.045	0.60	2.00 -2.75	0.90 -1.20		0.50			485 -655	275	20	35		
A276 410	0.08 -0.15	1.00	0.040	0.030	1.00	11.5 -13.5						480	275	20	45		
A276 420	0.15	1.00	0.040	0.030	1.00	12.0 -14.0							725	16			Average: 27; Min: 20
A320 L7	0.38 -0.048	0.75 -1.00	0.035	0.040	0.15 -0.35	0.80 -1.10	0.15 -0.25					860			50	241	Average: 27; Min: 20
A320 L7M	0.38 -0.048	0.75 -1.00	0.035	0.040	0.15 -0.35	0.80 -1.10	0.15 -0.25					690	550	18	50		
A336 F22	0.05 -0.15	0.30 -0.60	0.025	0.025	0.50	2.00 -2.50	0.90 -1.10					515 -690	310	19	40	235	Average: 18; Min: 14
A350 LF1	0.30	0.60 -1.35	0.035	0.040	0.15 -0.30	0.30	0.12	0.40	0.40	0.08	0.02	418 -585	205	28	38		Average: 20; Min: 16
A350 LF2	0.30	0.60 -1.35	0.035	0.040	0.15 -0.30	0.30	0.12	0.40	0.40	0.08	0.02	485 -655	250	30	30		
A351 CF3	0.03	1.50	0.040	0.040	2.00	17.0 -21.0	0.50	8.0 -12.0				485	205	35.0			
A351 CF3M	0.03	1.50	0.040	0.040	1.50	17.0 -21.0	2.0 -3.00	9.0 -13.0				485	205	30.0			
A351 CF8	0.08	1.50	0.040	0.040	2.00	18.0 -21.0	0.50	8.0 -11.0				485	205	35.0			
A351 CF8M	0.08	1.50	0.040	0.040	1.50	18.0 -21.0	2.0 -3.00	9.0 -12.0	3.0 -4.0			485	205	30.0			
A351 CF8C	0.08	1.50	0.040	0.040	2.00	18.0 -21.0	0.50	9.0 -12.0				485	205	30.0			
A351 CF7M	0.07	1.50	0.040	0.040	1.50	19.0 -22.0	2.0 -3.00	27.5 -30.5				425	170	35			
A352 LC1	0.25	0.50-0.80	0.04	0.045	0.60		0.45 -0.65					450 -620	240	24	35		
A352 LC2	0.25	0.50-0.80	0.04	0.045	0.60			2.00 -3.00				485 -655	275	24	35		Average: 18; Min: 14
A352 LC3	0.15	0.50-0.80	0.04	0.045	0.60			3.00 -4.00				485 -655	275	24	35		Average: 20; Min: 16
A352 LCB	0.30	1.00	0.04	0.045	0.60	0.50	0.20	0.50	0.30	0.03		450 -620	240	24	35		Average: 20; Min: 16
A352 LCC	0.25	1.20	0.04	0.045	0.60	0.50	0.20	0.50		0.03		485 -655	275	22	35	139 -202	Average: 18; Min: 14
A439 D2	3.00	0.70 -1.25	0.08		1.50 -3.00	1.75 -2.75		18.00 -22.00				400	207	8.0			Average: 20; Min: 16

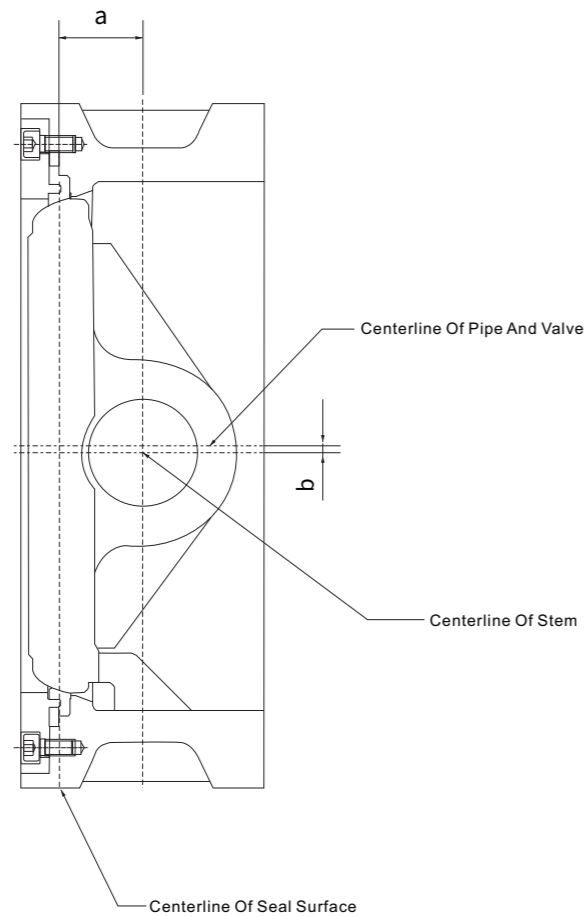
Attached Table (internal Materials)

Internal part number	Seat or body	Gate, disc, ball or body	Stem	Internal part number	Seat or body	Gate, disc, ball or body	Stem
01	13Cr	13Cr	13Cr	31	STELLITE	321SS	321SS
02	304SS	304SS	304SS	32	STEELITE	STEELITE	321SS
03	310SS	310SS	310SS	33	347SS	347SS	347SS
04	HARE D13Cr	HARE D13Cr	13Cr	34	STELLITE	347SS	347SS
05	STELLITE	STELLITE	13Cr	35	NICKELALLOY	13Cr	13Cr
06	Cu-Ni	13Cr	13Cr	36	A105/PTFE	A105+ENP	A105+ENP
07	13Cr	HARE D13Cr	13Cr	37	A105/PTFE	WCB+ENP	WCB+ENP
08	STELLITE	13Cr	13Cr	38	13Cr/PTFE	13Cr	13Cr
09	Cu-Ni	Cu-Ni	Cu-Ni	39	304/PTFE	304SS	304SS
10	316SS	316SS	316SS	40	316SS/PTFE	316SS	316SS
11	Cu-Ni	STELLITE	Cu-Ni	41	A105/RPTFE	A105+ENP	A105+ENP
12	STELLITE	316SS	316SS	42	A105/RPTFE	WCB+ENP	A105+ENP
13	ALLOY20	ALLOY20	ALLOY20	43	13Cr/RPTFE	13Cr	13Cr
14	STELLITE	ALLOY20	ALLOY20	44	304SS/RPTFE	304SS	304SS
15	STELLITE	STELLITE	304SS	45	316SS/RPTFE	316SS	316SS
16	STELLITE	STELLITE	316SS	46	A105/NYLON	A105+ENP	A105+ENP
17	STELLITE	STELLITE	347SS	47	A105/NYLON	WCB+ENP	A105+ENP
18	STELLITE	STELLITE	ALLOY20	48	A105/NYLON	304SS	304SS
19	MONEL	MONEL	MONEL	49	A105/NYLON	316SS	316SS
20	BRONZE	BRONZE	13Cr	50	13Cr/NYLON	13Cr	13Cr
21	HASTELLOYB	HASTELLOYB	HASTELLOYB	51	304SS/NYLON	304SS	304SS
22	HASTELLOYB	HASTELLOYC	HASTELLOYC	52	316SS/NYLON	316SS	316SS
23	STELLITE	304SS	304SS	53	A105/PEEK	A105+ENP	A105+ENP
24	304LSS	304LSS	304LSS	54	A105/PEEK	WCB+ENP	A105+ENP
25	STELLITE	304LSS	304LSS	55	13Cr/PEEK	13Cr	13Cr
26	STELLITE	STELLITE	304LSS	56	304SS/PEEK	304SS	304SS
27	316LSS	316LSS	316LSS	57	316SS/PEEK	316SS	316SS
28	STELLITE	316LSS	316LSS				
29	STELLITE	STELLITE	316LSS				
30	321SS	321SS	321SS	99	special requirem ents	special requirem ents	special requirem ents

Butterfly valve



**The Design of High Performance Butterfly Valve**



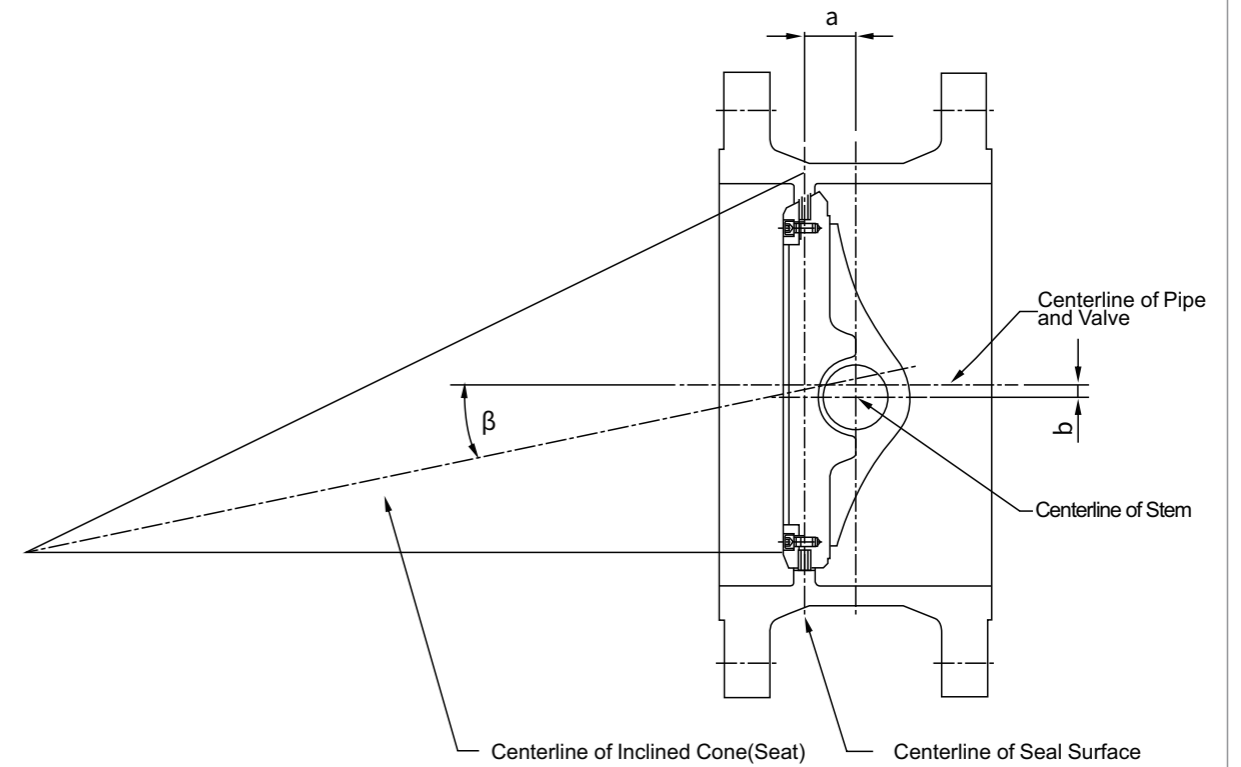
**a**

The 1st offset a: The stem deviates from the centerline of the seal surface

**b**

The 2nd offset b: The stem deviates from the pipe and the centerline of the valve both of which are designed to reduce friction between the seat and the seal rings on the disk throughout the route of opening and closing

**The Design of Triple Offset Butterfly Valve**



**a**

1st offset a: The stem deviates from the centerline of the sealing surface

**b**

2nd offset b: The stem deviates from the pipe and the centerline of the valve both of which are designed to reduce friction between the seat and the sealing ring when opening and closing

**c**

3rd offset  $\beta$ : The centerline of the inclined cone angle created by the seal surface of the valve deviates from the pipe and the centerline of the valve

1. Geometrically, the seat is completely detached from the seal ring throughout the opening and closing. This unique offset design not only makes the best of cam effect, but also completely eliminates friction so that there is no friction between seat and sealing ring when opening to 90° eliminating the possibilities of wear and leakage.

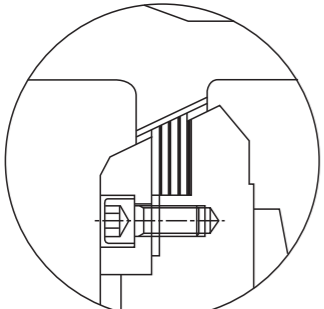
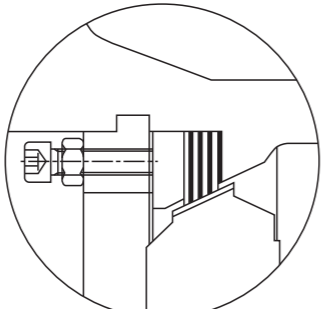
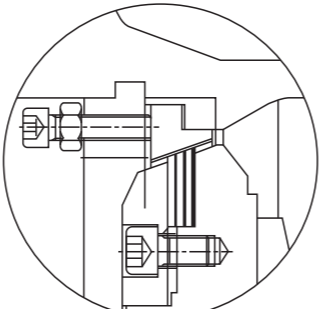
2. The characteristics of the contact between seat and seal ring are optimized. The contact angle of most gate valves is 3° to 6° which is in the range of locking taper, resulting in high sealing torque and opening torque.

3. The contact angle of the valve is larger than the locking taper range, and the possibility of being stuck is excluded from the geometric shape, which ensures that the torque required for the switch will not change greatly throughout the service life of the valve.

Common Standard	Design Criteria	Flange Standard	Face-to-face Length Standard	Test Standard
	JB/T 8527	GB/T9113	GB/T 12221	GB/T 13927
	EN593	EN1092	EN558	EN12266-1
	API 609	ASME B 16.5 ASME B 16.47B	API 609 ASME B 16.10	API 598

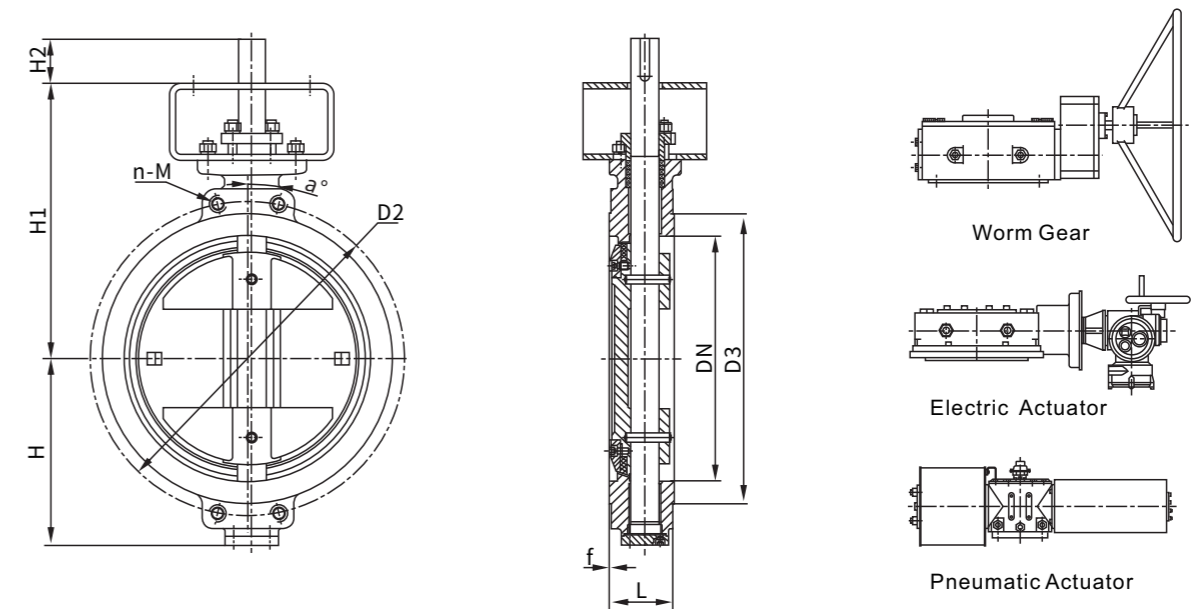
Production Range	Size Range	Pressure Range	Temperature Range	Connection	Material Range
	DN50-DN4000	Within 1500LB	-196~700(°C)	Wafer,Lug, Double Flange,Butt-welded	All Metal Material

Seal Structure Type

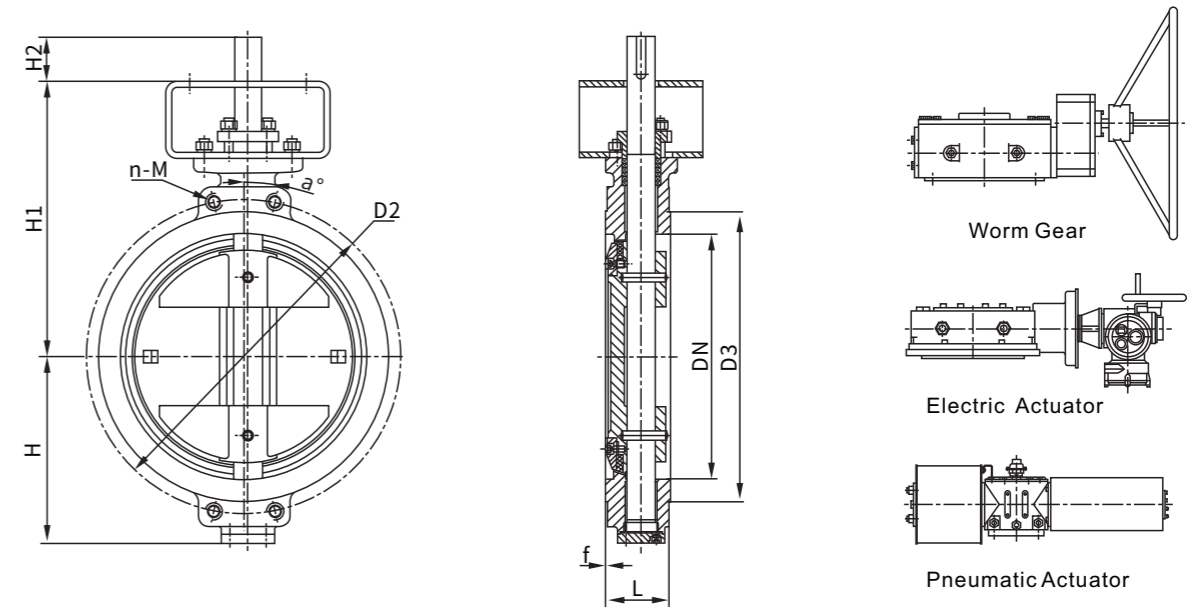
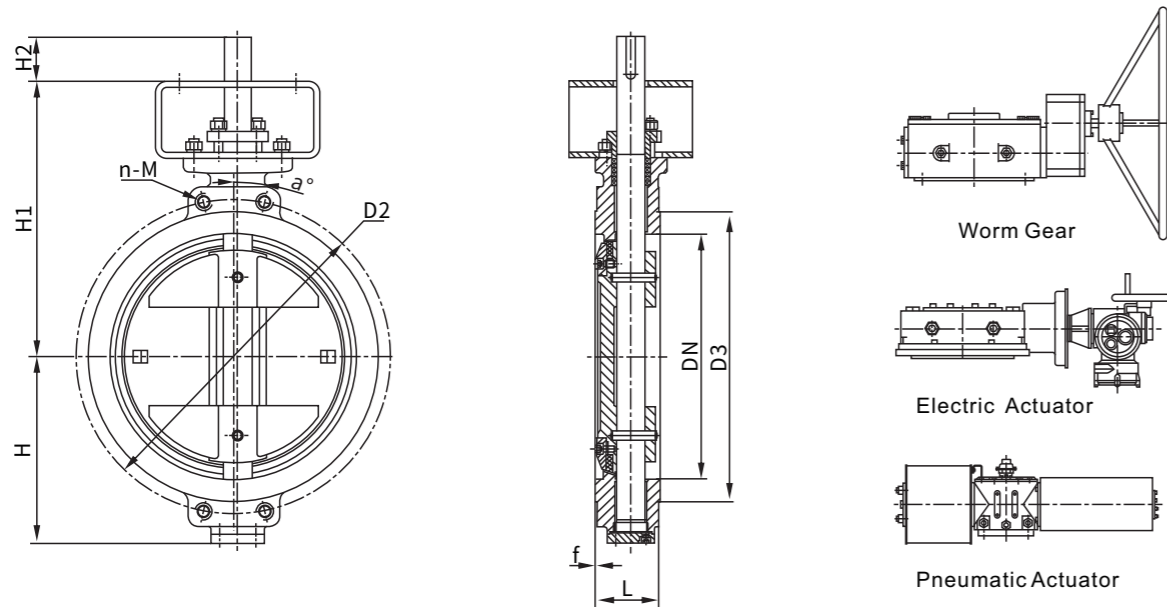




Materials of the Seal Rings: SS+Graphite / PTFE / Full Metal

- Advantages of Triple Offset Butterfly Valve
- ① Seal with elastic metal steel in the interlayer enables the valve to have zero leakage performance.
  - ② The friction-free design of right-angle rotation is realized by a unique triple offset design. There is no friction between the seat and seal ring when the valve opening from 0 to 90 degrees, which eliminates the possibilities of wear and leakage and prolongs the service life of the valve.
  - ③ torque seal can meet the requirement of two-way zero leakage in long-term operation of the valve. The switch life of the valve allows five hundred thousand times.
  - ④ All-metal structure with zero leakage performance makes the valve has essential fire safety characteristics.
  - ⑤ The butterfly valve adopts precision casting process, including the body and the disk. This process has many advantages comparing with steel plate coiling process, the most important of which is that the overall strength of the valve is high, and the cost of it is also higher than that of the coiling process.
  - ⑥ The external blow-out proof stem is safe and reliable and complies with the requirements of API 609.

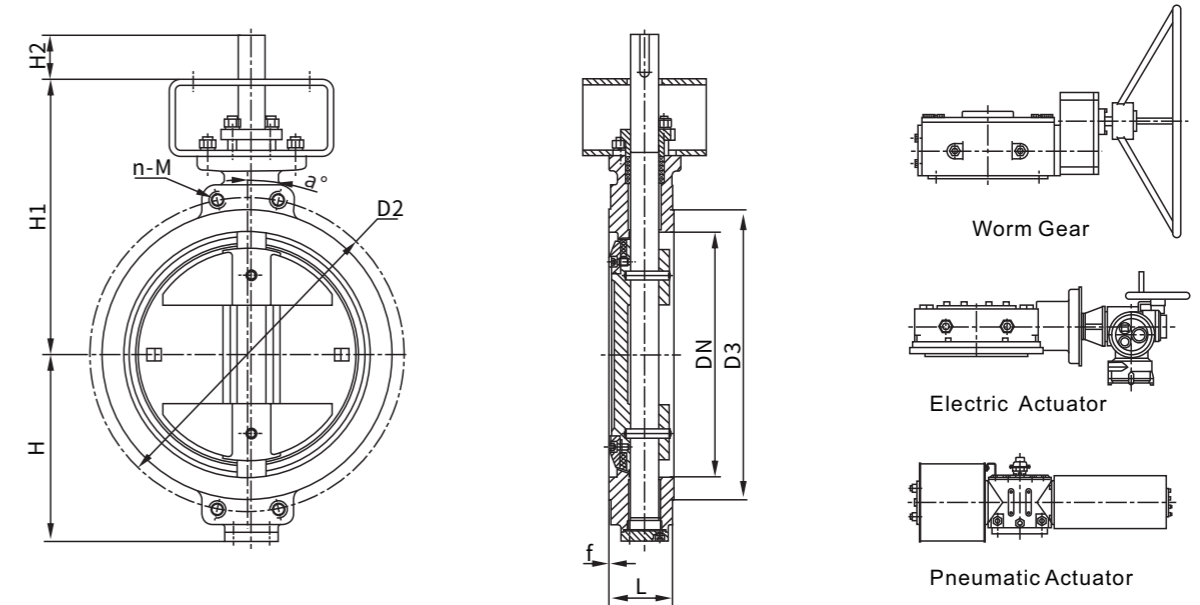
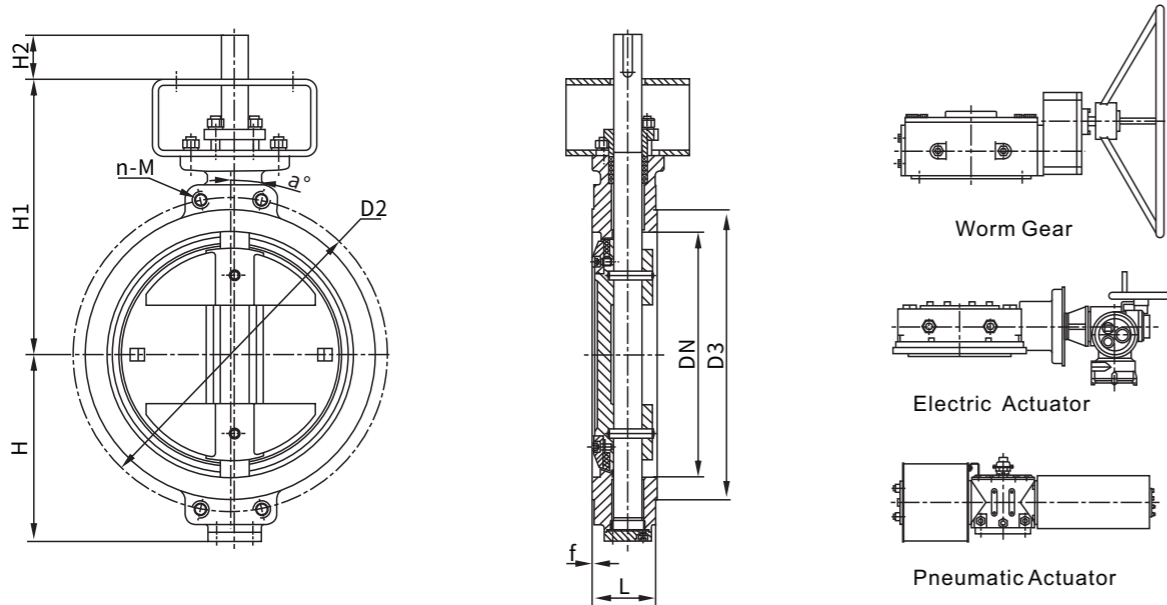


PN 10	DN	L	D2	D3	f	a°	n-M	ISO5211	Nm	Weight	CV	H	H1	H2
	2"(DN50)	43	125	99	/	45	4-φ18	F07	26	5	58	72	178	40
2.5"(DN65)	46	145	118	/	45	4-φ18	F07	30	6	109	80	189	40	
3"(DN80)	64	160	132	/	22.5	4-φ18	F07	50	10	165	95	199	40	
4"(DN100)	64	180	156	/	22.5	4-φ18	F07	80	11	318	110	209	40	
5"(DN125)	70	210	184	/	22.5	4-φ18	F10	120	15	648	165	250	60	
6"(DN150)	76	240	211	/	22.5	4-φ22	F10	240	21	932	185	270	60	
8"(DN200)	89	295	260	/	22.5	4-φ22	F12	480	32	1970	225	310	60	
10"(DN250)	114	350	312	/	15	4-φ22	F12	760	45	2689	260	345	60	
12"(DN300)	114	400	370	4	15	4-M20	F14	850	80	3930	290	395	80	
14"(DN350)	127	460	429	4	11.25	4-M20	F16	1800	90	5290	338	455	80	
16"(DN400)	140	515	470	4	11.25	4-M24	F16	2000	110	7726	375	490	90	
18"(DN450)	152	565	520	4	9	4-M24	F16	2509	170	9856	405	520	90	
20"(DN500)	152	620	570	5	9	4-M24	F16	3200	190	12180	435	550	100	
24"(DN600)	154	725	682	5	9	4-M27	F25	6350	290	19800	476	632	125	
28"(DN700)	165	840	794	5	7.5	4-M27	F25	6800	360	27600	520	670	150	
32"(DN800)	190	950	901	5	7.5	4-M30	F25	10050	480	35800	578	706	150	
36"(DN900)	203	1050	1001	5	6.428	4-M30	F25	12500	688	45600	650	795	150	
40"(DN1000)	216	1160	1112	5	6.428	4-M33	F35	20000	800	65320	720	885	150	
48"(DN1200)	254	1380	1328	5	5.625	4-M36	F35	30000	1400	96000	860	1020	150	



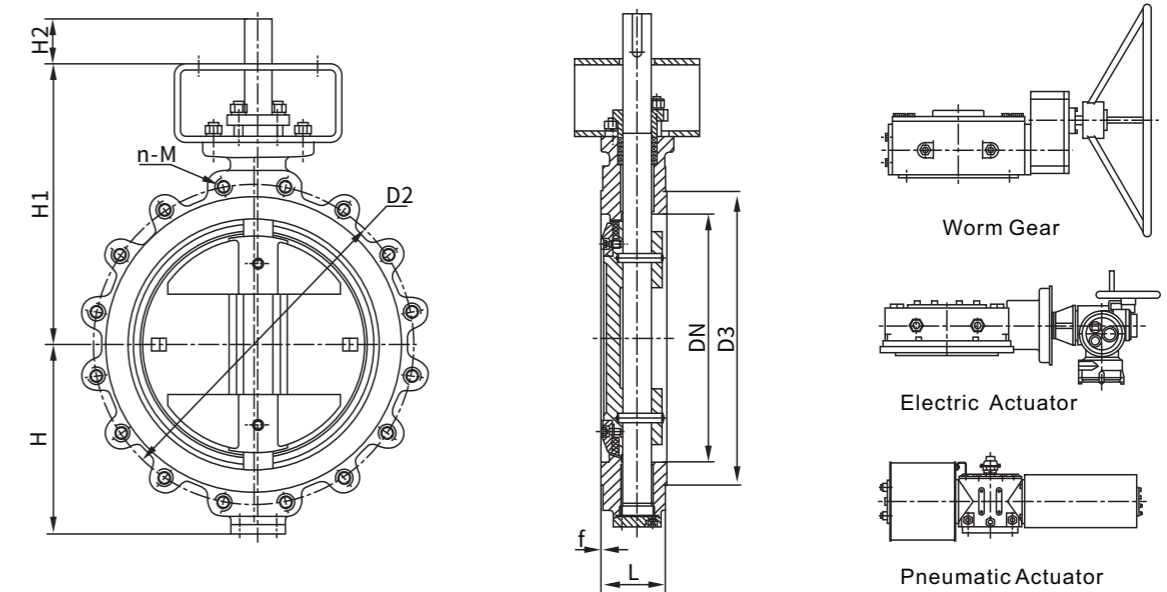
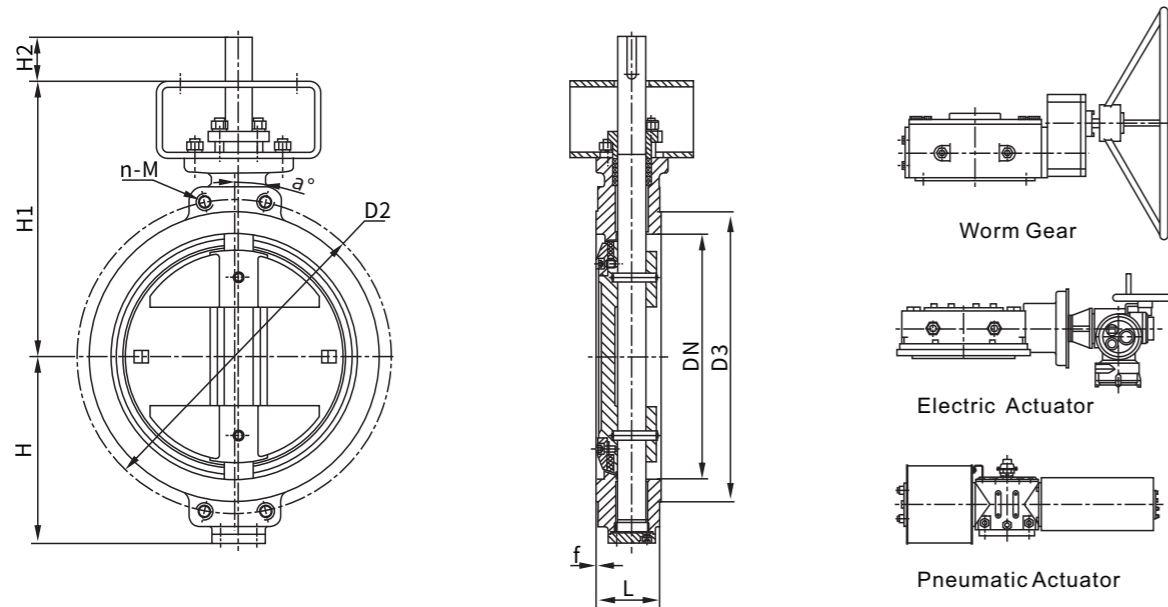
PN 16	DN	L	D2	D3	f	a°	n-M	ISO5211	Nm	Weight	CV	H	H1	H2
	2"(DN50)	43	125	99	/	45	4-φ18	F07	26	5	58	72	178	40
	2.5"(DN65)	46	145	118	/	45	4-φ18	F07	30	6	109	80	189	40
	3"(DN80)	64	160	132	/	22.5	4-φ18	F07	60	10	165	95	199	40
	4"(DN100)	64	180	156	/	22.5	4-φ18	F07	100	11	318	110	209	40
	5"(DN125)	70	210	184	/	22.5	4-φ18	F10	240	15	648	165	250	60
	6"(DN150)	76	240	211	/	22.5	4-φ22	F10	340	21	932	185	270	60
	8"(DN200)	89	295	260	3	15	4-φ20	F12	720	32	1970	225	310	60
	10"(DN250)	114	355	312	/	15	4-φ26	F12	950	45	2689	260	345	60
	12"(DN300)	114	410	365	4	15	4-M24	F14	1300	80	3930	290	395	80
	14"(DN350)	127	470	429	4	11.25	4-M24	F16	2200	90	5290	338	455	80
	16"(DN400)	140	525	470	4	11.25	4-M27	F16	2340	110	7726	375	490	90
	18"(DN450)	152	585	520	4	9	4-M27	F16	3300	170	9856	405	520	90
	20"(DN500)	152	650	570	5	9	4-M30	F25	5000	190	12180	435	565	100
24"(DN600)	154	770	720	5	9	4-M33	F25	7000	290	19800	480	640	125	
28"(DN700)	165	840	794	5	7.5	4-M33	F25	11000	360	27600	520	670	150	
32"(DN800)	190	950	901	5	7.5	4-M36	F30	16000	480	35800	578	706	150	
36"(DN900)	203	1050	1001	5	6.428	4-M36	F30	22000	688	45600	650	790	150	
40"(DN1000)	216	1170	1112	5	6.428	4-M39	F35	28000	800	65320	720	885	150	
48"(DN1200)	254	1390	1328	5	5.625	4-M45	F35	37000	1400	96000	860	1020	180	

PN 25	DN	L	D2	D3	f	a°	n-M	ISO5211	Nm	Weight	CV	H	H1	H2
	2"(DN50)	43	125	99	/	45	4-φ18	F07	40	5.5	58	72	178	40
	2.5"(DN65)	46	145	118	/	22.5	4-φ18	F07	50	6.6	109	80	189	40
	3"(DN80)	64	160	132	/	22.5	4-φ18	F07	90	11	165	95	199	40
	4"(DN100)	64	190	156	/	22.5	4-φ22	F07	150	12.1	318	110	209	40
	5"(DN125)	70	220	184	/	22.5	4-φ26	F10	320	16.5	648	165	250	60
	6"(DN150)	76	250	211	/	22.5	4-φ26	F10	500	23.1	932	185	270	60
	8"(DN200)	89	310	274	3	15	4-φ24	F12	1020	35.2	1970	225	310	60
	10"(DN250)	114	370	312	3	15	4-φ30	F12	1300	49.5	2689	260	345	60
	12"(DN300)	114	430	389	4	11.25	4-M27	F14	1800	88	3930	290	395	80
	14"(DN350)	127	490	429	4	11.25	4-M30	F16	3200	99	5290	338	455	80
	16"(DN400)	140	550	503	4	11.25	4-M33	F16	3600	121	7726	375	490	90
	18"(DN450)	152	600	520	4	9	4-M33	F25	5200	187	9856	405	535	90
	20"(DN500)	152	660	570	5	9	4-M33	F25	6200	209	12180	435	565	100
24"(DN600)	154	770	720	5	9	4-M36	F25	10600	319	19800	480	640	125	
28"(DN700)	165	875	820	5	7.5	4-M39	F30	18000	396	27600	520	690	150	
32"(DN800)	190	990	928	5	7.5	4-M45	F35	30000	528	35800	585	815	150	
36"(DN900)	203	1090	1028	5	6.428	4-M45	F35	38000	756.8	45600	650	830	150	
40"(DN1000)	216	1210	1140	5	6.428	4-M52	F35	42000	880	65320	720	915	180	
48"(DN1200)	254	1420	1350	5	5.625	4-M52	F40	58000	1540	96000	860	1090	180	



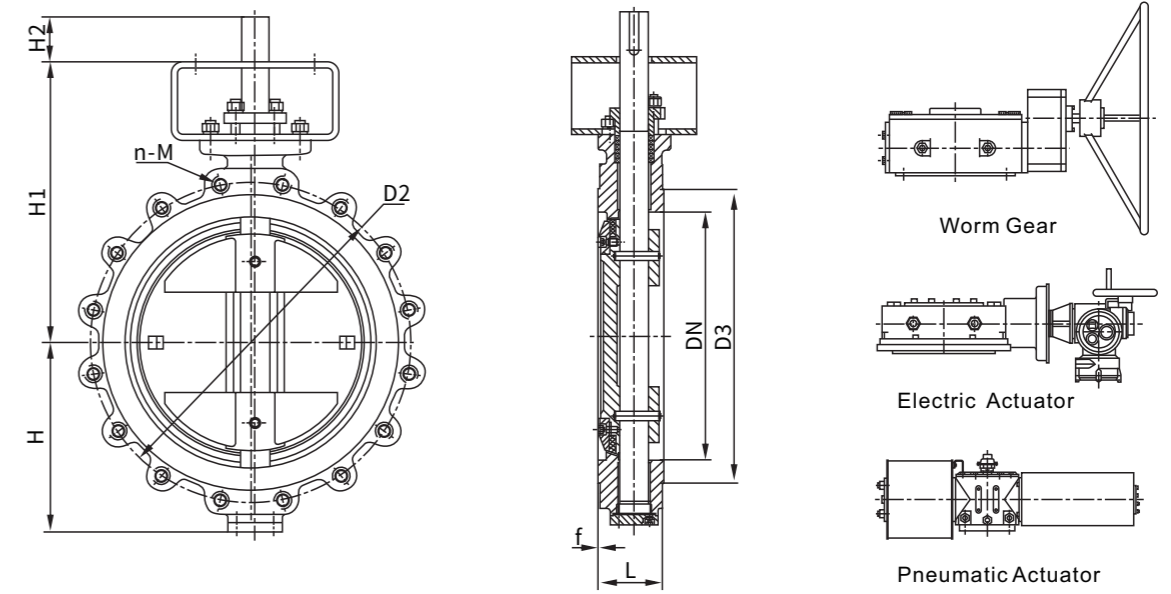
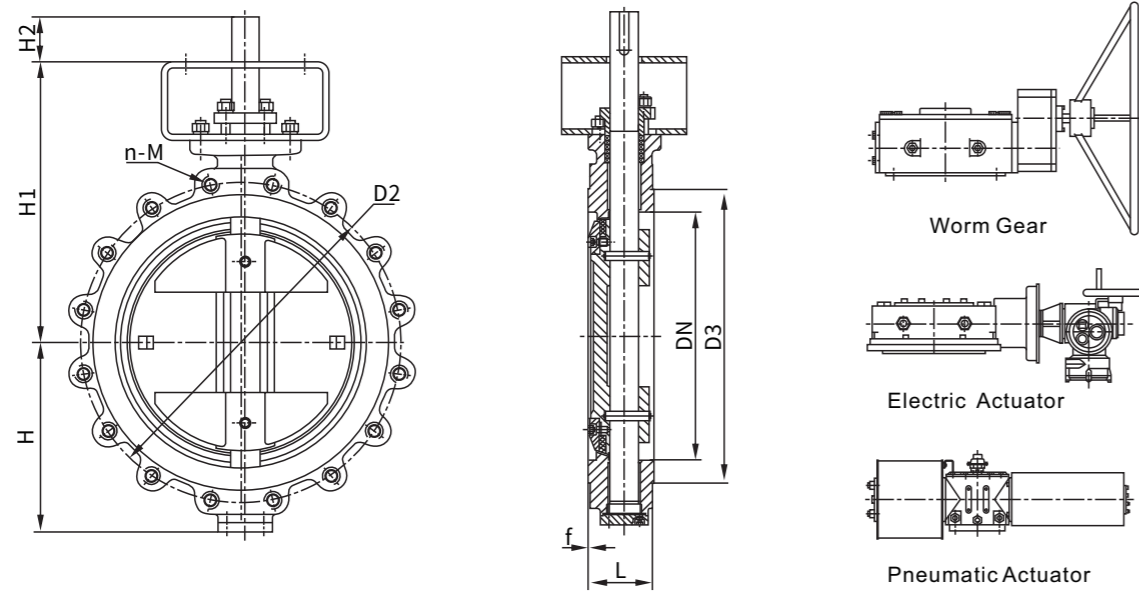
Class 150	DN	L	D2	D3	f	a°	n-M	ISO5211	Nm	Weight	CV	H	H1	H2
	2"(DN50)	43	120.7	92.1	/	/	/	/	F07	26	5	58	65	160
2.5"(DN65)	46	139.7	104.8	/	/	/	/	F07	32	6	109	85	167	40
3"(DN80)	48	152.4	127	/	/	/	/	F07	80	10	165	85	197	40
4"(DN100)	54	190.5	157.2	/	/	/	/	F07	142	11	318	107	204	40
5"(DN125)	57	215.9	185.7	/	/	/	/	F10	264	15	648	138	237	50
6"(DN150)	57	241.3	215.9	/	/	/	/	F10	362	21	932	147	272	60
8"(DN200)	64	298.5	269.9	/	/	/	/	F12	785	32	1970	185	307	60
10"(DN250)	71	362	323.8	/	/	/	/	F14	1080	45	2689	215	354	60
12"(DN300)	81	431.8	381	2	15	4-7/8-9UNC	F14	1510	80	3930	252	395	60	
14"(DN350)	92	476.3	412.8	2	15	4-1-8UNC	F16	2458	90	5290	287	445	80	
16"(DN400)	102	539.8	469.9	2	11.25	4-1-8UNC	F25	2850	110	7726	317	490	90	
18"(DN450)	114	577.9	533.4	2	11.25	4-1 1/8-8UN	F25	4536	170	9856	342	507	90	
20"(DN500)	127	635	584.2	2	9	4-1 1/8-8UN	F25	6200	190	12180	372	575	90	
22"(DN550)	154	692.2	641.4	2	9	4-1 1/8-8UN	F25	7300	250	15625	409	575	120	
24"(DN600)	154	749.3	692.2	2	9	4-1 1/8-8UN	F25	8240	290	19800	439	605	120	
26"(DN650)	165	744.5	711	2	5	8-3/4-10UNC	F30	10380	312	23850	510	645	120	
28"(DN700)	165	795.3	762	2	4.5	8-3/4-10UNC	F30	11682	392	27600	536	680	120	
30"(DN750)	190	846.1	813	2	4.09	8-3/4-10UNC	F30	14340	472	33700	580	710	150	
32"(DN800)	190	900.1	864	2	3.75	8-3/4-10UNC	F30	17856	528	35800	581	705	150	
34"(DN850)	203	957.3	921	2	4.5	8-7/8-9UNC	F30	23345	588	40400	636	825	150	
36"(DN900)	203	1009.6	972	2	4.09	8-7/8-9UNC	F30	27200	648	45600	675	850	150	
38"(DN950)	203	1070	1022	2	4.5	8-1-8UNC	F35	31000	784	50560	675	855	150	
40"(DN1000)	216	1120.8	1080	2	4.09	8-1-8UNC	F35	32000	926.4	56000	725	885	150	
42"(DN1050)	216	1171.6	1130	2	3.75	8-1-8UNC	F35	34000	960	61800	777	952	180	
44"(DN1100)	254	1222.4	1181	2	3.461	8-1-8UNC	F35	36000	1000	67800	786	965	180	
48"(DN1200)	254	1335.1	1289	2	3.75	8-1 1/8-8UNC	F40	45400	1496.8	82500	847	1020	180	
52"(DN1300)	279	1436.7	1391	2	3.461	8-1 1/8-8UNC	F40	56000	1600	104336	896	1080	180	
56"(DN1400)	279	1543	1492	2	3	8-1 1/8-8UNC	F40	70500	2000	121000	980	1205	200	
60"(DN1500)	318	1662.1	1600	2	3.461	8-1 1/4-8UNC	F40	86000	2500	160380	995	1225	200	

Class 300	DN	L	D2	D3	f	a°	n-M	ISO5211	Nm	Weight	CV	H	H1	H2
	2"(DN50)	43	127	92.1	/	/	/	/	F07	78	6	58	65	160
2.5"(DN65)	46	149.2	104.8	/	/	/	/	F07	88	7	109	85	167	40
3"(DN80)	48	168.3	127	/	/	/	/	F07	144	11	165	100	207	40
4"(DN100)	54	200	157.2	/	/	/	/	F07	258	13	318	120	222	45
5"(DN125)	59	235	185.7	2	22.5	4-3/4-10UNC	F10	412	21	648	165	272	60	
6"(DN150)	59	269.9	215.9	2	15	4-3/4-10UNC	F12	798	24	682	185	292	60	
8"(DN200)	73	330.2	269.9	2	15	4-7/8-9UNC	F14	1960	36	1230	215	345	80	
10"(DN250)	83	387.4	323.8	2	11.25	4-1-8UNC	F16	2270	57.6	2370	252	400	80	
12"(DN300)	92	450.8	381	2	11.25	4-1 1/8-8UN	F16	2780	80	3520	282	440	85	
14"(DN350)	117	514.4	412.8	2	9	4-1 1/8-8UN	F25	5680	110	4782	330	485	90	
16"(DN400)	133	571.5	469.9	2	9	4-1 1/4-8UN	F25	7800	160	6280	365	510	90	
18"(DN450)	149	628.6	533.4	2	7.5	4-1 1/4-8UN	F25	8956	240	7980	405	550	120	
20"(DN500)	159	685.8	584.2	2	7.5	4-1 1/4-8UN	F30	11518	300	10800	435	580	120	
22"(DN550)	181	743	641.4	2	7.5	4-1 1/2-8UN	F30	15800	350	13030	480	610	150	
24"(DN600)	181	812.8	692.2	2	7.5	4-1 1/2-8UN	F30	18393	400	16180	515	645	150	
26"(DN650)	229	803.3	737	2	5.625	8-1 1/4-8UN	F35	24000	500	19327	575	700	150	
28"(DN700)	229	857.2	787	2	5	8-1 1/4-8UN	F35	27478	656	22410	600	725	180	
30"(DN750)	229	920.8	845	2	5	8-1 3/8-8UN	F35	38971	800	27090	635	765	180	
32"(DN800)	241	977.9	902	2	5.625	8-1 1/2-8UN	F40	41150	928	33050	665	855	180	
34"(DN850)	241	1031.9	953	2	5	8-1 1/2-8UN	F40	48200	1000	37320	686	880	180	
36"(DN900)	241	1089	1010	2	5.625	8-1 5/8-8UN	F40	53700	1148	42090	712	920	180	
38"(DN950)	241	1139.8	1060	2	5	8-1 5/8-8UN	F40	63000	1280	47000	764	950	200	
40"(DN1000)	300	1190.6	1114	2	4.5	8-1 5/8-8UN	F40	68370	1420	48964	784	980	200	
42"(DN1050)	300	1244.6	1168	2	5	8-1 3/4-8UN	F40	75400	1560	53700	809	985	200	
44"(DN1100)	300	1295.4	1219	2	4.5	8-1 3/4-8UN	F40	82650	1800	62500	839	1010	200	
48"(DN1200)	360	1416	1327	2	4.5	8-1 7/8-8UN	F48	108000	2120	69350	916	1090	250	



Class 600	DN	L	D2	D3	f	a°	n-M	ISO5211	Nm	Weight	CV	H	H1	H2	
	2"(DN50)	54	127	92.1	7	22.5	4-5/8-11UNC	F07	162	7	42	82.5	190	40	
	2.5"(DN65)	54	149.2	104.8	7	22.5	4-3/4-10UNC	F07	208	9	72	95	210	40	
	3"(DN80)	54	168.3	127	7	22.5	4-3/4-10UNC	F10	340	13	107	100	227	40	
	4"(DN100)	64	215.9	157.2	7	22.5	4-7/8-9UNC	F12	633	42	250	120	242	60	
	5"(DN125)	78	266.7	185.7	7	22.5	4-1-8UNC	F12	960	45	416	188	282	60	
	6"(DN150)	78	292.1	215.9	7	15	4-1-8UNC	F16	1630	50	600	210	345	60	
	8"(DN200)	102	349.2	269.9	7	15	4-1 1/8-8UN	F16	3540	60	1079	245	380	80	
	10"(DN250)	117	431.8	323.8	7	11.25	4-1 1/4-8UN	F25	5462	105	1708	287	440	90	
	12"(DN300)	140	489	381	7	9	4-1 1/4-8UN	F25	6018	150	2620	315	475	90	
	14"(DN350)	155	527	412.8	7	9	4-1 3/8-8UN	F25	10913	220	4062	357	510	120	
	16"(DN400)	178	603.2	469.9	7	9	4-1 1/2-8UN	F30	15757	348.8	5292	401	570	150	
	18"(DN450)	200	654	533.4	7	9	4-1 5/8-8UN	F35	19805	509.6	7395	437	615	150	
	20"(DN500)	216	723.9	584.2	7	7.5	8-1 5/8-8UN	F35	25808	608	9320	543	670	150	
22"(DN550)	232	777.7	641.4	7	7.5	8-1 3/4-8UN	F40	40258	650	12260	560	705	180		
24"(DN600)	232	838.2	692.2	7	7.5	8-1 7/8-8UN	F40	44799	710.4	13578	597	735	180		

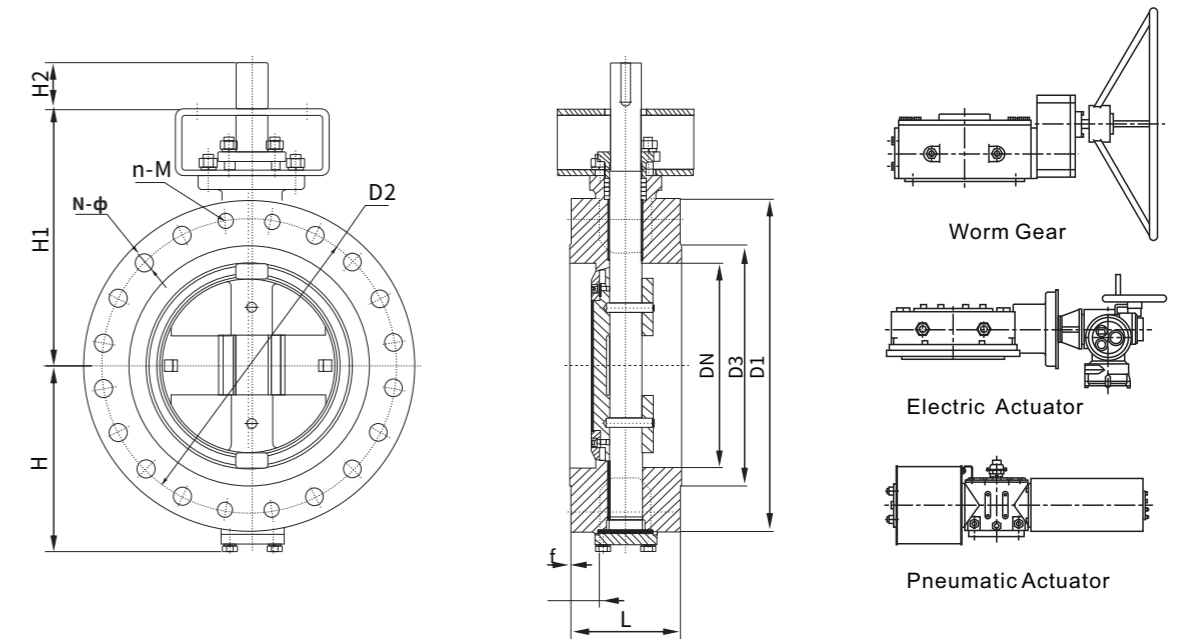
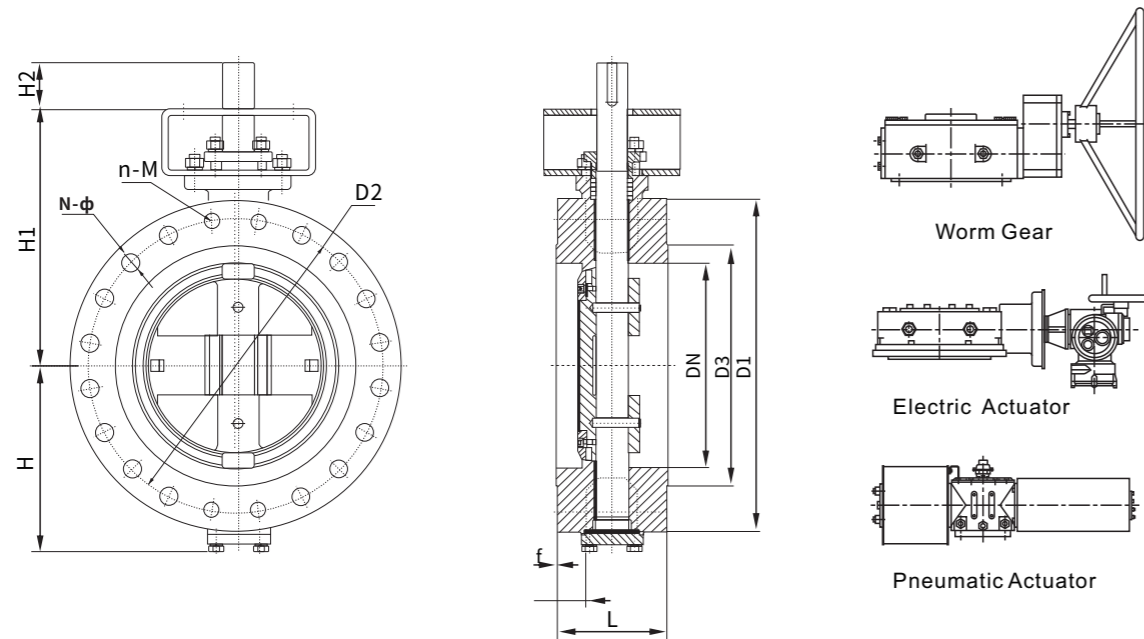
Class 150	DN	L	D2	D3	f	n-M	ISO5211	Nm	Weight	CV	H	H1	H2	
	2"(DN50)	43	120.7	92.1	2	4-5/8-11UNC	F07	26	5	58	65	160	40	
	2.5"(DN65)	46	139.7	104.8	2	4-5/8-11UNC	F07	32	6	109	85	167	40	
	3"(DN80)	48	152.4	127	2	4-5/8-11UNC	F07	80	8	165	85	197	40	
	4"(DN100)	54	190.5	157.2	2	8-5/8-11UNC	F07	142	12	318	107	204	40	
	5"(DN125)	57	215.9	185.7	2	8-3/4-10UNC	F10	264	20	648	138	237	50	
	6"(DN150)	57	241.3	215.9	2	8-3/4-10UNC	F10	362	25	932	147	272	60	
	8"(DN200)	64	298.5	269.9	2	8-3/4-10UNC	F12	785	36	1970	185	307	60	
	10"(DN250)	71	362	323.8	2	12-7/8-9UNC	F14	1080	60	2689	215	355	60	
	12"(DN300)	81	431.8	381	2	12-7/8-9UNC	F14	1510	80	3930	252	395	60	
	14"(DN350)	92	476.3	412.8	2	12-1-8UNC	F16	2458	120	5290	287	445	80	
	16"(DN400)	102	539.8	469.9	2	16-1-8UNC	F25	2850	140.8	7726	317	490	90	
	18"(DN450)	114	577.9	533.4	2	16-1 1/8-8UN	F25	4536	180	9856	342	507	90	
	20"(DN500)	127	635	584.2	2	20-1 1/8-8UN	F25	6200	220	12180	372	535	90	
	22"(DN550)	154	692.2	641.4	2	20-1 1/4-8UN	F25	7300	250	15625	409	575	120	
	24"(DN600)	154	749.3	692.2	2	20-1 1/4-8UN	F25	8240	300	19800	439	605	120	
	26"(DN650)	165	744.5	711	2	36-3/4-10UNC	F30	10380	400	23850	510	645	120	
	28"(DN700)	165	795.3	762	2	40-3/4-10UNC	F30	11682	456	27600	536	680	120	
	30"(DN750)	190	846.1	813	2	44-3/4-10UNC	F30	14340	512	33700	580	710	150	
	32"(DN800)	190	900.1	864	2	48-3/4-10UNC	F30	17856	560	35800	581	705	150	
	34"(DN850)	203	957.3	921	2	40-7/8-9UNC	F30	23345	620	40400	636	825	150	
	36"(DN900)	203	1009.6	972	2	44-7/8-9UNC	F30	27200	680	45600	675	850	150	
	38"(DN950)	203	1070	1022	2	40-1-8-UNC	F35	31000	850	50560	675	855	150	
	40"(DN1000)	216	1120.8	1080	2	44-1-8-UNC	F35	32000	1000	56000	725	885	150	
42"(DN1050)	216	171.6	1130	2	48-1-8-UNC	F35	34000	1136	61800	777	952	180		
44"(DN1100)	254	1222.4	1181	2	52-1-8-UNC	F35	36000	1200	67800	786	965	180		
48"(DN1200)	254	1335.1	1289	2	44-1 1/8-8UN	F40	45400	1337.6	82500	847	1020	180		



Class 300	DN	L	D2	D3	f	n-M	ISO5211	Nm	Weight	CV	H	H1	H2
	2"(DN50)	43	127	92.1	2	8-5/8-11UNC	F07	78	7	58	65	160	40
	2.5"(DN65)	46	149.2	104.8	2	8-3/4-10UNC	F07	88	9	109	85	167	40
	3"(DN80)	48	168.3	127	2	8-3/4-10UNC	F07	144	13	165	85	182	40
	4"(DN100)	54	200	157.2	2	8-3/4-10UNC	F07	258	18	318	100	204	45
	5"(DN125)	59	235	185.7	2	8-3/4-10UNC	F10	412	25	648	165	272	60
	6"(DN150)	59	269.9	215.9	2	12-3/4-10UNC	F12	798	32	682	185	292	60
	8"(DN200)	73	330.2	269.9	2	12-7/8-9UNC	F14	1960	51.2	1230	215	345	80
	10"(DN250)	83	387.4	323.8	2	16-1-8UNC	F16	2270	80	2370	252	400	80
	12"(DN300)	92	450.8	381	2	16-1 1/8-8UN	F16	2780	125.6	3520	282	440	85
	14"(DN350)	117	514.4	412.8	2	20-1 1/8-8UN	F25	5680	204	4782	330	485	90
	16"(DN400)	133	571.5	469.9	2	20-1/4-8UN	F25	7800	276.8	6280	365	510	90
	18"(DN450)	149	628.6	533.4	2	24-1 1/4-8UN	F25	8956	360	7980	405	550	120
	20"(DN500)	159	685.8	584.2	2	24-1 1/4-8UN	F30	11518	460	10800	435	580	120
22"(DN550)	181	743	641.4	2	24-1 1/2-8UN	F30	15800	550	13030	480	610	150	
24"(DN600)	181	812.8	692.2	2	24-1 1/2-8UN	F30	18393	630	16180	520	640	150	
26"(DN650)	229	803.3	737	2	32-1 1/4-8UN	F35	24000	630	19327	575	700	150	
28"(DN700)	229	857.2	787	2	36-1 1/4-8UN	F35	27478	800	22410	600	725	180	
30"(DN750)	229	920.8	845	2	36-1 3/8-8UN	F35	38971	960	27090	640	765	180	
32"(DN800)	241	977.9	902	2	32-1 1/2-8UN	F40	41150	1224	33050	665	855	180	
34"(DN850)	241	1031.9	953	2	36-1 1/2-8UN	F40	48200	1280	37320	686	880	180	
36"(DN900)	241	1089	1010	2	32-1 5/8-8UN	F40	53700	1336	42090	712	920	180	
38"(DN950)	241	1139.8	1060	2	36-1 5/8-8UN	F40	63000	1580	47000	764	950	200	
40"(DN1000)	300	1190.6	1114	2	40-1 5/8-8UN	F40	68370	1832	48964	784	980	200	
42"(DN1050)	300	1244.6	1168	2	36-1 3/4-8UN	F40	75400	2137.6	53700	809	985	200	
44"(DN1100)	300	1295.4	1219	2	40-1 3/4-8UN	F40	82650	2500	62500	839	1010	200	
48"(DN1200)	360	1416	1327	2	40-1 7/8-8UN	F48	10800	2880	69350	916	1090	250	

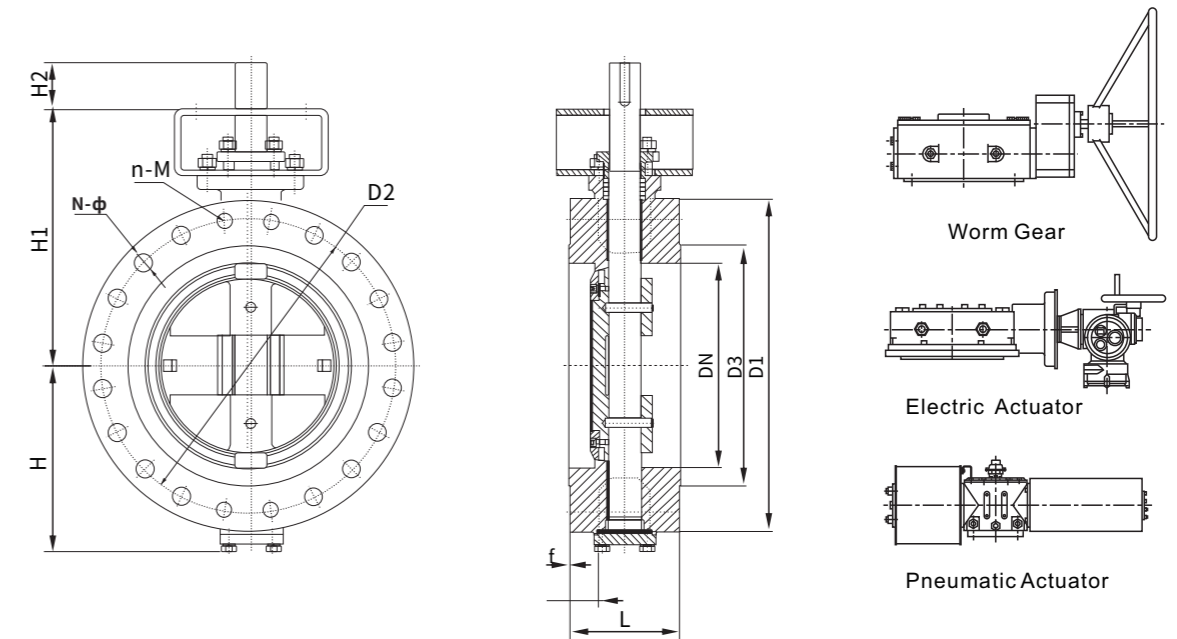
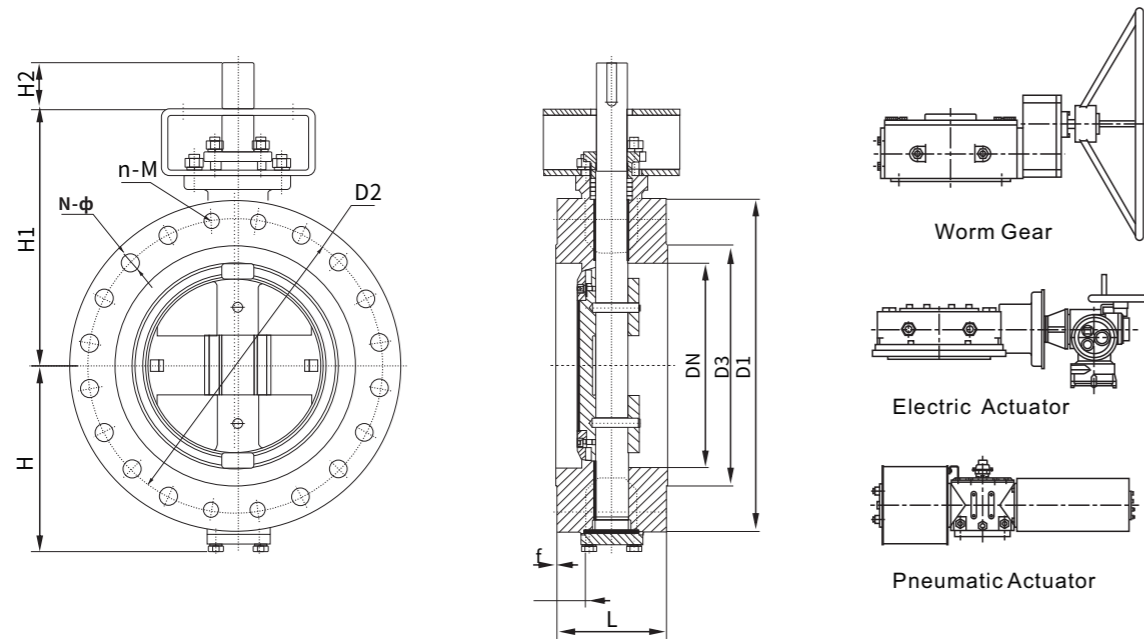
Class 600	DN	L	D2	D3	f	n-M	ISO5211	Nm	Weight	CV	H	H1	H2
	2"(DN50)	54	127	92.1	7	8-5/8-11UNC	F07	162	9	42	82.5	190	40
	2.5"(DN65)	54	149.2	104.8	7	8-3/4-10UNC	F07	208	13	72	95	210	40
	3"(DN80)	54	168.3	127	7	8-3/4-10UNC	F10	340	17	107	100	227	40
	4"(DN100)	64	215.9	157.2	7	8-7/8-9UNC	F12	633	25	250	120	243	60
	5"(DN125)	78	266.7	185.7	7	8-1-8UNC	F12	960	43	416	188	282	60
	6"(DN150)	78	292.1	215.9	7	12-1-8UNC	F16	1630	62	600	210	345	60
	8"(DN200)	102	349.2	269.9	7	12-1 1/8-8UN	F16	3540	100	1079	245	380	80
	10"(DN250)	117	431.8	323.8	7	16-1 1/4-8UN	F25	5462	140	1708	287	440	90
	12"(DN300)	140	489	381	7	20-1 1/4-8UN	F25	6018	210	2620	315	475	90
	14"(DN350)	155	527	412.8	7	20-1 3/8-8UN	F25	10913	350	4062	357	510	120
	16"(DN400)	178	603.2	469.9	7	20-1 1/2-8UN	F30	15757	530	5292	401	570	150
	18"(DN450)	200	654	533.4	7	20-1 5/8-8UN	F35	19808	720	7395	437	615	150
	20"(DN500)	216	723.9	584.2	7	24-1 5/8-8UN	F35	25808	890	9320	543	670	150
22"(DN550)	232	777.7	641.4	7	24-1 3/4-8UN	F40	40258	1000	12260	560	705	180	
24"(DN600)	232	838.2	692.2	7	24-1 7/8-8UN	F40	44799	1280	13578	597	735	180	





PN 6	DN	L	D1	D2	D3	N-φ	n-M	b	f	ISO5211	Nm	Weight	CV	H	H1	H2
2"(DN50)	108	140	110	88	4-φ14	/	16	3	F07	26	14	58	72	178	40	
2.5"(DN65)	112	160	130	108	4-φ14	/	16	3	F07	30	17	109	80	189	40	
3"(DN80)	114	190	150	124	4-φ18	/	18	3	F07	45	20	165	95	199	40	
4"(DN100)	127	210	170	144	4-φ18	/	18	3	F07	60	24	318	105	209	40	
5"(DN125)	140	240	200	174	8-φ18	/	20	3	F10	100	36	648	165	250	60	
6"(DN150)	140	265	225	199	8-φ18	/	20	3	F10	180	40	932	185	270	60	
8"(DN200)	152	320	280	254	8-φ18	/	22	3	F12	320	62	1970	225	310	60	
10"(DN250)	165	375	335	309	12-φ18	/	24	3	F12	420	80	2689	260	345	60	
12"(DN300)	178	440	395	363	12-φ22	/	24	4	F14	700	100	3930	280	375	80	
14"(DN350)	190	490	445	413	12-φ22	/	24	4	F16	1600	112	5290	315	430	80	
16"(DN400)	216	540	495	463	16-φ22	/	24	4	F16	1700	136	7726	345	465	80	
18"(DN450)	222	595	550	518	12-φ22	/	24	4	F16	1800	176	9856	370	505	90	
20"(DN500)	229	645	600	568	20-φ222	/	26	4	F16	2200	255	12180	410	525	100	
24"(DN600)	267	755	705	667	20-φ26	/	26	5	F25	4600	324	19800	440	605	125	
28"(DN700)	292	860	810	772	24-φ26	/	26	5	F25	5000	475	34900	480	650	150	
32"(DN800)	318	975	920	878	24-φ30	/	26	5	F25	7000	600	46300	578	711	150	
36"(DN900)	330	1075	1020	978	24-φ30	/	26	5	F25	9500	712	60700	615	765	150	
40"(DN1000)	410	1175	1120	1078	28-φ30	/	26	5	F25	12000	880	75700	665	815	150	
48"(DN1200)	470	1405	1340	1295	32-φ33	/	28	5	F35	26000	1135	110000	760	965	150	
56"(DN1400)	530	1630	1560	1510	36-φ36	/	32	5	F35	38000	1600	151000	925	1120	180	
64"(DN1600)	600	1830	1760	1710	40-φ36	/	34	5	F35	48000	2200	232000	1030	1240	180	
72"(DN1800)	670	2045	1970	1918	44-φ39	/	36	5	F40	68000	2800	296000	1130	1365	250	
80"(DN2000)	540	2265	2180	2125	48-φ42	/	38	5	F48	88000	4000	380000	1250	1520	250	

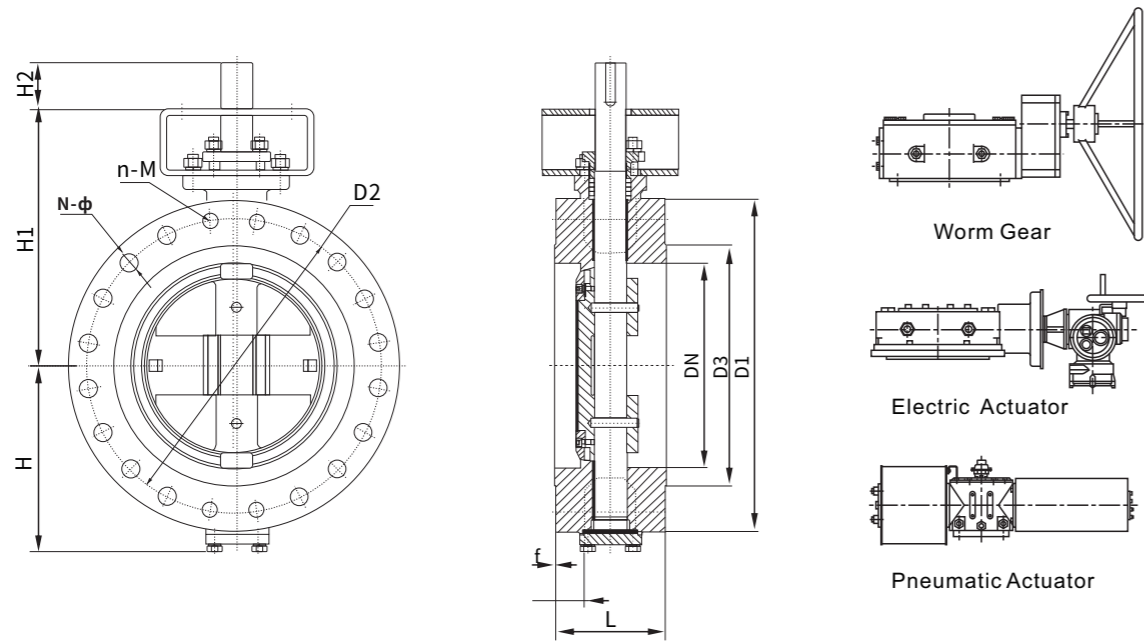
PN 10	DN	L	D1	D2	D3	N-φ	n-M	b	f	ISO5211	Nm	Weight	CV	H	H1	H2
2"(DN50)	108	165	125	99	4-φ18	/	20	3	F07	26	14	58	72.5	178	40	
2.5"(DN65)	112	185	145	118	4-φ18	/	20	3	F07	30	17	109	92.5	189	40	
3"(DN80)	114	200	160	132	8-φ18	/	20	3	F07	50	20	165	100	199	40	
4"(DN100)	127	220	180	156	8-φ18	/	22	3	F07	80	24	318	100	209	40	
5"(DN125)	140	250	210	184	8-φ18	/	22	3	F10	120	36	648	165	250	60	
6"(DN150)	140	285	240	211	8-φ1822	/	24	3	F10	240	40	932	185	270	60	
8"(DN200)	152	340	295	266	8-φ22	/	24	3	F12	480	62	1970	225	310	60	
10"(DN250)	165	395	350	319	12-φ22	/	26	3	F12	760	80	2689	260	345	60	
12"(DN300)	178	445	400	370	12-φ22	/	26	4	F14	850	100	3930	280	375	80	
14"(DN350)	190	505	460	429	16-φ22	/	26	4	F16	1800	124	5290	315	430	80	
16"(DN400)	216	565	515	480	16-φ26	/	26	4	F16	2000	145	7726	345	465	80	
18"(DN450)	222	615	565	530	20-φ26	/	28	4	F16	2509	195	9856	370	505	90	
20"(DN500)	229	670	620	582	20-φ26	/	28	4	F16	3200	245	12180	410	525	100	
24"(DN600)	267	780	725	682	20-φ30	/	30	5	F25	6350	330	19800	440	605	125	
28"(DN700)	292	895	840	794	24-φ30	/	30	5	F25	6800	470	27600	528.5	650	150	
32"(DN800)	318	1015	950	901	24-φ33	/	32	5	F25	10050	625	35800	580	730	150	
36"(DN900)	330	1115	1050	1001	28-φ33	/	34	5	F25	12500	760	45600	650	790	150	
40"(DN1000)	410	1230	1160	1112	28-φ36	/	34	5	F35	30000	970	65320	720	885	150	
48"(DN1200)	470	1455	1380	1328	32-φ39	/	38	5	F35	30000	1630	96000	830	1000	150	
56"(DN1400)	530	1675	1590	1530	36-φ42	/	42	5	F40	45000	2100	139700	980	1185	180	
64"(DN1600)	600	1915	1820	1750	40-φ48	/	46	5	F40	75000	3400	176000	1055	1325	250	
72"(DN1800)	670	2115	2020	1950	44-φ48	/	50	5	F48	100000	4200	250000	1155	1430	250	
80"(DN2000)	540	2325	2230	2150	48-φ48	/	54	5	F48	130000	5200	360000	1250	1520	250	



PN 16	DN	L	D1	D2	D3	N-φ	n-M	b	f	ISO5211	Nm	Weight	CV	H	H1	H2
2"(DN50)	108	165	125	99	4-φ18	/	20	3	F07	26	14	58	82.5	178	40	
2.5"(DN65)	112	185	145	118	4-φ18	/	20	3	F07	30	17	109	92.5	189	40	
3"(DN80)	114	200	160	132	8-φ18	/	20	3	F07	60	20	165	100	199	40	
4"(DN100)	127	220	180	156	8-φ18	/	22	3	F07	100	24	318	110	209	40	
5"(DN125)	140	250	210	184	8-φ18	/	22	3	F10	240	36	648	165	250	60	
6"(DN150)	140	285	240	211	8-φ22	/	24	3	F10	340	40	932	185	270	60	
8"(DN200)	152	340	295	266	12-φ22	/	24	3	F12	720	62	1970	225	310	60	
10"(DN250)	165	405	355	319	12-φ26	/	26	3	F12	950	80	2689	260	345	60	
12"(DN300)	178	460	410	370	12-φ26	/	28	4	F14	1300	115	3930	290	395	80	
14"(DN350)	190	520	470	429	16-φ26	/	30	4	F16	2200	140	5290	338	455	80	
16"(DN400)	216	580	525	480	16-φ30	/	32	4	F16	2340	170	7726	375	490	80	
18"(DN450)	222	640	585	548	20-φ30	/	34	4	F16	3300	220	9856	370	505	90	
20"(DN500)	229	715	650	609	20-φ33	/	36	4	F25	5000	260	12180	435	565	100	
24"(DN600)	267	840	770	720	20-φ36	/	38	5	F25	7000	450	19800	486	635	125	
28"(DN700)	292	910	840	794	24-φ36	/	40	5	F25	11000	580	27600	529	670	150	
32"(DN800)	318	1025	950	901	24-φ39	/	42	5	F30	16000	750	35800	580	730	150	
36"(DN900)	330	1125	1050	1001	28-φ39	/	44	5	F30	22000	890	45600	650	790	150	
40"(DN1000)	410	1255	1170	1112	28-φ43	/	46	5	F35	28000	1100	65320	720	885	150	
48"(DN1200)	470	1485	1390	1328	32-φ48	/	52	5	F35	37000	1600	96000	843	1035	180	
56"(DN1400)	530	1685	1590	1530	36-φ48	/	58	5	F40	58000	2500	139700	980	1185	180	
64"(DN1600)	600	1930	1820	1750	40-φ56	/	64	5	F48	105000	3600	176000	1110	1335	250	
72"(DN1800)	670	2130	2020	1950	44-φ56	/	68	5	F48	156000	5000	250000	1155	1430	250	
80"(DN2000)	540	2345	2230	2150	48-φ62	/	70	5	F60	210000	5600	360000	1275	1545	290	

PN 25	DN	L	D1	D2	D3	N-φ	n-M	b	f	ISO5211	Nm	Weight	CV	H	H1	H2
2"(DN50)	108	165	125	99	4-φ18	/	20	3	F07	40	14	58	82.5	178	40	
2.5"(DN65)	112	185	145	118	8-φ18	/	22	3	F07	50	17	109	92.5	189	40	
3"(DN80)	114	200	160	132	8-φ18	/	24	3	F07	90	20	165	100	199	40	
4"(DN100)	127	235	190	156	8-φ22	/	24	3	F07	150	24	318	117.5	209	40	
5"(DN125)	140	270	220	184	8-φ26	/	26	3	F10	320	36	648	165	250	60	
6"(DN150)	140	300	250	211	4-φ26	4-M24	28	3	F10	500	44	932	182	270	60	
8"(DN200)	152	360	310	274	8-φ26	4-M24	30	3	F10	1020	68.2	1970	225	310	60	
10"(DN250)	165	425	370	330	8-φ30	4-M27	32	3	F12	1300	88	2689	260	345	60	
12"(DN300)	178	485	430	389	12-φ30	4-M27	34	4	F14	1800	126.5	3930	290	395	80	
14"(DN350)	190	555	490	448	-12-φ33	4-M30	38	4	F16	3200	154	5290	338	455	80	
16"(DN400)	216	620	550	503	12-φ36	-M33	40	4	F16	3600	1897	7726	375	490	80	
18"(DN450)	222	670	600	548	16-φ36	4-M33	42	4	F25	5200	242	9856	405	505	90	
20"(DN500)	229	730	660	609	16-φ36	4-M33	44	4	F25	6200	286	12180	435	565	100	
24"(DN600)	267	845	770	720	16-φ39	4-M36	46	5	F25	10600	495	19800	480	635	125	
28"(DN700)	292	960	875	820	20-φ43	4-M39	50	5	F30	18000	638	27600	528.5	690	150	
32"(DN800)	318	1085	990	928	20-φ48	4-M45	54	5	F35	30000	825	35800	585	815	150	
36"(DN900)	330	1185	1090	1028	24-φ48	4-M45	58	5	F35	38000	797	45600	650	830	150	
40"(DN1000)	410	1320	1210	1140	24-φ56	4-M52	62	5	F35	42000	1210	65320	720	915	150	
48"(DN1200)	470	1530	1420	1350	32-φ56	/	70	5	F40	58000	1760	96000	860	1090	180	
56"(DN1400)	530	1755	1640	1560	36-φ62	/	76	5	F48	88000	2750	139700	985	1230	200	
64"(DN1600)	600	1975	1860	1780	40-φ62	/	84	5	F48	140000	3960	165000	1110	1335	250	





Class600	DN	L	D1	D2	D3	N-φ	n-M	b	f	ISO5211	Nm	Weight	CV	H	H1	H2
	2" (DN50)	150	165	127	92.1	4-φ19.1	4-5/8-11UNC	32.4	7	F07	162	42	42	82.5	190	40
	2.5" (DN65)	170	190	149.2	104.8	4-φ22.2	4-3/4-10UNC	35.6	7	F07	208	72	72	95	210	40
	3" (DN80)	180	210	168.3	127	4-φ22.2	4-3/4-10UNC	38.8	7	F10	340	107	107	105	242	40
	4" (DN100)	190	275	215.9	157.2	4-φ25.4	4-7/8-9UNC	45.1	7	F12	633	250	250	137.5	242	60
	5" (DN125)	200	330	266.7	185.7	4-φ28.6	4-1-8UNC	51.5	7	F12	960	416	416	188	282	60
	6" (DN150)	210	355	292.1	215.9	8-φ28.6	4-1-8UNC	54.7	7	F16	1630	600	600	210	345	65
	8" (DN200)	230	420	349.2	269.9	8-φ31.8	4-1 1/8"-8UN	62.6	7	F16	3540	1079	1079	2	380	80
	10" (DN250)	250	510	431.8	323.8	12-φ34.9	4-1 1/4-8UN	70.5	7	F25	5462	1708	1708	292	440	90
	12" (DN300)	270	560	489	381	16-φ34.9	4-1 1/4-8UN	73.7	7	F25	6018	2620	2620	320	465	90
	14" (DN350)	290	605	527	412.8	16-φ38.1	4-1 3/8-8UN	76.9	7	F25	10913	4062	4062	350	527	120
	16" (DN400)	310	685	603.2	469.9	16-φ41.3	4-1 1/2-8UN	83.2	7	F30	15757	5292	5292	05	570	150
	18" (DN450)	330	745	654	533.4	16-φ44.5	4-1 5/8-8UN	89.6	7	F35	19805	7395	7395	440	615	150
	20" (DN500)	350	815	723.9	584.2	16-φ44.5	8-1 5/8-8UN	95.9	7	F35	25808	9320	9320	543	670	150
	22" (DN550)	370	870	777.7	641.4	16-φ47.6	8-13/4-8UN	102.2	7	F40	40258	12260	12260	560	105	180
24" (DN600)	390	940	838.2	692.2	16-φ50.8	8-1 7/8-8UN	108.6	7	F40	44799	13578	13578	597	735	180	
26" (DN650)	410	890	806.4	727	20-φ44.5	8-1 5/8-8UN	118.2	7	F40	54490	16490	16490	90	130	180	
28" (DN700)	430	950	863.6	784	20-φ47.6	8-1 3/4-8UN	122.9	7	F40	66593	20326	20326	62	780	180	
30" (DN750)	450	1020	927.1	841	20-φ50.8	8-1 7/8-8UN	132.5	7	F48	79506	23400	23400	675	850	180	
32" (DN800)	470	1085	984.2	895	20-φ54	8-2-8UN	137.2	7	F48	90160	26370	26370	705	890	200	
36" (DN900)	510	1215	11049	1010	20-φ60.3	8-2 1/4-8UN	153.1	7	F48	117500	32816	32816	760	970	250	

Item	Project Location	Client	Project Name	Order product	Specifications of Valves Supplied	Qty	Year of supply
1	Argentina	Duralitte.	N/A	Gate Valve	3000PSI 2 1/16"	NA	2023
2	CZECH	Armatury KLAD SPOL,s.r.o	N/A	Cryogenic Ball Valve	PN 16-100 DN50-800	NA	2022
3	FRANCE	AIMCO TERM	N/A	Ball valve	150LB DN600	NA	2022
4	GERMANY	Fromme armaturen	N/A	Extended stem Ball Valve	PN150 DN200	37	2020
5	SPAIN	IBERFLUID INSTRUMENTS	INTEGRATED SOLAR COMBINED CYCLE	Cryogenic Ball Valve Check Valve	150LB- DN 200 - DN400 900LB DN300-DN450	12 15	2020
6	SPAIN	IBERFLUID INSTRUMENTS	Repsol	Ball Valve, Butterfly Valve	600LB 14"-20"	65	2021
7	SPAIN	IBERFLUID INSTRUMENTS	Ute Abener Hassi R'mel Construction	Butterfly Valve, Gate Valve	900-1500LB 8"-14"	NA	2021
8	SPAIN	ATC NEVA SYSTEMS, S.L.	N/A	Gate Valve Check valve, Ball valve	800LB DN15-DN50	NA	2023
9	UK	Tullow Oil	Ten Project	Butterfly Valve	150LB DN 150 - DN 400	149	2021
				Ball Valve	900LB DN200-DN400 900LB DN500	12 17	2021
10	UK	ALCO	N/A(including many small orders)	Ball Valve	300LB 3"-6"	NA	2021
11	UK	LFF	RUMAILA Project	Ball Valve	150LB- DN 250 - DN 750 1500LB DN25 - DN50 900 LB DN400 600 LB DN 750	94 118 22 14	2021
12	DUBAI	EVERN	Rumaila	Ball Valve F55 A105+625	150LB DN 400 - DN 900 300LB DN 400 - DN 900 600LB DN 400 - DN 900	53 42 24	2020
13	INDIA	BDK Engineering Industries Limited	N/A	Gate Valve	600LB DN 400 - DN 600 900 LB DN800 1500 LB DN1000	61 15 3	2021
				Ball Valve	900 LB DN800 600 LB DN1100 900LB DN1000	5 3 9	2021
14	IRAQ	BOC	RUMAILA	Ball Valve, Check Valve	150LB-1500LB 1/2"-32"	NA	2020
15	IRAQ	BP	RUMAILA	Metal hard seal Trunnion ball valve	2500LB DN50 1500LB DN50-DN300 1500LB DN400 1500LB DN500	120 32 12 16	2020
16	KOREA	Abei	KLPE-PKG-3	Cryogenic Ball Valve, Check Valve Gate Valve	600LB 2"-16"	NA	2019
17	MALAYSIA	Mukuni	99010DL25910515	Butterfly Valve 4A	600LB DN 350 2500LB DN200	NA NA	2021
				Ball Valve	900LB DN350 900LB DN 800	NA NA	2021
18	MALAYSIA	Petronas	Tinggi A Platform Maintenan	F316 Ball Valves, Butterfly Valves	1500LB,2500LB 4",12"x10",14"x12"	NA	2021
19	MALAYSIA	Mukuni	99010DL25910515	Ball valve ,F51	900LB 2"-16"	NA	2021
20	Oman	Petrostar	OT MODIFICATION NEW TEC	Check Valve	150LB, 900LB 2"	NA	2020
21	Oman	Petrostar	MP 10892 - MARMUL	Check Valve	150LB,900LB 14"-20"	NA	2020
22	QUATAR	Petrogas group	N/A	Ball valve,gate valve	900LB-1500LB 4"-20"	NA	2020
23	Sultanate of Oman	OOCEPOman Oil Company Exploration & Production LLC (OOCEP)	ABB PROJECT	Trunnion Mounted Ball Valve	1500LB DN50-DN80 150LB DN100-DN500 300LB DN800 600LB DN1300 900LB DN1300	43 24 5 6 10	2016
24	SINGAPORE	Singore HydroPower Station	N/M	Ball Valve, Butterfly Valve	300LB-2500LB 6"-10"	NA	2020
25	THAILAND	EGAT Mae Moh Mine, Thailand	TPCH01(Boiler)	Ball Valve, Butterfly Valve	600LB-2500LB 4"-8"	NA	2019
26	THAILAND	Energy Qtech	N/A	Butterfly Valve, Ball Valve	150LB-900LB 6"-12"	NA	2020
27	TURKEY	FAF	N/A	Ball Valve,F316	2500LB 2"-8"	NA	2020
28	TURKEY	Hektomuhendislik	N/A	Butterfly Valve	150LB-600LB 3"-9"	NA	2020
29	VIETNAM	Hai Phong Vietnam II	Hai Phong Vietnam II*300 MW Power Plant	Control Valve	PN16 DN25-DN150	NA	2020
30	VIETNAM	Datong Coal Mine Group Tonghua Power Station	N/M	Electricity Ball Valve, Hydro Control Butterfly Valve	300LB-900LB 8"-24"	NA	2020