



# Triple Offset Butterfly Valves

**SWM**

Reliable Performance In Extreme Conditions

[www.swivalve.com](http://www.swivalve.com)



## FOREWORD

SWI Valve Co., Ltd. is a leading industrial valve manufacturing company, specializing in the design and manufacture of Ball, Gate, Globe, Check, Cryogenic, Bellows Seal, Positive Isolation Block & Bleed, Instrumentation and Triple Offset Butterfly valves.

We are pleased to introduce our range of Triple Offset Metal Seated Butterfly Valves and trust this catalogue will assist our customers in the selection and application of SWI products.

At SWI, we stand for three values - quality, innovation and service. We know the world's Oil, Chemical, Petrochemical and Process industries require precision flow control products. We have dedicated ourselves to supplying that need with an extensive range of industrial valves, manufactured in our own factories and designed for environmental sensitivity.

## GENERAL APPLICATION

Industries : oil & gas upstream, downstream, pipe line & storage, supply & service; chemical & coal, petrochemical, destination plants, waterworks, food & beverage; renewable (solar, geothermal & hydro), fossils, district heating, nuclear, iron & steel; other mining, automotive; shipyard; aerospace.

Fluids : Hydrocarbon (crude oil, naphtha, diesel, jet fuel, kerosene, gasoline, acid gas), sour gas, synthesis gas, carbon dioxide, flare gas, industrial gases, chemical solvents (ethylene, glycol, ethylene benzene, butadiene, styrene), sulphur (tail gas).

## PRODUCTION RANGE

VALVE TYPE	ANSI CLASS	SIZE (NPS)																	
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	26"	28"	30"	36"	40"	42"	48"
Double Flanged Short	150#																		
	300#																		
	600#																		
	900#																		
Double Flanged Long	150#																		
	300#																		
	600#																		
	900#																		
Lug / Wafer	150#																		
	300#																		
	600#																		
	900#																		
Butt Weld	150#																		
	300#																		

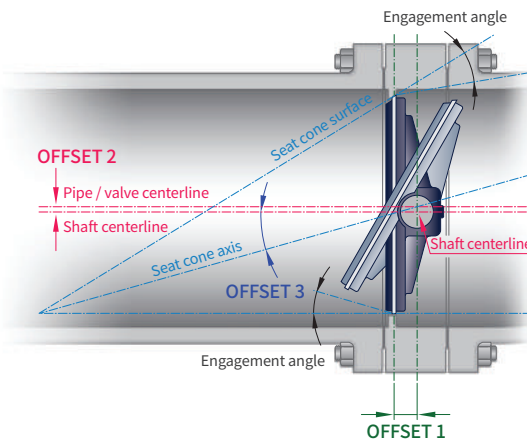


# TRIPLE OFFSET BUTTERFLY VALVES



## THE TRIPLE OFFSET GEOMETRY

The SWI Triple-offset valve provides a bidirectional bubble tight shut-off to API 598. This geometry ensures that the disc seal contacts the body seat only at the final shut-off position without rubbing or galling, providing a torque generated resilient seal with sufficient wedging to ensure a uniform seal contact.



- **OFFSET 1 :**  
The shaft is placed behind the plane of the sealing surface to provide a continuous seat path.
- **OFFSET 2 :**  
The shaft is placed to one side of the pipe and valve centerline to allow the displacement of the seal from the seat during the 90° opening.
- **OFFSET 3 :**  
The seat and seal cone centerlines are inclined in respect to the pipe and valve centerline. This third offset completely eliminates rubbing.

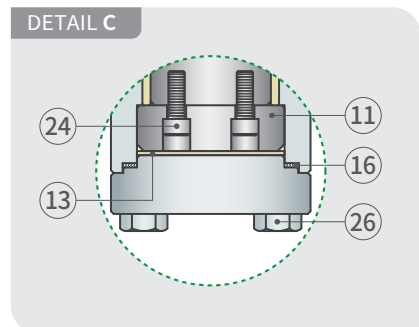
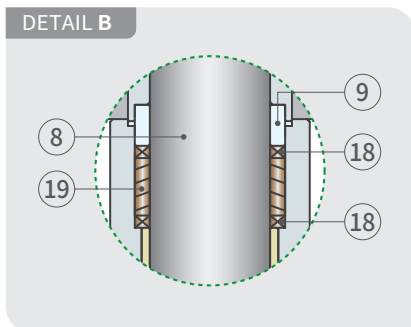
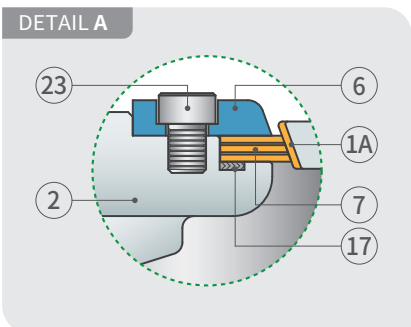
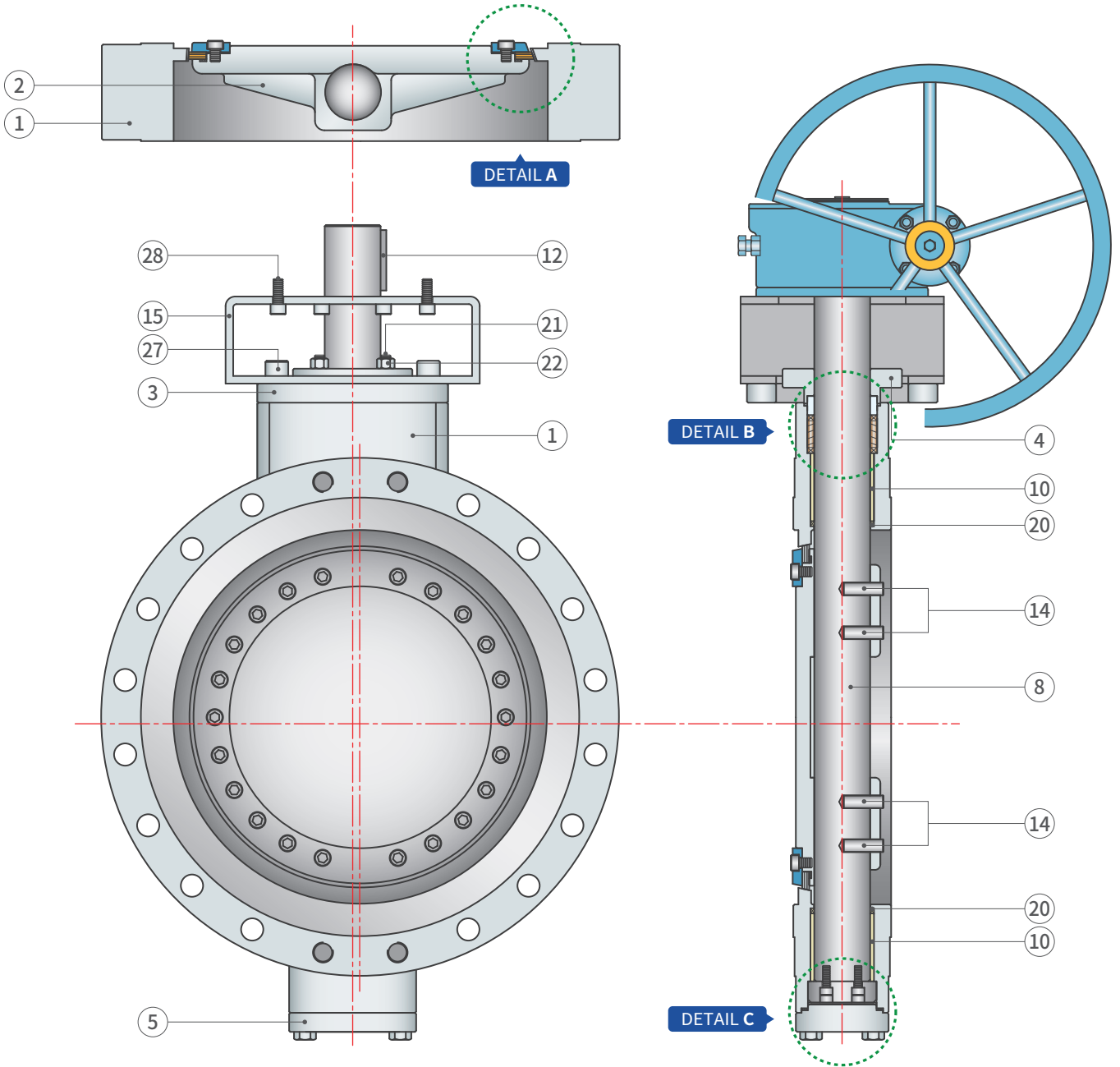
## KEY FEATURES

- A Duplex metal seal ring and a highly wear-resistant Stellite 21 seat ensure superior tightness for a prolonged period
- Asymmetric design and disparate torque demands ensure bi-directional tightness
- Integral position indicators on the shaft and the top mounting flange provide positive indication of disc position
- All-metal construction produces an inherently fire safe valve
- Extensively hardened bearings, incorporating a standard reinforced, braided, flexible graphite bearing protector, ensure increased reliability
- Blowout-proof shaft is safe to operate and provides complete compliance with API 609 due to its four different internal and external retaining devices
- Cryogenic and high temperature service designs are available

## DESIGN SPECIFICATIONS

- |  |  |
|--|--|
| • Valve design, Pressure & Temperature ratings : | ASME B16.34 / ASME VIII / API 609                |
| • Face to face dimensions :                      | API 609 / ASME B16.10 / ISO 5752                 |
| • Actuator mounting :                            | ISO 5211   |
| • Flange drilling :                              | ASME B16.5 / ASME B16.47 / ISO 7005              |
| • Seat testing :                                 | API 598 / API 6D / ISO 5208 / DIN 3230 / BS 6755 |
| • Fire tested :                                  | API 607, 6th Edition / ISO 10497                 |
| • Fugitive emission testing :                    | TA LUFT / ISO 15848                              |
| • Cryogenic service :                            | BS 6364  |
| • Valve markings :                               | MSS-SP-25 / ASME B16.34                          |

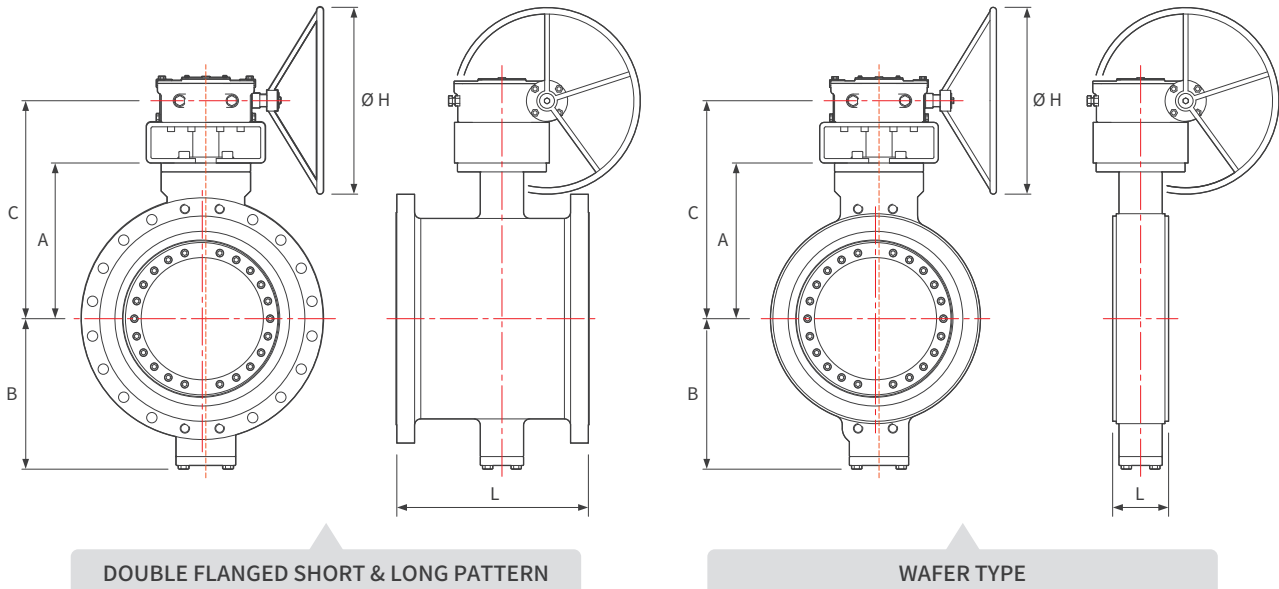
**BASIC CONFIGURATION**



## MATERIAL OF CONSTRUCTION

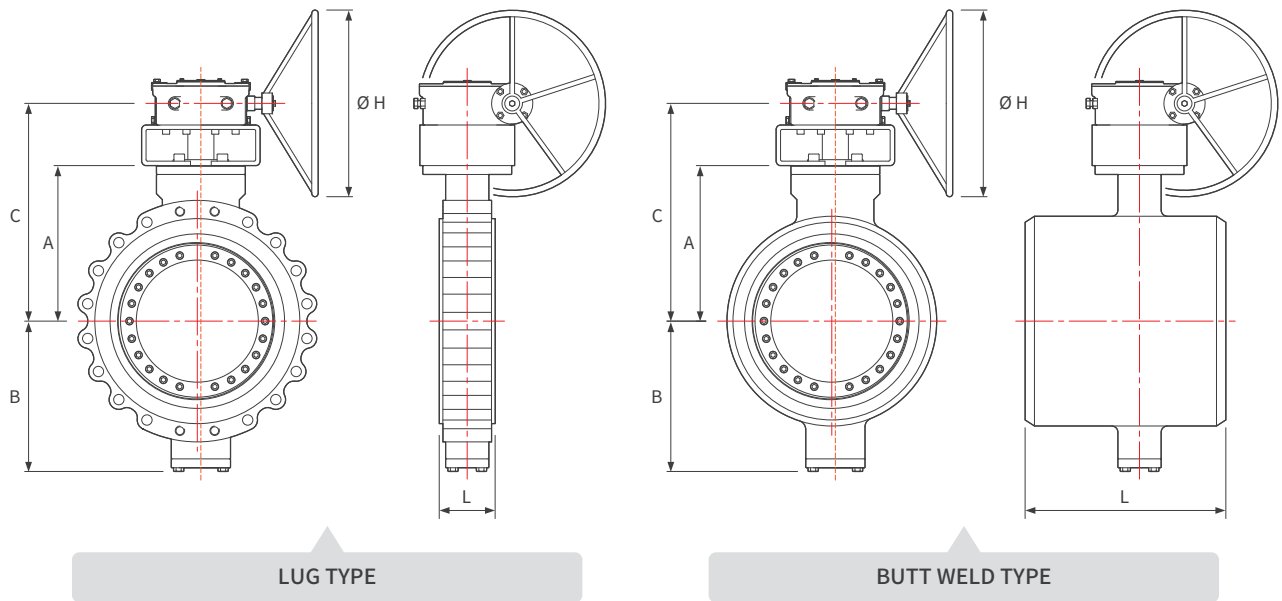
No.	Description	Valve Body Material		Q'ty
		Carbon Steel	Stainless Steel	
1	Body	ASTM A216 WCB	ASTM A351 CF8M	1
1A	Seat (hard faced)	CoCr alloy Gr. 21	CoCr alloy Gr. 21	
2	Disc	ASTM A216 WCB	ASTM A351 CF8M	1
3	Bonnet Cover	WCB or A105	CF8M or F316	1
4	Shaft Cover	WCB or A105	CF8M or F316	1
5	Bottom Cover	WCB or A105	CF8M or F316	1
6	Disc Cover	Duplex or A479 Gr. 410	Duplex	1
7	Disc Seal	Duplex + Graphite	Duplex + Graphite	1 set
8	Shaft	A479 Gr. 410	A564 Gr. 630	1
9	Packing Gland	A276 TP. 316	A276 TP. 316	1
10	Bush	A276 TP. 316 + Nitrided	A276 TP. 316 + Chrome plated	2
11	Shaft Stopper	A276 TP. 316 + Nitrided	A276 TP. 316 + Chrome plated	1
12	Shaft Key	Alloy Steel	Alloy Steel	1
13	Stopper Bearing	A240 TP. 316 + Nitrided	A240 TP. 316 + Chrome plated	1
14	Disc Pin	A479 Gr. 410	A564 Gr. 630	4
15	Bracket	Carbon Steel	Carbon Steel	1
16	Bottom Gasket	SS 347 + Graphite	SS 347 + Graphite	1
17	Seal Packing	SS 347 + Graphite	SS 347 + Graphite	1
18	Shaft Packing I	Graphite braided	Graphite braided	2
19	Shaft Packing II	Graphite die formed	Graphite die formed	1 set
20	Sub Packing	Graphite	Graphite	2
21	Shaft Bolt	A193 Gr. B7	A193 Gr. B8M	4
22	Shaft Nut	A194 Gr. 2H	A194 Gr. 8M	4
23	Disc Bolt	A193 Gr. B8M	A193 Gr. B8M	22
24	Stopper Bolt	A193 Gr. B8M	A193 Gr. B8M	2
25	Bonnet Bolt	A193 Gr. B7	A193 Gr. B8	4
26	Bottom Bolt	A193 Gr. B7	A193 Gr. B8	4
27	Bracket Bolt	A193 Gr. B7	A193 Gr. B8	4
28	Gear Bolt	A193 Gr. B7	A193 Gr. B8	8



**VALVE TYPE & DIMENSIONS**


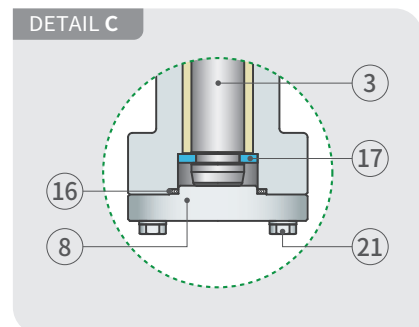
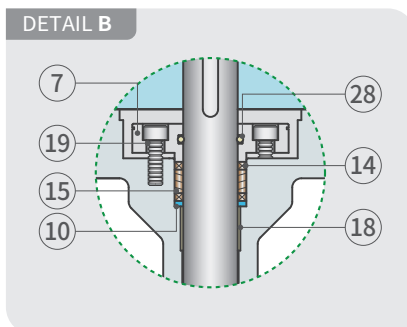
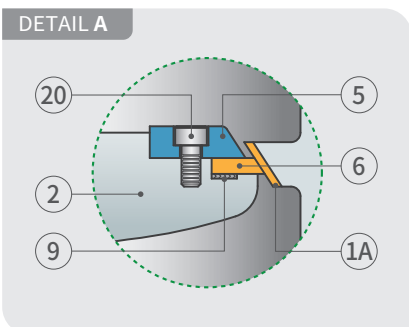
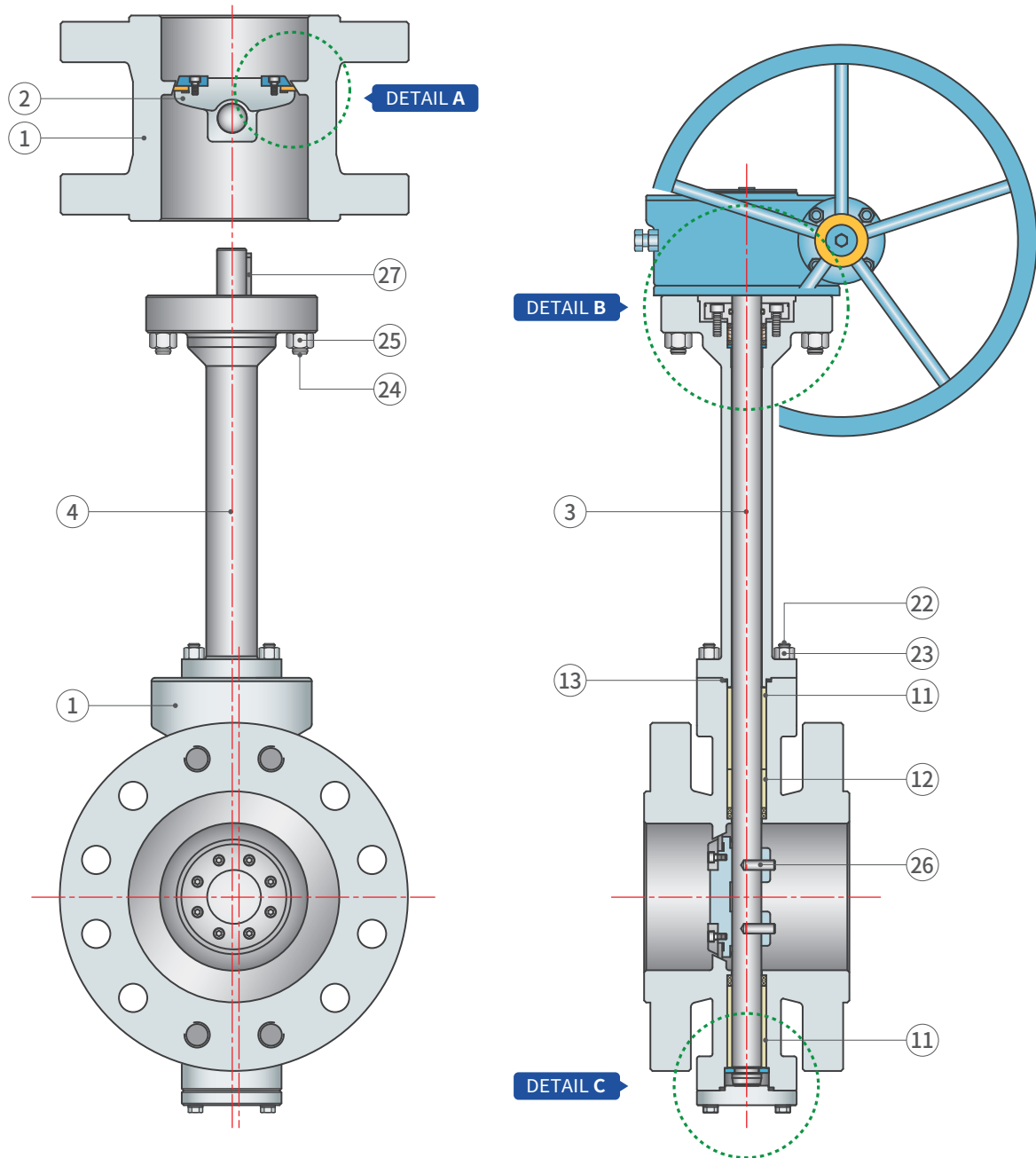
DN (mm)	NPS (inch)	Dimension (mm)								
		A	L					B	C	Ø H
			Long	Short	Lug	Wafer	Butt Weld			
ASME Class 150 / DN 80 - 1200 / NPS 3 - 48										
80	3	138	203	114	48	48	-	125	240	200
100	4	158	229	127	54	54	191	148	287	200
150	6	158	267	140	57	57	225	165	307	200
200	8	225	292	152	64	64	252	215	361	300
250	10	250	330	165	71	71	305	240	387	500
300	12	291	356	178	81	81	346	283	434	500
350	14	318	381	191	92	92	364	303	517	600
400	16	348	406	216	102	102	406	338	556	600
450	18	392	432	222	114	114	437	380	599	500
500	20	425	457	229	127	127	475	410	634	500
600	24	525	508	267	154	154	527	495	735	600
700	28	620	610	292	165	165	-	573	949	600
750	30	635	610	318	191	191	-	590	949	600
900	36	750	711	330	203	203	-	700	1103	600
1000	40	768	813	409	229	229	-	762	1121	610
1050	42	775	813	409	246	246	-	806	1138	700
1200	48	835	914	470	276	276	-	890	1208	700
ASME Class 300 / DN 80 - 900 / NPS 3 - 36										
80	3	138	282	114	48	48	-	125	240	200
100	4	158	305	127	54	54	191	148	287	200
150	6	200	403	140	59	59	225	192	337	300

## VALVE TYPE & DIMENSIONS



DN (mm)	NPS (inch)	Dimension (mm)								
		A	L					B	C	Ø H
			Long	Short	Lug	Wafer	Butt Weld			
200	8	243	419	152	73	73	252	236	386	500
250	10	275	457	165	83	83	305	260	474	600
300	12	307	502	178	92	92	346	297	514	600
350	14	340	762	191	117	117	364	330	548	500
400	16	375	838	216	133	133	406	361	587	500
450	18	422	914	222	149	149	437	407	633	600
500	20	470	991	229	159	159	475	441	682	600
600	24	553	1143	267	181	181	527	511	866	600
700	28	656	1346	292	229	229	-	612	1009	600
750	30	670	1397	451	241	241	-	620	1023	600
900	36	750	1727	508	241	241	-	709	1110	600
ASME Class 600 / DN 100 - 600 / NPS 4 - 24										
100	4	172	432	191	64	64	-	171	307	300
150	6	225	559	210	78	78	-	215	367	500
200	8	266	660	230	102	102	-	254	473	600
250	10	306	787	249	117	117	-	300	513	500
300	12	342	838	270	140	140	-	336	553	500
350	14	370	889	290	155	155	-	389	735	600
400	16	446	991	310	178	178	-	412	866	600
450	18	483	1092	330	200	200	-	446	861	600
500	20	528	1194	350	216	216	-	488	907	610
600	24	612	1397	390	232	232	-	564	975	700

**CRYOGENIC CONFIGURATION**





### CRYOGENIC DESIGN FEATURES & MATERIALS

No.	Description	Valve Body Material
		Stainless Steel
1	Body	ASTM A351 CF8M
1A	Seat (hard faced)	CoCr alloy Gr. 21
2	Disc	ASTM A351 CF8M
3	Shaft	A564 Gr. 630
4	Extension Bonnet	A182 F316
5	Disc Cover	Duplex
6	Disc Seal	Duplex
7	Shaft Cover	A276 TP. 316
8	Bottom Cover	A276 TP. 316
9	Disc Packing	Graphite
10	Packing Ring	A276 TP. 316
11	Main Bush	A276 TP. 316 + Chrome plated
12	Sub Bush	A276 TP. 316 + Chrome plated
13	Bonnet Packing	Graphite
14	Shaft Packing I	Graphite braided
15	Shaft Packing II	Graphite die formed
16	Bottom Gasket	SS 347 + Graphite
17	Shaft Stopper	A276 TP. 316 + Chrome plated
18	Dry Bearing	SS 316 + PTFE
19	Shaft Bolt	A193 B8
20	Disc Bolt	A193 B8M
21	Bottom Bolt	A193 B8M
22	Bonnet Bolt	A193 B8M
23	Bonnet Nut	A194 8M
24	Gear Bolt	A194 B8
25	Gear Nut	A194 8
26	Disc Pin	A564 Gr. 630
27	Shaft Key	Alloy Steel
28	Shaft O-ring	FKM

#### • Triple Offset Disc Rotation

provides bubble tight sealing without rubbing or galling.

#### • Cryogenic Stem Packing (Detail A)

composed of superposed viton o-rings and expanded graphite rings.

#### • No Cavity (Detail B)

no cavity to prevent build-up of solids.

#### • Drainage Possibility (Detail C)

the bottom cover can be removed if drainage is required.

#### • Internal Blow-out Protection

prevents the shaft from blowing out under pressure.

#### • Inherent Fire Safe Design

stainless steel construction and metallic seal provide inherent fire safe function.

#### • Extended Bonnet

with a sufficient gas column to keep the stem packing away from cold fluid. Extended bonnet length is qualified for use in LNG application with type approvals from major accreditation companies.

#### • High Quality Castings

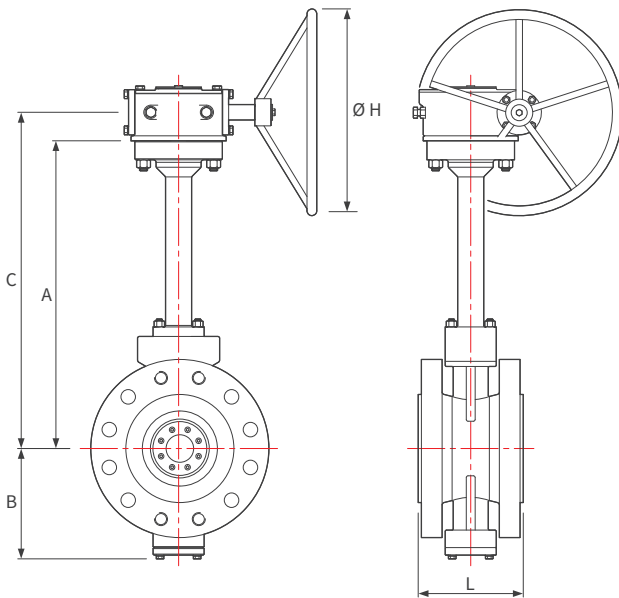
radiographic control, dye penetrant test, ferrite content control, impact test at -196°C according to customer's requirements.

#### • Reinforced Shaft Bearings

for high cycles and smooth operation at very low temperature.



### VALVE TYPE & DIMENSIONS



DOUBLE FLANGED SHORT PATTERN

DN (mm)	NPS (inch)	DIMENSIONS (mm)				
		A	L	B	C	ØH
ASME Class 150 / DN 80 - 2000 / NPS 3 - 80						
80	3	550	114	125	594	150
100	4	570	127	147	614	150
150	6	590	140	166	634	200
200	8	642	152	199	685	300
250	10	680	165	239	724	500
300	12	729	178	255	774	500
350	14	760	190	303	810	600
400	15	800	216	338	850	700
450	18	880	222	381	943	500
500	20	950	229	409	1013	500
600	24	1085	267	495	1165	600
750	30	1230	318	590	1323	500
800	32	1352	318	622	1437	600
900	36	1450	330	700	1543	700
1000	40	1566	410	766	1665	600
1050	42	1602	410	802	1701	700
1200	48	1707	470	907	1812	800
1350	54	1913	530	1013	2036	700
1400	56	1948	530	1048	2071	700
1500	60	2120	600	1120	2249	700
1600	64	2189	600	1189	2318	700
1650	66	2226	610	1226	2355	800
1800	72	2430	670	1330	2559	800
2000	80	2700	760	1500	2829	1000

DN (mm)	NPS (inch)	DIMENSIONS (mm)				
		A	L	B	C	ØH
ASME Class 300 / DN 80 - 900 / NPS 3 - 36						
80	3	550	114	125	594	150
100	4	572	127	147	616	300
150	6	617	140	192	661	300
200	8	680	152	236	725	500
250	10	701	165	261	751	600
300	12	770	178	297	833	400
350	14	787	191	330	850	500
400	15	823	216	361	903	500
450	18	906	222	407	986	600
500	20	982	229	441	1067	500
600	24	1101	267	511	1194	600
750	30	1260	305	620	1359	500
800	32	1390	318	660	1495	600
900	36	1435	330	705	1558	900
ASME Class 600 / DN 100 - 600 / NPS 4 - 24						
100	4	582	191	173	626	300
150	6	615	230	213	659	500
200	8	804	249	254	854	600
250	10	851	270	301	914	400
300	12	1027	290	336	1115	500
350	14	1065	310	365	1145	500
400	15	1100	330	400	1185	500
450	18	1135	330	435	1220	500
500	20	1175	350	475	1268	700
600	24	1220	390	520	1319	500
ASME Class 900 / DN 150 - 600 / NPS 6 - 24						
150	6	652	225	250	697	500
200	8	865	275	315	928	400
250	10	926	325	376	989	400
300	12	1111	375	420	1191	400
350	14	1160	425	460	1245	500
400	15	1201	475	501	1286	500
450	18	1245	500	545	1338	700
500	20	1294	575	594	1387	800
600	24	1350	675	650	1455	700



## ORDERING INFORMATION

**CODE TABLE : A B C D E F G H I**

**Sample Valve Code : A - 8 B - F 02 A - P D - A**

Example : Flanged B16.5, NPS 8 (DN 200), Class 300, Long pattern, Butterfly Valve with Duplex & Graphite seal ring and a carbon steel body with stainless steel trim for standard service

## A

VALVE TYPE			
A	Long pattern - Double flanged (API 609 Table 3), ASME B16.10	C	Lug & wafer (API 609 Table 3), MSS SP-68 (Table 2)
B	Short pattern - Double flanged (API 609 Table 3), ISO 5752	D	SWI standard face to face

## B

VALVE SIZE (NPS / DN)													
3	3 (80)	10	10 (250)	18	18 (450)	26	26 (650)	34	34 (850)	48	48 (1200)	64	64 (1600)
4	4 (100)	12	12 (300)	20	20 (500)	28	28 (700)	36	36 (900)	54	54 (1350)	66	66 (1650)
6	6 (150)	14	14 (350)	22	22 (550)	30	30 (750)	40	40 (1000)	56	56 (1400)	72	72 (1800)
8	8 (200)	16	16 (400)	24	24 (600)	32	32 (800)	42	42 (1050)	60	60 (1500)	80	80 (2000)

## C

ASME CLASS			
A	150	C	600
B	300	D	900

## D

CONNECTION TYPE			
B	Butt weld	M	Lug (series B)
D	Din flange	R	Flanged ring joint
F	Flanged B16.5 (B16.47 series A)	U	Undrilled flanges
L	Lug	W	Wafer
Y	Flanged (B16.47 series B) API 605		

## E

BODY MATERIAL			
02	A105, WCB	18	Inconel 625
06	Cr. MOLY F5, C5	20	Hastelloy C
08	Cr. MOLY F9, C12	22	Alloy 20 (CN7M)
10	S.Steel F316, CF8M	24	LCC
12	S.Steel F316L, CF3M	26	S.Steel F51, 4A, CD3MN
16	Monel M35	28	Titanium

## F

DISC MATERIAL			
A	Same as body - plated	E	Inconel 625
B	Same as body - not plated	F	Hastelloy
C	S.Steel 316, CF8M	G	Alloy 20
D	Monel	H	CoCr alloy

## G

SEAL RING			
A	S.Steel 316 & Graphite	G	Inconel (solid)
B	Monel & Graphite	H	XM-19 Nitronic 50 (solid)
C	Alloy 20 & Graphite	I	Same as shaft (solid)
D	Inconel & Graphite	J	Duplex & Graphite
E	Hastelloy & Graphite	K	Titanium & Graphite
F	S.Steel 316 (solid)	L	Hastelloy & PTFE

## H

SHAFT MATERIAL			
02	XM-19 (Nitronic 50)	12	Hastelloy C
06	S.Steel 630	14	Alloy 20
08	Monel K500	16	Duplex
10	Inconel		

## I

SPECIAL SERVICE			
A	Standard	E	Nuclear
B	Oxygen	F	Double packed with leak-off
C	Cryogenic	G	API 6D tested
D	NACE sour gas		



Forged Steel Valves



Cryogenic Service Valves



Bellows Seal Valves



High Integrity Floating Ball Valves



Trunnion Mounted Ball Valves



Top Entry Trunnion Ball Valves



Automation Valves



Triple Offset Butterfly Valves



Positive Isolation Block & Bleed Valves



Instrumentation Valves



## HEAD OFFICE & PLANT 1

SWI Valve Co., Ltd.  
91-9 Beolmal-ro, Dongan-gu  
Anyang-si, Gyeonggi-do  
KOREA

Tel : +82 31 421 1831~3  
Fax : +82 31 421 1834  
www.swivalve.com

## PLANT 2

SWI Valve Co., Ltd.  
51 Goryeom-gil, Cheongbuk-myeon  
Pyeongtaek-si, Gyeonggi-do  
KOREA

Tel : +82 31 684 2981~3  
Fax : +82 31 684 2984

## USA OFFICE

SWI Valve International, LLC  
13207 Stafford Rd., Suite 400  
Missouri City, TX 77489  
USA

Tel : +1 713 266 7033  
Fax : +1 281 261 7507