



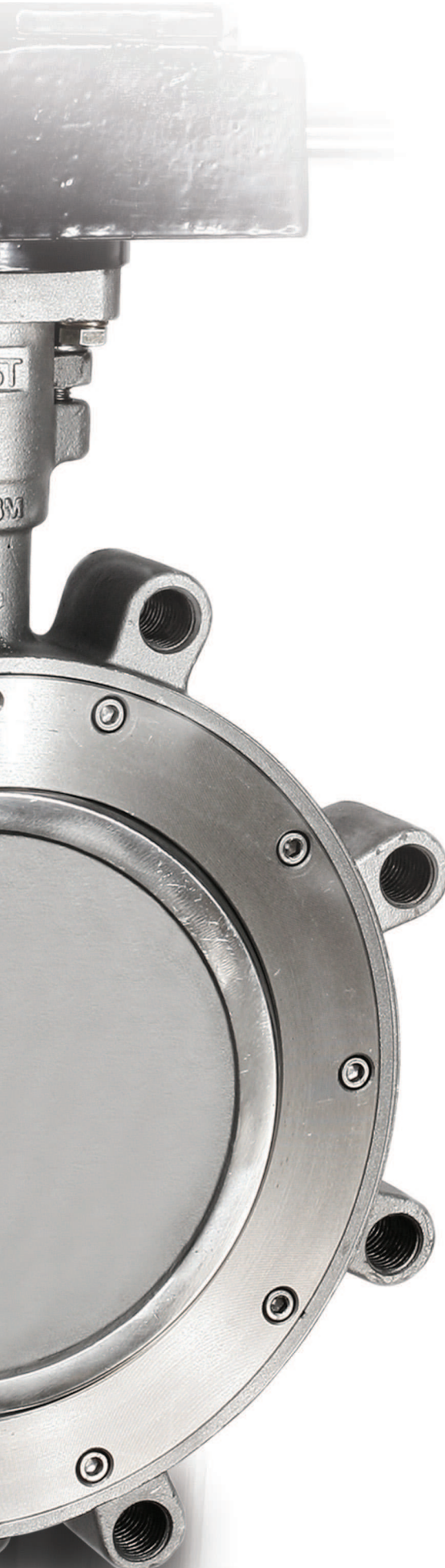
## HIGH PERFORMANCE BUTTERFLY VALVES



**Howell Valve & Automation**

**Toll Free: 1-888-469-3557**

**Howellvalve.com**



## High Performance Butterfly Valve

STHW

STHL

Size : 2" ~ 24"

Type: Wafer , Lug

Pressure Rating: Class 150, 300

Body Material: Cast Steel and Stainless Steel

Seat Material: Soft Seat (PTFE / RTFE) NBR, EPDM, VITON,  
Metal Seat (A240Tp 316 / 304)

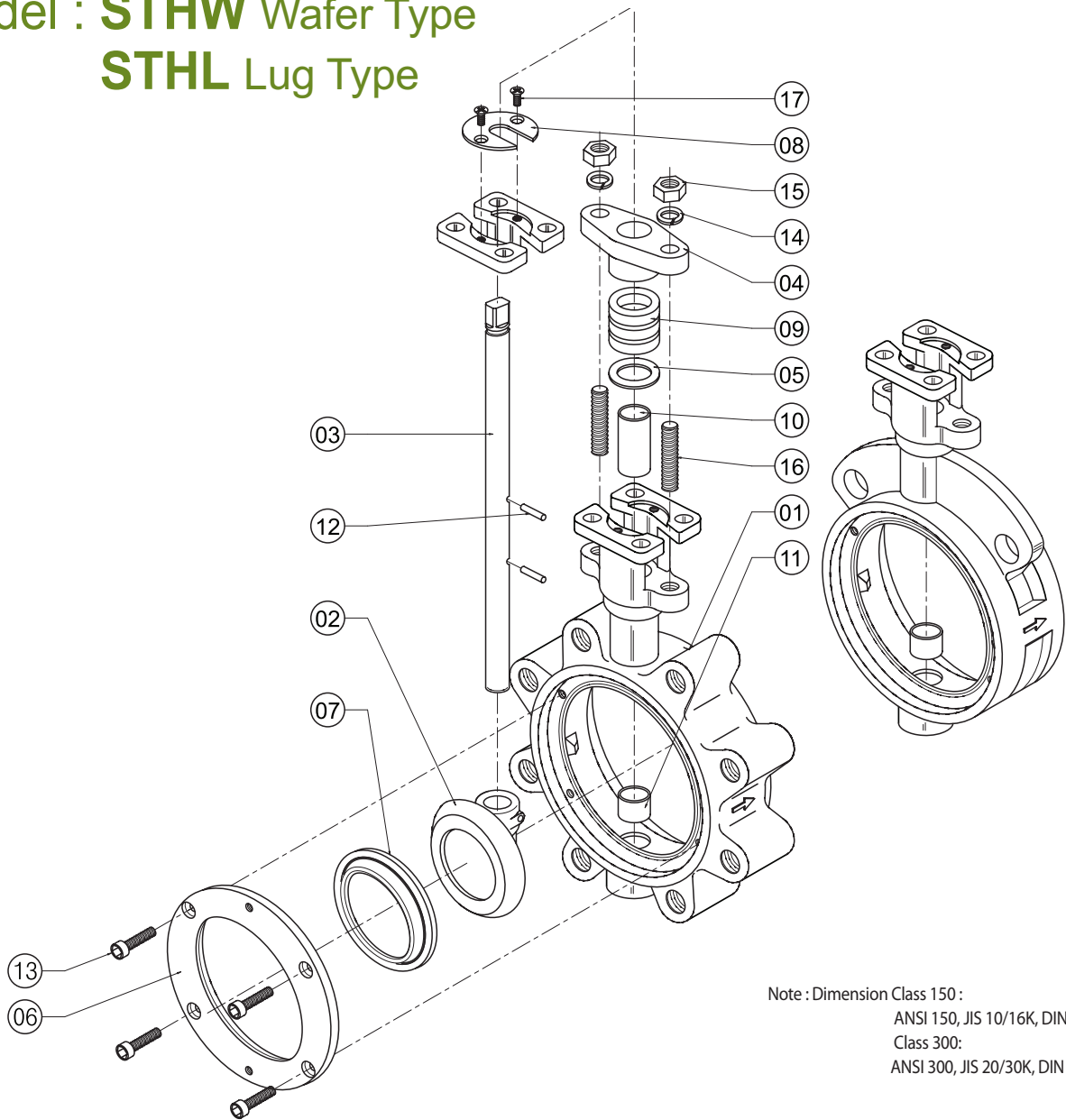
Operation: Lever , Gear , Actuators

Drilling: ANSI 150, JIS 10/16K, DIN PN 10/16

ANSI 300, JIS 20K, 30K, DIN PN 25/ 40.

- Tight shut-off design.
- One - piece body materials are either cast steel or stainless steel for excellent corrosion resistance.
- High strength one-piece stem in A564 Gr.630 / PH 17-4 materials.
- ISO 5211 mounting pad with square shaft 2" ~ 12", Key Type Connection 14" ~ 24" permits direct mount actuation for both Manual (Lever & gear), pneumatic and electric actuators.
- Double off-set configuration with conical angled disc design. Maximize flow and minimize resistance providing high Cv.
- Seat available in either Soft (PTFE / RTFE) NBR, EPDM, VITON or Metal (A240 Tp 316 / 304). Both soft seats and Metal seats are interchangeable.
- Gland Flange preventing uneven load distribution against packing.
- Internal travel stop design to prevent over travel of the disc. Minimizing possible seat damage.
- Retainer ring surface finish is 125 to 200 AARH and is compatible with both standard gasket and spiral wound gasket designs. Outside diameter is recessed within gasket sealing surface to prevent external leakage.
- The heavy duty handle and 10 position notch plates allow for positioning the valve disc to precise angle stops.
- Valve Rating:
  - Top flange mounting pad: ISO 5211
  - Basic Design: API 609, MSS-SP-68, BS 5155, ISO 5752
  - Shell/Seat Test: API 598, MSS-SP-61
  - Seat Hydro: Class 150 (360 psig)
  - Class 300 (740 psig)
  - Pressure / Temp Rating : ANSI B16.34
  - Metal to Metal seat leakage is rated at Class IV per ASME/FCI 70-2

Model : **STHW** Wafer Type  
**STHL** Lug Type

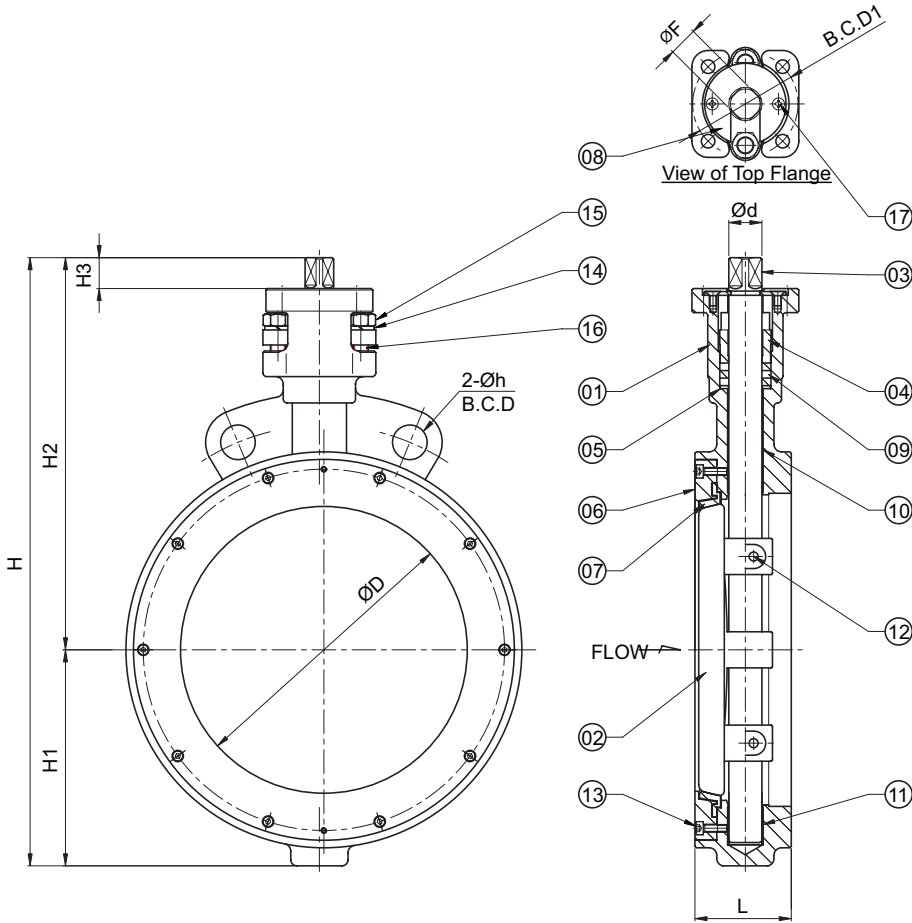


Note : Dimension Class 150 :  
 ANSI 150, JIS 10/16K, DIN PN 10/16  
 Class 300:  
 ANSI 300, JIS 20/30K, DIN PN 25/40

NO.	DESCRIPTION	MATERIAL	Q'TY
1	Body	A216 WCB / A351 CF8M	1
2	Disc	A351 CF8M	1
3	Stem	A 564 Gr. 630	1
4	Gland Flange	A216 WCB / A351 CF8M	1
5	Packing Retainer	A276 Tp 316	1
6	Retainer Ring	A351 CF8M	1
7	Seat	PTFE/RTFE/ METAL A240/ NBR / EPDM / VITON	1
8	Top Retainer	A283D - A36 / A276 Tp 316	1
9	Grand Packing	Graphite	3
10	Upper Bearing	R.TFE + 316SS	1
11	Lower Bearing	R.TFE + 316SS	1
12	Disc Pin	A276 Tp 316	2
13	Hex Socket Bolt	A283D - A36 / A276 316SS	4 ~ 14
14	Spring Washer	A283D - A36 / A276 316SS	2
15	Hex Nut	A283D - A36 / A276 316SS	2
16	Stud Bolt	A283D - A36 / A276 316SS	2
17	Flat Head Screw	A283D - A36 / A276 316SS	2

# Model : STHW

## Wafer Type, Class 150



NO.	DESCRIPTION
1	Body
2	Disc
3	Stem
4	Gland Flange
5	Packing Retainer
6	Retainer Ring
7	Seat
8	Top Retainer
9	Grand Packing
10	Upper Bearing
11	Lower Bearing
12	Disc Pin
13	Hex Socket Bolt
14	Spring Washer
15	Hex Nut
16	Stud Bolt
17	Flat Head Screw

### Dimension

(unit : mm)

SIZE (mm)	H	H1	H2	H3	d	F	D	B.C.D1	L	L1
50	219.7	60.5	159.2	15.2	13.0	11.0	42.0	70	44.0	20.0
65	242.2	70.0	172.2	15.2	16.0	14.0	61.0	70	47.0	20.5
80	250.2	76.5	173.7	15.2	16	14	74.0	70	48.0	22.5
100	281.2	90.0	191.2	17.7	16	14	94.0	70	54.0	26.5
125	318.7	104.0	214.7	17.7	18	14	118.0	70	57.0	28.0
150	346.0	115.0	231.0	19.0	22	17	140.0	70	58.0	27.5
200	404.0	143.5	260.5	20.5	22	17	188.0	70	64.0	30.5
250	468.5	170.0	298.5	20.5	28	22	238.5	102	71.5	34.5
300	520.1	193.0	327.1	24.1	28	22	280.0	102	81.0	35.5

(unit : inch)

SIZE (inch)	H	H1	H2	H3	d	F	D	B.C.D1	L	L1
2"	8.65	2.38	6.26	0.60	0.51	0.43	1.65	2.75	1.73	0.79
2.5"	9.53	2.75	6.77	0.60	0.63	0.55	2.40	2.75	1.85	0.80
3"	9.85	3.01	6.84	0.60	0.63	0.55	2.91	2.76	1.89	0.89
4"	11.07	3.54	7.53	0.70	0.63	0.55	3.70	2.76	2.13	1.04
5"	12.55	4.09	8.45	0.70	0.75	0.55	4.65	2.76	2.24	1.10
6"	13.62	4.53	9.09	0.75	0.87	0.67	5.51	2.76	2.28	1.08
8"	15.91	5.65	10.26	0.81	0.87	0.67	7.40	2.76	2.52	1.20
10"	18.44	6.69	11.75	0.81	1.10	0.87	9.39	4.02	2.81	1.36
12"	20.48	7.60	12.88	0.95	1.10	0.87	11.02	4.02	3.19	1.40

## Model : **STHW**

Wafer Type Class 150

### Material Selection & Drilling

#### Material Selection

NO.	DESCRIPTION	#150 CS-STHW		#150 SS-STHW		Q'TY
		SOFT SEAT	METAL SEAT	SOFT SEAT	METAL SEAT	
1	Body	A 216 WCB		A 351 CF8M		1
2	Disc	A 351 CF8M				1
3	Stem	A 564 Gr. 630				1
4	Gland Flange	A 216 WCB		A351 CF8M		1
5	Packing Retainer	A276 Tp 316				1
6	Retainer Ring	A351 CF8M				1
7	Seat	PTFE/RTFE/ METAL A240/ NBR / EPDM / VITON				1
8	Top Retainer	A283D-A36		A276Tp 316		1
9	Grand Packing	GRAPHITE				3
10	Upper Bearing	R.TFE+316SS				1
11	Lower Bearing	R.TFE+316SS				1
12	Disc Pin	A 276 Tp 316				2
13	Hex Socket Bolt	A283D-A36		A276 316SS		4 ~ 14
14	Spring Washer	A283D-A36		A276 316SS		2
15	Hex Nut	A283D-A36		A276 316SS		2
16	Stud Bolt	A283D-A36		A276 316SS		2
17	Flat Head Screw	A283D-A36		A276 316SS		2

#### Drilling

(unit : mm)

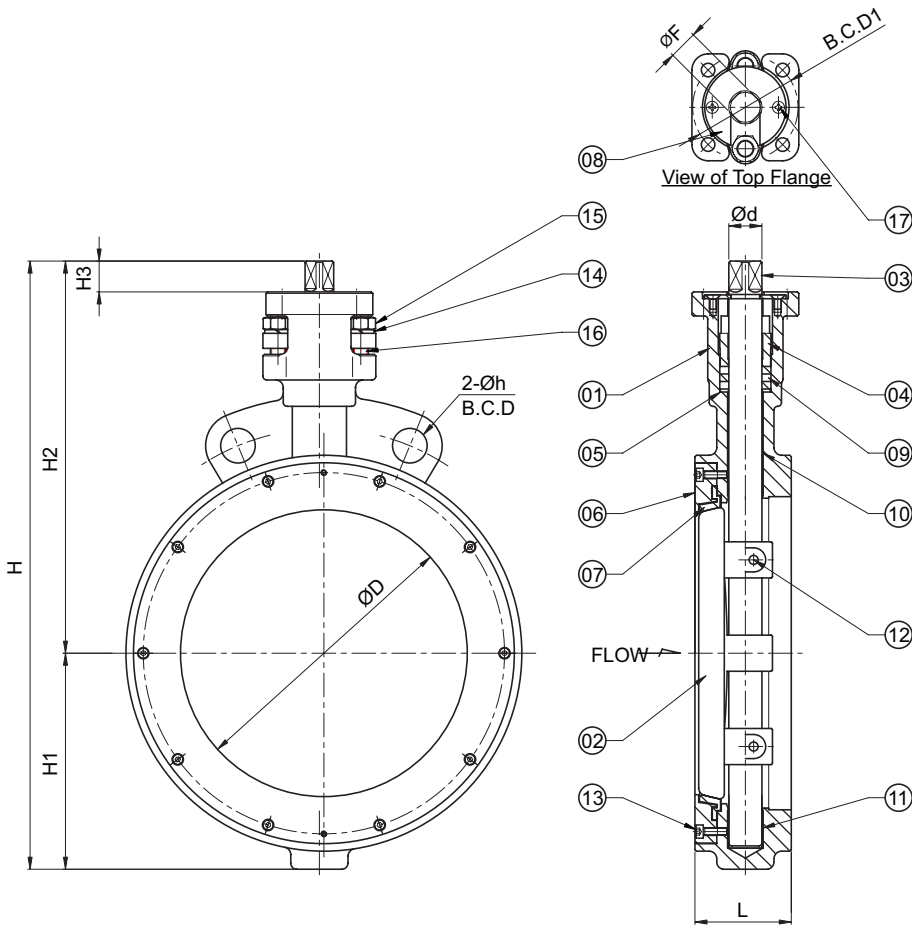
SIZE	ANSI 150			JIS 10K			JIS 16K			PN 10			PN 16		
	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h
50	120.7	4	19	120	4	19	120	8	19	125	4	18	125	4	18
65	139.7	4	19	140	4	19	140	8	19	145	8	18	145	8	18
80	152.4	4	19.0	150	8	19	160	8	23	160	8	18	160	8	18
100	190.5	8	19.0	175	8	19	185	8	23	180	8	18	180	8	18
125	215.9	8	22.2	210	8	23	225	8	25	210	8	18	210	8	18
150	241.3	8	22.2	240	8	23	260	12	25	240	8	22	240	8	22
200	298.5	8	22.2	290	12	23	305	12	25	295	8	22	295	12	22
250	362.0	12	25.4	355	12	25	380	12	27	350	12	22	355	12	26
300	431.8	12	25.4	400	16	25	430	16	27	400	12	22	410	12	26

(unit : inch)

SIZE	ANSI 150			JIS 10K			JIS 16K			PN 10			PN 16		
	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h
2"	4.75	4	0.75	4.72	4	0.75	4.72	8	0.75	4.92	4	0.71	4.92	4	0.71
2.5"	5.50	4	0.75	5.51	4	0.75	5.51	8	0.75	5.71	8	0.71	5.71	8	0.71
3"	6	4	0.75	5.91	8	0.75	6.3	8	0.91	6.3	8	0.71	6.3	8	0.71
4"	7.5	8	0.75	6.89	8	0.75	7.28	8	0.91	7.09	8	0.71	7.09	8	0.71
5"	8.5	8	0.88	8.27	8	0.91	8.86	8	0.98	8.27	8	0.71	8.27	8	0.71
6"	9.5	8	0.88	9.45	8	0.91	10.24	12	0.98	9.45	8	0.87	9.45	8	0.87
8"	11.75	8	0.88	11.42	12	0.91	12.01	12	0.98	11.61	8	0.87	11.61	12	0.87
10"	14.25	12	1	13.98	12	0.98	14.96	12	1.06	13.78	12	0.87	13.98	12	1.02
12"	17	12	1	15.75	16	0.98	16.93	16	1.06	15.75	12	0.87	16.14	12	1.02

# Model : STHW

## Wafer Type, Class 300



NO.	DESCRIPTION
1	Body
2	Disc
3	Stem
4	Gland Flange
5	Packing Retainer
6	Retainer Ring
7	Seat
8	Top Retainer
9	Grand Packing
10	Upper Bearing
11	Lower Bearing
12	Disc Pin
13	Hex Socket Bolt
14	Spring Washer
15	Hex Nut
16	Stud Bolt
17	Flat Head Screw

### Dimension

(unit : mm)

SIZE (mm)	H	H1	H2	H3	d	F	D	B.C.D1	L
50	219.2	60	159.2	15.2	13.0	11.0	42.0	70.0	44.0
65	242.2	70.0	172.2	15.2	16.0	14.0	61.0	70.0	46.0
80	250.2	76.5	173.7	15.2	16	14	74.0	70	48.0
100	281.2	90.0	191.2	17.7	16	14	94.0	70	54.0
125	318.7	104.0	214.7	17.7	18	14	118.0	70	57.0
150	346.0	115.0	231.0	19.0	22	17	140.0	70	58.0
200	404.0	143.5	260.5	20.5	28	22	188.0	102	73.0
250	468.5	170.0	298.5	20.5	28	22	238.5	102	82.5
300	520.1	193.0	327.1	24.1	28	22	280.0	102	92.0

(unit : inch)

SIZE (inch)	H	H1	H2	H3	d	F	D	B.C.D1	L
2"	8.62	2.36	6.26	0.60	0.51	0.43	1.65	2.75	1.73
2.5"	9.53	2.75	6.77	0.60	0.63	0.55	2.40	2.75	1.85
3"	9.85	3.01	6.84	0.60	0.63	0.55	2.91	2.76	1.89
4"	11.07	3.54	7.53	0.70	0.63	0.55	3.70	2.76	2.13
5"	12.55	4.09	8.45	0.70	0.71	0.55	4.65	2.76	2.24
6"	13.62	4.53	9.09	0.75	0.87	0.67	5.51	2.76	2.28
8"	15.91	5.65	10.26	0.81	0.87	0.87	7.40	102	2.87
10"	18.44	6.69	11.75	0.81	1.10	0.87	9.39	4.02	3.25
12"	20.48	7.60	12.88	0.95	1.10	0.87	11.02	4.02	3.62



## Model : **STHW**

Wafer Type Class 300

Material Selection & Drilling

### Material Selection

NO.	DESCRIPTION	#300 CS-STHW		#300 SS-STHW		Q'TY
		SOFT SEAT	METAL SEAT	SOFT SEAT	METAL SEAT	
1	Body	A 216 WCB		A 351 CF8M		1
2	Disc	A 351 CF8M				1
3	Stem	A 564 Gr. 630				1
4	Gland Flange	A 216 WCB		A351 CF8M		1
5	Packing Retainer	A276 Tp 316				1
6	Retainer Ring	A351 CF8M				1
7	Seat	PTFE/RTFE/ METAL A240/ NBR / EPDM / VITON				1
8	Top Retainer	A283D-A36		A276 Tp 316		1
9	Grand Packing	GRAPHITE				3
10	Upper Bearing	R.TFE+316SS				1
11	Lower Bearing	R.TFE+316SS				1
12	Disc Pin	A 276 Tp 316				2
13	Hex Socket Bolt	A283D-A36		A276 316SS		4 ~ 14
14	Spring Washer	A283D-A36		A276 316SS		2
15	Hex Nut	A283D-A36		A276 316SS		2
16	Stud Bolt	A283D-A36		A276 316SS		2
17	Flat Head Screw	A283D-A36		A276 316SS		2

### Drilling

(unit : mm)

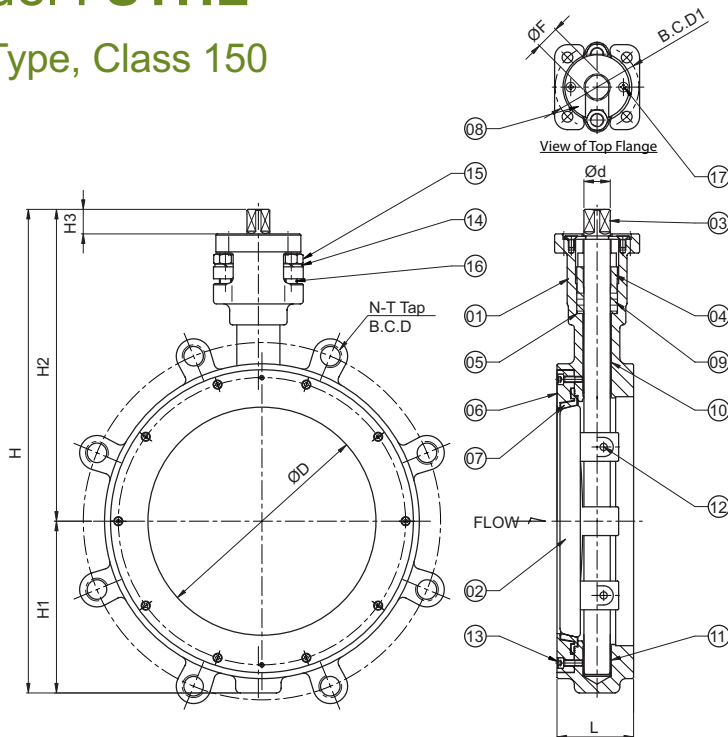
SIZE	ANSI 300			JIS 16K/20K			JIS 30K			PN 25			PN 40		
	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h
50	127	8	19	120	8	19	130	8	19	125	4	18	125	4	18
65	149.2	8	22.2	140	8	19	160	8	23	145	8	18	145	8	18
80	168.3	8	22.2	160	8	23	170	8	23	160	8	12	160	8	18
100	200.0	8	22.2	185	8	23	195	8	25	190	8	22	190	8	22
125	235.0	8	22.2	225	8	25	230	8	25	220	8	26	220	8	26
150	269.9	12	22.2	260	12	25	275	12	25	250	8	26	250	8	26
200	330.2	12	25.4	305	12	25	320	12	27	310	12	26	320	12	30
250	387.4	16	28.6	380	12	27	390	12	33	370	12	30	385	12	33
300	450.8	16	31.8	430	16	27	450	16	33	430	16	30	450	16	33

(unit : inch)

SIZE	ANSI 300			JIS 16K/20K			JIS 30K			PN 25			PN 40		
	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h
2"	5.00	8	0.75	4.72	8	0.75	5.12	8	0.75	4.92	4	0.71	4.92	4	0.71
2.5"	5.88	8	0.88	5.51	8	0.75	6.3	8	0.91	5.71	8	0.71	5.71	8	0.71
3"	6.62	8	0.88	6.30	8	0.91	6.69	8	0.91	6.30	8	0.71	6.30	8	0.71
4"	7.88	8	0.88	7.28	8	0.91	7.68	8	0.91	7.48	8	0.87	7.48	8	0.87
5"	9.25	8	0.88	8.86	8	0.98	9.06	8	0.98	8.66	8	1.02	8.66	8	1.02
6"	10.62	12	0.88	10.24	12	0.98	10.83	12	0.98	9.84	8	1.02	9.84	8	1.02
8"	13.00	12	1.00	12.01	12	0.98	12.60	12	0.98	12.20	12	1.02	12.60	12	1.18
10"	15.25	16	1.13	14.96	12	1.06	15.35	12	1.06	14.57	12	1.18	15.16	12	1.30
12"	17.75	16	1.25	16.93	16	1.06	17.72	16	1.06	16.93	16	1.18	17.72	16	1.30

# Model : **STHL**

## Lug Type, Class 150



NO.	DESCRIPTION
1	Body
2	Disc
3	Stem
4	Gland Flange
5	Packing Retainer
6	Retainer Ring
7	Seat
8	Top Retainer
9	Grand Packing
10	Upper Bearing
11	Lower Bearing
12	Disc Pin
13	Hex Socket Bolt
14	Spring Washer
15	Hex Nut
16	Stud Bolt
17	Flat Head Screw

### Dimension

(unit : mm)

SIZE (mm)	H	H1	H2	H3	d	F	D	B.C.D1	L
50	219.2	60.0	159.2	15.2	13	11	42.0	70	44
65	242.2	70.0	172.2	15.2	16	14	61.0	70	46
80	250.2	76.5	173.7	15.2	16	14	74.0	70	48
100	281.2	90.0	191.2	17.7	16	14	94.0	70	54
125	318.7	104.0	214.7	17.7	18	14	118.0	70	57
150	346.0	115.0	231.0	19.0	22	17	140.0	70	58
200	404.0	143.5	260.5	20.5	22	17	188.0	70	64
250	468.5	170.0	298.5	20.5	28	22	238.5	102	72
300	524.1	197.0	327.1	24.1	28	22	280.0	102	81
350	682.5	279.5	327.1	70.0	28		331.7	140	92
400	804.1	318.5	403.0	88.5	38		317.4	165	102
450	856.7	338.2	485.6	88.5	45		452.4	165	114
500	878.5	360.0	518.5	88.5	55		507.4	165	127
600	1,019.0	433.5	585.5	93.5	55		609.4	165	154

(unit : inch)

SIZE (mm)	H	H1	H2	H3	d	F	D	B.C.D1	L
2"	8.63	2.36	6.27	0.60	0.51	0.43	1.65	2.76	1.73
2 1/2"	9.54	2.76	6.78	0.60	0.63	0.55	2.40	2.76	1.81
3"	9.85	3.01	6.84	0.60	0.63	0.55	2.91	2.76	1.89
4"	11.07	3.54	7.53	0.70	0.63	0.55	3.70	2.76	2.13
5"	12.55	4.09	8.45	0.70	0.71	0.55	4.65	2.76	2.24
6"	13.62	4.53	9.09	0.75	0.87	0.67	5.51	2.76	2.28
8"	15.91	5.65	10.26	0.81	0.87	0.67	7.40	2.76	2.52
10"	18.44	6.69	11.75	0.81	1.10	0.87	9.39	4.02	2.81
12"	20.63	7.76	12.88	0.95	1.10	0.87	11.02	4.02	3.19
14"	26.87	11.00	12.88	2.76	1.10		13.06	5.51	3.62
16"	31.66	12.54	15.87	3.48	1.50		12.50	6.50	4.02
18"	33.73	13.31	19.12	3.48	1.77		17.81	6.50	4.49
20"	34.59	14.17	20.41	3.48	2.17		19.98	6.50	5.00
24"	40.12	17.07	23.05	3.68	2.17		23.99	6.50	6.06



## Model : **STHL**

### Lug Type, Class 150 Material Selection & Drilling

#### Material Selection

NO.	DESCRIPTION	#150 CS-STHL		#150 SS-STHL		Q'TY
		SOFT SEAT	METAL SEAT	SOFT SEAT	METAL SEAT	
1	Body	A 216 WCB		A 351 CF8M		1
2	Disc	A 351 CF8M				1
3	Stem	A 564 Gr. 630				1
4	Gland Flange	A 216 WCB		A351 CF8M		1
5	Packing Retainer	A276 Tp 316				1
6	Retainer Ring	A351 CF8M				1
7	Seat	PTFE/RTFE/ METAL A240/ NBR / EPDM / VITON				1
8	Top Retainer	A283D-A36		A276 Tp 316		1
9	Grand Packing	GRAPHITE				3
10	Upper Bearing	R.TFE+316SS				1
11	Lower Bearing	R.TFE+316SS				1
12	Disc Pin	A 276 Tp 316				2
13	Hex Socket Bolt	A283D-A36		A276 316SS		4 ~ 14
14	Spring Washer	A283D-A36		A276 316SS		2
15	Hex Nut	A283D-A36		A276 316SS		2
16	Stud Bolt	A283D-A36		A276 316SS		2
17	Flat Head Screw	A283D-A36		A276 316SS		2

#### Drilling

(unit : mm)

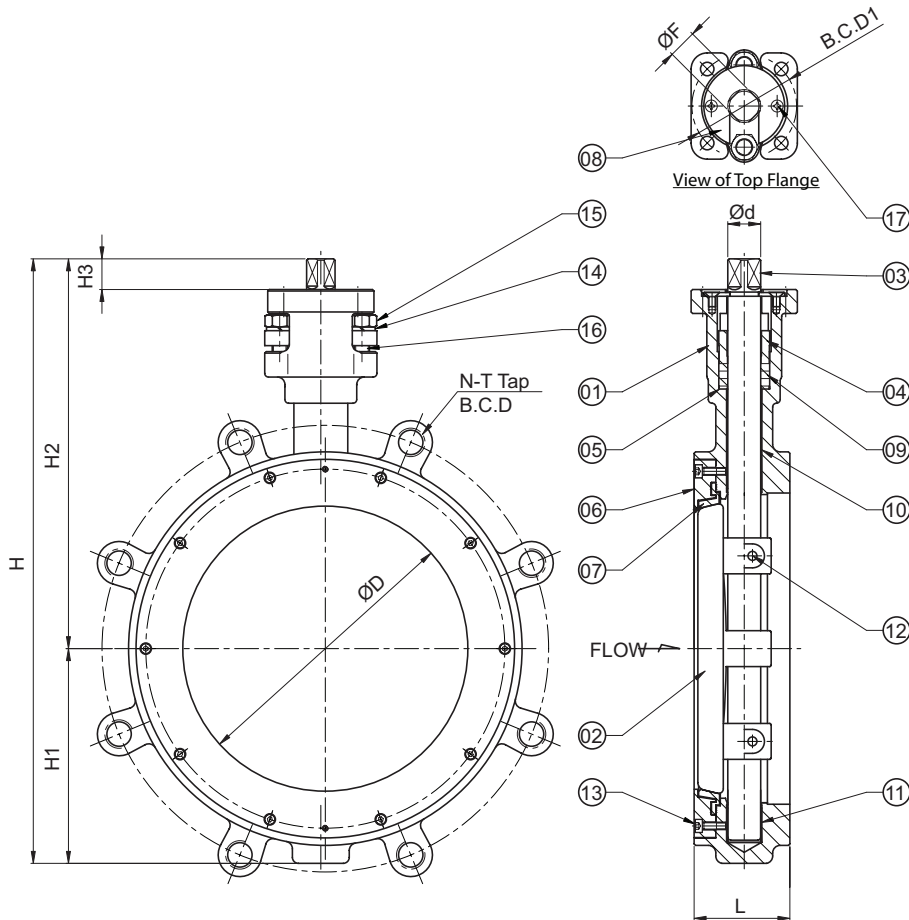
SIZE	PN10			PN16			ANSI 150 LBS			JIS 5K			JIS 10K		
	mm	c	n	h	c	n	h	c	n	h	c	n	h	c	n
50A	125	4	18	125	4	18	120.7	4	19.1	105	4	15	120	4	19
65A	145	8	18	145	8b	18	139.7	4	19.1	130	4	15	140	4	19
80A	160	8	18	160	8	18	152.4	4	19.1	145	4	19	150	8	19
100A	180	8	18	180	8	18	190.5	8	19.1	165	8	19	175	8	19
125A	210	8	18	210	8	18	215.9	8	22.2	200	8	19	210	8	23
150A	240	8	22	240	8	22	241.3	8	22.2	230	8	19	240	8	23
200A	295	8	22	295	12	22	298.5	8	22.2	280	8	23	290	12	23
250A	350	12	22	355	12	26	362.0	12	25.4	345	12	23	355	12	25
300A	400	12	22	410	12	26	431.8	12	25.4	390	12	23	400	16	25
350A	460	16	22	470	16	26	476.3	12	28.6	435	12	25	445	16	25
400A	515	16	26	525	16	30	539.8	16	28.6	495	16	25	510	16	27
450A	565	20	26	585	20	30	577.9	16	31.8	555	16	25	565	20	27
500A	620	20	26	650	20	33	635.0	20	31.8	605	20	25	620	20	27
600A	725	20	30	770	20	36	749.3	20	34.9	715	20	27	730	24	33

(unit : inch)

inch	PN10			PN16			ANSI 150 LBS			JIS 5K			JIS 10K		
	c	n	h	c	n	h	c	n	h	c	n	h	c	n	h
2"	4.92	4	0.71	4.92	4	0.71	4.75	4	0.75	4.13	4	0.59	4.72	4	0.75
2 1/2"	5.71	8	0.71	5.71	8b	0.71	5.50	4	0.75	5.12	4	0.59	5.51	4	0.75
3"	6.30	8	0.71	6.30	8	0.71	6.00	4	0.75	5.71	4	0.75	5.91	8	0.75
4"	7.09	8	0.71	7.09	8	0.71	7.50	8	0.75	6.50	8	0.75	6.89	8	0.75
5"	8.27	8	0.71	8.27	8	0.71	8.50	8	0.87	7.87	8	0.75	8.27	8	0.91
6"	9.45	8	0.87	9.45	8	0.87	9.50	8	0.87	9.06	8	0.75	9.45	8	0.91
8"	11.61	8	0.87	11.61	12	0.87	11.75	8	0.87	11.02	8	0.91	11.42	12	0.91
10"	13.78	12	0.87	13.98	12	1.02	14.25	12	1.00	13.58	12	0.91	13.98	12	0.98
12"	15.75	12	0.87	16.14	12	1.02	17.00	12	1.00	15.35	12	0.91	15.75	16	0.98
14"	18.11	16	0.87	18.50	16	1.02	18.75	12	1.13	17.13	12	0.98	17.52	16	0.98
16"	20.28	16	1.02	20.67	16	1.18	21.25	16	1.13	19.49	16	0.98	20.08	16	1.06
18"	22.24	20	1.02	23.03	20	1.18	22.75	16	1.25	21.85	16	0.98	22.24	20	1.06
20"	24.41	20	1.02	25.59	20	1.30	25.00	20	1.25	23.82	20	0.98	24.41	20	1.06
24"	28.54	20	1.18	30.31	20	1.42	29.50	20	1.37	28.15	20	1.06	28.74	24	1.30

# Model : **STHL**

Lug Type, Class 300



NO.	DESCRIPTION
1	Body
2	Disc
3	Stem
4	Gland Flange
5	Packing Retainer
6	Retainer Ring
7	Seat
8	Top Retainer
9	Grand Packing
10	Upper Bearing
11	Lower Bearing
12	Disc Pin
13	Hex Socket Bolt
14	Spring Washer
15	Hex Nut
16	Stud Bolt
17	Flat Head Screw

## Dimension

(unit : mm)

SIZE (mm)	H	H1	H2	H3	d	F	D	B.C.D1	L
50	219.2	60	159.2	15.2	13.0	11.0	42.0	70.0	44.0
65	242.2	70.0	172.2	15.2	16.0	14.0	61.0	70.0	47.0
80	250.2	76.5	173.7	15.2	16	14	74.0	70	48.0
100	281.2	90.0	191.2	17.7	16	14	94.0	70	54.0
125	318.7	104.0	214.7	17.7	18	14	118.0	70	57.0
150	346.0	115.0	231.0	19.0	22	17	140.0	70	58.0
200	404.0	143.5	260.5	20.5	28	22	188.0	70	73.0
250	468.5	170.0	298.5	20.5	28	22	238.5	102	82.5
300	520.1	193.0	327.1	24.1	28	22	280.0	102	92.0

(unit : inch)

SIZE (inch)	H	H1	H2	H3	d	F	D	B.C.D1	L
2"	8.63	2.36	6.26	0.60	0.51	0.43	1.65	2.75	1.73
2.5"	9.53	2.75	6.77	0.60	0.63	0.55	2.40	2.75	1.85
3"	9.85	3.01	6.84	0.60	0.63	0.55	2.91	2.76	1.89
4"	11.07	3.54	7.53	0.70	0.63	0.55	3.70	2.76	2.13
5"	12.55	4.09	8.45	0.70	0.91	0.55	4.65	2.76	2.24
6"	13.62	4.53	9.09	0.75	0.87	0.67	5.51	2.76	2.28
8"	15.91	5.65	10.26	0.81	1.10	0.87	7.40	2.76	2.87
10"	18.44	6.69	11.75	0.81	1.10	0.87	9.39	4.02	3.25
12"	20.48	7.60	12.88	0.95	1.10	0.87	11.02	4.02	3.62

## Model : **STHL**

Lug Type, Class 300

### Material Selection & Drilling

#### Material Selection

NO.	DESCRIPTION	#300 CS-STHL		#300 SS-STHL		Q'TY
		SOFT SEAT	METAL SEAT	SOFT SEAT	METAL SEAT	
1	Body	A 216 WCB		A 351 CF8M		1
2	Disc	A 351 CF8M				1
3	Stem	A 564 Gr. 630				1
4	Gland Flange	A 216 WCB		A351 CF8M		1
5	Packing Retainer	A276 Tp 316				1
6	Retainer Ring	A351 CF8M				1
7	Seat	PTFE/RTFE/ METAL A240/ NBR / EPDM / VITON				1
8	Top Retainer	A283D-A36		A276 Tp 316		1
9	Grand Packing	GRAPHITE				3
10	Upper Bearing	R.TFE+316SS				1
11	Lower Bearing	R.TFE+316SS				1
12	Disc Pin	A 276 Tp 316				2
13	Hex Socket Bolt	A283D-A36		A276 316SS		4 ~ 14
14	Spring Washer	A283D-A36		A276 316SS		2
15	Hex Nut	A283D-A36		A276 316SS		2
16	Stud Bolt	A283D-A36		A276 316SS		2
17	Flat Head Screw	A283D-A36		A276 316SS		2

#### Drilling

(unit : mm)

SIZE	ANSI 300			JIS 16/20K			JIS 30K			PN25			PN40		
	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h
50	127.0	8	19	120.0	8	19	130.0	8	19	125	4	18	125	4	18
65	149.2	8	22.2	140.0	8	19	160.0	8	23	145	8	18	145	8	18
80	168.3	8	22.2	160.0	8	23	170.0	8	23	160	8	18	160	8	18
100	200.0	8	22.2	185.0	8	23	195.0	8	25	190	8	22	190	8	22
125	235.0	8	22.2	225.0	8	25	230.0	8	25	220	8	26	220	8	26
150	269.9	12	22.2	260.0	12	25	275.0	12	25	250	8	26	250	8	26
200	330.2	12	25.4	305.0	12	25	320.0	12	27	310	12	26	320	12	30
250	387.4	16	28.57	380.0	12	27	390.0	12	33	370	12	30	385	12	33
300	450.8	16	31.75	430.0	16	27	450.0	16	33	430	16	30	450	16	33

(unit : inch)

SIZE	ANSI 300			JIS 16/20K			JIS 30K			PN25			PN40		
	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h	B.C.D	n	h
2"	5.00	8	3/4"	4.72	8	0.75	5.12	8	0.75	4.92	4	0.71	4.92	4	0.71
2 1/2"	5.87	8	7/8"	5.51	8	0.75	6.30	8	0.91	5.71	8	0.71	5.71	8	0.71
3"	6.63	8	7/8"	6.30	8	0.91	6.69	8	0.91	6.30	8	0.71	6.30	8	0.71
4"	7.87	8	7/8"	7.28	8	0.91	7.68	8	0.98	7.48	8	0.87	7.48	8	0.87
5"	9.25	8	7/8"	8.86	8	0.98	9.06	8	0.98	8.66	8	1.02	8.66	8	1.02
6"	10.63	12	7/8"	10.24	12	0.98	10.83	12	0.98	9.84	8	1.02	9.84	8	1.02
8"	13.00	12	1"	12.01	12	0.98	12.60	12	1.06	12.20	12	1.02	12.60	12	1.18
10"	15.25	16	1-1/8"	14.96	12	1.06	15.35	12	1.30	14.57	12	1.18	15.16	12	1.30
12"	17.75	16	1-1/4"	16.93	16	1.06	17.72	16	1.30	16.93	16	1.18	17.72	16	1.30

## TORQUE DATA - HIGH PERFORMANCE BFV

lbs.inch		CLASS 150				CLASS 300			
		Actual Torque: lbf.inch				Actual Torque: lbf.inch			
		TEFLON SEAT		METAL SEAT		TEFLON SEAT		METAL SEAT	
SIZE		150 PSIG	285 PSIG	150 PSIG	285 PSIG	150 PSIG	500 PSIG	150 PSIG	500 PSIG
(mm)	(inch)								
50A	2"	200	270	564	677	220	520	900	1550
65A	2-1/2"	200	270	564	677	220	520	900	1550
80A	3"	200	270	564	677	220	520	900	1550
100A	4"	225	470	903	1128	250	670	1200	1850
125A	6"	540	680	1467	2144	600	1120	2800	5700
200A	8"	910	1620	2031	2595	1000	2440	4100	8100
250A	10"	1620	2530	3385	4288	1800	4640	6800	14500
300A	12"	2530	3600	4513	5190	2790	7480	9100	23600
350A	14"	3720	5970	CONSULT ST&H		4130	10200	CONSULT ST&H	
400A	16"	5530	9180			6140	17070		
450A	18"	6840	11900			7600	20400		
500A	20"	10020	16970			11140	31530		
600A	24"	18330	32290			20370	58820		

N.m		CLASS 150				CLASS 300			
		Actual Torque: N.m				Actual Torque: N.m			
		TEFLON SEAT		METAL SEAT		TEFLON SEAT		METAL SEAT	
SIZE		10 BAR	20 BAR	10 BAR	20 BAR	10 BAR	35 BAR	10 BAR	35 BAR
(mm)	(inch)								
50A	2"	23	31	64	76	25	59	102	175
65A	2-1/2"	23	31	64	76	25	59	102	175
80A	3"	23	31	64	76	25	59	102	175
100A	4"	25	53	102	127	28	76	136	209
125A	6"	61	77	166	242	68	127	316	644
200A	8"	103	183	229	293	113	276	463	915
250A	10"	183	286	382	484	203	524	768	1638
300A	12"	286	407	510	586	315	845	1028	2666
350A	14"	420	675	CONSULT ST&H		467	1152	CONSULT ST&H	
400A	16"	625	1037			694	1929		
450A	18"	773	1345			859	2305		
500A	20"	1132	1917			1259	3562		
600A	24"	2071	3648			2302	6646		

kgf.m		CLASS 150				CLASS 300			
		Actual Torque: kgf.m				Actual Torque: kgf.m			
		TEFLON SEAT		METAL SEAT		TEFLON SEAT		METAL SEAT	
SIZE		10 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	20 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	35 kg/cm <sup>2</sup>	10 kg/cm <sup>2</sup>	35 kg/cm <sup>2</sup>
(mm)	(inch)								
50A	2"	2	3	6	8	3	6	10	18
65A	2-1/2"	2	3	6	8	3	6	10	18
80A	3"	2	3	6	8	3	6	10	18
100A	4"	3	5	10	13	3	8	14	21
125A	6"	6	8	17	25	7	13	32	66
200A	8"	10	19	23	30	12	28	47	93
250A	10"	19	29	39	49	21	53	78	167
300A	12"	29	41	52	60	32	86	105	272
350A	14"	43	69	CONSULT ST&H		48	118	CONSULT ST&H	
400A	16"	64	106			71	197		
450A	18"	79	137			88	235		
500A	20"	115	196			128	363		
600A	24"	211	372			235	678		

NOTE : All torques shown on the chart were derived from test data using water at 5°C.  
 For torques using dry gases, multiply these numbers by 1.6.  
 Above table has additional 30% safety factor to average net torque.  
 For severe services, or unusual fluids or slurries, consult ST&H.  
 For 600 & 700 psig Torque, Please consult ST&H.

The torques listed are applicable to sea water, lubricating type of hydro carbons and most media at temperature 0~82 °C (32~180 °F). The operating speed of the actuator must be considered in order to avoid water hammer when the valve is closed in junction with Liquid.

The factors affect the torque required to operate Butterfly Valves

- Valve Diameter
- Shaft Diameter
- Bearing Friction Coefficient
- Type of Seat Material
- Shut off Pressure
- Velocity
- Shape of Disc
- System Head Characteristics
- Piping Arrangement

Actuator torques can be calculated using the following formulas.

$$Ta = Tb + Ts + Th = 1.2Tb \pm Td$$

$$Ts = CsD^2$$

$$Tb = 4.17D^2dfp$$

$$Td = CtD^3P$$

$$Th = 3.06D^4$$

$$V = Cf\sqrt{p} = \frac{Q}{0.785D^2}$$

Ta : The required actuator torque(lb-ft)

Ts : Seating or unseating torque(lb-ft)

Td : Dynamic torque(lb-ft)

Th : Hydrostatic torque(lb-ft)

Q : Flow (cubic for per second)

V : Velocity (feet per second)

D : Diameter of valve (feet)

d : Diameter of Shaft (inch)

P : Pressure drop across valve(psi)

Cs : Coefficient of Seating or unseating torque

Ct : Coefficient of dynamic torque

Cf : Coefficient of flow

f : Bearing friction coefficient

# Operating Characteristics for Sizing

- The Size of Butterfly Valve used for control purpose should be calculated on the basis of the operating characteristics. In order to achieve optimum control, the flow coefficient (Cv, Kv) below need to be considered.
- Flow Coefficient for ST&H corporation Butterfly Valves.

CLASS	DISC POSITION IN DEGREES OPEN								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
150									
3"	1.23	1.59	2.56	4.00	6.25	9.09	14.29	12.99	15.87
4"	2.38	3.03	4.76	7.69	11.49	16.39	25.00	24.39	32.26
5"	5.00	7.69	14.29	24.39	43.48	71.43	111.11	100.00	125.00
6"	5.00	7.69	14.29	24.39	43.48	71.43	111.11	100.00	125.00
8"	12.99	19.23	31.25	55.56	90.91	158.73	256.41	217.39	238.10
10"	22.73	34.48	55.56	100.00	166.67	277.78	454.55	384.62	416.27
12"	33.33	52.63	100.00	166.67	333.33	467.19	625.00	588.24	625.00
14"	35.71	55.56	90.91	158.74	256.41	454.55	714.29	625.00	769.23
16"	66.67	106.38	185.19	322.58	625.00	613.50	1,333.39	1,219.51	1,351.35
18"	83.33	120.48	208.33	357.14	588.24	1,000.00	1,538.46	1,333.33	1,428.57
20"	126.58	196.08	344.83	588.24	1,136.36	1,724.14	2,500.00	2,272.73	2,439.02
24"	200.00	322.58	588.24	1,000.00	1,960.74	2,702.70	4,000.00	5,882.35	3,546.14

CLASS	DISC POSITION IN DEGREES OPEN								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
300									
3"	0.94	1.23	2.00	3.13	4.76	7.14	10.64	12.99	12.66
4"	1.75	2.22	3.57	5.56	8.33	12.05	18.52	22.73	23.26
5"	3.70	5.88	10.42	17.54	30.30	52.63	78.74	76.92	83.33
6"	3.70	5.88	10.42	17.54	30.30	52.63	78.74	76.92	83.33
8"	9.09	13.70	22.22	38.46	66.67	109.89	185.44	169.42	163.93
10"	15.15	23.26	38.46	66.67	112.36	185.89	303.03	263.16	270.27
12"	23.81	28.46	71.43	117.65	232.56	333.33	464.55	434.78	444.44
14"	33.33	50.00	83.33	144.93	238.10	400.00	625.00	588.24	666.67
16"	62.50	100.00	163.99	277.78	500.00	769.23	1162.79	1098.00	1176.47
18"	66.67	102.04	175.44	285.71	454.78	769.23	1204.82	1190.48	1234.57
20"	102.04	163.93	277.78	476.19	909.09	1315.79	1923.08	1785.71	2040.82
24"	158.74	250.00	454.55	269.23	1369.86	2083.33	3125.00	2777.78	2941.18

• Cv is in imperial units, the water flow in U.S. gallons per minute which passes through the valve giving a pressure drop of 1 PSI at a temperature of 68°F

In metric units the same coefficient is called Kv and correspond to the flow rate in m3/h passing through the valve giving a pressure drop of 1 bar at a temperature of 20°C

The approximate corresponding formulas are :

$$Q = Cv \cdot \sqrt{\frac{\Delta p \cdot 62.4}{D}}$$

where :

Q = valve flow rate in gpm (USGPM)

Δp = pounds per square inch (psi) pressure drop through the valve

62.4 = conversion factor for fluids computed in relation to water

D = pounds per cu.ft (pct) fluid density

$$Q = Kv \cdot \sqrt{\frac{\Delta p \cdot 1000}{D}}$$

where :

Q = valve flow rate in m3/h

Δp = pressure drop through the valve in bar

1000 = conversion factor for fluids computed in relation to water.

D = Kg/m<sup>3</sup> fluid density

The relation between Cv and Kv, expressed in the above mentioned unit of measure is as follows ;

$$Cv = 1.16Kv$$

## HOW TO ORDER:

### 1 SERIES

**STHW** Wafer Style  
**STHL** Lug Style

### 2 MATERIAL

**1** Carbon Steel - A216 WCB  
**2** Stainless Steel - A351CF8M

### 3 SEAT

**S** Soft Seat - RPTFE  
**M** Metal Seat - 316SS  
**X** Special

### 4 CLASS

**150** ANSI 150lb  
**300** ANSI 300lb

### 5 OPERATOR

**B** Bare Shaft  
**G** Gear Operator  
**L** Lever Handle  
**X** Special

### 6 - SIZE

**2** 2"  
**212** 2-1/2"  
**3** 3"  
**4** 4"  
**5** 5"  
**6** 6"  
**8** 8"  
**10** 10"  
**12** 12"  
**14** 14"  
**16** 16"  
**18** 18"  
**20** 20"  
**24** 24"

### 7 - ACTUATOR

**D3** HDA-65 Pneumatic Double Acting  
**D4** HDA-80 Pneumatic Double Acting  
**D5** HDA-100 Pneumatic Double Acting  
**D6** HDA-125 Pneumatic Double Acting  
**D7** HDA-140 Pneumatic Double Acting  
**D8** HDA-160 Pneumatic Double Acting  
**D9** HDA-210 Pneumatic Double Acting  
**S3** HSR-65 Pneumatic Spring Return  
**S4** HSR-80 Pneumatic Spring Return  
**S5** HSR-100 Pneumatic Spring Return  
**S6** HSR-125 Pneumatic Spring Return  
**S7** HSR-140 Pneumatic Spring Return  
**S8** HSR-160 Pneumatic Spring Return  
**S9** HSR-210 Pneumatic Spring Return

Note, add "L" to prefix for low temperature actuator (-40°C). Example:

**D3L** HDA-65 LT Pneumatic Double Acting

### 8 - ACCESSORIES / OPTIONS

**4L** Nema 4 Limit Switch  
**7L** Nema 7 Limit Switch  
**4S1** Nema 4 Namur Solenoid Valve 120vac  
**4S2** Nema 4 Namur Solenoid Valve 24vdc  
**7S1** Nema 7 Namur Solenoid Valve 120vac  
**7S2** Nema 7 Namur Solenoid Valve 24vdc  
**4S0** Nema 4 Namur Solenoid Valve special voltage  
**7S0** Nema 7 Namur Solenoid Valve special voltage

**Contact Howell for full actuator and accessory specifications**