

SICO

Since 1983
SICO[®]
TOTAL SPECIAL VALVE SOLUTION



ROTARY FEEDER

DIVERT VALVE

JACKET VALVE

BELLOWS SEAL VALVE

BALL VALVE

TANK BOTTOM FLUSH VALVE

RAM PISTON VALVE

GATE VALVE

KNIFE GATE VALVE

GLOBE VALVE

CHECK VALVE

BUTTERFLY VALVE

STRAINER

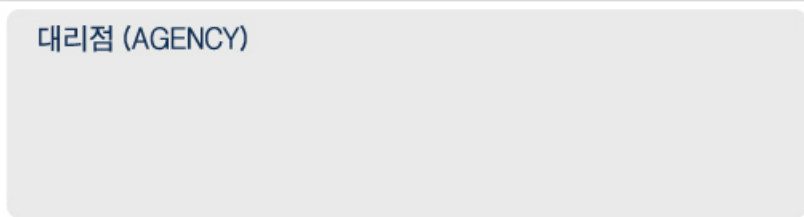
SIGHT GLASS

SICO[®]

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대리점 (AGENCY)



❖ 본 제품은 기술향상 및 품질개선을 위하여 사전에 예고없이 사양이 변경될 수 있습니다.
❖ This product is subject to without notice. For the specific application, please consult with SUNG IL VALVE IND. CO., LTD

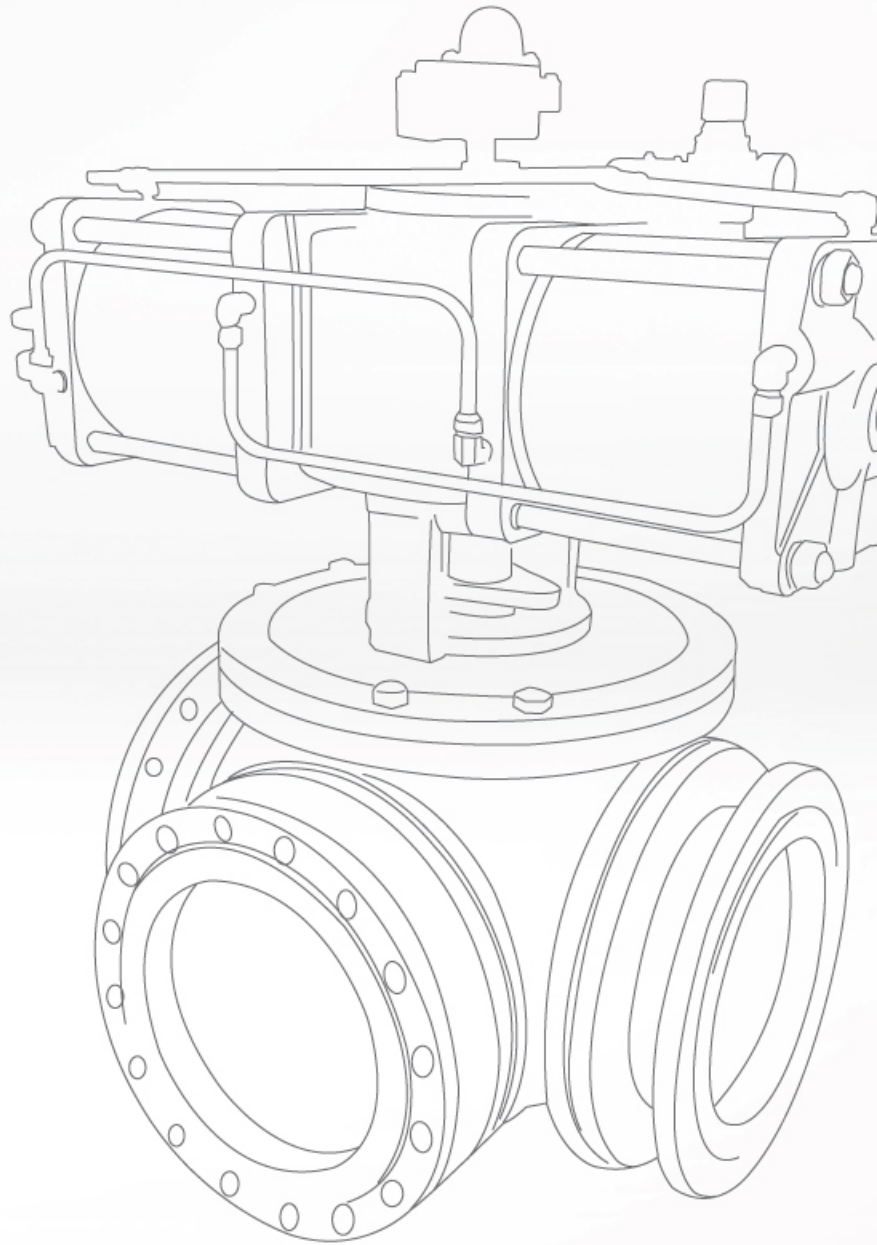
SUNG IL VALVE INDUSTRY CO., LTD.

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Since 1983

SICO®

TOTAL SPECIAL VALVE SOLUTION



SUNG IL VALVE INDUSTRY CO., LTD.



Since our company, "SICO", was founded in 1983, SICO has been at the forefront of design, development and manufactures of high quality Casting Valves which can be applied for all industrial areas such as Chemical, Petrochemical, Oil & Gas, Power Plant, Refinery, Water Treatment and off-shores in all over the world.

The Management teams of SICO are composed of professional technicians who have experienced supplying all valves for those fields of industrial areas.

In such results, we have well evaluated from our customers as one of the most reliable and trustable Korean company to meet customer's requirements and one of our aim is to provide high qualified products to all customers with the most competitive and reasonable prices to make our customer's needs satisfy.

All valves with using the latest computerized design systems, development, and manufacturing have been reflected in order to produce the most standardization products and continuous technical testing are also reflected on manufacturing in order to not allow any errors.

Any customer requests will be satisfied by our prompt answer and flexible business activities, even though the large amount of valve will be ordered, the shortest delivery will fulfill our customer's demand.

SICO valves have been always supplying with certified test reports that have been included chemical, mechanical properties and the results of hydrostatic-pneumatic pressure test.

An absolute commitment to outstanding quality and reliability of SICO has assisted our successes in supplying Engineering projects and supporting End user around the world.

Thank you for your attention!!!



API 6D



ISO 9001





API-6FA



API-607



Flow Direction Transfer Equipment



ROTARY FEEDER



3-WAY DIVERT VALVE

HISTORY

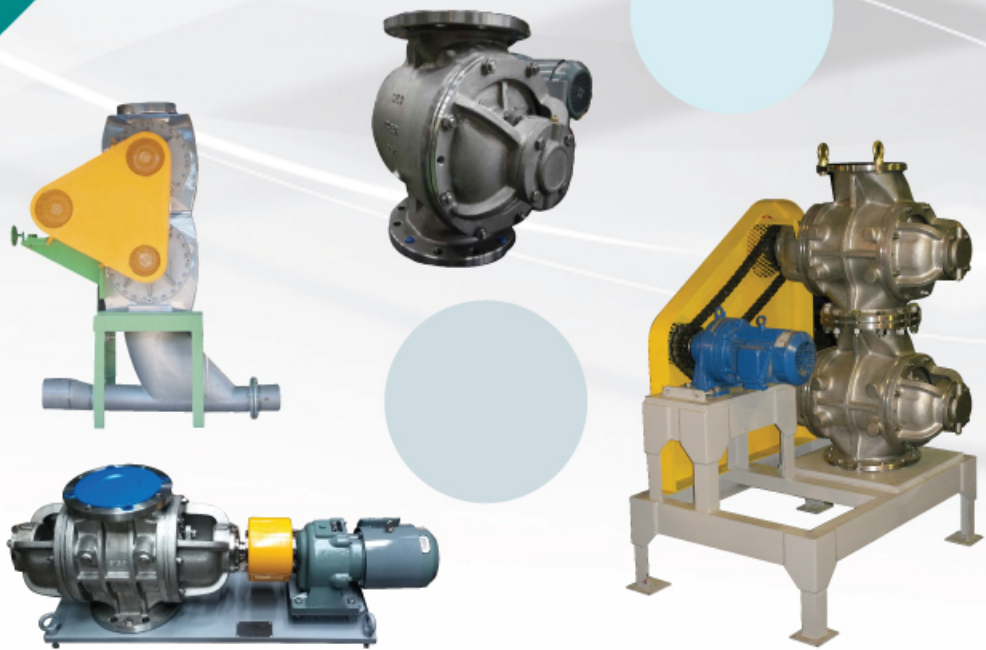
- 1983. Established as SUNG IL VALVE COMPANY
- 1985. Registered to HYOSING T&C
- 1986. Registered to HANJIN HEAVY IND. CO., LTD.
Registered to SAEHAN IND. INC. (CHEIL SYNTHETICS)
Registered to POSCO
Registered to SUNKYONG INDUSTRIES.
- 1987. Registered to SAMSUNG HEAVY INDUSTRIES.
- 1997. Registered to LG ENGINEERING CO., LTD.
Approved Valve manufacturer by API 6D
Approved quality management system by ABS quality evaluations ISO 9001
Registered to LG CHEMICAL LTD.
- 1999. Registered to DAELIM ENGINEERS & CONSTRUCTORS
Registered to SAMSUNG ENGINEERING CO., LTD.
- 2000. Acquired a patent on a utility model of 3-WAY DIVERT VALVE (COCK DISC TYPE)
- 2001. Registered to LG PETROCHEMICAL CO.,LTD.
- 2002. Registered to STRAHMAN'S VALVE (U.S.A)
Registered to KOREA PETROCHEMICAL IND. CO.,LTD.
Acquired a Patent on a utility model Of ROTARY FEEDER
Acquired a Patent on a utility model Of 3-WAY DIVERT VALVE
- 2003. Registered to PETRONAS (INDONESIA)
- 2006. Registered to HYUNDAI HEAVY INDUSTRIES CO., LTD.(CUBA PROJECT)
Registered to PAKISTAN water resources construction registration.
- 2007. Registered to HYUNDAI HEAVY INDUSTRIES CO., LTD.(IRAQ PROJECT)
- 2009. Approved FIRE SAFETY TEST CERTIFICATE by VELOSI INTERNATIONAL KOREA
- 2010. Registered to HYUNDAI HEAVY INDUSTRIES CO.,LTD (ECUADOR SANTA ELENA / QUEVEDO PROJET)
- 2011. Registered to TORAY ADVANCED MATERIALS KOREA INC.
- 2012. Registered to MOORIM P&P
Registered to KOREA ENG. PLASTICS.,LTD
Registered to HYUNDAI HEAVY INDUSTRIES CO.,LTD (NICARAGUA ALBANISA PROJECT)
Registered to KUMHO P&B(BPA III PROJECT)
Registered to CHEIL INDUSTRIES INC.
- 2013. Registered to SAMSUNG ENGINEERING (SMP W-1 PROJECT)
Registered to LOTTE E&C(MSR R-1 PROJECT)
Registered to TOYO ENGINEERING (RUSIA NKGPS PROJECT)
Registered to HYUNDAI HEAVY IND. (JEDDAH SOUTH THERMAL POWER PLANT STAGE-1)
- 2014. Registered to LOTTE CHEMICAL
Registered to CJ CORATION
Registered to KOREA EAST-WEST POWER CO.,LTD(EWP).



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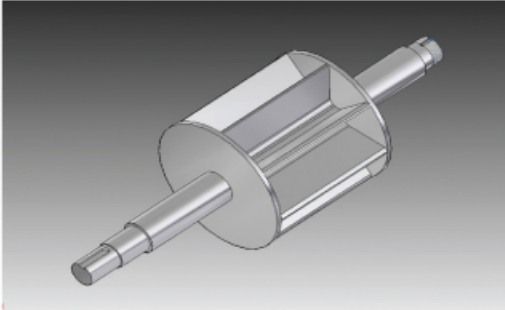
ROTARY FEEDER

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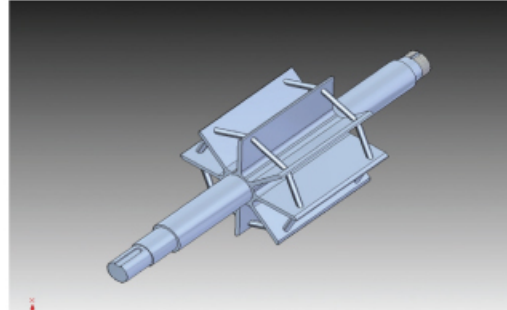
ROTARY FEEDER

SICO's Rotary Feeder

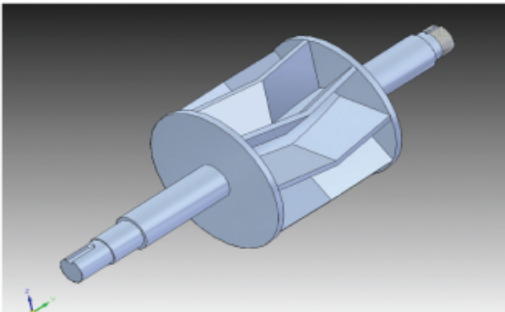
IMPELLER TYPE



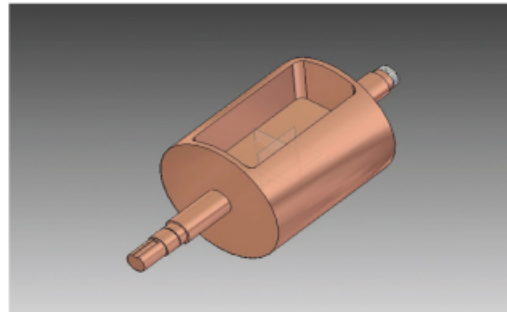
Side Wall Type



Side Open Type

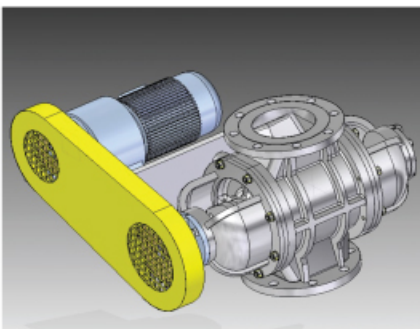


Double Helical Type

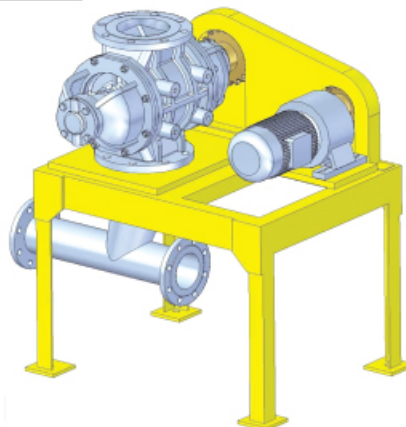


Bucket Type

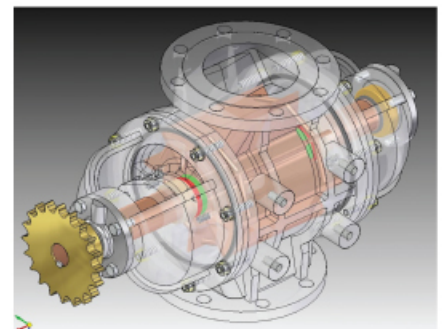
ROTARY FEEDER TYPE



Side Bed Type



Common Bed Type

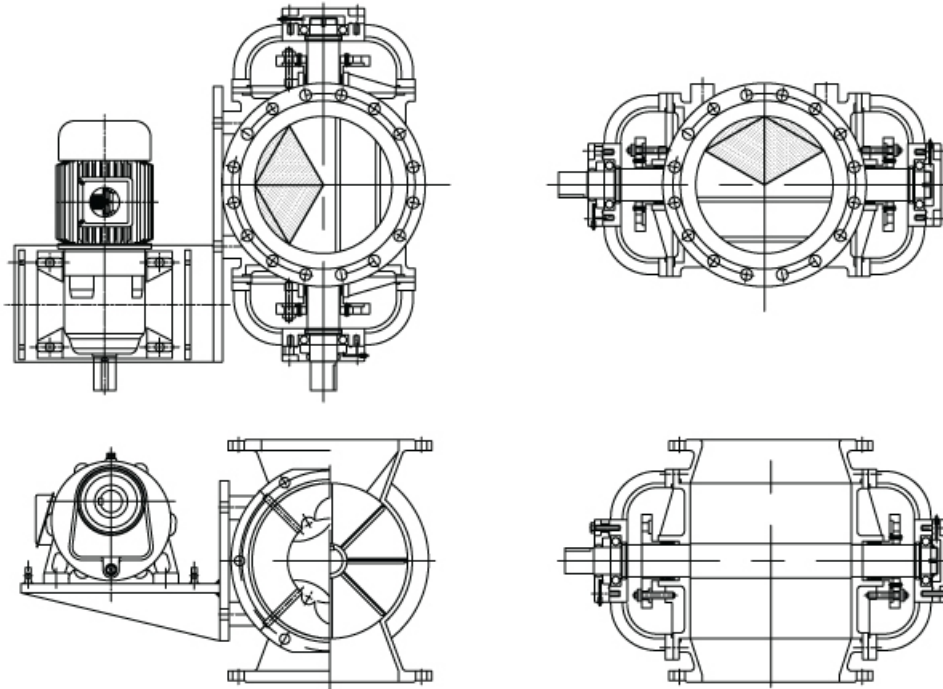


Body Type

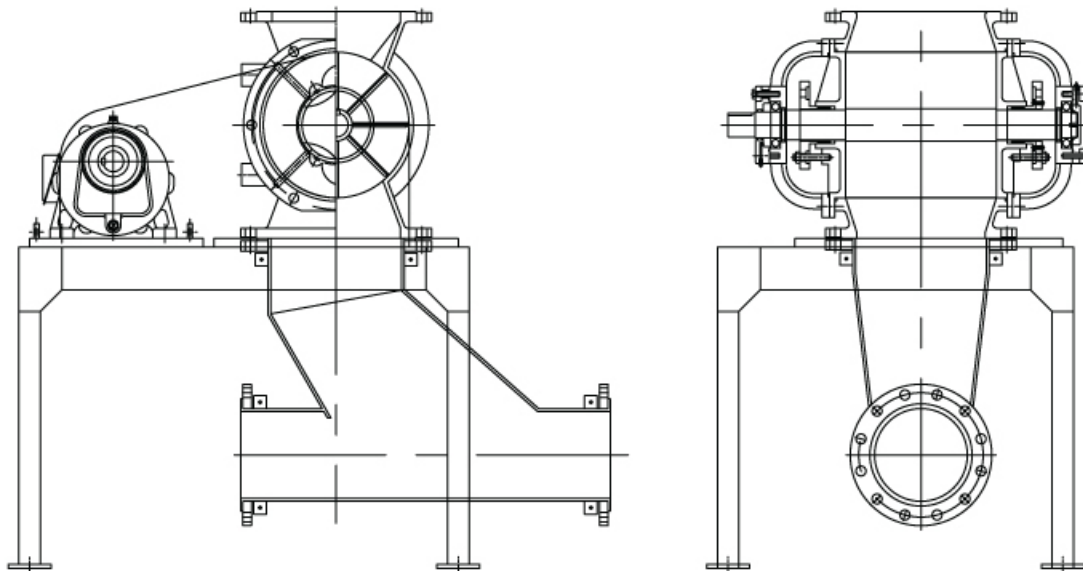
ROTARY FEEDER (NON CUTTING)

Model No.
SRV

Side Bed Type



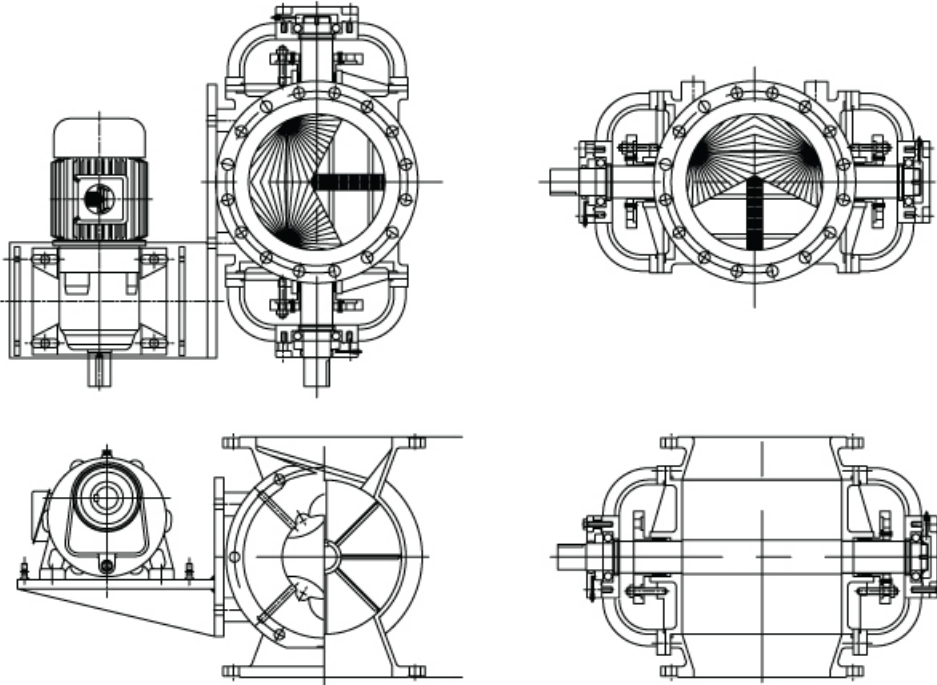
Common Bed Type



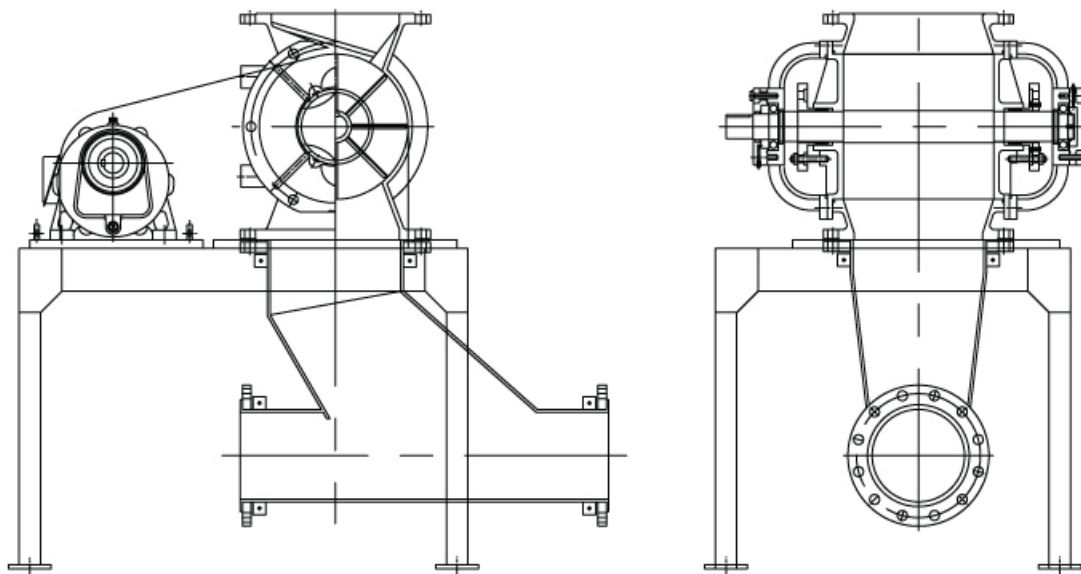
ROTARY FEEDER (NON CUTTING)

Model No.
SNRV

Side Bed Type



Common Bed Type



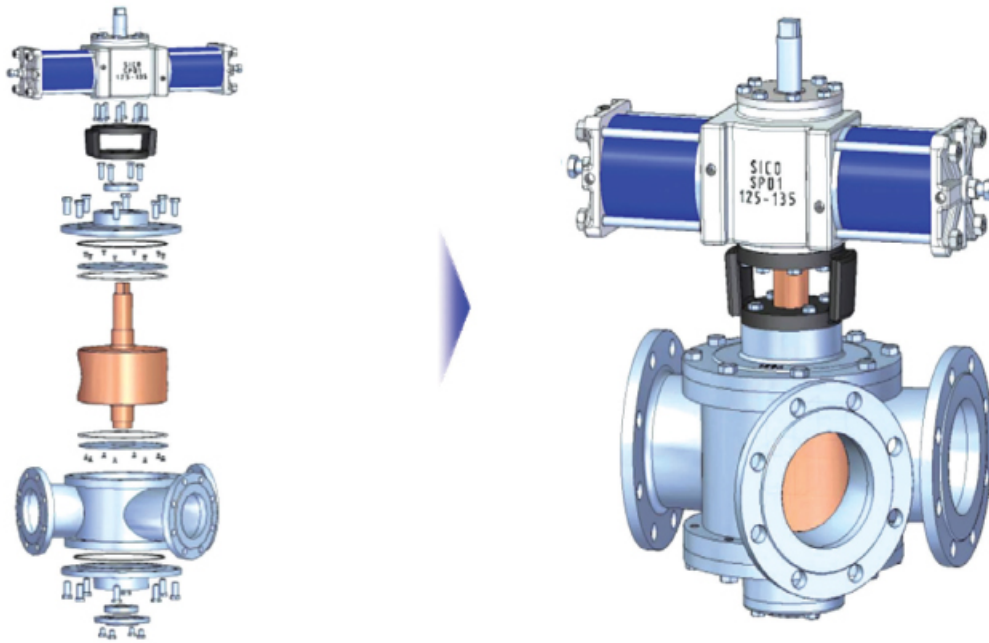


DIVERT VALVE

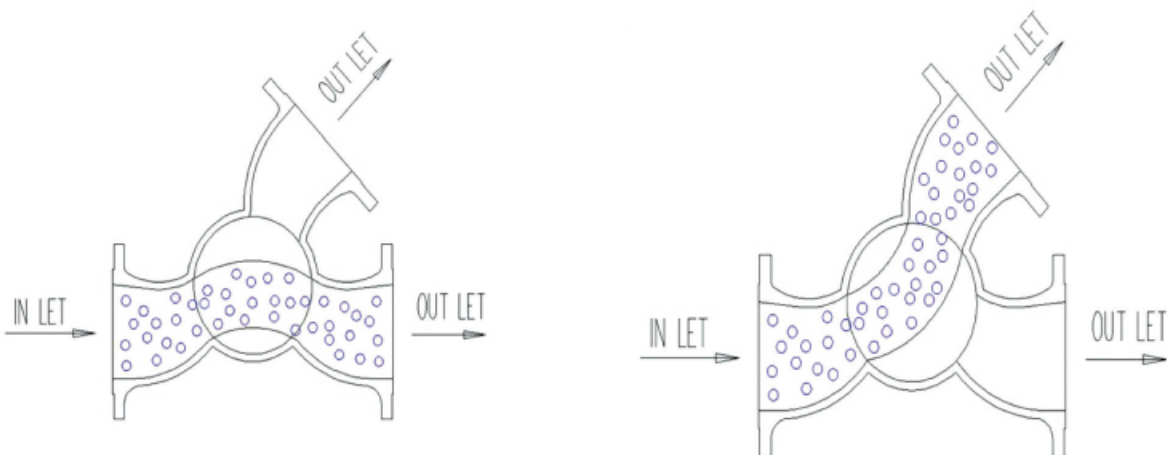
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■ DIVERT VALVE C-30°~ 90°	12

SICO'S DIVERT VALVE

ASSEMBLY



SMOOTH ACTION



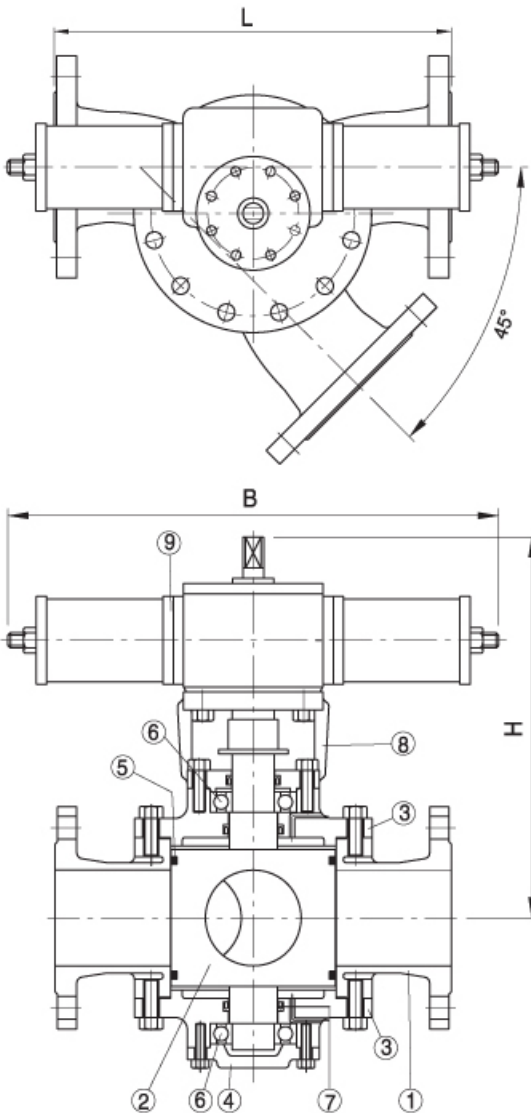
PNEUMATIC OPERATED DIVERT VALVE (R-45° TYPE / L-45° TYPE)

Model No. SDVF-AP

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	2	2½	3	4	5	6	8	10	12	14
	mm	50	65	80	100	125	150	200	250	300	350
CL. 150 (JIS 10K)	L	230	313	330	357	435	480	554	674	806	960
	*H	440	460	480	500	560	570	640	700	780	880
	*B	560	560	560	560	660	660	700	810	810	960



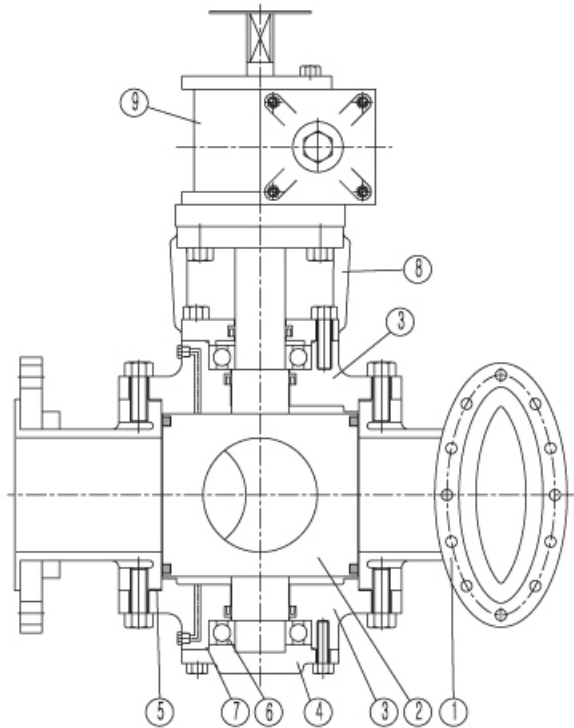
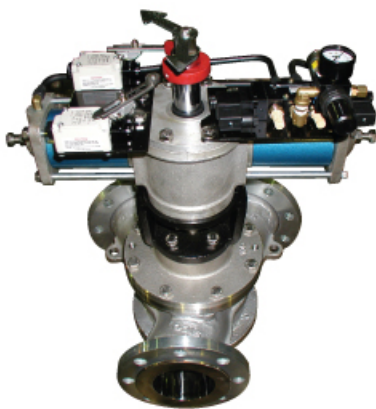
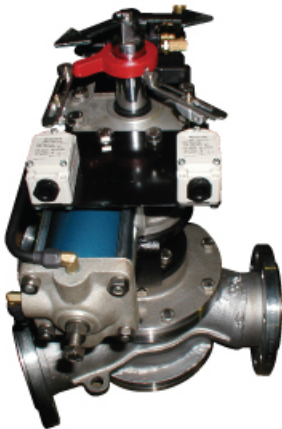
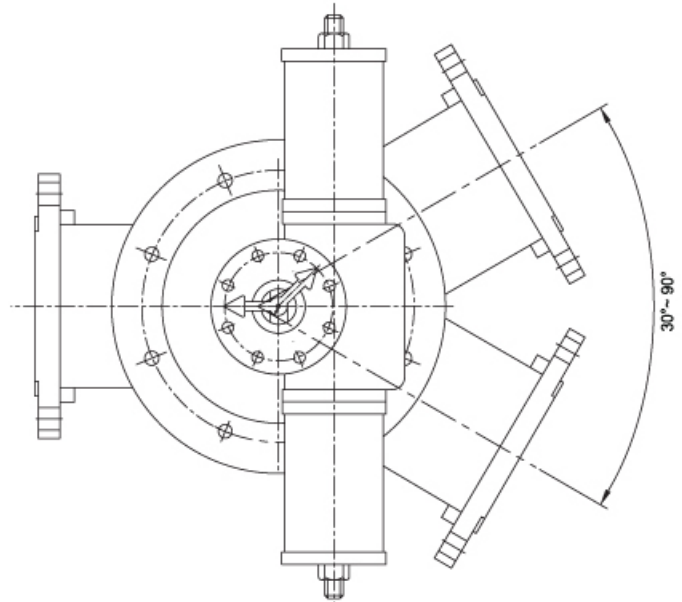
10	ACCESSORY	OPTION		
9	ACTUATOR	DOUBLE ACTING		
8	BRACKET	A536(FCD)		
7	OIL SEAL	NBR / VITON		
6	BEARING	COMMERCIAL		
5	SEAL	PTFE		
4	CAP	CF8	CF8M	CF3M
3	COVER	CF8	CF8M	CF3M
2	DISC	CF8	CF8M	CF3M
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		



PNEUMATIC OPERATED DIVERT VALVE C-30°~ 90°

Model No.
SDVF-AD

10	ACCESSORY	OPTION		
9	ACTUATOR	DOUBLE ACTING		
8	BRACKET	A536(FCD)		
7	OIL SEAL	NBR / VITON		
6	BEARING	COMMERCIAL		
5	SEAL	PTFE		
4	CAP	CF8	CF8M	CF3M
3	COVER	CF8	CF8M	CF3M
2	DISC	CF8	CF8M	CF3M
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		





JACKET VALVE

■ SEMI JACKET BALL VALVE	14
■ FULL JACKET BALL VALVE	15
■ JACKET METAL BALL VALVE	16
■ JACKET GATE VALVE	17
■ JACKET GLOBE VALVE	18

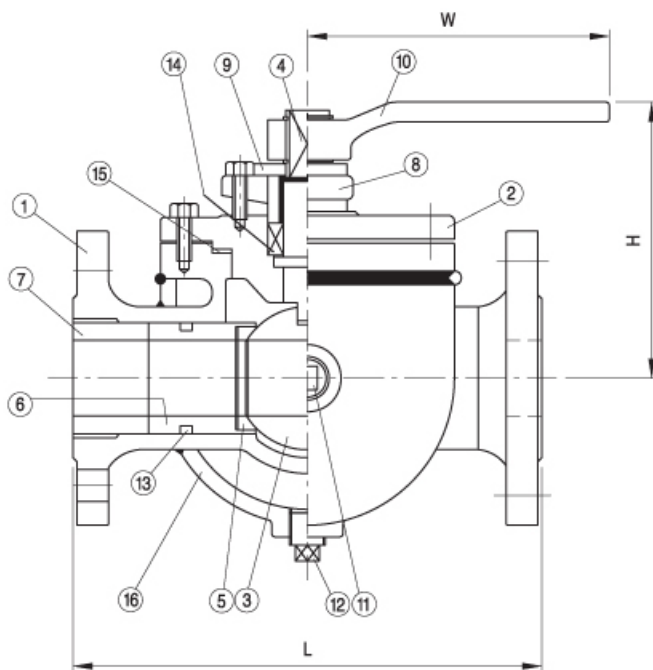
SEMI JACKET BALL VALVE

Model No.
SBAF-SJ

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
	mm	15	20	25	32	40	50	65	80	100
CL. 150 (JIS 10K)	L	155	155	180	190	200	240	260	290	360
	*H	100	100	110	115	145	160	175	190	230
	*W	145	145	185	185	245	245	245	370	450



16	JACKET	WCB	CF8	CF8	CF8
15	GASKET	PTFE or SPIRAL WOUND			
14	PACKING	PTFE or GRAPHITE			
13	O-RING	VITON			
12	DRAIN PLUG	CF8(304)			
11	VENT PLUG	C · S			
10	HAND LEVER	WCB			
9	STOPPER	304SS			
8	PACKING GLAND	CF8(304)			
7	RETAINER	CF8(304)	CF8(304)	CF8M(316)	CF3M(316L)
6	SEAT RING CASE	CF8(304)	CF8(304)	CF8M(316)	CF3M(316L)
5	SEAT RING	PTFE or RTFE			
4	STEM	304SS	304SS	316SS	316LSS
3	BALL	CF8(304)	CF8(304)	CF8M(316)	CF3M(316L)
2	BONNET	WCB	CF8	CF8M	CF3M
1	BODY	WCB	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL			



FULL JACKET BALL VALVE

Model No.
SBAF-FJ

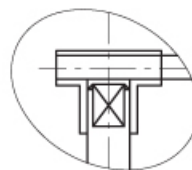
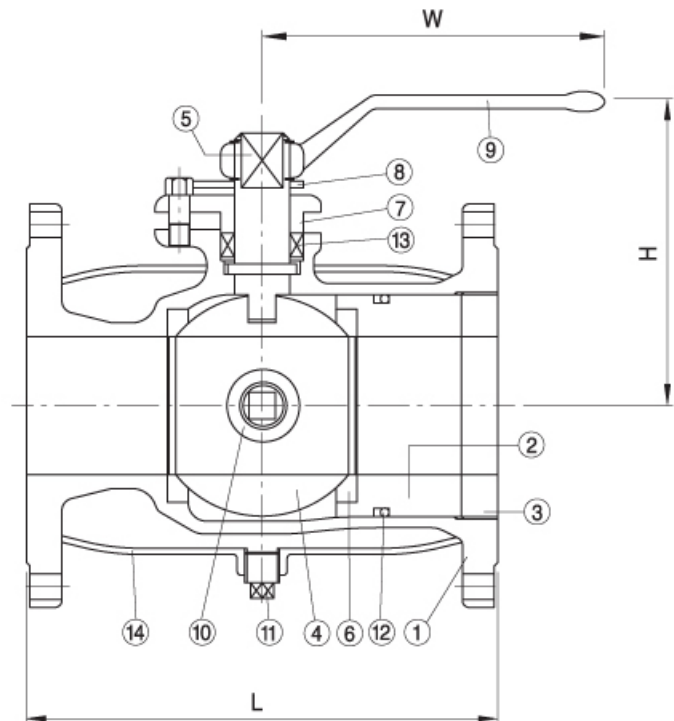
DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2x1 1/2	3/4x1 1/2	1x2	1 1/4x2 1/2	1 1/2x2 1/2	2x3	2 1/2x4	3x5	4x6	5x8	6x8	8x10	10x14	12x16
	mm	15x40	20x40	25x50	32x65	40x65	50x80	65x100	80x125	100x150	125x200	150x200	200x250	250x350	300x400
CL. 150 (JIS 10K)	L	117	117	127	140	165	178	190	203	229	457	457	610	686	762
	*H	115	115	132	143	143	153	197	205	215	275	GEAR OPERATOR			
	*W	185	129	185	180	190	245	290	290	450	600	GEAR OPERATOR			

14	JACKET	WCB	CF8	CF8	CF8
13	PACKING	PTFE or GRAPHITE			
12	O-RING	VITON			
11	DRAIN PLUG	CF8(304)			
10	VENT PLUG	C · S			
9	HANDLE	WCB			
8	STOPPER	304SS			
7	PACKING GLAND	CF8(304)			
6	SEAT RING	PTFE or RTFE			
5	STEM	304SS	304SS	316SS	316LSS
4	BALL	CF8(304)	CF8(304)	CF8M(316)	CF3M(316L)
3	RETAINER	CF8(304)	CF8(304)	CF8M(316)	CF3M(316L)
2	SEAT RING CASE	CF8(304)	CF8(304)	CF8M(316)	CF3M(316L)
1	BODY	WCB	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL			

※6×8" OVER TOP ENTRY



5Bx8B OVER HANDLE PART

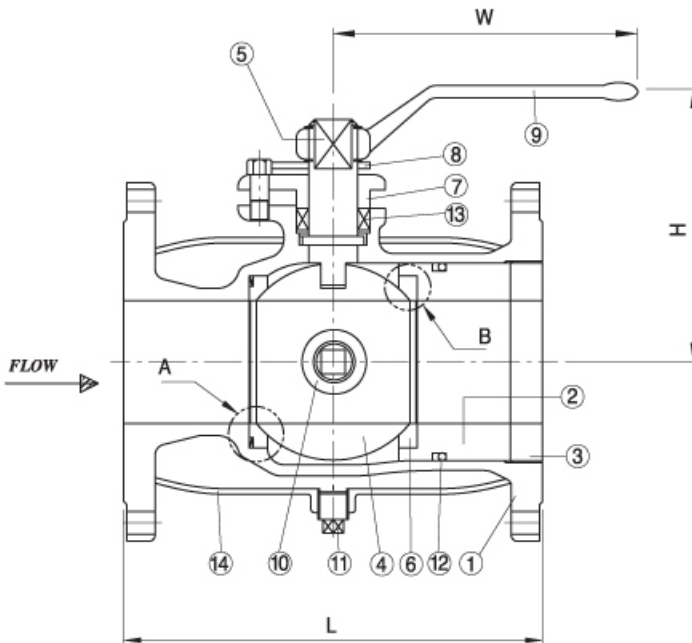
JACKET METAL BALL VALVE

Model No.
SBAF-FJM

DIMENSION (* REFERENCE DIMENSION)

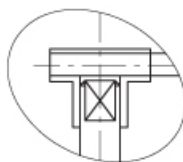
(UNIT: mm)

Size	in	1/2x1 1/2	3/4x1 1/2	1x2	1 1/4x2 1/2	1 1/2x2 1/2	2x3	2 1/2x4	3x5	4x6	5x8	6x8	8x10	10x14	12x16
	mm	15x40	20x40	25x50	32x65	40x65	50x80	65x100	80x125	100x150	125x200	150x200	200x250	250x350	300x400
CL. 150 (JIS 10K)	L	117	117	127	140	165	178	190	203	229	457	457	610	686	762
	*H	115	115	132	143	143	153	197	205	215	275	GEAR OPERATOR			
	*W	185	129	185	180	190	245	290	290	450	600	GEAR OPERATOR			

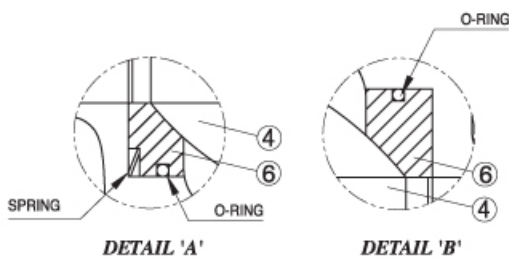


14	JACKET	WCB	CF8	CF8	CF8
13	PACKING	PTFE or GRAPHITE			
12	O-RING	VITON			
11	DRAIN PLUG	304SS			
10	VENT PLUG	C · S			
9	HANDLE	WCB			
8	PACKING GLAND	304SS			
7	PACKING GLAND	CF8(304)			
6	SEAT RING	PTFE or RTFE			
5	STEM	304SS	304SS	316SS	316LSS
4	BALL	CF8(304)	CF8(304)	CF8M(316)	CF3M(316L)
3	RETAINER	CF8(304)	CF8(304)	CF8M(316)	CF3M(316L)
2	SEAT RING CASE	CF8(304)	CF8(304)	CF8M(316)	CF3M(316L)
1	BODY	WCB	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL			

※ 6 × 8" OVER TOP ENTRY



5Bx8B OVER HANDLE PART



DETAIL 'A'

DETAIL 'B'



JACKET GATE VALVE

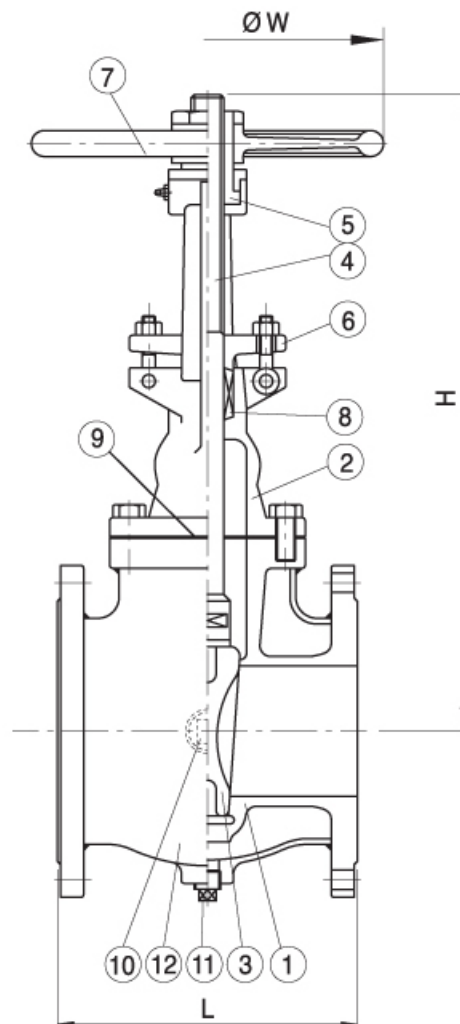
Model No.
SGAF-FJ

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2x1 1/2	3/4x1 1/2	1x2	1 1/2x2 1/2	2x3	2 1/2x4	3x5	4x6	5x8	6x8	8x10	10x14	12x16
	mm	15x40	20x40	25x50	40x65	50x80	65x100	80x125	100x150	125x200	150x200	200x250	250x350	300x400
CL. 150 (JIS 10K)	L	117	127	140	178	190	203	215	244	267	281	309	360	381
	*H	214	219	239	293	342	407	449	528	631	724	924	118	1307
	*W	100	100	125	155	170	170	200	230	250	270	300	350	350
CL. 300 (JIS 20K)	L	152	165	178	205	241	255	309	330	395	405	435	465	515
	*H	219	115	236	303	360	415	464	536	649	749	943	1148	1348
	*W	100	129	125	155	170	170	200	230	250	280	300	355	400

12	JACKET	CF8	CF8	CF8
11	DRAIN PLUG	304SS	304SS	304SS
10	VENT PLUG	C · S	C · S	C · S
9	GASKET	PTFE or SPIRAL WOUND		
8	PACKING	PTFE or GRAPHITE		
7	HAND WHEEL	A536(FCD)		
6	PACKING GLAND	CF8(304)		
5	SLEEVE	A536(FCD)		
4	STEM	304SS	316SS	316LSS
3	DISC	CF8(304)	CF8M(316)	CF3M(316L)
2	BONNET	CF8	CF8M	CF3M
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		



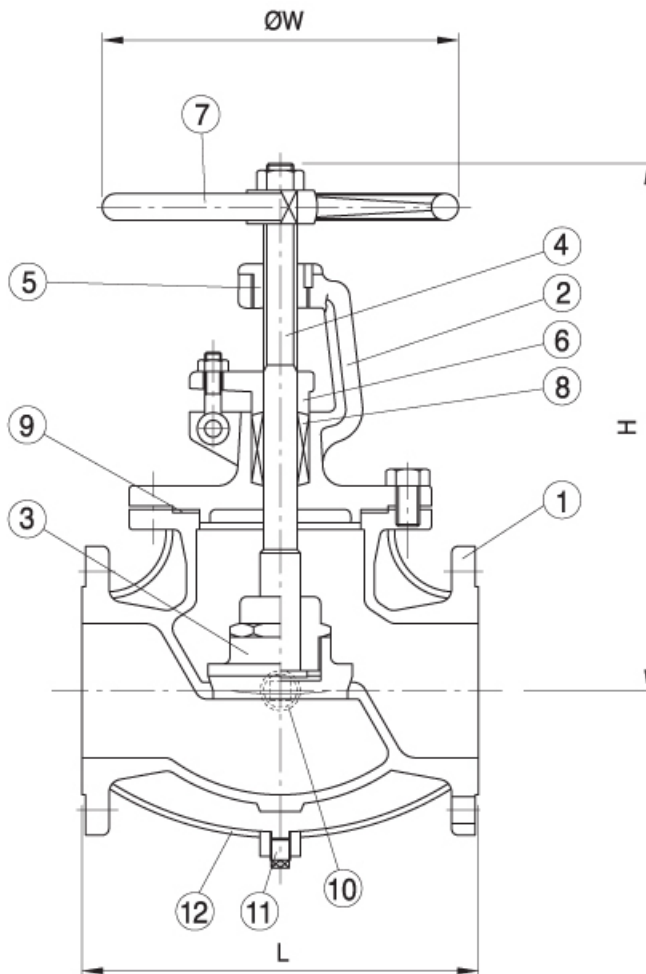
JACKET GLOBE VALVE

Model No.
SGLF-FJ

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2x1 1/2	3/4x1 1/2	1x2	1 1/2x2 1/2	2x3	2 1/2x4	3x5	4x6	5x8	6x8	8x10
	mm	15x40	20x40	25x50	40x65	50x80	65x100	80x125	100x150	125x200	150x200	200x250
CL. 150 (JIS 10K)	L	117	127	140	172	216	228	253	307	366	420	500
	*H	182	182	185	220	242	283	313	350	395	458	555
	*W	100	100	125	155	170	200	200	230	250	270	300
CL. 300 (JIS 20K)	L	166	188	215	240	292	305	356	400	425	455	575
	*H	185	185	190	235	278	311	361	420	474	539	680
	*W	100	100	125	155	170	200	230	250	355	400	450



12	JACKET	CF8	CF8	CF8
11	DRAIN PLUG	304SS	304SS	304SS
10	VENT PLUG	C · S	C · S	C · S
9	GASKET	PTFE or SPIRAL WOUND		
8	PACKING	PTFE or GRAPHITE		
7	HAND WHEEL	A536(FCD)		
6	PACKING GLAND	CF8(304)		
5	SLEEVE	A536(FCD)		
4	STEM	304SS	316SS	316LSS
3	DISC	CF8(304)	CF8M(316)	CF3M(316L)
2	BONNET	CF8	CF8M	CF3M
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		





BELLOWS SEAL VALVE

■ BELLOWS SEAL GATE VALVE	20
■ BELLOWS SEAL GLOBE VALVE	21
■ JACKET BELLOWS SEAL GATE VALVE	22
■ JACKET BELLOWS SEAL GLOBE VALVE	23
■ BELLOWS SEAL GATE VALVE	24

BELLOWS SEAL GATE VALVE

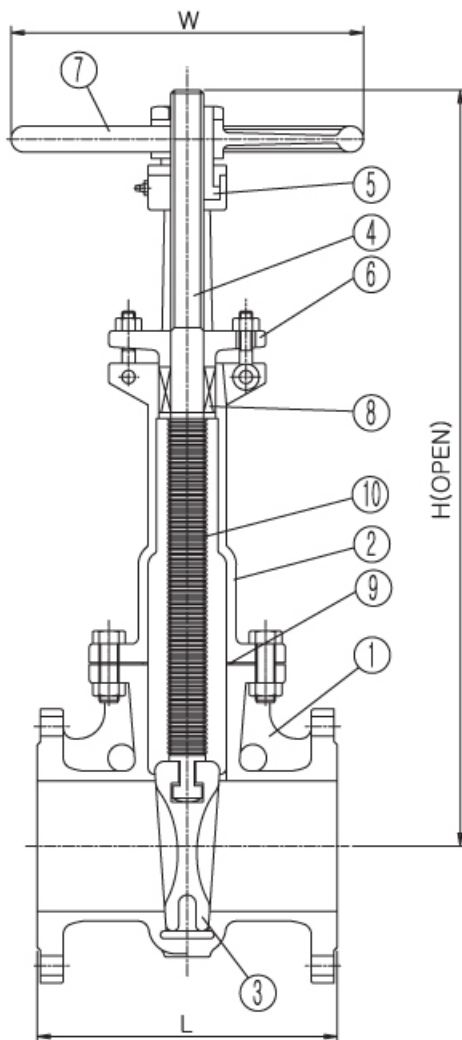
Model No.
SGAF-BS

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
	mm	15	20	25	32	40	50	65	80	100	125	150	200
CL. 150 (JIS 10K)	L	108	117	127	140	165	178	190	203	229	254	267	292
	*H	320	340	380	425	450	530	620	700	820	1000	1110	1420
	*W	100	100	125	125	155	170	170	200	230	270	300	350
CL. 300 (JIS 20K)	L	140	152	165	178	190	216	241	283	305	381	403	419
	*H	330	350	400	450	470	560	660	740	865	1040	1170	1600
	*W	100	100	125	125	155	170	170	200	230	270	300	350

* Rating Over 600LB is Order Production



10	BELLOWS	STAINLESS STEEL or INCONEL	1
9	GASKET	PTFE / 304SS+GRAPHITE	1
8	PACKING	PTFE / GRAPHITE	1SET
7	HAND WHEEL	A536	1
6	PACKING GLAND	CF8	1
5	SLEEVE	A536	1
4	STEM	304SS / 316SS / 316LSS	1
3	DISC	A351-CF8 / CF8M / CF3M	1
2	BONNET	A351-CF8 / CF8M / CF3M	1
1	BODY	A351-CF8 / CF8M / CF3M	1
NO.	PART NAME	MATERIAL	Q' TY

BELLOWS SEAL GLOBE VALVE

Model No.
SGLF-BS

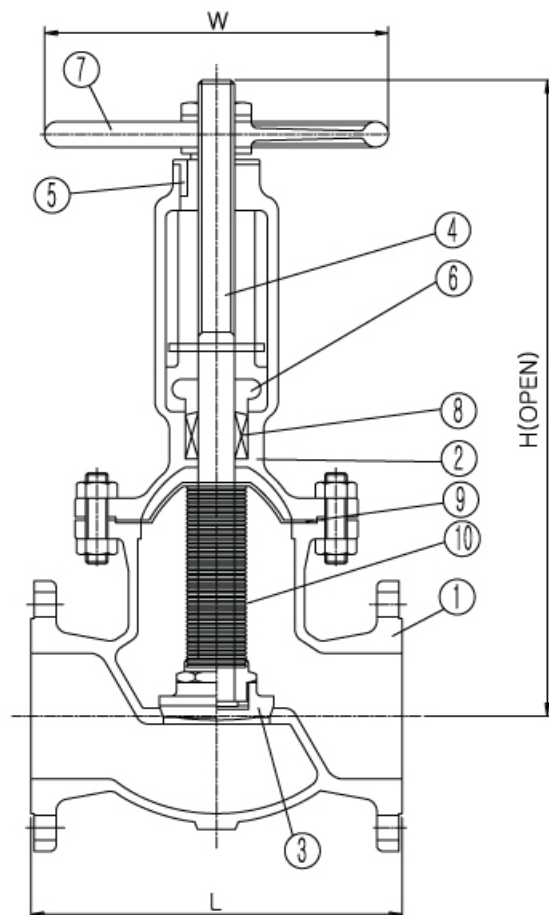
DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
	mm	15	20	25	32	40	50	65	80	100	125	150	200
CL. 150 (JIS 10K)	L	108	117	127	140	165	203	216	241	292	356	406	495
	*H	195	195	227	240	260	270	360	395	430	510	520	635
	*W	100	100	125	125	155	170	200	200	230	270	300	350
CL. 300 (JIS 20K)	L	140	178	203	216	229	267	292	318	356	400	444	559
	*H	330	215	245	260	280	335	450	520	550	600	620	760
	*W	100	100	125	125	155	170	200	230	270	350	400	450

* Rating Over 600LB is Order Production

10	BELLOWS	STAINLESS STEEL or INCONEL	1
9	GASKET	PTFE / 304SS+GRAPHITE	1
8	PACKING	PTFE / GRAPHITE	1SET
7	HAND WHEEL	A536	1
6	PACKING GLAND	CF8	1
5	SLEEVE	A536	1
4	STEM	304SS / 316SS / 316LSS	1
3	DISC	A351-CF8 / CF8M / CF3M	1
2	BONNET	A351-CF8 / CF8M / CF3M	1
1	BODY	A351-CF8 / CF8M / CF3M	1
NO.	PART NAME	MATERIAL	Q' TY



JACKET BELLOWS SEAL GATE VALVE

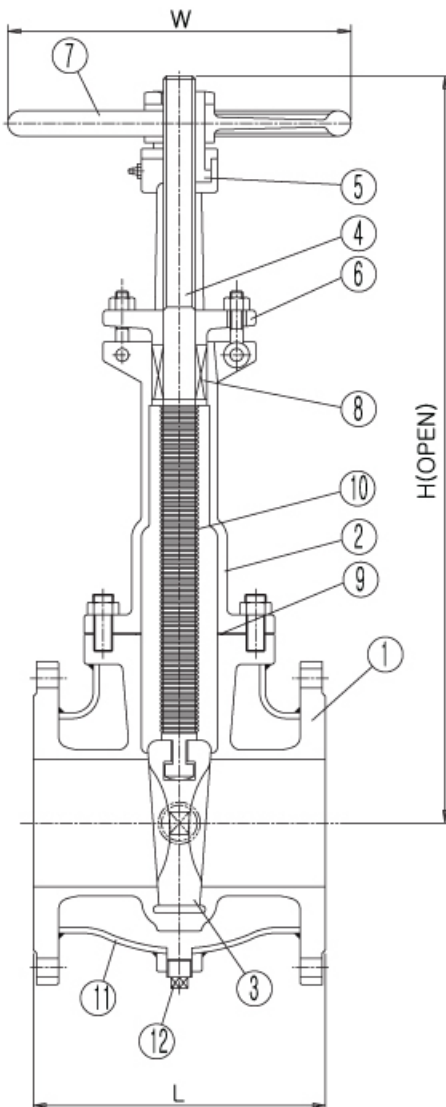
Model No.
SGAF-FJBS

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	2×3	2½×4	3×5	4×6	5×8	6×8	8×10
	mm	50×80	65×100	80×125	100×150	125×200	150×200	200×250
CL. 150 (JIS 10K)	L	190	203	215	244	267	280	309
	*H	525	620	720	830	1030	1115	1525
	*W	170	170	200	230	250	270	300
CL. 300 (JIS 20K)	L	241	265	309	330	419	430	457
	*H	580	670	780	890	1110	1185	1610
	*W	170	170	200	230	250	280	300

* Rating Over 600LB is Order Production



12	DRAIN & VENT PLUG	304SS	1
11	JACKET	CF8	1
10	BELLOWS	STAINLESS STEEL or INCONEL	1
9	GASKET	PTFE / 304SS+GRAPHITE	1
8	PACKING	PTFE / GRAPHITE	1SET
7	HAND WHEEL	A536	1
6	PACKING GLAND	CF8	1
5	SLEEVE	A536	1
4	STEM	304SS / 316SS / 316LSS	1
3	DISC	A351-CF8 / CF8M / CF3M	1
2	BONNET	A351-CF8 / CF8M / CF3M	1
1	BODY	A351-CF8 / CF8M / CF3M	1
NO.	PART NAME	MATERIAL	Q' TY

JACKET BELLOWS SEAL GLOBE VALVE

Model No.
SGLF-FJBS

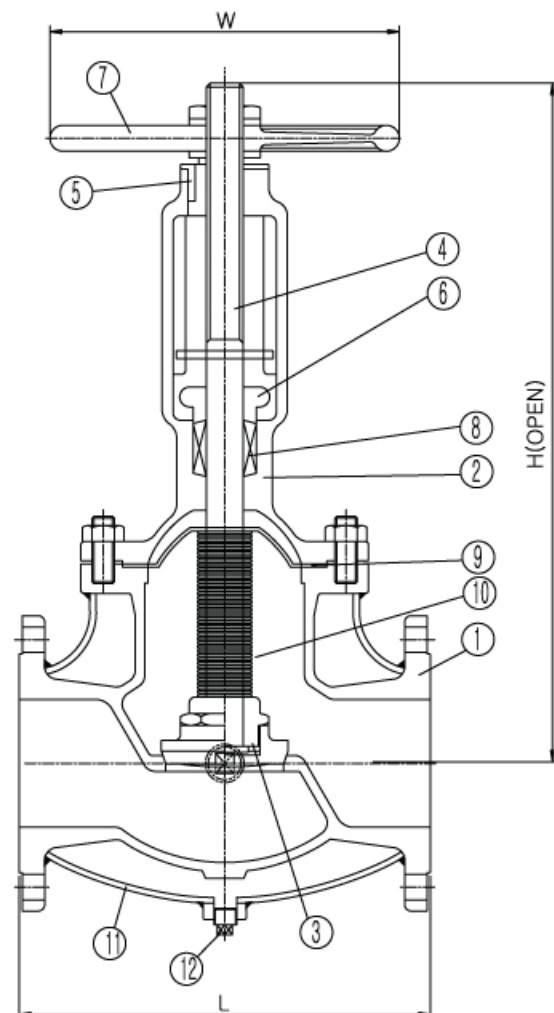
DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	2×3	2½×4	3×5	4×6	5×8	6×8	8×10
	mm	50×80	65×100	80×125	100×150	125×200	150×200	200×250
CL. 150 (JIS 10K)	L	216	228	253	307	366	420	508
	*H	320	370	415	440	535	550	655
	*W	170	200	200	230	250	270	300
CL. 300 (JIS 20K)	L	292	318	356	400	444	471	595
	*H	380	475	545	570	630	670	790
	*W	170	200	230	250	355	400	450

* Rating Over 600LB is Order Production

12	DRAIN & VENT PLUG	304SS	1
11	JACKET	CF8	1
10	BELLOWS	STAINLESS STEEL or INCONEL	1
9	GASKET	PTFE / 304SS+GRAPHITE	1
8	PACKING	PTFE / GRAPHITE	1SET
7	HAND WHEEL	A536	1
6	PACKING GLAND	CF8	1
5	SLEEVE	A536	1
4	STEM	304SS / 316SS / 316LSS	1
3	DISC	A351-CF8 / CF8M / CF3M	1
2	BONNET	A351-CF8 / CF8M / CF3M	1
1	BODY	A351-CF8 / CF8M / CF3M	1
NO.	PART NAME	MATERIAL	Q' TY



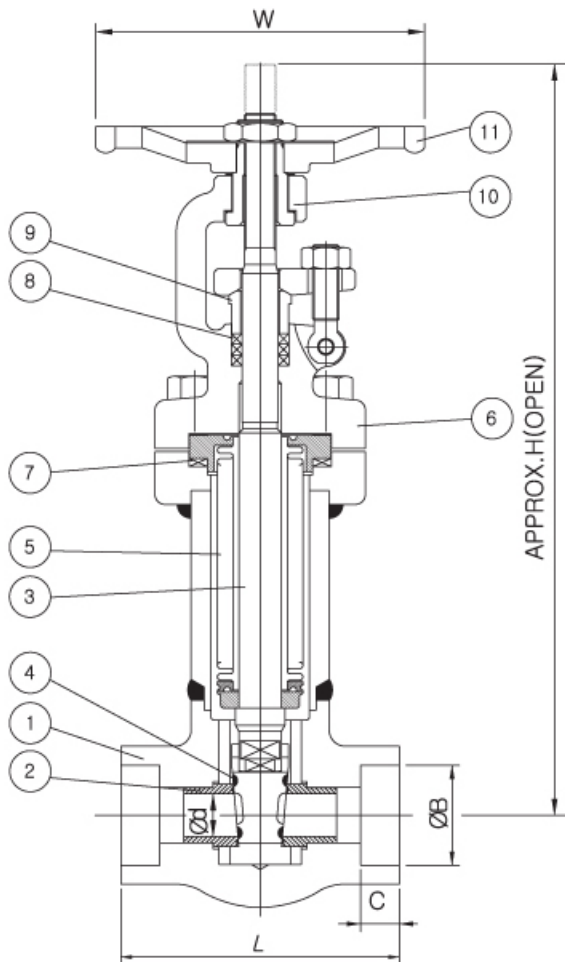
BELLOWS SEAL GATE VALVE

Model No.
SGASW-BS

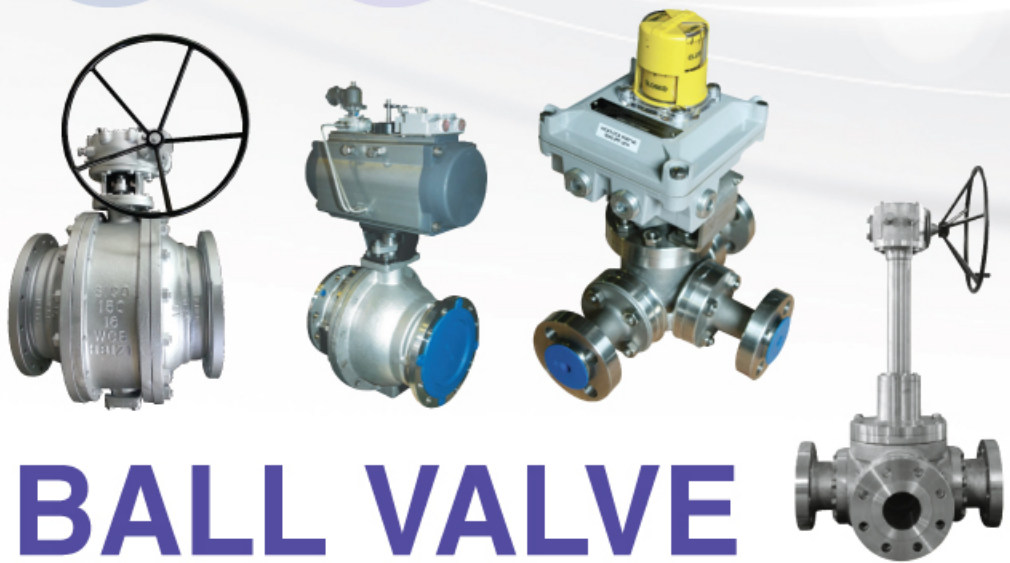
DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2
	mm	15	20	25	32	40	50
CL. 150,300,600,800	L	96	96	141	141	141	161
	*H	279	279	345	345	345	385
	*W	105	105	135	135	135	160
	D	10	13	19	25	30	35
CL. 1500	L	141	141	161	161	161	172
	H	345	345	385	385	385	445
	W	135	135	160	160	160	180
	D	10	13	19	25	30	35



11	HAND WHEEL	A197	1
10	SLEEVE	A276-410	1
9	GLAND	A276-304	1
8	GLAND PACKING	PTFE / GRAPHITE	1
7	GASKET	PTFE / 304SS+GRAPHITE	1
6	BONNET	A105 / F304 / F316	1
5	BELLOWS	STAINLESS STEEL or INCONEL	1
4	DISC	A217-CA15 / CF8 / CF8M	1
3	STEM	A276-410 / 304 / 316	1
2	SEAT RING	A276-410 / 304 / 316	2
1	BODY	A105 / F304 / F316	1
NO.	PART NAME	MATERIAL	Q' TY



BALL VALVE

■ DESIGN FEATURES OF BALL VALVE	26
■ 2-WAY BALL VALVE (FLOATING TYPE)	28
■ 2-WAY BALL VALVE (TRUNNION TYPE)	29
■ 2-WAY BALL VALVE (METAL SEAT)	30
■ 3-WAY BALL VALVE	31
■ 2-WAY BALL VALVE (TRUNNION TYPE)	32

DESIGN FEATURES OF BALL VALVE

■ Blowout-proof stem

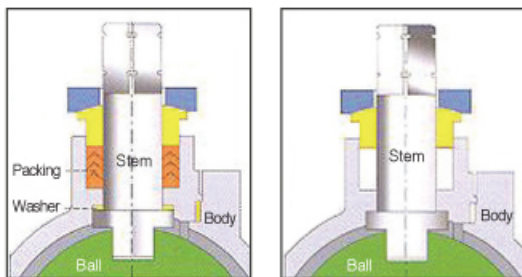
A stem having a flange at its lower side is inserted from the inner side of body. Owing to such a specific design the stem is not forced out even when abnormal pressure is generated or the bolts become loose. Should the stem packing burn out due to fire, the stem is pressed against the body, thereby preventing excessive leak.

■ Secondary metal seat

If the ball seat burns out, the ball is pressed against the secondary metal seat by the internal pressure of piping, which prevents excessive leakage, there-by preventing the fire from spreading.



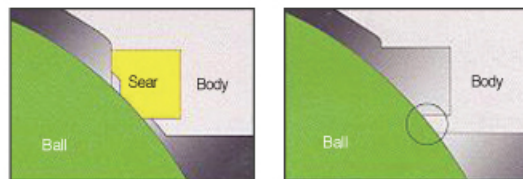
■ Contact between ball and valve shell



(Before Fire)

(After fire)
Metal-to-metal contact

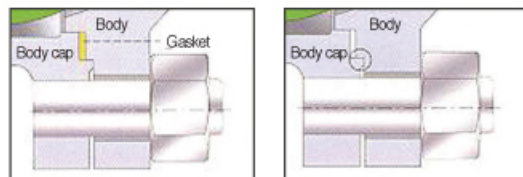
■ Contact between ball and valve shell(*Optional)



(Before Fire)

(After fire)
Metal-to-metal contact

■ Valve shell coupling flanges of split body design



(Before Fire)

(After fire)
Metal-to-metal contact

DESIGN FEATURES OF BALL VALVE

■ Metal-to-metal seal

Because the dual seal, namely Teflon gasket and metal touch, is used at the connection of body and body cap, the sealing effect is maintained even when the Teflon gasket burns out. Hence, leakage is prevented.

■ Antistatic device

The springs provided at two places on the stem allow the static charges to be led to the piping.

■ Locking device

The locking device ensures two-position key lock(full open, complete close). Therefore misoperation is prevented reliably. (The key is optional.)

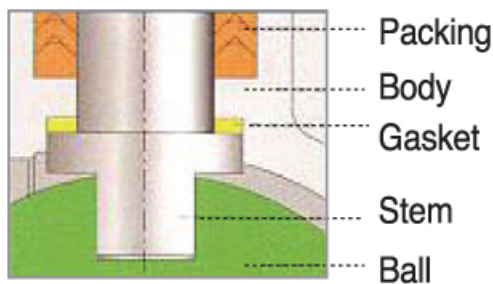


Fig.1

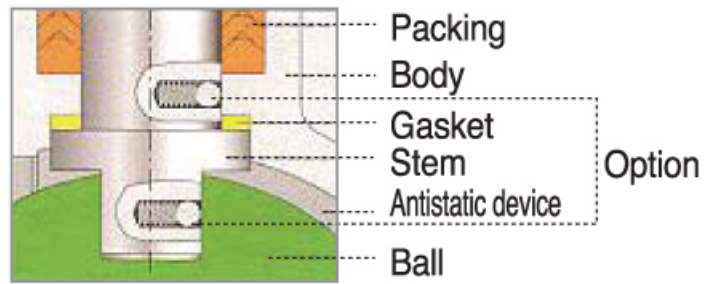


Fig.2

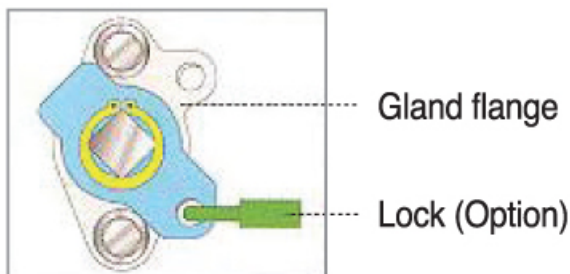


Fig.3 (* Optional)

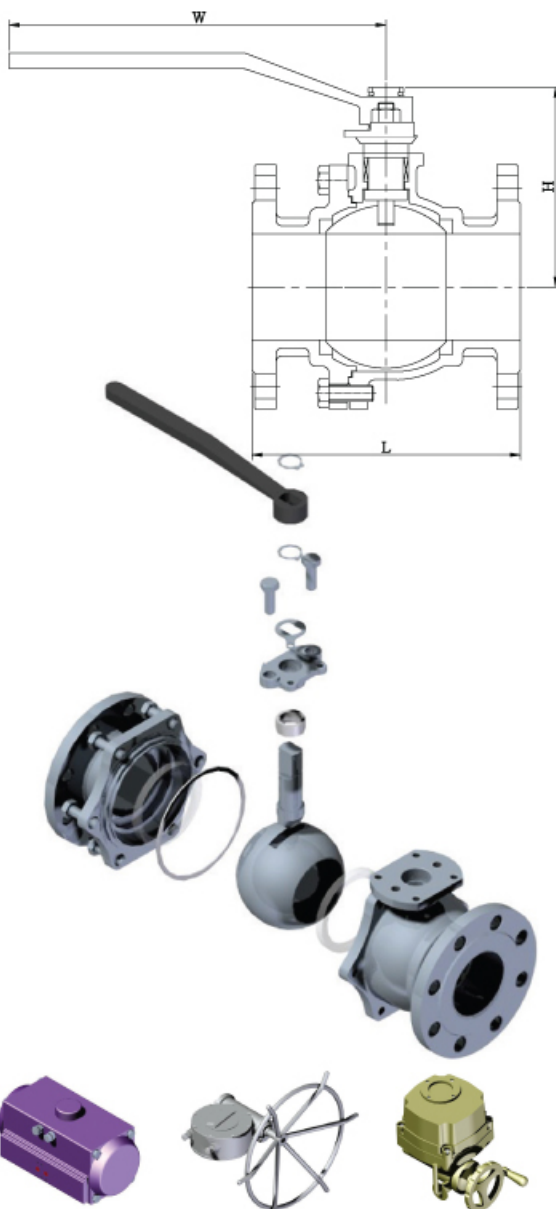
2-WAY BALL VALVE (FLOATING TYPE)

Model No.
SBAF-T

DIMENSION

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10
	mm	15	20	25	32	40	50	65	80	100	125	150	200	250
CL. 150 (JIS 10K)	L	108	117	127	140	165	178	190	203	229	254	267	457	533
	H	67	72	80	95	105	118	133	153	183	220	285	310	580
	W	145	145	185	185	245	245	245	290	370	550	550	800	GEAR
CL. 300 (JIS 20K)	L	140	152	165	178	190	216	241	283	305	381	403	502	568
	H	70	80	80	100	115	120	150	165	205	240	280	350	590
	W	145	145	185	185	245	245	290	290	370	550	550	800	GEAR



13	DESIGN	ANSI B16.34 & API-6D & API-608 or BS5351
12	FACE TO FACE	ANSI B16.10
11	FLANGED ENDS	ANSI B16.5
10	BUTT WELD ENDS	ANSI B16.25
9	BY-PASS & DRAIN	MSS SP-45
8	TEST	API-598, ANSI B16.34
7	CONSTRUCTION	<ul style="list-style-type: none"> • Open/close Position indicator • Locking Device • Anti-blow out stem • Antistatic Device • Fire Protection Structure • Middle Flange Leak-tight Structure • Dependable Seating Structure • Full and Reduced Bore • Manual Oper Required (gearbox, electric, pneumatic...)
6	BODY	A216-WCB, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CN7M / CG8M / CG3M, A352-LCB / LCC / LC1 / LC2, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-WC6 / WC9 / C5 / C12
5	BALL	MONEL, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CG8M / CG3M / CN7M, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-C5 / C12
4	STEM	MONEL, 304SS, 316SS, 316LSS, 304LSS, 347SS, 304HSS, 316HSS, 310SS, 317SS, 317LSS, HASTELLOY, INCONEL, INCOLOY, DUPLEX, 410SS
3	SEAT	A351-CF8 / CF8M / CF3 / CF3M, STELLITED HARDFACING, TUNGSTEN CARBIDE PTFE, RTFE, PEEK, PCTFE, NYLON, GRAPHITE, CARBON
2	GASKET	PTFE, RTFE, GRAPHITE, SPIRAL WOUND
1	OTHERS	Cryogenic Services, H.F. Services, All Kind of Operated, All Type of Painting and Coating
No.	PART NAME	MATERIAL

2-WAY BALL VALVE (TRUNNION TYPE)

Model No.
SBAF-T

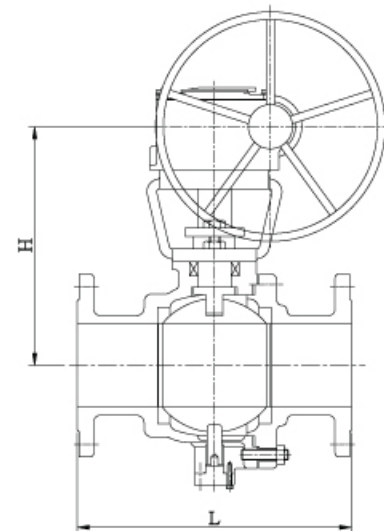
DIMENSION

(UNIT: mm)

Size	in	8	10	12	14	16
	mm	200	250	300	350	400
CL. 150 (JIS 10K)	L	457	533	610	686	762
	*H	310	580	630	650	720
	*W	GEAR OPERATOR				

Size	in	8	10	12	14	16
	mm	200	250	300	350	400
CL. 300 (JIS 20K)	L	502	568	648	762	838
	*H	350	590	655	680	750
	*W	GEAR OPERATOR				

13	DESIGN	ANSI B16.34 & API-6D & API-608 or BS5351
12	FACE TO FACE	ANSI B16.10
11	FLANGED ENDS	ANSI B16.5
10	BUTT WELD ENDS	ANSI B16.25
9	BY-PASS & DRAIN	MSS SP-45
8	TEST	API-598, ANSI B16.34
7	CONSTRUCTION	<ul style="list-style-type: none"> • Open/close Position indicator • Locking Device • Anti-blow out stem • Antistatic Device • Fire Protection Structure • Middle Flange Leak-tight Structure • Dependable Seating Structure • Full and Reduced Bore • Manual Oper Required (gearbox, electric, pneumatic...)
6	BODY	A216-WCB, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CN7M / CG8M / CG3M, A352-LCB / LCC / LC1 / LC2, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-WC6 / WC9 / C5 / C12
5	BALL	MONEL, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CG8M / CG3M / CN7M, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-C5 / C12
4	STEM	MONEL, 304SS, 316SS, 316LSS, 304LSS, 347SS, 304HSS, 316HSS, 310SS, 317SS, 317LSS, HASTELLOY, INCONEL, INCOLOY, DUPLEX, 410SS
3	SEAT	A351-CF8 / CF8M / CF3 / CF3M, STELLITED HARDFACING, TUNGSTEN CARBIDE PTFE, RTFE, PEEK, PCTFE, NYLON, GRAPHITE, CARBON
2	GASKET	PTFE, RTFE, GRAPHITE, SPIRAL WOUND
1	OTHERS	Cryogenic Services, H.F. Services, All Kind of Operated, All Type of Painting and Coating
No.	PART NAME	MATERIAL



BALL VALVE

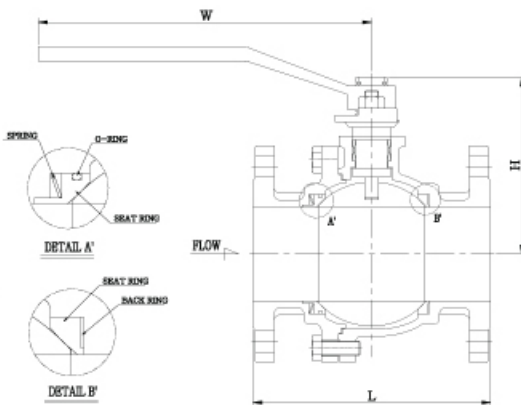
2-WAY BALL VALVE (METAL SEAT)

Model No.
SBAF-M

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16
	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
CL. 150 (JIS 10K)	L	108	117	127	140	165	178	190	203	229	254	267	457	533	610	686	762
	*H	67	72	80	95	105	118	133	153	183	220	285	310	580	630	650	720
	*W	145	145	185	185	245	245	245	245	370	450	550	550	800	GEAR OPERATOR		
CL. 300 (JIS 20K)	L	140	152	165	178	190	216	241	283	305	381	403	502	568	648	762	838
	*H	70	80	80	100	115	120	150	165	205	240	280	350	590	655	680	750
	*W	145	145	185	185	245	245	245	370	450	550	550	750	GEAR OPERATOR			



16	SPRING	INCONEL
15	SEAT GASKET	VITON
14	O-RING	VITON
13	GASKET	PTFE, RTFE, GRAPHITE, SPIRAL WOUND
12	PACKING	PTFE, RTFE, GRAPHITE, VOC
11	SNAP RING	W1-8
10	GRAND BOLT	A193-B8 / B8M, A307-B
9	BONNET BOLT	A193-B8 / B8M, A307-B
8	STOPPER	A240-304
7	HAND LEVER	A536(OPTION : GEAR, ELECTRIC MOTOR, PENUMATIC ACTUATOR)
6	PACKING GLAND	A216-WCB / A351-CF8
5	STEM	MONEL, 304SS, 316SS, 316LSS, 304LSS, 347SS, 304HSS, 316HSS, 310SS, 317SS, 317LSS, HASTELLOY, INCONEL, INCOLOY, DUPLEX, 410SS
4	SEAT RING	A351-CF8 / CF8M / CF3 / CF3M, STELLITED HARDFACING, TUNGSTEN CARBIDE
3	BALL	MONEL, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CG8M / CG3M / CN7M, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-C5 / C12
2	BONNET	A216-WCB, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CN7M / CG8M / CG3M, A352-LCB / LCC / LC1 / LC2, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-WC6 / WC9 / C5 / C12
1	BODY	A216-WCB, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CN7M / CG8M / CG3M, A352-LCB / LCC / LC1 / LC2, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-WC6 / WC9 / C5 / C12
No.	PART NAME	MATERIAL

3-WAY BALL VALVE (METAL SEAT)

Model No.
SBAF-M

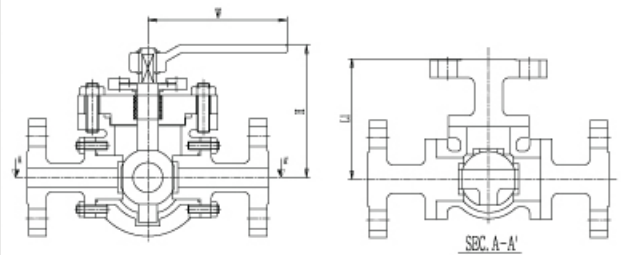
DIMENSION

(UNIT: mm)

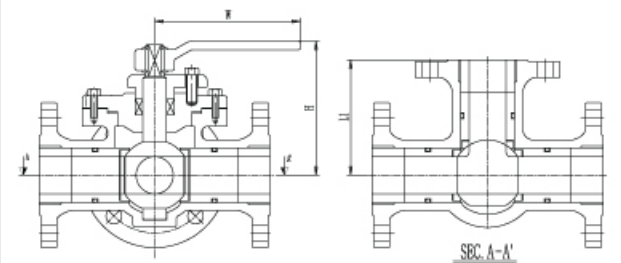
SIZE	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10
	mm	15	20	25	32	40	50	65	80	100	125	150	200	250
CL. 150 (JIS 10K)	L	280	280	300	210	210	230	260	290	430	460	500	620	850
	L1	140	140	150	105	105	134	130	145	215	230	250	310	425
	H	150	150	165	148	148	155	178	190	280	230	275	800	825
	W	245	240	245	245	245	245	290	290	500	550	550	GEAR OPERATOR	

※ Other NPS is available upon request

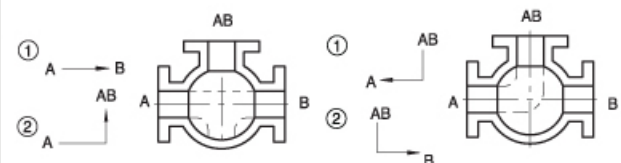
13	DESIGN	Maker Standard
12	FACE TO FACE	Maker Standard
11	FLANGED ENDS	ANSI B16.5
10	BUTT WELD ENDS	ANSI B16.25
9	BY-PASS & DRAIN	MSS SP-45
8	TEST	Maker Standard
7	CONSTRUCTION	<ul style="list-style-type: none"> • Locking Device • Anti-blow out stem • Antistatic Device • Fire Protection Structure • Middle Flange Leak-tight Structure • Dependable Seating Structure • Full and Reduced Bore • Manual Oper Required (gearbox, electric, pneumatic...)
6	BODY	A216-WCB, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CN7M / CG8M / CG3M, A352-LCB / LCC / LC1 / LC2, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-WC6 / WC9 / C5 / C12
5	BALL	MONEL, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CG8M / CG3M / CN7M, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-C5 / C12
4	STEM	MONEL, 304SS, 316SS, 316LSS, 304LSS, 347SS, 304HSS, 316HSS, 310SS, 317SS, 317LSS, HASTELLOY, INCONEL, INCOLOY, DUPLEX, 410SS
3	SEAT	A351-CF8 / CF8M / CF3 / CF3M, STELLITED HARDFACING, TUNGSTEN CARBIDE PTFE, RTFE, PEEK, PCTFE, NYLON, GRAPHITE, CARBON
2	GASKET	PTFE, RTFE, GRAPHITE, SPIRAL WOUND
1	OTHERS	H.F. Services, All Kind of Operated, All Type of Painting and Coating
No.	PART NAME	MATERIAL



<ELBOW TYPE>



<INTEGRAL TYPE>



<FLOW DIRECTION>



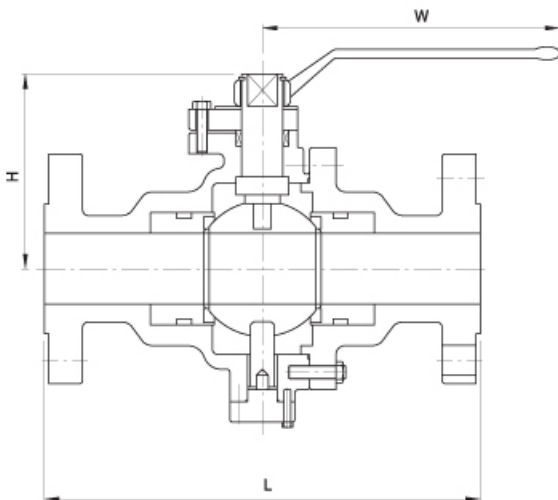
2-WAY BALL VALVE (TRUNNION TYPE)

Model No.
SBAF-T

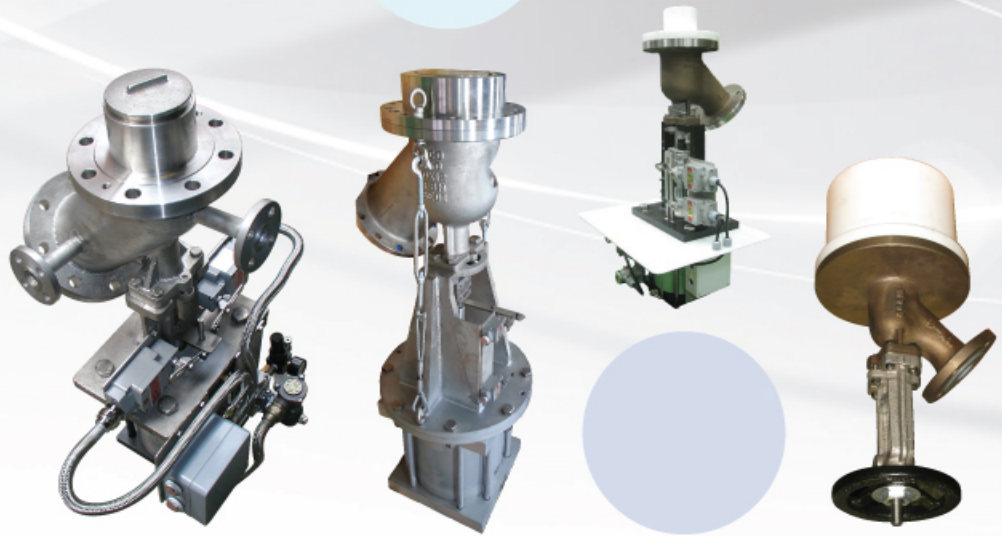
DIMENSION

(UNIT: mm)

Size	in	2	2½	3	4	5	6	8	10	12	14	16
	mm	50	65	80	100	125	150	200	250	300	350	400
CL. 600 (JIS 40K)	L	292	330	356	432	508	559	660	787	838	889	991
	H	160	183	192	220	235	285	370	615	680	710	750
	W	370	450	450	GEAR/ACTUATOR / MOV							



13	DESIGN	ANSI B16.34 & API-6D & API-608 or BS5351
12	FACE TO FACE	ANSI B16.10
11	FLANGED ENDS	ANSI B16.5
10	BUTT WELD ENDS	ANSI B16.25
9	BY-PASS & DRAIN	MSS SP-45
8	TEST	API-598, ANSI B16.34
7	CONSTRUCTION	<ul style="list-style-type: none"> • Open/close Position indicator • Locking Device • Anti-blow out stem • Antistatic Device • Fire Protection Structure • Middle Flange Leak-tight Structure • Dependable Seating Structure • Full and Reduced Bore • Manual Oper Required (gearbox, electric, pneumatic...)
6	BODY	A216-WCB, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CN7M / CG8M / CG3M, A352-LCB / LCC / LC1 / LC2, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-WC6 / WC9 / C5 / C12
5	BALL	MONEL, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CG8M / CG3M / CN7M, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-C5 / C12
4	STEM	MONEL, 304SS, 316SS, 316LSS, 304LSS, 347SS, 304HSS, 316HSS, 310SS, 317SS, 317LSS, HASTELLOY, INCONEL, INCOLOY, DUPLEX
3	SEAT	A351-CF8 / CF8M / CF3 / CF3M, STELLITED HARDFACING, TUNGSTEN CARBIDE PTFE, RTFE, PEEK, PCTFE, NYLON, GRAPHITE, CARBON
2	GASKET	PTFE, RTFE, GRAPHITE, SPIRAL WOUND
1	OTHERS	Cryogenic Services, H.F. Services, All Kind of Operated, All Type of Painting and Coating
No.	PART NAME	MATERIAL



TANK BOTTOM FLUSH VALVE

■ TANK BOTTOM FLUSH VALVE	34
UPPER TYPE	
LOWER TYPE	
■ BOTTOM FLUSH BALL VALVE	36

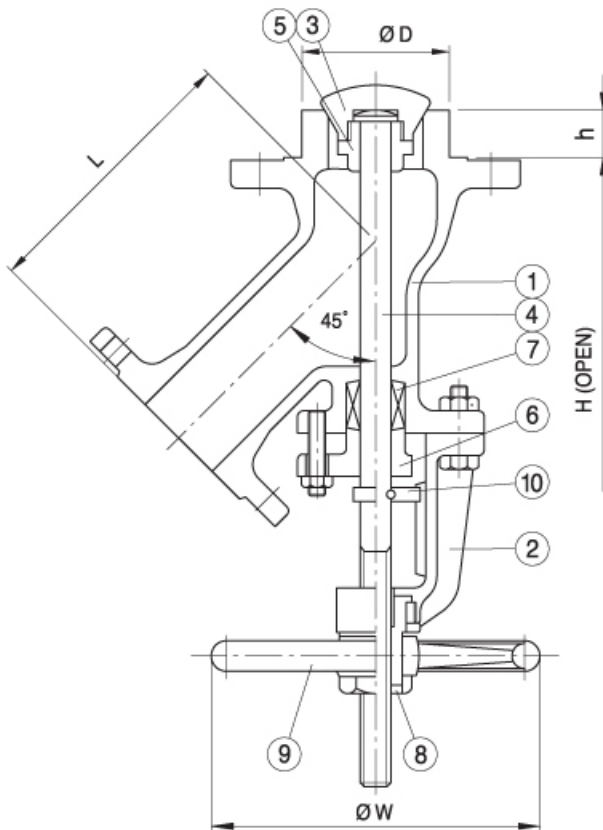
TANK BOTTOM FLUSH VALVE (UPPER TYPE)

Model No.
STBF-U

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
	mm	15	20	25	32	40	50	65	80	100	125	150	200
CL. 150 (JIS 10K)	L	115	115	115	140	140	160	170	220	230	250	290	340
	*H	350	350	320	340	340	350	445	475	560	720	770	1050
	*W	100	100	100	115	155	170	200	200	230	270	300	GEAR
	h	30	30	30	35	35	45	50	55	70	75	75	110
	D	38	38	38	55	55	65	80	95	114	140	165	220



10	STOPPER	304SS		
9	HAND WHEEL	A536(FCD)		
8	SLEEVE	A536(FCD)		
7	PACKING	PTFE		
6	PACKING GLAND	CF8(304)		
5	DISC GLAND	CF8(304)	CF8M(316)	CF3M(316L)
4	STEM	304SS	316SS	316LSS
3	DISC	CF8(304)	CF8M(316)	CF3M(316L)
2	YOKE	CF8(304)	CF8(304)	CF8(304)
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		



TANK BOTTOM FLUSH VALVE (LOWER TYPE)

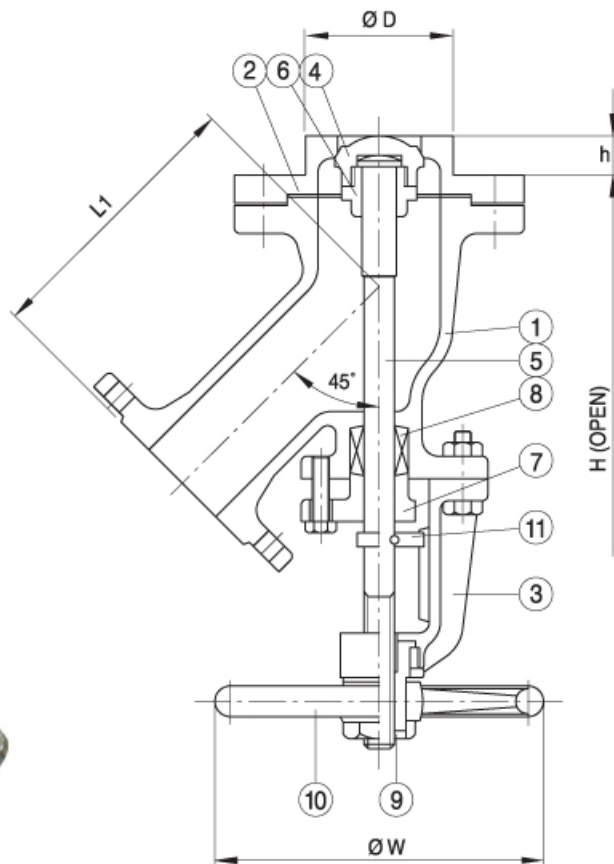
Model No.
STBF-L

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2 x 1 1/2	3/4 x 1 1/2	1 x 2	1 1/4 x 2 1/2	1 1/2 x 2 1/2	2 x 3	2 1/2 x 4	3 x 5	4 x 6	5 x 8	6 x 8	8 x 10	10 x 12
	mm	15 x 40	20 x 40	25 x 50	32 x 65	40 x 65	50 x 80	65 x 100	80 x 125	100 x 150	125 x 200	150 x 200	200 x 250	250 x 300
CL. 150 (JIS 10K)	L1	115	115	115	140	140	160	170	220	230	250	290	315	415
	*H	360	360	360	455	455	555	640	710	760	820	820	980	1900
	*W	155	155	155	170	170	200	200	230	270	300	350	400	GEAR
	h	30	30	30	35	38	45	45	64	76	90	100	115	101
	D	40	40	50	75	75	90	115	135	165	200	235	250	340

11	STOPPER	304SS		
10	HAND WHEEL	A536(FCD)		
9	SLEEVE	A536(FCD)		
8	PACKING	PTFE		
7	PACKING GLAND	CF8(304)		
6	DISC GLAND	CF8(304)	CF8M(316)	CF3M(316L)
5	STEM	304SS	316SS	316LSS
4	DISC	CF8(304)	CF8M(316)	CF3M(316L)
3	YOKE	CF8(304)	CF8(304)	CF8(304)
2	CAP	CF8	CF8M	CF3M
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		



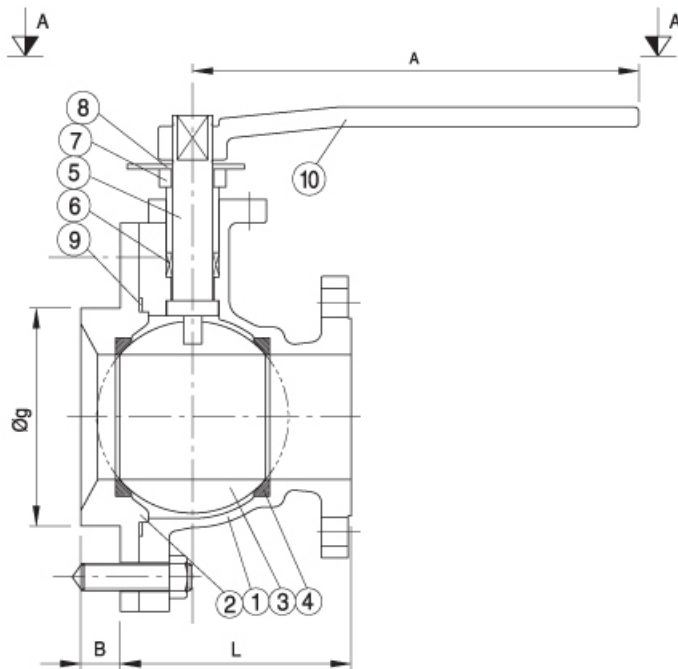
BOTTOM FLUSH BALL VALVE

Model No.
STBF-B

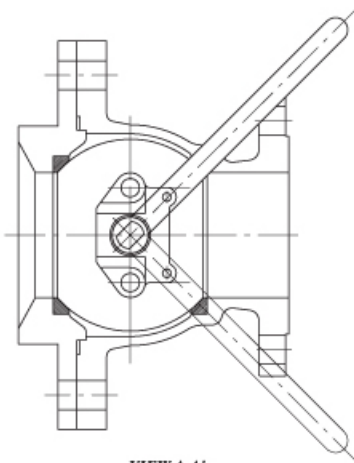
DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1	1½	2	2½	3	4	5	6	8
	mm		25	40	50	65	80	100	125	150
CL. 150 (JIS 10K)	L	94	109	123	130	150	169	253	263	329
	B	12	12	14.5	23	25	40	42	30	35
	g	49	61	77	114	140	165	192	250	300
	* A	185	245	245	245	370	450	600	GEAR	GEAR



10	HANDLE	WCB			
9	GASKET	PTFE			
8	STOPPER	304SS			
7	PACKING GLAND	CF8(304)			
6	PACKING	PTFE			
5	STEM	304SS	304SS	316SS	316LSS
4	SEAT RING	PTFE or RTFE			
3	BALL	CF8(304)	CF8(304)	CF8M(316)	CF3M(316L)
2	BONNET	WCB	CF8	CF8M	CF3M
1	BODY	WCB	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL			



VIEW A-A'



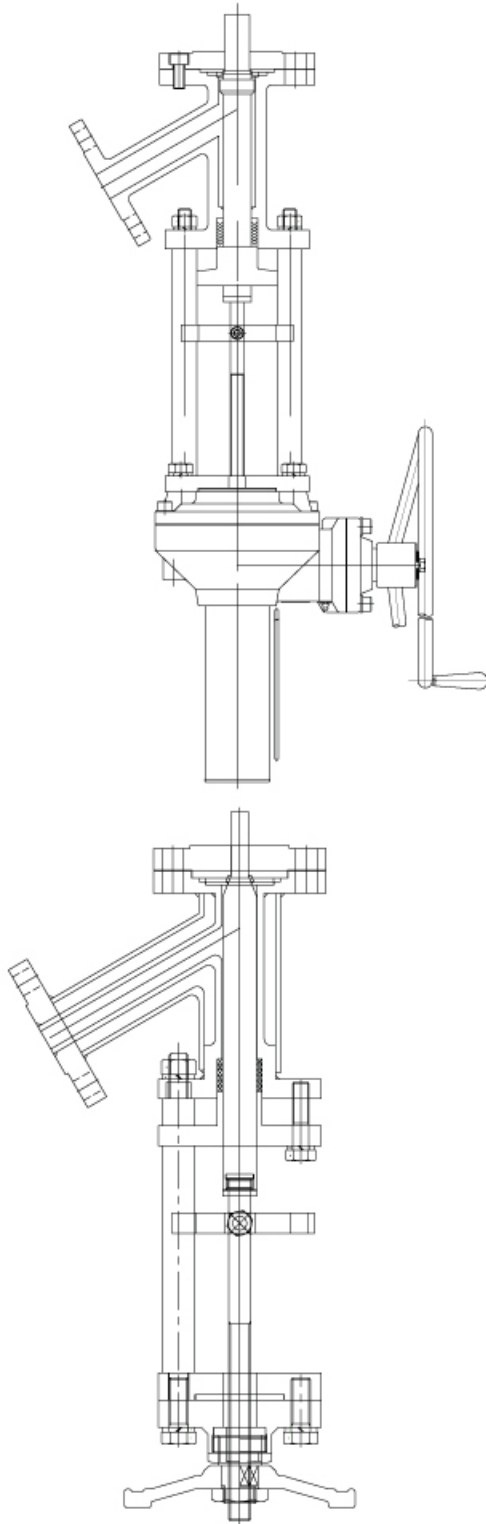


RAM PISTON VALVE

■ MANUAL TYPE	38
■ MOV OPERATING TYPE	39
■ PNEUMATIC OPERATING TYPE	40

MANUAL TYPE

Model No.
SRAM-MA



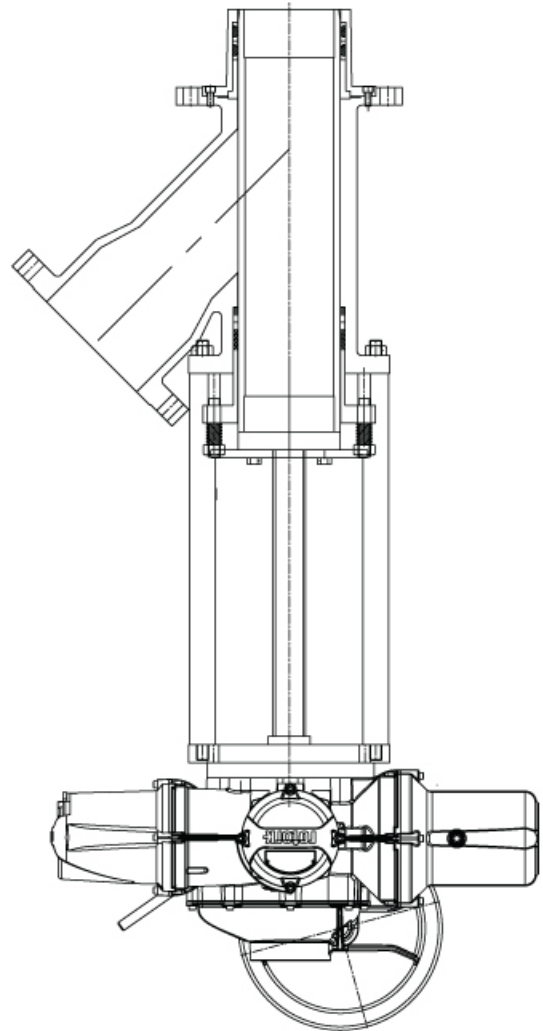
8	DESIGN	CLIENT SCOPE
7	CONSTRUCTION	<ul style="list-style-type: none"> • Open/close Position indicator • Full and Reduced Bore • Manual Oper Required (gearbox, electric, pneumatic...)
6	BODY	A216-WCB, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CN7M / CG8M / CG3M, A352-LCB / LCC / LC1 / LC2, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-WC6 / WC9 / C5 / C12
5	PISTON	MONEL, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CG8M / CG3M / CN7M, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-C5 / C12
4	STEM	MONEL, 304SS, 316SS, 316LSS, 304LSS, 347SS, 304HSS, 316HSS, 310SS, 317SS, 317LSS, HASTELLOY, INCONEL, INCOLOY, DUPLEX
3	SEAT	A351-CF8 / CF8M / CF3 / CF3M, STELLITED HARDFACING, TUNGSTEN CARBIDE PTFE, RTFE, PEEK, PCTFE, NYLON, GRAPHITE, CARBON
2	GASKET	PTFE, RTFE, GRAPHITE, SPIRAL WOUND
1	OTHERS	H.F. Services, All Kind of Operated, All Type of Painting and Coating
No.	PART NAME	MATERIAL



MOV OPERATING TYPE

Model No.
SRAM-MOV

8	DESIGN	CLIENT SCOPE
7	CONSTRUCTION	<ul style="list-style-type: none"> • Open/close Position indicator • Full and Reduced Bore • Manual Oper Required (gearbox, electric, pneumatic...)
6	BODY	A216-WCB, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CN7M / CG8M / CG3M, A352-LCB / LCC / LC1 / LC2, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-WC6 / WC9 / C5 / C12
5	PISTON	MONEL, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CG8M / CG3M / CN7M, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-C5 / C12
4	STEM	MONEL, 304SS, 316SS, 316LSS, 304LSS, 347SS, 304HSS, 316HSS, 310SS, 317SS, 317LSS, HASTELLOY, INCONEL, INCOLOY, DUPLEX
3	SEAT	A351-CF8 / CF8M / CF3 / CF3M, STELLITED HARDFACING, TUNGSTEN CARBIDE PTFE, RTFE, PEEK, PCTFE, NYLON, GRAPHITE, CARBON
2	GASKET	PTFE, RTFE, GRAPHITE, SPIRAL WOUND
1	OTHERS	H.F. Services, All Kind of Operated, All Type of Painting and Coating
No.	PART NAME	MATERIAL

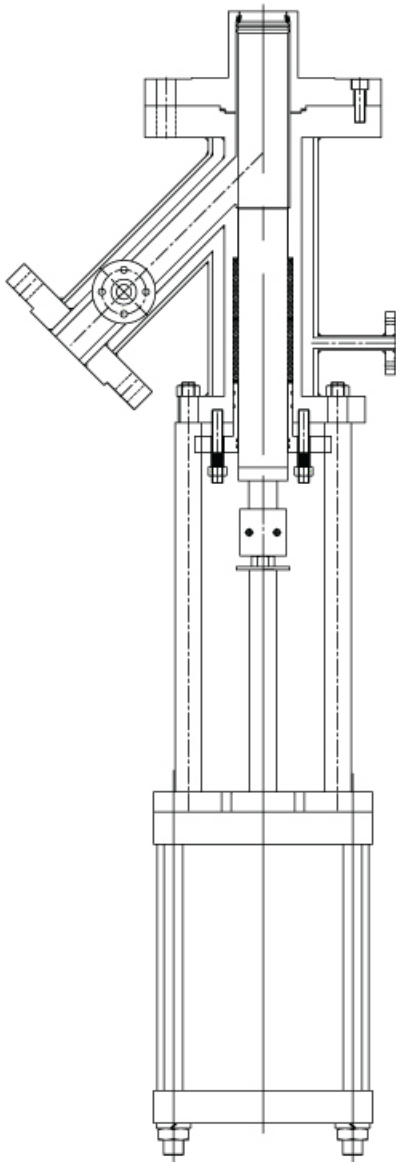


RAM PISTON VALVE



PNEUMATIC OPERATING TYPE

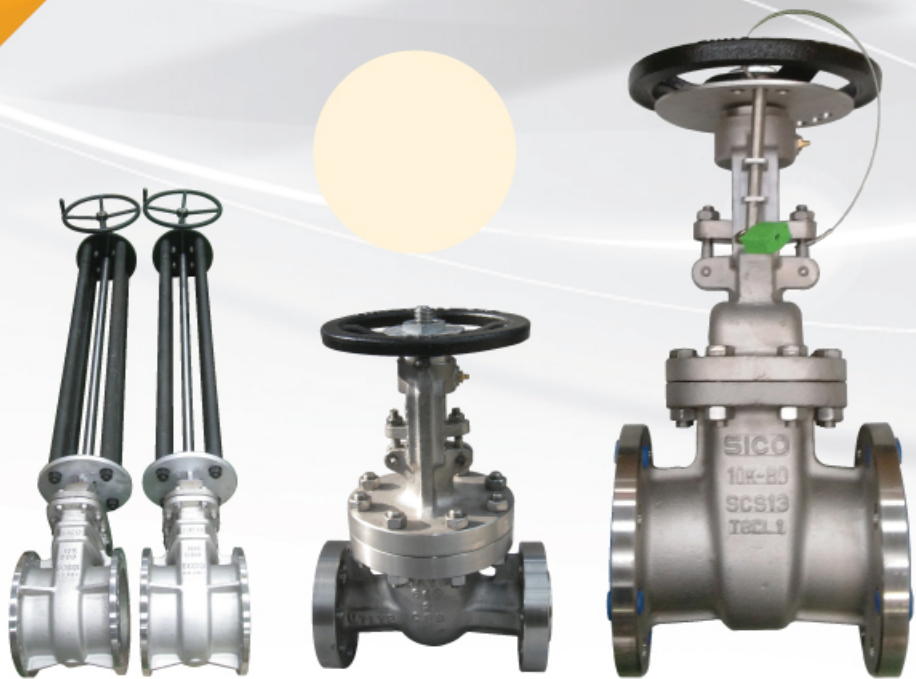
Model No.
SRAM-PNE



8	DESIGN	CLIENT SCOPE
7	CONSTRUCTION	<ul style="list-style-type: none"> • Open/close Position indicator • Full and Reduced Bore • Manual Oper Required (gearbox, electric, pneumatic...)
6	BODY	A216-WCB, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CN7M / CG8M / CG3M, A352-LCB / LCC / LC1 / LC2, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-WC6 / WC9 / C5 / C12
5	PISTON	MONEL, A351-CF8 / CF8M / CF3 / CF3M / CF8C / CF10 / CF10M / CK20 / CG8M / CG3M / CN7M, HASTELLOY, INCONEL, INCOLOY, DUPLEX, ASTM B61, B62, B148, A890-4A, A217-C5 / C12
4	STEM	MONEL, 304SS, 316SS, 316LSS, 304LSS, 347SS, 304HSS, 316HSS, 310SS, 317SS, 317LSS, HASTELLOY, INCONEL, INCOLOY, DUPLEX
3	SEAT	A351-CF8 / CF8M / CF3 / CF3M, STELLITED HARDFACING, TUNGSTEN CARBIDE PTFE, RTFE, PEEK, PCTFE, NYLON, GRAPHITE, CARBON
2	GASKET	PTFE, RTFE, GRAPHITE, SPIRAL WOUND
1	OTHERS	H.F. Services, All Kind of Operated, All Type of Painting and Coating
No.	PART NAME	MATERIAL



RAM PISTON VALVE



GATE VALVE

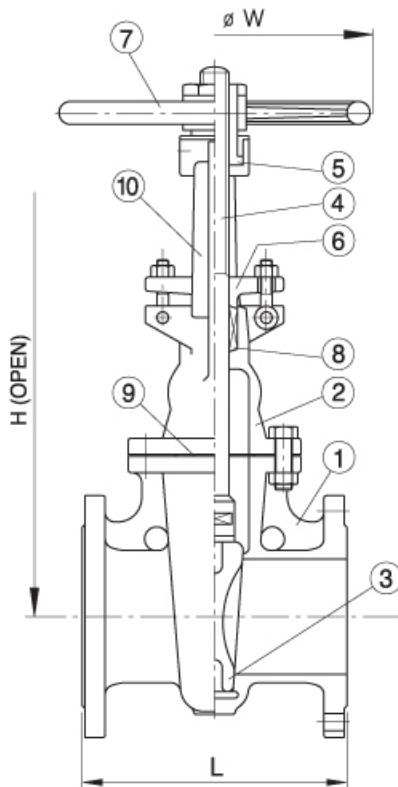
GATE VALVE

Model No.
SGAF

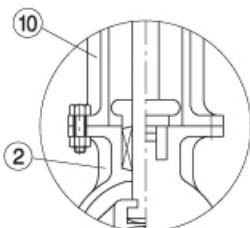
DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

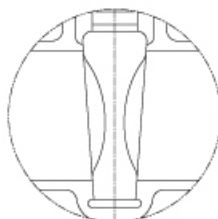
Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20
	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500
CL. 150 (JIS 10K)	L	108	117	127	140	165	178	190	203	229	254	267	292	330	356	381	406	432	457
	*H	204	209	229	262	283	350	409	435	520	597	720	820	1020	1180	1350	1530	1710	1910
	*W	100	100	125	125	155	170	170	200	230	270	300	350	400	400	400	400	500	600
CL. 300 (JIS 20K)	L	140	152	165	178	190	216	241	283	305	381	403	419	457	502	762	838	914	991
	*H	209	210	226	259	293	370	445	475	565	639	780	933	1138	1338	1669	1880	2145	2505
	*W	100	100	125	125	155	170	170	200	230	270	300	350	400	400	600	600	700	800



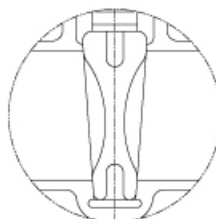
10	YOKE	CF8(304)		
9	GASKET	PTFE		
8	PACKING	PTFE		
7	HAND WHEEL	A536(FCD)		
6	PACKING GLAND	CF8		
5	SLEEVE	A536(FCD)		
4	STEM	304SS	316SS	316LSS
3	DISC	CF8(304)	CF8M(316)	CF3M(316L)
2	BONNET	CF8	CF8M	CF3M
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		



8B OVER

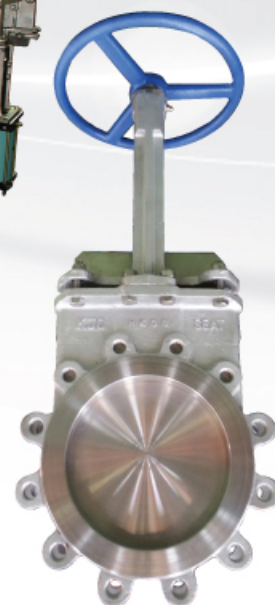


3" (80A) and smaller
(Solid Wedge Type)



4" (100A) and smaller
(Flexible Wedge Type)





KNIFE GATE VALVE

■ KNIFE GATE VALVE

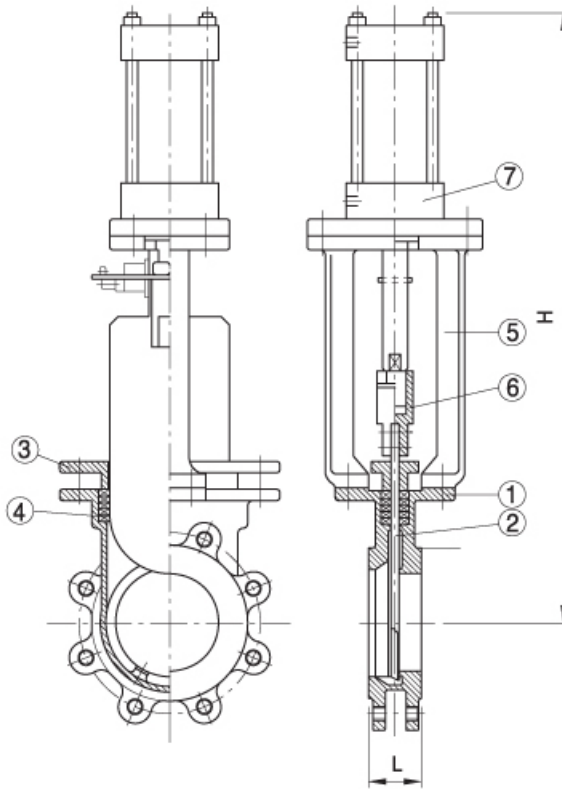
PNEUMATIC OPERATED KNIFE GATE VALVE

Model No.
SKNF-DA (DOUBLE ACTING TYPE)
SKNF-SR (SPRING RETURN TYPE)

DIMENSION (*REFERENCE DIMENSION)

(UNIT: mm)

Size	in	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20
	mm	50	65	80	100	125	150	200	250	300	350	400	450	500
CL. 150 (JIS 10K)	L	47.6	51	51	51	57	57	70	70	76	76	89	89	114
	*H	520	550	590	675	765	830	980	1170	1335	1460	1610	1900	2200



8	ACCESSORY	OPTION		
7	ACTUATOR	PNEUMATIC		
6	KNUCKLE	C · S		
5	YOKE	A536(FCD)		
4	PACKING	PTFE		
3	PACKING GLAND	CF8(304)		
2	DISC	304SS	316SS	316LSS
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		





GLOBE VALVE

■ GLOBE VALVE	46
■ Y-GLOBE VALVE	47
■ AUTO GLOBE VALVE	48

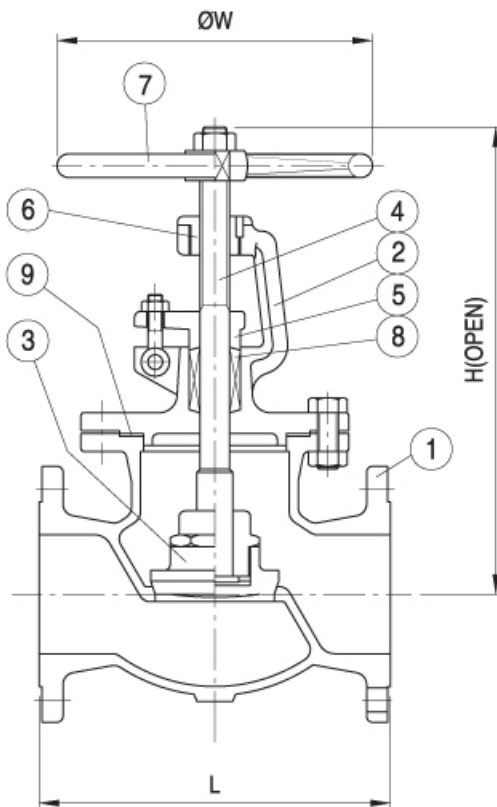
GLOBE VALVE

Model No.
SGLF

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16
	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
CL. 150 (JIS 10K)	L	108	117	127	140	165	203	216	241	292	356	406	495	622	698	787	914
	*H	195	195	227	240	260	270	290	327	340	385	448	545	666	685	793	1190
	*W	100	100	125	125	155	170	200	200	230	270	300	350	400	400	500	600
CL. 300 (JIS 20K)	L	152	178	203	216	229	267	292	318	356	400	444	559	622	711	838	864
	*H	215	215	245	260	280	335	380	445	460	490	529	670	789	832	891	1600
	*W	100	100	125	125	155	170	200	230	270	350	400	450	450	500	500	600



9	GASKET	PTFE		
8	PACKING	PTFE		
7	HAND WHEEL	A536(FCD)		
6	SLEEVE	A536(FCD)		
5	PACKING GLAND	CF8		
4	STEM	304SS	316SS	316LSS
3	DISC	CF8(304)	CF8M(316)	CF3M(316L)
2	BONNET	CF8	CF8M	CF3M
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		



Y-GLOBE VALVE

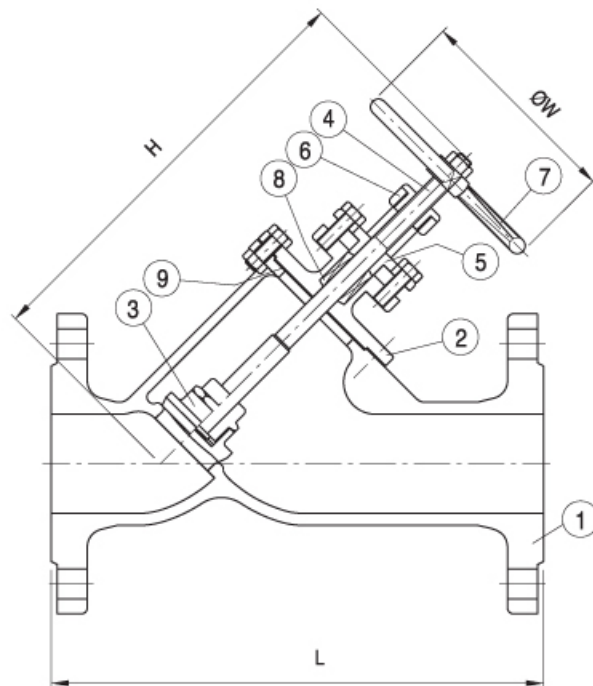
Model No.
SYGLF

DIMENSION (× REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10
	mm	15	20	25	32	40	50	65	80	100	125	150	200	250
CL. 150 (JIS 10K)	L	140	140	160	220	220	250	280	318	344	394	442	575	673
	*H	180	180	200	247	247	282	313	358	404	483	555	665	869
	*W	125	125	125	125	155	170	200	200	230	270	300	400	450
CL. 300 (JIS 20K)	L	160	160	195	265	265	267	292	335	400	480	520	582	673
	*H	180	180	200	247	247	282	333	373	424	503	574	715	869
	*W	125	125	125	125	155	170	200	200	230	270	300	400	450

9	GASKET	PTFE		
8	PACKING	PTFE		
7	HAND WHEEL	A536(FCD)		
6	SLEEVE	A536(FCD)		
5	PACKING GLAND	CF8		
4	STEM	304SS	316SS	316LSS
3	DISC	CF8(304)	CF8M(316)	CF3M(316L)
2	BONNET	CF8	CF8M	CF3M
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		



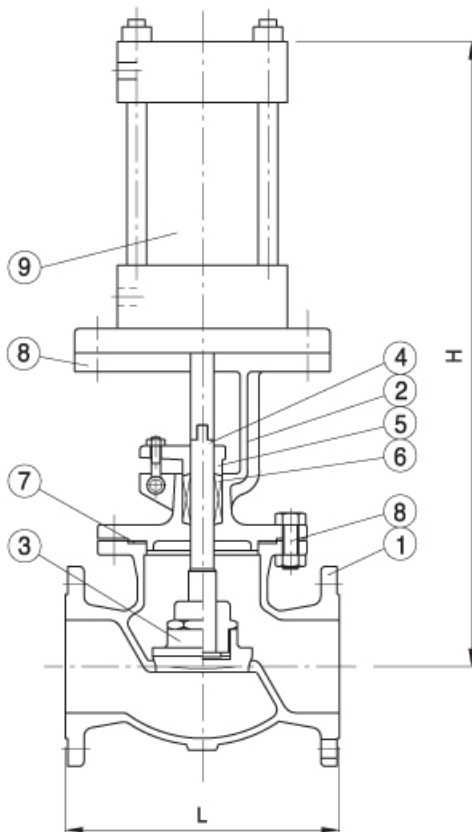
PNEUMATIC OPERATED ON-OFF GLOBE VALVE

Model No.
SKNF-DA (DOUBLE ACTING TYPE)
SKNF-SR (SPRING RETURN TYPE)

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16
	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
CL. 150 (JIS 10K)	L	108	117	127	140	165	203	216	241	292	356	406	495	622	698	787	914
	*H	200	200	210	250	254	270	312	326	372	462	479	565	747	875	-	-



10	ACCESSORY	OPTION		
9	ACTUATOR	PNEUMATIC		
8	BRACKET	A536(FCD)		
7	GASKET	PTFE		
6	PACKING	PTFE		
5	PACKING GLAND	CF8(304)		
4	STEM	304SS	316SS	316LSS
3	DISC	CF8(304)	CF8M(316)	CF3M(316L)
2	BONNET	CF8	CF8M	CF3M
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		





CHECK VALVE

■ SWING CHECK VALVE 50

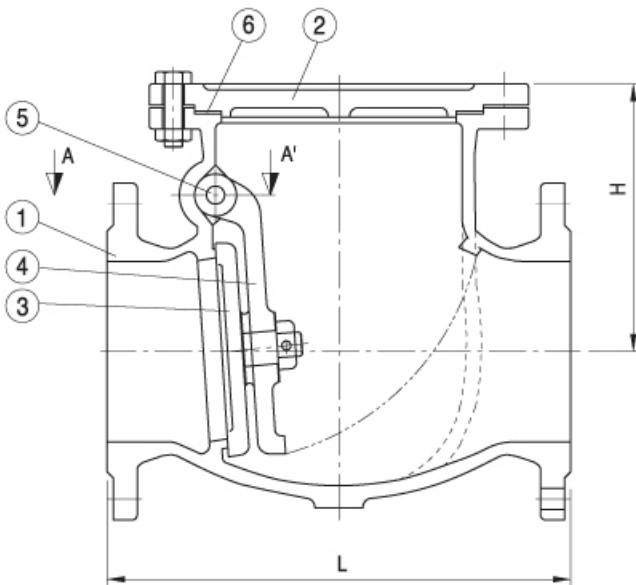
SWING CHECK VALVE

Model No.
SCHF

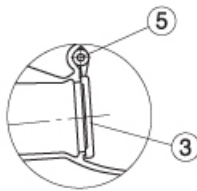
DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

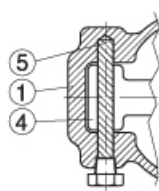
Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16
	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
CL. 150 (JIS 10K)	L	108	117	127	140	165	203	216	241	292	330	356	495	622	698	787	864
	*H	70	75	80	85	90	105	125	155	165	185	225	280	325	370	400	430
CL. 300 (JIS 20K)	L	140	152	216	229	241	267	292	318	356	400	444	533	622	711	838	-
	*H	70	75	95	100	105	130	150	170	220	240	270	300	350	390	420	-



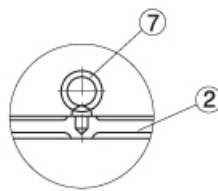
7	EYE BOLT	A307-B		
6	GASKET	PTFE		
5	HINGE PIN	304SS	316SS	316LSS
4	DISC ARM	CF8(304)	CF8M(316)	CF3M(316L)
3	DISC	CF8(304)	CF8M(316)	CF3M(316L)
2	COVER	CF8	CF8M	CF3M
1	BODY	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL		



2B UNDER



SEC. A-A'



5B OVER





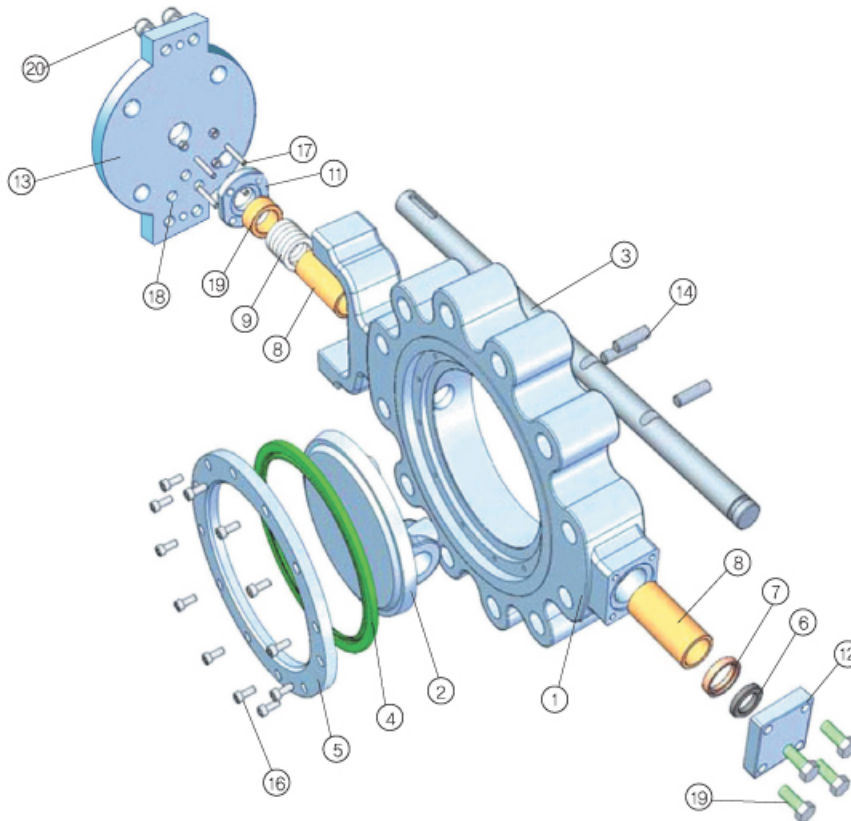
BUTTERFLY VALVE

■ HIGH PERFORMANCE BUTTERFLY VALVE DESIGN

52

HIGH PERFORMANCE BUTTERFLY VALVE DESIGN

Model No.
SBVF-H



No.	PART	MATERIALS
1	BODY	DUCTILE IRON, CAST STEEL, STAINLESS STEEL, ALUMINIUM BRONZE
2	DISC	
3	SHAFT	STAINLESS, DUPLEX, MONEL
4	BODY SEAT	PTFE, NBR, EPDM, VITON, SILICON, NR, ETC
5	BODY SEAT RETAINER	STAINLESS, ALUMINIUM BRONZE, MONEL
6	SHAFT RING	ALUMINIUM BRONZE, STAINLESS, DUPLEX, MONEL
7	SHAFT RING HOLDER	STAINLESS, DUPLEX, MONEL
8	MAIN / BUSH	ALUMINIUM BRONZE, STAINLESS+CHROME
9	PACKING	PTFE, NBR, EPDM, VITON, SILICON, NR, ETC
10	PACKING BUSH	BRONZE, ALUMINIUM BRONZE
11	PACKING GLAND	STEEL PLATE, STAINLESS, ALUMINIUM BRONZE
12	END COVER/GASKET	STAINLESS, ALUMINIUM BRONZE / NBR, EPDM
13	TOP FLANGE	STAINLESS, DUPLEX, MONEL
14	TAPER PIN	STAINLESS, DUPLEX, MONEL
16	RETAINER BOLT	STAINLESS
17	PACKING BOLT	STAINLESS
18	PACKING NUT	STAINLESS
19	COVER BOLT	STAINLESS
20	BRACKET BOLT	STAINLESS



STRAINER

■ Y-STRAINER (CASTING TYPE)	54
■ BUCKET-STRAINER (WELDING TYPE)	55
■ TEMPORARY STRAINER	56

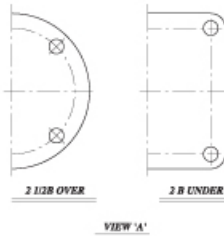
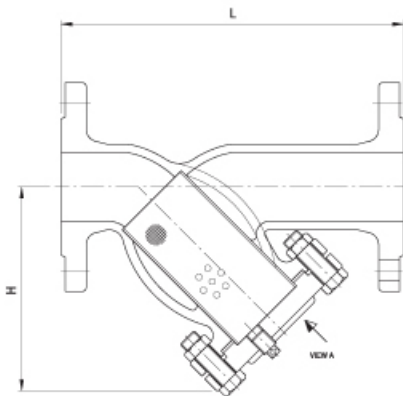
Y-STRAINER (CASTING TYPE)

Model No.
SSTF-Y

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14
	mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350
CL. 150 (JIS 10K)	L	140	140	160	220	220	250	280	318	344	394	442	575	673	775	880
	*H	75	75	100	130	130	140	200	220	240	300	330	410	480	570	670
CL. 300 (JIS 20K)	L	160	160	195	265	265	267	292	335	400	460	520	582	673	810	912
	*H	80	80	100	130	130	160	220	235	270	365	375	450	475	490	615



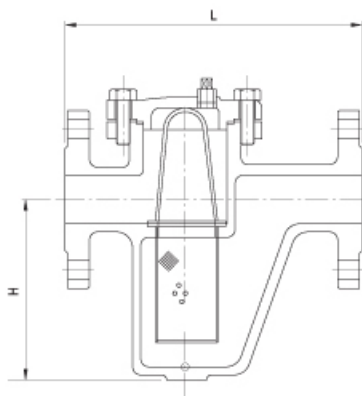
BUCKET STRAINER (CASTING TYPE)

Model No.
SSTF-B

DIMENSION (* REFERENCE DIMENSION)

(UNIT: mm)

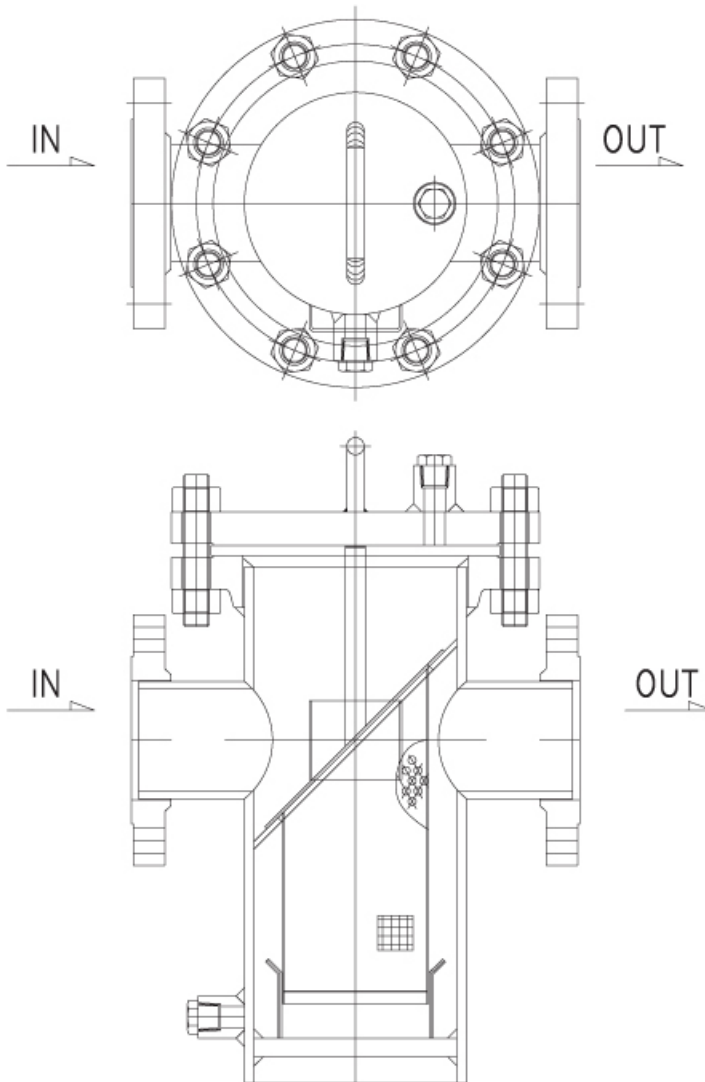
Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
	mm	15	20	25	32	40	50	65	80	100	125	150	200
CL. 150 (JIS 10K)	L	180	180	190	230	230	260	290	300	385	460	500	630
	*H	75	75	120	145	145	145	180	200	290	350	420	552



BUCKET-STRAINER (WELDING TYPE)

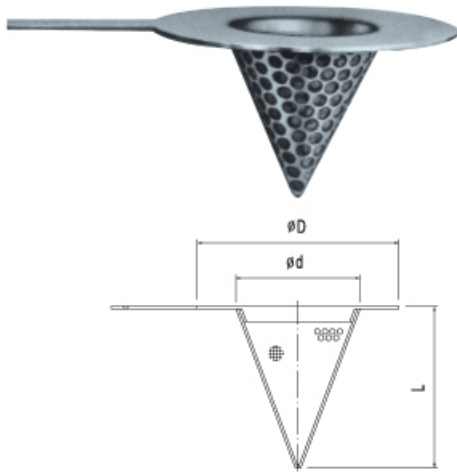
Model No.
SSTF-W

6	DRAIN PLUG	304SS	316SS	316LSS
5	VENT PLUG	304SS	316SS	316LSS
4	GASKET	PTFE		
3	PUNCHING PLATE	304SS	316SS	316LSS
2	COVER	304SS	316SS	316LSS
1	BODY	304SS	316SS	316LSS
NO.	PART NAME	MATERIAL		



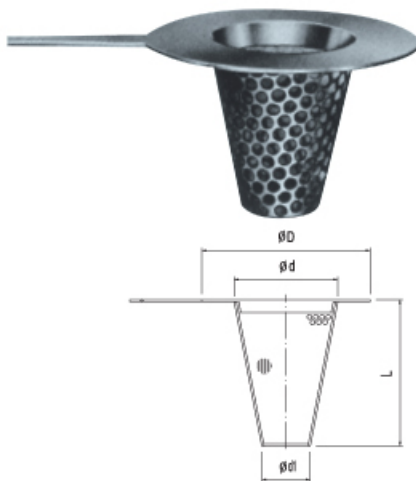
TEMPORARY STRAINER

SIC-1



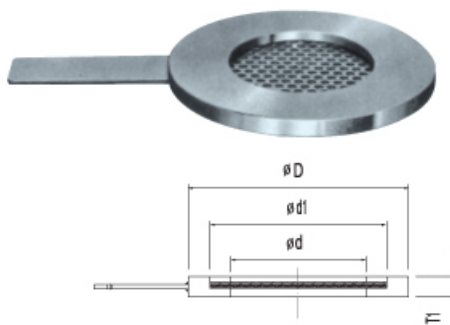
Size	L	d	D			
			JIS 10kg/cm ²	JIS 20kg/cm ²	ANSI 150psi	ANSI 300psi
15A (1/2B)	25	13	55		45.5	51.5
20A (3/4B)	30	18	60		55	63.5
25A (1 B)	40	23	71		64.5	70
32A (1 1/4B)	45	30	81		74	79.5
40A (1 1/2B)	50	36	86		83.5	92.5
50A (2 B)	60	46	101		101.5	108
65A (2 1/2B)	70	58	121		120.5	127
80A (3 B)	80	70	131	137	133.5	146.5
100A (4 B)	100	92	156	162	171.5	178
125A (5 B)	120	115	187	200	194	213
150A (6 B)	140	135	217	235	219.5	248
200A (8 B)	190	185	267	280	276.5	305
250A (10B)	230	230	330	353	337	358.5
300A (12B)	270	270	375	403	407	419
350A (14B)	310	305	420	447	447	482.5
400A (16B)	350	350	483	507	510.5	536.5
450A (18B)	410	400	538	572	546	593.5
500A (20B)	460	450	593	627	603	651

SIC-2



Size	d	d ₁	L	D			
				JIS 10kg/cm ²	JIS 20kg/cm ²	ANSI 150psi	ANSI 300psi
15A (1/2B)	13	10	25	55		45.5	51.5
20A (3/4B)	18	10	30	60		55	63.5
25A (1 B)	23	10	40	71		64.5	70
32A (1 1/4B)	30	15	45	81		74	79.5
40A (1 1/2B)	36	20	50	86		83.5	92.5
50A (2 B)	46	25	60	101		101.5	108
65A (2 1/2B)	58	30	70	121		120.5	127
80A (3 B)	70	40	80	131	137	133.5	146.5
100A (4 B)	92	55	100	156	162	171.5	178
125A (5 B)	115	70	120	187	200	194	213
150A (6 B)	135	90	140	217	235	219.5	248
200A (8 B)	185	100	190	267	280	276.5	305
250A (10B)	230	120	230	330	353	337	358.5
300A (12B)	270	140	270	375	403	407	419
350A (14B)	305	160	310	420	447	447	482.5
400A (16B)	350	180	350	483	507	510.5	536.5
450A (18B)	400	200	410	538	572	546	593.5
500A (20B)	450	220	460	593	627	603	651

SIC-3



Size	d	d ₁	T ₁	D			
				JIS 10kg/cm ²	JIS 20kg/cm ²	ANSI 150psi	ANSI 300psi
15A (1/2B)	18	30	4	55		45.5	51.5
20A (3/4B)	24	38	4	60		55	63.5
25A (1 B)	29	45	4	71		64.5	70
32A (1 1/4B)	36	54	4	81		74	79.5
40A (1 1/2B)	44	63	4	86		83.5	92.5
50A (2 B)	55	75	6	101		101.5	108
65A (2 1/2B)	70	90	6	121		120.5	127
80A (3 B)	83	105	6	131	137	133.5	146.5
100A (4 B)	105	130	8	156	162	171.5	178
125A (5 B)	130	158	8	187	200	194	213
150A (6 B)	155	185	10	217	235	219.5	248
200A (8 B)	205	235	10	267	280	276.5	305
250A (10B)	255	290	10	330	353	337	358.5



SIGHT GLASS

SIGHT GLASS

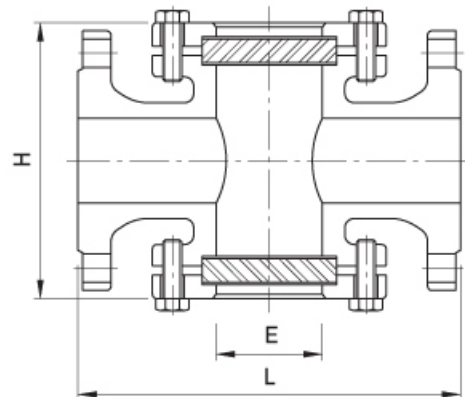
Model No. SSGF-C(CROSS TYPE)

DIMENSION

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
	mm	15	20	25	32	40	50	65	80	100	125	150	200
CL. 150 (JIS 10K)	L	130	150	170	200	200	220	254	260	295	380	380	460
	H	155	100	110	125	125	140	200	220	255	300	310	396
	E	36	36	45	60	60	78	90	110	128	169	210	210

4	GASKET	GRAPHITE, PTFE			
3	GLASS	HARD, BOROSILICATE			
2	CAP	WCB	CF8	CF8M	CF3M
1	BODY	WCB	CF8	CF8M	CF3M
NO.	PART NAME	MATERIAL			



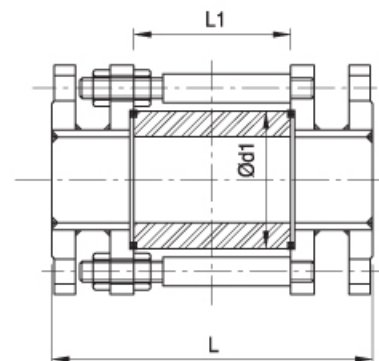
Model No. SSGF-L(LANTERN TYPE)

DIMENSION

(UNIT: mm)

Size	in	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
	mm	15	20	25	32	40	50	65	80	100	125	150	200
CL. 150 (JIS 10K)	L	220	220	220	220	220	240	240	240	260	280	280	280
	L1	74	74	74	74	74	74	74	74	74	74	74	74
	d1	40	45	55	65	70	85	100	110	140	165	195	250

5	FLANGE	WCB	CF8	CF8M	CF3M
4	FLANGE	WCB	CF8	CF8M	CF3M
3	O-RING	NBR, VITON			
2	GLASS	HARD, BOROSILICATE			
1	BODY	A105	TP304	TP316	TP316L
NO.	PART NAME	MATERIAL			



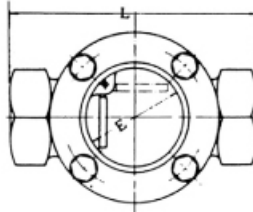
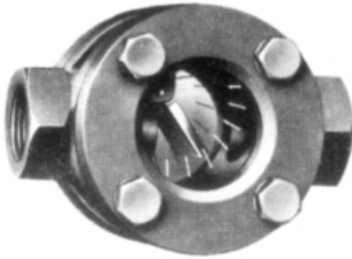
SIGHT GLASS

WITH FLAPPER

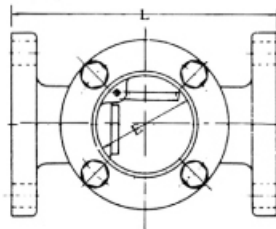
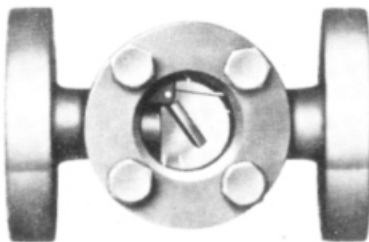
(Max. working pressure 10kg/cm²)

SICO[®] Sight glass with flapper can check the state of fluid flow by opening and closing the flapper.

SSGS-F(Screw end)



SSGS-F(Flange end)



SPECIALITY

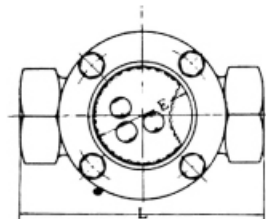
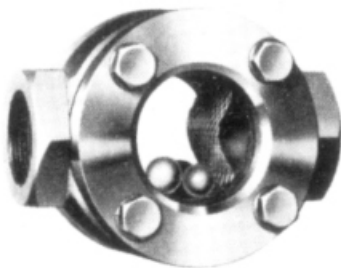
1. The flapper pushes the inlet side lightly by spring. Therefore, it don't open by its own weight. For this reason, we can use this not withstanding the direction of fluid flow.
2. Flapper, pin & spring are made from stainless steel, so don't rust.
3. Glass is strengthened glass and tested by pressure of 20kg/cm².

WITH BALL

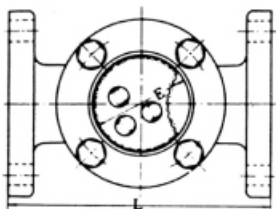
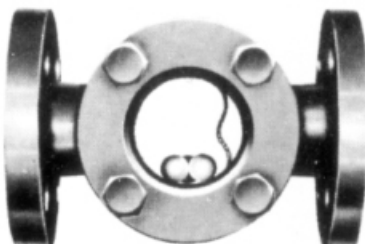
(Max. working pressure 10kg/cm²)

SICO[®] Sight glass with balls can check the fluid flow by the motion of balls.

SSGS-B(Screw end)



SSGS-B(Flange end)



SPECIALITY

1. This has some balls which are different specific weight each other. Therefore balls move sensitively by the flow state of fluid.
2. This can use for any direction of fluid flow.
3. Structure is very simple, so there is no functional disorder due to dust, etc.

ASTM 2013

ASTM	GRADE	UNS No.	C	Mn	Si	S	P	Cr	Ni	Mo	Cu	V	Cb/Nb	N	T.S	Y.S	E	R/A
			%	%	%	%	%	%	%	%	%	%	%	%	%	Mpa	Mpa	%
A216	WCA	J02502	MAX 0.25	MAX 0.70	MAX 0.600	MAX 0.035	MAX 0.035	MAX 0.50	MAX 0.50	MAX 0.20	MAX 0.30	MAX 0.03			415 -585	MIN 205	MIN 24	MIN 35
	WCB	J03002	MAX 0.30	MAX 1.00	MAX 0.600	MAX 0.035	MAX 0.035	MAX 0.50	MAX 0.50	MAX 0.20	MAX 0.30	MAX 0.03			485 -655	MIN 250	MIN 22	MIN 35
	WCC	J02503	MAX 0.25	MAX 1.20	MAX 0.600	MAX 0.035	MAX 0.035	MAX 0.50	MAX 0.50	MAX 0.20	MAX 0.30	MAX 0.03			485 -655	MIN 275	MIN 22	MIN 35
A351	CF3/CF3A	J92700	MAX 0.03	MAX 1.50	MAX 2.00	MAX 0.040	MAX 0.040	17.0 -21.0	8.0 -12.0	MAX 0.50					MIN 485 / 530	MIN 205 / 240	MIN 35	
	CF8/CF8A	J92600	MAX 0.08	MAX 1.50	MAX 2.00	MAX 0.040	MAX 0.040	18.0 -21.0	8.0 -11.0	MAX 0.50					MIN 485 / 530	MIN 205 / 240	MIN 35	
	CF3M/CF3MA	J92800	MAX 0.03	MAX 1.50	MAX 1.50	MAX 0.040	MAX 0.040	17.0 -21.0	9.0 -13.0	2.0 -3.0					MIN 485 / 550	MIN 205 / 255	MIN 30	
	CF8M	J92900	MAX 0.08	MAX 1.50	MAX 1.50	MAX 0.040	MAX 0.040	18.0 -21.0	9.0 -12.0	2.0 -3.0					MIN 485	MIN 205	MIN 30	
	CF3MN	J92804	MAX 0.03	MAX 1.50	MAX 1.50	MAX 0.040	MAX 0.040	17.0 -21.0	9.0 -13.0	2.0 -3.0				0.10 -0.20	MIN 515	MIN 255	MIN 35	
	CF8C	J92710	MAX 0.08	MAX 1.50	MAX 2.00	MAX 0.040	MAX 0.040	18.0 -21.0	9.0 -12.0	MAX 0.50				note:a	MIN 485	MIN 205	MIN 30	
	CF10	J92950	0.04 0.10	MAX 1.50	MAX 2.00	MAX 0.040	MAX 0.040	18.0 -21.0	8.0 -11.0	MAX 0.50					MIN 485	MIN 205	MIN 35	
	CF10M	J92901	0.04 0.10	MAX 1.50	MAX 1.50	MAX 0.040	MAX 0.040	18.0 -21.0	9.0 -12.0	2.0 -3.0					MIN 485	MIN 205	MIN 30	
	CH8	J93400	MAX 0.08	MAX 1.50	MAX 1.50	MAX 0.040	MAX 0.040	22.0 -26.0	12.0 -15.0	MAX 0.50					MIN 450	MIN 195	MIN 30	
	CH10	J93401	0.04 -0.10	MAX 1.50	MAX 2.00	MAX 0.040	MAX 0.040	22.0 -26.0	12.0 -15.0	MAX 0.50					MIN 485	MIN 205	MIN 30	
	CH20	J93402	0.04 -0.20	MAX 1.50	MAX 2.00	MAX 0.040	MAX 0.040	22.0 -26.0	12.0 -15.0	MAX 0.50					MIN 485	MIN 205	MIN 30	
	CK20	J94202	0.04 -0.20	MAX 1.50	MAX 1.75	MAX 0.040	MAX 0.040	23.0 -27.0	19.0 -22.0	MAX 0.50					MIN 450	MIN 195	MIN 30	
	HK30	J94203	0.25 -0.35	MAX 1.50	MAX 1.75	MAX 0.040	MAX 0.040	23.0 -27.0	19.0 -22.0	MAX 0.50					MIN 450	MIN 240	MIN 10	
	HK40	J94204	0.35 -0.45	MAX 1.50	MAX 1.75	MAX 0.040	MAX 0.040	23.0 -27.0	19.0 -22.0	MAX 0.50					MIN 425	MIN 240	MIN 10	
	HT30	N08030	0.25 -0.35	MAX 2.00	MAX 2.50	MAX 0.040	MAX 0.040	13.0 -17.0	33.0 -37.0	MAX 0.50					MIN 450	MIN 195	MIN 15	
	CF10MC		MAX 0.10	MAX 1.50	MAX 1.50	MAX 0.040	MAX 0.040	15.0 -18.0	13.0 -16.0	1.75 -2.25				note:b	MIN 485	MIN 205	MIN 20	
	CN7M	N08007	MAX 0.07	MAX 1.50	MAX 1.50	MAX 0.040	MAX 0.040	19.0 -22.0	27.5 -30.5	2.0 -3.0	3.0 -4.0				MIN 425	MIN 170	MIN 35	
	CN3MN	J94651	MAX 0.03	MAX 2.00	MAX 1.00	MAX 0.010	MAX 0.040	20.0 -22.0	23.5 -25.5	6.0 -7.0	MAX 0.75			0.18 -0.26	MIN 550	MIN 260	MIN 35	
	CG6MMN	J93790	MAX 0.06	4.00 -6.00	MAX 1.00	MAX 0.030	MAX 0.040	20.5 -23.5	11.5 -13.5	1.5 -3.0		0.10 -0.30	0.10 -0.30	0.20 -0.40	MIN 585	MIN 295	MIN 30	
	CG8M	J93000	MAX 0.08	MAX 1.50	MAX 1.50	MAX 0.040	MAX 0.040	18.0 -21.0	9.0 -13.0	3.0 -4.0					MIN 515	MIN 240	MIN 25	
	CF10sMnN	J92972	MAX 0.10	7.00 -9.00	3.50 -4.50	MAX 0.030	MAX 0.060	16.0 -18.0	8.0 -9.0					0.08 -0.18	MIN 585	MIN 295	MIN 30	
	CT15C	N08151	0.05 -0.15	0.15 -1.50	0.50 -1.50	MAX 0.030	MAX 0.030	19.0 -21.0	31.0 -34.0					0.50 -1.50	MIN 435	MIN 170	MIN 20	
	CK3MCuN	J93254	MAX 0.025	MAX 1.20	MAX 1.00	MAX 0.010	MAX 0.045	19.5 -20.5	17.5 -19.5	6.0 -7.0	0.5 -1.0			0.18 -0.24	MIN 550	MIN 260	MIN 35	
	CE20N	J92802	MAX 0.02	MAX 1.50	MAX 1.50	MAX 0.040	MAX 0.040	23 -26	8 -11	MAX 0.50				0.08 -0.20	MIN 550	MIN 275	MIN 30	
	CG3M	J92999	MAX 0.03	MAX 1.50	MAX 1.50	MAX 0.040	MAX 0.040	18 -21	9 -13	3 -4					MIN 515	MIN 240	MIN 25	
	A352	LCA	J02504	MAX 0.25	MAX 0.70	MAX 0.60	MAX 0.045	MAX 0.040	MAX 0.50	MAX 0.50	MAX 0.20	MAX 0.30	MAX 0.03			415 -585	MIN 205	MIN 24
LCB		J03003	MAX 0.30	MAX 1.00	MAX 0.60	MAX 0.045	MAX 0.040	MAX 0.50	MAX 0.50	MAX 0.20	MAX 0.30	MAX 0.03			450 -620	MIN 240	MIN 24	MIN 35
LCC		J02505	MAX 0.25	MAX 1.20	MAX 0.60	MAX 0.045	MAX 0.040	MAX 0.50	MAX 0.50	MAX 0.20	MAX 0.30	MAX 0.03			485 -655	MIN 275	MIN 22	MIN 35
LC1		J12522	MAX 0.25	0.50 -0.80	MAX 0.60	MAX 0.045	MAX 0.040			0.45 -0.65					450 -620	MIN 240	MIN 24	MIN 35
LC2		J22500	MAX 0.25	0.50 -0.80	MAX 0.60	MAX 0.045	MAX 0.040		2.0 -3.0						485 -655	MIN 275	MIN 24	MIN 35
LC2-1		J42215	MAX 0.22	0.55 -0.75	MAX 0.50	MAX 0.045	MAX 0.040	1.35 -1.85	2.5 -3.5	0.3 -0.6					725 -895	MIN 550	MIN 18	MIN 30
LC3		J31550	MAX 0.15	0.50 -0.80	MAX 0.60	MAX 0.045	MAX 0.040		3.0 -4.0						485 -655	MIN 275	MIN 24	MIN 35
LC4		J41500	MAX 0.15	0.50 -0.80	MAX 0.60	MAX 0.045	MAX 0.040		4.0 -5.0						485 -655	MIN 275	MIN 24	MIN 35
LC9		J31300	MAX 0.13	MAX 0.90	MAX 0.45	MAX 0.045	MAX 0.040	MAX 0.50	8.5 -1.0	MAX 0.20	MAX 0.30	MAX 0.30			MIN 585	MIN 515	MIN 20	MIN 30
CA6NM		J91540	MAX 0.06	MAX 1.00	MAX 1.00	MAX 0.030	MAX 0.040	11.5 -14.0	3.5 -4.5	0.4 -1.0					760 -930	MIN 550	MIN 15	MIN 35

Note a : Grade CF8C shall have a columbium content of not less then 8 times the carbon content but no over 1.00%
b : Grade CF10MC shall have a columbium content not less than 10 times the carbon content bou not over 1.20%

ASTM 2013

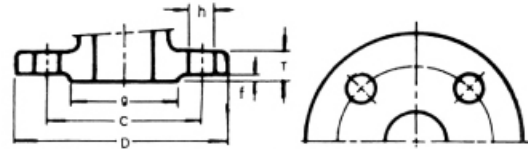
ASTM	GRADE	UNS No.	C	Mn	Si	P	S	Cu	Mo	Fe	Ni	Cr	Cb/Nb	W	V	Bi	Sn	N	T.S	Y.S	E	R/A	Hardness	
			%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	Mpa	Mpa	%	%	HBW
A105			MAX 0.35	0.60 1.05	0.10 -0.35	MAX 0.035	MAX 0.040	MAX 0.40	MAX 0.12		MAX 0.40	MAX 0.30			MAX 0.08				MIN 485	MIN 250	MIN 30	MIN 30	MIN 187	
A494	CZ100	N02100	MAX 1.00	MAX 1.50	MAX 2.00	MAX 0.030	MAX 0.020	MAX 1.25		MAX 3.00	MAX 95.00								MIN 345	MIN 125	MIN 10			
	M25S	N24025	MAX 0.25	MAX 1.50	3.5 -4.5	MAX 0.030	MAX 0.020	27.0 -33.0		MAX 3.50	balance		note: b											
	M30C(note:a)	N24130	MAX 0.30	MAX 1.50	1.0 -2.0	MAX 0.030	MAX 0.020	26.0 -33.0		MAX 3.50	balance		1.0 -3.0							MIN 450	MIN 225	MIN 25		
	M30H	N24030	MAX 0.30	MAX 1.50	2.7 -3.7	MAX 0.030	MAX 0.020	27.0 -33.0		MAX 3.50	balance		note: b							MIN 690	MIN 415	MIN 10		
	M35-1(note:a)	N24135	MAX 0.35	MAX 1.50	MAX 1.25	MAX 0.030	MAX 0.020	26.0 -33.0		MAX 3.50	balance		MAX 0.50							MIN 450	MIN 170	MIN 25		
	M35-2	N24020	MAX 0.35	MAX 1.50	MAX 2.0	MAX 0.030	MAX 0.020	26.0 -33.0		MAX 3.50	balance		MAX 0.50							MIN 450	MIN 205	MIN 25		
	N3M	J30003	MAX 0.03	MAX 1.00	MAX 0.5	MAX 0.030	MAX 0.020		30.0 -33.0	MAX 3.00	balance	MAX 1.00			note: b					MIN 525	MIN 275	MIN 20		
	N7M	J30007	MAX 0.07	MAX 1.00	MAX 1.00	MAX 0.030	MAX 0.020		30.0 -33.0	MAX 3.00	balance	MAX 1.00			note: b					MIN 525	MIN 275	MIN 20		
	N12MV	N30012	MAX 0.12	MAX 1.00	MAX 1.00	MAX 0.030	MAX 0.020		26.0 -30.0	4.0 -6.0	balance	MAX 1.00			0.20 -0.60					MIN 525	MIN 275	MIN 6		
	CU5MCuC	N08826	MAX 0.05	MAX 1.00	MAX 1.00	MAX 0.030	MAX 0.020	1.50 -3.50	2.50 -3.50	balance	38.0 -44.0	19.5 -23.5	0.6 -1.2	note: b	note: b					MIN 520	MIN 240	MIN 20		
	CW2M	N26455	MAX 0.02	MAX 1.00	MAX 0.80	MAX 0.030	MAX 0.020	note: b	15.0 -17.50	MAX 2.00	balance	15.0 -17.5	note: b	MAX 1.00	note: b					MIN 495	MIN 275	MIN 20		
	CW6M	N30107	MAX 0.07	MAX 1.00	MAX 1.00	MAX 0.030	MAX 0.020	note: b	17.0 -20.00	MAX 3.00	balance	-20.0	note: b	note: b	note: b					MIN 495	MIN 275	MIN 25		
	CW6MC	N26625	MAX 0.06	MAX 1.00	MAX 1.00	MAX 0.015	MAX 0.015	note: b	8.0 -10.00	MAX 5.00	balance	20.0	3.15 -4.50	note: b	note: b					MIN 485	MIN 275	MIN 25		
	CW12MW	N30002	MAX 0.12	MAX 1.00	MAX 1.00	MAX 0.030	MAX 0.020	note: b	16.0 -18.00	4.50 -7.50	balance	15.5 -17.5	note: b	3.75 -5.25	0.20 -0.40					MIN 495	MIN 275	MIN 4		
	CX2M	N26059	MAX 0.02	MAX 1.00	MAX 0.50	MAX 0.020	MAX 0.020	note: b	15.0 16.50	MAX 1.50	balance	22.0 -24.0	note: b	note: b	note: b					MIN 495	MIN 270	MIN 40		
	CX2MW	N26022	MAX 0.02	MAX 1.00	MAX 0.80	MAX 0.025	MAX 0.020	note: b	12.50 -14.50	2.00 -6.00	balance	20.0 -22.5	note: b	2.5 -3.5	MAX 0.35					MIN 550	MIN 310	MIN 30		
	CY40	N06040	MAX 0.40	MAX 1.50	MAX 3.00	MAX 0.030	MAX 0.020	note: b	note: b	MAX 11.00	balance	14.0 -17.0	note: b	note: b	note: b					MIN 485	MIN 195	MIN 30		
	CY5SnBIM	N26055	MAX 0.05	MAX 1.50	MAX 0.50	MAX 0.030	MAX 0.020		2.0 -3.5	MAX 2.00	balance	11.0 -14.0				3.0 -5.0	3.0 -5.0							
A890	1B(note: c)	J83372/CD4MCuN	MAX 0.04	MAX 1.00	MAX 1.00	MAX 0.040	MAX 0.040	2.7 -3.3	1.7 -2.3		4.7 -6.0	24.5 -26.5						0.10 -0.25	MIN 690	MIN 485	MIN 16			
	1C(note: d)	J83373/CD3MCuN	MAX 0.03	MAX 1.20	MAX 1.10	MAX 0.030	MAX 0.030	1.4 -1.9	2.9 -3.8		5.6 -6.7	24.0 -26.7						0.22 -0.33	MIN 690	MIN 450	MIN 25			
	2A	J83345/CE3MN	MAX 0.08	MAX 1.00	MAX 1.50	MAX 0.040	MAX 0.040		3.0 -4.5		8.0 -11.0	22.5 -25.5						0.10 -0.30	MIN 655	MIN 450	MIN 25			
	3A	J83371/CD6MN	MAX 0.06	MAX 1.00	MAX 1.00	MAX 0.040	MAX 0.040		1.75 -2.5		4.0 -6.0	24.0 -27.0						0.15 -0.25	MIN 655	MIN 450	MIN 25			
	4A	J82205/CD3MN	MAX 0.03	MAX 1.50	MAX 1.00	MAX 0.040	MAX 0.020	MAX 1.0	2.5 -3.5		4.5 -6.5	21.0 -23.5						0.10 -0.30	MIN 620	MIN 415	MIN 25			
	5A(note: d)	J83404/CE3MN	MAX 0.03	MAX 1.50	MAX 1.00	MAX 0.040	MAX 0.040		4.0 -5.0		6.0 -8.0	24.0 -26.0		0.50 -1.00				0.10 -0.30	MIN 690	MIN 515	MIN 18			
	6A(note: d)	J83300/CD3MNCuN	MAX 0.03	MAX 1.00	MAX 1.00	MAX 0.030	MAX 0.025	0.5 -1.0	3.0 -4.0		6.5 -8.5	24.0 -26.0		3.0 -4.0				0.20 -0.30	MIN 690	MIN 450	MIN 25			
	7A(note: e)	J93379	MAX 0.03	1.00 -3.00	MAX 1.00	MAX 0.030	MAX 0.020	MAX 1.0	2.0 -3.5		6.0 -8.0	26.0 -28.0		Boron 0.001-0.010, Barium 0.001-0.010, Ce+La 0.005-0.030				0.30 -0.40	MIN 690	MIN 515	MIN 20			
B148	C95200	9A / Grade A						MIN 86.0	AI: 8.5 -9.5			Iron: 2.5 -4.0							MIN 450	MIN 170	MIN 20	brinell(3000-kg load) 110		
	C95300	9B / Grade B						MIN 86.0	AI: 9.0 -11.0			Iron: 0.8 -1.5							MIN 450	MIN 170	MIN 20	brinell(3000-kg load) 110		
	C95400	9C / Grade C		MAX 0.50				MIN 83	AI: 10.0 -11.5	MAX 1.50		Iron: 3.0 -5.0							MIN 515	MIN 205	MIN 12	brinell(3000-kg load) 150		
	C95410			MAX 0.50				MIN 83	AI: 10.0 -11.5	1.50		Iron: 3.0 -5.0							MIN 515	MIN 205	MIN 12	brinell(3000-kg load) 150		
	C95500	9D / Grade D		MAX 3.50				MIN 78	AI: 10.0 -11.5	3.00		Iron: 3.0 -5.0							MIN 620	MIN 275	MIN 6	brinell(3000-kg load) 190		
	C85620(note: f)			MAX 1.50	MAX 1.50			MIN 74.5	AI: 10.5 -11.5	4.20		Iron: 4.0 -6.00		Lead: MAX 0.03						MIN	MIN	MIN		
	C95600	9E / Grade E			1.8 -3.2			MIN 88	AI: 6.0 -8.0	MAX 0.25		Iron:								MIN 415	MIN 195	MIN 10		
	C95700	9F / Grade F		11.0 -14.0	MAX 0.10			MIN 71	AI: 7.0 -8.5	1.50		Iron: 2.0 -4.0		Lead: MAX 0.03						MIN 620	MIN 275	MIN 20		
	C95800			0.8 -1.5	MAX 0.10			MIN 79	AI: 8.5 -9.5	4.00		Iron: 3.5 -4.5(h)		Lead: MAX 0.03						MIN 585	MIN 240	MIN 15		
	C85820(note: g)			MAX 1.50	MAX 0.10			MIN 77.5	AI: 9.0 -10.0	4.50		Iron: 4.0 -5.0		Lead: MAX 0.02						MIN 650	MIN 270	MIN 13		
C95900			MAX 1.50				remainder	AI: 12.0 -13.5	MAX 0.50		Iron: 3.0 -5.0													

Note a : Order M35-1 or M30C when weldability is required.
b : Element to be analyzed and reported for information only.
c : CD4MCu has been removed from the standard.
CD4MCuN is an acceptable substitute for CD4MCu.
d : % Cr + 3.3% Mo + 16 % N ≥ 40.
e : %Cr + 3.3(%Mo+0.5%W)+30%N ≥ 45.
f : Chromium shall be 0.05 max, cobalt 0.20 max, tin 0.25 max, and zinc 0.30 max.
g : Zinc shall be 0.2 max and tin 0.02 max.
h : Iron content shall not exceed the nickel content.

STEEL PIPE FLANGES

FLANGE DIMENSION & DRILLING TEMPLATES

JIS B2220 : 2012



Class 10kgf/cm² Steel Pipe Flange Dimensions

Nominal Size		D	C	g	f	T	h	Bolt	
mm	in							Number	Diam
10	3/8	90	65	48	1	12	15	4	M 12
15	1/2	95	70	51	1	12	15	4	M 12
20	3/4	100	75	56	1	14	15	4	M 12
25	1	125	90	67	1	14	19	4	M 16
32	1 1/4	135	100	76	2	16	19	4	M 16
40	1 1/2	140	105	81	2	16	19	4	M 16
50	2	155	120	96	2	16	19	4	M 16
65	2 1/2	175	140	116	2	18	19	4	M 16
80	3	185	150	126	2	18	19	8	M 16
100	4	210	175	151	2	18	19	8	M 16
125	5	250	210	182	2	20	23	8	M 20
150	6	280	240	212	2	22	23	8	M 20
200	8	330	290	262	2	22	23	12	M 20
250	10	400	355	324	2	24	25	12	M 22
300	12	445	400	368	3	24	25	16	M 22
350	14	490	445	413	3	26	25	16	M 22
400	16	560	510	475	3	28	27	16	M 24
450	18	620	565	530	3	30	27	20	M 24
500	20	675	620	585	3	30	27	20	M 24
600	24	795	730	690	3	32	33	24	M 30

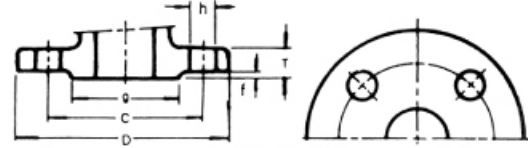
Class 20kgf/cm² Steel Pipe Flange Dimensions

Nominal Size		D	C	g	f	T	h	Bolt	
mm	in							Number	Diam
10	3/8	90	65	48	1	14	15	4	M 12
15	1/2	95	70	51	1	14	15	4	M 12
20	3/4	100	75	56	1	16	15	4	M 12
25	1	125	90	67	1	16	19	4	M 16
32	1 1/4	135	100	76	2	18	19	4	M 16
40	1 1/2	140	105	81	2	18	19	4	M 16
50	2	155	120	96	2	18	19	8	M 16
65	2 1/2	175	140	116	2	20	19	8	M 16
80	3	200	160	132	2	22	23	8	M 20
100	4	225	185	160	2	24	23	8	M 20
125	5	270	225	195	2	26	25	8	M 22
150	6	305	260	230	2	28	25	12	M 22
200	8	350	305	275	2	30	25	12	M 22
250	10	430	380	345	2	34	27	12	M 24
300	12	480	430	395	3	35	27	16	M 24
350	14	540	480	440	3	40	33	16	M 30
400	16	605	540	495	3	46	33	16	M 30
450	18	675	605	560	3	48	33	20	M 30
500	20	730	660	615	3	50	33	20	M 30
600	24	845	770	720	3	54	33	24	M 36

STEEL PIPE FLANGES

FLANGE DIMENSION & DRILLING TEMPLATES

ASMEB 16.5 : 2013



Class 150LB Steel Pipe Flange Dimensions

Nominal Size		D		C		g		T		(h) Bolt Hole		Bolt	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	Number	Diam
1/2	15	3.50	89	2.38	60.5	1.38	35	0.44	11.2	0.62	16	4	1/2
3/4	20	3.88	98	2.75	70.0	1.69	43	0.50(0.44)	12.7(11.2)	0.62	16	4	1/2
1	25	4.25	108	3.12	79.5	2.00	51	0.56(0.44)	14.3(11.2)	0.62	16	4	1/2
1 1/4	32	4.62	117	3.50	89.0	2.50	64	0.62(0.50)	15.9(12.7)	0.62	16	4	1/2
1 1/2	40	5.00	127	3.88	98.5	2.88	73	0.69(0.56)	17.5(14.3)	0.62	18	4	1/2
2	50	6.00	152	4.75	120.5	3.62	92	0.75(0.62)	19.1(15.9)	0.75	19	4	5/8
2 1/2	65	7.00	178	5.50	139.5	4.12	105	0.88(0.69)	22.3(17.5)	0.75	19	4	5/8
3	80	7.50	190	6.00	152.5	5.00	127	0.94(0.75)	23.9(19.1)	0.75	19	4	5/8
4	100	9.00	229	7.50	190.5	6.19	157	0.94	23.9	0.75	19	8	5/8
5	125	10.00	254	8.50	216.0	7.31	186	0.94	23.8	0.88	22	8	3/4
6	150	11.00	279	9.50	241.5	8.50	216	1.00	25.4	0.88	22	8	3/4
8	200	13.50	343	11.75	298.5	10.62	270	1.12	28.6	0.88	22	8	3/4
10	250	16.00	406	14.25	362.0	12.75	324	1.19	30.2	1.00	25	12	7/8
12	300	19.00	483	17.00	432.0	15.00	381	1.25	31.8	1.00	25	12	7/8
14	350	21.00	533	18.75	476.5	16.26	413	1.38	35.0	1.12	29	12	1
16	400	23.50	597	21.25	539.5	18.50	470	1.44	36.6	1.12	29	16	1
18	450	25.00	635	22.75	578.0	21.00	533	1.56	39.7	1.25	32	16	1 1/8
20	500	27.50	698	25.00	635.0	23.00	584	1.69	42.9	1.25	32	20	1 1/8
24	600	32.00	813	29.50	749.5	27.25	692	1.88	47.7	1.38	35	20	1 1/4

Hight of raised face is 0.06 inch(1.6mm) each. Dimensions in () are for casting integral flange

Class 300LB Steel Pipe Flange Dimensions

Nominal Size		D		C		g		T		(h) Bolt Hole		Bolt	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	Number	Diam
1/2	15	3.75	95	2.62	66.5	1.38	35	0.56	14.3	0.62	16	4	1/2
3/4	20	4.62	117	3.25	82.5	1.69	43	0.62	15.9	0.75	19	4	5/8
1	25	4.88	124	3.50	89.0	2.00	51	0.69	17.5	0.75	19	4	5/8
1 1/4	32	5.25	133	3.88	98.5	2.50	64	0.75	19.1	0.75	19	4	5/8
1 1/2	40	6.12	156	4.50	114.5	2.88	73	0.81	20.7	0.88	22	4	3/4
2	50	6.50	165	5.00	127.0	3.62	92	0.88	22.3	0.75	19	8	5/8
2 1/2	65	7.50	190	5.88	149.0	4.12	105	1.00	25.4	0.88	22	8	3/4
3	80	8.25	210	6.62	168.0	5.00	127	1.12	28.6	0.88	22	8	3/4
4	100	10.00	254	7.88	200.0	6.19	157	1.25	31.8	0.88	22	8	3/4
5	125	11.00	279	9.25	235.0	7.31	186	1.38	35.0	0.88	22	8	3/4
6	150	12.50	318	10.62	270.0	8.50	216	1.44	36.6	0.88	22	12	3/4
8	200	15.00	381	13.00	330.0	10.62	270	1.62	41.3	1.00	25	12	7/8
10	250	17.50	444	15.25	387.0	12.75	324	1.88	47.7	1.12	29	16	1
12	300	20.50	521	17.75	451.0	15.00	381	2.00	50.8	1.25	32	16	1 1/8
14	350	23.00	584	20.25	514.5	16.26	413	2.12	54.0	1.25	32	20	1 1/8
16	400	25.50	648	22.50	571.5	18.50	470	2.25	57.2	1.38	35	20	1 1/4
18	450	28.00	711	24.75	628.5	21.00	533	2.38	60.4	1.38	35	24	1 1/4
20	500	30.50	715	27.00	686.0	23.00	584	2.50	63.5	1.38	35	24	1 1/4
24	600	36.00	914	32.00	813.0	27.25	692	2.75	69.9	1.62	41	24	1 1/2

Hight of raised face is 0.06 inch(1.6mm) each.

Inside Dia d, mm	Minimum Wall Thickness, mm						
	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500	Class 4500
3	2.5	2.5	2.8	2.7	3.1	3.6	4.9
6	2.7	2.8	3.1	3.2	3.6	4.6	7.2
9	2.9	3.0	3.3	3.6	4.2	5.6	9.6
12	3.1	3.3	3.6	4.1	4.8	6.6	12.0
15	3.3	3.5	3.8	4.5	5.3	7.7	14.3
18	3.5	3.7	4.1	5.0	5.9	8.7	16.7
21	3.7	4.0	4.3	5.4	6.4	9.7	19.0
24	3.9	4.2	4.6	5.9	7.0	10.7	21.4
27	4.1	4.4	4.9	6.4	7.5	11.7	23.7
31	4.3	4.7	5.1	6.7	8.3	13.1	26.9
35	4.6	5.0	5.3	6.9	9.0	14.5	30.0
40	4.9	5.3	5.6	7.2	9.9	16.2	33.9
45	5.2	5.7	5.9	7.5	10.8	17.9	37.9
50	5.5	6.0	6.2	7.8	11.8	19.6	41.8
55	5.6	6.2	6.5	8.3	12.7	21.3	45.7
60	5.7	6.4	6.8	8.8	13.6	23.0	49.6
65	5.8	6.5	7.2	9.3	14.5	24.7	53.6
70	5.9	6.7	7.5	9.9	15.5	26.4	57.5
75	6.0	6.9	7.9	10.4	16.4	28.1	61.4
80	6.1	7.0	8.2	10.9	17.3	29.8	65.3
85	6.2	7.2	8.5	11.4	18.2	31.5	69.3
90	6.3	7.4	8.9	11.9	19.1	33.2	73.2
95	6.4	7.5	9.2	12.5	20.1	34.9	77.1
100	6.5	7.7	9.5	13.0	21.0	36.6	81.0
110	6.5	8.0	10.2	14.0	22.8	40.0	88.9
120	6.7	8.4	10.9	15.1	24.7	43.4	96.7
130	6.8	8.7	11.6	16.1	26.5	46.9	104.6
140	7.0	9.0	12.2	17.2	28.4	50.3	112.4
150	7.1	9.4	12.9	18.2	30.2	53.7	120.3
160	7.3	9.7	13.6	19.3	32.0	57.1	128.1
170	7.5	10.0	14.3	20.3	33.9	60.5	136.0
180	7.6	10.3	14.9	21.3	35.7	63.9	143.8
190	7.8	10.7	15.6	22.4	37.6	67.3	151.7
200	8.0	11.0	16.3	23.4	39.4	70.7	159.5
210	8.1	11.3	17.0	24.5	41.3	74.1	167.4
220	8.3	11.7	17.6	25.5	43.1	77.5	175.2
230	8.4	12.0	18.3	26.6	45.0	80.9	183.1
240	8.6	12.3	19.0	27.6	46.8	84.4	190.9
250	8.8	12.7	19.7	28.7	48.6	87.8	198.8
260	8.9	13.0	20.3	29.7	50.5	91.2	206.6
270	9.1	13.3	21.0	30.8	52.3	94.6	214.5
280	9.3	13.6	21.7	31.8	54.2	98.0	222.3
290	9.4	14.0	22.4	32.8	56.0	101.4	230.2
300	9.6	14.3	23.0	33.9	57.9	104.8	238.0
310	9.8	14.6	23.7	34.9	59.7	108.2	245.9
320	9.9	15.0	24.4	36.0	61.6	111.6	253.7
330	10.1	15.3	25.1	37.0	63.4	115.0	261.6
340	10.2	15.6	25.7	38.1	65.2	118.4	269.4
350	10.4	16.0	26.4	39.1	67.1	121.9	277.2
360	10.6	16.3	27.1	40.2	68.9	125.3	285.1
370	10.7	16.6	27.8	41.2	70.8	128.7	292.9
380	10.9	16.9	28.4	42.2	72.6	132.1	300.8
390	11.1	17.3	29.1	43.3	74.5	135.5	308.6
400	11.2	17.6	29.8	44.3	76.3	138.9	316.5
410	11.4	17.9	30.5	45.4	78.2	142.3	324.3
420	11.5	18.3	31.1	46.4	80.0	145.7	332.2
430	11.7	18.6	31.8	47.5	81.8	149.1	340.0
440	11.9	18.9	32.5	48.5	83.7	152.5	347.9
450	12.0	19.3	33.2	49.6	85.5	155.9	355.7
460	12.2	19.6	33.8	50.6	87.4	159.4	363.6

Inside Dia d, mm	Minimum Wall Thickness, mm						
	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500	Class 4500
470	12.4	19.9	34.5	51.7	89.2	162.8	371.4
480	12.5	20.2	35.2	52.1	91.1	166.2	379.3
490	12.7	20.6	35.9	53.7	92.9	169.6	387.1
500	12.9	20.9	36.5	54.8	94.8	173.0	395.0
510	13.0	21.2	37.2	55.8	96.6	176.4	402.8
520	13.2	21.6	37.9	56.9	98.4	179.8	410.7
530	13.3	21.9	38.6	57.9	100.3	183.2	418.5
540	13.5	22.2	39.2	59.0	102.1	186.6	426.4
550	13.7	22.6	39.9	60.0	104.0	190.0	434.2
560	13.8	22.9	40.6	61.1	105.8	193.4	442.4
570	14.0	23.2	41.3	62.1	107.7	196.9	449.9
580	14.2	23.5	41.9	63.1	109.5	200.3	457.8
590	14.3	23.9	42.6	64.2	111.4	203.7	465.6
600	14.5	24.2	43.3	65.2	113.2	207.1	473.5
610	14.6	24.5	44.0	66.3	115.0	210.5	481.3
620	14.8	24.9	44.6	67.3	116.9	213.9	489.2
630	15.0	25.2	45.3	68.4	118.7	217.3	497.0
640	15.1	25.5	46.0	69.4	120.6	220.7	504.9
650	15.3	25.9	46.7	70.5	122.4	224.1	512.7
660	15.5	26.2	47.3	71.5	124.3	227.5	520.6
670	15.6	26.5	48.0	72.5	126.1	230.9	528.4
680	15.8	26.8	48.7	73.6	128.0	234.4	536.3
690	15.9	27.2	49.4	74.6	129.8	237.8	544.1
700	16.1	27.5	50.0	75.7	131.6	241.2	552.0
710	16.3	27.8	50.7	76.1	133.5	244.6	559.8
720	16.4	28.2	51.4	77.8	135.3	248.0	567.7
730	16.6	28.5	52.1	78.8	137.2	251.4	575.5
740	16.8	28.8	52.7	79.9	139.0	254.8	583.4
750	16.9	29.2	53.4	80.9	140.9	258.2	591.2
760	17.1	29.5	54.1	82.0	142.7	261.6	599.0
770	17.3	29.8	54.8	83.0	144.6	265.0	606.9
780	17.4	30.1	55.4	84.0	146.4	268.4	614.7
790	17.6	30.5	56.1	85.1	148.2	271.9	622.6
800	17.7	30.8	56.8	86.1	150.1	275.3	630.4
820	18.1	31.5	58.1	88.2	153.8	282.1	646.1
840	18.4	32.1	59.5	90.3	157.5	288.9	661.8
860	18.7	32.8	60.8	92.4	161.1	295.7	677.5
880	19.0	33.4	62.2	94.5	164.8	302.5	693.2
900	19.4	34.1	63.5	96.6	168.5	309.4	708.9
920	19.7	34.8	64.9	98.7	172.2	316.2	724.6
940	20.0	35.4	66.2	100.8	175.9	323.0	740.3
960	20.3	36.1	67.6	102.9	179.6	329.6	756.0
980	20.7	36.7	68.9	104.9	183.3	336.6	771.7
1000	21.0	37.4	70.3	107.0	187.0	343.5	787.4
1020	21.3	38.1	71.6	109.1	190.7	350.3	803.1
1040	21.7	38.7	73.0	111.2	194.3	357.1	818.8
1060	22.0	39.4	74.3	113.3	198.0	363.9	834.5
1080	22.3	40.0	75.7	115.4	201.7	370.7	850.2
1100	22.6	40.7	77.0	117.5	205.4	377.5	865.9
1120	23.0	41.4	78.4	119.3	209.1	384.4	881.6
1140	23.3	42.0	79.7	121.7	212.8	391.2	897.3
1160	23.6	42.7	81.1	123.7	216.5	398.0	913.0
1180	23.9	43.3	82.4	125.8	220.2	404.8	928.7
1200	24.3	44.0	83.8	127.9	223.9	411.6	944.4
1220	24.6	44.7	85.1	130.0	227.5	418.5	960.1
1240	24.9	45.3	86.5	132.1	231.2	425.3	975.8
1260	25.2	46.0	87.8	134.2	234.9	432.1	991.5
1280	25.6	46.6	89.2	136.3	238.6	438.9	1007.2
1300	25.9	47.3	90.5	138.4	242.3	445.7	1022.9