



Butterfly Valves

STC / STC-SR / STL / STL-SR



Standard Butterfly Valve

STC

STC-SR

STL

STL-SR

Size : Boot design seat type : 2" ~ 24"

Cartridge design seat type : 2" ~ 48"

Type : Wafer , Lug

Pressure Rating : Class 125/150

Body Material : Cast Iron, Ductile Iron and Stainless Steel

Seat Type : Standard Boot , Cartridge Type

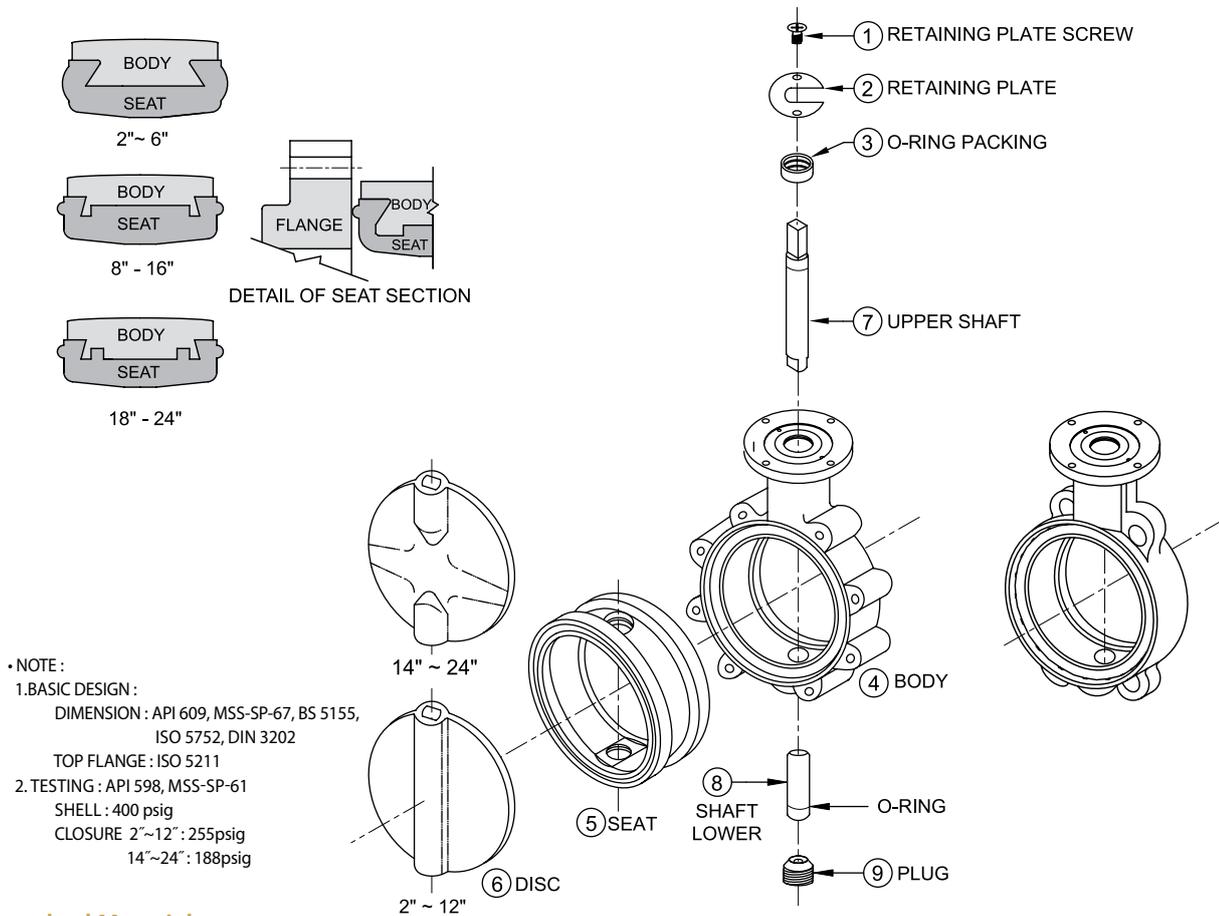
Operation : Lever , Gear

Drilling : ANSI 125/150, JIS 5/10/16K, DIN PN 10/16

Available in tapped lug body or wafer design with common drilling (universal) including ANSI 125/150, JIS 5/10/16K, DIN PN 10/16.

- One – piece body construction of Ductile Iron, Cast Iron or Stainless Steel design complies with API 609, MSS SP 67, and ISO 5752.
- ISO 5211 mounting pad with square shaft permits direct mount actuation for both Manual (Lever & gear), pneumatic and electric operations.
- Teflon stem bushing to assure long life even during extended period of activity. Lowers operating torque for easy manual operation and maximize shaft support.
- High strength two-piece stem eliminates taper pins or disc screws which often fail prematurely through abrasion, corrosion or fatigue.
- All disc castings are spherically machined & polished for extended seat life & bubble tight shut off.
- Seat type available in both encapsulated phenolic backed Cartridge seat and Boot design. Cartridge design seat permits easy change without special tools
- Conform to API 598 and MSS SP 61. Shell tested to 150% and seat tested to 110% of maximum working pressure
- Lug body valves are rated for 150 PSI in dead end service.
- Valve Rating:
 - Top flange mounting pad: ISO 5211
 - Basic Design: API 609, MSS-SP-67, BS 5155, ISO 5752, DIN 3202
 - Shell/Seat Test: API 598, MSS-SP-61
 - Shell: 400 psig
 - Closure: 2" ~ 12": 255 psig
 - 14" ~ 24": 188 psig

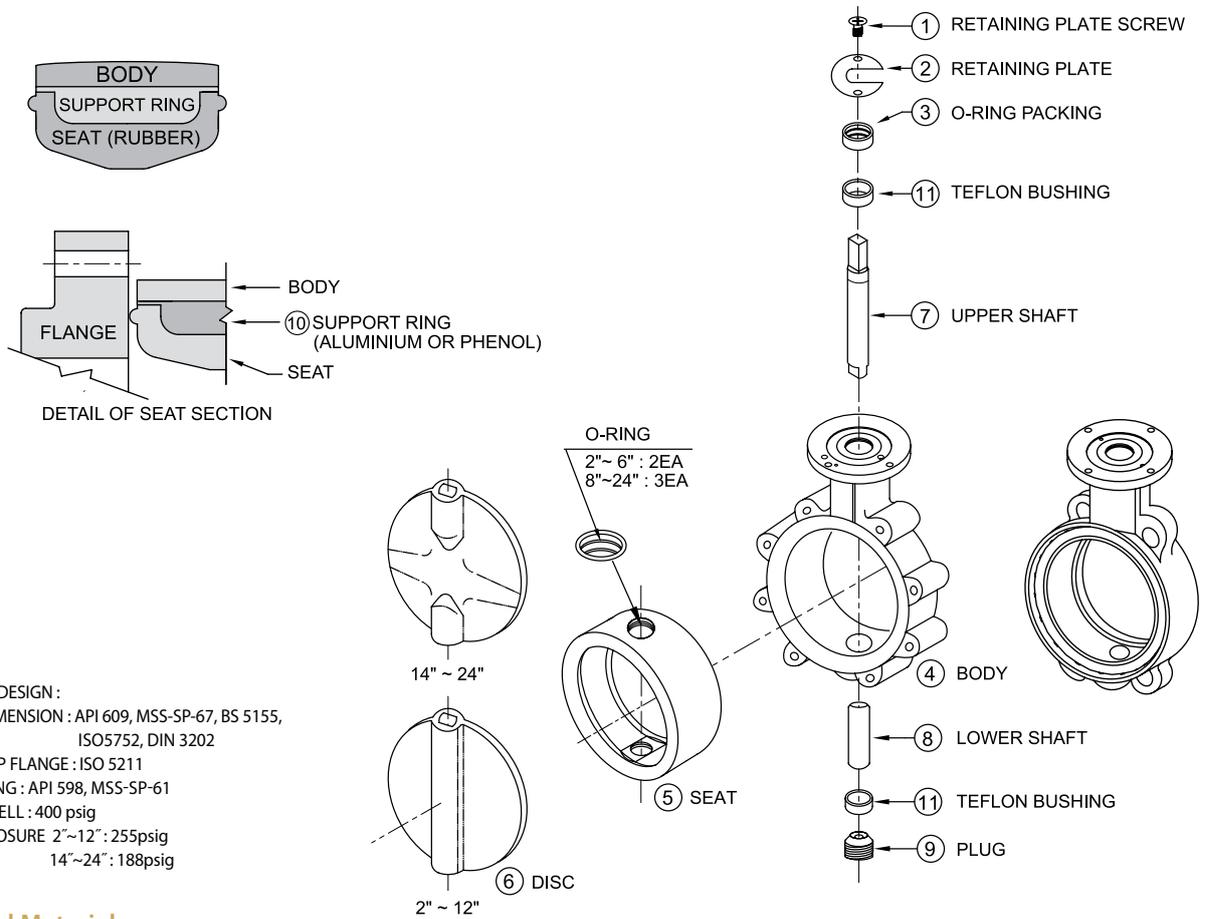
Standard Resilient Boot Type Seat Butterfly Valve Parts : STC / STL



Standard Material

NO	DESCRIPTION	MATERIAL	CODE NO.	STANDARD	REMARKS
1	RETAINING PLATE SCREW	CARBON STEEL		ASTM A283D-A36	GALVANIZED
2	RETAINING PLATE	CARBON STEEL		ASTM A283D-A36	GALVANIZED
3	O-RING PACKING	SAME AS SEAT MATERIAL		ASTM D2000	
4	BODY	CAST IRON	EN-GJL-250	ASTM A126/EN1561	
		DUCTILE IRON	GGG40	ASTM A536/DIN1693	
5	SEAT				WORKING TEMPERATURE
		EPDM		ASTM D2000	-30 °C ~ +110 °C
		BUNA-N (NBR)		ASTM D2000	-20 °C ~ +90 °C
		WHITE EPDM		ASTM D2000	-30 °C ~ +110 °C
		VITON		ASTM D2000	-10 °C ~ +160 °C
		HIGH TEMPERATURE EPDM		ASTM D2000	-30 °C ~ +130 °C
6	DISC	DUCTILE IRON	GGG40	ASTM A536/DIN1693	CHROME PLATED
		STAINLESS STEEL	CF8	ASTM A351	
			CF8M	ASTM A351	
		ALUMINIUM BRONZE	ALBC2	JIS H 5114	
7	UPPER STEM	STAINLESS STEEL	410SS	ASTM A276	
			316SS	ASTM A276	
8	LOWER STEM		304SS	ASTM A276	
9	PLUG	CARBON STEEL		ASTM A283D-A36	

Cartridge Type Butterfly Valve Parts : STC-SR / STL-SR



• NOTE :

1. BASIC DESIGN :

DIMENSION : API 609, MSS-SP-67, BS 5155, ISO5752, DIN 3202

TOP FLANGE : ISO 5211

2. TESTING : API 598, MSS-SP-61

SHELL : 400 psig

CLOSURE 2"~12" : 255psig

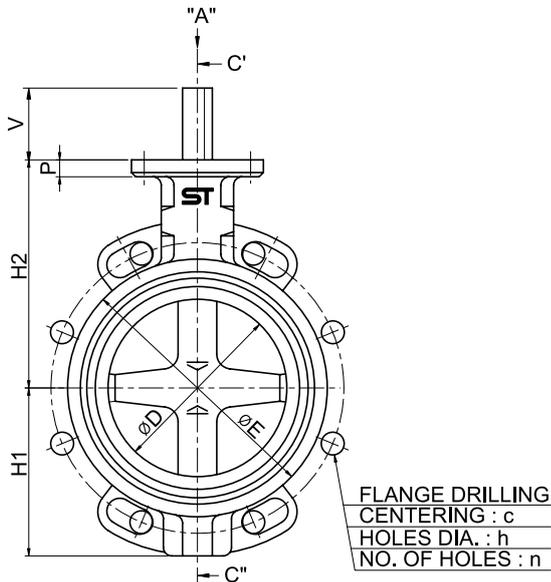
14"~24" : 188psig

Standard Material

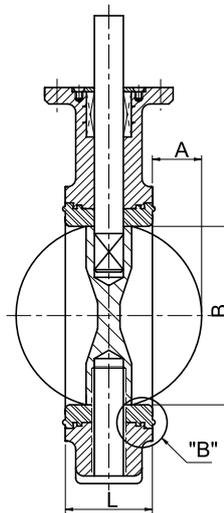
NO	DESCRIPTION	MATERIAL	CODE NO.	STANDARD	REMARKS
1	RETAINING PLATE SCREW	CARBON STEEL/ STAINLESS STEEL304		ASTM A283D-A36	GALVANIZED
2	RETAINING PLATE	CARBON STEEL/ STAINLESS STEEL316		ASTM A283D-A36	GALVANIZED
3	O-RING PACKING	SAME AS SEAT MATERIAL		ASTM D2000	
4	BODY	CAST IRON	EN-GJL-250	ASTM A126/EN1561	
		DUCTILE IRON	GGG40	ASTM A536/DIN1693	
		STAINLESS STEEL	CF8M	ASTM A351	
5	SEAT	EPDM		ASTM D2000	WORKING TEMPERATURE -30 °C ~ +110 °C
		BUNA-N (NBR)		ASTM D2000	-20 °C ~ +90 °C
		WHITE EPDM		ASTM D2000	-30 °C ~ +110 °C
		VITON		ASTM D2000	-10 °C ~ +160 °C
		HIGH TEMPERATURE EPDM		ASTM D2000	-30 °C ~ +130 °C
		TEFLON (PTFE)		PTFE	-40 °C ~ +300 °C
6	DISC	DUCTILE IRON	GGG40	ASTM A536/DIN1693	CHROME PLATED
		STAINLESS STEEL	CF8	ASTM A351	
			CF8M	ASTM A351	
		ALUMINIUM BRONZE	ALBC2	JIS H 5114	only available in CI/DI Body
7	UPPER STEM	STAINLESS STEEL	410SS	ASTM A276	
8	LOWER STEM		316SS	ASTM A276	
			304SS	ASTM A276	
9	PLUG	CARBON STEEL/ STAINLESS STEEL316		ASTM A283D-A36	
10	SUPPORT RING	PHENOL		ASTM D2000	(2" ~ 14")
		ALUMINIUM		ASTM B275	(16" ~ 24")
11	TEFLON BUSHING	TEFLON		PTFE	

Model : STC

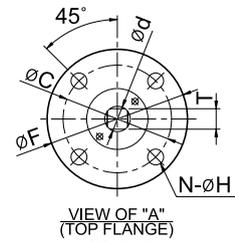
Wafer type, Common Drilled ANSI 150LBS, DIN PN10, PN16, JIS5K,10K,16K



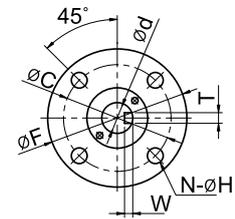
Remarks* = ISO 5211 Flange Type



SECTION OF C'-C"



VIEW OF "A"
(TOP FLANGE)
2"~12"



VIEW OF "A"
(TOP FLANGE)
14"~24"

Dimensions

(unit : mm)

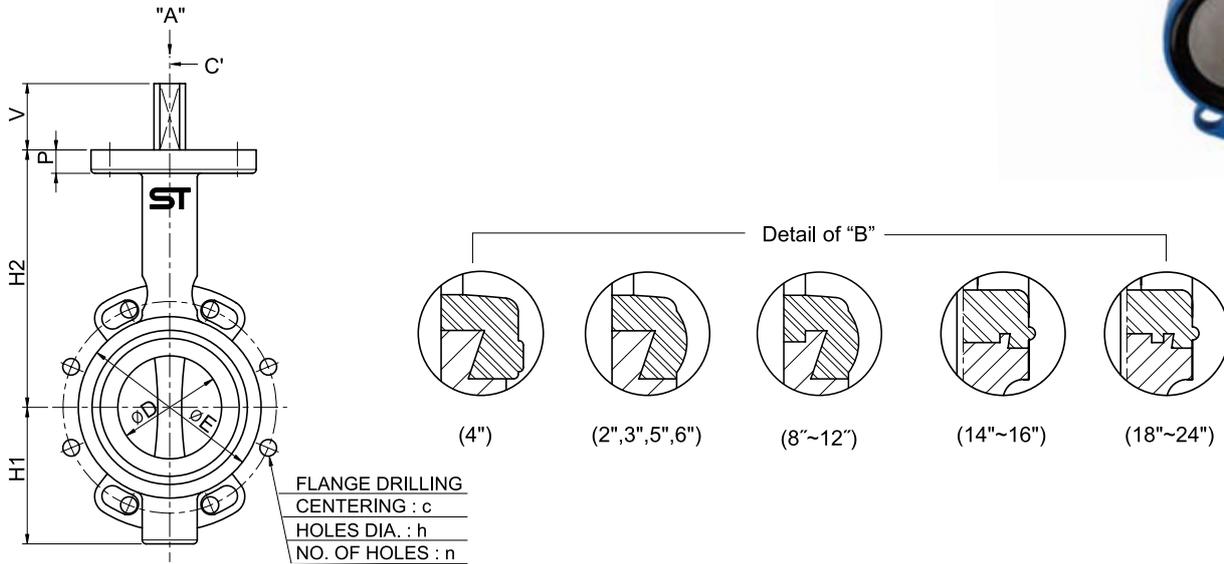
SIZE	TOP FLANGE & STEM										OUT LINE DIMENSION						
mm	d	P	C	N	H	T	F	V	W	REMARKS*	L	D	H1	H2	E	A	B
50A	14	14	70	4	9.0	11	90	15.2	-	F07	43.0	50.5	75.0	133.0	94	4.5	49.0
65A	14	14	70	4	9.0	11	90	15.2	-	F07	46.0	66.2	80.0	141.0	109	10.5	64.0
80A	16	14	70	4	9.0	14	90	15.2	-	F07	46.0	78.9	95.0	145.0	123	17.0	77.0
100A	16	16	70	4	9.0	14	90	17.7	-	F07	52.0	99.5	110.0	166.5	147	24.0	97.0
125A	19	16	70	4	9.0	14	90	17.7	-	F07	56.0	124.1	123.0	190.5	173	34.5	122.0
150A	22	16	70	4	9.0	17	90	19.0	-	F07	56.0	149.5	143.0	206.5	202	47.3	148.0
200A	22	17	70	4	9.0	17	90	20.5	-	F07	60.0	195.6	168.0	240.0	251.0	68.3	193.5
250A	28	20	102	4	11.0	22	125	20.5	-	F10	68.0	247.0	203.0	286.0	318.0	89.5	245.0
300A	28	20	102	4	11.0	22	125	24.1	-	F10	78.0	295.5	242.0	313.0	362.0	108.8	293.0
350A	28	20	102	4	12.0	10	125	71.5	5	F10	78.0	330.0	264.5	345.5	415	126.0	326.0
400A	32	23	140	4	18.0	10	175	80.0	5	F14	102.0	379.0	305.5	349.5	462	138.5	376.5
450A	38	23	140	4	18.0	12	175	80.0	5	F14	114.0	437.0	350.0	400.0	527	161.5	434.0
500A	45	23	165	4	22.0	12	210	90.0	5	F16	127.0	490.0	380.0	440.0	578	181.5	486.0
600A	55	23	165	4	22.0	14	210	95.0	5	F16	154.0	574.5	440.0	510.0	680	210.3	570.5

(unit : inch)

SIZE	TOP FLANGE & STEM										OUT LINE DIMENSION						
inch	d	P	C	N	H	T	F	V	W	REMARKS*	L	D	H1	H2	E	A	B
2"	0.55	0.55	2.76	4	0.35	0.43	3.54	0.60	-	F07	1.69	1.99	2.95	5.24	3.70	0.18	1.93
2 1/2"	0.55	0.55	2.76	4	0.35	0.43	3.54	0.60	-	F07	1.81	2.61	3.15	5.55	4.29	0.41	2.52
3"	0.63	0.55	2.76	4	0.35	0.55	3.54	0.60	-	F07	1.81	3.11	3.74	5.71	4.84	0.67	3.03
4"	0.63	0.63	2.76	4	0.35	0.55	3.54	0.70	-	F07	2.05	3.92	4.33	6.56	5.79	0.94	3.82
5"	0.75	0.63	2.76	4	0.35	0.55	3.54	0.70	-	F07	2.20	4.89	4.84	7.50	6.81	1.36	4.80
6"	0.87	0.63	2.76	4	0.35	0.67	3.54	0.75	-	F07	2.20	5.89	5.63	8.13	7.95	1.86	5.83
8"	0.87	0.67	2.76	4	0.35	0.67	3.54	0.81	-	F07	2.36	7.70	6.61	9.45	9.88	2.69	7.62
10"	1.10	0.79	4.02	4	0.43	0.87	4.92	0.81	-	F10	2.68	9.72	7.99	11.26	12.52	3.52	9.65
12"	1.10	0.79	4.02	4	0.43	0.87	4.92	0.95	-	F10	3.07	11.63	9.53	12.32	14.25	4.28	11.54
14"	1.10	0.79	4.02	4	0.47	0.39	4.92	2.81	0.20	F10	3.07	12.99	10.41	13.60	16.34	4.96	12.83
16"	1.26	0.91	5.51	4	0.71	0.39	6.89	3.15	0.20	F14	4.02	14.92	12.03	13.76	18.19	5.45	14.82
18"	1.50	0.91	5.51	4	0.71	0.47	6.89	3.15	0.20	F14	4.49	17.20	13.78	15.75	20.75	6.36	17.09
20"	1.77	0.91	6.50	4	0.87	0.47	8.27	3.54	0.20	F16	5.00	19.29	14.96	17.32	22.76	7.15	19.13
24"	2.17	0.91	6.50	4	0.87	0.55	8.27	3.74	0.20	F16	6.06	22.62	17.32	20.08	26.77	8.28	22.46

Model : STC

Wafer type, Common Drilled ANSI 150LBS,
DIN PN10, PN16, JIS5K, 10K, 16K



Drilling

(unit : mm)

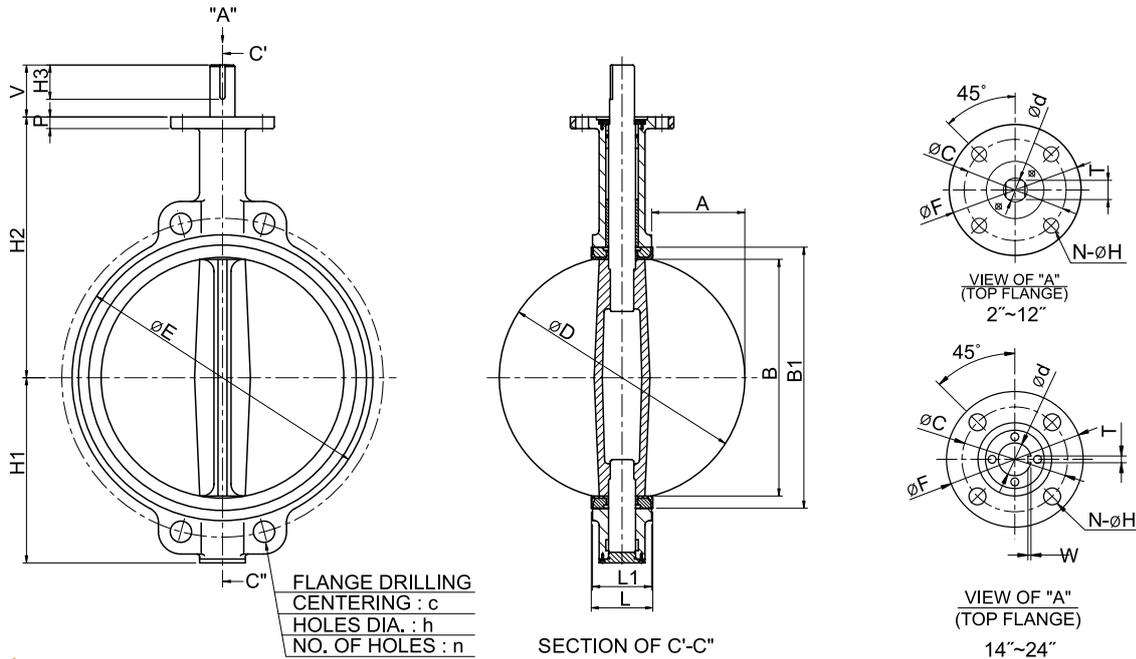
SIZE	PN 10			PN 16			ANSI 150 LBS			JIS 5K			JIS 10K		
	c	n	h	c	n	h	c	n	h	c	n	h	c	n	h
50A	125.0	4	18.0	125.0	4	18.0	120.7	4	19.0	105.0	4	15.0	120.0	4	19.0
65A	145.0	4	18.0	145.0	4	18.0	139.7	4	19.0	130.0	4	15.0	140.0	4	19.0
80A	160.0	8	18.0	160.0	8	18.0	152.4	4	19.0	145.0	4	19.0	150.0	8	19.0
100A	180.0	8	18.0	180.0	8	18.0	190.5	8	19.0	165.0	8	19.0	175.0	8	19.0
125A	210.0	8	18.0	210.0	8	18.0	215.9	8	22.0	200.0	8	19.0	210.0	8	23.0
150A	240.0	8	22.0	240.0	8	22.0	241.3	8	22.0	230.0	8	19.0	240.0	8	23.0
200A	295.0	8	22.0	295.0	12	22.0	298.5	8	22.0	280.0	8	23.0	290.0	12	23.0
250A	350.0	12	22.0	355.0	12	26.0	362.0	12	25.0	345.0	12	23.0	355.0	12	25.0
300A	400.0	12	22.0	410.0	12	26.0	431.8	12	25.0	390.0	12	23.0	400.0	16	25.0
350A	460.0	16	22.0	470.0	16	26.0	476.0	12	29.0	435.0	12	25.0	445.0	12	25.0
400A	515.0	16	26.0	525.0	16	30.0	539.5	16	29.0	495.0	16	25.0	510.0	16	27.0
450A	565.0	20	26.0	585.0	20	30.0	578.0	16	32.0	555.0	16	25.0	565.0	20	27.0
500A	620.0	20	26.0	650.0	20	33.0	635.0	20	32.0	605.0	20	25.0	620.0	20	27.0
600A	725.0	20	30.0	770.0	20	36.0	749.5	20	35.0	715.0	20	27.0	730.0	24	33.0

(unit : inch)

SIZE	PN 10			PN 16			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	4	0.71	5.71	4	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	0.98	13.58	12	0.91	13.98	12	0.98
12"	15.75	12	0.87	16.14	12	1.02	17.00	12	0.98	15.35	12	0.91	15.75	16	0.98
14"	18.11	16	0.87	18.50	16	1.02	18.74	12	1.14	17.13	12	0.98	17.52	12	0.98
16"	20.28	16	1.02	20.67	16	1.18	21.24	16	1.14	19.49	16	0.98	20.08	16	1.06
18"	22.24	20	1.02	23.03	20	1.18	22.76	16	1.26	21.85	16	0.98	22.24	20	1.06
20"	24.41	20	1.02	25.59	20	1.30	25.00	20	1.26	23.82	20	0.98	24.41	20	1.06
24"	28.54	20	1.18	30.31	20	1.42	29.51	20	1.38	28.15	20	1.06	28.74	24	1.30

Model : **STC-SR** Cartridge Seat Type

Wafer Type, Common Drilled ANSI 150LBS, DIN PN10, PN16, JIS10K,16K



Dimensions

(unit : mm)

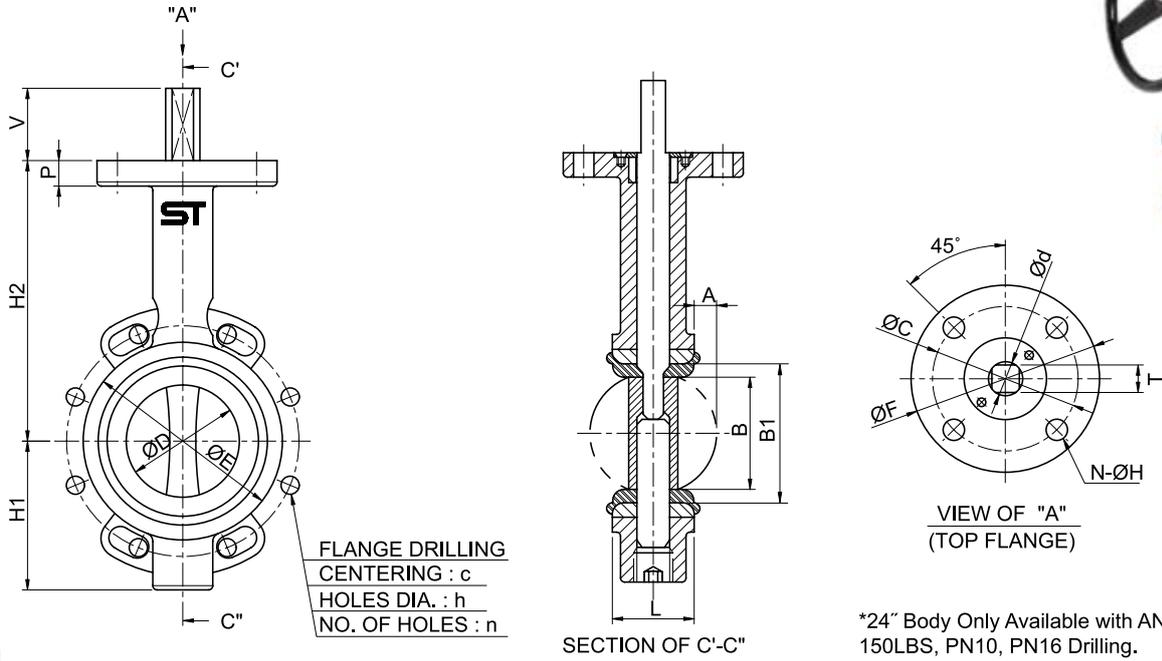
SIZE	TOP FLANGE & STEM											OUT LINE DIMENSION									
mm	d	P	C	N	H	H3	T	F	V	W	REMARKS*	L	L1	D	H1	H2	E	A	B	B1	
50A	14	14	70	4	9.0	-	11	90	15.2	-	F07	43.0	-	50.5	70.40	128.40	93	4.5	49.0	-	
65A	14	14	70	4	9.0	-	11	90	15.2	-	F07	46.0	-	66.2	75.05	136.05	108	10.5	64.0	-	
80A	16	14	70	4	9.0	-	14	90	15.2	-	F07	46.0	-	78.9	93.20	143.20	126	17.0	77.0	-	
100A	16	16	70	4	9.0	-	14	90	17.7	-	F07	52.0	-	99.5	106.20	162.70	150	24.0	97.0	-	
125A	19	16	70	4	9.0	-	14	90	17.7	-	F07	56.0	-	124.1	119.05	186.55	177	34.5	122.0	-	
150A	22	16	70	4	9.0	-	17	90	19.0	-	F10	56.0	-	149.5	139.20	202.70	208	47.3	148.0	-	
200A	22	17	70	4	9.0	-	17	90	20.5	-	F07	60.0	-	195.6	165.25	237.25	259	68.3	193.5	-	
250A	28	20	102	4	11.0	-	22	125	20.5	-	F10	68.0	-	247.0	199.60	282.60	317	89.5	245.0	-	
300A	28	20	102	4	11.0	-	22	125	24.1	-	F10	78.0	-	295.5	240.60	311.60	371	108.8	293.0	-	
350A	28	20	102	4	12.0	60	10	125	71.5	5	F10	86.0	78	330.0	264.5	345.5	415.1	126.0	326.0	375.1	
400A	32	23	140	4	18.0	60	10	175	80.0	5	F14	110.0	102	379.0	298.5	349.5	474.7	138.5	376.5	430.7	
450A	38	23	140	4	18.0	60	12	175	80.0	5	F14	122.0	114	437.0	350.0	400.0	526.5	161.5	434.0	482	
500A	45	23	165	4	22.0	70	12	210	90.0	5	F16	135.0	127	490.0	380.0	440.0	588.5	181.5	486.0	533.5	
600A	55	23	165	4	22.0	70	14	210	95.0	5	F16	162.0	154	574.5	440.0	510.0	706.1	210.25	570.5	641.1	

(unit : inch)

SIZE	TOP FLANGE & STEM											OUT LINE DIMENSION									
inch	d	P	C	N	H	H3	T	F	V	W	REMARKS*	L	L1	D	H1	H2	E	A	B	B1	
2"	0.55	0.55	2.76	4	0.35	-	0.43	3.54	0.60	-	F07	1.69	-	1.99	2.77	5.06	3.66	0.18	1.93	-	
2 1/2"	0.55	0.55	2.76	4	0.35	-	0.43	3.54	0.60	-	F07	1.81	-	2.61	2.95	5.36	4.25	0.41	2.52	-	
3"	0.63	0.55	2.76	4	0.35	-	0.55	3.54	0.60	-	F07	1.81	-	3.11	3.67	5.64	4.96	0.67	3.03	-	
4"	0.63	0.63	2.76	4	0.35	-	0.55	3.54	0.70	-	F07	2.05	-	3.92	4.18	6.41	5.91	0.94	3.82	-	
5"	0.75	0.63	2.76	4	0.35	-	0.55	3.54	0.70	-	F07	2.20	-	4.89	4.69	7.34	6.97	1.36	4.80	-	
6"	0.87	0.63	2.76	4	0.35	-	0.67	3.54	0.75	-	F10	2.20	-	5.89	5.48	7.98	8.19	1.86	5.83	-	
8"	0.87	0.67	2.76	4	0.35	-	0.67	3.54	0.81	-	F07	2.36	-	7.70	6.51	9.34	10.20	2.69	7.62	-	
10"	1.10	0.79	4.02	4	0.43	-	0.87	4.92	0.81	-	F10	2.68	-	9.72	7.86	11.13	12.48	3.52	9.65	-	
12"	1.10	0.79	4.02	4	0.43	-	0.87	4.92	0.95	-	F10	3.07	-	11.63	9.47	12.27	14.61	4.28	11.54	-	
14"	1.10	0.79	4.02	4	0.47	2.36	0.39	4.92	2.81	0.20	F10	3.39	3.07	12.99	10.41	13.60	16.34	4.96	12.83	14.77	
16"	1.26	0.91	5.51	4	0.71	2.36	0.39	6.89	3.15	0.20	F14	4.33	4.02	14.92	11.75	13.76	18.69	5.45	14.82	16.96	
18"	1.50	0.91	5.51	4	0.71	2.36	0.47	6.89	3.15	0.20	F14	4.80	4.49	17.20	13.78	15.75	20.73	6.36	17.09	18.98	
20"	1.77	0.91	6.50	4	0.87	2.76	0.47	8.27	3.54	0.20	F16	5.31	5.00	19.29	14.96	17.32	23.17	7.15	19.13	21.00	
24"	2.17	0.91	6.50	4	0.87	2.76	0.55	8.27	3.74	0.20	F16	6.38	6.06	22.62	17.32	20.08	27.80	8.28	22.46	25.24	

Model : **STC-SR** Cartridge Seat Type

Wafer Type, Common Drilled ANSI 150LBS, DIN PN10, PN16, JIS10K, 16K



Drilling

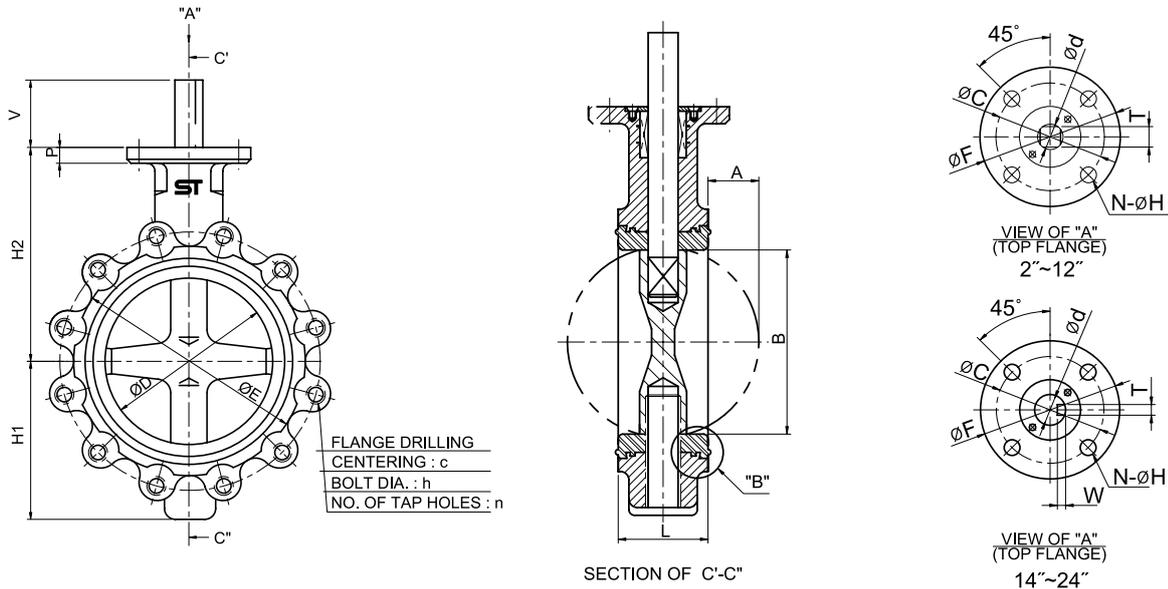
SIZE	PN 10			PN 16			ANSI 150 LBS			JIS 10K		
mm	c	n	h	c	n	h	c	n	h	c	n	h
50A	125.0	4	18.0	125.0	4	18.0	120.7	4	19.0	120.0	4	19.0
65A	145.0	4	18.0	145.0	4	18.0	139.7	4	19.0	140.0	4	19.0
80A	160.0	8	18.0	160.0	8	18.0	152.4	4	19.0	150.0	8	19.0
100A	180.0	8	18.0	180.0	8	18.0	190.5	8	19.0	175.0	8	19.0
125A	210.0	8	18.0	210.0	8	18.0	215.9	8	22.0	210.0	8	23.0
150A	240.0	8	22.0	240.0	8	22.0	241.3	8	22.0	240.0	8	23.0
200A	295.0	8	22.0	295.0	12	22.0	298.5	8	22.0	290.0	12	23.0
250A	350.0	12	22.0	355.0	12	26.0	362.0	12	25.0	355.0	12	25.0
300A	400.0	12	22.0	410.0	12	26.0	431.8	12	25.0	400.0	16	25.0
350A	460.0	16	22.0	470.0	16	26.0	476.0	12	29.0	445.0	16	25.0
400A	515.0	16	26.0	525.0	16	30.0	539.5	16	29.0	510.0	16	27.0
450A	565.0	20	26.0	585.0	20	30.0	578.0	16	32.0	565.0	20	27.0
500A	620.0	20	26.0	650.0	20	33.0	635.0	20	32.0	620.0	20	27.0
600A	725.0	20	30.0	770.0	20	36.0	749.5	20	35.0	-	-	-

(unit : inch)

SIZE	PN 10			PN 16			ANSI 150 LBS			JIS 10K		
inch	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	4.72	4	0.75
2 1/2"	5.71	4	0.71	5.71	4	0.71	5.50	4	0.75	5.51	4	0.75
3"	6.30	8	0.71	6.30	8	0.71	6.00	4	0.75	5.91	8	0.75
4"	7.09	8	0.71	7.09	8	0.71	7.50	8	0.75	6.89	8	0.75
5"	8.27	8	0.71	8.27	8	0.71	8.50	8	0.87	8.27	8	0.91
6"	9.45	8	0.87	9.45	8	0.87	9.50	8	0.87	9.45	8	0.91
8"	11.61	8	0.87	11.61	12	0.87	11.75	8	0.87	11.42	12	0.91
10"	13.78	12	0.87	13.98	12	1.02	14.25	12	0.98	13.98	12	0.98
12"	15.75	12	0.87	16.14	12	1.02	17.00	12	0.98	15.75	16	0.98
14"	18.11	16	0.87	18.50	16	1.02	18.74	12	1.14	17.52	16	0.98
16"	20.28	16	1.02	20.67	16	1.18	21.24	16	1.14	20.08	16	1.06
18"	22.24	20	1.02	23.03	20	1.18	22.76	16	1.26	22.24	20	1.06
20"	24.41	20	1.02	25.59	20	1.30	25.00	20	1.26	24.41	20	1.06
24"	28.54	20	1.18	30.31	20	1.42	29.51	20	1.38	-	-	-

Model : STL

Lug Type, ANSI 150LBS, DIN PN10, PN16, JIS 5K, 10K, 16K



Dimensions

(unit : mm)

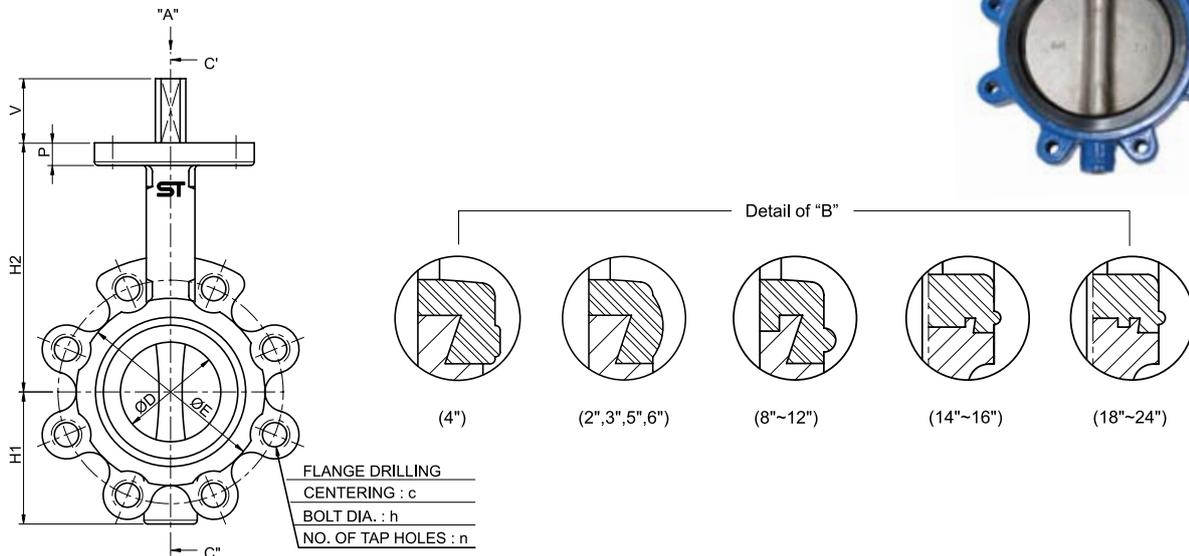
SIZE	TOP FLANGE & STEM										OUT LINE DIMENSION						
	mm	d	P	C	N	H	T	F	V	W	REMARKS*	L	D	H1	H2	E	A
50A	14	14	70	4	9.0	11	90	15.2	-	F07	43.0	50.5	75.0	130.0	93	4.5	49.0
65A	14	14	70	4	9.0	11	90	15.2	-	F07	46.0	66.2	80.0	137.0	108	10.5	64.0
80A	16	14	70	4	9.0	14	90	15.2	-	F07	46.0	78.9	95.0	156.0	122	17.0	77.0
100A	16	16	70	4	9.0	14	90	17.7	-	F07	52.0	99.5	110.0	170.0	150	24.0	97.0
125A	19	16	70	4	9.0	14	90	17.7	-	F07	56.0	124.1	123.0	185.0	180	34.5	122.0
150A	22	16	70	4	9.0	17	90	19.0	-	F07	56.0	149.5	143.0	203.0	208	47.3	148.0
200A	22	17	70	4	9.0	17	90	20.5	-	F07	60.0	195.6	168.0	238.0	259	68.3	193.5
250A	28	20	102	4	11.0	22	125	20.5	-	F10	68.0	247.0	203.0	270.0	318	89.5	245.0
300A	28	20	102	4	11.0	22	125	24.1	-	F10	78.0	295.5	242.0	310.0	370	108.8	293.0
350A	28	20	102	4	12	10	125	71.5	5	F10	78.0	330.0	264.5	345.5	410	126.0	326.0
400A	32	23	140	4	18	10	175	80.0	5	F14	102.0	379.0	298.5	349.5	468	138.5	376.5
450A	38	23	140	4	18	12	175	80.0	5	F14	114.0	437.0	350.0	400.0	527	161.5	434.0
500A	45	23	165	4	22	12	210	90.0	5	F16	127.0	490.0	380.0	440.0	578	181.5	486.0
600A	55	23	165	4	22	14	210	95.0	5	F16	154.0	574.5	440.0	510.0	680	210.3	570.5

(unit : inch)

SIZE	TOP FLANGE & STEM										OUT LINE DIMENSION						
	inch	d	P	C	N	H	T	F	V	W	REMARKS*	L	D	H1	H2	E	A
2"	0.55	0.55	2.76	4	0.35	0.43	3.54	0.60	-	F07	1.69	1.99	2.95	5.12	3.66	0.18	1.93
2 1/2"	0.55	0.55	2.76	4	0.35	0.43	3.54	0.60	-	F07	1.81	2.61	3.15	5.39	4.25	0.41	2.52
3"	0.63	0.55	2.76	4	0.35	0.55	3.54	0.60	-	F07	1.81	3.11	3.74	6.14	4.80	0.67	3.03
4"	0.63	0.63	2.76	4	0.35	0.55	3.54	0.70	-	F07	2.05	3.92	4.33	6.69	5.91	0.94	3.82
5"	0.75	0.63	2.76	4	0.35	0.55	3.54	0.70	-	F07	2.20	4.89	4.84	7.28	7.09	1.36	4.80
6"	0.87	0.63	2.76	4	0.35	0.67	3.54	0.75	-	F07	2.20	5.89	5.63	7.99	8.19	1.86	5.83
8"	0.87	0.67	2.76	4	0.35	0.67	3.54	0.81	-	F07	2.36	7.70	6.61	9.37	10.20	2.69	7.62
10"	1.10	0.79	4.02	4	0.43	0.87	4.92	0.81	-	F10	2.68	9.72	7.99	10.63	12.52	3.52	9.65
12"	1.10	0.79	4.02	4	0.43	0.87	4.92	0.95	-	F10	3.07	11.63	9.53	12.20	14.57	4.28	11.54
14"	1.10	0.79	4.02	4	0.47	0.39	4.92	2.81	0.20	F10	3.07	12.99	10.41	13.60	16.14	4.96	12.83
16"	1.26	0.91	5.51	4	0.71	0.39	6.89	3.15	0.20	F14	4.02	14.92	11.75	13.76	18.43	5.45	14.82
18"	1.50	0.91	5.51	4	0.71	0.47	6.89	3.15	0.20	F14	4.49	17.20	13.78	15.75	20.75	6.36	17.09
20"	1.77	0.91	6.50	4	0.87	0.47	8.27	3.54	0.20	F16	5.00	19.29	14.96	17.32	22.76	7.15	19.13
24"	2.17	0.91	6.50	4	0.87	0.55	8.27	3.74	0.20	F16	6.06	22.62	17.32	20.08	26.77	8.28	22.46

Model : STL

Lug Type, ANSI 150LBS, DIN PN10, PN16, JIS 5K, 10K, 16K



Drilling

(unit : mm)

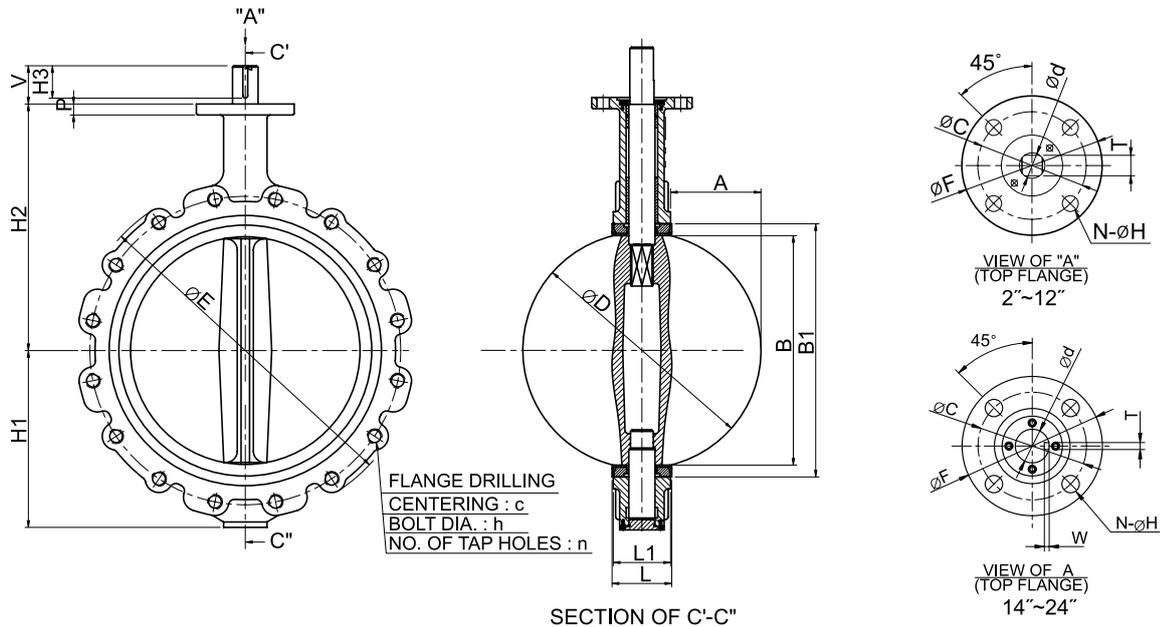
SIZE	PN 10			PN 16			ANSI 150 LBS			JIS 5K			JIS 10K		
mm	c	n	h	c	n	h	c	n	h	c	n	h	c	n	h
50A	125.0	4	M16	125.0	4	M16	120.7	4	5/8"	105.0	4	M12	120.0	4	M16
65A	145.0	4	M16	145.0	4	M16	139.7	4	5/8"	130.0	4	M12	140.0	4	M16
80A	160.0	8	M16	160.0	8	M16	152.4	4	5/8"	145.0	4	M16	150.0	8	M16
100A	180.0	8	M16	180.0	8	M16	190.5	8	5/8"	165.0	8	M16	175.0	8	M16
125A	210.0	8	M16	210.0	8	M16	215.9	8	3/4"	200.0	8	M16	210.0	8	M20
150A	240.0	8	M20	240.0	8	M20	241.3	8	3/4"	230.0	8	M16	240.0	8	M20
200A	295.0	8	M20	295.0	12	M20	298.5	8	3/4"	280.0	8	M20	290.0	12	M20
250A	350.0	12	M20	355.0	12	M24	362.0	12	7/8"	345.0	12	M20	355.0	12	M22
300A	400.0	12	M20	410.0	12	M24	431.8	12	7/8"	390.0	12	M20	400.0	16	M22
350A	460.0	16	M20	470.0	16	M24	476.0	12	1"	435.0	12	M22	445.0	12	M22
400A	515.0	16	M24	525.0	16	M27	539.5	16	1"	495.0	16	M22	510.0	16	M24
450A	565.0	20	M24	585.0	20	M27	578.0	16	1 1/8"	555.0	16	M22	565.0	20	M24
500A	620.0	20	M24	650.0	20	M30	635.0	20	1 1/8"	605.0	20	M22	620.0	20	M24
600A	725.0	20	M27	770.0	20	M33	749.5	20	1 1/4"	715.0	20	M24	730.0	24	M30

(unit : inch)

SIZE	PN 10			PN 16			ANSI 150 LBS			JIS 5K			JIS 10K		
inch	c	n	h	c	n	h	c	n	h	c	n	h	c	n	h
2"	4.92	4	M16	4.92	4	M16	4.75	4	5/8"	4.13	4	M12	4.72	4	M16
2 1/2"	5.71	4	M16	5.71	4	M16	5.50	4	5/8"	5.12	4	M12	5.51	4	M16
3"	6.30	8	M16	6.30	8	M16	6.00	4	5/8"	5.71	4	M16	5.91	8	M16
4"	7.09	8	M16	7.09	8	M16	7.50	8	5/8"	6.50	8	M16	6.89	8	M16
5"	8.27	8	M16	8.27	8	M16	8.50	8	3/4"	7.87	8	M16	8.27	8	M20
6"	9.45	8	M20	9.45	8	M20	9.50	8	3/4"	9.06	8	M16	9.45	8	M20
8"	11.61	8	M20	11.61	12	M20	11.75	8	3/4"	11.02	8	M20	11.42	12	M20
10"	13.78	12	M20	13.98	12	M24	14.25	12	7/8"	13.58	12	M20	13.98	12	M22
12"	15.75	12	M20	16.14	12	M24	17.00	12	7/8"	15.35	12	M20	15.75	16	M22
14"	18.11	16	M20	18.50	16	M24	18.74	12	1"	17.13	12	M22	17.52	12	M22
16"	20.28	16	M24	20.67	16	M27	21.24	16	1"	19.49	16	M22	20.08	16	M24
18"	22.24	20	M24	23.03	20	M27	22.76	16	1 1/8"	21.85	16	M22	22.24	20	M24
20"	24.41	20	M24	25.59	20	M30	25.00	20	1 1/8"	23.82	20	M22	24.41	20	M24
24"	28.54	20	M27	30.31	20	M33	29.51	20	1 1/4"	28.15	20	M24	28.74	24	M30

Model : STL-SR

Lug - Cartridge Type, ANSI 150LBS, DIN PN10, PN16, JIS10K, 16K



Dimensions

(unit : mm)

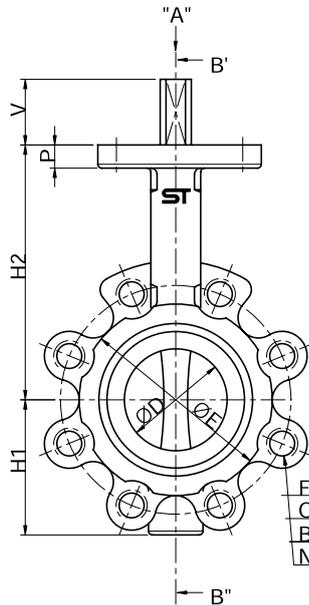
SIZE	TOP FLANGE & STEM											OUT LINE DIMENSION									
	mm	d	P	C	N	H	H3	T	F	V	W	REMARKS*	L	L1	D	H1	H2	E	A	B	B1
50A	14	14	70	4	9.0	-	11	90	15.2	-	F07	43.0	-	50.5	70.4	125.4	93	4.5	49.0	-	
65A	14	14	70	4	9.0	-	11	90	15.2	-	F07	46.0	-	66.2	75.05	132.05	108	10.5	64.0	-	
80A	16	14	70	4	9.0	-	14	90	15.2	-	F07	46.0	-	78.9	93.2	154.2	122	17.0	77.0	-	
100A	16	16	70	4	9.0	-	14	90	17.7	-	F07	52.0	-	99.5	106.2	166.2	150	24.0	97.0	-	
125A	19	16	70	4	9.0	-	14	90	17.7	-	F07	56.0	-	124.1	119.05	181.05	180	34.5	122.0	-	
150A	22	16	70	4	9.0	-	17	90	19.0	-	F07	56.0	-	149.5	139.2	199.2	208	47.3	148.0	-	
200A	22	17	70	4	9.0	-	17	90	20.5	-	F07	60.0	-	195.6	165.25	235.25	259	68.3	193.5	-	
250A	28	20	102	4	11.0	-	22	125	20.5	-	F10	68.0	-	247.0	199.6	266.6	318	89.5	245.0	-	
300A	28	20	102	4	11.0	-	22	125	24.1	-	F10	78.0	-	295.5	240.6	308.6	371	108.8	293.0	-	
350A	28	20	102	4	12.0	60	10	125	71.5	5	F10	86.0	78	330.0	264.5	345.5	511.9	126.0	326.0	375.1	
400A	32	23	140	4	18.0	60	10	175	80.0	5	F14	110.0	102	379.0	298.5	349.5	575.2	138.5	376.5	430.7	
450A	38	23	140	4	18.0	60	12	175	80.0	5	F14	122.0	114	437.0	350.0	400.0	622.0	161.5	434.0	482	
500A	45	23	165	4	22.0	70	12	210	90.0	5	F16	135.0	127	490.0	380.0	440.0	690.0	181.5	486.0	533.5	
600A	55	23	165	4	22.0	70	14	210	95.0	5	F16	162.0	154	574.5	440.0	510.0	813.0	210.25	570.5	641.1	

(unit : inch)

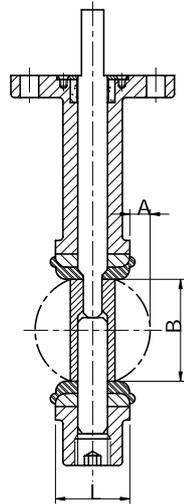
SIZE	TOP FLANGE & STEM											OUT LINE DIMENSION									
	inch	d	P	C	N	H	H3	T	F	V	W	REMARKS*	L	L1	D	H1	H2	E	A	B	B1
2"	0.55	0.55	2.76	4	0.35	-	0.43	3.54	0.60	-	F07	1.69	-	1.99	2.77	4.94	3.66	0.18	1.93	-	
2 1/2"	0.55	0.55	2.76	4	0.35	-	0.43	3.54	0.60	-	F07	1.81	-	2.61	2.95	5.20	4.25	0.41	2.52	-	
3"	0.63	0.55	2.76	4	0.35	-	0.55	3.54	0.60	-	F07	1.81	-	3.11	3.67	6.07	4.80	0.67	3.03	-	
4"	0.63	0.63	2.76	4	0.35	-	0.55	3.54	0.70	-	F07	2.05	-	3.92	4.18	6.54	5.91	0.94	3.82	-	
5"	0.75	0.63	2.76	4	0.35	-	0.55	3.54	0.70	-	F07	2.20	-	4.89	4.69	7.13	7.09	1.36	4.80	-	
6"	0.87	0.63	2.76	4	0.35	-	0.67	3.54	0.75	-	F07	2.20	-	5.89	5.48	7.84	8.19	1.86	5.83	-	
8"	0.87	0.67	2.76	4	0.35	-	0.67	3.54	0.81	-	F07	2.36	-	7.70	6.51	9.26	10.20	2.69	7.62	-	
10"	1.10	0.79	4.02	4	0.43	-	0.87	4.92	0.81	-	F10	2.68	-	9.72	7.86	10.50	12.52	3.52	9.65	-	
12"	1.10	0.79	4.02	4	0.43	-	0.87	4.92	0.95	-	F10	3.07	-	11.63	9.47	12.15	14.61	4.28	11.54	-	
14"	1.10	0.79	4.02	4	0.47	2.36	0.39	4.92	2.81	0.20	F10	3.39	3.07	12.99	10.41	13.60	20.15	4.96	12.83	14.77	
16"	1.26	0.91	5.51	4	0.71	2.36	0.39	6.89	3.15	0.20	F14	4.33	4.02	14.92	11.75	13.76	22.65	5.45	14.82	16.96	
18"	1.50	0.91	5.51	4	0.71	2.36	0.47	6.89	3.15	0.20	F14	4.80	4.49	17.20	13.78	15.75	24.49	6.36	17.09	18.98	
20"	1.77	0.91	6.50	4	0.87	2.76	0.47	8.27	3.54	0.20	F16	5.31	5.00	19.29	14.96	17.32	27.17	7.15	19.13	21.00	
24"	2.17	0.91	6.50	4	0.87	2.76	0.55	8.27	3.74	0.20	F16	6.38	6.06	22.62	17.32	20.08	32.01	8.28	22.46	25.24	

Model : STL-SR

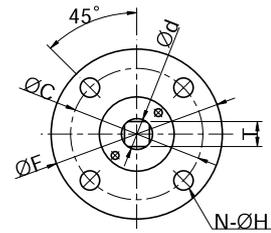
Lug - Cartridge Type, ANSI 150LBS, DIN PN10, PN16, JIS 10K,16K Drilling



FLANGE DRILLING
CENTERING : c
BOLT DIA. : h
NO. OF TAP HOLES : n



SECTION OF B'-B''



VIEW OF "A"
(TOP FLANGE)

*24" Body Only Available with ANSI 150LBS, PN10, PN16 Drilling.

Drilling

(unit : mm)

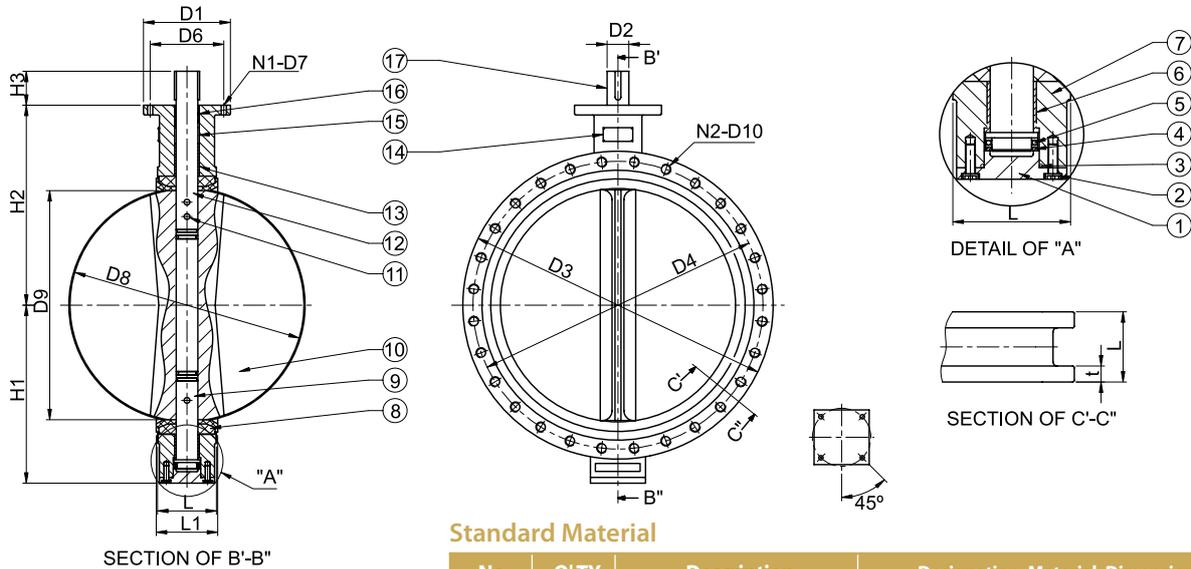
SIZE	PN 10			PN 16			ANSI 150 LBS			JIS 10K		
	mm	c	n	h	c	n	h	c	n	h	c	n
50A	125.0	4	M16	125.0	4	M16	120.7	4	5/8"	-	-	-
65A	145.0	4	M16	145.0	4	M16	139.7	4	5/8"	-	-	-
80A	160.0	8	M16	160.0	8	M16	152.4	4	5/8"	-	-	-
100A	180.0	8	M16	180.0	8	M16	190.5	8	5/8"	-	-	-
125A	210.0	8	M16	210.0	8	M16	215.9	8	3/4"	-	-	-
150A	240.0	8	M20	240.0	8	M20	241.3	8	3/4"	-	-	-
200A	295.0	8	M20	295.0	12	M20	298.5	8	3/4"	-	-	-
250A	350.0	12	M20	355.0	12	M24	362.0	12	7/8"	-	-	-
300A	400.0	12	M20	410.0	12	M24	431.8	12	7/8"	-	-	-
350A	460.0	16	M20	470.0	16	M24	476.0	12	1"	445.0	16	M22
400A	515.0	16	M24	525.0	16	M27	539.5	16	1"	510.0	16	M24
450A	565.0	20	M24	585.0	20	M27	578.0	16	1 1/8"	565.0	20	M24
500A	620.0	20	M24	650.0	20	M30	635.0	20	1 1/8"	620.0	20	M24
600A	725.0	20	M27	770.0	20	M33	749.5	20	1 1/4"	-	-	-

(unit : inch)

SIZE	PN 10			PN 16			ANSI 150 LBS			JIS 10K		
	inch	c	n	h	c	n	h	c	n	h	c	n
2"	4.92	4	M16	4.92	4	M16	4.75	4	5/8"	-	-	-
2 1/2"	5.71	4	M16	5.71	4	M16	5.50	4	5/8"	-	-	-
3"	6.30	8	M16	6.30	8	M16	6.00	4	5/8"	-	-	-
4"	7.09	8	M16	7.09	8	M16	7.50	8	5/8"	-	-	-
5"	8.27	8	M16	8.27	8	M16	8.50	8	3/4"	-	-	-
6"	9.45	8	M20	9.45	8	M20	9.50	8	3/4"	-	-	-
8"	11.61	8	M20	11.61	12	M20	11.75	8	3/4"	-	-	-
10"	13.78	12	M20	13.98	12	M24	14.25	12	7/8"	-	-	-
12"	15.75	12	M20	16.14	12	M24	17.00	12	7/8"	-	-	-
14"	18.11	16	M20	18.50	16	M24	18.74	12	1"	17.52	16	M22
16"	20.28	16	M24	20.67	16	M27	21.24	16	1"	20.08	16	M24
18"	22.24	20	M24	23.03	20	M27	22.76	16	1 1/8"	22.24	20	M24
20"	24.41	20	M24	25.59	20	M30	25.00	20	1 1/8"	24.41	20	M24
24"	28.54	20	M27	30.31	20	M33	29.51	20	1 1/4"	-	-	-

Model : U-SECTION

Lug - Cartridge Type, Butterfly Valve



Standard Material

No.	Q'TY	Description	Designation, Material, Dimension ETC
1	1	End Cover	ASTM A536
2	4	Screw	Steel
3	1	"O" Ring	ASTM D2000 (NBR)
4	1	Gasket	Steel
5	1	Bearing	ASTM A584 C83600
6	1	Lower Bushing	ASTM A584 C83600
7	1	Body	ASTM A536
8	1	Seat	ASTM D2000 (EPDM)
9	1	Lower Shaft	ASTM A276 S31600
10	1	Disc	ASTM A351 CF8M
11	3	Taper Pin	ASTM A564 S17400
12	1	Upper Shaft	ASTM A276 S31600
13	1	Long Bushing	ASTM A584 C83600
14	1	Name Plate	Aluminium
15	4	Short Bushing	ASTM A584 C83600
16	3	"O" Ring	ASTM D2000 (EPDM)
17	2	Key	Steel

Technical Data

Working Pressure		150 psi
Test Pressure	SEAT	165 psi
	SHELL	225 psi
Working Temp.	EPDM	-30° to 110°
	NBR	-20° to 82°

Dimensions

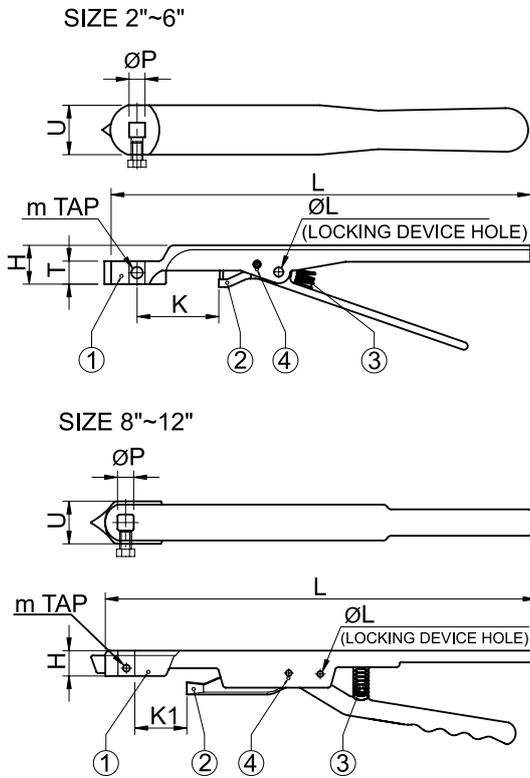
(unit : mm)

SIZE	D1	D2	D3	D4	N2	D10	D6	N1	D7	D8	D9	L	L1	H1	H2	H3	t	KEY
DN 700	300	63.35	910	840	24	1-1/4-7UNC-2B	254	8	18	695	676	163	169	520	624	66	54	18 x 63
DN 750	300	63.75	984	914.4	28	1-1/4-7UNC-2B	254	8	18	744	726	167	173	560	660	66	54	18 x 63
DN 800	300	63.35	1015	950	24	1-3/8-6UNC-2B	254	8	18	795	722	188	195	591	672	118	61	18 x 63
DN 900	300	75	1168	1086	32	1-1/2-6UNC-2B	254	8	18	865	841	203	211	656	720	118	61	20 x 100
DN 1000	300	85	1230	1170	28	1-1/2-6UNC-2B	254	8	18	965	940	216	224	721	800	150	64	20 x 100
DN 1050	300	95	1346	1257	36	1-1/2-6UNC-2B	254	8	18	1030	999	251	261	777	858	150	67	25 x 140
DN 1200	350	105	1511	1422	44	1-1/2-6UNC-2B	298	8	22	1160	1127	276	286	864	941	150	70	28 x 140

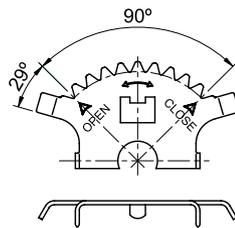
(unit : inch)

SIZE	D1	D2	D3	D4	N2	D10	D6	N1	D7	D8	D9	L	L1	H1	H2	H3	t	KEY
28"	11.81	2.49	35.83	33.07	24	1-1/4-7UNC-2B	10.00	0.31	0.71	27.36	26.61	6.42	6.65	20.47	24.57	2.60	2.13	18 x 63
30"	11.81	2.51	38.74	36.00	28	1-1/4-7UNC-2B	10.00	0.31	0.71	29.29	28.58	6.57	6.81	22.05	25.98	2.60	2.13	18 x 63
32"	11.81	2.49	39.96	37.40	24	1-3/8-6UNC-2B	10.00	0.31	0.71	31.30	28.43	7.40	7.68	23.27	26.46	4.65	2.40	18 x 63
36"	11.81	2.95	45.98	42.76	32	1-1/2-6UNC-2B	10.00	0.31	0.71	34.06	33.11	7.99	8.31	25.83	28.35	4.65	2.40	20 x 100
40"	11.81	3.35	48.43	46.06	28	1-1/2-6UNC-2B	10.00	0.31	0.71	37.99	37.01	8.50	8.82	28.39	31.50	5.91	2.52	20 x 100
42"	11.81	3.74	52.99	49.49	36	1-1/2-6UNC-2B	10.00	0.31	0.71	40.55	39.33	9.88	10.28	30.59	33.78	5.91	2.64	25 x 140
48"	13.78	4.13	59.49	55.98	44	1-1/2-6UNC-2B	11.73	0.31	0.87	45.67	44.37	10.87	11.26	34.02	37.05	5.91	2.76	28 x 140

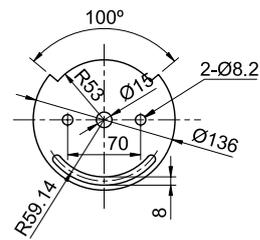
Model : Lever



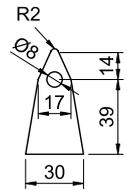
'P' Tolerance : $^{+0.2}_{-0.0}$



10 POSITION INDICATOR



INFINITE NOTCH PLATE



INFINITE NOTCH PLATE USE

Lever Weight

Size	Kg
2"	0.50
2 1/2"	0.50
3"	0.50
4"	0.50
5"	0.60
6"	0.60
8"	1.85
10"	1.85
12"	1.85

Standard Material

No.	Description	Material
1	Lever	Steel Plate or Malleable Iron
2	Aux Lever	Steel Plate or Malleable Iron
3	Spring	SUP3
4	Pin	SS41

Dimensions

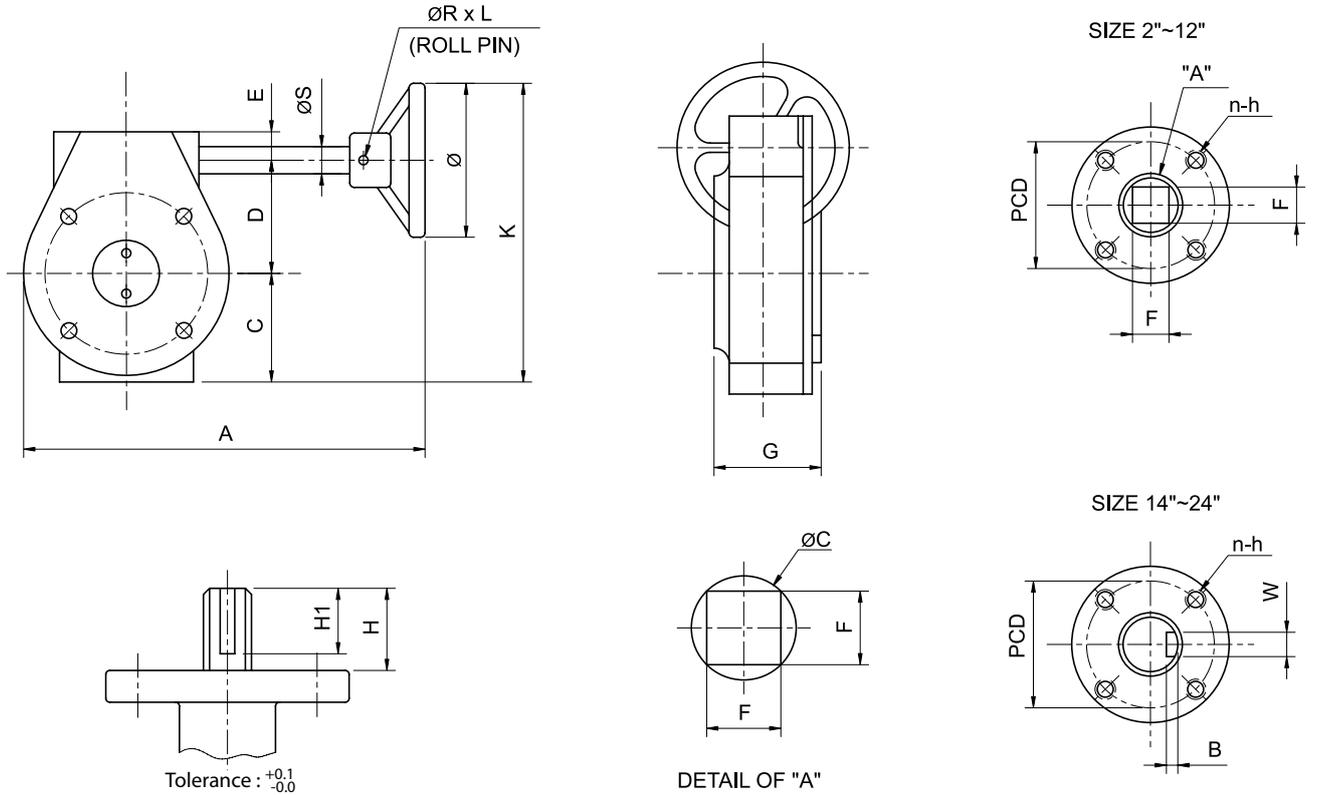
(unit : mm)

SIZE	P	T	L	m	U	H	K	K1	ØL
DN50~DN65	11	16	288.7	8	34	27	55	-	7.5
DN80	14	18	288.7	8	34	27	55	-	7.5
DN100	14	18	288.7	8	34	27	55	-	7.5
DN125	14	18	288.7	8	34	27	55	-	7.5
DN150	17	20	288.7	8	34	27	55	-	7.5
DN200	17	-	453.0	10	45	26	-	42	7.5
DN250 ~ DN300	22	-	453.0	8	45	26	-	53	7.5

(unit : inch)

SIZE	P	T	L	m	U	H	K	K1	ØL
2" ~ 2 1/2"	0.43	0.63	11.37	0.31	1.34	1.06	2.17	-	0.30
3"	0.55	0.71	11.37	0.31	1.34	1.06	2.17	-	0.30
4"	0.55	0.71	11.37	0.31	1.34	1.06	2.17	-	0.30
5"	0.55	0.71	11.37	0.31	1.34	1.06	2.17	-	0.30
6"	0.67	0.79	11.37	0.31	1.34	1.06	2.17	-	0.30
8"	0.67	-	17.83	0.39	1.77	1.02	-	1.65	0.30
10" ~ 12"	0.87	-	17.83	0.31	1.77	1.02	-	2.09	0.30

Model : Gear



Dimensions

(unit : mm)

SIZE	RATIO	A	G	C	D	E	K	Ø	n-h	PCD	B	W	H	F	ØC	H1	ØS	ØRxL	Weight (kgs)
DN50	24:1	222	72	54	45	28	174	147	4-M8	70	-	-	15.2	11	14	-	16	5.2X40	3.40
DN80	24:1	222	72	54	45	28	174	147	4-M8	70	-	-	15.2	14	16	-	16	5.2X40	3.40
DN100	24:1	222	72	54	45	28	174	147	4-M8	70	-	-	17.7	14	16	-	16	5.2X40	3.46
DN125	24:1	222	72	54	45	28	174	147	4-M8	70	-	-	17.7	14	19	-	16	5.2X40	3.46
DN150	24:1	222	72	54	45	28	174	147	4-M8	70	-	-	19.0	17	22	-	16	5.2X40	3.62
DN200	30:1	267	84	76	66	34	292	300	4-M8	70	-	-	20.5	17	22	-	19	6.4X50	6.70
DN250	30:1	267	84	76	66	34	292	300	4-M10	102	-	-	20.5	22	28	-	19	6.4X50	7.18
DN300	30:1	267	84	76	66	34	292	300	4-M10	102	-	-	24.1	22	28	-	19	6.4X50	9.58
DN350	50:1	346	88.6	78.5	77.5	39	308.5	300	4-M10	102	5	10	71.5	-	28	60	19	6.4X50	9.44
DN400	50:1	346	88.6	78.5	77.5	39	308.5	300	4-M16	140	5	10	80.0	-	32	60	19	6.4X50	10.34
DN450	50:1	346	88.6	78.5	77.5	39	308.5	395	4-M16	140	5	12	80.0	-	38	60	19	6.4X50	10.62
DN500	80:1	440	110	130	135	40	465	395	4-M20	165	5	12	90.0	-	45	70	25	8.4X51	23.54
DN600	80:1	440	110	130	135	40	465	395	4-M20	165	5	14	95.0	-	55	70	25	8.4X51	23.54

(unit : inch)

SIZE	RATIO	A	G	C	D	E	K	Ø	n-h	PCD	B	W	H	F	ØC	H1	ØS	ØRxL	Weight (lbs)
2"	24:1	8.74	2.83	2.13	1.77	1.10	6.85	5.79	4-M8	2.76	-	-	0.60	0.43	0.55	-	0.63	5.2X40	7.50
3"	24:1	8.74	2.83	2.13	1.77	1.10	6.85	5.79	4-M8	2.76	-	-	0.60	0.55	0.63	-	0.63	5.2X40	7.50
4"	24:1	8.74	2.83	2.13	1.77	1.10	6.85	5.79	4-M8	2.76	-	-	0.70	0.55	0.63	-	0.63	5.2X40	7.63
5"	24:1	8.74	2.83	2.13	1.77	1.10	6.85	5.79	4-M8	2.76	-	-	0.70	0.55	0.75	-	0.63	5.2X40	7.63
6"	24:1	8.74	2.83	2.13	1.77	1.10	6.85	5.79	4-M8	2.76	-	-	0.75	0.67	0.87	-	0.63	5.2X40	7.98
8"	30:1	10.51	3.31	2.99	2.60	1.34	11.50	11.81	4-M8	2.76	-	-	0.81	0.67	0.87	-	0.75	6.4X50	14.77
10"	30:1	10.51	3.31	2.99	2.60	1.34	11.50	11.81	4-M10	4.02	-	-	0.81	0.87	1.10	-	0.75	6.4X50	15.83
12"	30:1	10.51	3.31	2.99	2.60	1.34	11.50	11.81	4-M10	4.02	-	-	0.95	0.87	1.10	-	0.75	6.4X50	21.12
14"	50:1	13.62	3.49	3.09	3.05	1.54	12.15	11.81	4-M10	4.02	0.20	0.39	2.81	-	1.10	2.36	0.75	6.4X50	20.81
16"	50:1	13.62	3.49	3.09	3.05	1.54	12.15	11.81	4-M16	5.51	0.20	0.39	3.15	-	1.26	2.36	0.75	6.4X50	22.80
18"	50:1	13.62	3.49	3.09	3.05	1.54	12.15	15.55	4-M16	5.51	0.20	0.47	3.15	-	1.50	2.36	0.75	6.4X50	23.41
20"	80:1	17.32	4.33	5.12	5.31	1.57	18.31	15.55	4-M20	6.50	0.20	0.47	3.54	-	1.77	2.76	0.98	8.4X51	51.90
24"	80:1	17.32	4.33	5.12	5.31	1.57	18.31	15.55	4-M20	6.50	0.20	0.55	3.74	-	2.17	2.76	0.98	8.4X51	51.90