

SERIES STHW / STHL

HIGH PERFORMANCE BUTTERFLY VALVES



FEATURES:

- High strength one piece stem in A564 Gr. 630 / PH 17-4 materials
- ISO 5211 mounting pad permits direct mount actuation for both manual (lever and gear), pneumatic and electric actuators.
- Double off-set configuration. Conical angled disc design provides maximum flow and minimal resistance.
- 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 produces an even load distribution to packing.
- 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.
- Tight shut-off design
- Excellent corrosion resistance

VALVE RATINGS:

- 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, Wafer and Lug
Class 300, Wafer and Lug
- Pressure / Temp Rating: ANSI B16.34
- Metal to Metal seat leakage is rated at Class IV per ASME/FCI 70-2

SPECIFICATIONS:

- 2" ~ 24"
- Wafer and Lug
- Pressure rating: Class 150 and 300
- Cast Steel and Stainless Steel
- Seat Material: Soft Seat (PTFE / RTFE) NBR, EPDM, VITON, METAL (A240 Tp 316 / 304)
- Drilling: ANSI 150, JIS 10/16K, DIN PN 10/16
ANSI 300, JIS 20K, 30K, DIN PN 25/40

Triad Process Equipment®



triadvalves.com

FEATURES AND BENEFITS HIGH PERFORMANCE BUTTERFLY VALVES



SERIES ST HIGH PERFORMANCE BUTTERFLY VALVE

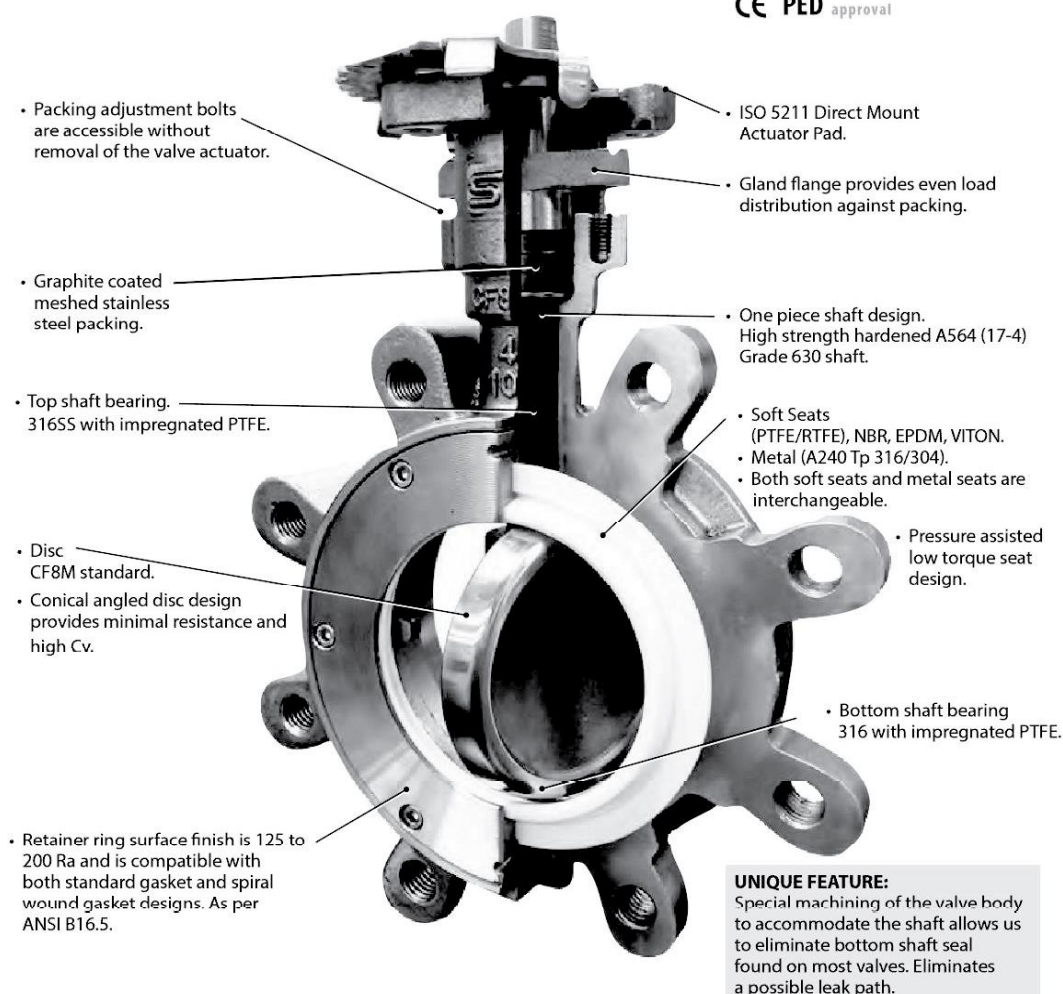
Series ST Features and Benefits

- Sizes: 2" ~ 24"
- Class 150# and Class 300#
- Low Operating Torques
- Direct Mount Actuator
- CF8M / WCB
- JIS and DIN drillings available

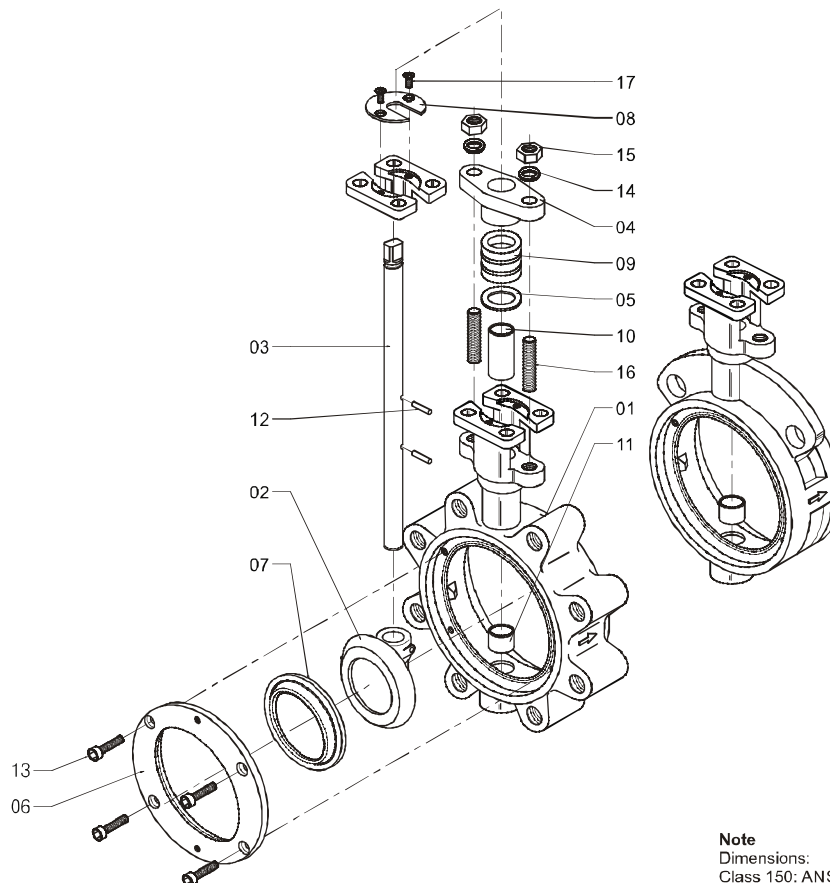
Valve Ratings:

- Top flange mounting: ISO 5211
- Basic Design: API 609, MSS-SP-68, BS 5155, ISO 5752, ANSI B16.34
- Shell/Seat Test: API 598, MSS-SP-61
- Pressure / Temp Rating: ANSI B16.5
- Metal to Metal seat leakage is rated at Class IV per ASME/FCI 70-2

CE PED approval



MATERIAL LIST HIGH PERFORMANCE BUTTERFLY VALVES SERIESSTHW (WAFER) STHL (LUG)



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

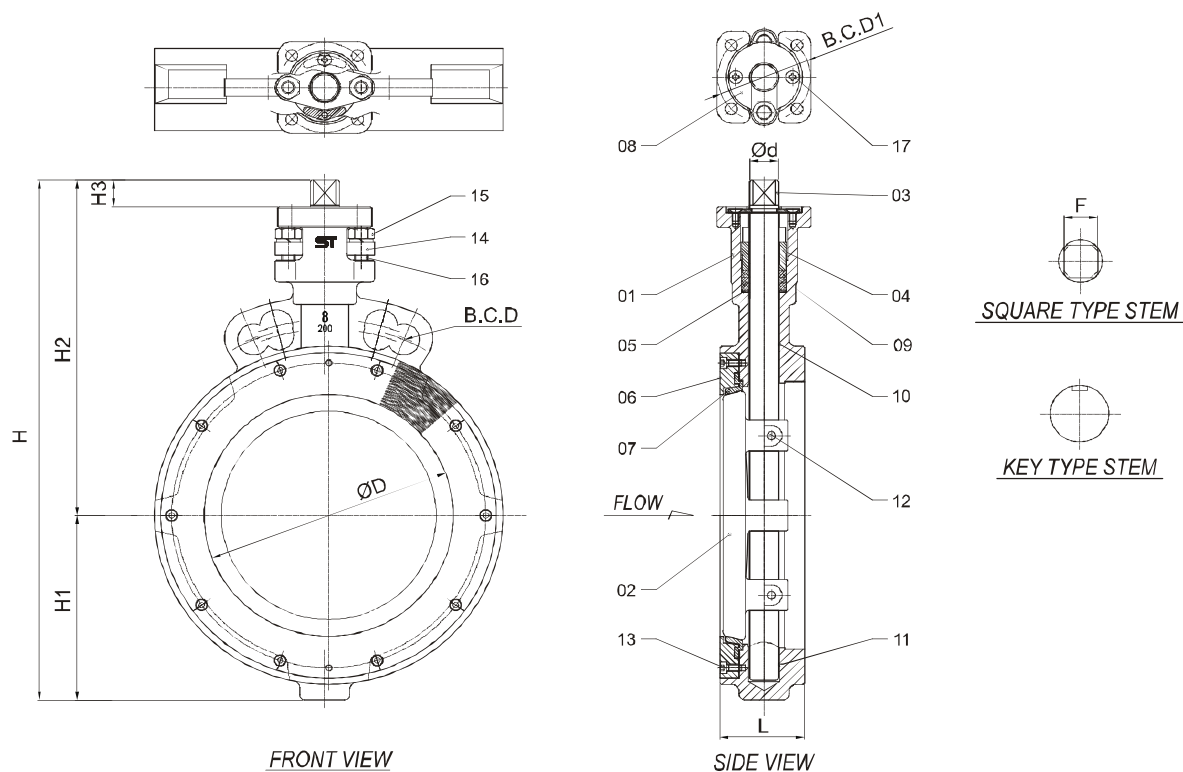
NO.	DESCRIPTION	MATERIAL	Q'TY
1	Body	A216 WCB / A351 CF8M	1
2	Disc	A351 CF8M	1
3	Stem	A 564 Gr. 630	1
4	Gland Flange	A216 WCB / A351 CF8M	1
5	Packing Retainer	A276 Tp 316	1
6	Retainer Ring	A351 CF8M	1
7	Seat	PTFE/RTFE/ METAL A240/ NBR / EPDM / VITON	1
8	Top Retainer	A283D - A36 / A276 Tp 316	1
9	Grand 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

**METAL SEAT TYPE WILL SUPPLY WITH GRAPHITE SEAT RING.

DIMENSIONS

HIGH PERFORMANCE BUTTERFLY VALVES

SERIESSTHW (WAFER)CLASS 150



Dimension

SIZE (inch)	H	H1	H2	H3	Ød	F	ØD	B.C.D1	L	WEIGHT (lbs.)
2"	8.63	2.36	6.27	0.60	0.51	0.43	1.65	F07	1.73	6.55
2.5"	9.54	2.75	6.78	0.60	0.63	0.55	2.40	F07	1.81	8.58
3"	9.85	3.01	6.84	0.60	0.63	0.55	2.91	F07	1.89	11.31
4"	11.07	3.54	7.53	0.70	0.63	0.55	3.70	F07	2.13	14.68
5"	12.55	4.09	8.45	0.70	0.71	0.55	4.65	F07	2.24	17.79
6"	13.62	4.53	9.09	0.75	0.87	0.67	5.51	F07	2.28	27.03
8"	15.91	5.65	10.26	0.81	0.87	0.67	7.40	F07	2.52	35.71
10"	18.44	6.69	11.75	0.81	1.10	0.87	9.39	F10	2.81	54.72
12"	22.12	9.24	12.88	0.95	1.10	0.87	11.02	F10	3.19	104.50

*2 additional bolt locating holes on select sizes.

(unit : inch)

MATERIALSELECTION & DRILLING

HIGH PERFORMANCE BUTTERFLY VALVES

SERIESSTHW (WAFER)CLASS 150

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		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

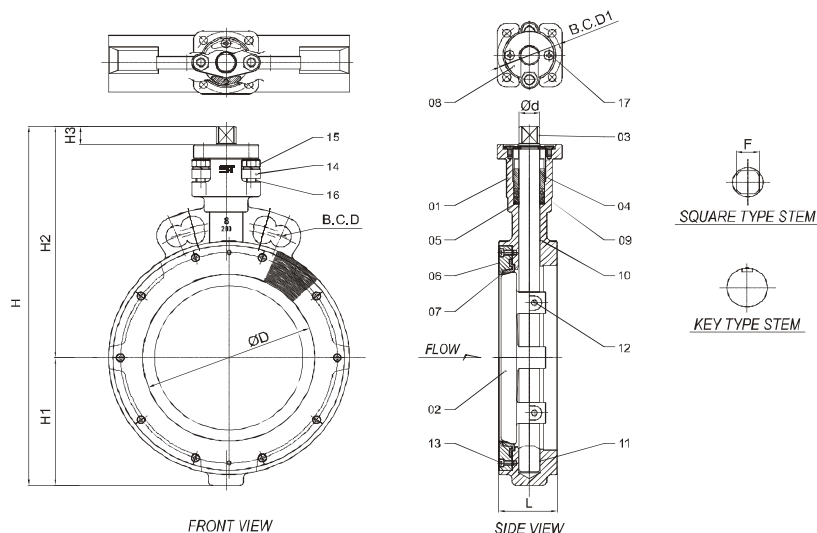
Flange Drilling Table

SIZE	ANSI 150		
inch	B.C.D	n	h
2"	4.75	4	0.75
2.5"	5.50	4	0.75
3"	6.00	4	0.75
4"	7.50	8	0.75
5"	8.50	8	0.88
6"	9.50	8	0.88
8"	11.75	8	0.88
10"	14.25	12	1.00
12"	17.00	12	1.00

Note

"n" Number of Bolt hole
 "h" Bolt Hole Dia

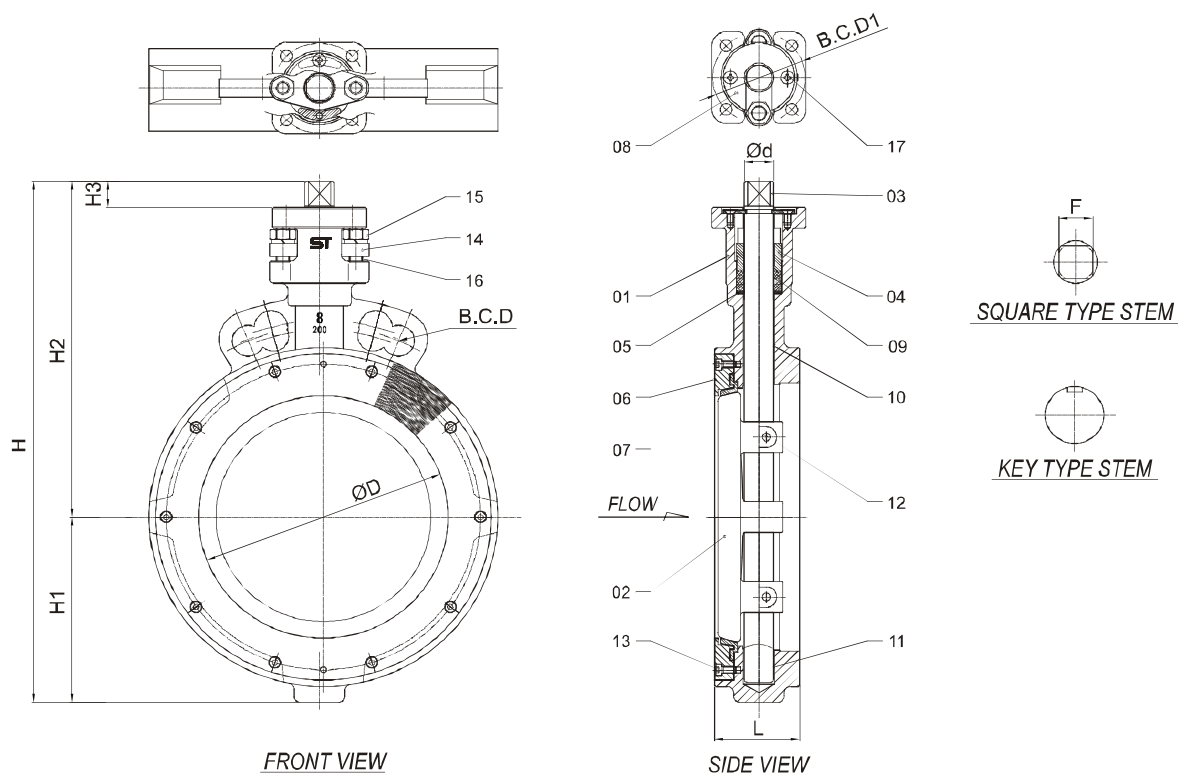
(unit : inch)



DIMENSIONS

HIGH PERFORMANCE BUTTERFLY VALVES

SERIESSTHW (WAFER)CLASS 300



Dimension

SIZE (inch)	H	H1	H2	H3	$\varnothing d$	F	$\varnothing D$	B.C.D1	L	WEIGHT (lbs.)
2"	8.63	2.36	6.27	0.60	0.51	0.43	1.65	F07	1.73	6.55
2.5"	9.54	2.75	6.78	0.60	0.63	0.55	2.40	F07	1.81	8.58
3"	9.85	3.01	6.84	0.60	0.63	0.55	2.91	F07	1.89	11.31
4"	11.07	3.54	7.53	0.70	0.63	0.55	3.70	F07	2.13	14.68
5"	12.55	4.09	8.45	0.70	0.71	0.55	4.65	F07	2.24	17.79
6"	13.62	4.53	9.09	0.75	0.87	0.67	5.51	F07	2.28	27.69
8"	15.91	5.65	10.26	0.81	1.10	0.87	7.40	F10	2.87	40.57
10"	18.44	6.69	11.75	0.81	1.10	0.87	9.39	F10	3.25	63.93
12"	20.48	7.60	12.88	0.95	1.10	0.87	11.02	F10	3.62	104.50

(unit : inch)

MATERIAL SELECTION & DRILLING

HIGH PERFORMANCE BUTTERFLY VALVES

SERIES STHW (WAFER) CLASS 300

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

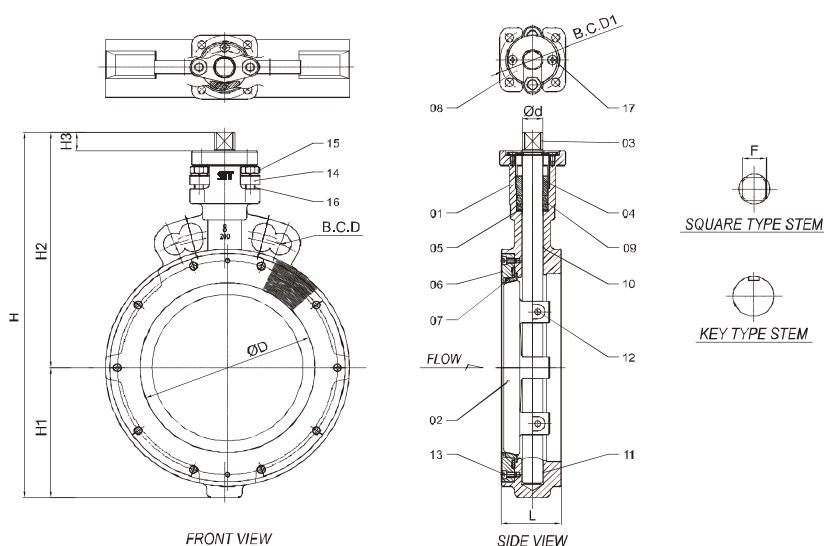
Flange Drilling Table

SIZE	ANSI 300		
inch	B.C.D	n	h
2"	5.00	8	0.75
2.5"	5.87	8	0.87
3"	6.63	8	0.87
4"	7.87	8	0.87
5"	9.25	8	0.87
6"	10.62	12	0.87
8"	13.00	12	1.00
10"	15.25	16	1.13
12"	17.75	16	1.25

Note

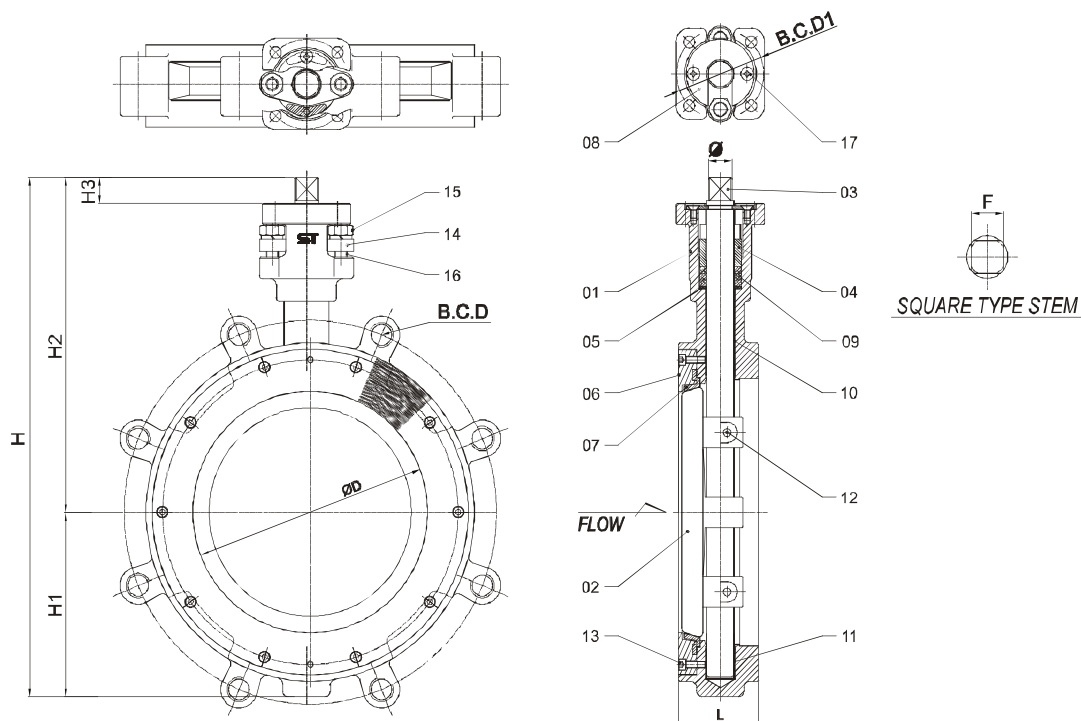
"n" Number of Bolt hole
 "h" Bolt Hole Dia

(unit : inch)





DIMENSIONS
HIGH PERFORMANCE BUTTERFLY VALVES
SERIESSTHL (LUG)CLASS 300



Dimension

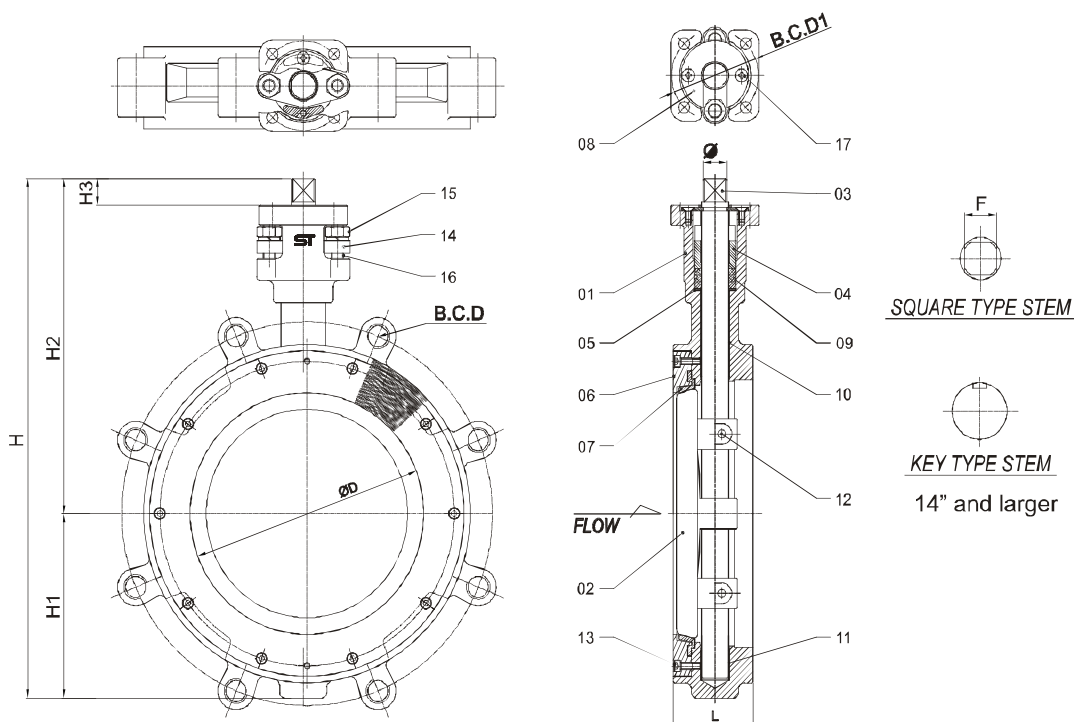
SIZE (inch)	H	H1	H2	H3	Ød	F	ØD	B.C.D1	L	WEIGHT (lbs.)
2"	8.63	2.36	6.27	0.60	0.51	0.43	1.65	F07	1.73	7.21
2.5"	9.54	2.76	6.77	0.60	0.63	0.55	2.40	F07	1.85	9.24
3"	9.85	3.01	6.84	0.60	0.63	0.55	2.91	F07	1.89	12.63
4"	11.07	3.54	7.53	0.70	0.63	0.55	3.70	F07	2.13	18.21
5"	12.55	4.09	8.45	0.70	0.91	0.55	4.65	F07	2.24	26.39
6"	13.62	4.53	9.09	0.75	0.87	0.67	5.51	F07	2.28	37.17
8"	15.91	5.65	10.26	0.81	1.10	0.87	7.40	F10	2.87	58.20
10"	18.44	6.69	11.75	0.81	1.10	0.87	9.39	F10	3.25	90.17
12"	20.71	7.83	12.88	0.95	1.10	0.87	11.02	F10	3.62	104.50

(unit : inch)

DIMENSIONS

HIGH PERFORMANCE BUTTERFLY VALVES

SERIESSTHL (LUG)CLASS 150



SIZE
(mm)
Dimension

SIZE (inch)	H	H1	H2	H3	ϕd	F	ϕD	B.C.D1	L	WEIGHT (lbs.)
2"	8.63	2.36	6.27	0.60	0.51	0.43	1.65	F07	1.73	7.43
2 1/2"	9.54	2.76	6.78	0.60	0.63	0.55	2.40	F07	1.81	9.24
3"	9.85	3.01	6.84	0.60	0.63	0.55	2.91	F07	1.89	10.65
4"	11.07	3.54	7.53	0.70	0.63	0.55	3.70	F07	2.13	18.21
5"	12.55	4.09	8.45	0.70	0.71	0.55	4.65	F07	2.24	23.59
6"	13.62	4.53	9.09	0.75	0.87	0.67	5.51	F07	2.28	30.12
8"	15.91	5.65	10.26	0.81	0.87	0.67	7.40	F07	2.52	39.90
10"	18.44	6.69	11.75	0.81	1.10	0.87	9.39	F10	2.81	67.51
12"	20.63	7.76	12.88	0.95	1.10	0.87	11.02	F10	2.81	104.50
14"	26.87	11.00	15.87	2.76	1.50		13.06	F14	3.62	180.00
16"	31.66	12.54	19.12	3.48	1.77		15.65	F16	F16	268.00
18"	33.73	13.31	20.41	3.48	2.17		17.81	F16	4.49	373.00
20"	34.59	14.17	20.41	3.48	2.17		19.98	F16	5.00	359.00
24"	39.76	16.70	23.05	3.68	2.56		23.99	F16	6.06	620.00

(unit : inch)

MATERIAL SELECTION & DRILLING

HIGH PERFORMANCE BUTTERFLY VALVES

SERIESSTHL (LUG)CLASS 150

Material Selection

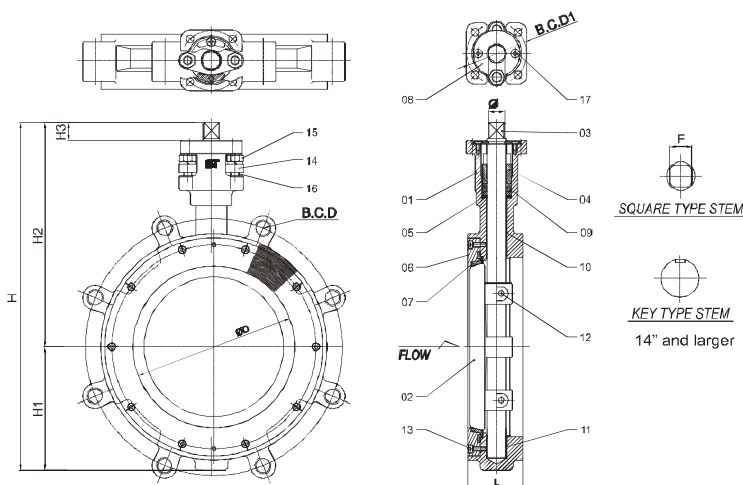
NO.	DESCRIPTION	#150 CS-STHL		#150 SS-STHL		Q'TY
		SOFT SEAT	METAL SEAT	SOFT SEAT	METAL SEAT	
1	Body	A 216 WCB		A 351 CF8M		1
2	Disc	A 351 CF8M				1
3	Stem	A 564 Gr. 630				1
4	Gland Flange	A 216 WCB		A351 CF8M		1
5	Packing Retainer	A276 Tp 316				1
6	Retainer Ring	A351 CF8M				1
7	Seat	PTFE/RTFE/ METAL 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

Flange Drilling Table

inch	ANSI 150 LBS		
	B.C.D	n	h
2"	4.75	4	0.75
2 1/2"	5.50	4	0.75
3"	6.00	4	0.75
4"	7.50	8	0.75
5"	8.50	8	0.87
6"	9.50	8	0.87
8"	11.75	8	0.87
10"	14.25	12	1.00
12"	17.00	12	1.00
14"	18.75	12	1.13
16"	21.25	16	1.13
18"	22.75	16	1.25
20"	25.00	20	1.25
24"	29.50	20	1.37

(unit : inch)

Note
 "n" Number of Bolt hole
 "h" Bolt Hole Dia



TORQUE DATA

HIGH PERFORMANCE BUTTERFLY VALVES

SERIESSTHL (LUG) / STHW (WAFER)

CLASS 150 / 300

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"	220	300	620	740	250	580	990	1710
65A	2 1/2"	440	530	620	740	520	940	990	1710
80A	3"	440	530	620	740	520	940	990	1710
100A	4"	550	660	990	1240	580	1040	1330	2040
125A	5"	590	750	1620	2350	660	1240	3080	6270
150A	6"	540	680	1470	2140	660	1240	2800	5700
200A	8"	910	1620	2760	3340	1000	2440	4100	8100
250A	10"	1620	2530	3380	4280	1800	4640	6800	14500
300A	12"	2530	3600	4510	5190	2790	7480	9100	23590
350A	14"	3720	5970	CONTACT TRIAD					
400A	16"	5530	9180						
450A	18"	6840	11900						
500A	20"	10020	16970						
600A	24"	18330	32280						

Note

All torques shown on the chart were derived from test data using water at 41°F.
 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, please contact Triad.
 For 600 & 700 psig torque, please contact Triad.

The torques listed are applicable to sea water. Lubricating type of hydro carbons and most media at temperature -32°F ~ 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

MATERIAL SELECTION & DRILLING

HIGH PERFORMANCE BUTTERFLY VALVES

SERIES STHL (LUG) CLASS 300

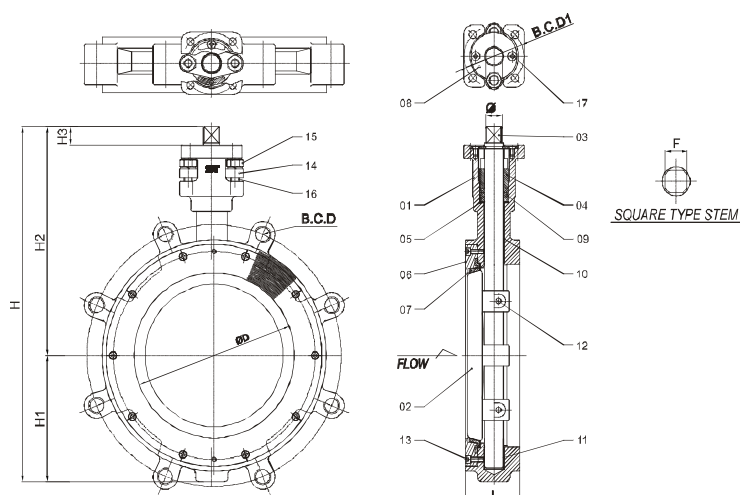
Material Selection

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

Flange Drilling Table

SIZE	ANSI 300		
inch	B.C.D	n	h
2"	5.00	8	3/4"
2 1/2"	5.87	8	7/8"
3"	6.63	8	7/8"
4"	7.87	8	7/8"
5"	9.25	8	7/8"
6"	10.63	12	7/8"
8"	13.00	12	1"
10"	15.25	16	1-1/8"
12"	17.75	16	1-1/4"

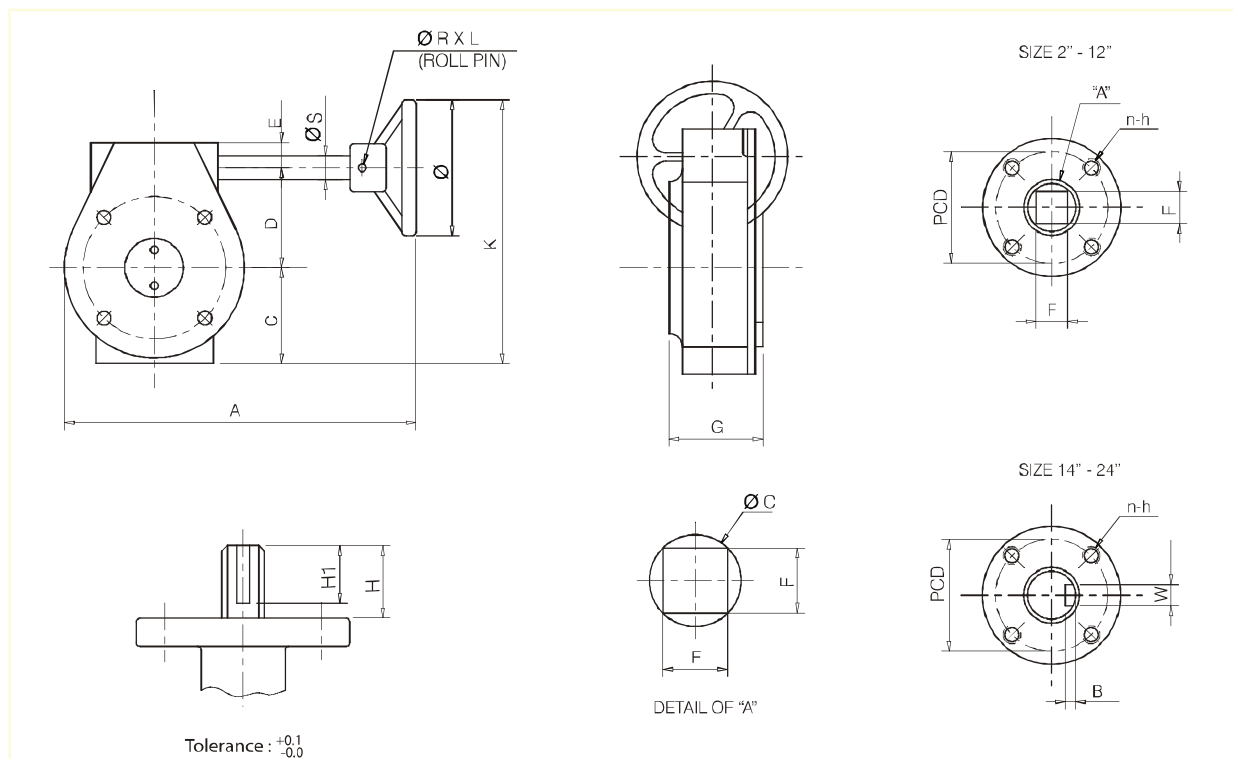
(unit : inch)



DIMENSIONS

HIGH PERFORMANCE BUTTERFLY VALVES

GEAR



Dimension

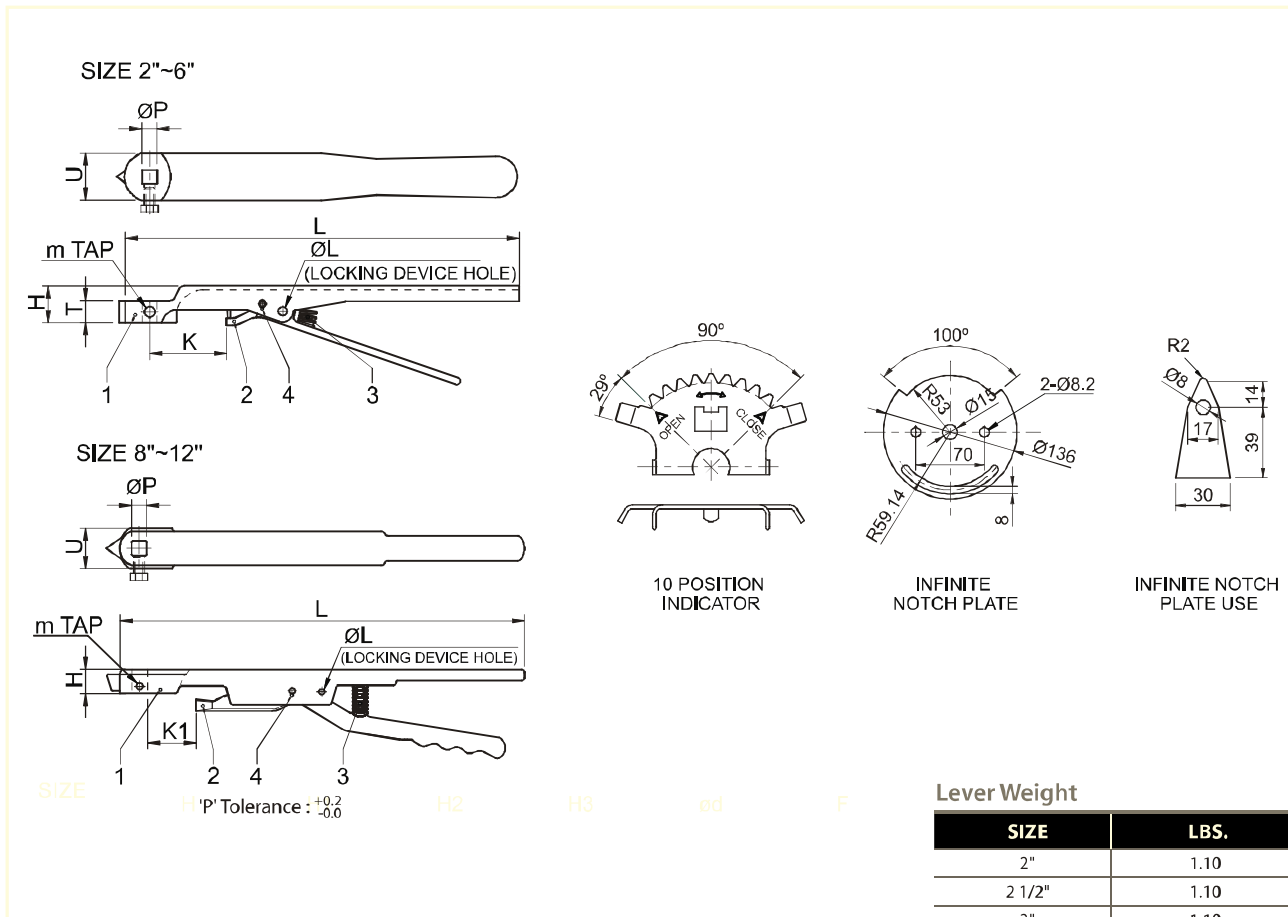
	RA-TIO	A	L	G	C	D	E	K	Φ	n-h	PCD	B	W	H	F	ΦC	H1	ΦS	ΦRxL	Weight (lbs)
2	24:1	8.35	6.22	2.83	2.13	1.77	1.1	6.71	5.79	4-M8	F07			0.6	0.43	0.55		0.63	0.2x1.57	7.5
2.5	24:1	8.35	6.22	2.83	2.13	1.77	1.1	6.71	5.79	4-M8	F07			0.6	0.43	0.55		0.63	0.2x1.57	7.5
3	24:1	8.35	6.22	2.83	2.13	1.77	1.1	6.71	5.79	4-M8	F07			0.6	0.43	0.55		0.63	0.2x1.57	7.5
4	24:1	8.35	6.22	2.83	2.13	1.77	1.1	6.71	5.79	4-M8	F07			0.7	0.55	0.63		0.63	0.2x1.57	7.63
5	24:1	8.35	6.22	2.83	2.13	1.77	1.1	6.71	5.79	4-M8	F07			0.7	0.55	0.71		0.63	0.2x1.57	7.63
6	24:1	8.35	6.22	2.83	2.13	1.77	1.1	6.71	5.79	4-M8	F07			0.7	0.55	0.71		0.63	0.2x1.57	7.98
8	30:1	10.98	8.07	2.83	2.87	2.6	1.22	11.38	11.81	4-M8	F07			0.81	0.67	0.87		0.75	0.25x1.97	14.77
10	30:1	10.98	8.07	2.83	2.99	2.6	1.34	11.5	11.81	4-M10	F10			0.81	0.87	1		0.75	0.25x1.97	15.83
12	50:1	11.18	8.1	3.23	3.19	3.17	1.29	12.19	11.81	4-M10	F10			0.95	0.87	1.1		0.75	0.25x1.97	21.12
14	50:1	11.18	8.1	3.07	3.46	3.09	1.36	12.46	11.81	4-M10	F10	0.2	0.39	2.81	0	1.1	2.36	0.75	0.25x1.97	20.81
16	50:1	11.18	8.1	3.07	3.46	3.09	1.36	12.46	11.81	4-M16	F14	0.2	0.39	3.15	0	1.26	2.36	0.75	0.25x1.97	22.8
18	50:1	11.18	8.1	3.19	3.46	3.09	1.36	14.13	15.16	4-M16	F14	0.2	0.47	3.15	0	1.5	2.36	0.75	0.25x1.97	23.41
20	80:1	15.16	10.53	4.49	4.98	4.7	1.46	17.26	15.16	4-M20	F16	0.2	0.47	3.54	0	1.77	2.76	0.98	0.33x2.01	51.9
24	80:1	15.16	10.53	4.49	4.98	4.7	1.46	17.26	15.16	4-M20	F16	0.2	0.55	3.74	0	2.17	2.76	0.98	0.33x2.01	51.9

(unit: inch)

DIMENSIONS

HIGH PERFORMANCE BUTTERFLY VALVES

LEVER



Standard Material

NO.	DESCRIPTION	MATERIAL
1	Lever	Malleable Iron or Stainless Steel
2	Aux Lever	Malleable Iron or Stainless Steel
3	Spring	Steel or SS 304
4	Pin	Steel or SS 410

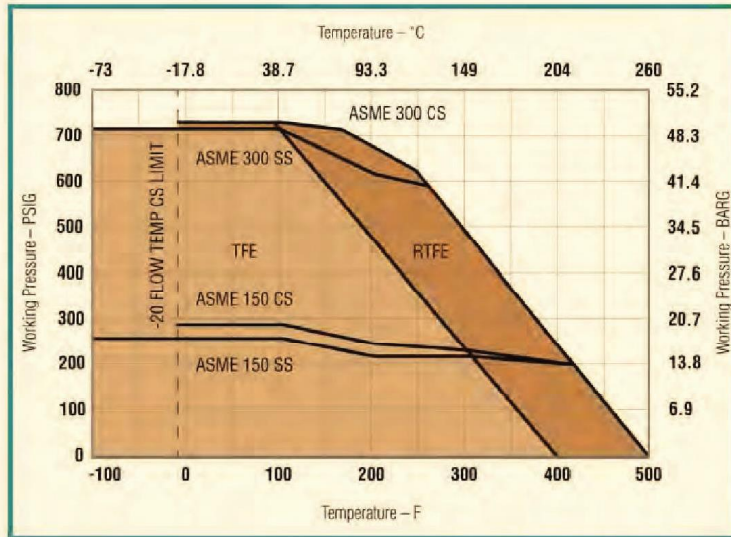
For High Performance Butterfly Valve - STHL, STHW

	P	T	L	m	U	H	K	K1	ΦL
2	0.43	0.63	11.37	M8	1.34	1.06	2.09		0.30
2.5	0.43		11.37	M8	1.34	1.06	2.09		0.30
3	0.43		11.37	M8	1.34	1.06	2.09		0.30
4	0.55		11.37	M8	1.34	1.06	2.09		0.30

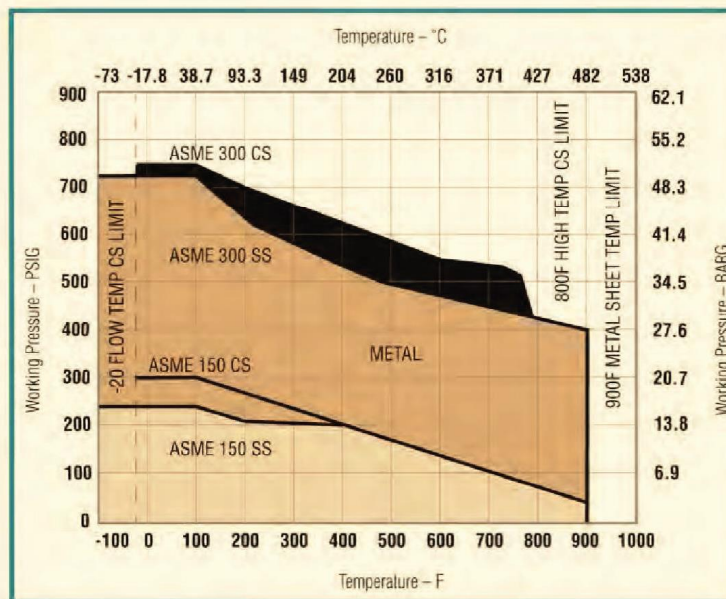
(unit : inch)

PRESSURE vs. TEMPERATURE
HIGH PERFORMANCE BUTTERFLY VALVES
 SERIESSTHL(LUG) / STHW (WAFER)
 CLASS 150 / 300

PTFE & RTFE SEAT



Metal Seat



FLOW COEFFICIENT CHARTS

HIGH PERFORMANCE BUTTERFLY VALVES

SERIES STHL (LUG) / STHW (WAFER)

CLASS 150 / 300

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.

1 Cv = 1.16 Kv

CLASS 150 SIZE		DISC OPENING															
		20°		30°		40°		50°		60°		70°		80°		90°	
(mm)	(inch)	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv
50	2"	5	6	12	14	22	25	34	39	48	56	66	76	85	99	88	102
65	2½"	8	9	18	21	32	37	48	56	69	80	95	110	122	142	126	146
80	3"	12	14	28	32	49	57	75	87	108	125	147	171	191	221	197	228
100	4"	23	27	54	63	98	114	147	171	214	248	291	338	377	437	389	451
125	5"	37	43	86	100	155	180	234	271	338	392	461	535	597	692	616	714
150	6"	57	66	133	154	240	278	361	419	523	607	713	827	922	1070	951	1103
200	8"	107	124	249	289	448	520	676	784	978	1135	1366	1584	1726	2002	1779	2064
250	10"	182	211	424	492	764	886	1152	1336	1667	1934	2274	2638	2941	3411	3032	3517
300	12"	250	290	584	677	1051	1219	1585	1838	2293	2660	3128	3628	4043	4690	4170	4837
350	14"	338	392	788	914	1419	1646	2139	2481	3097	3592	4223	4898	5629	6530	5911	6857
400	16"	458	531	1060	1230	1922	2229	2898	3361	4194	4865	5719	6634	7625	8845	8006	9287
450	18"	590	684	1376	1596	3339	3873	3735	4332	5405	6270	7371	8550	9716	11270	9828	11400
500	20"	714	828	1666	1932	2998	3478	4521	5244	6543	7590	8923	10350	11897	13800	12431	14420
600	24"	1086	1260	2535	2940	4562	5292	6802	7890	9957	11550	13578	15750	18104	21000	19009	22050

CLASS 300 SIZE		DISC OPENING															
		20°		30°		40°		50°		60°		70°		80°		90°	
(mm)	(inch)	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv	Kv	Cv
50	2"	5	6	11	13	21	24	31	36	45	52	61	71	82	95	86	100
65	2½"	7	8	16	19	29	34	45	52	65	75	88	102	117	136	123	143
80	3"	11	13	26	30	46	53	70	81	101	117	137	159	183	212	192	223
100	4"	22	25	50	58	90	104	135	157	197	228	267	310	357	414	375	435
125	5"	34	40	79	92	142	165	214	248	311	361	423	491	565	655	593	688
150	6"	52	60	120	139	216	250	325	377	471	546	641	744	855	992	897	1041
200	8"	94	109	220	255	396	459	597	692	863	1001	1177	1365	1569	1820	1647	1911
250	10"	158	183	367	426	661	767	997	1156	1442	1673	1967	2282	2622	3042	2753	3194
300	12"	218	253	509	590	916	1063	1381	1602	1999	2319	2727	3163	3635	4217	3817	4428
350	14"	281	326	655	760	1179	1368	1778	2063	2574	2986	3510	4072	4681	5430	4916	5702
400	16"	375	435	875	1015	1575	1827	2375	2755	3438	3988	4688	5438	6267	7185	6506	7502
450	18"	478	555	1116	1295	2009	2331	3030	3515	4386	5088	5981	6938	7974	9250	8372	9712
500	20"	543	630	1267	1470	2281	2646	3440	3990	4978	5775	6789	7875	9150	10550	9588	11058
600	24"	833	966	1943	2254	3497	4057	5274	6118	7634	8855	10409	12075	13879	16100	14570	16905

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:

The approximate corresponding formulas are:

$$Q = C_v \sqrt{\frac{\Delta P \cdot 62.4}{D}}$$

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

$$Q = K_v \sqrt{\frac{\Delta P \cdot 1000}{D}}$$

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/m³ fluid density

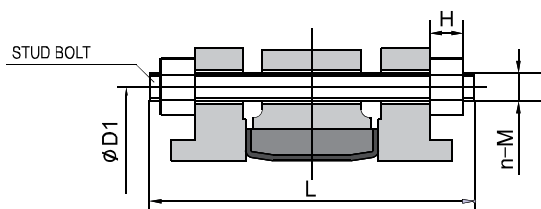
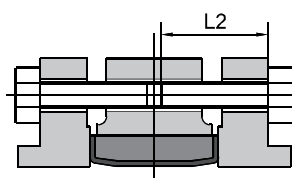
The relation between Cv and Kv, expressed in the above mentioned unit of measure is as follows:

$$C_v = 1.16 K_v$$

FLANGE BOLTING

HIGH PERFORMANCE BUTTERFLY VALVE

SERIES ST (2" ~ 24")

WAFER TYPE

LUG TYPE

Wafer

SIZE		ANSI 150 FLANGES		JIS 10K FLANGES		DIN PN10 FLANGES		DIN PN16 FLANGES	
mm	in	Studs Dia and length (in) L	N° studs	Studs Dia and length (mm) L	N° studs	Studs Dia and length (mm) L	N° studs	Studs Dia and length (mm) L	N° studs
50	2"	5/8" x 5-18"	4	M16 x 130	4	M16 x 130	4	M16 x 130	4
65	2-1/2"	5/8" x 5-1/8"	4	M16 x 130	4	M16 x 130	4	M16 x 130	4
80	3"	5/8" x 5-1/12"	4	M16 x 140	8	M16 x 140	4	M16 x 140	8
100	4"	5/8" x 5-1/12"	8	M16 x 150	8	M16 x 150	8	M16 x 150	8
125	5"	3/4" x 6-3/8"	8	M20 x 150	8	M16 x 150	8	M16 x 150	8
150	6"	3/4" x 6-3/8"	8	M20 x 160	8	M20 x 160	8	M20 x 160	8
200	8"	3/4" x 6-1/4"	8	M20 x 170	12	M20 x 170	8	M20 x 170	12
250	10"	7/8" x 7-1/2"	12	M22 x 190	12	M20 x 180	12	M24 x 190	12
300	12"	7/8" x 8-3/8"	12	M22 x 200	16	M20 x 190	12	M24 x 200	12
350	14"	1" x 8-3/4"	12	M22 x 220	16	M20 x 230	16	M24 x 220	16
400	16"	1" x 10"	16	M24 x 240	16	M22 x 230	16	M27 x 240	16
450	18"	1-1/8" x 11-1/8"	16	M24 x 250	20	M24 x 250	20	M27 x 250	20
500	20"	1-1/8" x 12"	20	M24 x 280	20	M24 x 250	20	M30 x 280	20
600	24"	1-1/4" x 13-13/16"	20	M30 x 300	24	M27 x 300	20	M33 x 300	20

For conveying oil, the flange needs 8 studs instead of 4.

Lug

SIZE		ANSI 150 FLANGES		JIS 10K FLANGES		DIN PN10 FLANGES		DIN PN16 FLANGES	
mm	in	Studs Dia and length (in) L1	N° studs	Studs Dia and length (mm) L1	N° studs	Studs Dia and length (mm) L1	N° studs	Studs Dia and length (mm) L1	N° studs
50	2"	5/8" x 1-1/2"	8	M16 x 35	8	M16 x 35	8	M16 x 35	8
65	2-1/2"	5/8" x 1-1/2"	8	M16 x 35	8	M16 x 35	8	M16 x 35	8
80	3"	5/8" x 1-1/2"	8	M16 x 35	16	M16 x 35	8	M16 x 35	16
100	4"	3/4" x 1-3/4"	16	M16 x 40	16	M16 x 40	16	M16 x 40	16
125	5"	5/8" x 1-3/4"	16	M20 x 45	16	M16 x 45	16	M16 x 45	16
150	6"	3/4" x 2"	16	M20 x 45	16	M20 x 45	16	M20 x 45	16
200	8"	3/4" x 2-1/4"	16	M20 x 50	24	M20 x 50	16	M20 x 50	24
250	10"	7/8" x 2-1/4"	24	M22 x 55	24	M20 x 55	24	M24 x 55	24
300	12"	7/8" x 2-1/2"	24	M22 x 60	32	M20 x 60	24	M24 x 60	24
350	14"	1" x 2-1/2"	24	M22 x 60	32	M20 x 60	32	M24 x 60	32
400	16"	1" x 3-1/4"	32	M24 x 70	32	M24 x 70	32	M27 x 70	32
450	18"	1-1/8" x 3-1/4"	32	M24 x 80	40	M24 x 80	40	M27 x 80	40
500	20"	1-1/8" x 3-1/4"	40	M24 x 80	40	M24 x 80	40	M30 x 80	40
600	24"	1-1/4" x 3-1/2"	40	M30 x 90	48	M27 x 90	40	M33 x 90	40

For pipe conveying oil, the flange needs 16 screws instead of 8.

N.B. - For lug type valves with free holes use the same studs as referred in wafer type valve's table.

End pipe service

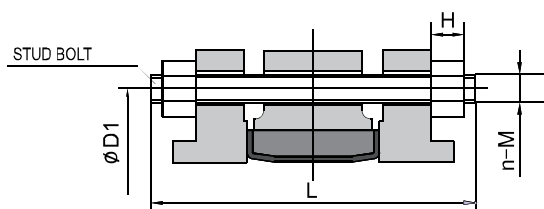
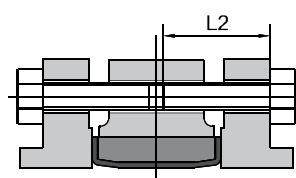
Due to the particular seat perimeter, Triad lug type butterfly valves can also be installed at the end of pipe. Also known as dead-end service. In this case it is possible to remove downstream piping under pressure for maintenance and operations. For this particular service weld neck or socket flanges are necessary. When the valve is correctly installed on single flange by means of screws, it will have zero leakage, no fluid infiltrations between the flange and seat.

Do not use other types of flanges as they will cause infiltrations and cause the seat to slide into the body. Lug type butterfly valves were specifically designed for this service, however, they can not intercept liquids with pressure over 10.5 bar.

They are not suitable for gas or air lines on single flange service.

After having removed the downstream piping, protect the valve with a blind flange.

FLANGE BOLTING HIGH PERFORMANCE BUTTERFLY VALVE SERIES ST (2" ~ 24")

WAFER TYPE

LUG TYPE

Wafer

SIZE		ANSI 300		JIS 20K FLANGES		PN25 FLANGES		JIS 30K FLANGES		PN40 FLANGES	
mm	in	Studs Dia and length (in) L	N° studs	Studs Dia and length (mm) L	N° studs	Studs Dia and length (mm) L	N° studs	Studs Dia and length (mm) L	N° studs	Studs Dia and length (mm) L	N° studs
50	2"	5/8" x 5-3/8"	8	M16 x 135	8	M16 x 135	4	M16 x 135	8	M16 x 135	4
65	2-1/2"	3/4" x 5-7/8"	8	M16 x 150	8	M16 x 150	8	M20 x 150	8	M16 x 150	8
80	3"	3/4" x 6-3/8"	8	M20 x 160	8	M16 x 160	8	M20 x 160	8	M16 x 160	8
100	4"	3/4" x 6-3/4"	8	M20 x 170	8	M20 x 170	8	M22 x 170	8	M20 x 170	8
125	5"	3/4" x 7"	8	M22 x 180	8	M24 x 180	8	M22 x 180	8	M24 x 180	8
150	6"	3/4" x 7-1/8"	12	M22 x 180	12	M24 x 180	8	M24 x 180	12	M24 x 180	8
200	8"	7/8" x 8-1/2"	12	M22 x 215	12	M24 x 215	12	M24 x 215	12	M27 x 215	12
250	10"	1" x 9-5/8"	16	M24 x 245	12	M27 x 245	12	(M30 x 3) x 245	12	M30 x 245	12
300	12"	1-1/8" x 10-3/8"	16	M24 x 265	16	M27 x 265	16	(M30 x 3) x 265	16	M30 x 265	16
350	14"	1-1/8" x 11-3/4"	20	(M30 x 3) x 300	16	M30 x 300	16	(M30 x 3) x 300	16	M33 x 300	16
400	16"	1-1/4" x 12-3/4"	20	(M30 x 3) x 325	16	M33 x 325	16	(M30 x 3) x 325	16	M36 x 325	16
450	18"	1-1/4" x 13-5/8"	24	(M30 x 3) x 345	20	M33 x 345	20	-	-	-	-
500	20"	1-1/4" x 14-3/8"	24	(M30 x 3) x 365	20	M33 x 365	20	-	-	-	-
600	24"	1-1/2" x 16-1/4"	24	(M36 x 3) x 415	24	M36 x 415	20	-	-	-	-

For conveying oil, the flange needs 8 studs instead of 4.

Lug

SIZE		ANSI 300 FLANGES		JIS 20K FLANGES		PN25 FLANGES		JIS 30K FLANGES		PN40 FLANGES	
mm	in	Studs Dia and length (in) L1	N° studs	Studs Dia and length (mm) L1	N° studs	Studs Dia and length (mm) L1	N° studs	Studs Dia and length (mm) L1	N° studs	Studs Dia and length (mm) L1	N° studs
50	2"	5/8" x 1-1/2"	8	M16 x 40	8	M16 x 40	8	M16 x 40	8	M16 x 40	4
65	2-1/2"	3/4" x 1-3/4"	8	M16 x 45	8	M16 x 45	8	M20 x 45	8	M16 x 45	8
80	3"	3/4" x 1-3/4"	8	M20 x 50	8	M16 x 50	8	M20 x 50	8	M16 x 50	8
100	4"	3/4" x 2-1/4"	8	M20 x 55	8	M20 x 55	8	M22 x 55	8	M20 x 55	8
125	5"	3/4" x 2-1/4"	8	M22 x 60	8	M24 x 60	8	M22 x 60	8	M24 x 60	8
150	6"	3/4" x 2-1/2"	12	M22 x 60	12	M24 x 60	12	M24 x 60	12	M24 x 60	8
200	8"	7/8" x 2-7/8"	12	M22 x 75	12	M24 x 75	12	M24 x 75	12	M27 x 75	12
250	10"	1" x 3-1/4"	16	M24 x 85	12	M27 x 85	16	(M30 x 3) x 85	12	M30 x 85	12
300	12"	1-1/8" x 3-1/2"	16	M24 x 95	16	M27 x 95	16	(M30 x 3) x 95	16	M30 x 95	16
350	14"	1-1/8" x 4-1/4"	20	(M30 x 3) x 110	16	M30 x 110	20	(M30 x 3) x 110	16	M33 x 110	16
400	16"	1-1/4" x 4-3/4"	20	(M30 x 3) x 120	16	M33 x 120	20	(M36 x 3) x 120	16	M36 x 120	16
450	18"	1-1/4" x 5-1/4"	24	(M30 x 3) x 130	20	M33 x 130	24	-	-	-	-
500	20"	1-1/4" x 5-1/2"	24	(M30 x 3) x 140	20	M33 x 140	24	-	-	-	-
600	24"	1-1/2" x 6-1/4"	24	(M36 x 3) x 155	24	M36 x 155	24	-	-	-	-

For pipe conveying oil, the flange needs 16 screws instead of 8.

N.B. - For lug type valves with free holes use the same studs as referred in wafer type valve's table.

End pipe service

Due to the particular seat perimeter, Triad lug type butterfly valves can also be installed at the end of pipe. Also known as dead-end service. In this case it is possible to remove downstream piping under pressure for maintenance and operations. For this particular service weld neck or socket flanges are necessary. When the valve is correctly installed on single flange by means of screws, it will have zero leakage, no fluid infiltrations between the flange and seat.

Do not use other types of flanges as they will cause infiltrations and cause the seat to slide into the body. Lug type butterfly valves were specifically designed for this service, however, they can not intercept liquids with pressure over 10.5 bar.

They are not suitable for gas or air lines on single flange service.

After having removed the downstream piping, protect the valve with a blind flange.

RECOMMENDED BOLT TIGHTENING TORQUES
HIGH PERFORMANCE BUTTERFLY VALVE
SERIES ST (2" ~ 24")

ANSI 150			
Valve Size (in)	Connection Bolt Size	Min. (in lbs.)	Max. (in. lbs)
2"	5/8"	7	22
2-1/2"	5/8"	7	22
3"	5/8"	7	22
4"	5/8"	7	22
5"	3/4"	11	37
6"	3/4"	11	37
8"	3/4"	11	37
10"	7/8"	19	75
12"	7/8"	19	75
14"	1"	26	93
16"	1"	26	93
18"	1-1/8"	37	131
20"	1-1/8"	37	131
24"	1-1/4"	56	168

ANSI 300			
Valve Size (in)	Connection Bolt Size	Min. (in lbs.)	Max. (in. lbs)
2"	5/8"	7	22
2-1/2"	3/4"	11	37
3"	3/4"	11	37
4"	3/4"	11	37
5"	3/4"	11	37
6"	3/4"	11	37
8"	3/4"	19	75
10"	1"	26	93
12"	1-1/8"	37	131
14"	1-1/8"	37	131
16"	1-1/4"	56	168
18"	1-1/4"	56	168
20"	1-1/4"	56	168
24"	1-1/2"	75	224

MATERIAL SELECTION HIGH PERFORMANCE BUTTERFLY VALVE SERIES ST

Model	Body Material	Disc Material	Stem Material	Seat Material	Operation	Drilling or Pressure Rate
<div> <div> <div>Model</div> <div> STHW - Wafer STHL - Lug </div> </div> <div> <div>Body Material</div> <div> 3 - Cast Steel, WCB 5 - 316 Stainless Steel CF8M 6 - 316L Stainless Steel, CF3M </div> </div> <div> <div>Disc</div> <div> K - 316 Stainless Steel, CF8M J - 316L Stainless Steel, CF3M </div> </div> <div> <div>Stem</div> <div>7 - A564 Gr. 630 (PH 17-4)</div> </div> <div> <div>Drilling or Pressure Rate</div> <div> 0 - 150 Class Common 1 - ANSI 150 3 - JIS 10K 4 - DIN PN10 5 - DIN PN16 6 - 300 Class Common 7 - ANSI 300 8 - DIN PN25 9 - DIN PN40 A - JIS 16K B - JIS 20K C - JIS 30K </div> </div> <div> <div>Operation</div> <div> 1 - Bare Stem 3 - Lever 6 - Gear </div> </div> <div> <div>Seat</div> <div> S - PTFE R - RTFE T - Metal Seat </div> </div> </div>						

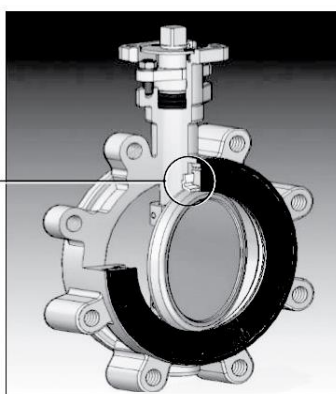
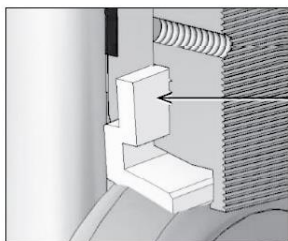
FEATURES AND BENEFITS HIGH PERFORMANCE BUTTERFLY VALVES



SERIES ST HIGH PERFORMANCE BUTTERFLY VALVE

ST HIGH PERFORMANCE FEATURES

Triad's Engineered Seat Design



The ST High Performance Butterfly valve features a carbon or stainless steel body and is ideal for commercial and industrial services. The body and disc are carefully manufactured by investment cast methods. The carbon steel body includes a powder coated epoxy finish. The valve features a direct mount actuator design. The valve has a dual offset disc design to extend seat life. A one piece 17-4 PH stem is provided for strength and is lubricated with TFE coated stainless steel bearings. The valve packing is graphite coated meshed stainless steel. The gland flange applies pressure to the packing to prevent external leakage. This feature is also fully adjustable. The lug body provides leak-tight deadend service.

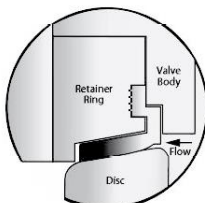


Figure 1
Valve Closed
With Right to Left Flow.

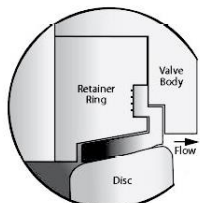


Figure 2
Valve Closed
With Left to Right Flow.

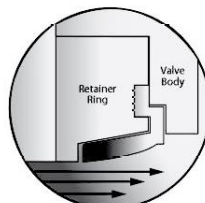


Figure 3
Valve Open
With Media Flow.

The ST High Performance butterfly valve provides excellent proportion control and features positive shutoff. The unique shape of the soft seat flexes against the disc under pressure to provide bubble tight sealing at all pressures. The simple design of the seat does not require o-rings that can swell or metal rings that can corrode.

Unique Cantilever design seat provides pressure assisted sealing regardless of the flow direction.

NOTE: Figure 1 is the desired way to install the valve because the retainer ring provides seat isolation from the flow.



Welded travel stop prevents over travel of the disc.
(Positions the disc for optimal sealing.)

High strength one-piece in A564 Gr. 630 / PH 17-4 A351 shaft and CF8M disc are welded together with a secured pin during assembly. Welded pins are staked to prevent loosening.