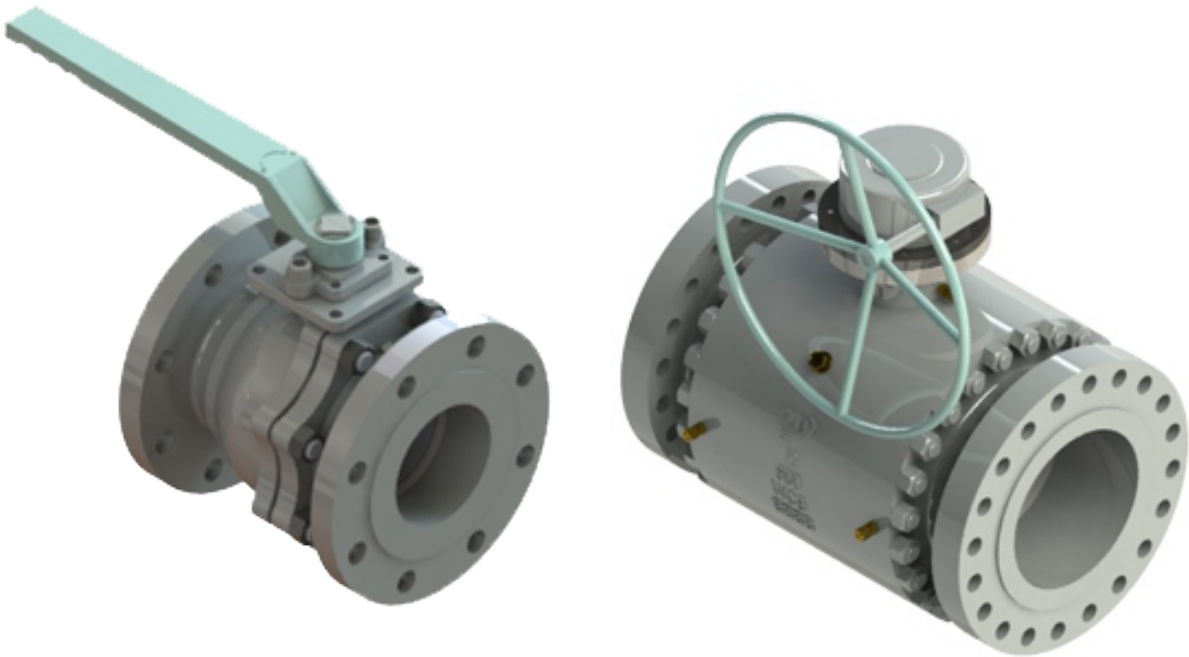


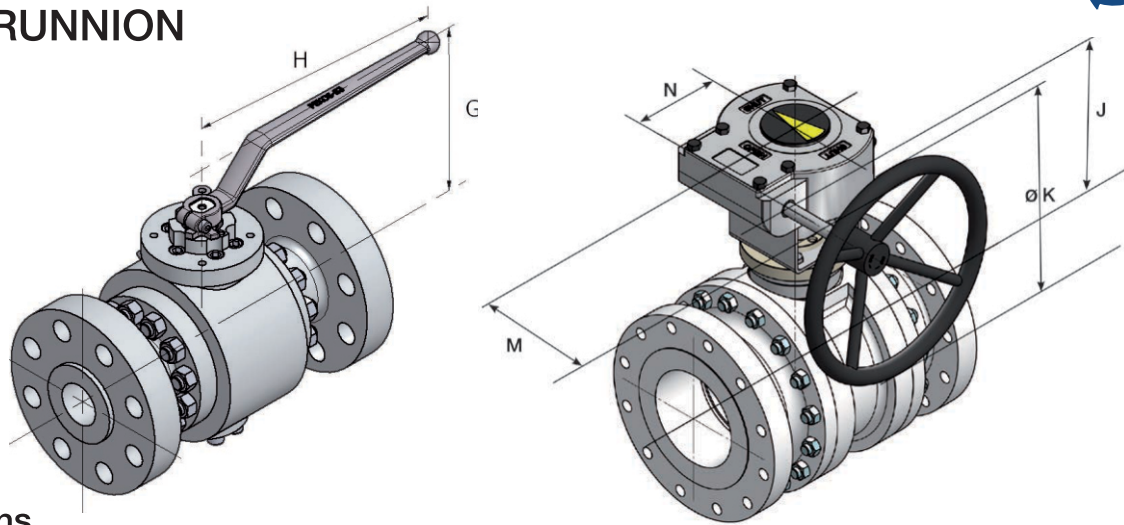
# **PT OHTORI INDONESIA**

**FLANGES, FITTING AND VALVE & WELLHEAD AND  
X-MAS TREE ASSEMBLY MANUFACTURE**



**BALL VALVES**

# FULL TRUNNION



## Dimensions

Class 150/300/600

NPS		D		L (RF)			L1(RTJ)			L2 (BW) (SW)			E		
FB	RB	150-600 FB	150-600 RB	150	300	600	150	300	600	150	300	600	150	300	600
2	-	50	-	178	216	292	191	232	295	216	216	292	152	165	165
3	3 x 2	75	50	203	283	356	215	300	359	283	283	356	191	210	210
4	4 x 3	100	75	229	305	432	241	321	435	305	305	432	229	254	273
6	6 x 4	150	100	394	403	559	406	419	562	457	457	559	279	318	356
8	8 x 6	201	150	457	502	660	470	518	663	521	521	660	343	381	419
10	10 x 8	252	201	533	568	787	545	584	790	559	559	787	406	445	508
12	12 x 10	303	252	610	648	838	622	664	841	635	635	838	483	521	559
14	14 x 10	334	252	686	762	889	698	778	891	762	762	889	535	585	605
16	16 x 12	385	303	762	838	991	774	854	877	838	838	991	595	650	685
18	18 x 14	438	334	864	914	1092	877	930	1095	914	914	1092	635	710	745
20	20 x 16	487	385	914	991	1194	927	1007	1200	991	991	1194	700	775	815
24	24 x 20	589	487	1067	1143	1397	1080	1165	1407	1143	1143	1397	815	915	940

NPS		Class 150						Class 300						Class 600								
FB	RB	G	H	J	K	M	N	ISO 5211	G	H	J	K	M	N	ISO 5211	G	H	J	K	M	N	ISO 5211
2"	3" x 2"	154	293	-	-	-	-	F07	153	293	-	-	-	-	F07	154	293	-	-	-	-	F07
3"	4" x 3"	207	350	-	-	-	-	F10	205	350	-	-	-	-	F10	181	350	-	-	-	-	F10
4"	6" x 4"	221	350	-	-	-	-	F10	220	350	-	-	-	-	F10	-	-	397	500	189	86	F12
6"	8" x 6"	268	680	-	-	-	-	F12	-	-	372	500	189	86	F12	-	-	401	500	189	86	F14
8"	10" x 8"	-	-	347	500	189	86	F14	-	-	427	500	189	86	F14	-	-	397	500	230	105	F16
10"	12" x 10" 14" x 10"	-	-	392	500	230	105	F14	-	-	472	500	230	105	F14	-	-	456	500	275	130	F16
12"	16" x 12"	-	-	454	500	230	105	F14	-	-	545	500	230	105	F14	-	-	526	500	335	211	F25
14"	18" x 14"	-	-	504	500	275	130	F16	-	-	517	500	275	130	F16	-	-	619	600	300	182	F25
16"	20" x 16"	-	-	554	600	300	182	F16	-	-	561	600	300	182	F16	-	-	600	669	388	263	F25
18"	-	-	-	621	600	388	263	F25	-	-	621	600	388	263	F25	-	-	600	689	429	278	F30
20"	24" x 20"	-	-	655	600	429	278	F25	-	-	671	600	429	278	F25	-	-	700	736	499	431	F30
24"	-	-	-	791	700	499	431	F30	-	-	791	700	499	431	F30	-	-	700	816	499	431	F30

Class 900/1500/2500

NPS		D						L (RF)			L1(RTJ)			L2 (BW) (SW)			E		
FB	RB	900 FB	900 RB	1500 FB	1500 RB	2500 FB	2500 RB	900	1500	2500	900	1500	2500	900	1500	2500	900	1500	2500
2	-	50	-	50	-	42	-	368	368	451	371	371	454	368	368	451	215	215	235
3	3 x 2	75	50	75	50	62	42	381	470	578	384	473	584	381	470	578	240	265	305
4	4 x 3	100	75	100	75	87	62	457	546	673	460	549	683	457	546	673	290	310	355
6	6 x 4	150	100	144	100	131	87	610	705	914	613	711	927	610	705	914	380	395	485
8	8 x 6	201	150	192	144	179	131	737	832	1022	740	841	1038	737	832	1022	470	485	550
10	10 x 8	252	201	239	192	223	179	838	991	1270	841	1000	1292	838	991	1270	545	585	675
12	12 x 10	303	252	287	239	265	223	965	1130	1422	968	1146	1445	965	1130	1422	610	675	760
14	14 x 10	334	252	315	239	-	-	1029	1250	-	1039	1276	-	1029	1250	-	640	750	-
16	16 x 12	373	303	360	287	-	-	1130	1384	-	1140	1407	-	1130	1384	-	705	825	-
18	18 x 14	423	334	-	-	-	-	1219	-	-	1221	-	-	1219	-	-	785	-	-
20	20 x 16	471	373	-	-	-	-	1321	-	-	1334	-	-	1321	-	-	855	-	-

NPS		Class 900						Class 1500						Class 2500								
FB	RB	G	H	J	K	M	N	ISO 5211	G	H	J	K	M	N	ISO 5211	G	H	J	K	M	N	ISO 5211
2"	3" x 2"	203	350	-	-	-	-	F10	203	350	-	-	-	-	F10	-	-	319	500	201	71	F12
3"	4" x 3"	-	-	343	500	201	71	F12	-	-	347	500	189	86	F12	-	-	392	500	189	86	F14
4"	6" x 4"	-	-	371	500	189	86	F12	-	-	372	500	230	105	F14	-	-	366	500	230	105	F16
6"	8" x 6"	-	-	429	500	230	105	F14	-	-	381	500	275	130	F16	-	-	414	500	335	211	F25
8"	10" x 8"	-	-	361	500	346	185	F16	-	-	459	500	335	211	F25	-	-	487	600	388	263	F25
10"	12" x 10" 14" x 10"	-	-	474	500	275	130	F16	-	-	527	600	388	263	F25	-	-	527	600	388	263	F30
12"	16" x 12"	-	-	556	500	335	211	F25	-	-	559	600	388	263	F30	-	-	567	600	429	278	F35
14"	18" x 14"	-	-	649	600	388	263	F30	-	-	559	600	429	278	F30	-	-	-	-	-	-	-
16"	20" x 16"	-	-	699	600	388	263	F30	-	-	651	700	499	431	F35	-	-	-	-	-	-	-
18"	-	-	-	746	700	499	431	F35	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20"	-	-	-	771	700	499	431	F35	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Valves up to ISO 5211 F14: Gear box assembled to the valve with mounting bracket.

Valves with ISO 5211 F16 and higher: Gear box assembled directly without mounting bracket.

# **PT OHTORI INDONESIA**

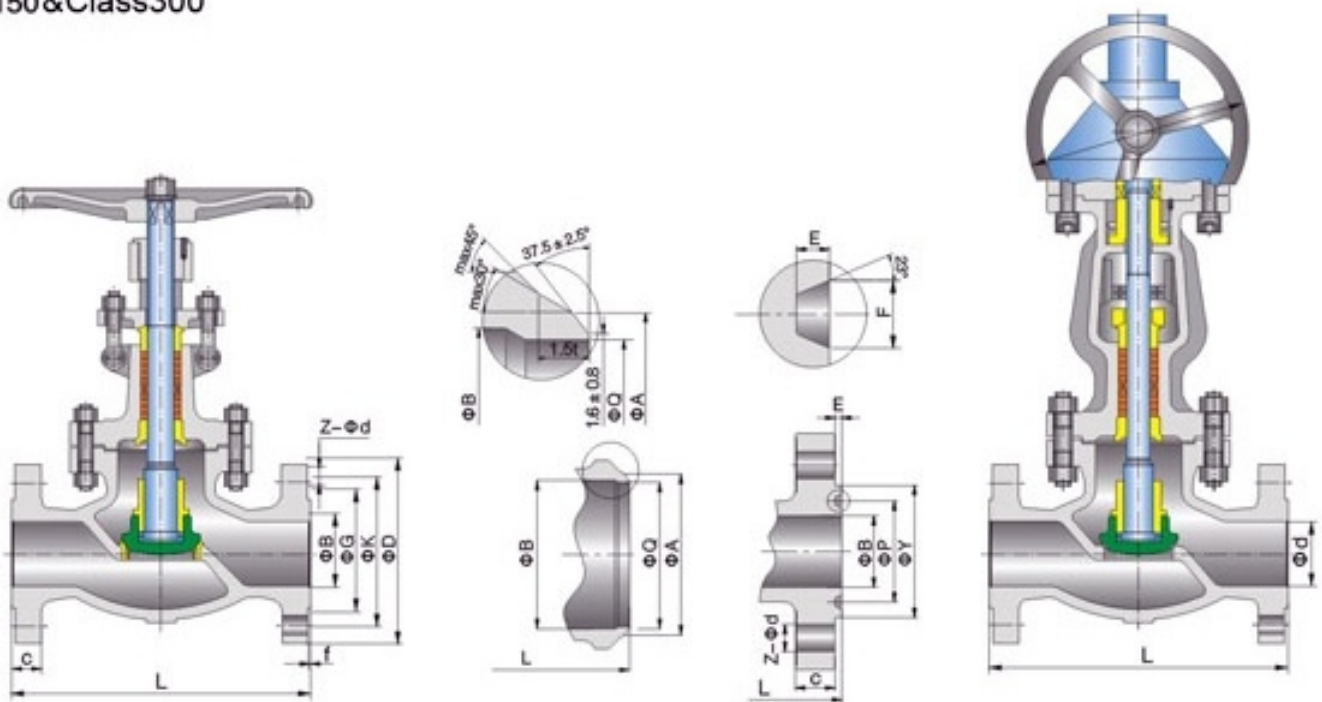
**FLANGES, FITTING AND VALVE & WELLHEAD AND  
X-MAS TREE ASSEMBLY MANUFACTURE**



**GLOBE VALVES**

# FULL TRUNNION

Class150&Class300



Main Connection Dimension

Class	Size		Dimensions(mm)										
	NPS	DN	L		B	D	G	f	K	Z-Ød	C	A	Q
			RF	BW									
150Lb	2	50	203	203	51	152	91.9	1.6	120.7	4-19.1	15.8	63	Asper client's requirement
	2 1/2	65	216	216	64	178	104.6	1.6	139.7	4-19.1	17.5	75	
	3	80	241	241	76	191	127	1.6	152.4	4-19.1	19.1	91	
	4	100	292	292	102	229	157.2	1.6	190.5	8-19.1	23.9	117	
	6	150	406	406	152	279	215.9	1.6	241.3	8-22.2	25.4	172	
	8	200	495	495	203	343	269.7	1.6	298.5	8-22.2	28.4	223	
	10	250	622	622	254	406	323.9	1.6	362	12-25.4	30.2	278	
	12	300	699	699	305	483	381	1.6	431.8	12-25.4	31.8	329	
	14	350	787	787	337	533	412.8	1.6	476.2	12-28.6	35.1	362	
16	400	914	914	387	597	469.9	1.6	539.8	16-28.6	36.6	413		

Class	Size		Dimensions(mm)															
	NPS	DN	L			B	D	G	f	K	Z-Ød	C	RTJ				A	Q
			RF	RTJ	BW								Y	P	E	F		
300Lb	2	50	267	283	267	51	165	91.9	1.6	127	8-19.1	22.4	108	82.55	7.92	11.91	63	Asper client's requirement
	2 1/2	65	292	308	292	64	191	104.6	1.6	149.2	8-22.2	25.4	127	101.6	7.92	11.91	75	
	3	80	318	333	318	76	210	127	1.6	168.3	8-22.2	28.4	146	123.82	7.92	11.91	91	
	4	100	356	371	356	102	254	157.2	1.6	200.2	8-22.2	31.8	175	149.22	7.92	11.91	117	
	6	150	445	460	445	152	318	215.9	1.6	269.8	12-22.2	36.6	241	211.12	7.92	11.91	172	
	8	200	559	575	559	203	381	269.7	1.6	330.2	12-25.4	41.1	302	269.88	7.92	11.91	223	
	10	250	622	638	622	254	445	323.9	1.6	387.4	16-28.6	47.8	356	323.85	7.92	11.91	278	
	12	300	711	727	711	305	521	381	1.6	450.9	16-31.8	50.8	413	381	7.92	11.91	329	

# **PT OHTORI INDONESIA**

**FLANGES, FITTING AND VALVE & WELLHEAD AND  
X-MAS TREE ASSEMBLY MANUFACTURE**



**GATE VALVES**



## Gate Valves

### API 600 Gate Valves Class 150

Dimensions and Weights										*Gear Operated
Nom Size	Face to Face RF		Face to Face RTJ		Face to Face BW		Height•		Handwheel Diameter•	Weight•
	in	mm	in	mm	in	mm	in	mm		
2	7.00	178	7.52	191	8.50	216	16.10	409	200	18
2½	7.50	190	8.00	203	9.50	241	17.40	442	200	28
3	8.00	203	8.50	216	11.10	283	20.00	508	250	34
4	9.00	229	9.50	241	12.00	305	23.20	590	250	52
5	10.00	254	10.50	267	15.00	381	26.50	673	250	71
6	10.50	267	11.00	279	15.80	403	30.20	767	300	88
8	11.50	292	12.00	305	16.50	419	37.80	960	350	144
10	13.00	330	13.50	343	18.00	457	45.60	1158	400	197
12	14.00	356	14.50	368	19.80	502	54.30	1378	450	298
14	15.00	381	15.50	394	22.50	572	60.75	1543	500	406
16	16.00	406	16.50	419	24.00	610	68.40	1738	600	524
18	17.00	432	17.50	445	26.00	660	77.10	1959	600	720
20	18.00	457	18.50	470	28.00	711	87.20	2214	680	1117
24	20.00	508	20.50	521	32.00	813	102.30	2599	760	1466
26*	22.00	559	22.50	572	34.00	863	121.50	3086	GO	1699
28*	24.00	610	24.50	622	36.00	914	131.00	3327	GO	1931
30*	24.00	610	24.50	622	36.00	914	142.00	3606	GO	2380
32*	26.00	660	26.50	673	38.00	965	146.00	3708	GO	2490
36*	28.00	711	28.50	724	40.00	1016	154.50	3924	GO	3600
42*	32.00	813	32.50	826	45.00	1143	179.00	4546	GO	4710
48*	42.00	1066	42.50	1079	54.00	1371	204.00	5181	GO	6500

### API 600 Gate Valves Class 300

Dimensions and Weights										*Gear Operated
Nom Size	Face to Face RF		Face to Face RTJ		Face to Face BW		Height•		Handwheel Diameter•	Weight•
	in	mm	in	mm	in	mm	in	mm		
2	8.50	216	9.12	232	8.50	216	16.70	424	200	24
2½	9.50	241	10.12	257	9.50	241	18.10	460	200	44
3	11.13	283	11.80	298	11.13	283	21.00	535	250	52
4	12.00	305	12.60	321	2.00	305	24.20	615	250	76
5	15.00	381	15.60	397	15.00	381	26.10	662	350	94
6	15.86	403	16.50	419	15.86	403	31.30	795	350	146
8	16.50	419	17.10	435	16.50	419	39.90	1012	400	218
10	18.00	457	18.60	473	18.00	457	48.50	1231	450	352
12	19.75	502	20.40	518	19.75	502	57.00	1450	500	472
14	30.00	762	30.60	778	30.00	762	64.80	1645	600	694
16	33.00	838	33.60	854	33.00	838	72.50	1841	600	1080
18	36.00	914	36.60	930	36.00	914	76.50	1943	680	1235
20	39.00	991	39.80	1010	39.00	991	84.80	2154	965	1655
24	45.00	1143	45.90	1165	45.00	1143	100.50	2553	915	2320
26*	49.00	1244	49.80	1266	49.00	1244	108.30	2750	GO	3100
28*	53.00	1346	53.90	1368	53.00	1346	122.05	3100	GO	3893
30*	55.00	1397	56.00	1422	55.00	1397	130.71	3320	GO	4930
32*	60.00	1524	61.90	1546	60.00	1524	140.20	3560	GO	5230
36*	68.00	1727	69.00	1752	68.00	1727	153.94	3910	GO	6885

### API 600 Gate Valves Class 600

Dimensions and Weights										*Gear Operated
Nom Size	Face to Face RF		Face to Face RTJ		Face to Face BW		Height•		Handwheel Diameter•	Weight•
	in	mm	in	mm	in	mm	in	mm		
2	11.50	292	11.63	295	11.50	292	18.00	458	250	46
2½	13.00	320	13.13	333	13.00	320	20.00	508	250	55
3	14.00	356	14.13	359	14.00	356	22.60	570	250	72
4	17.00	432	17.13	435	17.00	432	49.50	1257	600	754
6	22.00	559	21.13	562	22.00	559	34.33	872	500	253
8	26.00	660	26.13	664	26.00	660	43.35	1101	560	413
10	31.00	787	31.13	791	31.00	787	50.35	1279	640	623
12	33.00	838	33.13	841	33.00	838	57.80	1468	680	981
14	35.00	889	35.13	892	35.00	889	63.90	1623	760	1316
16	39.00	991	39.13	994	39.00	991	71.50	1816	760	1672
18*	42.90	1092	43.13	1095	42.90	1092	89.00	2260	GO	2070
20*	47.00	1194	47.25	1200	47.00	1194	106.50	2705	GO	2405
24*	55.00	1397	55.38	1407	55.00	1397	110.60	2810	GO	4550
26*	57.00	1447	57.48	1460	57.00	1447	115.00	2921	GO	5260
28*	61.00	1549	61.50	1562	61.00	1549	123.50	3136	GO	5960

## Gate Valves

### API 600 Gate Valves Class 900

Dimensions and Weights										*Gear Operated
Nom Size	Face to Face RF		Face to Face RTJ		Face to Face BW		Height•		Handwheel Diameter,	Weight-
	in	mm	in	mm	in	mm	in	mm		
2	14.50	368	14.63	371	14.50	368	14.50	620	300	95
2½	16.50	419	16.63	422	16.50	419	27.80	705	350	108
3	15.00	381	15.13	384	15.00	381	27.40	695	350	125
4	18.00	457	18.13	460	18.00	457	32.50	825	400	192
6	24.00	610	24.13	613	24.00	610	42.00	1065	500	378
8	29.00	737	29.13	740	29.00	737	52.00	1320	600	635
10	33.00	838	33.13	841	33.00	838	60.60	1540	750	900
12	38.00	965	38.13	968	38.00	965	72.50	1840	850	1550
14*	40.50	1029	40.88	1038	40.50	1029	79.70	2025	GO	2170
16*	44.50	1130	44.88	1140	44.50	1130	85.40	2170	GO	3070
18*	48.00	1219	48.50	1232	48.00	1219	87.87	2232	GO	3930
20*	52.00	1320	52.52	1334	52.00	1320	95.87	2435	GO	5120
24*	61.00	1549	61.54	1563	61.00	1549	112.80	2865	GO	7800

### API 600 Gate Valves Class 1500

Dimensions and Weights										*Gear Operated
Nom Size	Face to Face RF		Face to Face RTJ		Face to Face BW		Height•		Handwheel Diameter,	Weight-
	in	mm	in	mm	in	mm	in	mm		
2	14.50	368	11.63	371	14.50	368	22.00	559	250	82
2½	16.50	419	16.63	422	16.50	419	26.50	673	400	127
3	18.50	470	18.63	473	18.50	470	28.00	711	400	168
4	21.50	546	21.63	549	21.50	546	33.00	838	500	277
6	27.80	705	28.00	711	27.80	705	55.00	1397	600	640
8*	32.80	832	33.13	841	32.80	832	71.80	1822	GO	1180
10*	39.00	991	39.38	1000	39.00	991	80.80	2051	GO	2118
12*	44.50	1130	45.13	1146	44.50	1130	84.00	2134	GO	3244
14*	49.50	1257	50.25	1276	49.50	1257	89.30	2267	GO	3693
16*	54.50	1384	55.38	1407	54.50	1384	95.30	2420	GO	4890

### API 600 Gate Valves Class 2500

Dimensions and Weights										*Gear Operated
Nom Size	Face to Face RF		Face to Face RTJ		Face to Face BW		Height•		Handwheel Diameter,	Weight-
	in	mm	in	mm	in	mm	in	mm		
2	17.75	451	17.88	454	17.75	451	27.60	700	350	135
2½	20.00	508	20.25	514	20.00	508	29.50	750	450	210
3	22.75	578	23.00	584	22.75	578	34.60	887	560	271
4	26.50	673	26.88	683	26.50	673	42.50	1079	720	506
6*	36.00	914	36.50	927	36.00	914	53.90	1370	GO	1571
8*	40.25	1022	40.88	1038	40.25	1022	60.50	1530	GO	2401
10*	50.00	1270	50.88	1292	50.00	1270	80.50	2045	GO	4520

# **PT OHTORI INDONESIA**

**FLANGES, FITTING AND VALVE & WELLHEAD AND  
X-MAS TREE ASSEMBLY MANUFACTURE**

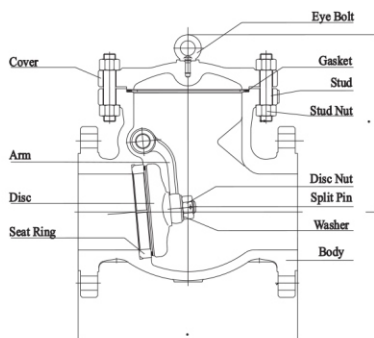


**SWING CHECK VALVE**

## CLASS 150 SWING CHECK VALVE

Designed to API 600  $\Phi$

Cast steel swing check valves, Bolted cover, Horizontal or vertical lines.



### Standard Parts & Material - Fig. 3A1C1

PARTS	MATERIALS
Body	A216 WCB
Cover	A216 WCB
Disc	A216 WCB + Cr13
Seat Ring	A105 + Cr13/STL
Hinge Arm	A216 WCB
Hinge Pin	A182-F6a
Disc Nut	A194-2H
Gasket	Spiral Wound + Graphite
Cover Bolt	A193-B7
Cover Nut	A194-2H

NOTE: Other valve material composition are available

### Dimensions

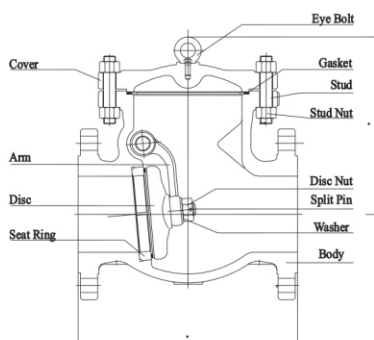
Valve Size		2"	2½"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	
		50mm	65mm	80mm	100mm	125mm	150mm	200mm	250mm	300mm	350mm	400mm	450mm	500mm	600mm	
Face to Face (L)	RF	mm	203	216	241	292	330	356	495	622	699	787	864	978	978	1295
	RTJ	mm	216	229	254	305	343	368	508	635	711	800	876	991	991	1308
	BW	mm	203	216	241	292	330	356	495	622	699	787	864	978	978	1295
Valve Center to Top (H)		mm	155	168	185	205	230	255	310	345	370	415	460	510	555	650
Approximate Weight		kg	18	24	32	52	75	95	140	205	298	430	540	680	830	1550

Working Pressure: Carbon Steel - 285 p.s.i. @ 100°F / 38°C

## CLASS 300 SWING CHECK VALVE

Designed to API 600  $\Phi$

Cast steel swing check valves, Bolted cover, Horizontal or vertical lines.



### Standard Parts & Material - Fig. 3A1C3

PARTS	MATERIALS
Body	A216 WCB
Cover	A216 WCB
Disc	A216 WCB + Cr13
Seat Ring	A105 + Cr13/STL
Hinge Arm	A216 WCB
Hinge Pin	A182-F6a
Disc Nut	A194-2H
Gasket	Spiral Wound + Graphite
Cover Bolt	A193-B7
Cover Nut	A194-2H

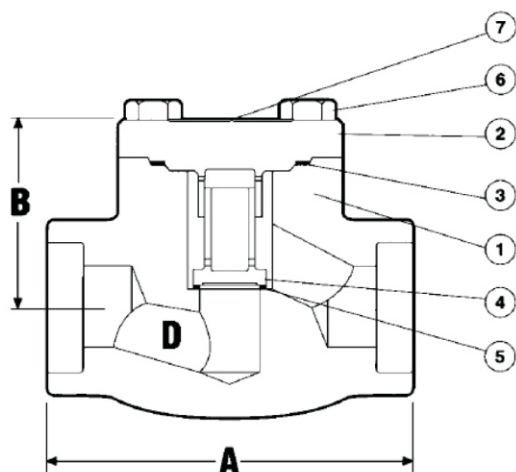
NOTE: Other valve material composition are available

### Dimensions

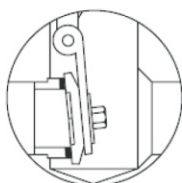
Valve Size		2"	2½"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	
		50mm	65mm	80mm	100mm	125mm	150mm	200mm	250mm	300mm	350mm	400mm	450mm	500mm	
Face to Face (L)	RF	mm	267	292	318	356	400	445	533	622	711	838	864	978	1016
	RTJ	mm	283	308	333	371	416	460	549	638	727	854	879	994	1035
	BW	mm	267	292	318	356	400	445	533	622	711	838	864	978	1016
Valve Center to Top (H)		mm	165	185	205	228	250	275	325	378	410	480	530	575	630
Approximate Weight		kg	24	32	46	70	105	136	184	298	415	682	748	980	1320

Working Pressure: Carbon Steel - 740 p.s.i. @ 100°F / 38°C

Forged steel piston and swing check valve, Bolted cover, Regular & full port, Threaded and socket weld ends.



Piston Type



Swing Type

#### Standard Parts & Material - 3A2F8, 3A2F15

NO.	PARTS	MATERIALS
1	Body	A105
2	Cover	A105
3	Gasket	304+Graphite
4	Disc	A276-420
5	Seat Ring	A276-410
6	Cap Bolt	A193-B7
7	Hinge	A743-CA40
8	Hinge Pin	A276-410
9	Nameplate	Stainless Steel

NOTE: Other valve material composition are available

#### Manufacturing Standards

General Design	API 602
Pressure Rating	ANSI B16.34
Face to Face	ANSI B16.10
Screwed Ends (NPT)	ANSI B16.11
Socket Weld Ends	ANSI B16.11
Inspection and Test	API 598

### CLASS 800 CHECK VALVE

Designed to API 602  $\Phi$

Regular Port	-	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	-	
Full Port	1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	
Face to Face (A)	mm	79	79	92	111	120	152	172	200
Valve Center to Top (B)	mm	61	61	61	78	84	103	118	132
Seat Port Dia. (C)	mm	7	10	13	17	23	30	37	46.5
Approx. Weight	kg	1.6	1.5	1.7	2.8	6.5	7.8	9.7	10.8

Working Pressure: Carbon Steel - 1975 p.s.i. @ 100°F / 38°C

### CLASS 1500 CHECK VALVE

Designed to API 602  $\Phi$

Regular Port	-	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	-	
Full Port	1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	
Face to Face (A)	mm	111	111	111	130	152	172	200	220
Valve Center to Top (B)	mm	79	79	79	97	104	120	139	215
Seat Port Dia. (C)	mm	7	10	13	17	23	30	37	46.5
Approx. Weight	kg	2.3	3.5	3.8	5.3	8.4	13.2	16.8	19

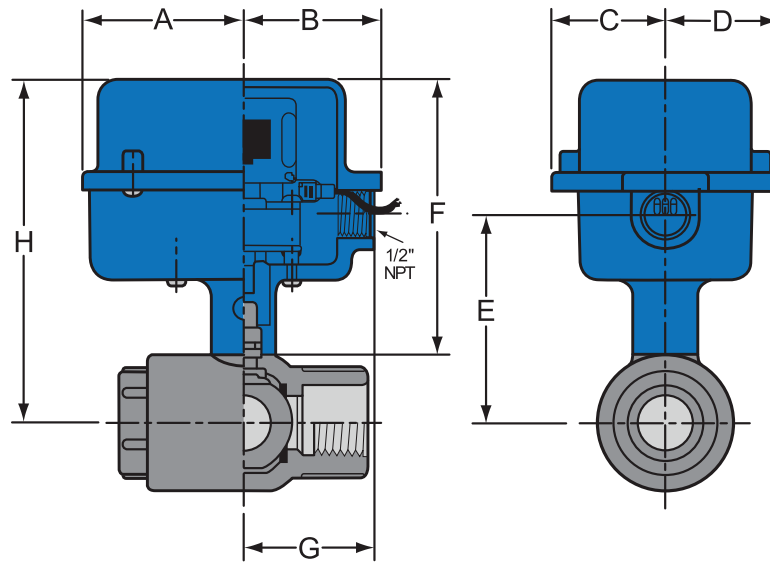
Working Pressure: Carbon Steel - 3705 p.s.i. @ 100°F / 38°C

# PT OHTORI INDONESIA

FLANGES, FITTING AND VALVE & WELLHEAD AND  
X-MAS TREE ASSEMBLY MANUFACTURE



**ACTUATED VALVES**



**Actuated Compact Ball Valve Dimensions**

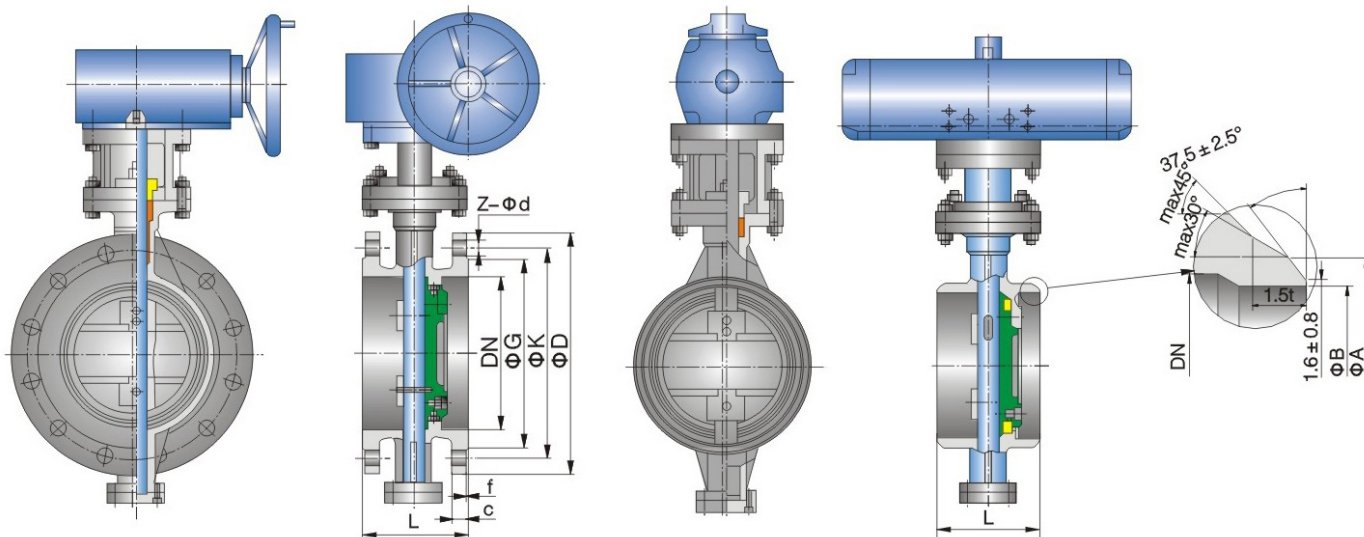
Valve Size	A	B	C	D	E	F	G	H
1/2	2-7/8	2-1/2	2	2	3-3/8	5-5/8	2-5/16	6-5/8
3/4	2-7/8	2-1/2	2	2	3-9/16	5-5/8	2-5/16	6-7/8
1	2-7/8	2-1/2	2	2	3-5/8	5-5/8	2-5/16	7-1/16
1-1/4	3-5/8	2-7/16	2	2	4-3/4	5-7/8	2-7/16	7-5/8
1-1/2	3-5/8	2-7/16	2	2	5	5-7/8	2-7/16	7-7/8
2	3-5/8	2-7/16	2	2	5-1/2	5-7/8	2-7/16	8-3/8

# **PT OHTORI INDONESIA**

**FLANGES, FITTING AND VALVE & WELLHEAD AND  
X-MAS TREE ASSEMBLY MANUFACTURE**



**BUTTERFLY VALVES**



**Main Connection Dimension**

Class			Dimensions(mm)									
	NPS	DN	L		D	G	f	K	Z-φd	C	A	B
			RF	BW								
150Lb	2	50	108	150	152	91.9	1.6	120.7	4-19.1	15.8	63	Asper client's requirement
	2 1/2	65	112	170	178	104.6	1.6	139.7	4-19.1	17.5	75	
	3	80	114	180	191	127	1.6	152.4	4-19.1	19.1	91	
	4	100	127	190	229	157.2	1.6	190.5	8-19.1	23.9	117	
	5	125	140	200	254	185.7	1.6	215.9	8-22.2	23.9	144	
	6	150	140	210	279	215.9	1.6	241.3	8-22.2	25.4	172	
	8	200	152	230	343	269.7	1.6	298.5	8-22.2	28.4	223	
	10	250	165/203	250	406	323.9	1.6	362	12-25.4	30.2	278	
	12	300	178/203	270	483	381	1.6	431.8	12-25.4	31.8	329	
	14	350	190	290	533	412.8	1.6	476.2	12-28.6	35.1	362	
	16	400	216	310	597	469.9	1.6	539.8	16-28.6	36.6	413	
	18	450	222	330	635	533.4	1.6	577.9	16-31.8	39.6	464	
	20	500	229	350	699	584.2	1.6	635	20-31.8	42.9	516	
	24	600	267	390	813	692.2	1.6	749.3	20-34.9	47.8	619	
	26	650	292	410	786	711.2	1.6	744.5	36-22.2	41.1	670	
	28	700	292	430	837	762	1.6	795.3	40-22.2	44.5	721	
	30	750	318	450	887	812.8	1.6	846.1	44-22.2	44.5	772	
	32	800	318	470	941	863.6	1.6	900.2	48-22.2	46	825	
	36	900	330	510	1057	971.6	1.6	1009.7	44-25.4	52.3	927	
	38	950	410	530	1124	1022.4	1.6	1069.8	40-28.6	53.8	978	
40	1000	410	550	1175	1079.5	1.6	1120.6	44-28.6	55.6	1029		
42	1050	410	570	1226	1130.3	1.6	1171.4	48-28.6	58.7	1080		
44	1100	444	570	1276	1181.1	1.6	1222.2	52-28.6	60.5	1130		
48	1200	470	630	1392	1289.1	1.6	1335	44-31.8	65	1232		
52	1300	470	630	1494	1390.7	1.6	1436.6	52-31.8	69.9	1334		
56	1400	530	710	1600	1492.3	1.6	1543.1	60-31.8	73.2	1436		
60	1500	530	710	1726	1600.2	1.6	1662.2	52-34.9	76.2	1538		