

TT2

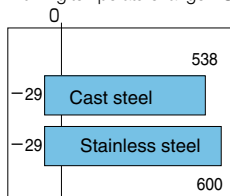
Valve nominal size

80 to 600mm

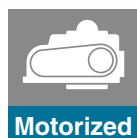
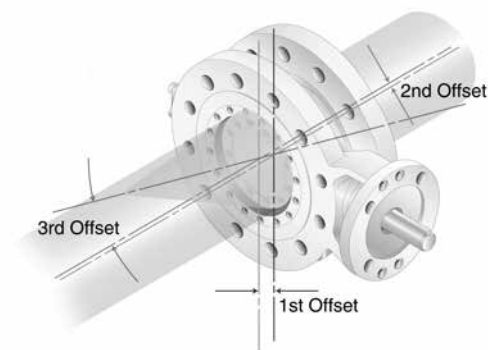
Max. working pressure MPa

150Lb	300Lb

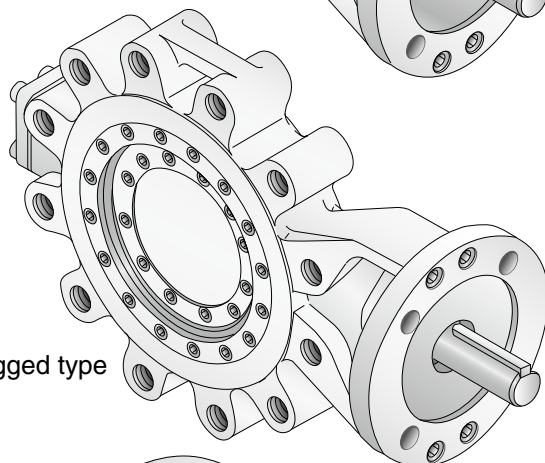
Working temperature range °C



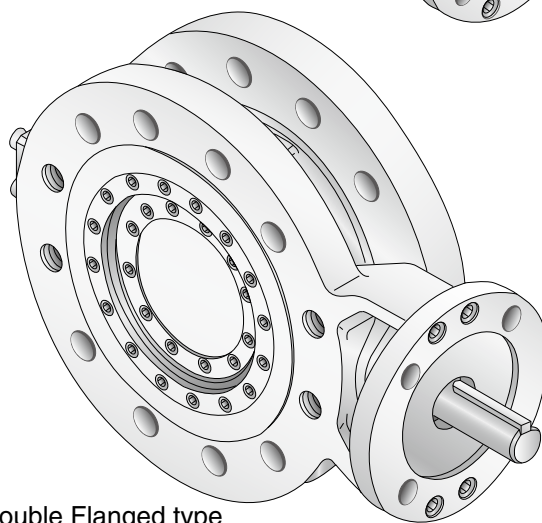
FS Fire safe certification to API607 5th Edition



Wafer type



Lugged type



Double Flanged type

Always at the leading edge

Through an extensive commitment to Research & Development, TOMOE has remained at the leading edge of valve design for more than 50 years. The TT2 Triple Offset process valve is the result of advanced technology design and stringent testing to develop a valve that meets the high performance demands of applications where long life and positive shut-off under arduous conditions is essential.

The TT2 inherits the torque sealing, friction-free sealing design of other valves in the TT series and the unique triple offset and ellipsoidal sealing geometry guarantees zero leakage and bubble-tight shut-off.

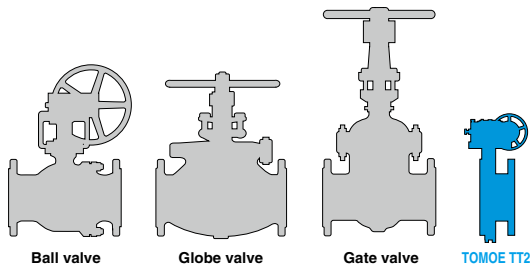
In addition, the compact, lightweight design of the TT2 triple offset valve has revolutionised design and maintenance of piping systems in the OPC industry.

Smaller and lighter than traditional ball, globe and gate valves, the TT2 features a fully field-replaceable seat and seal design for increased plant efficiency and reduced cost of ownership.

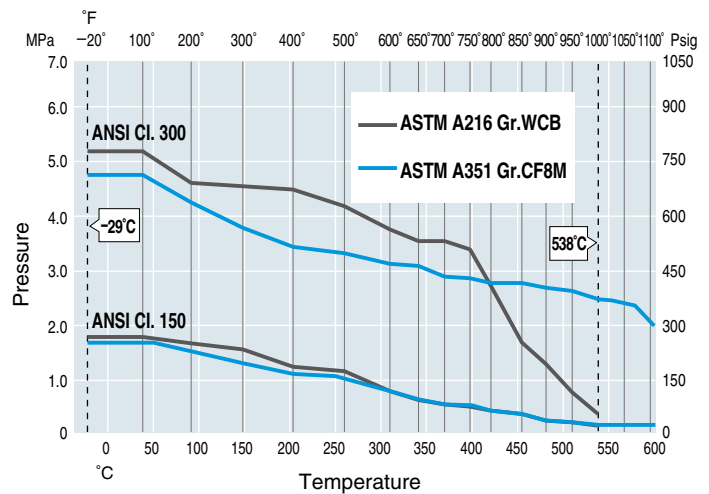
Available in Wafer, Lugged and Double Flanged type body styles to 150 lb and 300 lb pressure ratings, the TT2 triple offset valve has fire safe certification to API607 5th Edition, making it inherently safe in high risk industry applications.

Features and Benefits

- Zero leakage with metal seat
- Compact, lightweight design
- Fully field replaceable seat and seal design
- Longer life cycle
- Fire Safe Certification to API607 5th Edition



Pressure-Temperature Ratings



Standard Specifications

Design	API 609 Cat. B, ASME B16.34	
Nominal diameter ^{*1}	3" (80mm) to 24" (600mm)	
Pressure rating	Class 150, Class 300	
Body style	Wafer, Lugged and double flanged, short and long	
Applicable flange standard ^{*2}	ASME B16.5/JPI Class 150/300 JIS 10/16/20/30K BS4504 (DIN) PN10/16/25/40	
Face-to-face dimensions ^{*3}	Wafer, Lugged : API609 Category B Class 150/300. Double flanged : ISO 5752/API 609 Category B, double flanged short pattern Class 150/300	
Pressure-temperature rating ^{*4}	ASME B16.34 Class 150, 300lb, API609 Class 150, 300lb. Operating temperature (standard specifications): -29 to 538 degrees C (A216-WCB), -29 to 600 degrees C (A351 CF8M)	
Pressure test	Main body pressure and seat leakage test: API598. Allowable seat leakage: Preferred; API 598, ISO 5208 rate A, ANSI/FCI 70-2 Class VI.	
Fire safe	Fire Safe Certification based on API 607 4th / 5th Edition	
Actuator	Manual Gear, Electric, Pneumatic, Hydraulic	
Flow direction	Bi-directional (However, the standard pressure direction is for high pressure at the stem side. Selection of the drive section will differ depending on the pressure direction.)	
Applicable gaskets	Use a spiral gasket. ASME B16.5/JPI Class 150/300 commercial products may be used. Please consult us regarding JIN, BS and DIN.	
Standard materials	Body	A216 WCB or A351 CF8M
	Disc	A216 WCB or A351 CF8M
	Stem ^{*5}	A564 type 630 H1150+H1150
	Body seat	316SS / Graphite
	Disc seal ^{*6}	316SS
Coating	Silicon resin coating (Grey N7) for 200 degrees C and lower. Heat resistant silver coating for over 200 degrees C. No painting for stainless steel.	

*1 Except for 5" (125mm), 22" (550mm)

*2 Please consult us regarding JIN, BS and DIN lugs and double flange types

*3 Long-pattern types can be manufactured to your desired specifications

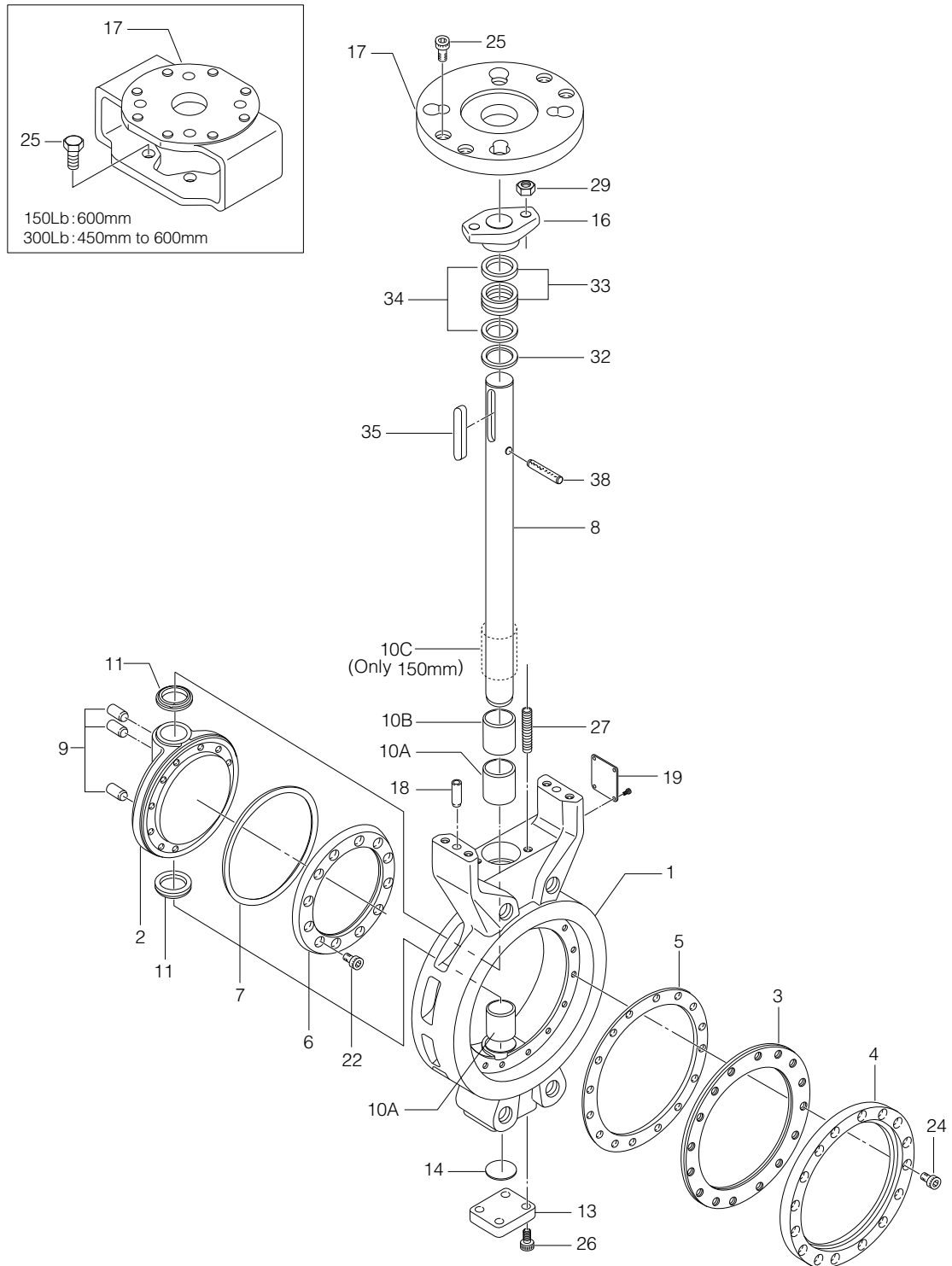
*4 400 degrees C or less in an oxidized atmosphere

*5 Use Inconel 718 for over 400 degrees C.

*6 Titanium nitride hardened, Stellite #6 welding is available as an option

* Valve stem position : horizontal position.

TT2 Expanded view of components



TT2 Parts list

■ TT2 Parts list (150Lb: 80mm to 500mm) (300Lb: 80mm to 400mm)

No.	Description		Q'ty	Remarks
1	Body		1	
2	Disc		1	
3	Body seat		1	
4	Retainer		1	
5	Body seat gasket		1	
6	Disc seal		1	
7	Disc seal gasket		1	
8	Stem		1	
9	Shaft pin		3	
10A	Bearing A		2	
10B	Bearing B		0 or 1	150Lb: 80, 100mm: 1 150mm over: 0 300Lb: 1
10C	Bearing spacer		0 or 1	150Lb: 150mm over: 1 300Lb: 150mm: 1
11	Thrust ring		2	
13	Bottom cover		1	
14	Bottom gasket		1	
16	Glandplate spigot		1	
17	Mounting plate		1	
18	Dowel pin		2	
19	Nameplate		1	
22	Hexagon hole bolt	80mm to 200mm	4	80mm
			6	100mm
			8	150mm
			12	200mm
		250mm to 400mm	8	250mm
			12	300mm, 350mm
24	Hexagon hole bolt	80mm to 200mm	16	400mm
			8	80mm
			12	100mm, 150mm
		250mm to 400mm	16	200mm
			20	250mm
			24	300mm
25	Hexagon hole bolt		4	
	Hexagon hole bolt		4	
	Gland bolt		2	
29	Hexagon nut		2	
32	Packing retainer		1	
33	Gland packing		3	
34	Gland packing		2	
35	Key		1	
38	Spring pin		1	

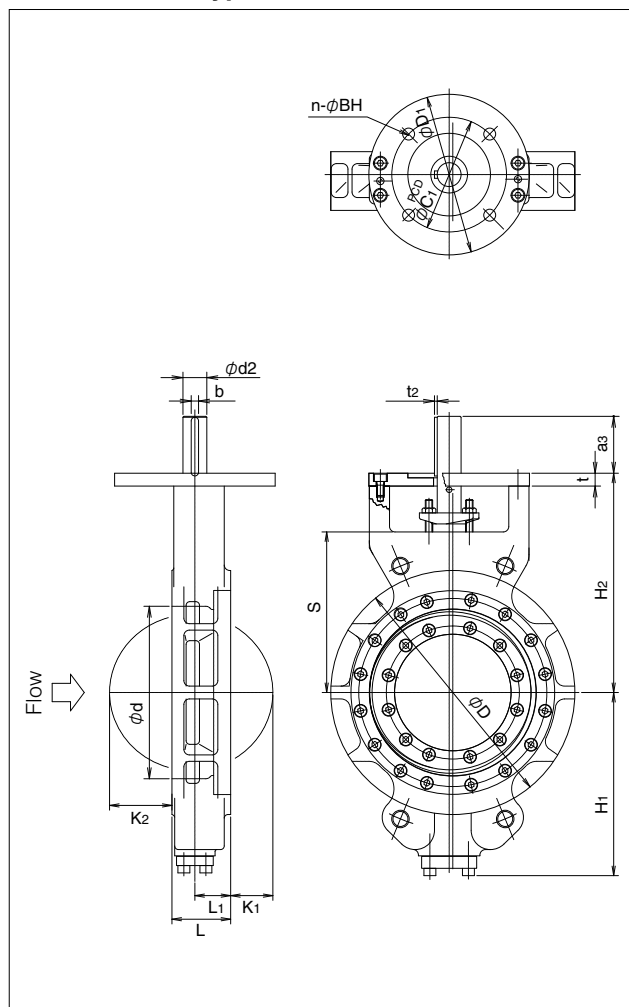
■ TT2 Parts list (150Lb: 600mm) (300Lb: 450mm to 600mm)

No.	Description		Q'ty	Remarks
1	Body		1	
2	Disc		1	
3	Body seat		1	
4	Retainer		1	
5	Body seat gasket		1	
6	Disc seal		1	
7	Disc seal gasket		1	
8	Stem		1	
9	Shaft pin		3	
10A	BearingA		2	
10B	BearingB		1	300Lb
10C	Bearing spacer		1	150Lb
11	Thrust ring		2	
13	Bottom cover		1	
14	Bottom gasket		1	
16	Glandplate spigot		1	
17	Bracket		1	
19	Nameplate		1	
22	Hexagon hole bolt		16	450mm, 600mm
			12	500mm
24	Hexagon hole bolt		20	450mm, 500mm
			28	600mm
25	Hexagon hole bolt		4	
26	Hexagon hole bolt		4	
27	Gland bolt		2	
29	Hexagon nut		2	
32	Packing retainer		1	
33	Gland packing		3	
34	Gland packing		2	
35	Key		1	
38	Spring pin		1	

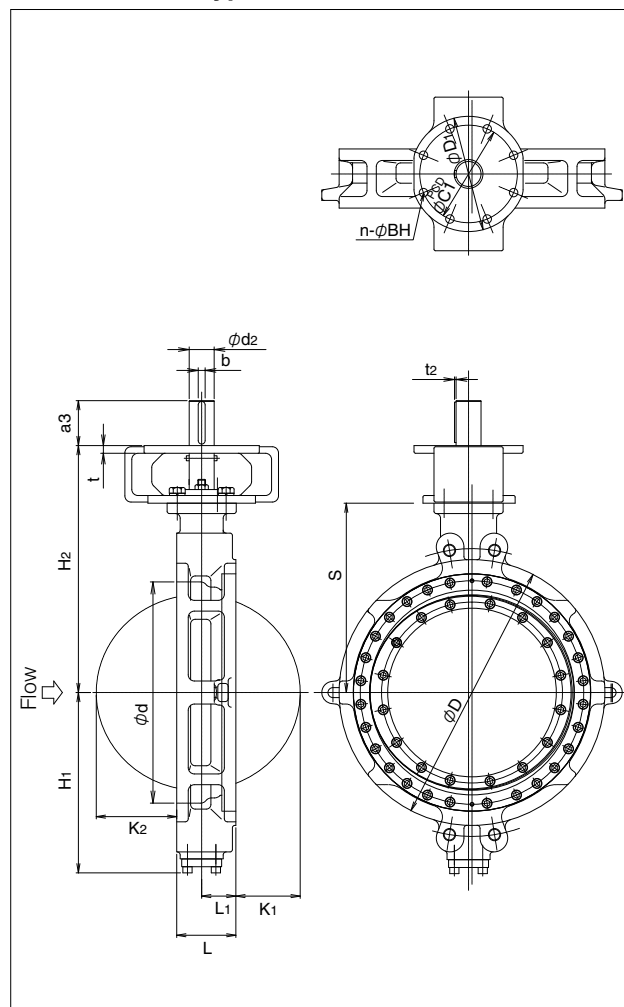
TT2-150Lb Bare shaft (Wafer type)

Nominal size		Dimension (mm)																		Approx. Mass (kg)
mm	inch	ϕd	ϕD	L	L ₁	K ₁	K ₂	H ₁	H ₂	S	a ₃	t	ϕD_1	n	BH	ϕC_1	ϕd_2	b	t ₂	
80	3	82	127	48	29	3	23.1	120.6	159	110	34	12	125	4	11	102	18	6	2.5	7
100	4	108	154	54	31.5	9	27.0	144.6	194	132	34	12	125	4	11	102	20	6	2.5	11
150	6	159	215	57	35	25.5	45.5	189.6	242	180	34	12	125	4	11	102	22	6	2.5	18
200	8	202	266	64	39	46.7	67.4	199.6	248	180	64	14	175	4	11	102	26	8	3	27
250	10	235	324	71	43	63.5	86.5	245.6	326	252	64	14	175	4	13	125	30	8	3	45
300	12	290	373	81	48.5	84	109	281.6	376	281	79	20	210	4	22	165	37	10	3	66
350	14	329	413	92	52	95.5	117.5	307.6	400	305	79	20	210	4	22	165	37	10	3	82
400	16	370	470	102	63	108.3	144.3	345.6	470	355	79	25	226	4	22	165	45	14	3.5	107
450	18	432	534	114	68	120.6	158.4	383.6	510	395	79	25	226	4	22	165	52	16	4	160
500	20	488	585	127	79	131.3	178.3	410.6	531	416	79	25	226	4	22	165	52	16	4	188
600	24	576	692	154	89	167.5	209.5	469.6	643	493	117	20	300	8	19	254	65	18	4	306

150Lb Wafer type 80mm to 500mm



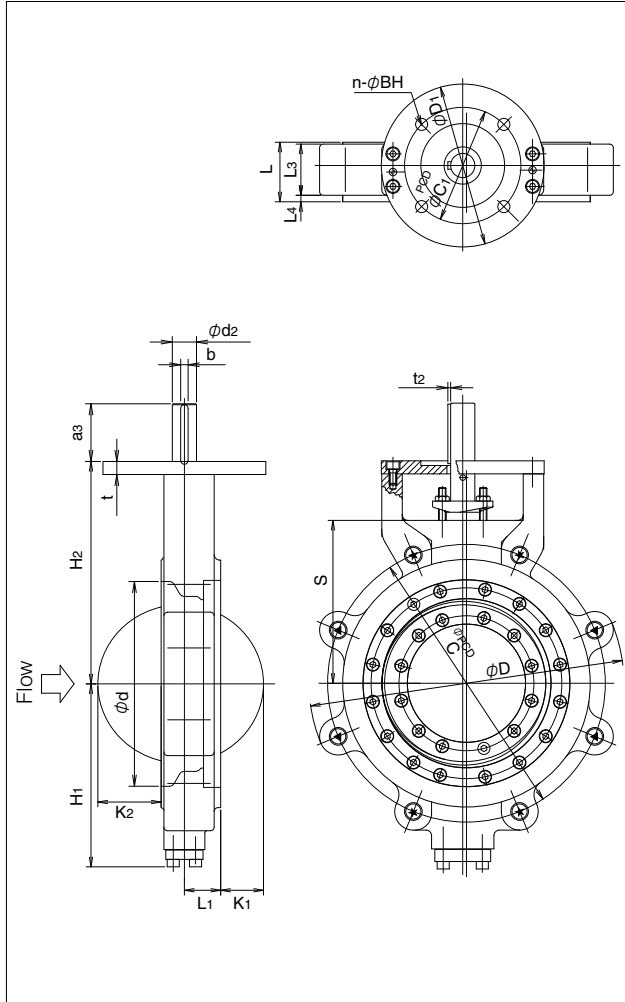
150Lb Wafer type 600mm



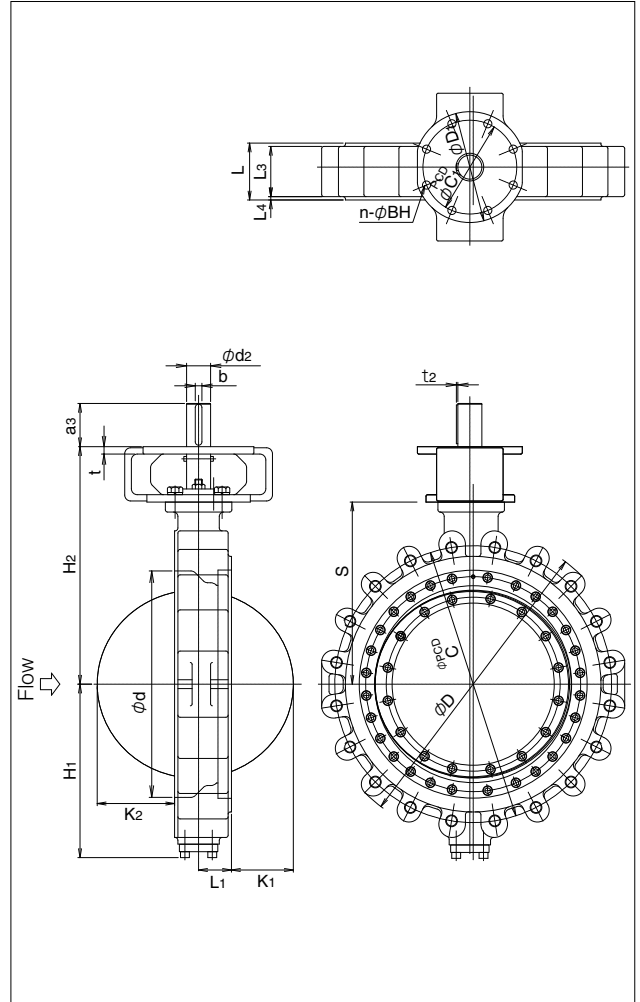
TT2-150Lb Bare shaft (Full Lugged type)

Nominal size		Dimension (mm)																				Approx. Mass (kg)
mm	inch	ϕd	ϕD	L	L ₁	L ₃	L ₄	K ₁	K ₂	H ₁	H ₂	S	a ₃	t	ϕD_1	n	BH	ϕC_1	ϕd_2	b	t ₂	
80	3	100	185	48	29	42	4	3	23.1	120.6	159	110	34	12	125	4	11	102	18	6	2.5	7
100	4	117	238	54	31.5	46.5	5	9	27	144.6	194	132	34	12	125	4	11	102	20	6	2.5	13
150	6	167	281	57	35	51.5	3.5	25.5	45.5	189.6	242	180	34	12	125	4	11	102	22	6	2.5	21
200	8	218	338	64	39	55	7	46.7	67.4	199.6	248	180	64	14	175	4	11	102	26	8	3	29
250	10	270	424	71	43	63	4	63.5	86.5	245.6	326	252	64	14	175	4	13	125	30	8	3	52
300	12	320	478	81	48.5	71	5	84	109	281.6	376	281	79	20	210	4	22	165	37	10	3	76
350	14	350	526	92	52	79	6.5	95.5	117.5	307.6	400	305	79	20	210	4	22	165	37	10	3	91
400	16	410	592	102	63	92	5	108.3	144.3	345.6	470	355	79	25	226	4	22	165	45	14	3.5	134
450	18	460	634	114	68	98	10	120.6	158.4	383.6	510	395	79	25	226	4	22	165	52	16	4	185
500	20	510	714	127	79	107	10	131.3	178.3	410.6	531	416	79	25	226	4	22	165	52	16	4	225
600	24	614	830	154	89	136	9	167.5	209.5	469.6	643	493	117	20	300	8	19	254	65	18	4	393

150Lb Full Lugged 80mm to 500mm



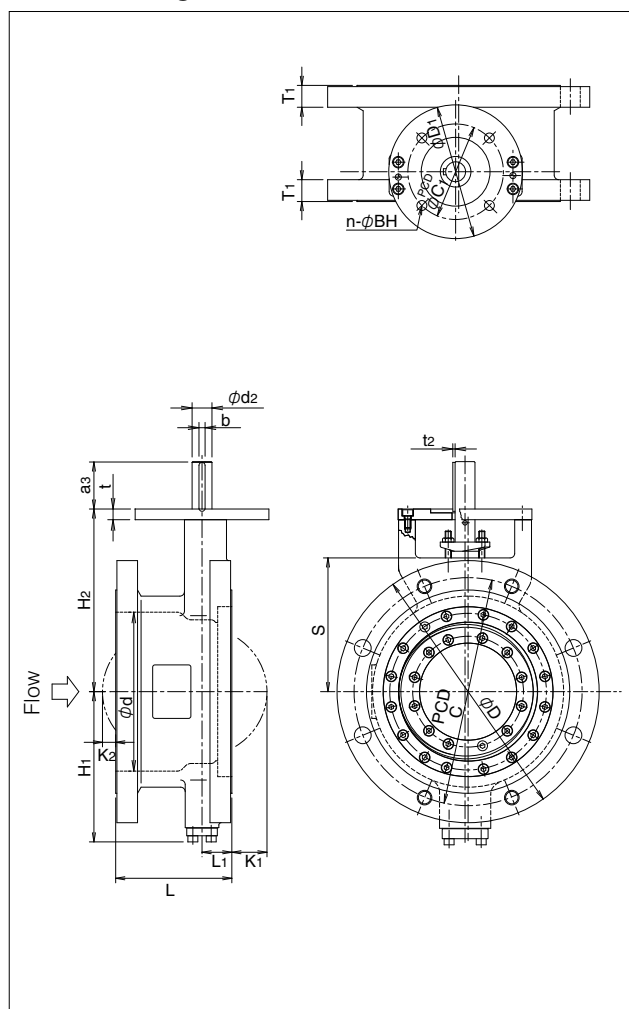
150Lb Full Lugged 600mm



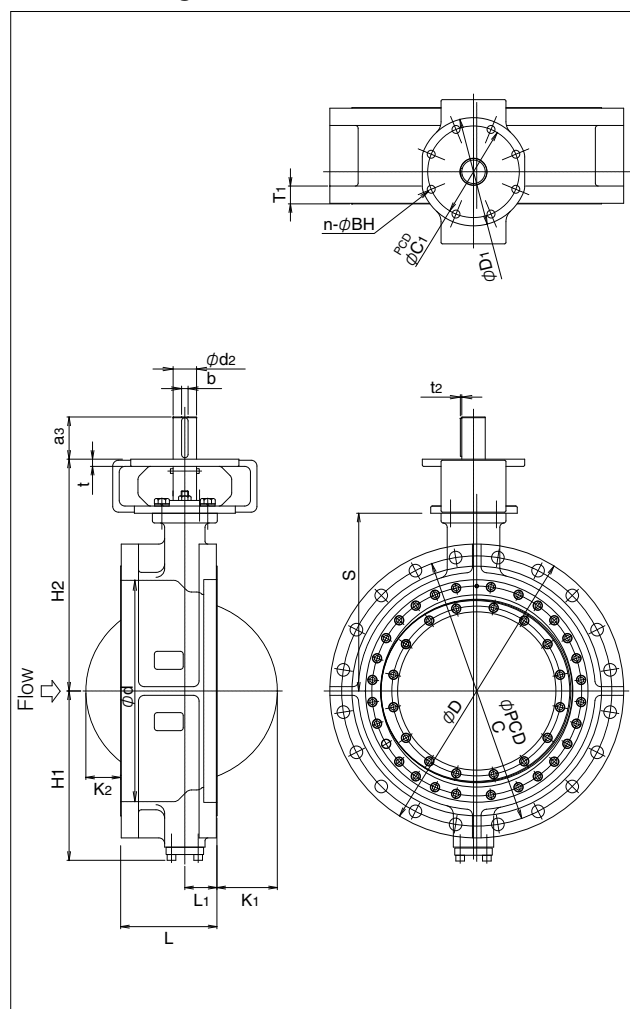
TT2-150Lb Bare shaft(Flanged type)

Nominal size		Dimension (mm)																			Approx. Mass (kg)
mm	inch	ϕd	ϕD	L	L ₁	K ₁	K ₂	T ₁	H ₁	H ₂	S	a ₃	t	ϕD_1	n	BH	ϕC_1	ϕd_2	b	t ₂	
80	3	90	190	114	29	3	0	25.5	120.6	159	110	34	12	125	4	11	102	18	6	2.5	15
100	4	117	229	127	31.5	9	0	25	144.6	194	132	34	12	125	4	11	102	20	6	2.5	21
150	6	167	279	140	35	25.5	0	27	189.6	242	180	34	12	125	4	11	102	22	6	2.5	35
200	8	218	343	152	39	46.7	0	29	199.6	248	180	64	14	175	4	11	102	26	8	3	49
250	10	270	406	165	43	63.5	0	32	245.6	326	252	64	14	175	4	13	125	30	8	3	77
300	12	320	483	178	48.5	84	12	33	281.6	376	281	79	20	210	4	22	165	37	10	3	117
350	14	350	535	190	52	95.5	19.5	36	307.6	400	305	79	20	210	4	22	165	37	10	3	155
400	16	410	595	216	63	108.3	30.3	37	345.6	470	355	79	25	226	4	22	165	45	14	3.5	194
450	18	458	635	222	68	120.6	50.4	40	383.6	510	395	79	25	226	4	22	165	52	16	4	237
500	20	510	700	229	79	131.3	76.3	43	410.6	531	416	79	25	226	4	22	165	52	16	4	312
600	24	614	815	267	89	167.5	96.5	48	469.6	643	493	117	20	300	8	19	254	65	18	4	432

150Lb Flanged 80mm to 500mm



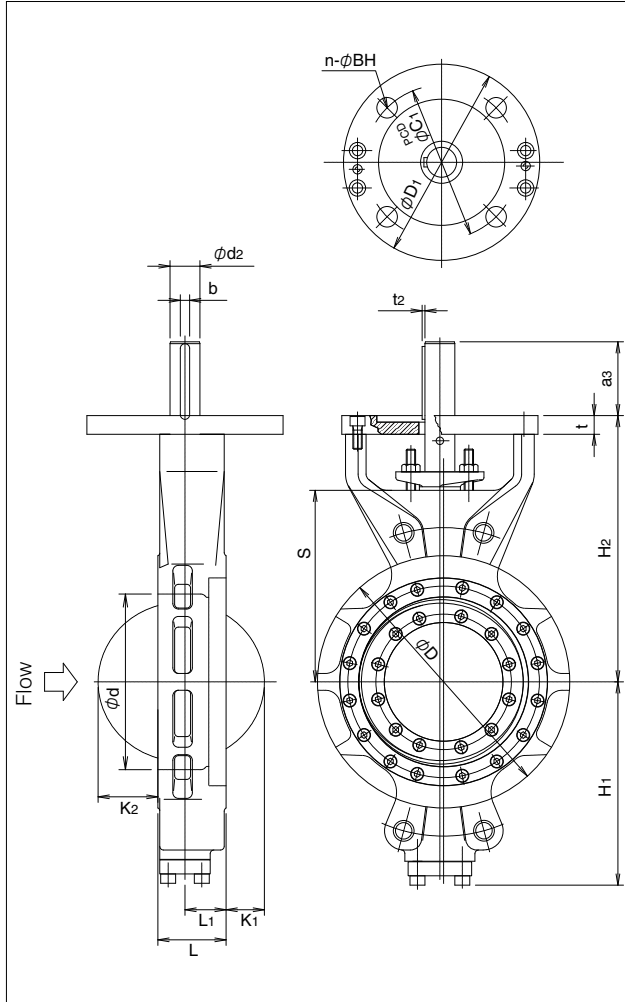
150Lb Flanged 600mm



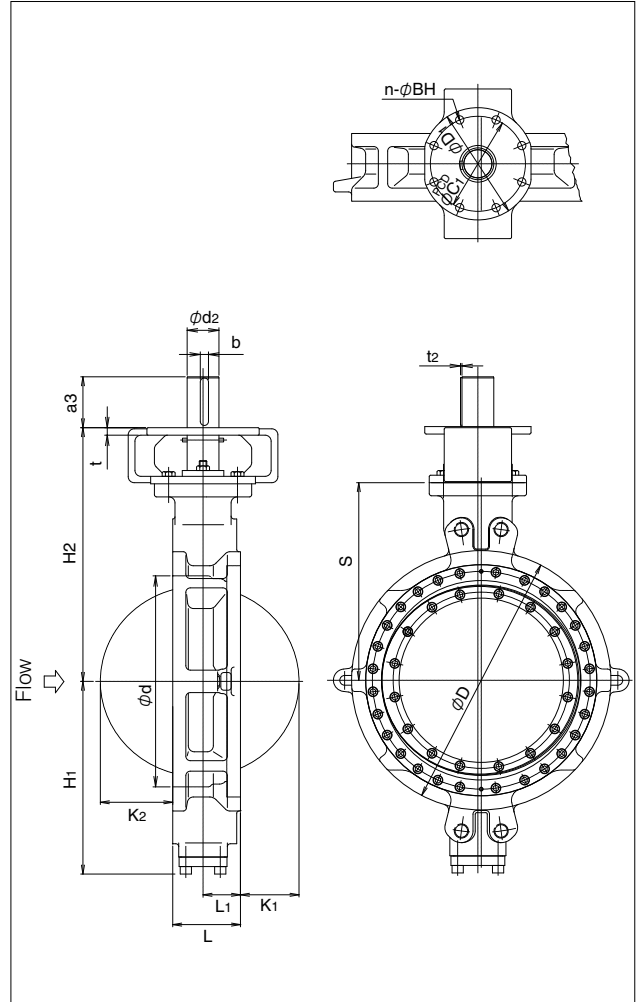
TT2-300Lb Bare shaft (Wafer type)

Nominal size		Dimension (mm)																		Approx. Mass (kg)
mm	inch	ϕd	ϕD	L	L ₁	K ₁	K ₂	H ₁	H ₂	S	a ₃	t	ϕD_1	n	BH	ϕC_1	ϕd_2	b	t ₂	
80	3	82	127	48	29	3	23.1	120.6	159	110	34	12	125	4	11	102	18	6	2.5	7
100	4	108	154	54	31.5	9	27	144.6	194	132	34	12	125	4	11	102	20	6	2.5	11
150	6	153	215	59	36.5	24	45	188.6	276	212	64	14	175	4	11	102	26	8	3	23
200	8	188	270	73	44	41.7	63.4	217.6	285	205	79	20	210	4	18	140	32	10	3	37
250	10	235	324	83	47.5	59	79	259.6	355	260	79	20	210	4	22	165	37	10	3	59
300	12	290	381	92	53	79.5	102.5	305.6	428	313	79	25	226	4	22	165	45	14	3.5	89
350	14	329	413	117	60.5	87	101	340.6	460	345	79	25	226	4	22	165	52	16	4	113
400	16	370	470	133	71	100.3	121.3	373.6	518	388	109	32	300	8	18	254	60	18	4	166
450	18	426	534	149	79	109.6	134.4	400.6	574	424	117	20	300	8	22	254	70	20	4.5	231
500	20	476	592	159	85	125.3	152.3	441.6	602	452	136	20	300	8	22	254	75	20	4.5	292
600	24	564	693	181	100	156.5	193.5	514.6	678	528	136	20	300	8	22	254	85	22	5	416

300Lb Wafer 80mm to 400mm



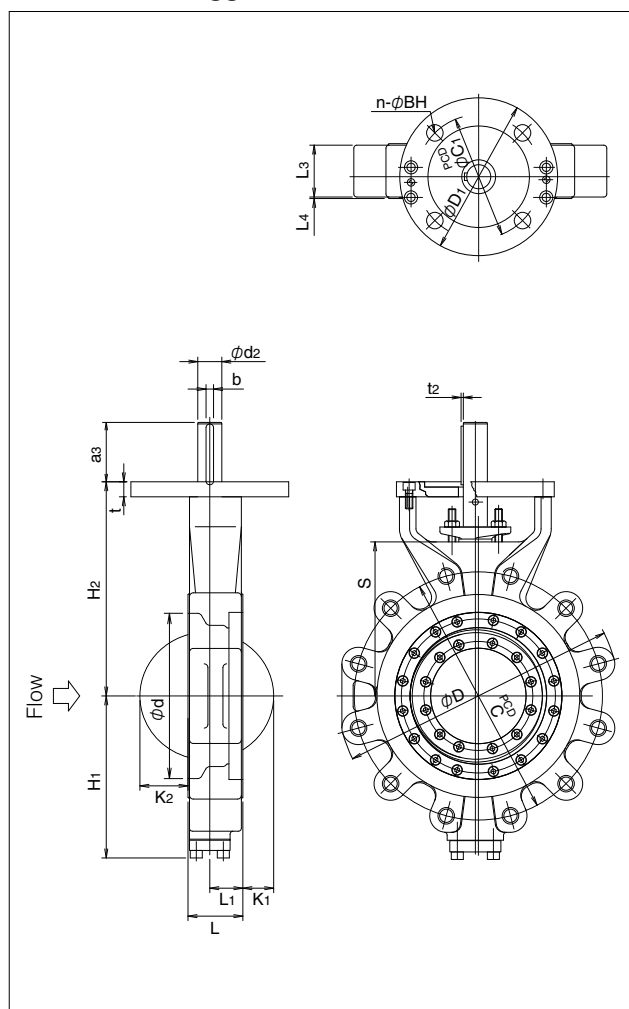
300Lb Wafer 450mm to 600mm



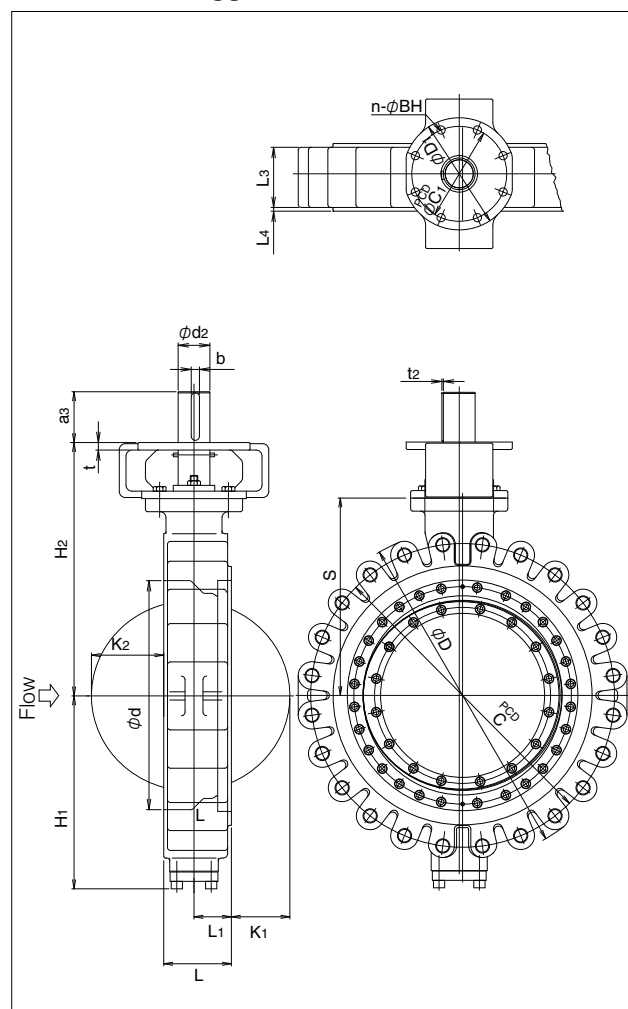
TT2-300Lb Bare shaft (Full Lugged type)

Nominal size		Dimension (mm)																				Approx. Mass (kg)
mm	inch	ϕd	ϕD	L	L ₁	L ₃	L ₄	K ₁	K ₂	H ₁	H ₂	S	a ₃	t	ϕD_1	n	BH	ϕC_1	ϕd_2	b	t ₂	
80	3	82	204	48	29	42	4	3	23.1	120.6	159	110	34	12	125	4	11	102	18	6	2.5	8.4
100	4	117	238	54	31.5	47	5	9	27	144.6	194	132	34	12	125	4	11	102	20	6	2.5	13
150	6	166	312	59	36.5	52	5	24	45	188.6	276	212	64	14	175	4	11	102	26	8	3	24
200	8	220	374	73	44	69	2	41.7	63.4	217.6	285	205	79	20	210	4	18	140	32	10	3	44
250	10	275	435	83	47.5	75	4	59	79	259.6	355	260	79	20	210	4	22	165	37	10	3	71
300	12	320	503	92	53	82	5	79.5	102.5	305.6	428	313	79	25	226	4	22	165	45	14	3.5	105
350	14	360	570	117	60.5	109	4	87	101	340.6	460	345	79	25	226	4	22	165	52	16	4	163
400	16	400	630	133	71	125	4	100.3	121.3	373.6	518	388	109	32	300	8	18	254	60	18	4	225
450	18	460	690	149	79	137	6	109.6	134.4	400.6	574	424	117	20	300	8	22	254	70	20	4.5	327
500	20	513	748	159	85	141	8	125.3	152.3	441.6	602	452	136	20	300	8	22	254	75	20	4.5	375
600	24	613	887	181	100	161	10	156.5	193.5	514.6	678	528	136	20	300	8	22	254	85	22	5	560

300Lb Full Lugged 80mm to 400mm



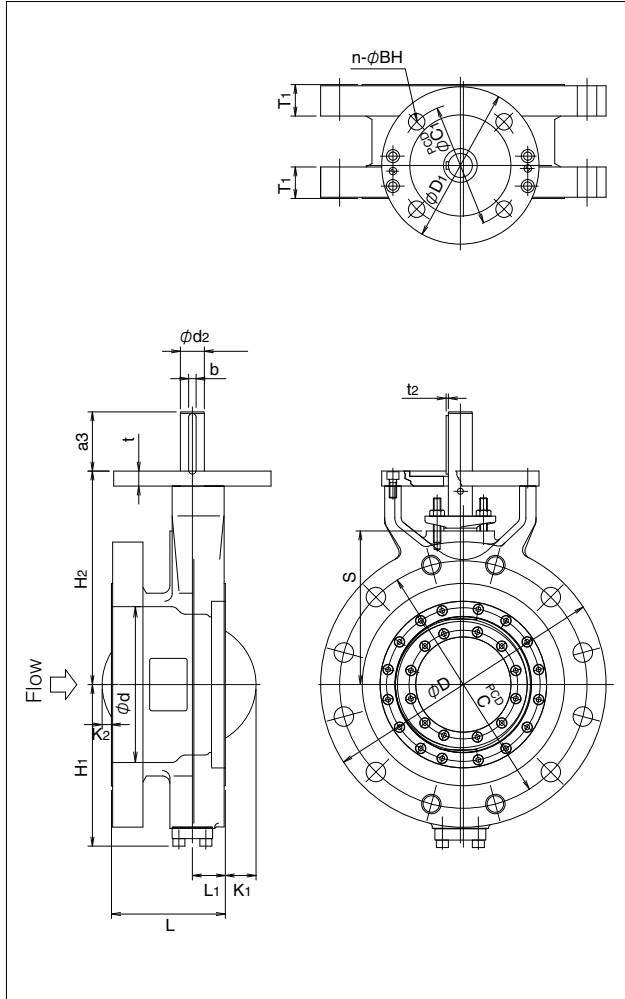
300Lb Full Lugged 450mm to 600mm



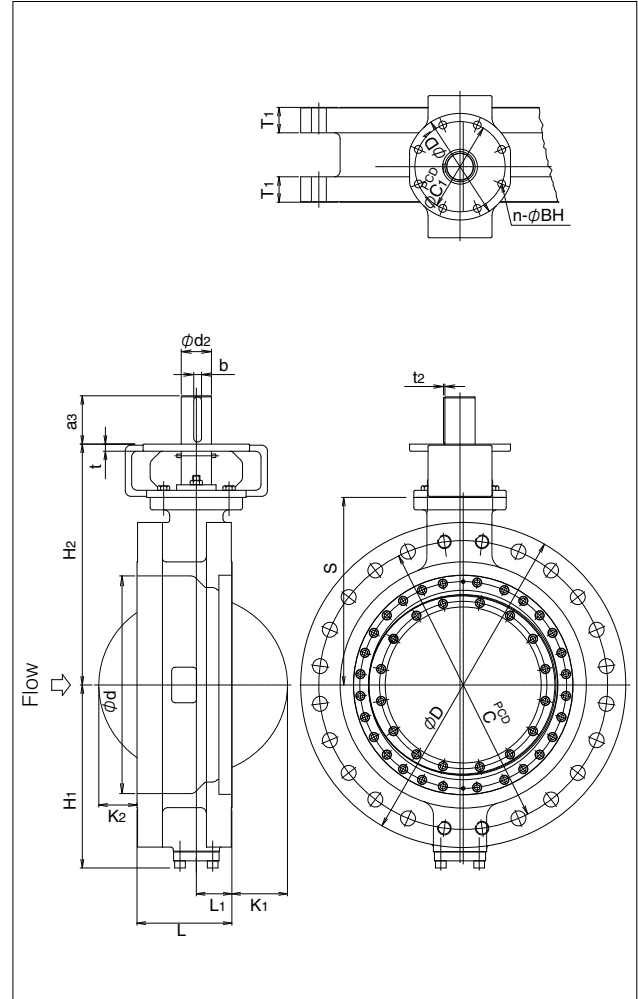
TT2-300Lb Bare shaft (Flanged type)

Nominal size		Dimension (mm)																			Approx. Mass (kg)
mm	inch	ϕd	ϕD	L	L ₁	K ₁	K ₂	T ₁	H ₁	H ₂	S	a ₃	t	ϕD ₁	n	BH	ϕC ₁	ϕd ₂	b	t ₂	
80	3	90	210	114	29	3	0	29	120.6	159	110	34	12	125	4	11	102	18	6	2.5	17
100	4	117	254	127	31.5	9	0	32	144.6	194	132	34	12	125	4	11	102	20	6	2.5	28
150	6	166	318	140	36.5	24	0	37	188.6	276	212	64	14	175	4	11	102	26	8	3	48
200	8	208	381	152	44	41.7	0	42	217.6	285	205	79	20	210	4	18	140	32	10	3	78
250	10	275	444	165	47.5	59	0	48	259.6	355	260	79	20	210	4	22	165	37	10	3	114
300	12	310	520	178	53	79.5	16.5	51	305.6	428	313	79	25	226	4	22	165	45	14	3.5	175
350	14	360	585	190	60.5	87	28	55	340.6	460	345	79	25	226	4	22	165	52	16	4	235
400	16	410	648	216	71	100.3	38.3	58	373.6	518	388	109	32	300	8	18	254	60	18	4	302
450	18	460	710	222	79	109.6	61.4	61	400.6	574	424	117	20	300	8	22	254	70	20	4.5	407
500	20	513	775	229	85	125.3	82.3	64	441.6	602	452	136	20	300	8	22	254	75	20	4.5	491
600	24	613	915	267	100	156.5	107.5	70	514.6	678	528	136	20	300	8	22	254	85	22	5	724

300Lb Flanged 80mm to 400mm



300Lb Flanged 450mm to 600mm



TT2 Actuator selection chart

■ 150 Lb/300 Lb Manual Gear

Nominal size		150 Lb class (Max. pressure: 2.0MPa)		300 Lb class (Max. pressure: 5.1MPa)	
mm	inch	Gear type	Handle diameter	Gear type	Handle diameter
80	3	2U - 3	200	2U - 3	200
100	4			SBWG-01	370
150	6				
200	8			SBWG-02	450
250	10	2U - 4	280	SBWG-02	450
300	12	SBWG-02	450	SBWG-03	550
350	14			SBWG-03-1S	
400	16	SBWG-03	550	SBWG-04-1S	710
450	18	SBWG-03-1S		SBWG-05-1S	
500	20			SBWG-05-1SD	
600	24	SBWG-04-1S	710	SBWG-06-1SD	900

■ 150 Lb Double-action Cylinder

Nominal size		150 Lb class (Max. pressure: 2.0MPa)							
		Normal-pressure (stem) side pressurization			Reverse-pressure (retainer) side pressurization				
		Closure pressure differential			Closure pressure differential				
		1.0 MPa or less	Over 1.0 MPa 1.5 MPa or less	Over 1.5 MPa 2.0 MPa or less	1.0 MPa or less	Over 1.0 MPa 1.5 MPa or less	Over 1.5 MPa 2.0 MPa or less		
mm	inch								

80	3	T200							
100	4								
150	6	T380							
200	8	T750							
250	10	TGA-125							
300	12								
350	14	TGA-140		TGA-160		TGA-140		TGA-160	
400	16			TGA-160				TGA-180	
450	18	TGA-160		TGA-180		TGA-160		TGA-180	
500	20	TGA-180				TGA-200		TGA-220	
600	24	TGA-200		TGA-220		TGA-250		TGA-200	
		TGA-220		TGA-250		TGA-280		TGA-300	

TT2 Actuator Selection Chart

■ 300 Lb, Recommended pressure direction (pressure from stem side), Double-action Cylinder

Nominal size		300 Lb class (Max. pressure: 5.1 MPa)									
		Normal-pressure (stem) side pressurization									
		Closure pressure differential									
mm	inch	1.0 MPa or less	Over 1.0 MPa 1.5 MPa or less	Over 1.5 MPa 2.0 MPa or less	Over 2.0 MPa 2.5 MPa or less	Over 2.5 MPa 3.0 MPa or less	Over 3.0 MPa 3.5 MPa or less	Over 3.5 MPa 4.0 MPa or less	Over 4.0 MPa 4.5 MPa or less	Over 4.5 MPa 5.1 MPa or less	
80	3	T200									
100	4										
150	6	T380						T750			
200	8										
250	10	T750(TGA-125)						TGA-125			
300	12										
350	14	TGA-125						TGA-140			
400	16										
450	18	TGA-140				TGA-160				TGA-180	
500	20										
600	24	TGA-160				TGA-180				TGA-200	
		TGA-180		TGA-200		TGA-220					
		TGA-200		TGA-220		TGA-250					
		TGA-220		TGA-250							

■ 300 Lb, Non-recommended pressure direction (pressure from retainer side), Double-action Cylinder

Nominal size		300 Lb class (Max. pressure: 5.1 MPa)							
		Reverse-pressure (retainer) side pressurization							
		Closure pressure differential							
		1.0 MPa or less	Over 1.0 MPa 1.5 MPa or less	Over 1.5 MPa 2.0 MPa or less	Over 2.0 MPa 2.5 MPa or less	Over 2.5 MPa 3.0 MPa or less	Over 3.0 MPa 3.5 MPa or less	Over 3.5 MPa 4.0 MPa or less	Over 4.0 MPa 4.5 MPa or less
mm	inch								
80	3	T200							
100	4	T380							
150	6							T750	
200	8	TGA-125						TGA-140	
250	10						TGA-140		TGA-160
300	12	TGA-160						TGA-180	
350	14						TGA-200		
400	16	TGA-180			TGA-200		TGA-220		
450	18			TGA-200	TGA-220		TGA-250		
500	20	TGA-200		TGA-220					
600	24	TGA-220	TGA-250						

TT2 Actuator Selection Chart

150Lb Single-action Cylinder

Nominal size		150 Lb class (Max. pressure: 2.0 MPa)					
		Normal-pressure (stem) side pressurization			Reverse-pressure (retainer) side pressurization		
		Closure pressure differential			Closure pressure differential		
		1.0 MPa or less	Over 1.0 MPa 1.5 MPa or less	Over 1.5 MPa 2.0 MPa or less	1.0 MPa or less	Over 1.0 MPa 1.5 MPa or less	Over 1.5 MPa 2.0 MPa or less
80	3	T380S					
100	4						
150	6	T750S					
200	8				TG-12S		
250	10						
300	12				TG-14S		
350	14						
400	16						
450	18				TG-20S		
500	20						
600	24						

300Lb • Recommended pressure direction (pressure from stem side), Single-action Cylinder

Nominal size		300 Lb class (Max. pressure: 5.1 MPa)							
		Normal-pressure (stem) side pressurization							
		Closure pressure differential							
		1.0 MPa or less	Over 1.0 MPa 1.5 MPa or less	Over 1.5 MPa 2.0 MPa or less	Over 2.0 MPa 2.5 MPa or less	Over 2.5 MPa 3.0 MPa or less	Over 3.0 MPa 3.5 MPa or less	Over 3.5 MPa 4.0 MPa or less	Over 4.0 MPa 4.5 MPa or less
mm	inch								

80	3	T750S								TG-10S
100	4									
150	6									
200	8	TG-12S								
250	10									TG-14S
300	12									
350	14									
400	16									
450	18									
500	20									
600	24									

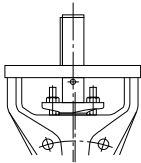
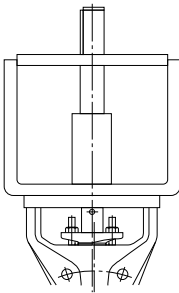
TT2 Actuator Selection Chart

■300Lb • Non-recommended pressure direction (pressure from retainer side), Single-action Cylinder

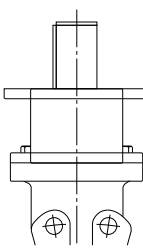
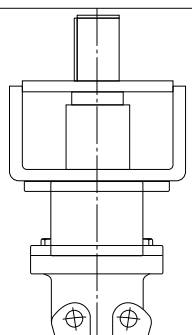
Nominal size		300 Lb class (Max. pressure: 5.1 MPa)								
		Reverse-pressure (retainer) side pressurization								
		Closure pressure differential								
mm	inch	1.0 MPa or less	Over 1.0 MPa 1.5 MPa or less	Over 1.5 MPa 2.0 MPa or less	Over 2.0 MPa 2.5 MPa or less	Over 2.5 MPa 3.0 MPa or less	Over 3.0 MPa 3.5 MPa or less	Over 3.5 MPa 4.0 MPa or less	Over 4.0 MPa 4.5 MPa or less	Over 4.5 MPa 5.1 MPa or less
80	3	T750S								
100	4	TG-10S								
150	6	TG-12S								
200	8	TG-14S								
250	10									
300	12	TG-20S								
350	14									

TT2 Actuator Mounting Finished by Temperature

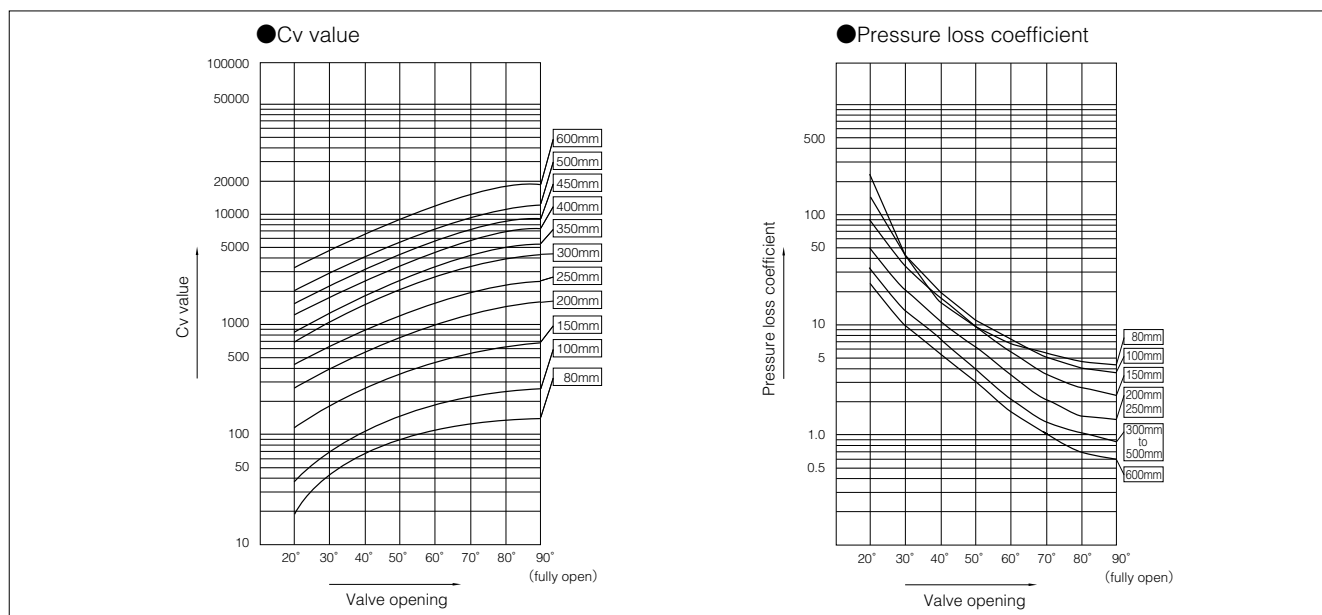
■300Lb-80 to 400mm, 150Lb-80 to 500mm

			
-29 to 400 degrees C		400 to 600 degrees C	
Body / Disc	A216 WCB (-29 to 538 degrees C)		
	A351 CF8M (-29 to 600 degrees C)		
Disc seal	316SS		
Stem	A564-630 (H1150X2)	Inconel 718	
Body seat	316SS + graphite laminate		

■300Lb-450 to 600mm, 150Lb-600mm

		
-29 to 400 degrees C	400 to 600 degrees C	
Body / Disc	A216 WCB(-29 to 538 degrees C)	
	A351 CF8M(-29 to 600 degrees C)	
Disc seal	316SS	
Stem	A564-630(H1150X2)	Inconel 718
Body seat	316SS + graphite laminate	

TT2 150Lb Cv value/pressure loss coefficient



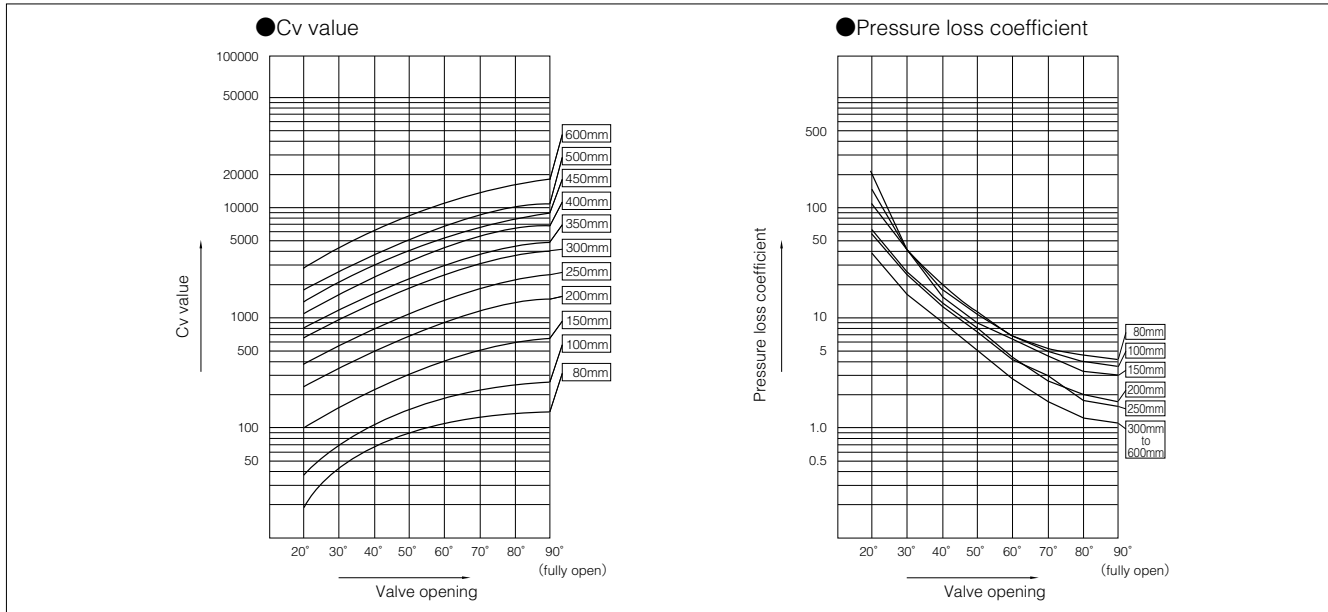
TT2 150Lb Cv value

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	18.5	42.9	69.8	92.5	109	121	130	134
100	4	38.9	73.1	109	146	182	217	244	255
150	6	111	181	253	340	446	559	650	686
200	8	259	400	542	730	980	1260	1480	1570
250	10	411	635	859	1160	1550	1990	2340	2480
300	12	697	1080	1460	1960	2630	3370	3970	4210
350	14	861	1330	1800	2420	3250	4170	4910	5200
400	16	1200	1850	2510	3370	4530	5810	6840	7250
450	18	1500	2310	3130	4220	5670	7270	8550	9060
500	20	1930	2980	4040	5440	7310	9360	11000	11700
600	24	3110	4800	6500	8750	11800	15100	17700	18800

TT2 150Lb Pressure loss coefficient

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	233	43.2	16.3	9.29	6.71	5.47	4.69	4.45
100	4	155	43.9	19.5	11.0	7.04	4.99	3.92	3.6
150	6	90.4	33.9	17.3	9.6	5.58	3.56	2.63	2.36
200	8	50.8	21.3	11.6	6.41	3.55	2.16	1.56	1.39
250	10	48.5	20.3	11.1	6.12	3.39	2.07	1.49	1.33
300	12	34.7	14.6	7.95	4.38	2.43	1.48	1.07	0.95
350	14	35.7	15	8.17	4.5	2.50	1.52	1.1	0.976
400	16	31.3	13.2	7.18	3.96	2.19	1.34	0.964	0.858
450	18	32.1	13.5	7.35	4.05	2.24	1.37	0.987	0.878
500	20	29.8	12.5	6.83	3.76	2.09	1.27	0.917	0.817
600	24	24.1	10.1	5.52	3.04	1.69	1.03	0.741	0.66

TT2 300Lb Cv value/pressure loss coefficient



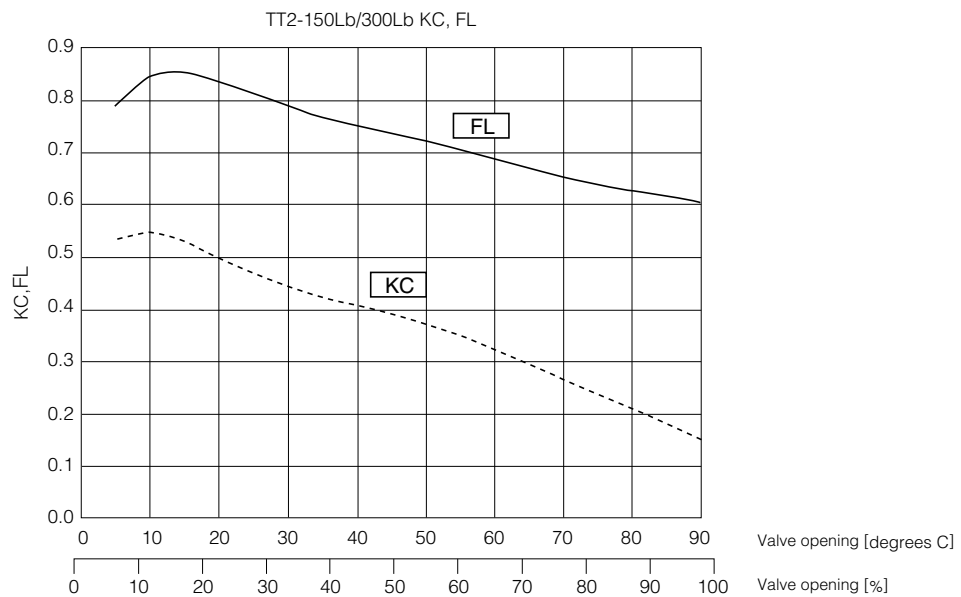
TT2 300Lb Cv value

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	18.5	42.9	69.8	92.5	109	121	130	134
100	4	38.9	73.1	109	146	182	217	244	255
150	6	99	162	226	304	399	499	580	612
200	8	232	357	484	652	875	1120	1320	1400
250	10	367	567	767	1030	1390	1780	2090	2220
300	12	622	960	1300	1750	2350	3010	3550	3760
350	14	768	1190	1610	2160	2910	3270	4380	4640
400	16	1070	1650	2240	3010	4050	5190	6100	6470
450	18	1340	2070	2800	3770	5060	6490	7630	8090
500	20	1730	2660	3610	4860	6520	8360	9840	10400
600	24	2780	4290	5800	7820	10500	13500	15800	16800

TT2 300Lb Pressure loss coefficient

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	233	43.2	16.3	9.29	6.71	5.47	4.69	4.45
100	4	155	43.9	19.5	11.0	7.04	4.99	3.92	3.6
150	6	113	42.5	21.7	12.0	7.00	4.46	3.3	2.97
200	8	63.7	26.7	14.6	8.04	4.46	2.71	1.96	1.74
250	10	60.8	25.5	13.9	7.67	4.25	2.59	1.87	1.66
300	12	43.5	18.3	9.97	5.49	3.05	1.85	1.34	1.19
350	14	44.7	18.8	10.2	5.65	3.13	1.91	1.38	1.22
400	16	39.3	16.5	9	4.96	2.75	1.67	1.21	1.08
450	18	40.3	16.9	9.22	5.08	2.82	1.71	1.24	1.1
500	20	37.4	15.7	8.57	4.72	2.62	1.59	1.15	1.02
600	24	30.2	12.7	6.92	3.81	2.11	1.29	0.929	0.827

TT2 KC, FL

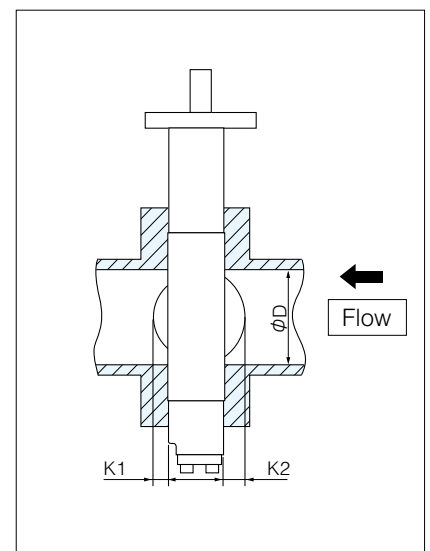


150Lb, 300Lb

mm	Valve opening							
	20°	30°	40°	50°	60°	70°	80°	90°
KC	0.498	0.443	0.407	0.372	0.324	0.265	0.209	0.151
FL	0.838	0.788	0.752	0.724	0.691	0.654	0.626	0.604

TT2 Minimum internal diameters of piping

Nominal size		Minimum internal diameters of piping	
mm	inch	150Lb	300Lb
80	3	73	73
100	4	87	87
150	6	129	128
200	8	185	181
250	10	227	221
300	12	281	275
350	14	313	301
400	16	363	349
450	18	395	385
500	20	446	430
600	24	538	534



Worm gear type TT2-2U(80mm to 250mm) / TT2-2K (300mm to 600mm)

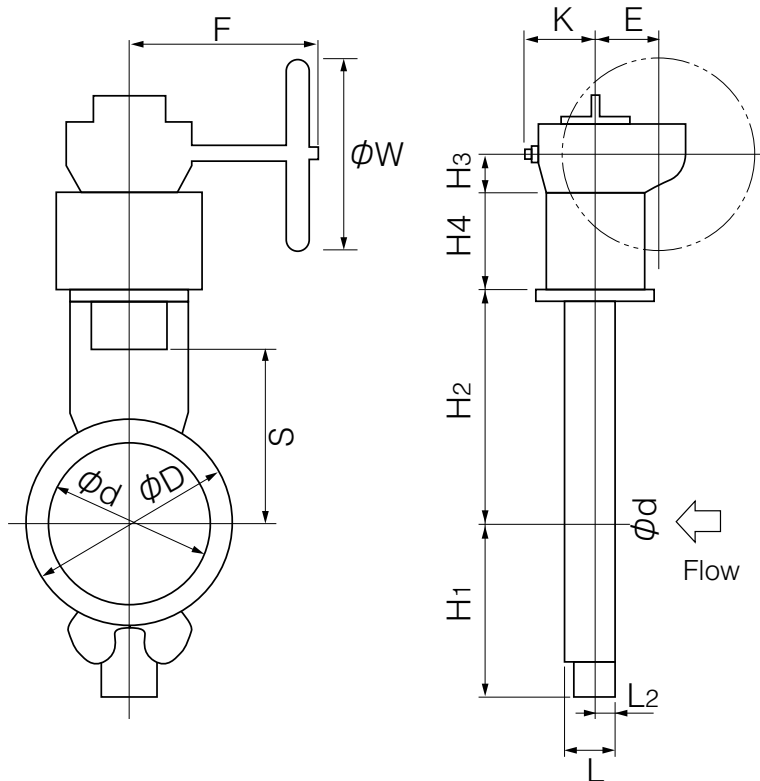
■150Lb Wafer type High temperature specification

Nominal size		Dimension (mm)													Gear type	Approx. Weight (kg)
mm	inch	ϕd	ϕD	L	L ₂	H ₁	H ₂	S	H ₃	H ₄	E	K	F	ϕW		
80	3	82	127	48	19	120.6	159	110	42	100	67	75	198	200	2U	19 (15)
100	4	108	154	54	22.5	144.6	194	132	42	100	67	75	198	200		23 (19)
150	6	159	215	57	22	189.6	242	180	42	100	67	75	198	200		30 (26)
200	8	202	266	64	25	199.6	248	180	42	100	67	88	198	200		39 (35)
250	10	235	324	71	28	245.6	326	252	48	150	88	90	223	280		67 (61)
300	12	290	373	81	32.5	281.6	376	281	63	150	91.5	127	310	400	2K	103 (87)
350	14	329	413	92	40	307.6	400	305	63	150	91.5	127	310	400		119 (103)
400	16	370	470	102	39	345.6	470	355	63	180	113	156	343	560		155 (135)
450	18	432	534	114	46	383.6	510	395	63	180	31.5	156	363	560		214 (194)
500	20	488	585	127	48	410.6	531	416	63	180	31.5	156	363	500		241 (221)
600	24	576	692	154	65	469.6	643	493	85	200	32.7	200	422	630	SBWG-04-1S	411 (381)

Standard is H₄=0. Approx. Mass is shown in ().

■TT2-2U/2K

80 to 250mm



■2U/2K Installation direction

Stem side Retainer side 2UA / 2KA	Stem side Retainer side 2UB / 2KB	Stem side Retainer side 2UC / 2KC	Stem side Retainer side 2UD / 2KD
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Worm Gear Type TT2-2U (80mm to 250mm) / TT2-2K (300mm to 600mm)

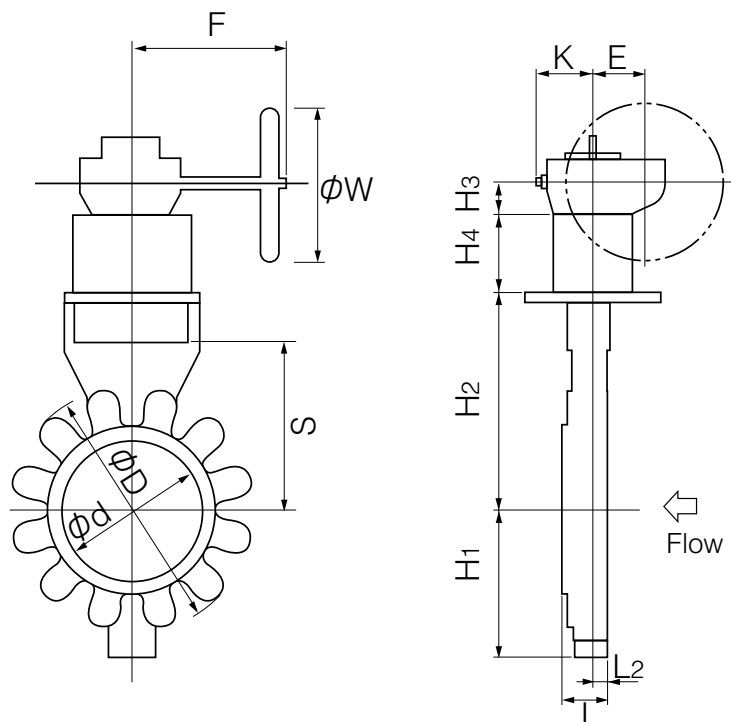
150Lb Full Lugged Type in High Temperature Specification

Nominal size		Dimension (mm)													Gear type	Approx. Weight (kg)	
mm	inch	φd	φD	L	L ₂	H ₁	H ₂	S	H ₃	H ₄	E	K	F	φW			
80	3	100	185	48	19	120.6	159	110	42	100	67	75	198	200	2U	2U-3	19 (15)
100	4	117	238	54	22.5	144.6	194	132	42	100	67	75	198	200		2U-3	25 (21)
150	6	167	281	57	22	189.6	242	180	42	100	67	75	198	200		2U-3	32 (28)
200	8	218	338	64	25	199.6	248	180	42	100	67	88	198	200		2U-3	40 (36)
250	10	270	424	71	28	245.6	326	252	48	150	88	90	222.5	280		2U-4	74 (68)
300	12	320	478	81	32.5	281.6	376	281	63	150	91.5	127	310	400	2K	SBWG-02	113 (97)
350	14	350	526	92	40	307.6	400	305	63	150	91.5	127	310	400		SBWG-02	128 (112)
400	16	410	592	102	39	345.6	470	355	63	180	113	156	343	560		SBWG-03	182 (162)
450	18	460	634	114	46	383.6	510	395	63	180	31.5	156	363	560		SBWG-03-1S	238 (218)
500	20	510	714	127	48	410.6	531	416	63	180	31.5	156	363	500		SBWG-03-1S	278 (258)
600	24	614	830	154	65	469.6	643	493	85	200	32.7	200	422	630	SBWG-04-1S	498 (468)	

Standard is H₄=0. Approx, Mass is shown in ().

TT2-2U/2K

80 to 250mm



2U/2K Installation Direction

Stem Side Retainer Side 2UA / 2KA	Stem Side Retainer Side 2UB / 2KB	Stem Side Retainer Side 2UC / 2KC	Stem Side Retainer Side 2UD / 2KD
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Worm Gear Type TT2-2U (80mm to 250mm) / TT2-2K (300mm to 600mm)

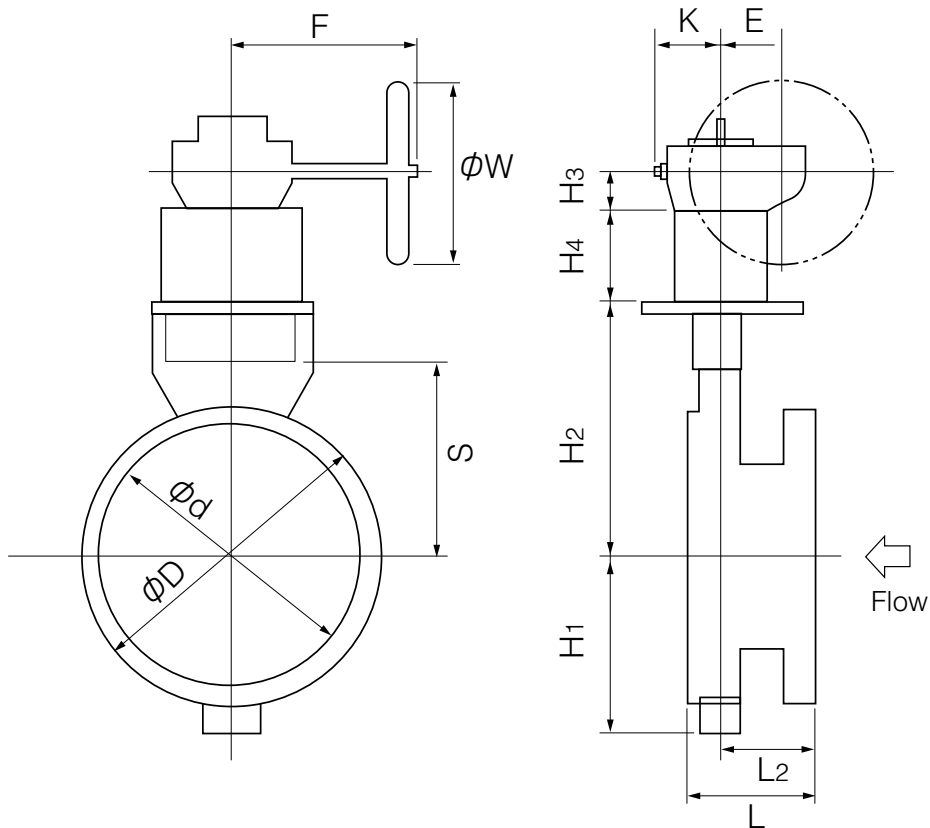
■150Lb Flanged Type in High Temperature Specification

Nominal size		Dimension (mm)													Gear type	Approx. Weight (kg)
mm	inch	ϕd	ϕD	L	L ₂	H ₁	H ₂	S	H ₃	H ₄	E	K	F	ϕW		
80	3	90	190	114	85	120.6	159	110	42	100	67	75	198	200	2U	26 (22)
100	4	117	229	127	95.5	144.6	194	132	42	100	67	75	198	200		33 (29)
150	6	167	279	140	105	189.6	242	180	42	100	67	75	198	200		46 (42)
200	8	218	343	152	113	199.6	248	180	42	100	67	88	198	200		60 (56)
250	10	270	406	165	122	245.6	326	252	48	150	88	90	222.5	280		99 (93)
300	12	320	483	178	129.5	281.6	376	281	63	150	91.5	127	310	400	2K	154 (138)
350	14	350	535	190	138	307.6	400	305	63	150	91.5	127	310	400		192 (176)
400	16	410	595	216	153	345.6	470	355	63	180	113	156	343	560		242 (222)
450	18	458	635	222	154	383.6	510	395	63	180	31.5	156	363	560		290 (270)
500	20	510	700	229	150	410.6	531	416	63	180	31.5	156	363	500		365 (345)
600	24	614	815	267	178	469.6	643	493	85	200	32.7	200	422	630	SBWG-04-1S	537 (507)

Standard is H₄=0. Approx. Mass is shown in ().

■TT2-2U/2K

80 to 250mm



■2U/2K Installation Direction

Stem Side Retainer Side 2UA / 2KA	Stem Side Retainer Side 2UB / 2KB	Stem Side Retainer Side 2UC / 2KC	Stem Side Retainer Side 2UD / 2KD
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Worm Gear Type TT2-2U (80mm to 150mm) / TT2-2K (200mm to 600mm)

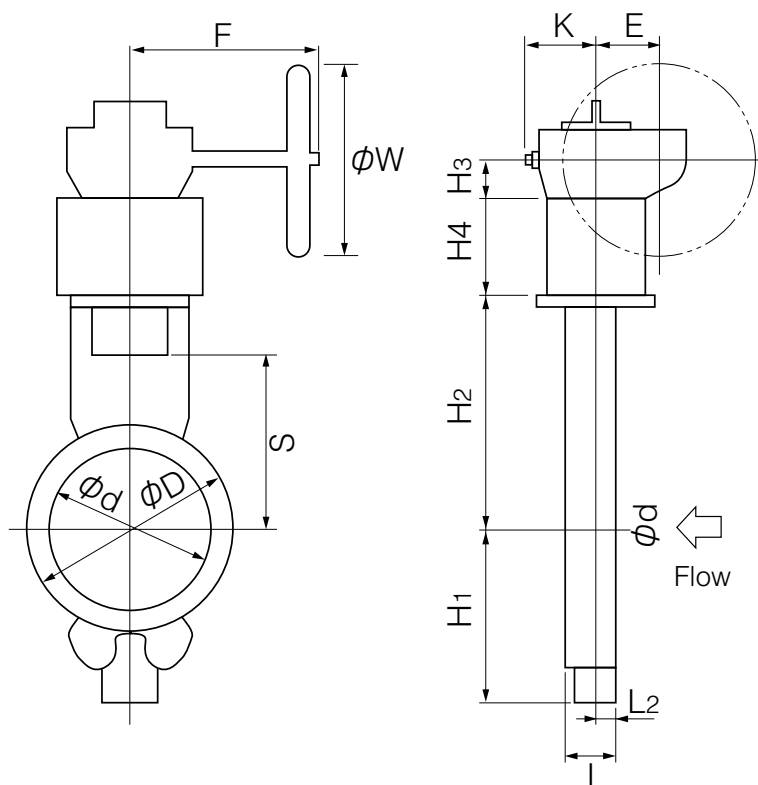
■300Lb Wafer Type in High Temperature Specification

Nominal size		Dimension (mm)													Gear type	Approx. Weight (kg)	
mm	inch	φd	φD	L	L ₂	H ₁	H ₂	S	H ₃	H ₄	E	K	F	φW			
80	3	82	127	48	19	120.6	159	110	42	100	67	75	198	200	2U	2U-3	19 (15)
100	4	108	154	54	22.5	144.6	194	132	42	100	67	75	198	200		2U-3	23 (19)
150	6	153	215	59	22.5	188.6	276	212	42	100	67	88	198	200		2U-3	35 (31)
200	8	188	270	73	29	217.6	285	205	52	150	75	110	252	300	2K	SBWG-01	61 (49)
250	10	235	324	83	35.5	259.6	355	260	63	150	91.5	127	310	400		SBWG-02	96 (80)
300	12	290	381	92	39	305.6	428	313	63	180	113	156	343	560		SBWG-03	137 (117)
350	14	329	413	117	56.5	340.6	460	345	63	180	31.5	156	363	560		SBWG-03-1S	166 (146)
400	16	370	470	133	62	373.6	518	388	85	200	32.7	180	422	630		SBWG-04-1S	268 (238)
450	18	426	534	149	70	400.6	574	424	87	200	72.7	216	476	710		SBWG-05-1S	366 (329)
500	20	476	592	159	74	441.6	602	452	87	200	184.5	218	508	710		SBWG-05-1SD	436 (399)
600	24	564	693	181	81	514.6	678	528	110	200	230	290	648	800	SBWG-06-1SD	673 (636)	

Standard is $H_4=0$. Approx. Mass is shown in ().

■TT2-2U/2K

80 to 150mm



■2U/2K Installation Direction

Stem Side Retainer Side 2UA / 2KA	Stem Side Retainer Side 2UB / 2KB	Stem Side Retainer Side 2UC / 2KC	Stem Side Retainer Side 2UD / 2KD
--	--	--	--

Worm Gear Type TT2-2U (80mm to 150mm) / TT2-2K (200mm to 600mm)

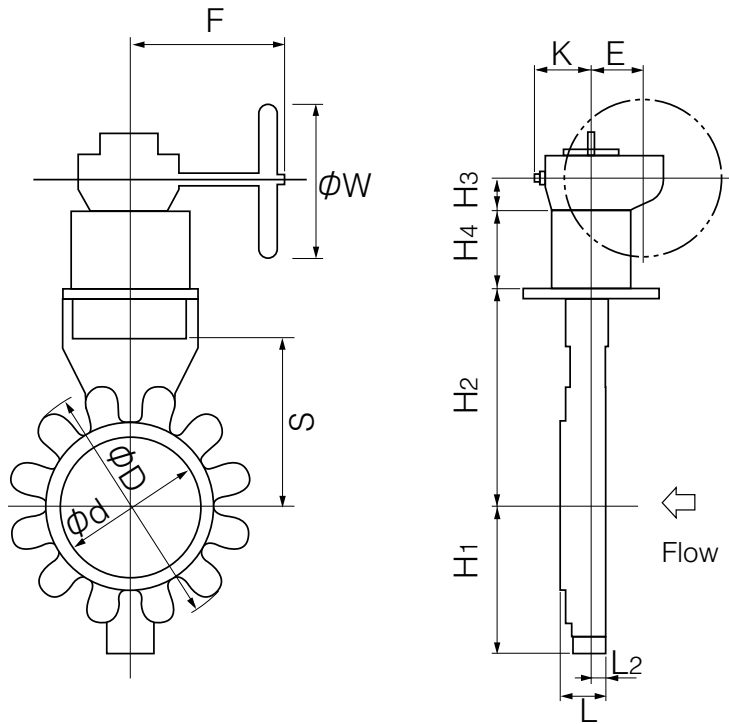
■300Lb Full Lugged Type in High Temperature Specification

Nominal size		Dimension (mm)													Gear type	Approx. Weight (kg)
mm	inch	ϕd	ϕD	L	L ₂	H ₁	H ₂	S	H ₃	H ₄	E	K	F	ϕW		
80	3	82	204	48	19	120.6	159	110	42	100	67	75	198	200	2U	2U-3 20 (16)
100	4	177	238	54	22.5	144.6	194	132	42	100	67	75	198	200		2U-3 25 (21)
150	6	166	312	59	22.5	188.6	276	212	42	100	67	88	198	200		2U-3 36 (32)
200	8	208	374	73	29	217.6	285	205	52	150	75	110	252	300		SBWG-01 72 (56)
250	10	275	435	83	35.5	259.6	355	260	63	150	91.5	127	310	400	2K	SBWG-02 108 (92)
300	12	320	503	92	39	305.6	428	313	63	180	113	156	343	560		SBWG-03 153 (133)
350	14	360	570	117	56.5	340.6	460	345	63	180	31.5	156	363	560		SBWG-03-1S 216 (196)
400	16	400	630	133	62	373.6	518	388	85	200	32.7	180	422	630		SBWG-04-1S 327 (297)
450	18	460	690	149	70	400.6	574	424	87	200	72.7	216	476	710		SBWG-05-1S 462 (425)
500	20	513	748	159	74	441.6	602	452	87	200	184.5	218	508	710		SBWG-05-1SD 519 (482)
600	24	613	887	181	81	514.6	678	528	110	200	230	290	648	800		SBWG-06-1SD 817 (780)

Standard is H₄=0. Approx. Mass is shown in ().

■TT2-2U/2K

80 to 150mm



■2U/2K Installation Direction

Stem Side Flow Retainer Side 2UA / 2KA	Stem Side Flow Retainer Side 2UB / 2KB	Stem Side Flow Retainer Side 2UC / 2KC	Stem Side Flow Retainer Side 2UD / 2KD
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Worm Gear Type TT2-2U (80mm to 150mm) / TT2-2K (200mm to 600mm)

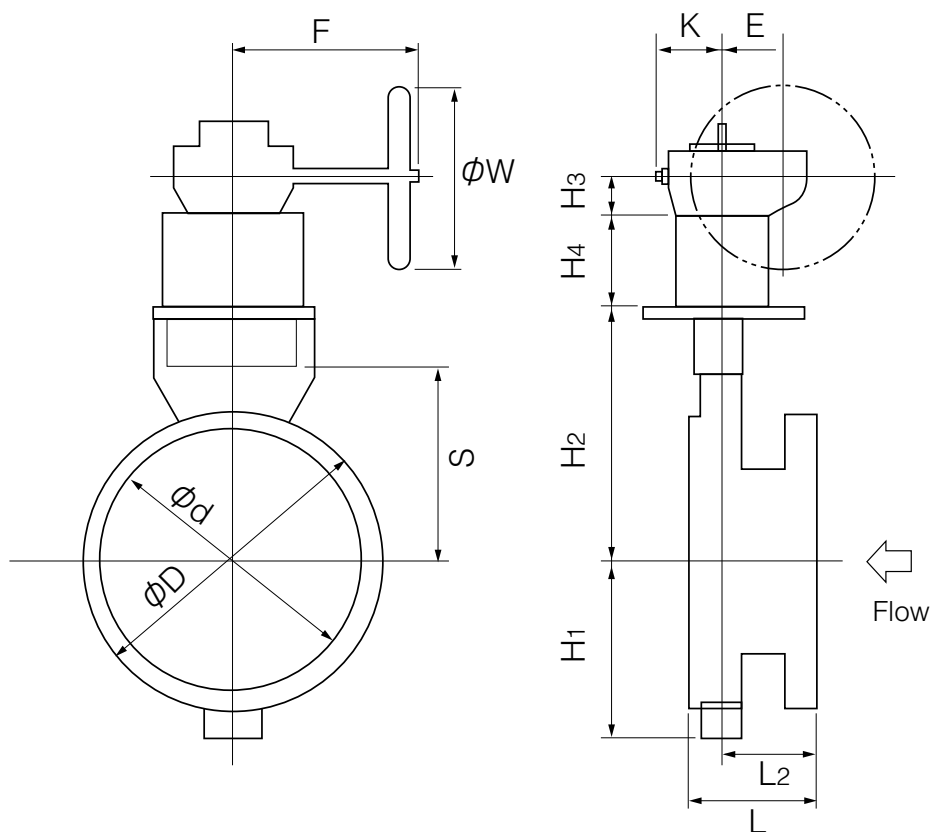
300Lb Flanged Type in High Temperature Specification

Nominal size		Dimension (mm)													Gear type	Approx. Weight (kg)	
mm	inch	φd	ΦD	L	L ₂	H ₁	H ₂	S	H ₃	H ₄	E	K	F	φW			
80	3	90	210	114	85	120.6	159	110	42	100	67	75	198	200	2U	2U-3	29 (25)
100	4	117	254	127	95.5	144.6	194	132	42	100	67	75	198	200		2U-3	40 (36)
150	6	166	318	140	103.5	188.6	276	212	42	100	67	88	198	200		2U-3	60 (56)
200	8	208	381	152	108	217.6	285	205	52	150	75	110	252	300	2K	SBWG-01	102 (90)
250	10	275	444	165	117.5	259.6	355	260	63	150	91.5	127	310	400		SBWG-02	151 (135)
300	12	310	520	178	125	305.6	428	313	63	180	113	156	343	560		SBWG-03	223 (203)
350	14	360	585	190	129.5	340.6	460	345	63	180	31.5	156	363	560		SBWG-03-1S	288 (268)
400	16	410	648	216	145	373.6	518	388	85	200	32.7	180	422	630		SBWG-04-1S	404 (374)
450	18	460	710	222	143	400.6	574	424	87	200	72.7	216	476	710		SBWG-05-1S	542 (505)
500	20	513	775	229	144	441.6	602	452	87	200	184.5	218	508	710		SBWG-05-1SD	635 (598)
600	24	613	915	267	167	514.6	678	528	110	200	230	290	648	800	SBWG-06-1SD	981 (944)	

Standard is H₄=0. Approx. Mass is shown in ().

TT2-2U/2K

80 to 150mm



2U/2K Installation Direction

Stem Side Retainer Side 2UA / 2KA	Stem Side Retainer Side 2UB / 2KB	Stem Side Retainer Side 2UC / 2KC	Stem Side Retainer Side 2UD / 2KD
--	--	--	--

TT2 Applicable flange standard

■150Lb Wafer

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	T (D)	—	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
100	4	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
150	6	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
200	8	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
250	10	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
300	12	×	T (D)	T	T	×	T (D)	T (D)	×	×
350	14	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
400	16	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
450	18	×	T	T	T	×	T	T	×	×
500	20	×	T	T	T	×	T	T	×	×
600	24	×	T	T	T	×	T	T	×	×

■300Lb Wafer

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	T (D)	—	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
100	4	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
150	6	T (D)	×	×	T (D)	T (D)	×	T (D)	T (D)	T (D)
200	8	T (D)	×	×	T (D)	T (D)	×	T (D)	T (D)	T (D)
250	10	T	×	×	T (D)	T (D)	×	T (D)	T (D)	T (D)
300	12	T	×	×	T	T	×	T (D)	T	T
350	14	T	×	×	T	T	×	T	T	T
400	16	T	×	×	T	T	×	T	T	T
450	18	T	×	×	T	×	×	T	T	T
500	20	T	×	×	T	×	×	T	T	T
600	24	T	×	×	T	×	×	T	T	T

T(D): With drill hole or tapping.

T : With flange tapping

— : No nominal diameter.

×

TT2 Applicable flange standard

■150Lb Lugged

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	×	T (D)	×	×	×	×	×	×	×
100	4	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
150	6	×	T (D)	T (D)	×	×	T (D)	T (D)	×	×
200	8	×	T (D)	×	×	×	T (D)	×	×	×
250	10	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
300	12	×	T (D)	×	×	×	T (D)	T (D)	×	×
350	14	×	T (D)	×	×	×	×	×	×	×
400	16	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
450	18	×	T	×	×	×	×	×	×	×
500	20	×	T	T	T	×	T	T	×	×
600	24	×	T	×	×	×	T	T	×	×

■300Lb Lugged

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	T (D)	×	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
100	4	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
150	6	T (D)	×	×	T (D)	T (D)	×	×	×	×
200	8	T (D)	×	×	T (D)	T (D)	×	T (D)	T (D)	T (D)
250	10	T	×	×	×	×	×	×	×	×
300	12	T	×	×	T	T	×	×	T	T
350	14	T	×	×	×	×	×	×	×	×
400	16	T	×	×	×	×	×	×	×	×
450	18	T	×	×	×	×	×	×	×	×
500	20	T	×	×	×	×	×	×	×	×
600	24	T	×	×	×	×	×	×	×	×

T(D) : With drill hole or tapping.

T : With flange tapping

×

: Not applicable

TT2 Applicable flange standard

■150Lb DFSP

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	×	D	×	×	×	×	×	×	×
100	4	×	T	×	×	×	×	×	×	×
150	6	×	T	×	×	×	×	×	×	×
200	8	×	T	×	×	×	×	×	×	×
250	10	×	T	×	×	×	×	×	×	×
300	12	×	T	×	×	×	×	×	×	×
350	14	×	T	×	×	×	×	×	×	×
400	16	×	T	×	×	×	×	×	×	×
450	18	×	T	×	×	×	×	×	×	×
500	20	×	T	×	×	×	×	×	×	×
600	24	×	T	×	×	×	×	×	×	×

■300Lb DFSP

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	T	×	×	×	×	×	×	×	×
100	4	T	×	×	×	×	×	×	×	×
150	6	T	×	×	×	×	×	×	×	×
200	8	T	×	×	×	×	×	×	×	×
250	10	T	×	×	×	×	×	×	×	×
300	12	T	×	×	×	×	×	×	×	×
350	14	T	×	×	×	×	×	×	×	×
400	16	T	×	×	×	×	×	×	×	×
450	18	T	×	×	×	×	×	×	×	×
500	20	T	×	×	×	×	×	×	×	×
600	24	T	×	×	×	×	×	×	×	×

D : With flange drilling

T : With flange tapping

× : Not applicable

* JIS, BS, DIN double-flange type main body not available.

Please consult with us regarding the appropriateness of JIS, BS and DIN piping in an ANSI or API/JPI main body.

TT2 Wafer Type Piping Bolts and Nuts Sizes

■ Wafer Type 150Lb

Nominal size		ASME B16.5 150Lb, JPI-7S-15 150Lb			10K		
mm	inch	Setting Bolts	Long Bolts	No. of Nuts	Setting Bolts	Long Bolts	No. of Nuts
80	3	—	4-5/8-11UNC×160	8	8-M16× 75 (13× 8)	4-M16×145	16
100	4	8-5/8-11UNC× 85 (13× 8)	4-5/8-11UNC×160	16	8-M16× 75 (13× 8)	4-M16×145	16
150	6	8-3/4-10UNC× 95 (17×11)	4-3/4-10UNC×175	16	8-M20× 85 (17×11)	4-M20×170	16
200	8	8-3/4-10UNC× 95 (17×11)	4-3/4-10UNC×185	16	8-M20× 85 (17×11)	8-M20×180	24
250	10	8-7/8- 9UNC×100 (19×12)	8-7/8- 9UNC×205	24	8-M22× 95 (19×12)	8-M22×190	24
300	12	8-7/8- 9UNC×100 (19×12)	8-7/8- 9UNC×220	24	8-M22× 95 (19×12)	12-M22×200	32
350	14	8- 1-8UNC×115 (21×14)	8- 1-8UNC×245	24	8-M22× 95 (19×12)	12-M22×215	32
400	16	8- 1-8UNC×125 (21×14)	12- 1-8UNC×260	32	8-M24×120 (21×14)	12-M24×240	32
450	18	8- 1 1/8-8UN×135 (24×16)	12-1 1/8-8UN×285	32	8-M24×110 (21×14)	16-M24×250	40
500	20	8- 1 1/8-8UN×135 (24×16)	16-1 1/8-8UN×300	40	8-M24×110 (21×14)	16-M24×260	40
600	24	8- 1 1/4-8UN×145 (24×16)	16-1 1/4-8UN×345	40	8-M30×125 (24×16)	20-M30×320	48

Nominal size		16K			20K		
mm	inch	Setting Bolts	Long Bolts	No. of Nuts	Setting Bolts	Long Bolts	No. of Nuts
80	3	8-M20× 85 (17×11)	4-M20×160	16	8-M20× 85 (17×11)	4-M20×160	16
100	4	8-M20× 85 (17×11)	4-M20×170	16	8-M20× 85 (17×11)	4-M20×170	16
150	6	8-M22× 95 (19×12)	8-M22×175	24	8-M22× 95 (19×12)	8-M22×190	24
200	8	8-M22× 95 (19×12)	8-M22×190	24	8-M22×105 (19×12)	8-M22×200	24
250	10	8-M24×100 (21×14)	8-M24×210	24	8-M24×110 (21×14)	8-M24×220	24
300	12	8-M24×100 (21×14)	12-M24×220	32	8-M24×110 (21×14)	12-M24×230	32
350	14	8-M30 (P3)×125 (24×16)	12-M30 (P3)×250	32	8-M30 (P3)×135 (24×16)	12-M30 (P3)×260	32
400	16	8-M30 (P3)×135 (24×16)	12-M30 (P3)×275	32	8-M30 (P3)×145 (24×16)	12-M30 (P3)×285	32
450	18	8-M30 (P3)×135 (24×16)	16-M30 (P3)×285	40	8-M30 (P3)×145 (24×16)	16-M30 (P3)×300	40
500	20	8-M30 (P3)×135 (24×16)	16-M30 (P3)×300	40	8-M30 (P3)×145 (24×16)	16-M30 (P3)×315	40
600	24	8-M36 (P3)×155 (30×20)	20-M36 (P3)×355	48	8-M36 (P3)×165 (30×20)	20-M36 (P3)×365	48

Note: Bolt/Nut material: SNB7/S45C

Please use a nut with a height that is 100% of the screw diameter.

The bold length calculation is based on use of a 4.5 mm thick spiral gasket.

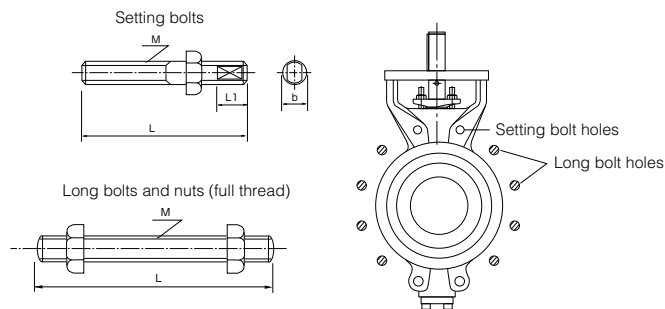
The flange thickness calculation is based on the standard steel flange thickness.

Quantities shown are for one valve.

Examples

Setting bolts: 8 - M16 × 75 (13 × 8)

Long bolts: 4 - M16 × 145



TT2 Wafer Type Piping Bolts and Nuts Sizes

■ Wafer Type 150Lb

Nominal size		DIN NP10, BS4504 PN10, ISO7005-1 PN10			DIN NP16, BS4504 PN16, ISO7005-1 PN16		
mm	inch	Setting Bolts	Long Bolts	No. of Nuts	Setting Bolts	Long Bolts	No. of Nuts
80	3	8-M16× 75(13× 8)	4-M16×145	16	8-M16× 75(13× 8)	4-M16×145	16
100	4	8-M16× 75(13× 8)	4-M16×155	16	8-M16× 75(13× 8)	4-M16×155	16
150	6	8-M20× 85(17×11)	4-M20×170	16	8-M20× 85(17×11)	4-M20×170	16
200	8	8-M20× 85(17×11)	4-M20×180	16	8-M20× 85(17×11)	8-M20×180	24
250	10	8-M20× 95(17×11)	8-M20×190	24	8-M24×100(21×14)	8-M24×200	24
300	12	8-M20× 95(17×11)	8-M20×210	24	8-M24×100(21×14)	8-M24×220	24
350	14	8-M20× 95(17×11)	12-M20×210	32	8-M24×110(21×14)	12-M24×230	32
400	16	8-M24×110(21×14)	12-M24×230	32	8-M27×125(22×14)	12-M27×250	32
450	18	8-M24×110(21×14)	16-M24×250	40	8-M27×125(22×14)	16-M27×265	40
500	20	8-M24×110(21×14)	16-M24×260	40	8-M30×125(24×16)	16-M30×285	40
600	24	8-M27×125(22×14)	16-M27×310	40	8-M33×145(27×18)	16-M33×350	40

■ Wafer Type 300Lb

Nominal size		ASME B16.5 300Lb, JPI-7S-15 300Lb			JIS20K		
mm	inch	Setting Bolts	Long Bolts	No. of Nuts	Setting Bolts	Long Bolts	No. of Nuts
80	3	8-3/4-10UNC×95(17×11)	4-3/4-10UNC×175	16	8-M20× 85(17×11)	4-M20×160	16
100	4	8-3/4-10UNC×95(17×11)	4-3/4-10UNC×185	16	8-M20× 85(17×11)	4-M20×170	16
150	6	8-3/4-10UNC×95(17×11)	8-3/4-10UNC×200	24	8-M22× 95(19×12)	8-M22×190	24
200	8	8-7/8-9UNC×115(19×12)	8- 7/8-9UNC×235	24	8-M22×105(19×12)	8-M22×200	24
250	10	8- 1-8UNC×125(21×14)	12- 1-8UNC×260	32	8-M24×110(21×14)	8-M24×230	24
300	12	8-1 1/8-8UN×135(24×16)	12-1 1/8-8UN×285	32	8-M24×120(21×14)	12-M24×240	32
350	14	8-1 1/8-8UN×135(24×16)	16-1 1/8-8UN×315	40	8-M30(P3)×125(24×16)	12-M30(P3)×285	32
400	16	8-1 1/4-8UN×145(24×16)	16-1 1/4-8UN×345	40	8-M30(P3)×135(24×16)	12-M30(P3)×315	32
450	18	8-1 1/4-8UN×145(24×16)	20-1 1/4-8UN×365	48	8-M30(P3)×135(24×16)	16-M30(P3)×335	40
500	20	8-1 1/4-8UN×155(24×16)	20-1 1/4-8UN×380	48	8-M30(P3)×135(24×16)	16-M30(P3)×350	40
600	24	8-1 1/2-8UN×185(30×20)	20-1 1/2-8UN×430	48	8-M36(P3)×165(30×20)	20-M36(P3)×385	48

Note: Bolt/Nut material: SNB7/S45C

Please use a nut with a height that is 100% of the screw diameter.

The bold length calculation is based on use of a 4.5 mm thick spiral gasket.

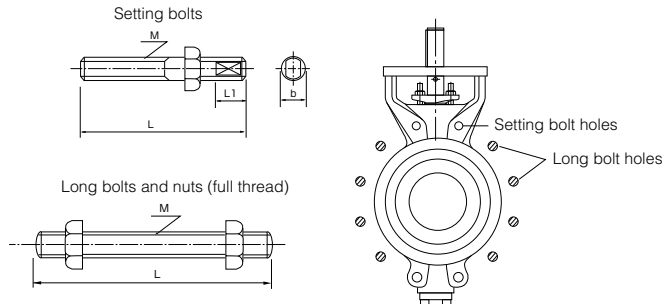
The flange thickness calculation is based on the standard steel flange thickness.

Quantities shown are for one valve.

Examples

Setting bolts: 8 - M16 × 75 (13 × 8)
 | | | | |
 N M L b L1

Long bolts: 4 - M16 × 145
 | | |
 N M L



TT2 Wafer Type Piping Bolts and Nuts Sizes

■ Wafer Type 300Lb

Nominal size		JIS30K			DIN NP25, BS4504 PN25, ISO7005-1 PN25		
mm	inch	Setting Bolts	Long Bolts	No. of Nuts	Setting Bolts	Long Bolts	No. of Nuts
80	3	8-M20× 85 (17×11)	4-M20×170	16	8-M16× 75 (13× 8)	4-M16×155	16
100	4	8-M22×105 (19×12)	4-M22×190	16	8-M20× 85 (17×11)	4-M20×170	16
150	6	8-M24×100 (21×14)	8-M24×210	24	8-M24×100 (21×14)	4-M24×190	16
200	8	8-M24×120 (21×14)	8-M24×240	24	8-M24×110 (21×14)	8-M24×210	24
250	10	8-M30 (P3)×135 (24×16)	8-M30 (P3)×275	24	8-M27×115 (22×14)	8-M27×230	24
300	12	8-M30 (P3)×145 (24×16)	12-M30 (P3)×285	32	8-M27×115 (22×14)	12-M27×250	32
350	14	8-M30 (P3)×145 (24×16)	12-M30 (P3)×315	32	8-M30×125 (24×16)	12-M30×285	32
400	16	8-M36 (P3)×155 (30×20)	12-M36 (P3)×355	32	8-M33×135 (27×18)	12-M33×310	32
450	18	—	—	—	8-M33×135 (27×18)	16-M33×330	40
500	20	—	—	—	8-M33×135 (27×18)	16-M33×350	40
600	24	—	—	—	8-M36×150 (30×20)	16-M36×380	40

■ Wafer Type 300Lb

Nominal size		DIN NP40, BS4504 PN40, ISO7005-1 PN40		
mm	inch	Setting Bolts	Long Bolts	No. of Nuts
80	3	8-M16× 75 (13× 8)	4-M16×155	16
100	4	8-M20× 85 (17×11)	4-M20×170	16
150	6	8-M24×100 (21×14)	4-M24×190	16
200	8	8-M27×115 (22×14)	8-M27×230	24
250	10	8-M30×125 (24×16)	8-M30×250	24
300	12	8-M30×125 (24×16)	12-M30×270	32
350	14	8-M33×145 (27×18)	12-M33×310	32
400	16	8-M36×150 (30×20)	12-M36×340	32
450	18	8-M36×150 (30×20)	16-M36×355	40
500	20	8-M39×160 (32×21)	16-M39×375	40
600	24	8-M45×185 (36×24)	16-M45×430	40

Note: Bolt/Nut material: SNB7/S45C

Please use a nut with a height that is 100% of the screw diameter.

The bold length calculation is based on use of a 4.5 mm thick spiral gasket.

The flange thickness calculation is based on the standard steel flange thickness.

Quantities shown are for one valve.

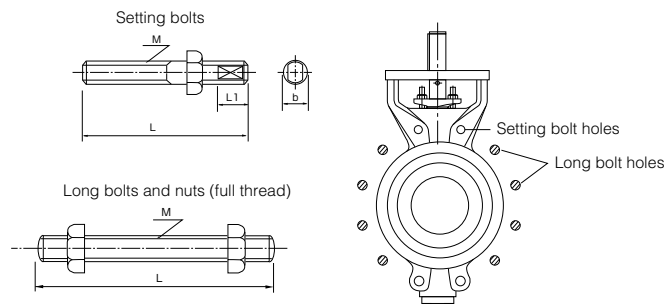
Examples

Setting bolts: 8 - M16 × 75 (13 × 8)

N
M
L
b
L1

Long bolts: 4 - M16 × 145

N
M
L



TT2 Full-lugged (fully-tapped) Piping Bolts and Nuts Sizes

■ Lugged Type 150Lb

Nominal size		ASME B16.5 150Lb, JPI-7S-15 150Lb		JIS10K		JIS16K	
mm	inch	Setting Bolts	No. of Nuts	Setting Bolts	No. of Nuts	Setting Bolts	No. of Nuts
80	3	8- 5/8-11UNC×85(13× 8)	8	—	—	—	—
100	4	16-5/8-11UNC×85(13× 8)	16	16-M16× 75(13× 8)	16	16 -M20×85(17×11)	16
150	6	16-3/4-10UNC×95(17×11)	16	16-M20× 85(17×11)	16	—	—
200	8	16-3/4-10UNC×95(17×11)	16	—	—	—	—
250	10	24-7/8-9UNC×100(19×12)	24	24-M22× 95(19×12)	24	24-M24×100(21×14)	24
300	12	24-7/8-9UNC×100(19×12)	24	—	—	—	—
350	14	24- 1-8UNC×115(21×14)	24	—	—	—	—
400	16	32- 1-8UNC×115(21×14)	32	32-M24×110(21×14)	32	32-M30(P3)×125(24×16)	32
450	18	32-1 1/8-8UN×135(24×16)	32	—	—	—	—
500	20	40-1 1/8-8UN×135(24×16)	40	40-M24×110(21×14)	40	40-M30(P3)×135(24×16)	40
600	24	40-1 1/4-8UN×145(24×16)	40	—	—	—	—

Nominal size		JIS20K		DIN NP10 BS4504 PN10, ISO7005-1 PN10		DIN NP16, BS4504 PN16, ISO7005-1 PN16	
mm	inch	Setting Bolts	No. of Nuts	Setting Bolts	No. of Nuts	Setting Bolts	No. of Nuts
80	3	—	—	—	—	—	—
100	4	16-M20× 85(17×11)	16	16-M16× 75(13× 8)	16	16-M16× 75(13× 8)	16
150	6	—	—	16-M20× 85(17×11)	16	16-M20× 85(17×11)	16
200	8	—	—	16-M20× 85(17×11)	16	—	—
250	10	24-M24×110(21×14)	24	24-M20× 95(17×11)	24	24-M24×100(21×14)	24
300	12	—	—	24-M20× 95(17×11)	24	24-M24×100(21×14)	24
350	14	—	—	—	—	—	—
400	16	32-M30(P3)×135(24×16)	32	32-M24×110(21×14)	32	32-M27×115(22×14)	32
450	18	—	—	—	—	—	—
500	20	40-M30(P3)×145(24×16)	40	40-M24×110(21×14)	40	40-M30×125(24×16)	40
600	24	—	—	40-M27×115(22×14)	40	40-M33×145(27×18)	40

Note: Bolt/Nut material: SNB7/S45C

Please use a nut with a height that is 100% of the screw diameter.

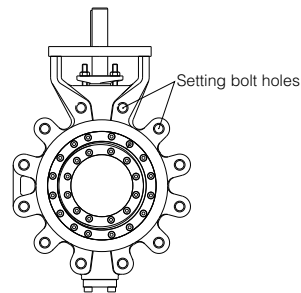
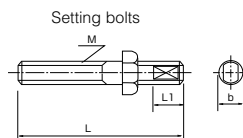
The bold length calculation is based on use of a 4.5 mm thick spiral gasket.

The flange thickness calculation is based on the standard steel flange thickness.

Quantities shown are for one valve.

Examples

Setting bolts: 8 - M16 × 75 (13 × 8)



TT2 Full-lugged (fully-tapped) Piping Bolts and Nuts Sizes

■ Lugged Type 300Lb

Nominal size		ASME B16.5 300Lb, JPI-7S-15 300Lb		JIS20K		JIS30K	
mm	inch	Setting Bolts	No. of Nuts	Hexagon Bolts	No. of Nuts	Hexagon Bolts	No. of Nuts
80	3	16-3/4-10UNC× 95(17×11)	16	16-M20× 75(17×11)	16	16-M20× 85(17×11)	16
100	4	16-3/4-10UNC× 95(17×11)	16	16-M20× 85(17×11)	16	16-M22× 95(19×12)	16
150	6	24-3/4-10UNC× 95(17×11)	24	24-M22× 95(19×12)	24	24-M24×110(21×14)	24
200	8	24- 7/8-9UNC×115(19×12)	24	24-M22×105(19×12)	24	24-M24×120(21×14)	24
250	10	32- 1-8UNC×125(21×14)	32	—	—	—	—
300	12	32- 1 1/8-8UN×135(24×16)	32	32-M24×120(21×14)	32	32-M30(P3)×135(24×16)	32
350	14	40- 1 1/8-8UN×135(24×16)	40	—	—	—	—
400	16	40- 1 1/4-8UN×145(24×16)	40	—	—	—	—
450	18	48- 1 1/4-8UN×145(24×16)	48	—	—	—	—
500	20	48- 1 1/4-8UN×155(24×16)	48	—	—	—	—
600	24	48- 1 1/2-8UN×185(30×20)	48	—	—	—	—

Nominal size		DIN NP25, BS4504 PN25, ISO7005-5 PN25		DIN NP40, BS4504 PN40, ISO7005-5 PN40	
mm	inch	Setting Bolts	No. of Nuts	Hexagon Bolts	No. of Nuts
80	3	16-M16× 75(13× 8)	16	16-M16× 75(13× 8)	16
100	4	16-M20× 85(17×11)	16	16-M20× 85(17×11)	16
150	6	—	—	—	—
200	8	24-M24×110(21×14)	24	24-M27×115(22×14)	24
250	10	—	—	—	—
300	12	32-M27×115(22×14)	32	32-M30×125(24×16)	32
350	14	—	—	—	—
400	16	—	—	—	—
450	18	—	—	—	—
500	20	—	—	—	—
600	24	—	—	—	—

Note: Bolt/Nut material: SNB7/S45C

Please use a nut with a height that is 100% of the screw diameter.

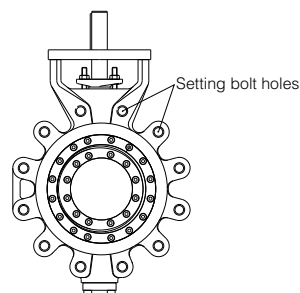
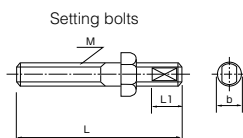
The bold length calculation is based on use of a 4.5 mm thick spiral gasket.

The flange thickness calculation is based on the standard steel flange thickness.

Quantities shown are for one valve.

Examples

Setting bolts: 8 - M16 × 75 (13 × 8)



TT2 Double-flanged (short-pattern) Piping Bolts and Nuts Sizes

■ 150 Lb, Double-flanged, Short-pattern Type

Nominal size		ASME B16.5 150Lb, JPI-7S-15 150Lb		
mm	inch	Setting Bolts	Hexagon Bolts	No. of Nuts
80	3	—	8-5/8-11UNC× 80	8
100	4	4-5/8-11UNC×70(13× 8)	12-5/8-11UNC× 80	16
150	6	4-3/4-10UNC×85(17×11)	12-3/4-10UNC× 95	16
200	8	4-3/4-10UNC×85(17×11)	12-3/4-10UNC× 95	16
250	10	4-7/8-9UNC×100(19×12)	20-7/8-9UNC×100	24
300	12	4-7/8-9UNC×100(19×12)	20-7/8-9UNC×100	24
350	14	4- 1-8UNC×115(21×14)	20- 1-8UNC×115	24
400	16	4- 1-8UNC×115(21×14)	28- 1-8UNC×115	32
450	18	4-1 1/8-8UN×125(24×16)	28-1 1/8-8UN×130	32
500	20	4-1 1/8-8UN×125(24×16)	36-1 1/8-8UN×130	40
600	24	4-1 1/4-8UN×135(24×16)	36-1 1/4-8UN×145	40

■ 300Lb, Double-flanged, Short-pattern Type

Nominal size		ASME B16.5 300Lb, JPI-7S-15 300Lb		
mm	inch	Setting Bolts	Hexagon Bolts	No. of Nuts
80	3	4-3/4-10UNC×85(17×11)	12-3/4-10UNC× 95	16
100	4	4-3/4-10UNC×85(17×11)	12-3/4-10UNC× 95	16
150	6	4-3/4-10UNC×95(17×11)	20-3/4-10UNC×105	24
200	8	4-7/8-9UNC×100(19×12)	20-7/8-9UNC×120	24
250	10	4- 1-8UNC×125(21×14)	28- 1-8UNC×140	32
300	12	4-1 1/8-8UN×135(24×16)	28-1 1/8-8UN×150	32
350	14	8-1 1/8-8UN×135(24×16)	32-1 1/8-8UN×150	40
400	16	8-1 1/4-8UN×145(24×16)	32-1 1/4-8UN×165	40
450	18	8-1 1/4-8UN×145(24×16)	40-1 1/4-8UN×165	48
500	20	8-1 1/4-8UN×145(24×16)	40-1 1/4-8UN×175	48
600	24	8-1 1/2-8UN×175(30×20)	40-1 1/2-8UN×195	48

Note: Bolt/Nut material: SNB7/S45C

Please use a nut with a height that is 100% of the screw diameter.

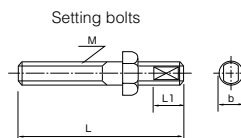
The bold length calculation is based on use of a 4.5 mm thick spiral gasket.

The flange thickness calculation is based on the standard steel flange thickness.

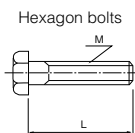
Quantities shown are for one valve.

Examples

Setting bolts: 8 - M16 × 75 (13 × 8)



Hexagon bolts : 4 - M30 × 95



TT2 Piping gasket

* In case of spiral gasket

For API, JPI, ANSI flange Any standard gaskets with inner/outer ring can be used.

For JIS, BS, DIN flange Use special spiral gasket shown below.

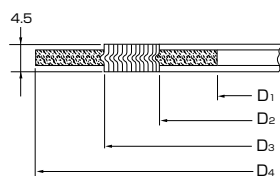
●TT2 Commercially available spiral gasket conformity chart (with inner and outer ring)

Nominal size		ASME/JPI		JIS			BS4504			
mm	inch	150Lb	300Lb	10K	16/20K	30K	PN10	PN16	PN25	PN40
80	3	○	○	×	×	×	×	×	×	×
100	4	○	○	×	×	×	×	×	×	×
150	6	○	○	○	○	×	○	○	○	○
200	8	○	○	○	○	×	○	○	○	○
250	10	○	○	○	×	×	○	○	○	○
300	12	○	○	○	×	×	○	○	○	○
350	14	○	○	○	×	×	○	○	○	○
400	16	○	○	○	×	×	○	○	○	○
450	18	○	○	○	○	—	○	○	○	○
500	20	○	○	○	○	—	○	○	○	○
600	24	○	○	○	○	—	○	○	○	○

* Please use the following special spiral gaskets for the portions marked in "X" in the conformity chart above.

●TT2 Special spiral gasket flange size

Nominal size		JIS10K				JIS16/20K				JIS30K				BS4504							
		D ₁	D ₂	D ₃	D ₄	D ₁	D ₂	D ₃	D ₄	D ₁	D ₂	D ₃	D ₄	D ₁	D ₂	D ₃	D ₄				
																	BS4504				
mm	inch																PN10	PN16	PN25	PN40	
80	3	91	111	125	134	89	111	126	140	80	111	125	150	84	111	126	144	144	144	144	
100	4	115	130	146	159	115	130	153	165	104	130	153	172	108	130	153	164	164	170	170	
150	6	—	—	—	—	—	—	—	—	153	176	202	249	—	—	—	—	—	—	—	
200	8	—	—	—	—	—	—	—	—	202	227	259	294	—	—	—	—	—	—	—	
250	10	—	—	—	—	268	281	321	354	251	282	322	360	—	—	—	—	—	—	—	
300	12	—	—	—	—	319	333	372	404	300	334	374	418	—	—	—	—	—	—	—	
350	14	—	—	—	—	356	370	410	450	336	367	407	463	—	—	—	—	—	—	—	
400	16	—	—	—	—	407	417	467	508	383	418	468	524	—	—	—	—	—	—	—	



MEMO