

# STANVAL

## HIGH PERFORMANCE BUTTERFLY VALVES



**STANVAL INDUSTRIAL & ENGINEERING CO., LTD.**

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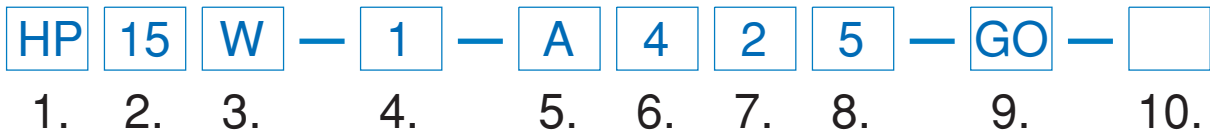
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## ORDERING GUIDE

**Example: 8" Figure #HP15W-1-A425-GO**



8" High Performance Butterfly, 150# Class, Wafer Type, Firesafe, WCB Body, CF8M SS Disc, 316SS Stem, PTFE Seat, Gear Operator

### 1. MODEL

- TO - Triple Offset
- HP - High Performance
- RS - Resilient Seated

### 2. RATING

- 12 - ASME Class 125
- 15 - ASME Class 150
- 30 - ASME Class 300
- 60 - ASME Class 600
  
- 10 - PN10
- 16 - PN16
- 25 - PN25
- 40 - PN40

### 3. END CONNECTION

- W - Wafer
- L - Lug
- DF - Double Flange

### 4. TYPE

- 1 - Fire-safe
- 3 - Standard

### 5. BODY

- A - WCB
- J - WC9
- M - CF8
- N - CF8M
- U - A126
- V - A395
- W - B148
- O - Special

### 6. DISC

- 1 - A216 WCB + ENP
- 2 - A217 WC9 + ENP
- 3 - A351 CF8
- 4 - A351 CF8M
- 5 - A536
- 6 - B148
- 7 - CA15 410SS
- X - Special

### 7. STEM

- 1 - 304SS
- 2 - 316SS
- 3 - 410SS
- 4 - 416SS
- 5 - 630SS
- 6 - 17-4 PHSS
- X - Special

### 8. SEAT

- 1 - BUNA-N
- 2 - EPDM
- 3 - Viton
- 4 - Neoprene
- 5 - PTFE
- 6 - RTFE
- 7 - 316SS
- 8 - Stellite
- 9 - Integral
- X - Special

### 9. OPERATOR

- (blank) - Lever
- GO - Gear Operator
- B - Bare Stem

### 10. SPECIAL REQUIREMENTS

- S - Supply complete information

## STANDARD ACTUATOR TYPE



### MANUAL GEAR OPERATION

STANVAL valves adopt a worm gear operation served as a standard of STANVAL Valve International. This type of valve has advantages of large output and easy operation due to high gear ratio, so that it is used extensively for quarter turn valves. The gear constructed by self-locking mechanism is suitable for triple offset valves which require torque seating. Clockwise turning of the handwheel makes the valve closed and counterclockwise turning makes the valve opened.

### ELECTRIC MOTOR ACTUATOR OPERATION

This valve is operated by an electric signal coming from the electric motor to open, close, or stop the valve in the process of operation. The position limit switch or torque switch signals stop at full open or close. The electric motor actuator is applied mainly to large size or high pressure valves because of greater torque over pneumatic actuator.

This type has advantages of simple wiring and good response. In addition, a remote control is available, and therefore the valve can be applied to a dangerous or limited space where it is difficult to access.



### PNEUMATIC ACTUATOR OPERATION

This type of valve is operated by a signal of air pressure, which is normally 2~9 kgf/cm<sup>2</sup> in control parts. There are two operating methods: single acting and double acting.

The single acting actuator is divided into full close and full open according to spring acting orientation. It is useful for control valve by virtue of its characteristics of safety and easy handling.

Furthermore, the construction is more responsive than electric motor or hydraulic actuator. The double acting actuator is served as STANVAL standard with air regulator, solenoid valve, and position indicator types. However, STANVAL is able to make whatever the customer need.



## SPECIFICATIONS—TRIPLE OFFSET METAL SEAT

### DESIGN FEATURE

- Designed in accordance with ASME B16.34 or other customer requirements.
- Fire safe design.

STANDARD	OPTION
<b>FACE TO FACE DIMENSIONS</b>	
<b>WAFER AND LUG TYPE</b>	
API 609 Table 2./MSS-SP-68 Table 1 Class 150 & 300: 3" ~ 24" Class 600: 3" ~ 12"	ISO 5752 Table 5 Class 150 & 300: 28" ~ 48" Class 600: 14" ~ 24"
<b>DOUBLE FLANGE</b>	
ISO 5752 Table 4, BS 5155 Table 6 (short) Class 150 & 300: 3" ~ 24" ISO 5752 Table 4, BS 5155 Table 6 (long) Class 600: 3" ~ 12"	ISO 5752 Table 4, BS 5155 Table 6 (short) Class 150 & 300: 28" ~ 80" ISO 5752 Table 4, BS 5155 Table 6 (long) Class 150 & 300: 3" ~ 80" Class 600: 14" ~ 24"  ASME B16.10 Class 150 & 300: 3" ~ 24" Class 600 : 3" ~ 24"
<b>BUTT WELDING</b>	
	ISO 5752 Table 4, BS 5155 Table 6 (long) Class 150 & 300: 3" ~ 80" Class 600: 3" ~ 24"
<b>END FLANGE</b>	
ASME B16.5 : Class 150, 300, 600 JIS B2210: 10K, 16K, 20K, 30K, 40K DIN, ISO PN10, PN16, PN20, PN25, PN40	ASME B16.47 series A: Class 150, 300 MSS-SP-44: Class 150, 300, 600 BS 3293: Class 150, 300
<b>OPERATING</b>	
MANUAL WORM GEAR	ELECTRIC, PNEUMATIC & HYDRAULIC AC- TUATOR LOCK LEVER
<b>MOUNTING FLANGE</b>	
ISO 5211	
<b>TESTING</b>	
API 598	MSS-SP-61, ANSI B16.104

## DESIGN PRINCIPLES—TRIPLE OFFSET METAL SEAT

### TRIPLE OFFSET DESIGN PRINCIPLES

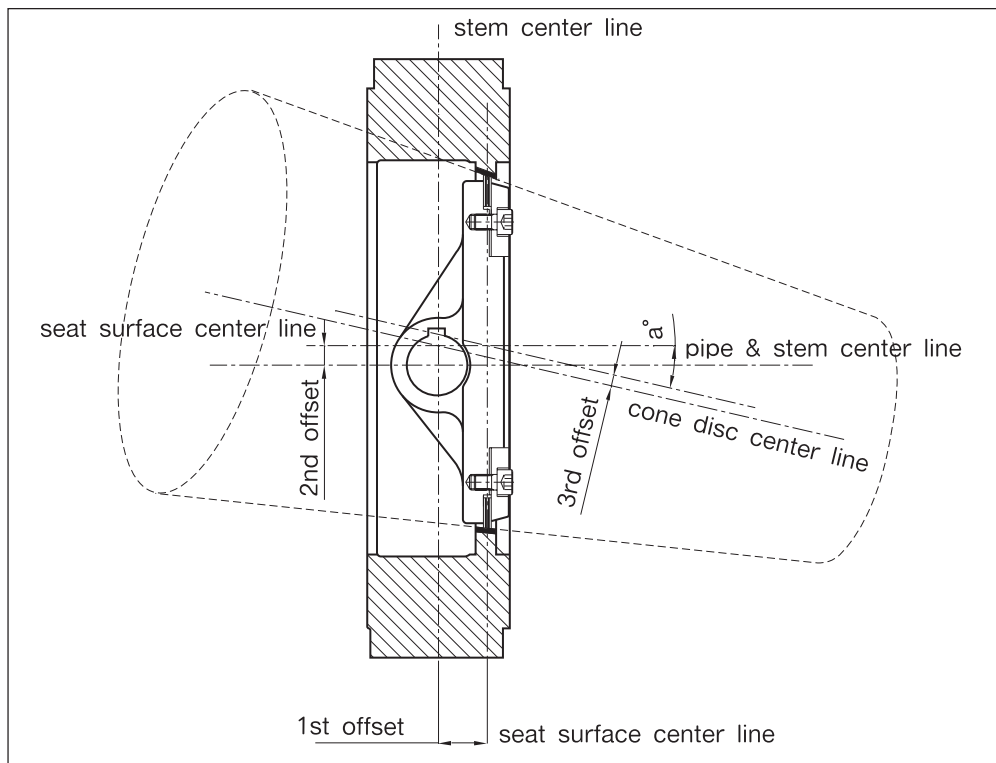
STANVAL Valve International triple offset metal seat butterfly valves provide a bi-directional and bubble-tight shutoff which is attributed to the geometry of triple offset seat.

The valve stem is offset by seat (1st offset) and the valve seat surface center line is offset against the center line of pipe (2nd offset) and the conical axis is offset by valve center line (3rd offset: inclined cone). The 3rd offset completely eliminates rubbing.

The seat surfaces of body and seal ring in triple offset valve contact with the inclined "cone-in-cone" and this design requires excellent sealing and seat part durability by slight wedging effect.

In addition, the angle of contact between body and seal ring has a good sealing performance by low torque because the angle travels the initial torque from actuator to seat parts without any loss by jamming.

This valve is characteristic of concentric, offset and double offset construction with remarkable sealing performance and seat part durability, and moreover it hardly ever needs repair.



### CHARACTERISTICS AND MERITS

- Excellent durability of seat part and low operating torque by non-rubbing characteristics with triple offset construction.
- Bi-directional zero leakage service by resilient metal sealing and torque seating.
- Unrestricted selection of face to face dimensions for API, ASME (ANSI), BS, ISO, etc. and perfect interchangeability of gate, ball, plug, high performance butterfly, and other valves.
- Low emission by quarter turn construction and good performance at automation by virtue of low operating torque and low cost.

## COMPONENT CHARACTERISTICS

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### BODY

- The valve body shall be one piece cast or fabrication.
- The body can be supplied with different types of materials in wafer, lug, or flanged and butt welding end connections to satisfy all installation requirements.

### BODY SEAT

- The valve seat shall be integrated with the body.
- Stellite or stainless steel shall be applied on the seating surfaces of valve body.
- The valve seat is designed for inclined cone to ensure non-rubbing, non-jamming, bi-directional shutoff, and zero leakage.

### DISC

- The valve disc shall be the same material as the valve body. It is supported by a laminated seal ring, which is kept in place by a seat retainer ring bolted to the disc and can be replaced easily.
- The spiral wound gasket shall be provided between laminated seal ring and disc.

### SEAL RING (LAMINATED)

- The seal ring shall be resilient stainless steel lamella alternated by graphite, aramid fiber and ceramic fiber layers.
- The surface contacting between seal ring and body seat is an inclined cone type and the inclined angle generates a slight wedging effect.
- With a seat retainer ring bolted to the disc, the seal ring is fixed to disc not too tightly to be replaced easily.

### STEM

- The stem shall be stainless steel and one piece and two piece construction.
- The stem shall be fixed to the disc by pin or in combination of pin and key. It can be protected by internal thrust bush and bush bearing.
- The thrust bush and bush bearing shall be provided to locate the valve disc in a proper position.
- The retainer ring shall be installed to avoid blowing out the stem.

### PACKING

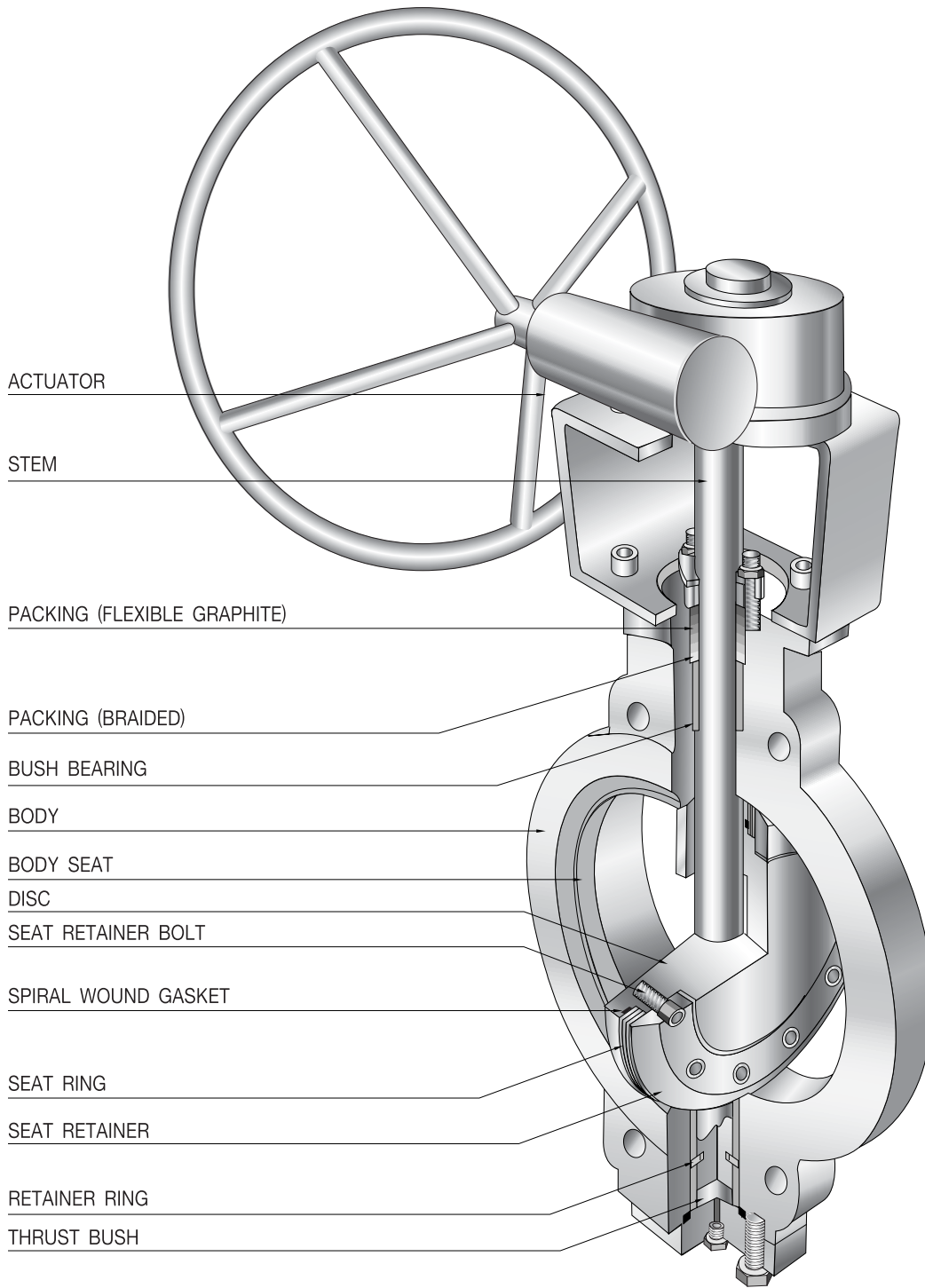
- The packing shall consist of two braided rings in the top and bottom of valve and three die formed graphite rings in the middle.
- The lantern ring may be provided as required by customer.

### ACTUATORS

- All valves shall be self-locking manual gear operation type which is served as standard.
- Electric, pneumatic or hydraulic actuator may be provided as required by customer.

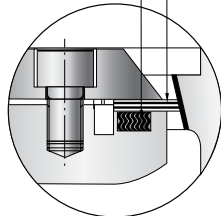


# BUTTERFLY VALVES

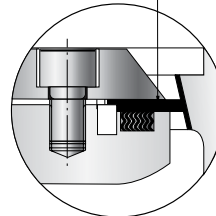


SEAT RING  
316SS+Graphite Laminated

SPIRAL WOUND GASKET  
316SS+Graphite



SEAT RING (Solid metal)  
316SS+Nitr





## STANDARD MATERIAL LIST—TRIPLE OFFSET METAL SEAT

### STANDARD MATERIAL LIST

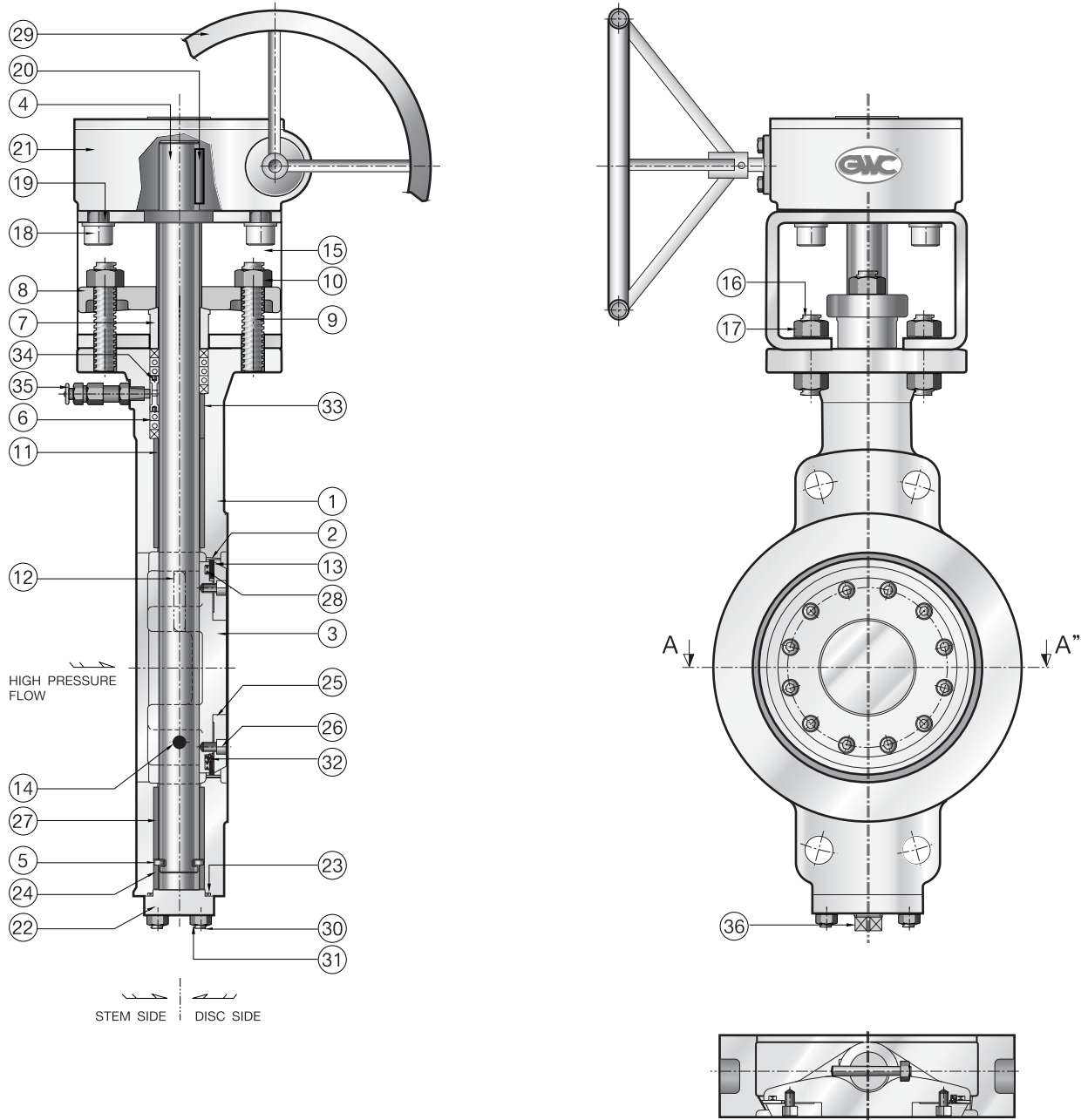
MATERIAL ACCORDING TO ASTM							
NO.	PART NAME	MATERIAL			QTY	REMARK	
1	BODY	A216-WCB	A217-WC9	A351-CF8M			
2	SEAT SURFACE	316 SS Faced	STELLITE NO. 6 Faced	Integral	1	Note 2	
3	DISC	A216-WCB + ENP	A217-WC9 + ENP	A351-CF8M	1	Note 1	
4	STEM	A479-410	A479-410	A564-630	1		
5	RETAINER RING	A479-410	A479-410	A479-316	1		
6	PACKING	Graphite	Graphite	Graphite	1	Set	
7	PACKING GLAND	A576-1020 + Cr	A479-410	A479-316	1		
8	GLAND FLANGE	A105 or A576-1020 (S20C)	A105 or A576-1020 (S20C)	A351-CF8	1		
9	GLAND BOLT	A193-B7	A193-B7	A193-B8	2/4		
10	NUT	A194-2H	A194-2H	A194-8	2/4		
11	BUSH BEARING	A479-304 + Nitr.	A479-316 + Nitr.	A479-316 + HCr. Plating	1	Note 1	
12	KEY	A479-410	A479-410	A564-630	1		
STANDARD	13	SEAL RING	316 SS + Graphite	316 SS + Graphite	316 SS + Graphite	1	Laminated
	14	TAPER PIN	410 SS	410 SS	A564-630	1	
	15	YOKE	A576-1020 (S20C)	A576-1020 (S20C)	A576-1020 + Zn. Plating	1	
	16	YOKE BOLT	A193-B7	A193-B7	A193-B8		
	17	YOKE NUT	A194-2H	A194-2H	A194-8		
	18	MOUNTING BOLT	A193-B7 or EQ.	A193-B7 or EQ.	A193-B7 or EQ.		
	19	SPRING WASHER	Steel	Steel	304 SS		
	20	KEY	A576-1045	A576-1045	A576-1045		
	21	GEAR BOX	Ductile	Ductile	Ductile	1	
	22	CAP	A576-1020 (S20C)	A240-304	A240-316	1	
	23	GASKET (CAP)	304 SS + Graphite	304 SS + Graphite	304 SS + Graphite	1	Spiral wound
	24	THRUST BUSH	A479-410	A479-410	A479-316		
	25	SEAT RETAINER	A576-1020 + ENP	A240-304	A240-316		
	26	RETAINER BOLT	A193-B8	A193-B8	A193-B8M		
	27	BUSH BEARING	A479-304 + Nitr.	A479-304 + Nitr.	A479-316 + HCr. Plating	1	Note 1
	28	GASKET	304 SS + Graphite	304 SS + Graphite	304 SS + Graphite	1	Spiral wound
	29	HANDWHEEL	A53	A53	A53	1	
	30	CAP BOLT	A193-B7	A193-B16	A193-B8	4/8	
	31	CAP NUT	A194-2H	A194-4	A194-8	4/8	
32	SEAL RING PIN	A479-304	A479-304	A479-316	1		
33	SPACER	A479-304	A479-304	A479-316	1		
OPTION	2	SEAT SURFACE	Stellite No. 6 Faced	Stellite No. 6 Faced	Stellite No. 6 Faced	1	
	13	SEAL RING	Duplex SS + GRAPHITE	Duplex SS + GRAPHITE	Duplex SS + GRAPHITE	1	Laminated
			316 SS + ARAMID	316 SS + ARAMID	316 SS + ARAMID		
			316 SS + CERMIC	316 SS + CERMIC	316 SS + CERMIC		
			A564-630 or 316 SS + Nitr.	A564-630 or 316 SS + Nitr.	A564-630 or 316 SS + Nitr.	1	Solid Metal Ring
34	LANTERN RING	410 SS	410 SS	316 SS	1		
35	PLUG	A105	410 SS	318 SS	1		
	GREASE FITTING	Carbon Steel + Cr. Plating	316 SS	316 SS	1		
36	DRAIN PLUG	A105	410 SS	316 SS	1		

#### NOTE:

- Nitr: Hardened by Nitriding; HCr: Hard Cr Plating; ENP: Electroless Nickel Plating
- Class 150 & 300: 316 SS Faced and Integral  
Class 600 & over: Stellite No. 6 Faced
- Recommended Spare Parts: Part No. 6, 13, 23, 28

## SECTIONAL DRAWING—TRIPLE OFFSET METAL SEAT

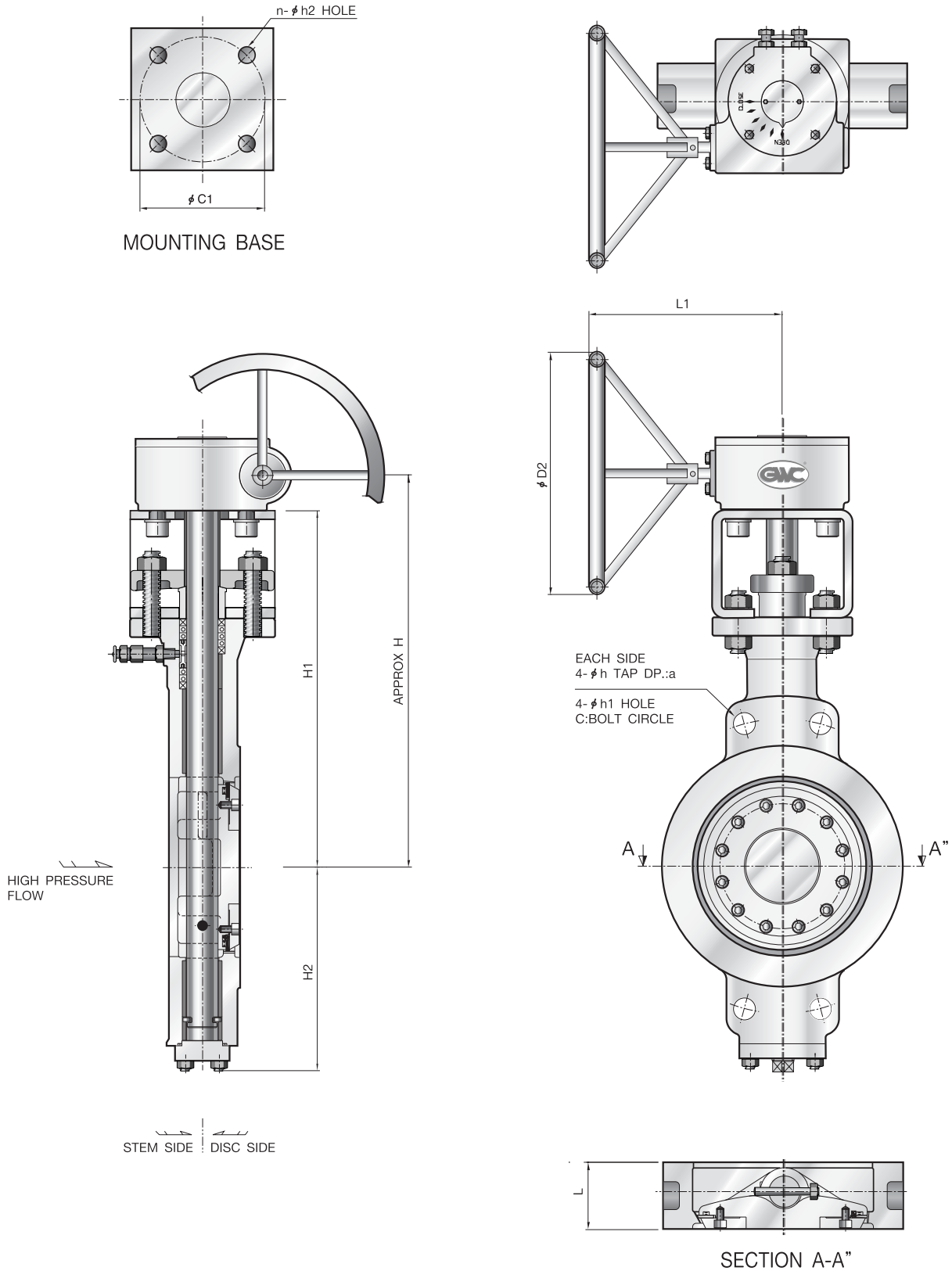
### SECTIONAL DRAWING



SECTION A-A''

## TOB VALVE: WAFER TYPE

### TOB VALVE: WAFER TYPE - OUTDRAWING



## TOB VALVE: WAFER TYPE

### TOB VALVE: WAFER TYPE - DIMENSIONS

TOB VALVE: WAFER TYPE – DIMENSIONS															UNIT: mm	
CLASS 150																
SIZE		L	FLANGE DIMENSION				H	H1	H2	D2	L1	MOUNTING BASE				Weight (Kgf)
Inch	mm		C	h	a	h1						TYPE	C1	n	h2	
3	80	48	152.4	-	-	19.1	282	258	142	200	165	F07	70	4	9	21
4	100	54	190.5	-	-	19.1	294	270	162	200	165	F07	70	4	9	27
5	125	57	215.9	-	-	22.2	319	295	170	200	165	F07	70	4	9	32
6	150	57	241.3	-	-	22.2	340	316	179	200	165	F07	70	4	9	35
8	200	64	298.4	-	-	22.2	384	344	208	300	270	F10	102	4	11	53
10	250	71	361.9	-	-	25.4	434	394	241	300	270	F10	102	4	11	74
12	300	81	431.8	-	-	25.4	520	470	267	400	335	F14	140	4	18	95
14	350	92	476.3	-	-	28.6	544	494	316	400	335	F14	140	4	18	131
16	400	102	539.7	-	-	28.6	643	578	349	500	375	F16	165	4	22	165
18	450	114	577.8	-	-	31.8	660	595	381	500	375	F16	165	4	22	230
20	500	127	635.0	1-1/8-8	28.6	-	695	630	412	500	375	F16	165	4	22	280
24	600	154	749.3	1-1/4-8	31.8	-	813	743	473	600	485	F25	254	8	18	450

CLASS 300																
SIZE		L	FLANGE DIMENSION				H	H1	H2	D2	L1	MOUNTING BASE				Weight (Kgf)
Inch	mm		C	h	a	h1						TYPE	C1	n	h2	
3	80	48	168.2	-	-	22.2	282	258	142	200	165	F07	70	4	9	21
4	100	54	200.0	-	-	22.2	294	270	162	200	165	F07	70	4	9	27
5	125	59	234.9	-	-	22.2	319	295	170	300	270	F10	102	4	11	38
6	150	59	269.8	-	-	22.2	375	336	199	300	270	F10	102	4	11	45
8	200	73	330.2	-	-	25.4	450	400	227	400	335	F14	140	4	18	72
10	250	83	387.3	1-8	25.4	-	499	449	265	400	335	F14	140	4	18	135
12	300	92	450.8	1-1/8-8	28.6	-	562	497	302	500	375	F16	165	4	22	148
14	350	117	514.3	1-1/8-8	28.6	-	616	551	328	500	375	F16	165	4	22	208
16	400	133	571.5	1-1/4-8	31.8	-	676	606	367	600	485	F25	254	8	18	298
18	450	149	628.6	1-1/4-8	31.8	-	711	641	402	600	485	F25	254	8	18	382
20	500	159	685.8	1-1/4-8	31.8	-	798	721	432	700	520	F30	298	8	22	450
24	600	181	812.8	1-1/2-8	38.1	-	914	837	530	700	515	F30	298	8	22	680

CLASS 600																
SIZE		L	FLANGE DIMENSION				H	H1	H2	D2	L1	MOUNTING BASE				Weight (Kgf)
Inch	mm		C	h	a	h1						TYPE	C1	n	h2	
3	80	54	168.2	-	-	22.2	289	265	148	200	165	F07	70	4	9	29
4	100	64	215.9	-	-	25.4	370	330	180	300	270	F10	102	4	11	38
5	125	78	266.7	-	-	28.6	405	355	195	400	335	F14	140	4	18	55
6	150	78	292.1	1-8	25.4	-	420	370	225	400	335	F14	140	4	18	75
8	200	102	349.2	1-1/8-8	28.6	-	490	425	255	500	375	F16	165	4	22	136
10	250	117	431.8	1-1/4-8	31.8	-	545	480	310	500	375	F16	165	4	22	200
12	300	140	488.9	1-1/4-8	31.8	-	630	560	330	600	485	F25	254	8	18	295

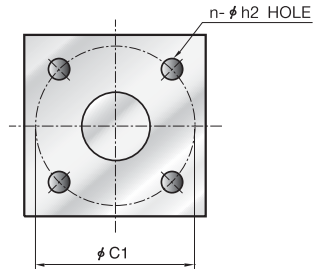
\* NOT SPECIFIED CLASS AND SIZE, PLEASE CONTACT SALES DEPARTMENT

#### NOTE:

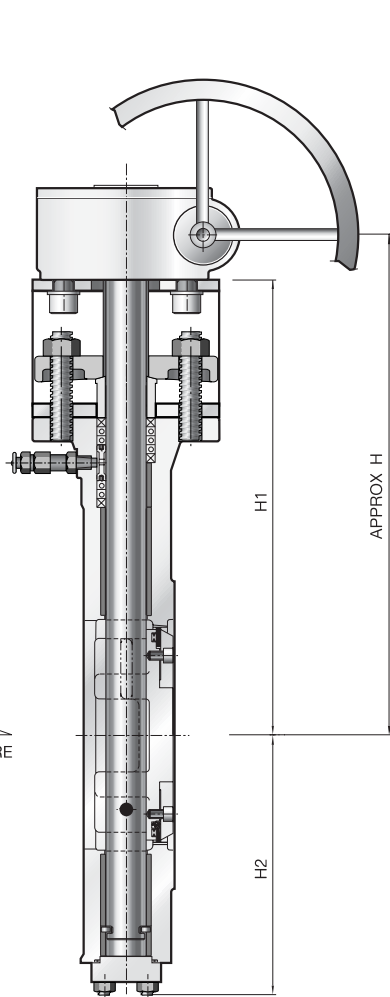
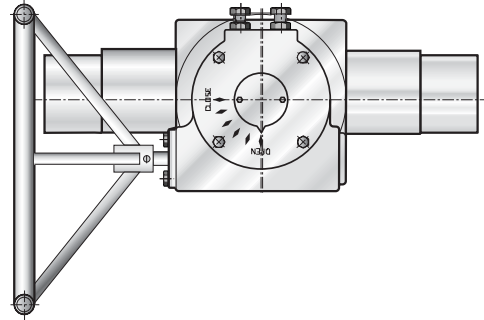
1. Valve Design: ASME B16.34
2. Face to Face Dimension: API 609 (Wafer Type)
3. End Flange Dimension: ASME B16.5

## TOB VALVE: LUG TYPE

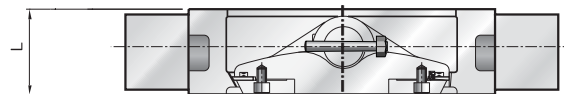
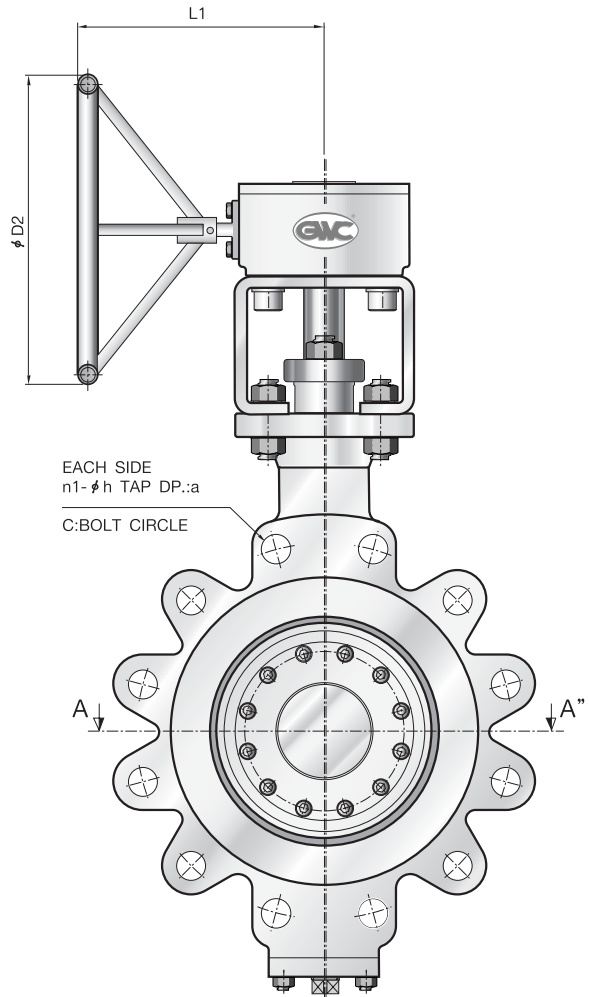
### TOB VALVE: LUG TYPE - OUTDRAWING



MOUNTING BASE



STEM SIDE | DISC SIDE



SECTION A-A''

## TOB VALVE: LUG TYPE

### TOB VALVE: LUG TYPE - DIMENSIONS

TOB VALVE: WAFER TYPE – DIMENSIONS																	UNIT: mm
CLASS 150																	
SIZE		L	FLANGE DIMENSION					MOUNTING BASE					Weight (Kgf)				
Inch	mm		C	h	a	n1	h1	H	H1	H2	D2	L1		TYPE	C1	n	h2
3	80	48	152.4	5/8-11	15.8	4	19.1	282	258	142	200	165	F07	70	4	9	23
4	100	54	190.5	5/8-11	15.8	8	19.1	294	270	162	200	165	F07	70	4	9	30
5	125	57	215.9	3/4-10	19.1	8	22.2	319	295	170	200	165	F07	70	4	9	36
6	150	57	241.3	3/4-10	19.1	8	22.2	340	316	179	200	165	F07	70	4	9	39
8	200	64	298.4	3/4-10	19.1	8	22.2	384	344	208	300	270	F10	102	4	11	59
10	250	71	361.9	7/8-9	22.2	12	25.4	434	394	241	300	270	F10	102	4	11	83
12	300	81	431.8	7/8-9	22.2	12	25.4	520	470	267	400	335	F14	140	4	18	110
14	350	92	476.3	1-8	25.4	12	28.6	544	494	316	400	335	F14	140	4	18	153
16	400	102	539.7	1-8	25.4	16	28.6	643	578	349	500	375	F16	165	4	22	193
18	450	114	577.8	1-1/8-8	28.6	16	31.8	660	595	381	500	375	F16	165	4	22	258
20	500	127	635.0	1-1/8-8	28.6	20	31.8	695	630	412	500	375	F16	165	4	22	318
24	600	154	749.3	1-1/4-8	31.8	20	35.1	813	743	473	600	485	F25	254	8	18	507

CLASS 300																	
SIZE		L	FLANGE DIMENSION					MOUNTING BASE					Weight (Kgf)				
Inch	mm		C	h	a	n1	h1	H	H1	H2	D2	L1		TYPE	C1	n	h2
3	80	48	168.2	3/4-10	19.1	8	22.2	282	258	142	200	165	F07	70	4	9	24
4	100	54	200.0	3/4-10	19.1	8	22.2	294	270	162	200	165	F07	70	4	9	32
5	125	59	234.9	3/4-10	19.1	8	22.2	319	295	170	300	270	F10	102	4	11	44
6	150	59	269.8	3/4-10	19.1	12	22.2	375	336	199	300	270	F10	102	4	11	52
8	200	73	330.2	7/8-9	22.2	12	25.4	450	400	227	400	335	F14	140	4	18	83
10	250	83	387.3	1-8	25.4	16	28.6	499	449	265	400	335	F14	140	4	18	151
12	300	92	450.8	1-1/8-8	28.6	16	31.8	562	497	302	500	375	F16	165	4	22	172
14	350	117	514.3	1-1/8-8	28.6	20	31.8	616	551	328	500	375	F16	165	4	22	249
16	400	133	571.5	1-1/4-8	31.8	20	35.1	616	606	367	600	375	F25	254	8	18	352
18	450	149	628.6	1-1/4-8	31.8	24	35.1	711	641	402	600	485	F25	254	8	18	449
20	500	159	685.8	1-1/4-8	31.8	24	35.1	798	721	432	700	520	F30	298	8	22	534
24	600	181	812.8	1-1/2-8	38.1	24	41.2	914	837	530	700	515	F30	298	8	22	812

CLASS 600																	
SIZE		L	FLANGE DIMENSION					MOUNTING BASE					Weight (Kgf)				
Inch	mm		C	h	a	n1	h1	H	H1	H2	D2	L1		TYPE	C1	n	h2
3	80	54	168.2	3/4-10	19.1	4	22.2	282	265	148	200	165	F07	70	4	9	32
4	100	64	215.9	7/8-9	22.2	4	25.4	370	330	180	300	270	F10	102	4	11	45
5	125	78	266.7	1-8	25.4	4	28.6	405	355	195	400	335	F14	140	4	18	67
6	150	78	292.1	1-8	25.4	8	28.6	420	370	225	400	335	F14	140	4	18	88
8	200	102	349.2	1-1/8-8	28.6	8	31.8	490	425	255	500	375	F16	165	4	22	157
10	250	117	431.8	1-1/4-8	31.8	12	35.1	545	480	310	500	375	F16	165	4	22	237
12	300	140	488.9	1-1/4-8	31.8	16	35.1	630	560	330	600	485	F25	254	8	18	335

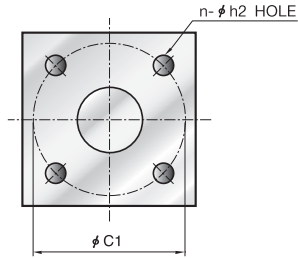
\* NOT SPECIFIED CLASS AND SIZE, PLEASE CONTACT SALES DEPARTMENT

#### NOTE:

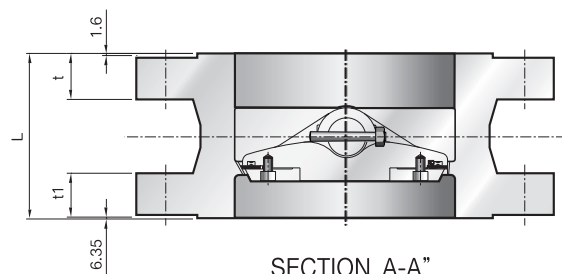
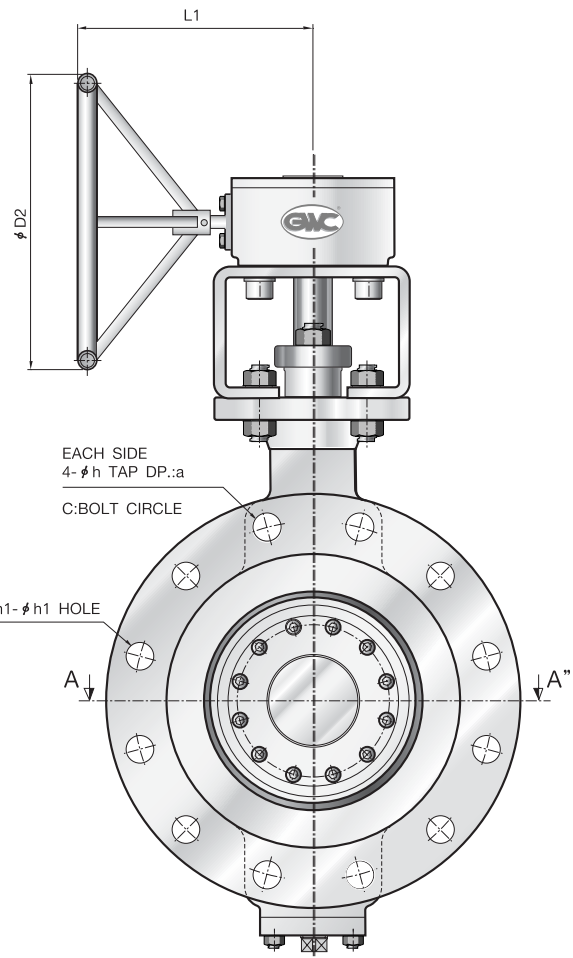
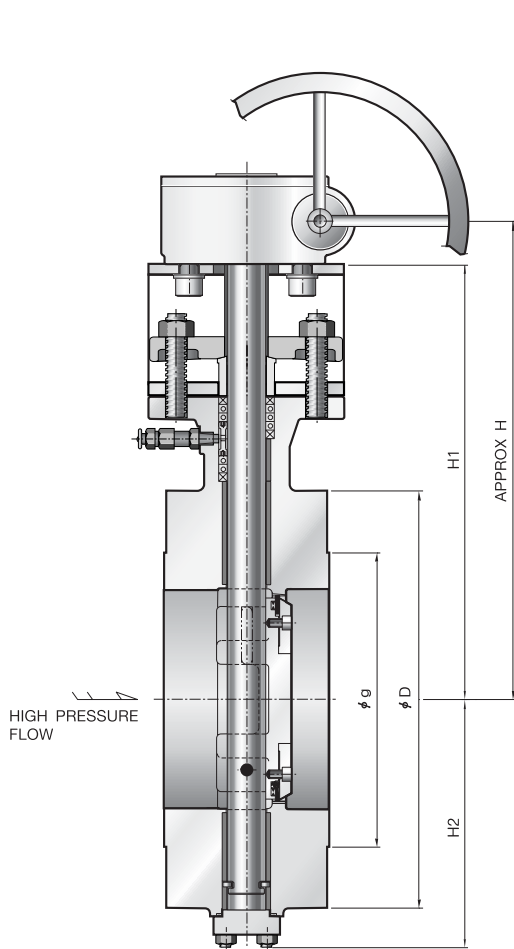
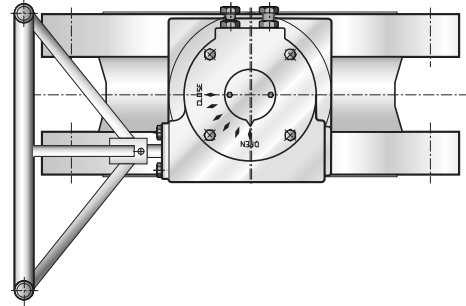
1. Valve Design: ASME B16.34
2. Face to Face Dimension: API 609 (LugType)
3. End Flange Dimension: ASME B16.5

## TOB VALVE: DOUBLE FLANGE (SHORT) TYPE

### TOB VALVE: DOUBLE FLANGE (SHORT) TYPE - OUTDRAWING



MOUNTING BASE





## TOB VALVE: DOUBLE FLANGE (SHORT) TYPE

### TOB VALVE: DOUBLE FLANGE (SHORT) TYPE - DIMENSIONS

TOB VALVE: WAFER TYPE – DIMENSIONS																	UNIT: mm			
CLASS 150																				
SIZE		L	FLANGE DIMENSION								MOUNTING BASE				Weight (Kgf)					
Inch	mm		D	g	C	t	h	a	n1	h1	H	H1	H2	D2		L1	TYPE	C1	n	h2
3	80	114	191	127.0	152.4	19.1	5/8-11	15.8	4	19.1	282	258	142	200	165	F07	70	4	9	27
4	100	127	229	157.2	190.5	24.0	5/8-11	15.8	8	19.1	294	270	162	200	165	F07	70	4	9	35
5	125	140	254	185.7	215.9	24.0	3/4-10	19.1	8	22.2	319	295	170	200	165	F07	70	4	9	41
6	150	140	279	215.9	241.3	25.4	3/4-10	19.1	8	22.2	340	316	179	200	165	F07	70	4	9	45
8	200	152	343	269.7	298.4	28.5	3/4-10	19.1	8	22.2	384	344	208	300	270	F10	102	4	11	68
10	250	165	406	323.9	361.9	30.3	7/8-9	22.2	12	25.4	434	394	241	300	270	F10	102	4	11	97
12	300	178	483	381.0	431.8	31.8	7/8-9	22.2	12	25.4	520	470	267	400	335	F14	140	4	18	133
14	350	190	533	412.8	476.3	35.1	1-8	25.4	12	28.6	544	494	316	400	335	F14	140	4	18	188
16	400	216	597	469.9	539.7	36.6	1-8	25.4	16	28.6	643	578	349	500	375	F16	165	4	22	238
18	450	222	635	533.4	577.8	39.7	1-1/8-8	28.6	16	31.8	660	595	381	500	375	F16	165	4	22	302
20	500	229	699	584.2	635.0	43.0	1-1/8-8	28.6	20	31.8	695	630	412	500	375	F16	165	4	22	380
24	600	267	813	692.2	749.3	47.8	1-1/4-8	31.8	20	35.1	813	743	473	600	485	F25	254	8	18	599

CLASS 300																				
SIZE		L	FLANGE DIMENSION								MOUNTING BASE				Weight (Kgf)					
Inch	mm		D	g	C	t	h	a	n1	h1	H	H1	H2	D2		L1	TYPE	C1	n	h2
3	80	114	210	127.0	168.2	28.5	3/4-10	19.1	8	22.2	282	258	142	200	165	F07	70	4	9	29
4	100	127	254	157.2	200.0	31.8	3/4-10	19.1	8	22.2	294	270	162	200	165	F07	70	4	9	39
5	125	140	279	185.7	234.9	35.0	3/4-10	19.1	8	22.2	319	295	170	300	270	F10	102	4	11	52
6	150	140	318	215.9	269.8	36.6	3/4-10	19.1	12	22.2	375	336	199	300	270	F10	102	4	11	63
8	200	152	381	269.7	330.2	41.2	7/8-9	22.2	12	25.4	450	400	227	400	335	F14	140	4	18	101
10	250	165	445	323.9	387.3	47.8	1-8	25.4	16	28.6	499	449	265	400	335	F14	140	4	18	176
12	300	178	521	381.0	450.8	50.8	1-1/8-8	28.6	16	31.8	562	497	302	500	375	F16	165	4	22	210
14	350	190	584	412.8	514.3	53.9	1-1/8-8	28.6	20	31.8	616	551	328	500	375	F16	165	4	22	315
16	400	216	648	469.9	571.5	57.2	1-1/4-8	31.8	20	35.1	676	606	367	600	485	F25	254	8	18	440
18	450	222	711	533.4	628.6	60.5	1-1/4-8	31.8	24	35.1	711	641	402	600	485	F25	254	8	18	558
20	500	229	775	584.2	685.8	63.5	1-1/4-8	31.8	24	35.1	798	721	432	700	520	F30	298	8	22	670
24	600	267	814	692.2	812.8	69.9	1-1/2-8	38.1	24	41.2	914	837	530	700	515	F30	298	8	22	1025

CLASS 600																				
SIZE		L	FLANGE DIMENSION								MOUNTING BASE				Weight (Kgf)					
Inch	mm		D	g	C	t	h	a	n1	h1	H	H1	H2	D2		L1	TYPE	C1	n	h2
3	80	180	210	127.0	168.2	31.8	3/4-10	19.1	8	22.2	289	265	148	200	165	F07	70	4	9	37
4	100	190	273	157.2	215.9	38.1	7/8-9	22.2	8	25.4	370	330	180	300	270	F10	102	4	11	55
5	125	200	330	185.7	266.7	44.5	1-8	25.4	12	28.6	405	355	195	400	335	F14	140	4	18	86
6	150	210	356	215.9	292.1	47.8	1-8	25.4	12	28.6	420	370	225	400	335	F14	140	4	18	109
8	200	230	419	269.7	349.2	55.7	1-1/8-8	28.6	12	31.8	490	425	255	500	375	F16	165	4	22	192
10	250	250	508	323.9	431.8	63.5	1-1/4-8	31.8	16	35.1	545	480	310	500	375	F16	165	4	22	296
12	300	270	559	381.0	488.9	66.6	1-1/4-8	31.8	20	35.1	630	560	330	600	485	F25	254	8	18	390

\* NOT SPECIFIED CLASS AND SIZE, PLEASE CONTACT SALES DEPARTMENT

#### NOTE:

1. Valve Design: ASME B16.34
2. Face to Face Dimension: ISO 5752 (Short Type)
3. End Flange Dimension: ASME B16.5

## TOB VALVE: TECHNICAL DATA

### PRESSURE/TEMPERATURE RATING (REF. ASME B16.34)

TEMPERATURE (°C)	MAXIMUM WORKING PRESSURE, kgf/cm <sup>2</sup> A								
	CLASS 150			CLASS 300			CLASS 600		
	WCB	CF8M	WC9	WCB	CF8M	WC9	WCB	CF8M	WC9
-29 to 38	20.0	19.3	20.4	52.0	50.6	52.7	104.1	101.2	105.5
93	18.3	16.9	18.3	47.5	43.6	50.3	94.9	87.2	100.5
149	16.2	15.1	16.2	46.1	39.4	47.5	92.5	78.8	95.3
204	14.1	13.7	14.1	44.7	36.2	45.7	89.3	72.4	91.1
260	12.0	12.0	12.0	42.2	33.8	45.0	84.4	67.1	90.0
316	9.8	9.8	9.8	38.7	31.6	42.5	77.0	63.6	85.1
343	8.8	8.8	8.8	37.6	31.3	41.5	75.6	62.6	82.6
371	7.7	7.7	7.7	37.6	32.3	40.1	74.9	60.8	79.8
399	6.7	6.7	6.7	35.5	29.9	37.3	71.0	59.4	74.9
427	5.6	5.6	5.6	28.8	29.2	35.9	58.0	58.4	71.4
454	4.6	4.6	4.6	19.0	28.5	34.1	37.6	57.0	68.6
482	3.5	3.5	3.5	12.0	27.8	31.6	24.3	55.5	63.3
510	2.5	2.5	2.5	7.4	27.1	26.7	14.4	54.5	53.1
538	1.4	1.4	1.4	3.5	25.7	19.0	7.4	51.0	37.6
566		1.4(1)	1.4(1)		25.3	14.1		50.6	28.1
593		1.4(1)	1.4(1)		22.9	8.1		45.4	15.8
624		1.4(1)	1.4(1)		19.3	7.4		38.7	14.4
649		1.4(1)	1.4(1)		14.4	3.9		28.8	110.0

**NOTE:**

(1) For weld valve only, the temperature rating of flanged end terminates at 538°C

### FLOW DATA

Valve flow coefficient Cv is defined as the flow of water at 60°F in gallons per minute (GPM) at a pressure of one pound per square inch (1 psi) across the valve.

$$Q = C_v \sqrt{(\Delta P (62.4/\rho))}$$

### WHERE

Q = Flow rate (GPM)

Cv = Flow coefficient

ΔP = Pressure drop (psi)

ρ = Density of fluid (ρ = 62.4, water at 60°F)

### THEREFORE

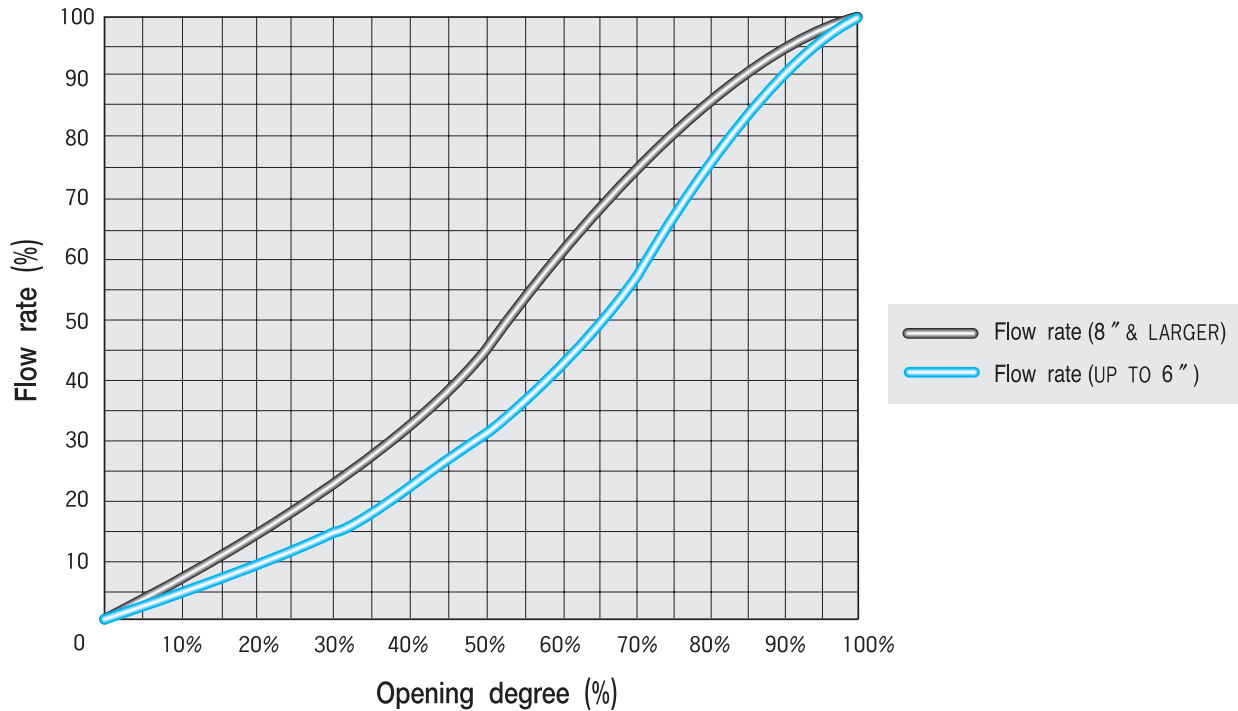
$$Q = C_v \sqrt{\Delta P}$$

### FLOW COEFFICIENT VALUE (Cv)

Class	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
150#	195	345	500	827	1523	2698	4032	5674	7880	10594	13292	19604
300#	195	345	500	786	1447	2563	3830	5390	7486	10064	12627	18624
600#	195	345	475	746	1374	2435	3640					

## TOB VALVE: TECHNICAL DATA

### FLOW CHARACTERISTIC CURVE



### TORQUE DATA

Max. $\Delta P$ (kdf/cm <sup>2</sup> )	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
10.5 (150PSIG)	2.8	4.9	6.8	11.0	19.3	29.8	51.2	61.7	86.5	143.7	181.8	272.5
20.0 (285PSIG)	5.4	9.3	13.0	20.8	36.5	56.4	96.8	116.5	163.1	271.0	342.1	510.7
28.1 (400PSIG)	7.6	13.0	18.2	29.1	52.3	81.5	134.2	169.3	236.8	386.0	495.1	735.1
42.2 (600PSIG)	11.3	19.6	27.3	43.7	78.4	122.1	201.0	253.6	354.5	578.0	741.0	1098.9
52.0 (740PSIG)	14.0	24.1	33.6	53.9	96.7	150.5	247.8	312.6	436.8	712.3	913.1	1353.5
104.1 (1480PSIG)	36.4	66.2	90.1	144.9	284.6	449.4	642.5					

\* The torque shown in the above chart is actuator sizing torque at the maximum differential pressure.

### APPLICATION

- Nuclear Power Plants and Power Plants
- Oil Refineries and Chemical Plants
- Pulp and Paper, Steel Mills
- Offshore Plants
- Gas Piping and Local Area Energy Supply System
- Ship Building

### INSTALLATION CAUTIONS

- The valve is bi-directional and can be mounted in any position. However, it is recommended that the valve is horizontal to the stem and the inclined cone edge of disc faces toward the downstream (refer to directional arrows and stem side).
- If you want to use at a temperature below -48°C or above 426°C, the extension design shall be applied. In such cases, please contact the Sales Department.

## SPECIFICATIONS—HIGH PERFORMANCE

### DESIGN FEATURE

- Designed in accordance with ASME B16.34 or other customer requirements.
- Fire safe design.

#### DOUBLE ECCENTRIC TYPE (HIGH PERFORMANCE)

#### CONCENTRIC TYPE (RUBBER SEATED)

### FACE TO FACE DIMENSIONS

#### WAFER AND LUG TYPE

API 609 / MSS-SP-68 / ISO 5752  
Class 150: 2" ~ 48"  
Class 300: 2" ~ 40"  
Class 600: 3" ~ 24"

API 609 / MSS-SP-68 / ISO 5752  
Class 150: 2" ~ 48"

#### DOUBLE FLANGE

ISO 5752, BS 5155  
Class 150: 2" ~ 48"  
Class 300: 2" ~ 40"  
Class 600: 3" ~ 24"

ISO 5752, BS 5155  
Class 150: 2" ~ 48"

#### END FLANGE

ASME B16.5 : Class 150, 300, 600  
JIS B2210: 10K, 16K, 20K  
DIN, ISO PN10, PN16, PN25, PN40

ASME B16.47 A/B: Class 150, 300, 600  
API 605, MSS-SP-44: Class 150, 300, 600  
BS 3293: Class 150, 300

#### OPERATING

MANUAL WORM GEAR  
LEVER HANDLE

ELECTRIC, PNEUMATIC & HYDRAULIC  
ACTUATOR

#### MOUNTING FLANGE

ISO 5211

MSS-SP-102

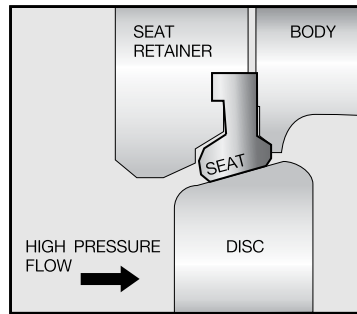
#### TESTING

API 598

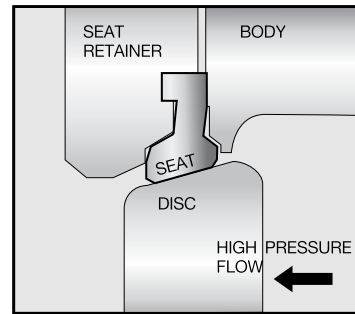
MSS-SP-61, ANSI B16.104

## SEAT DESIGN PRINCIPLES—HIGH PERFORMANCE

### STANDARD DESIGN



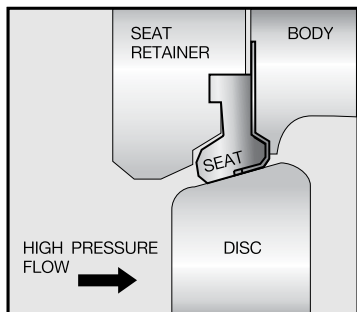
FORWARD FLOW



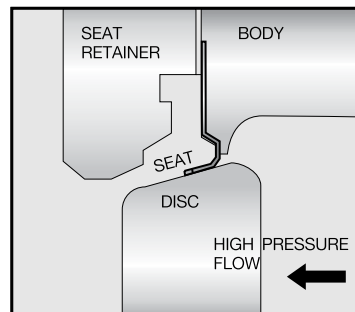
REVERSE FLOW

- Bi-directional flow and shut-off are easily accommodated.
- As pressure increases, seal becomes tighter.

### FIRE SAFE DESIGN



BEFORE FIRE TEST



AFTER FIRE TEST

### SEAT MATERIAL AND WORKING TEMPERATURE

SEAT MATERIAL	MAX. WORKING TEMPERATURE °C (°F)
PTFE	200 (392)
RTFE	250 (482)

### SEAT LEAKAGE

- Leakage soft seated version (PTFE, RTFE) is zero.

## STANDARD MATERIAL LIST–HIGH PERFORMANCE

### STANDARD MATERIAL LIST

MATERIAL ACCORDING TO ASTM						
NO.	PART NAME	MATERIAL			QTY	REMARK
1	BODY	A216-WCB	A351-CF8	A351-CF8M	1	
2	SEAT RING		PTFE, RTFE		1	Note 3
3	DISC	A351-CF8		A351-CF8M	1	
4	STEM	A267-304, A276-316, A564-630		A276-316, A564-630	1	
5	RETAINER RING		A276-304		1	
6	PACKING		Graphite, PTFE		1 Set	
7	PACKING GLAND		A276-304		1	
8	GLAND FLANGE		A240-304		1	
9	GLAND BOLT		A193-B8		2/4	
10	SPRING WASHER		304SS		2/4	
11	BUSH BEARING		A276-306 + RTFE		2	Note 3
12	STUFFING RING	A276-304		A276-316	1	
13	DISC PIN		A276-316		1 Set	
14	CAP	A576-1020 (S20C)	A240-304	A240-316	1	
15	GASKET		PTFE, RTFE		1	Note 3
16	SEAT RETAINER	A576-1045	A240-304	A240-316	1	
17	RETAINER BOLT	A193-B8		A193-B8M		
18	CAP BOLT		A193-B8			
19	SPRING WASHER		304SS			
20	KEY		A576-1045		1	Note 2
21	GEAR BOX		Ductile		1	
22	HANDWHEEL		A53		1	
2	SEAT RING	PTFE+ A240-304, RTFE+A240-304	PTFE+A240-316, RTFE+A240-316		1	
3	DISC	A351-CF8 + ENP or HCr.		A351-CF8M + ENP or HCr.	1	Note 1
		A351-CF8 + Stellite No. 6		A351-CF8M + Stellite No. 6		Faced
6	PACKING		Graphite		1 Set	
11	BUSH BEARING		A240-316		1	
15	GASKET		Graphite			

#### NOTE:

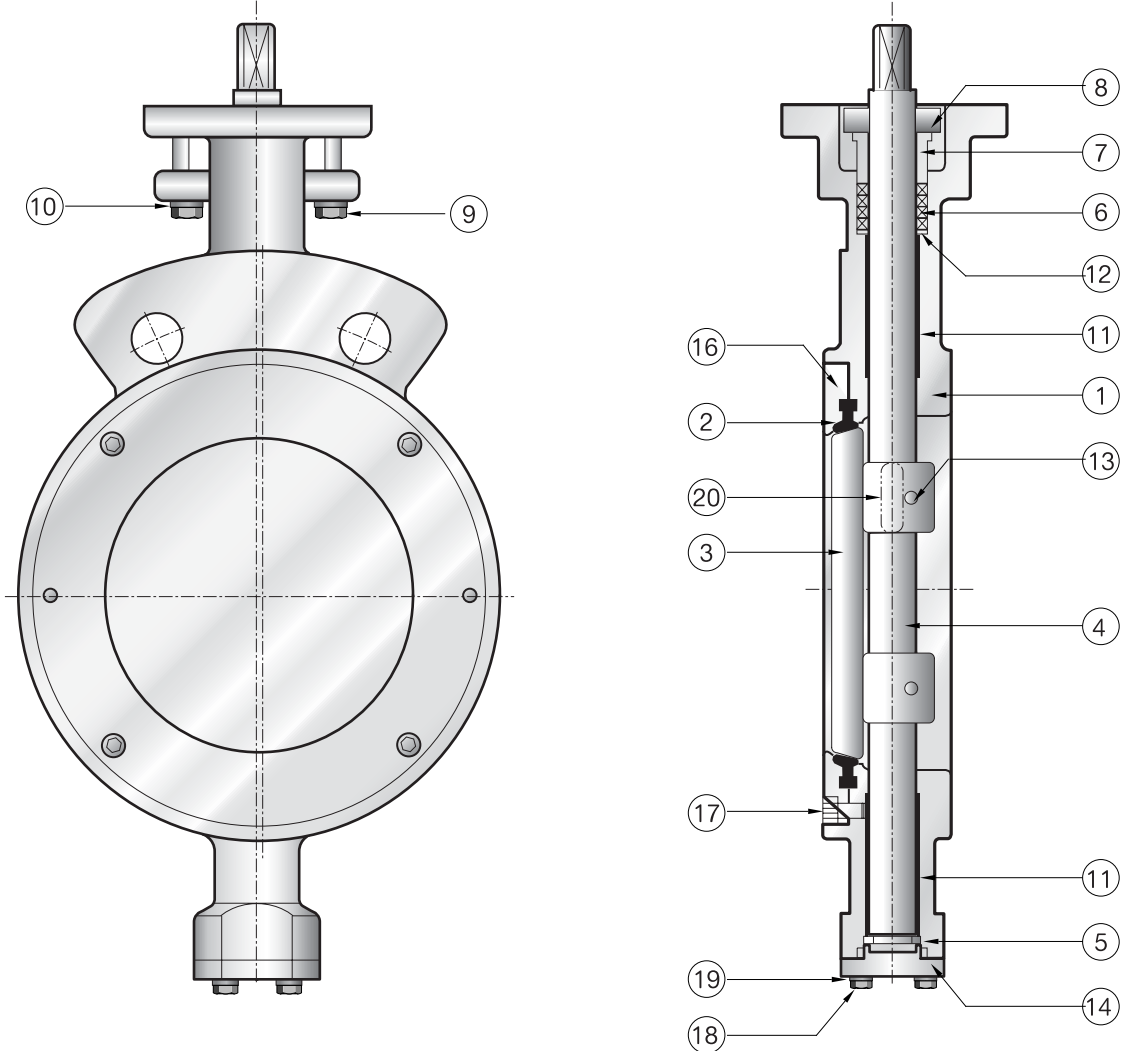
1. HCr: Hard Cr Plating; ENP: Electroless Nickel Plating
2. Part No. 20: For 8" and larger size
3. RTFE: Reinforced PTFE

#### FEATURES:

- Bubble tight shut-off
- Light weight, compact size and easy installation
- General application valve
- No flange gasket
- Easy replaceable seat
- Application:
  - Chemical processing
  - Power plant
  - Hydrocarbon processing

## SECTIONAL DRAWING—HIGH PERFORMANCE

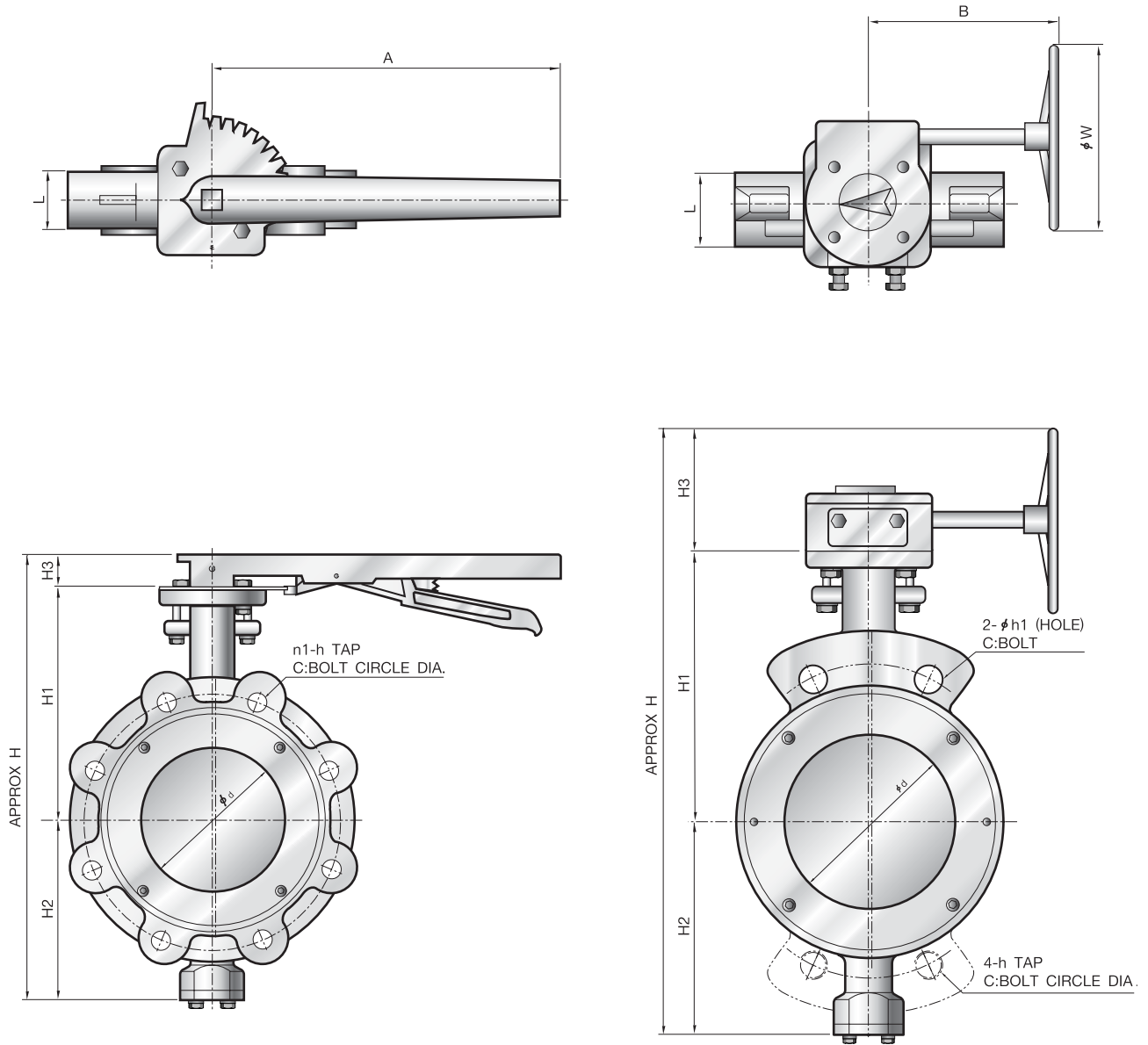
### SECTIONAL DRAWING



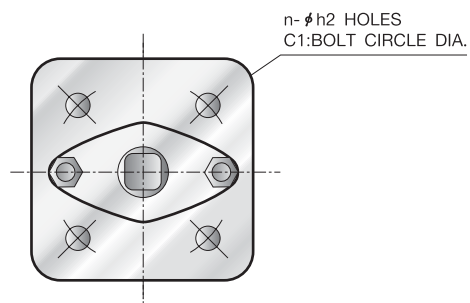


## OUTDRAWING-HIGH PERFORMANCE

### HIGH PERFORMANCE - OUTDRAWING



### ACTUATOR MOUNTING BASE



## DIMENSIONS—HIGH PERFORMANCE

### HIGH PERFORMANCE - DIMENSIONS

HIGH PERFORMANCE BUTTERFLY VALVE – DIMENSIONS																			UNIT: mm	
ANSI CLASS 150																				
SIZE											FLANGE DIMENSION				MOUNTING BASE			Weight		
Inch	mm	H	H1	H2	H3	ød	L	A	B	øW	C	n1	h	h1	n	h2	C1	WAFER	LUG	
2"	50	330	125	100	105	47	43	260	180	150	120.7	4	5/8" x 11unc	19	4	10	83	6.3	6.5	
2-1/2"	65	350	143	102	105	62	46	260	180	150	139.7	4	5/8" x 11unc	19	4	10	83	7.4	11	
3"	80	377	160	112	105	73	48	260	180	50	152.4	4	5/8" x 11unc	19	4	10	83	12	16	
4"	100	406	178	123	105	96	54	330	180	150	190.5	8	5/8" x 11unc	19	4	10	83	20	22	
5"	125	438	193	140	105	119	57	330	180	150	215.9	8	3/4" x 10unc	22.5	4	10	83	24	27	
6"	150	484	213	166	105	138	57	330	180	150	241.3	8	3/4" x 10unc	22.5	4	10	83	26	29	
8"	200	594	235	195	164	187	64	470	260	260	298.5	8	3/4" x 10unc	22.5	4	14	125	32	36	
10"	250	654	270	220	164	235	71	—	260	260	362.0	12	7/8" x 9unc	25.5	4	14	125	51	58	
12"	300	729	300	265	164	274	81	—	260	260	431.8	12	7/8" x 9unc	25.5	4	14	125	72	87	
14"	350	794	330	300	164	316	92	—	260	260	476.3	12	1" x 8unc	28.5	4	14	125	85	98	
16"	400	979	380	345	254	360	102	—	300	400	539.8	16	1" x 8unc	28.5	4	23	165	116	143	
18"	450	1024	400	370	254	418	114	—	300	400	577.9	16	1-1/8" x 8un	—	4	23	165	160	210	
20"	500	1099	435	410	254	468	127	—	300	400	635.0	20	1-1/8" x 8un	—	4	23	165	207	260	
22"	550	1185	470	455	260	510	154	—	350	400	692.2	20	1-1/4" x 8un	—	8	19	192	250	330	
24"	600	1225	490	475	260	548	154	—	350	400	749.3	20	1-1/4" x 8un	—	8	19	192	320	400	
26"	650	1375	570	545	260	607	165	—	350	400	806.5	24	1-1/4" x 8un	—	8	19	192	350	430	
28"	700	1440	600	580	260	654	165	—	350	400	863.6	28	1-1/4" x 8un	—	8	19	192	370	460	
30"	750	1590	625	600	365	698	190	—	390	605	914.4	28	1-1/4" x 8un	—	8	19	254	465	520	
32"	800	1625	645	615	365	755	190	—	390	605	977.9	28	1-1/2" x 8un	—	8	19	254	490	580	
34"	850	1720	690	665	365	813	203	—	390	605	1028.7	32	1-1/2" x 8un	—	8	19	254	—	—	
36"	900	1780	720	695	365	825	203	—	390	605	1085.9	32	1/2"x8un	—	8	19	254	750	805	
38"	950	1920	790	765	365	918	203	—	390	605	1149.4	32	1-1/2" x 8un	—	8	19	254	—	—	
40"	1000	1940	800	775	365	950	216	—	390	605	1200.2	36	1-1/2" x 8un	—	8	19	254	920	1105	
42"	1050	1090	875	850	365	1014	241	—	440	605	1257.3	36	1-1/2" x 8un	—	8	23	298	—	—	
44"	1100	2100	880	855	365	1040	241	—	440	605	1314.5	40	1-1/2" x 8un	—	8	23	298	1105	1230	
46"	1150	2120	890	865	365	1090	254	—	440	605	1365.3	40	1-1/2" x 8un	—	8	23	298	—	—	
48"	1200	2180	925	890	365	1162	254	—	440	605	1422.4	44	1-1/2" x 8un	—	8	23	298	1250	1320	

## DIMENSIONS—HIGH PERFORMANCE

### HIGH PERFORMANCE - DIMENSIONS

HIGH PERFORMANCE BUTTERFLY VALVE – DIMENSIONS																	UNIT: mm		
ANSI CLASS 300																			
SIZE		FLANGE DIMENSION									MOUNTING BASE			Weight					
Inch	mm	H	H1	H2	H3	ød	L	A	B	øW	C	n1	h	h1	n	h2	C1	WAFER	LUG
2"	50	330	125	100	105	47	43	260	180	150	27.0	8	5/8" x 11unc	19	4	10	83	6.3	7
2-1/2"	65	350	143	102	105	62	46	260	180	150	149.4	8	3/4" x 10unc	22.5	4	10	83	7.4	11
3"	80	377	160	112	105	73	48	260	180	150	168.1	8	3/4" x 10unc	22.5	4	10	83	12	16
4"	100	406	178	123	105	96	54	330	180	150	200.2	8	3/4" x 10unc	22.5	4	10	83	20	22
5"	125	438	193	140	105	119	57	330	180	150	235.0	8	3/4" x 10unc	22.5	4	10	83	24	27
6"	150	510	220	185	105	138	59	330	180	150	269.7	12	3/4" x 10unc	22.5	4	10	83	27	37
8"	200	639	260	215	164	187	73	—	260	260	330.2	12	7/8" x 9unc	25.5	4	14	125	45	63
10"	250	678	280	234	164	235	83	—	260	260	387.4	16	1" x 8unc	—	4	14	125	67	103
12"	300	749	320	265	164	274	92	—	260	260	450.9	16	1-1/8" x 8un	—	4	14	125	85	112
14"	350	929	360	315	254	316	117	—	300	400	514.4	20	1-1/8" x 8un	—	4	23	165	105	220
16"	400	1069	420	395	254	360	133	—	300	400	571.5	20	1-1/4" x 8un	—	4	23	165	180	280
18"	450	1120	440	420	260	418	149	—	350	400	628.7	24	1-1/4" x 8un	—	8	19	192	270	360
20"	500	1185	480	445	260	468	159	—	350	400	685.8	24	1-1/4" x 8un	—	8	19	192	320	450
22"	550	1355	510	480	365	510	181	—	390	605	743.0	24	1-1/2" x 8un	—	8	19	254	370	620
24"	600	1435	550	520	365	548	181	—	390	605	812.8	24	1-1/2" x 8un	—	8	19	254	410	700
26"	650	1505	600	540	365	607	210	—	390	605	876.3	28	1-5/8" x 8un	—	8	19	254	480	810
28"	700	1565	620	580	365	654	229	—	440	605	939.8	28	1-5/8" x 8un	—	8	19	254	540	960
30"	750	1695	670	660	365	698	230	—	440	605	997.0	28	1-3/4" x 8un	—	8	19	254	610	1110
32"	800	1730	690	675	365	755	241	—	440	605	1054.1	28	1-7/8" x 8un	—	8	19	254	670	1205
34"	850	1825	740	720	365	813	241	—	440	605	1104.9	28	1-7/8" x 8un	—	8	23	298	—	—
36"	900	1925	790	770	365	825	241	—	440	605	1168.4	32	2" x 8un	—	8	23	298	806	1310
38"	950	2025	840	820	365	918	300	—	440	605	1092.2	32	1-1/2" x 8un	—	8	23	298	—	—
40"	1000	2125	890	870	365	950	300	—	440	605	1155.7	32	1-5/8" x 8un	—	8	23	298	980	1425

HIGH PERFORMANCE BUTTERFLY VALVE – DIMENSIONS																	UNIT: mm		
ANSI CLASS 300																			
SIZE		FLANGE DIMENSION									MOUNTING BASE			Weight					
Inch	mm	H	H1	H2	H3	ød	L	A	B	øW	C	n1	h	h1	n	h2	C1	WAFER	LUG
3"	80	394	165	124	105	74	54	180	150	26:1	168.1	8	3/4" x 10unc	22.5	4	10	83	18	23
4"	100	504	190	150	164	92	64	260	260	32:1	215.9	8	7/8" x 9unc	25.5	4	14	125	22	30
5"	125	599	235	200	164	117	78	260	260	32:1	266.7	8	1" x 8unc	28.5	4	14	125	32	51
6"	150	609	240	205	164	132	78	260	260	32:1	292.1	12	1" x 8unc	—	4	14	125	60	72
8"	200	789	290	245	254	174	102	300	400	52:1	249.3	12	1-1/8" x 8un	—	4	23	165	98	116
10"	250	909	345	310	254	224	117	300	400	52:1	431.8	16	1-1/4" x 8un	—	4	23	165	130	195
12"	300	975	375	340	260	272	140	350	400	66:1	489.0	20	1-1/4" x 8un	—	8	19	192	250	297
14"	350	1042	412	370	260	314	155	350	400	66:1	527.1	20	1-3/8" x 8un	—	8	19	192	320	410
16"	400	1107	442	405	260	358	178	350	400	66:1	603.3	20	1-1/2" x 8un	—	8	19	192	370	500
18"	450	1190	480	450	260	402	200	350	400	66:1	654.1	20	1-5/8" x 8un	—	8	19	192	420	630
20"	500	1370	520	485	365	442	216	390	605	80:1	723.9	24	1-5/8" x 8un	—	8	19	254	510	720
24"	600	1545	595	585	365	542	232	390	605	80:1	838.2	24	1-7/8" x 8un	—	8	19	254	640	940

## TECHNICAL DATA—HIGH PERFORMANCE

### HIGH PERFORMANCE - TORQUE & Cv

#### TORQUE VALUE

#### Cv VALUE

SIZE		MAX. DIFFERENTIAL PRESSURE (kgf / cm <sup>2</sup> )						FULL OPEN		
INCH	mm	10.5 (150PSI)	20 (285PSI)	28.1 (400PSI)	42.2 (600PSI)	49.2 (700PSI)	104.1 (1480PSI)	CLASS		
								150	300	600
2"	50	3.1	3.5	4.4	4.6	4.7	—	92	92	—
2-1/2"	65	3.3	3.8	4.5	4.8	4.9	—	150	150	—
3"	80	3.5	4.3	4.8	5.3	5.5	11.8	260	260	155
4"	100	4.6	6.2	7.1	7.9	8.7	21.0	460	460	255
5"	125	6.2	8.8	9.4	11.0	12.2	27.8	760	760	710
6"	150	8.2	10.2	12.2	14.3	14.9	37.0	1150	1100	740
8"	200	14.3	17.3	19.4	22.4	24.5	67.8	2100	1900	1350
10"	250	20.9	29.1	34.7	40.8	45.6	105.0	3200	3000	2050
12"	300	29.9	43.8	53.5	64.2	69.1	160.6	4700	4500	2700
14"	350	44.7	72.2	100.9	126.4	138.7	254.9	5800	5500	3900
16"	400	63.7	106.0	138.7	168.2	185.1	328.3	8000	7600	5100
18"	450	86.2	137.7	185.1	218.7	235.5	408.4	10500	9900	5500
20"	500	130.0	197.3	246.8	291.6	314.1	547.1	14000	13000	7900
22"	550	161.6	242.2	295.7	358.9	381.4	—	—	—	—
24"	600	197.3	296.2	358.9	444.1	475.7	948.3	21000	19500	11100
26"	650	224.3	336.5	413.0	520.5	565.4	—	25000	—	—
28"	700	255.9	394.6	475.7	646.5	708.7	—	29000	—	—
30"	750	304.9	448.7	556.2	735.7	807.6	—	33500	—	—
32"	800	368.1	556.2	—	—	—	—	41000	—	—
34"	850	430.8	646.5	—	—	—	—	—	—	—
36"	900	493.5	744.4	—	—	—	—	55000	—	—
38"	950	565.9	843.3	—	—	—	—	—	—	—
40"	1000	655.7	987.1	—	—	—	—	70000	—	—
42"	1050	717.9	1076.8	—	—	—	—	—	—	—
44"	1100	781.1	1166.5	—	—	—	—	87000	—	—
46"	1150	852.5	1346.0	—	—	—	—	—	—	—
48"	1200	987.1	1480.6	—	—	—	—	104000	—	—

## STANDARD MATERIAL LIST–RESILIENT SEATED

### STANDARD MATERIAL LIST

	MATERIAL ACCORDING TO ASTM							QTY	REMARK
	NO.	PART NAME	MATERIAL						
S T A N D A R D	1	BODY	A126 Cl. B	A395	A216-WCB	A351-CF8	A351-CF8M	1	
	2	SEAT	BUNA-N (NBR), EPDM, VITON, NEOPRENE				1		
	3	DISC	A351-CF8, A351-CF8M, B148				1		
	4	UPPER STEM	A276-304, A276-316, A276-410, A564-630				1		
	5	LOWER STEM	A276-304, A276-316, A276-410, A564-630				1		
	6	BUSHING	PTFE, BRONZE				1		
	7	O-RING	BUNA-N (NBR), EPDM				1		
	8	STUFFING RING	A276-304				A276-316	1	
	9	DISC PIN	A276-316				1 Set	Note 2	
	10	CAP	A576-1045			A240-304	A240-316	1	
	11	GASKET	NON-ASBESTOS				1		
	12	CAP BOLT	A193-B8						
	13	SPRING WASHER	304SS						
	14	KEY	A576-1045				1	Note 1	
	15	GEAR BOX	DUCTILE				1		
	16	HANDWHEEL	A53				1		

#### NOTE:

- Part No. 14: For 8" and larger size
- Part No. 9: For 14" and larger size

### SEAT MATERIAL AND WORKING TEMPERATURE

SEAT MATERIAL	MAX. WORKING TEMPERATURE °C	
	CONTINUOUS	INTERMITTENT
BUNA-N (NBR)	-18° C ~ 93° C	-18° C ~ 100° C
EPDM	-40° C ~ 130° C	-40° C ~ 140° C
VITON	-18° C ~ 200° C	-18° C ~ 210° C
NEOPRENE	-16° C ~ 90° C	-16° C ~ 100° C

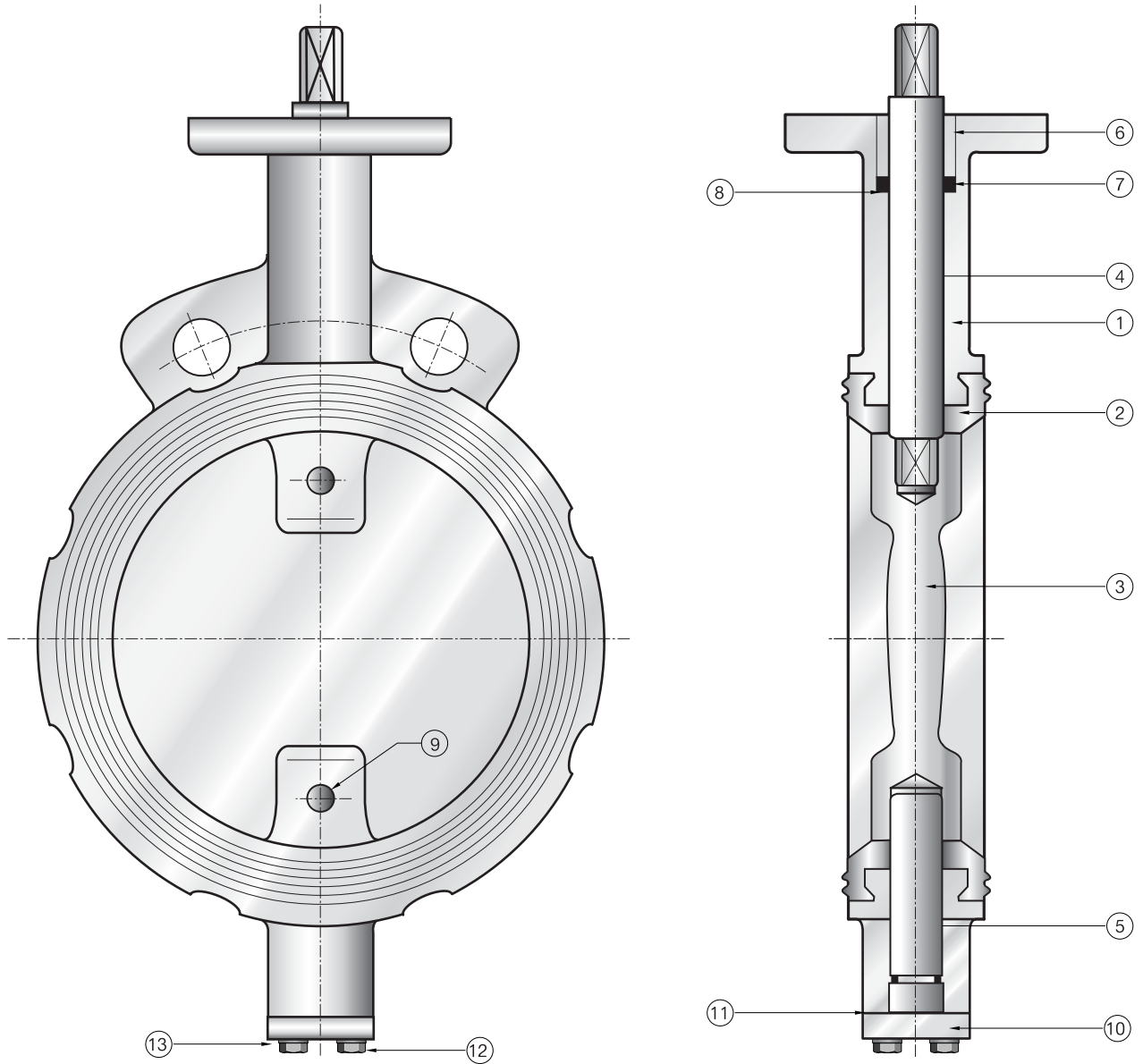
#### FEATURES:

- Bubble tight shut-off
- Light weight, compact size and easy installation
- General application valve
- No flange gasket
- Bi-directional mounting
- Easy replaceable seat
- Application:
  - Chemical processing
  - Oil field
  - Power plant
  - Hydrocarbon processing

# BUTTERFLY VALVES

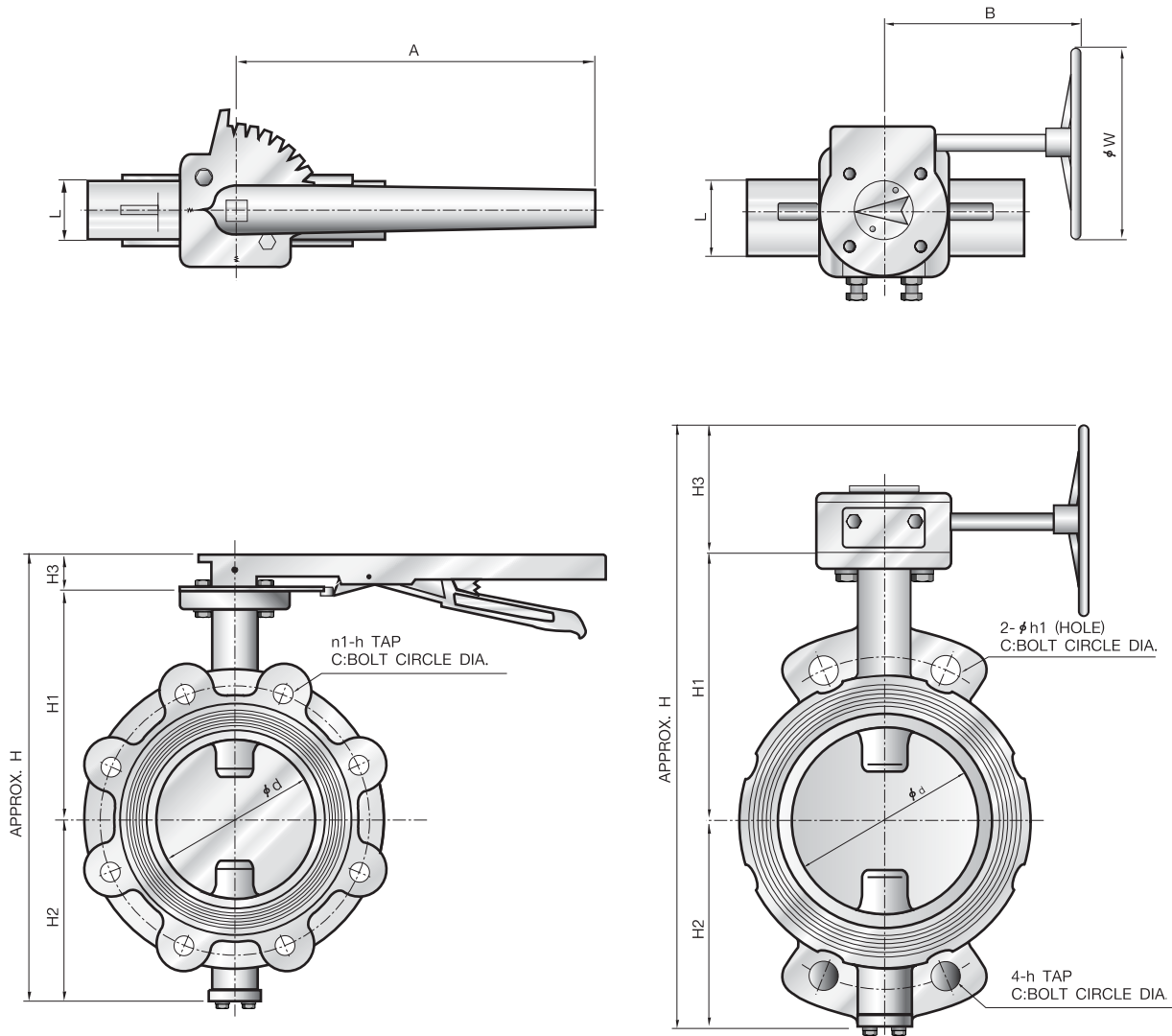
## SECTIONAL DRAWING—RESILIENT SEATED

### SECTIONAL DRAWING

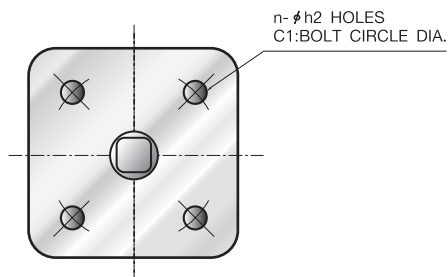


## OUTDRAWING-RESILIENT SEATED

### RESILIENT SEATED - OUTDRAWING



### ACTUATOR MOUNTING BASE





## DIMENSIONS—RESILIENT SEATED

### RESILIENT SEATED - DIMENSIONS

RESILIENT SEATED – DIMENSIONS																UNIT: mm			
ANSI CLASS 150																			
SIZE		FLANGE DIMENSION									MOUNTING BASE			Weight					
Inch	mm	H	H1	H2	H3	ød	L	A	B	øW	C	n1	h	h1	n	h2	C1	WAFER	LUG
2"	50	300	130	65	105	50	43	260	180	150	127.7	4	5/8" x 11 unc	19	4	10	83	2.9	3.7
2-1/2"	65	324	145	74	105	64	46	260	180	150	139.7	4	5/8" x 11 unc	19	4	10	83	4	4.4
3"	80	343	148	90	105	80	46	260	160	150	152.4	4	5/8" x 11 unc	19	4	10	83	4.8	5.1
4"	100	390	175	110	105	100	52	330	180	150	190.5	8	5/8" x 11 unc	19	4	10	83	6.8	8.5
5"	125	418	188	125	105	124	56	330	180	150	215.9	8	3/4" x 10 unc	22.5	4	10	83	8.2	12.1
6"	150	443	200	138	105	150	56	330	180	150	241.3	8	3/4" x 10 unc	22.5	4	10	83	11.5	13
8"	200	559	230	165	164	200	60	470	260	260	298.5	8	3/4" x 10 unc	22.5	4	14	125	16	21
10"	250	629	265	200	164	250	68	—	260	260	362.0	12	7/8" x 9 unc	25.5	4	14	125	22	31
12"	300	704	305	235	164	300	78	—	260	260	431.8	12	7/8" x 9 unc	25.5	4	14	125	38	46
14"	350	762	330	268	164	334	78	—	260	260	476.3	12	1" x 8 unc	28.5	4	14	125	50	62
16"	400	926	310	362	254	390	102	—	300	400	539.8	16	1" x 8 unc	28.5	4	23	165	80	106
18"	450	981	390	337	254	434	108	—	300	400	577.9	16	1-1/8" x 8 un	—	4	23	165	100	120
20"	500	1074	440	380	254	486	127	—	300	400	635.0	20	1-1/8" x 8 un	—	4	23	165	142	172
22"	550	1130	455	415	260	526	154	—	350	400	692.2	20	1-1/4" x 8 un	—	8	19	192	206	252
24"	600	1182	475	447	260	582	154	—	350	400	749.3	20	1-1/4" x 8 un	—	8	19	192	234	290
26"	650	1260	525	475	260	622	165	—	350	400	806.5	24	1-1/4" x 8 un	—	8	19	192	262	325
28"	700	1325	565	500	260	674	165	—	350	400	863.6	28	1-1/4" x 8 un	—	8	19	192	310	385
30"	750	1505	600	540	365	724	165	—	390	605	914.4	28	1-1/4" x 8 un	—	8	19	254	395	488
32"	800	1600	620	615	365	774	190	—	390	605	977.9	28	1-1/2" x 8 un	—	8	19	254	470	582
34"	850	1680	675	640	365	836	200	—	390	605	1028.7	32	1-1/2" x 8 un	—	8	19	254	522	655
36"	900	1740	705	670	365	872	200	—	390	605	1085.9	32	1-1/2" x 8 un	—	8	19	254	583	725
38"	950	1805	710	730	365	926	216	—	390	605	1149.4	32	1-1/2" x 8 un	—	8	19	254	—	—
40"	1000	1850	735	750	365	964	216	—	390	605	1200.2	36	1-1/2" x 8 un	—	8	19	254	66	822

### RESILIENT SEATED - TORQUE & Cv

#### TORQUE VALUE

#### Cv VALUE

SIZE		MAX. DIFFERENTIAL PRESSURE (kgf/cm <sup>2</sup> )		FULL OPEN
INCH	mm	5.3 (75 PSI)	105 (150 PSI)	
2"	50	2.0	2.5	115
2 1/2"	65	2.3	3.1	221
3"	80	3.4	4.1	425
4"	100	4.8	6.5	792
5"	125	7.3	9.0	1290
6"	150	11.2	14.6	2175
8"	200	14.6	19.1	3984
10"	250	29.2	35.9	4900
12"	300	43.8	53.8	8710
14"	350	57.1	91.8	11460
16"	400	78.5	117.3	13702
18"	450	123.4	173.3	18302
20"	500	157.0	246.8	22903
22"	550	208.0	342.6	27479
24"	600	241.7	432.3	32096
26"	650	314.1	550.6	34944
28"	700	403.8	656.7	37791
30"	750	471.1	780.1	42988
32"	800	527.2	874.9	48185
34"	850	605.7	987.1	54543
36"	900	683.2	1099.2	60901
40"	1000	1088.0	1884.4	60901

## **STANVAL INDUSTRIAL ENGINEERING CO, LTD**

Oubei Town, Yongjia County  
Zhejiang Province 325102 China  
Phone: 0086-577-80930685 □ □  
Fax: 0086-577-67989486  
[www.STANVAL.com](http://www.STANVAL.com)  
Email: [stanval@stanval.com](mailto:stanval@stanval.com)