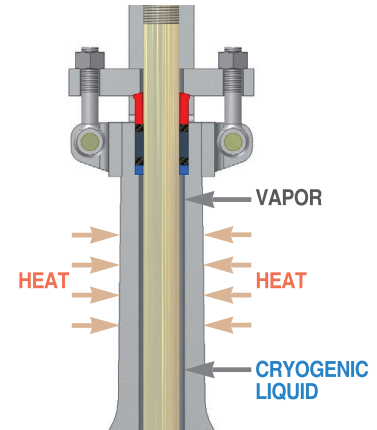


CRYOGENIC VALVE

CRYOGENIC SERVICE VALVE

Cryogenic valve are specially engineered and designed for piping systems used in the storage and transport of liquefied gasses such as LNG and liquid nitrogen and oxygen. The main structural feature of these valve is an extended bonnet with an enclosed vapor chamber to isolate packing from the cryogenic fluid and thereby allow packing to function properly. PK Valve Cryogenic designs and liquid nitrogen testing facilities go much further to assure proven performance in this most demanding application.



MATERIAL

Materials suitable for working condition must be adopted for low temperature VALVE.

Especially in petrochemical industry, the types of fluids to be processed are different according to each section even in the same plants.

At the same time, the temperatures used are also different. A full consideration must be paid to the selection of material.

BODY AND BONNET

As for the materials constituting the low temperature valve, special consideration must be paid to the materials used at pressure parts as in the case of body and bonnet.

BODY MATERIAL	SERVICE TEMPERATURE		BOLT	NUT
	°F	°C		
CARBON STEEL(GRADE LCB)	-50	-46	A320 GR. L7	A194 GR. 4
C-1/2Mo(GRADE LC1)	-75	-59	A320 GR. L7	A194 GR. 4
2 1/2NI(GRADE LC2)	-100	-73	A320 GR. L7	A194 GR. 4
3 1/2NI(GRADE LC3)	-150	-101	A320 GR. L7	A194 GR. 4
TYPE 304(GRADE CF8)	-425	-254	A320 GR. B8	A194 CR. 8
TYPE 304(GRADE CF3)	-425	-254	A320 GR. B8	A194 CR. 8
TYPE 316(GRADE CF8M)	-425	-254	A320 GR. B8	A194 CR. 8
TYPE 316L(GRADE CF3M)	-425	-254	A320 GR. B8	A194 CR. 8

TRIM

Following the body and bonnet, selection of materials for main parts such as stem, seat ring, and gland is very important. We adopt austenite stainless steel.

PACKING

Teflon or other plastic packing protecting from shrinkage by large column of insulating gas.

SEATING SURFACE

Stellite 6 for all medium and high pressure application prevents seizing and galling.

BOLT AND NUT

Material for bolts at low temperatures requires especially strength. Therefore, rigidity at low temperature is demanded and brittleness at low temperature of steel material can be improved generally by heat treatment. We use it according to ASTM standard.

TABLE OF LIQUEFIED GASSES

TYPE	BOILING POINT	
	°F	°C
NATURAL GAS, LNG	-270	-168
METHANE, CH ₄	-258	-162
OXYGEN, O ₂	-296	-183
ARGON, AR	-303	-186
CARBON DIOXIDE, CO ₂	-314	-192
NITROGEN, N ₂	-320	-196
HYDROGEN, H ₂	-423	-253
HELIUM, HE	-452	-269

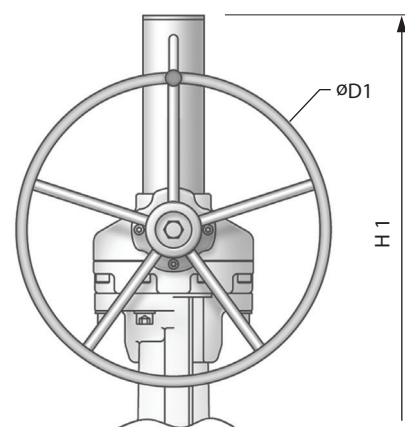
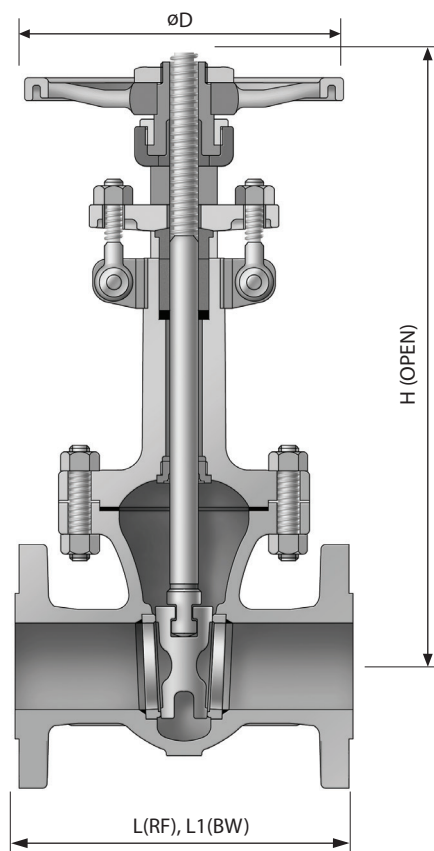
PRODUCTION MATERIALS

ASTM : A351-CF8, CF8M, CF3, CF3M or Equivalent

CLASS TYPE	UNIT : NPS					
	150	300	600	900	1500	2500
GATE	2-60	2-48	2-36	2-24	2-16	2-16
GLOBE	2-36	2-36	2-30	2-20	2-12	2-12
SWING CHECK	2-48	2-48	2-36	2-24	2-16	2-16
BALL	1/2 - 60	1/2 - 60	1/2 - 48	1/2 - 36	1/2 - 24	1/2 - 16
BUTTERFLY	2-52					



GATE VALVE



GOV (GEAR OPERATED)

END CONNECTION

- R.F FLANGED ENDS TO ASME B16.5
- B.W. ENDS TO ASME B16.25
- R.T.J FLANGED ENDS TO ASME B16.5
- SIZE 26" AND LARGER, FLANGED ENDS ACCORDING TO ASME B16.47 SER.A OR SER.B
- CONSULT US FOR LARGER SIZE

STANDARD MATERIAL SPECIFICATIONS

NO.	PART NAME	MATERIAL	
1	BODY	A351 - CF8	A351 - CF8M
2	BONNET	A351 - CF8	A351 - CF8M
3	WEDGE	A351 - CF8+STL	A351 - CF8M+STL
4	STEM	A479 - 304	A479 - 316
5	HAND WHEEL	A197	A197
6	BODY SEAT RING	A240 - 304+ STL	A240 - 316+STL
7	BACK SEAT RING	A479 - 304	A479 - 316
8	GASKET	SPIRAL WOUND / GRAPHITE+316+316	
9	PACKING	GRAPHITE+GRAPHITE WITH INCONEL WIRE	
10	GLAND FLANGE	A351 - CF8	A351 - CF8
11	HINGE BOLT	A193 - B8	A193 - B8
12	HINGE NUT	A194 - 8	A194 - 8
13	HINGE PIN	A479 - 304	A479 - 304
14	PACKING GLAND	A479 - 304	A479 - 316
15	BONNET BOLT	A320 - B8 CL.2	A320 - B8 CL.2
16	BONNET NUT	A194 - 8	A194 - 8
17	YOKE CAP	304 S.S	304 S.S
18	YOKE SLEEVE	AL-BRONZE	AL-BRONZE
19	HANDLE NUT	A47 - 32510+Zn	A47 - 32510+Zn
20	SET SCREW	STEEL+ Cr	STEEL+ Cr
21	NIPPLE	STEEL+ Cr	STEEL+ Cr
22	YOKE	A351 - CF8	A351 - CF8
23	STUFFING RING	A479 - 304	A479 - 316
24	GEAR BOX	DUCTILE IRON	DUCTILE IRON
25	STEM COVER	A53	A53

DIMENSION AND WEIGHT

CLASS 150

UNIT : mm

SIZE	2	3	4	6	8	10	12	14	16	18	24	28	30
L	177.8	203.2	228.6	266.7	292.1	330.2	355.6	381.0	406.4	431.8	1143.0	1346.2	1397.0
L1	215.9	282.5	304.8	403.4	419.1	457.2	501.7	571.5	609.6	660.4	1143.0	1346.2	1397.0
D	200	224	250	355	355	355	-	-	-	-	-	-	-
D1	-	-	-	250	250	355	355	355	500	500	710	800	800
H	653	763	844	1045	1222	1458	-	-	-	-	-	-	-
H1	-	-	-	1175	1323	1587	1835	2080	2314	2350	2986	3552	3716

CLASS 300

UNIT : mm

SIZE	2	3	4	6	8	10	12	14	16	18	20	24	28
L	215.9	282.4	304.8	403.4	419.1	457.2	501.7	762.0	838.2	914.4	990.6	1143.0	1346.2
L1	215.9	282.4	304.8	403.4	419.1	457.2	501.7	762.0	838.2	914.4	990.6	1143.0	1346.2
D	200	224	250	355	400	450	-	-	-	-	-	-	-
D1	-	-	-	250	355	355	355	500	500	630	630	710	800
H	676	766	851	1021	1278	1479	-	-	-	-	-	-	-
H1	-	-	-	1154	1457	1602	1853	1980	2316	2393	2663	2986	3552

CLASS 600

UNIT : mm

SIZE	2	3	4	6	8	10	12	14	16	18	20	26
L	292.1	355.6	431.8	558.8	660.4	787.4	838.2	889.0	990.6	1092.2	1193.8	1447.8
L1	292.1	355.6	431.8	558.8	660.4	787.4	838.2	889.0	990.6	1092.2	1193.8	1447.8
D	200	250	355	450	500	-	-	-	-	-	-	-
D1	-	-	-	355	500	500	630	630	710	710	800	900
H	674	785	879	1084	1326	-	-	-	-	-	-	-
H1	-	-	-	1213	1506	1628	1883	2014	2214	2445	2680	3320

CLASS 900

UNIT : mm

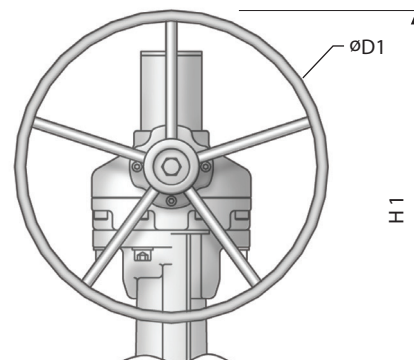
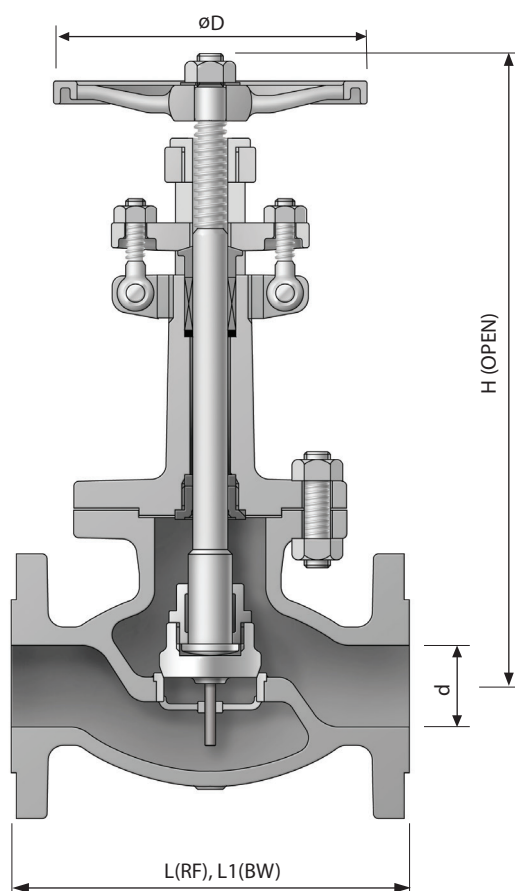
SIZE	2	3	4	6	8	10	12	14	16	18	20	24
L	368.3	381.0	457.2	609.6	736.6	838.2	965.2	1028.7	1130.3	1219.2	1320.8	1549.4
L1	368.3	381.0	457.2	609.6	736.6	838.2	965.2	1028.7	1130.3	1219.2	1320.8	1549.4
D	250	355	355	500	630	710	-	-	-	-	-	-
D1	-	250	250	500	500	630	710	710	710	900	900	900
H	595	802	928	1231	1393	1691	-	-	-	-	-	-
H1	-	-	1033	1327	1558	1813	1924	2020	2251	2509	2655	3178

CLASS 1500

UNIT : mm

SIZE	3	6
L	469.9	704.9
L1	469.9	704.9
D	-	-
D1	250	400
H	-	-
H1	950	1480

GLOBE VALVE



GOV (GEAR OPERATED)

END CONNECTION

- R.F FLANGED ENDS TO ASME B16.5
- B.W. ENDS TO ASME B16.25
- R.T.J FLANGED ENDS TO ASME B16.5
- SIZE 26" AND LARGER, FLANGED ENDS ACCORDING TO ASME B16.47 SER.A OR SER.B
- CONSULT US FOR LARGER SIZE

STANDARD MATERIAL SPECIFICATIONS

NO.	PART NAME	MATERIAL	
1	BODY	A351 - CF8	A351 - CF8M
2	BONNET	A351 - CF8	A351 - CF8M
3	DISC	A351 - CF8+STL	A351 - CF8M+STL
4	STEM	A479 - 304	A479 - 316
5	HAND WHEEL	A197	A197
6	BODY SEAT RING	A351 - CF8+ STL	A351 - CF8M+STL
7	BACK SEAT RING	A479 - 304	A479 - 316
8	GASKET	SPIRAL WOUND / GRAPHITE+316+316	
9	PACKING	GRAPHITE+GRAPHITE WITH INCONEL WIRE	
10	GLAND FLANGE	A351 - CF8	A351 - CF8
11	HINGE BOLT	A193 - B8	A193 - B8
12	HINGE NUT	A194 - 8	A194 - 8
13	HINGE PIN	A479 - 304	A479 - 304
14	PACKING GLAND	A479 - 304	A479 - 316
15	BONNET BOLT	A320 - B8 CL.2	A320 - B8 CL.2
16	BONNET NUT	A194 - 8	A194 - 8
17	YOKE BUSH	AL-BRONZE	AL-BRONZE
18	LOCK NUT	A479 - 304	A479 - 316
19	HANDLE NUT	A194 - 8	A194 - 8
20	WASHER	A240 - 304	A240 - 304
21	YOKE	A351 - CF8	A351 - CF8
22	STUFFING RING	A479 - 304	A479 - 316
23	GEAR BOX	DUCTILE IRON	DUCTILE IRON
24	STEM COVER	A53	A53

DIMENSION AND WEIGHT

CLASS 150

UNIT : mm

SIZE	2	3	4	6	8	10	12	14	18
L	203.2	241.3	292.1	406.4	495.3	622.3	698.5	787.4	978.0
L1	203.2	241.3	292.1	406.4	495.3	622.3	698.5	787.4	978.0
D	200	250	315	355	355	400	400	-	-
D1	-	-	-	350	450	450	500	560	630
H	573	655	693	816	990	-	-	-	-
H1	-	-	-	1094	1056	1148	1266	1358	1891

CLASS 300

UNIT : mm

SIZE	2	3	4	6	8	10	12	14
L	266.7	317.5	355.6	444.5	558.8	622.3	711.2	838.2
L1	266.7	317.5	355.6	444.5	558.8	622.3	711.2	838.2
D	200	250	315	355	400	450	-	-
D1	-	-	-	450	500	560	630	630
H	621	713	773	894	1047	1192	-	-
H1	-	-	-	1159	1156	1400	1638	1627

CLASS 600

UNIT : mm

SIZE	2	3	4	6	8
L	292.1	355.6	431.8	558.8	660.4
L1	292.1	355.6	431.8	558.8	660.4
D	224	315	315	450	-
D1	-	-	-	500	560
H	607	692	776	-	-
H1	-	-	-	1176	1426

CLASS 900

UNIT : mm

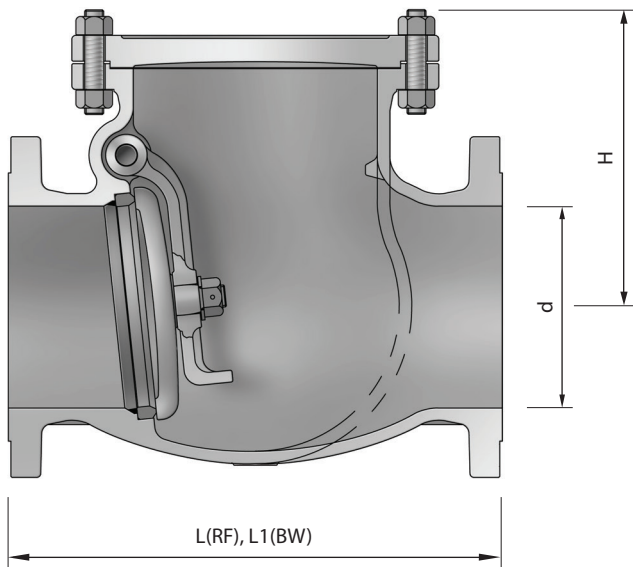
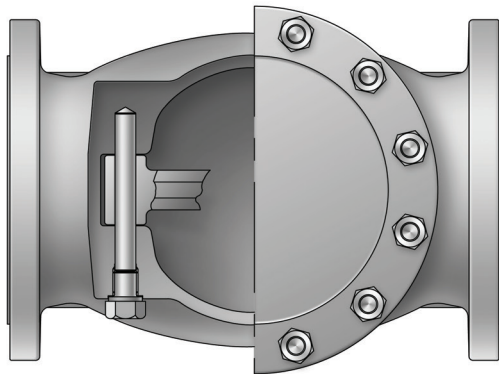
SIZE	2	3	4	6	8
L	368.3	381.0	457.2	609.6	736.6
L1	368.3	381.0	457.2	609.6	736.6
D	315	315	355	450	710
D1	-	-	-	560	630
H	688	737	882	-	-
H1	-	-	-	1488	1789

CLASS 1500

UNIT : mm

SIZE	2	3
L	368.3	469.9
L1	368.3	469.9
D	315	355
D1	-	-
H	688	798
H1	-	-

SWING CHECK VALVE



END CONNECTION

- R.F FLANGED ENDS TO ASME B16.5
- B.W. ENDS TO ASME B16.25
- R.T.J FLANGED ENDS TO ASME B16.5
- SIZE 26" AND LARGER, FLANGED ENDS ACCORDING TO ASME B16.47 SER.A OR SER.B
- CONSULT US FOR LARGER SIZE

STANDARD MATERIAL SPECIFICATIONS

NO.	PART NAME	MATERIAL	
1	BODY	A351 - CF8	A351 - CF8M
2	BONNET	A351 - CF8	A351 - CF8M
3	DISC	A351 - CF8+STL	A351 - CF8M+STL
4	ARM	A351 - CF8	A351 - CF8M
5	ROD PIN	A479 - 304	A479 - 316
6	BODY SEAT RING	A240+304+STL	A240+316+STL
7	PLUG BOLT	A479 - 304	A479 - 316
8	GASKET	SPIRAL WOUND / GRAPHITE+316+316	
9	PLUG GASKET	304 S.S	316 S.S
10	BONNET BOLT	A320 - B8 CL.2	A320 - B8 CL.2
11	BONNET NUT	A194 - 8	A194 - 8
12	DISC NUT	A194 - 8	A194 - 8M
13	PIN	304 S.S	316 S.S
14	WASHER	340 S.S	315 S.S

DIMENSION AND WEIGHT

CLASS 150

UNIT : mm

SIZE	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30
L	203.2	241.3	292.1	355.6	495.3	622.3	698.5	787.4	863.6	977.9	977.9	1295.4	1295.4	1447.8	1524
L1	203.2	241.3	292.1	355.6	495.3	622.3	698.5	787.4	863.6	977.9	977.9	1295.4	-	-	-
H	160	190	225	260	320	350	380	405	460	505	570	680	865	918	962
WEIGHT(kg)	16	26	45	78	136	214	319	412	514	749	933	1346	1727	1964	2247

CLASS 300

UNIT : mm

SIZE	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30
L	266.7	317.5	355.6	444.5	533.4	622.3	711.2	838.2	863.6	977.9	1016.0	1346.2	1346.2	1498.6	1593.9
L1	266.7	317.5	355.6	444.5	533.4	622.3	711.2	838.2	863.6	977.9	1016.0	1346.2	-	-	-
H	160	199	227	278	322	383	435	510	521	572	622	712	979	983	1115
WEIGHT(kg)	21	42	64	124	222	291	444	632	786	1058	1210	1916	2000	2600	3664

CLASS 600

UNIT : mm

SIZE	2	3	4	6	8	10	12	14	16	18	20	24	26	30
L	292.1	355.6	431.8	558.8	660.4	787.4	838.2	889.0	990.6	1092.2	1193.8	1397.0	-	1651
L1	292.1	355.6	431.8	558.8	660.4	787.4	838.2	889.0	990.6	1092.2	1193.8	1397.0	1448	-
H	197	210	256	329	364	464	486	572	660	711	787	864	1028	1135
WEIGHT(kg)	31	56	103	204	342	624	776	938	1250	1518	2390	3686	4000	5502

CLASS 900

UNIT : mm

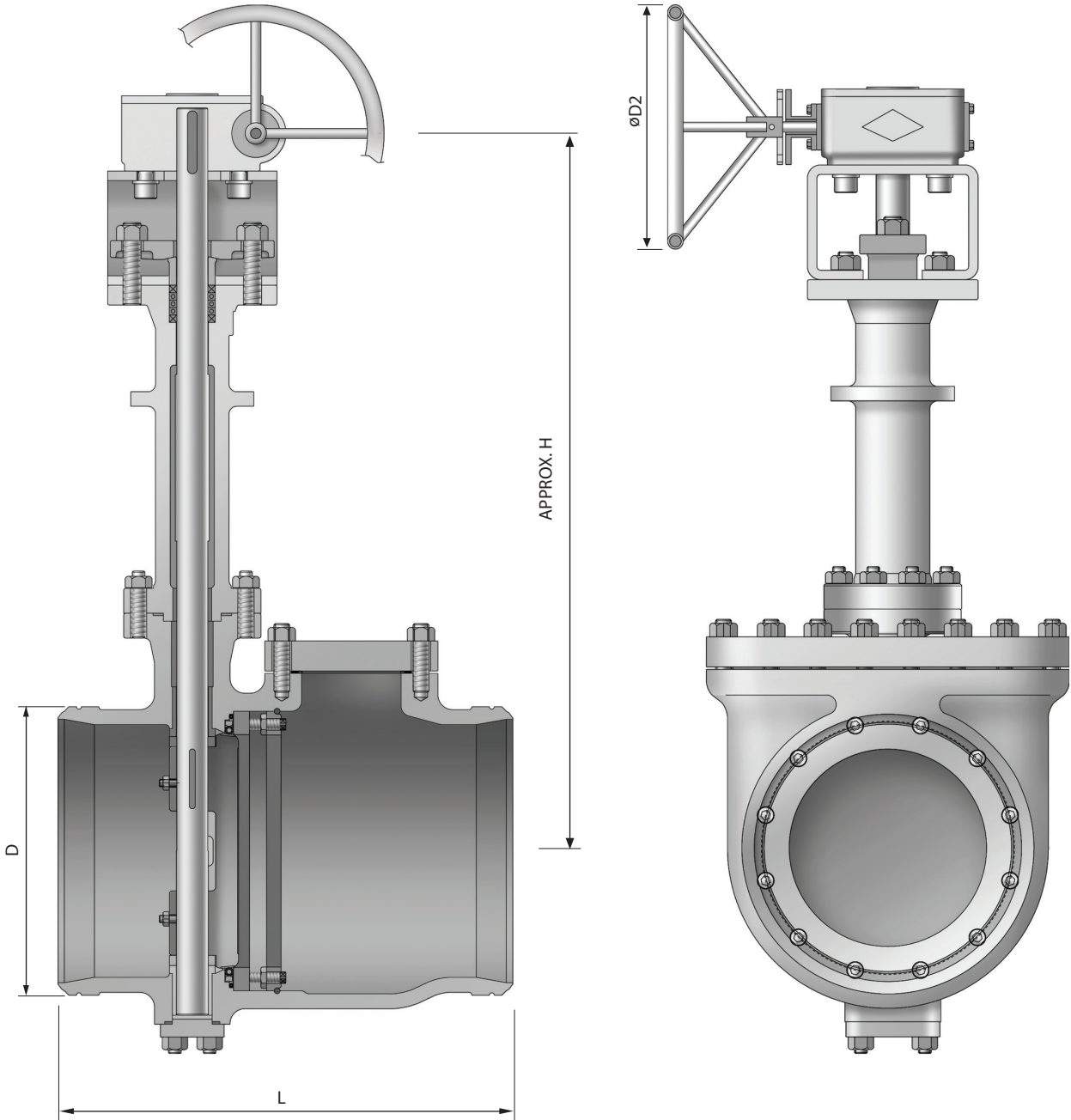
SIZE	2	3	4	6	8	10	12	14	16	18	20	24
L	368.3	381.0	457.2	609.6	736.6	838.2	965.2	1028.7	1130.3	1219.2	1320.8	1549.4
L1	368.3	381.0	457.2	609.6	736.6	838.2	965.2	1028.7	1130.3	1219.2	1320.8	1549.4
H	267	290	306	338	460	500	578	647	710	785	850	1006
WEIGHT(kg)	68	106	139	294	525	731	1025	1444	1850	2610	3407	5842

CLASS 1500

UNIT : mm

SIZE	2	3	4	6	8	10	12	16
L	368.3	469.9	546.1	704.9	831.9	990.6	1130.3	1384.3
L1	368.3	439.9	546.1	704.9	831.9	990.6	1130.3	1384.3
H	267	296	355	465	540	657	728	1116
WEIGHT(kg)	73	125	212	470	825	960	1510	4630

BUTTERFLY VALVE

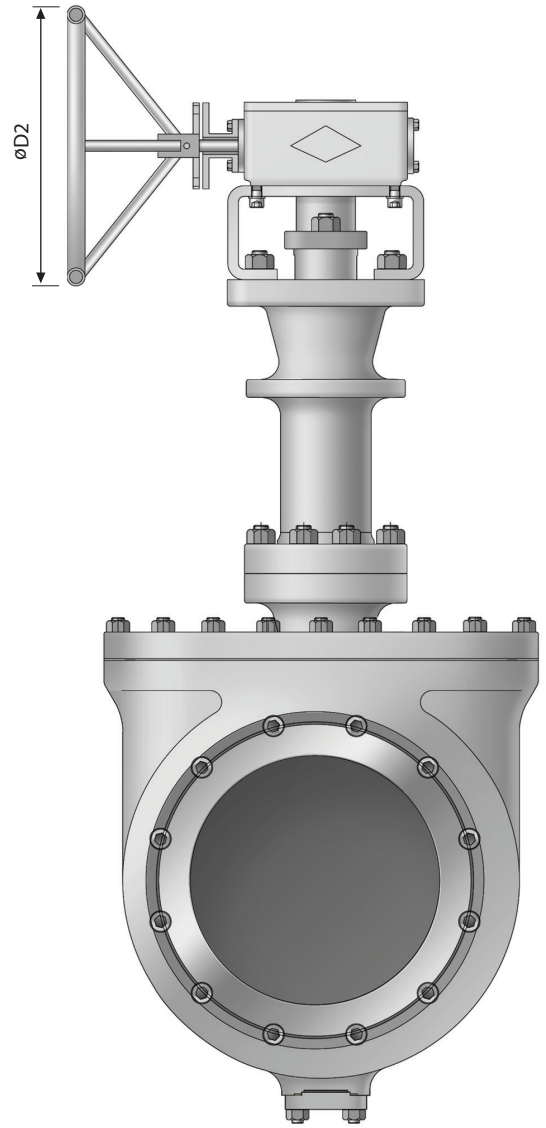
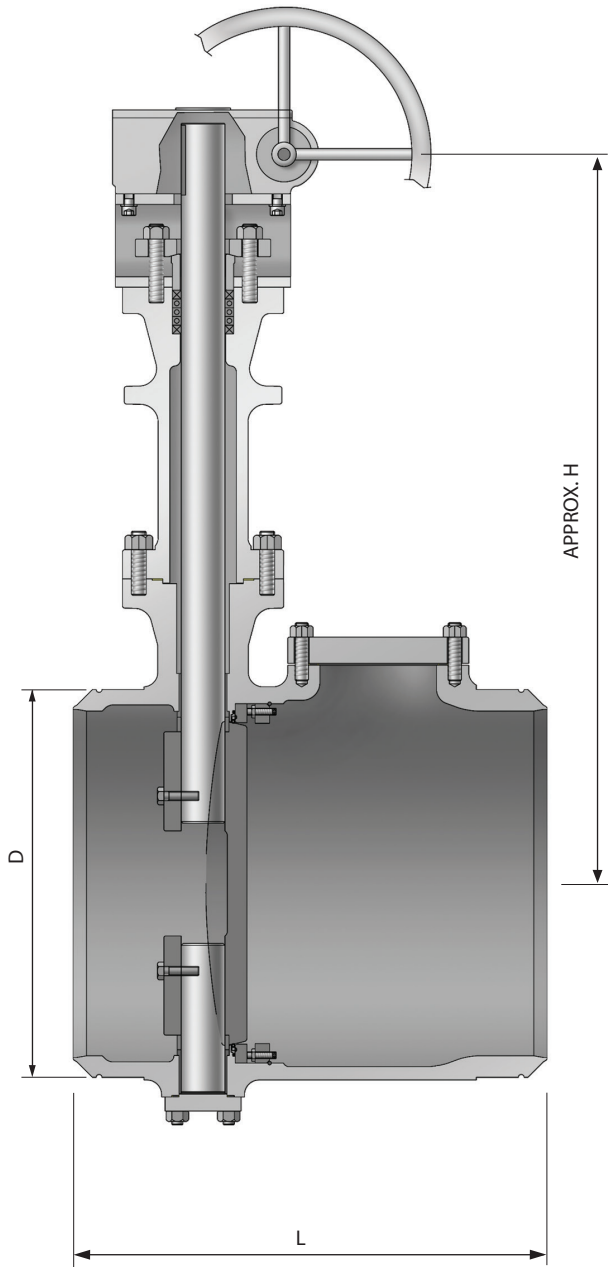


STANDARD MATERIAL SPECIFICATIONS

MATERIAL ACCORDING TO ASTM		
NO.	PART NAME	MATERIAL
1	BODY	A351 - CF3
2	DISC	A351 - CF8M+STL
3	STEM	A479 - 316
4	COVER	A351 - CF3
5	PACKING	GRAPHITE + CARBON FIBER
6	PACKING GLAND	A479 - 304
7	GLAND FLANGE	A351 - CF8
8	GLAND BOLT	A193 - B8
9	GLAND NUT	A194 - 8
10	BUSH BEARING	BI-MESH
11	KEY	A320 - B8
12	SEAL RING	304L SS+Cu ALLOY
13	STOP BOLT/NUT	A320 - B8/A194 - 8
14	YOKE	A240 - 304
15	YOKE BOLT	A193 - B8
16	YOKE NUT	A194 - 8
17	MOUNTING BOLT	A193 - B7+Cr
18	SPRING WASHER	A240 - 304
19	KEY	A576 - 1045
20	GEAR BOX	DUCTILE
21	CAP	A240 - 316
22	GASKET(CAP)	316SS+GRAPHITE
23	THRUST WASHER	B584 - C86300
24	SEAT RETAINER	A240 - 316
25	RETAINER BOLT	A320 - B8
26	RETAINER NUT	A194 - 8
27	ARRANGEMENT RING	A240-316
28	HANDWHEEL	A53 or STEEL
29	CAP BOLT	A320-B8M CLASS2
30	CAP NUT	A194-8MA
31	BONNET	A351 - CF3
32	BONNET BOLT	A320-B8M CLASS 2
33	BONNET NUT	A194-8MA
34	BONNET GASKET	316SS+GRAPHITE
35	COVER BOLT	A320-B8M CLASS 2
36	COVER NUT	A194-BMA
37	COVER GASKET	316SS+GRAPHITE
38	ADAPTER	316 SS
39	ADATER RETAINER	316 SS
40	LOCKING DEVICE	STEEL+ BRASS

DIMENSION AND WEIGHT

SIZE	6	8	10	12	14
d	153	204	254	305	337
L	403.4	419.1	457.2	501.7	571.5
SCH	10S	10S	10S	10S	10S
H	692	810	845	910	940
D2	300	300	400	400	500
Weight(Kg)	70	90	126	175	270



STANDARD MATERIAL SPECIFICATIONS

MATERIAL ACCORDING TO ASTM		
NO.	PART NAME	MATERIAL
1	BODY	A351 - CF3
2	DISC	A351 - CF8M+STL
3	STEM	A479 - 316
4	LOW STEM	A479 - 316
5	BUSH BEARING	BI-MESH
6	THRUST WASHER	B584 - C86300
9	STOP BOLT	A320 - B8
10	CAP	A240 - 316
11	CAP GASKET	316SS+GRAPHITE
12	CAP BOLT	A320-B8M CLASS 2
13	CAP NUT	A194 - 8MA
14	BONNET	A351 - CF3
15	BONNET GASKET	316SS+GRAPHITE
16	BONNET BOLT	A320-B8M CLASS 2
17	BONNET NUT	A194 - 8MA
18	PACKING	GRAPHITE + CARBON FIBER
19	PACKING GLAND	A479 - 304
20	GLAND FLANGE	A351 - CF8
21	GLAND BOLT	A193 - B8
22	GLAND NUT	A194 - 8
23	YOKE	A240 - 304
24	YOKE BOLT	A193 - B8
25	YOKE NUT	A194 - 8
26	KEY	A576 - 1045
27	GEAR BOX	DUCTILE
28	MOUNTING BOLT	A193 - B7+Cr
29	SPRING WASHER	A240 - 304
30	HANDWHEEL	A53 or STEEL
31	SEAL RING	304L SS+Cu ALLOY
32	ARRANGEMENT RING	A240 - 316
33	SEAT RETAINER	A240 - 316
34	RETAINER BOLT	A320 - B8
35	RETAINER NUT	A194 - 8
36	ADAPTER	316 SS
37	ADAPTER RETAINER	316 SS
38	COVER	A351 - CF3
39	COVER GASKET	316SS+GRAPHITE
40	COVER BOLT	A320-B8M CLASS 2
41	COVER NUT	A194 - 8MA
42	LOCKING DEVICE	STEEL+ BRASS

DIMENSION AND WEIGHT

SIZE	16	20	24	30	32	36
d	388	490	591	737	788	893
L	609.6	711.2	812.8	914.4	965.2	1016.0
SCH	10S	10S	10S	10	10	10
H	970	1110	1260	1375	1415	1465
D2	500	560	630	700	700	700
Weight(Kg)	330	600	1050	1750	2050	2800