



Swing Check Valve

Swing Check Valve

Model 6000

API 6D / BS 1868

Size - 2" to 48" (50mm to 1200mm)

Rating - Class 150 to Class 2500

Cast Steel Valves

Flange Design

Butt-Weld Design

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Swing Check Valve – Model 6000



Company Overview

“INVACO” (Industrial Valve Company) founded and promoted by the technocrats having experience of 18 years in National and International valve industry. INVACO PRIVATE LIMITED (Industrial Valve Company) is registered experience company in Design, Development, Fabrication & Manufacturing of Industrial Valves. Our mission is to produce high quality and reliable Valves to our national & international clients / customers. Our proactive approach to technical issues enables to understand and implement cost-effective solutions to our valuable customers.

“INVACO” (Industrial Valve Company) committed to excellence by manufacturing top quality valves to exceed customer’s needs with low cost, on-time delivery & providing finest service in industry. “INVACO” manufacture Ball valves (Floating & Trunnion Mounted), Butterfly Valves (Damper, Sleeved, Double offset & Triple Offset), Gate Valves, Globe Valves , Check Valves, Strainers, Flap Valves, Dismantling Joints, Flange Adaptor, Flange Couplings & Sluice Gate / Penstock for Oil & Gas, Petrochemicals, Refineries, Power Plants, Water Treatment Plants, Chemical, Paper & Pulp, Sugar, Steel, Pharma, Pipeline Transmission and other process industries.

“INVACO” (Industrial Valve Company) is specialized in design, manufacturing & testing of CAST & FORGED Steel Swing Check Valves. All swing check valves are designed as per ASME B16.34, API 600, API 6D, BS 1868 and follows ISO 9001:2015 Quality Management Systems. INVACO, manufacture of Cast Steel Gate, Globe & Check valve size from 2” to 48” (50mm to 1200mm) with pressure range from Class 150 to Class 2500 and equivalent EN pressure ratings. Gate , Globe & Check valves produced from FORGED materials like WCB, WC6,WC9, CA15 , LCB, LCC, CF8, CF3 , CF3M, CF8, CF8M, Alloy20, 4A, 5A, 6A, Aluminum Bronze, Inconel, Monel, Hast Alloys, and other special materials.



INVACO (Industrial Valve Company) aims to produced a zero defect valves for long life and reliable services. Making continual improvements aims towards to minimize the Total Ownership Cost for valued customers. Also aims to established sales and services of valves & actuators worldwide.

This catalog provides basic information of Swing Check Valves. Every effort has been made to maintain technical accuracies however INVACO has reserve rights to make any change in design and materials without prior notice.

Quality Policy

At “INVACO”, we established this comprehensive Quality Management System to implement a strategy of continual improvement and compliance with the requirements of the ISO 9001:2008 Quality Assurance standard and other industrial valves standards by:

Customer Focused:

- Make commitments we fully understand and believe we can meet and deliver.
- Meet all commitments to customers on time.
- Satisfy our customer’s needs and exceed their expectations.

Performance Driven:

- Verify that our products and services meet customer requirements.
- Monitor benchmark and continuously improve our business, products, and services, organization and employee’s performance.

Entire “INVACO” stick to the spirit and intent of this policy to ensure customer satisfaction is achieved at all respects and times.



Quality Standards for Check Valve

American Petroleum Institute (API)

API 6D API 954
 API 598 API Spec Q1
 API 602

American Society of Mechanical Engineers

ASME B16.34 ASME B16.5
 ASME B16.47 ASME B16.10
 ASME B16.25

British / European Standards

BS 1868 BS 5352
 BS EN 1092 BS EN 558
 BS EN 6364 BS EN 12266
 EN 10204

International Organization for Standardization (ISO)

ISO 9001:2015 ISO 5208
 ISO 5211 ISO 15848

Manufacturers Standardization Society (MSS – SP)

MSS SP-6 MSS SP-25
 MSS SP 44 MSS SP 45
 MSS SP 55 MSS SP 61
 MSS SP 72 MSS SP 82

National Association of Corrosion Engineers (NACE)

NACE MR 01-75 NACE TM 01-77
 NACE TM 02-84 NACE MR 01-03

Materials and Equipment Standards and Code (MESCC)

MESCC SPE 77/101 MESCC SPE 77/104 MESCC SPE 77/105 MESCC SPE 77/160 MESCC SPE 77/200
 MESCC SPE 77/300 MESCC SPE 77/302 MESCC SPE 77/312

Testing & Inspection for Swing Check Valves

Test	Applicable Standards	Extent of Test
Visual Inspection	MSS SP - 55	100%
Marking Inspection	MSS SP - 25	100%
Chemical, Physical & Heat Treatment	Relevant ASTM Standards	100%
Alloy Verification / Positive Material Identification(PMI)	INVACO Procedure	Upon Customer Request
Hardness Requirement	NACE MR 01 - 75	Upon Customer Request
Radiographic Testing (RT) (X-Ray & Gamma Ray)	ASME B16.34 (Annex B) , ASTM E94 , E142 , E446 , E186 , E280, BPVC Sec V-Art 7 & 22, ASME Sec VIII - Div-1	Upon Customer Request
Ultrasonic Testing (UT)	ASME B16.34 , ASTM A388 , A609 , A578 , BPVC Sec V – Art 4 & 23, ASME VIII Div-1	Upon Customer Request
Magnetic Particle Inspection(MPI)- (Dry & Wet)	ASME B16.34 Annex C , ASTM E709 , ASTM A275 , E1444, ASME Sec VIII Div-2, BPVC Sec V – Art 7 & 23	Upon Customer Request
Liquid / Dye Penetrant Inspection (LP / DP)	ASME B16.34 Annex D ,ASTM E 165 , E1417 , ASME Sec VIII Div 1,BPVC Sec V – Art 6 & 24.	Upon Customer Request
Impact Test	ASTM A 370	Upon Customer Request
Microstructural & Ferrite Content measurement	ASTM E 562	Upon Customer Request
Microscopic / inclusion Count Test	ASTM E 45	Upon Customer Request
Pitting Corrosion	ASTM G 48	Upon Customer Request



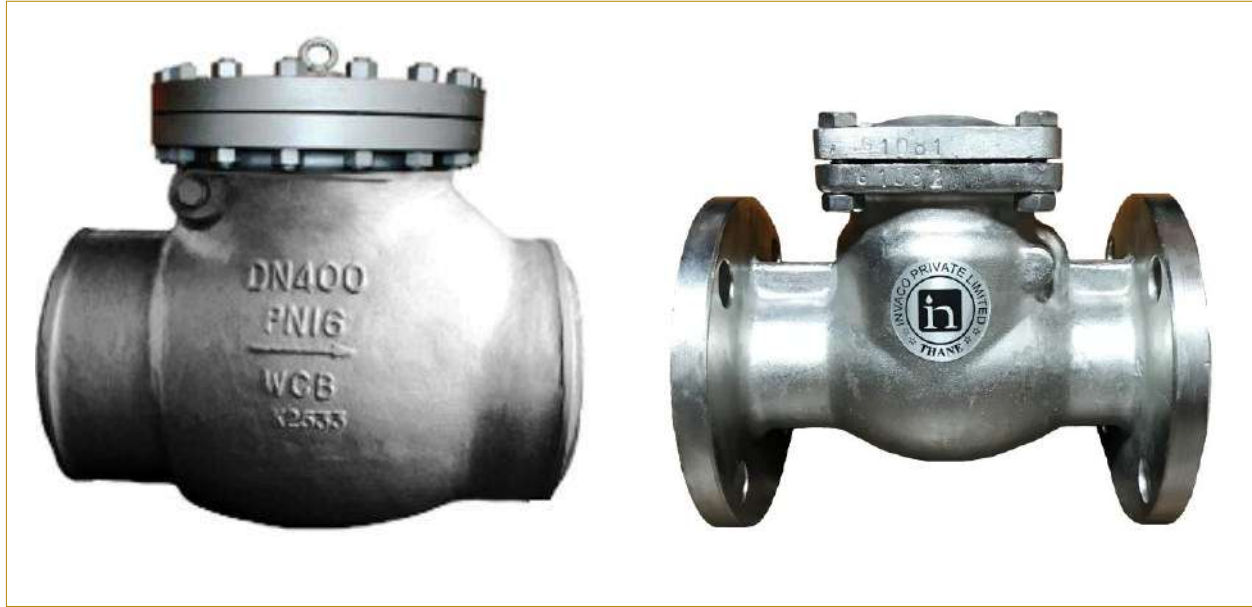
Crevice Corrosion	ASTM G 48	Upon Customer Request
Hydrogen Induced Cracking Test (HIC)	NACE TM 02 - 84	Upon Customer Request
Ferric Chloride Corrosion Test	ASTM A 923	Upon Customer Request
Hardness Test	ASTM E 18 , ASTM E 92, NACE MR 01 - 75	Upon Customer Request
Intergranular Corrosion Cracking (IGC)	ASTM A 262	Upon Customer Request
Chloride Stress Corrosion Cracking Test (CSCC)	NACE TM 01 - 75	Upon Customer Request
Size / Dimension Check	INVACO Approved Drawings	100%
Functional Check	INVACO Approved Drawings	100%
Shell Test (Hydro Test)	API 598, API6D, Approved GA Drawings	100%
Seat Test (Hydro Test)	API 598, API6D, Approved GA Drawings	100%
Backseat Test (Hydro Test)	API 598, API6D, Approved GA Drawings	100%
Seat Test (Air/Pneumatic Test)	API 598, API6D, Approved GA Drawings	100%
Helium Leak / Fugitive Emission Test	ISO 15848, MESC 77 / 312	Upon Customer Request
Torque Test (Not applicable to SCV)	API 6D , INVACO Procedure	10% or Upon Customer Request
Blasting Report	INVACO Procedure	10% or Upon Customer Request
Surface Finish Report	INVACO Procedure	10% or Upon Customer Request
Painting / Dry Film Thickness Report	INVACO Procedure	10% or Upon Customer Request
Tag No, Serial No, Name Plate	INVACO Procedure	100%
<p>Note: - 1) Backseat test is applicable to Gate & Globe Valve. 2) Above Test available upon customer request with extra cost. 3) For more information kindly contact "INVACO".</p>		

Manufacturing Range for GGC (Gate, Globe & Check Valve)

Valve	ASME CLASS / Size - in (mm)						
	150	300	600	800	900	1500	2500
Gate Valve	2" - 48" (50 - 1200)	2" - 48" (50 - 1200)	2" - 48" (50 - 1200)	----	2" - 24" (50 - 600)	2" - 12" (50 - 300)	2" - 12" (50 - 300)
Globe Valve	2" - 24" (50 - 600)	2" - 24" (50 - 600)	2" - 24" (50 - 600)	----	2" - 18" (50 - 450)	2" - 16" (50 - 400)	2" - 12" (50 - 300)
Check Valve	2" - 48" (50 - 1200)	2" - 48" (50 - 1200)	2" - 48" (50 - 1200)	----	2" - 16" (50 - 400)	2" - 14" (50 - 350)	2" - 10" (50 - 250)
Forge Valve (GGC)	----	----	----	1/2" - 2" (15 - 50)	1/2" - 2" (15 - 50)	1/2" - 2" (15 - 50)	----



Features of Swing Check Valve (Model - 6000)



Quality Standards:-

Design Standards	- API 6D / ASME B16.34 / BS 1863 / MESC SPE 77-103.
Testing Standards	- API 598 / EN 12266 / ISO 5208 / BS 6755
End to End Standards	- ASME B 16.10 / EN 558
Flange Drilling Standards	- ASME B16.5 / ASME B 16.47 / BS EN 1092.
Butt-Weld	- ASME B 16.25
Fugitive Emission Test	- MESC SPE 77 - 312 / ISO 15848
Valve Marking	- MSS SP 25 / ASME B 16.34
Visual Inspection	- MSS SP 55
Material Testing	- NDE / NACE MR 01- 75 / NACE MR 01- 03 Compliance available.

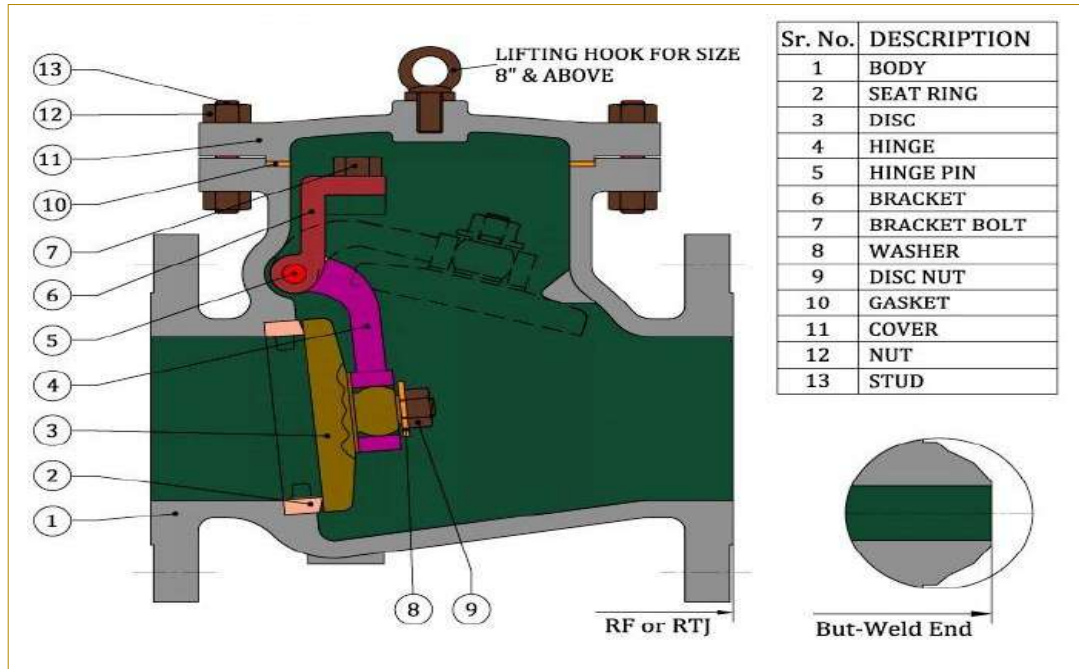
Key Features:-

- Size :- 2" to 48" (50mm to 1200mm)
- All API Trim, Hard Face, Stallite
- Disc Design as per gravitational Acceleration
- Flange RF, FF, RTJ, Butt-Weld End,
- Rating:- 150# to 2500# & Equiv. DIN Rating
- Tongue & Groove Design
- Bolted Cover & Swing Disc
- Low Emission Design

Materials - Carbon Steel, Low Temperature Carbon Steel, Stainless Steel, Duplex, Super Duplex, Incoloy, Inconel, Monel, Aluminum Bronze, Hastalloy, Titanium and other materials.

Applications - Offshore / Onshore Oil & Gas, Chemical, Petrochemical & Allied Process, Power Plant, Water Treatment Plant, Liquefied Natural Gas, Sugar, Paper & Pulp, Steel, Piping & Process Industry

GA Drawing for Check Valve (Model - 6000)



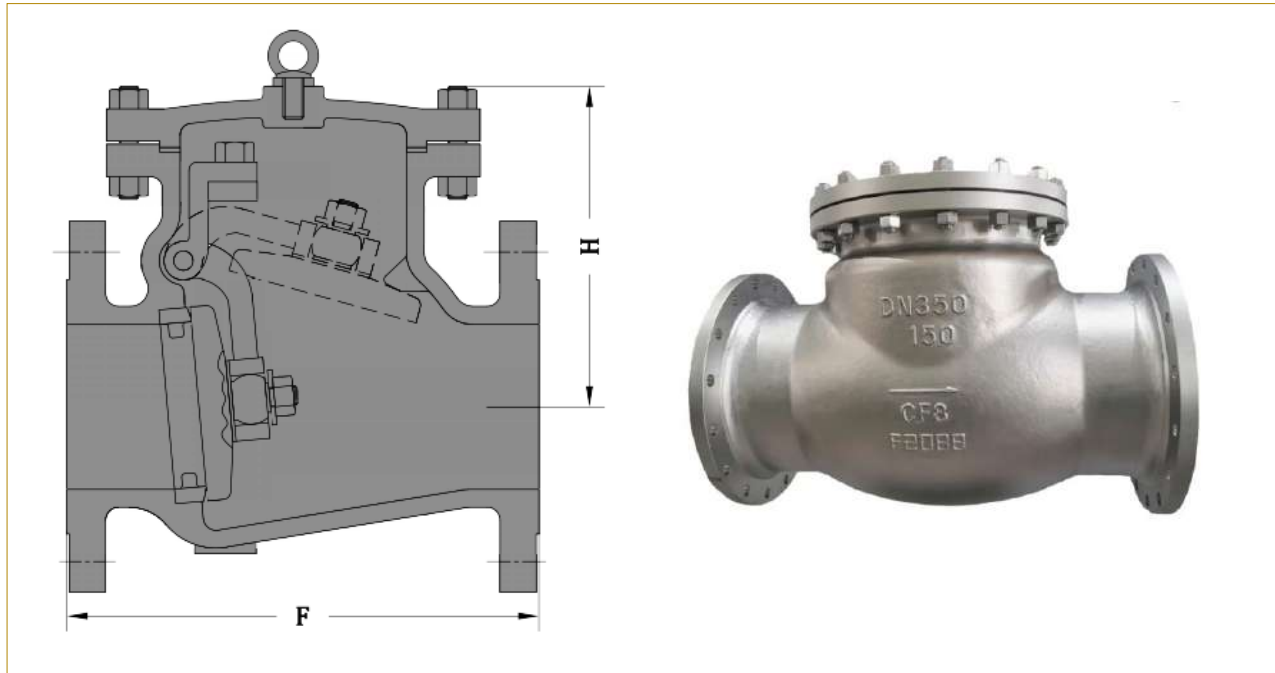
Material of Construction for Check Valve (Model - 6000)

Bill of Material For Check Valve							
Sr. No.	Part	Carbon Steel	Low Temp. Carbon Steel	Stainless Steel	Duplex	Aluminum Bronze	Nickel Alloys
1	Body	A216 Gr WCB	A325 Gr. LCB , LCC	A351 Gr. CF8M, CF8	A890 Gr. 4A, 5A, 6A	C95800, C95500, C63200	A494 Gr.CW6MC, CW12M, M 35-1
2	Seat Ring	CA15, CF8, CF8M	CF8M	CF8M, CF8	4A, 5A, 6A	C95800, C95500, C63200	CW6MC, 12MW , M35 -1
3	Disc						
4	Hinge	WCB	LCB , LCC				
5	Hinge Pin	F6a, AISI410, F304, F316	F316L	F316L, F304L	F51, F53, F55	MONEL	Inconel 625, 750, 825, Monel
6	Bracket	WCB	LCB , LCC	CF8M, CF8	4A, 5A, 6A	C95800, C95500, C63200	CW6MC, 12MW , M35 -1
7	Bracket Bolt	A193 Gr. B7 / B7M	A320 Gr L7 , L7M	A193 Gr. B8 , B8M			
8	Washer	Carbon Steel			Stainless Steel		
9	Disc Nut	A194 Gr. 2H, 2HM	A194 Gr. 4L, 7M, 4	A194 Gr. 8MA, 8M			
10	Gasket	SPWG + (SS304/SS316)	SPWG + SS316	SPWG + (SS304/SS316)	SPWG + Duplex	SPWG + (Monel / Inconel)	
11	Cover	WCB	LCB , LCC	CF8M, CF8	4A, 5A, 6A	C95800, C95500, C63200	CW6MC, 12MW , M35 -1
12	Nut	A194 Gr. 2H, 2HM	A194 Gr. 4L, 7M, 4	A194 Gr. 8MA, 8M			
13	Stud	A193 Gr. B7 / B7M	A320 Gr L7 , L7M	A193 Gr. B8 , B8M			

NOTE: ** Stellite or Hardface or API Trims are optional and as per customer requirement.

** "INVACO" reserve rights to change MATERIALS & DESIGN anytime without prior notice.

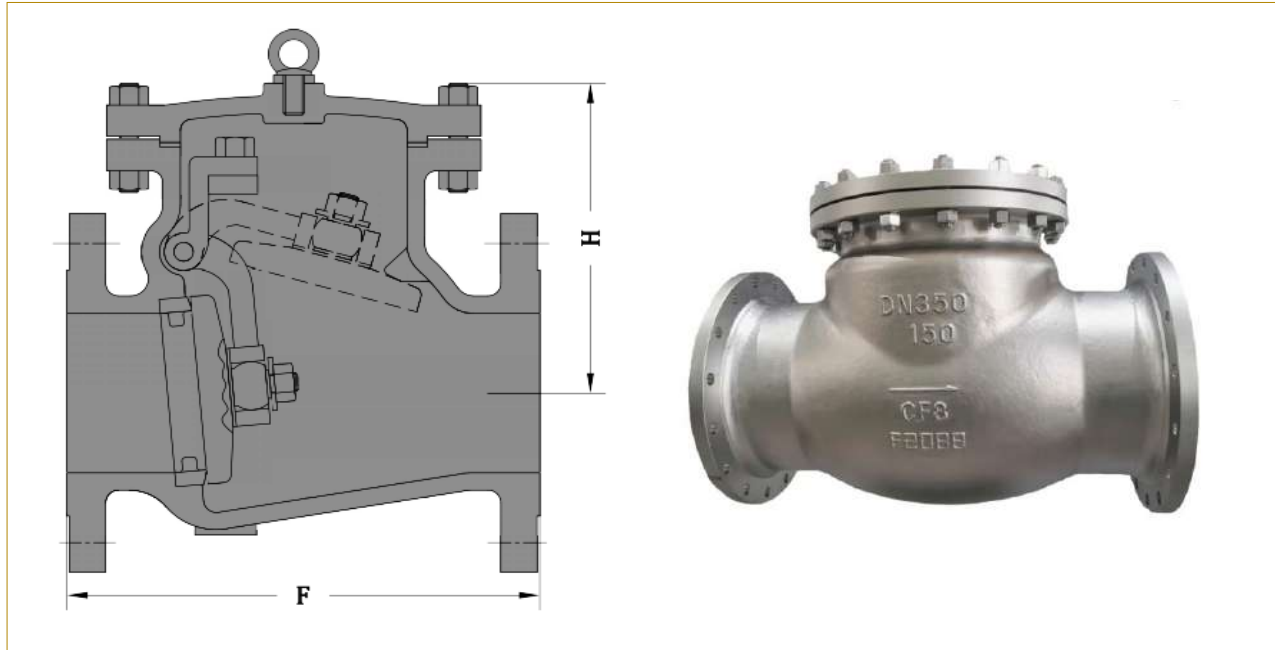
Dimensions for Swing Check Valve (Model - 6000)



Size		150#			300#			600#		
		Face to Face (mm)		H	Face to Face (mm)		H	Face to Face(mm)		H
in	mm	RF & WE	RTJ	mm	RF & WE	RTJ	mm	RF & WE	RTJ	mm
2	50	203	216	146	267	283	155	292	295	160
2½	65	216	229	165	292	308	170	330	333	170
3	80	241	254	194	318	333	200	356	359	225
4	100	292	305	224	356	371	225	432	435	240
6	150	356	368	276	445	460	275	559	562	295
8	200	495	508	328	533	549	325	660	664	345
10	250	622	635	395	622	638	415	787	791	425
12	300	699	711	436	711	727	435	838	841	526
14	350	787	800	509	838	854	500	889	892	587
16	400	864	876	562	864	879	575	991	994	695
18	450	978	991	636	978	994	655	1092	1095	749
20	500	978	991	674	1016	1035	695	1194	1200	963
24	600	1295	1308	799	1346	1368	815	1397	1407	1105
26	650	1295	---	886	1346	1372	926	1448	1461	1243
28	700	1448	---	923	1499	1524	1146	1600	1613	1296
30	750	1524	---	980	1594	1619	1238	1651	1664	1321
32	800	1626	---	1225	1727	---	1376	1778	---	1379
36	900	1956	---	1367	2083	---	1516	2083	---	1568
40	1000	2159	---	1413	2438	---	1744	2286	---	1734
48	1200	2388	---	1636	3151	---	2228	2540	---	2136

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Dimensions for Swing Check Valve (Model - 6000)



Size		900#			1500#			2500#		
		Face to Face (mm)		H	Face to Face (mm)		H	Face to Face (mm)		H
in	mm	RF & WE	RTJ	mm	RF & WE	RTJ	mm	RF & WE	RTJ	mm
2	50	368	371	241	368	371	249	451	454	386
2½	65	419	422	254	419	422	264	508	514	411
3	80	381	384	272	470	473	297	578	584	453
4	100	457	460	304	546	549	318	673	683	486
6	150	610	613	385	705	711	428	914	927	512
8	200	737	740	493	832	841	536	1022	1038	692
10	250	838	841	594	991	1000	648	1270	1292	843
12	300	965	968	683	1130	1146	734	1422	1445	992
14	350	1025	1038	764	1257	1276	826	1575	---	1192
16	400	1130	1140	835	1384	1407	956	1727	---	1295
18	450	1219	1232	884	1537	1559	1063	1877	---	1386
20	500	1321	1334	937	1664	1686	1192	---	---	---
24	600	1549	1568	1062	1943	1972	1492	---	---	---
26	650	1651	1673	1128	---	---	---	---	---	---
28	700	1753	1775	1364	---	---	---	---	---	---
30	750	1854	1876	1514	---	---	---	---	---	---
32	800	1956	---	1643	---	---	---	---	---	---
36	900	2156	---	1829	---	---	---	---	---	---

NOTE: - ** RF – Raised Face, RTJ – Ring Type Joint, BW – But Weld End, GO – Gear Operated
 ** All API Trims are available.
 ** All dimensions are in “mm” unless & otherwise specified.
 ** INVACO reserves the right to change materials, design & dimensions anytime without prior notice.

Body & Trim Material for Swing Check Valve (Model - 6000)

Body & Trim Material:-		
Material Group / Type	Casting	Forging
Carbon Steel	A216 Gr WCB , WCA	A105 / A 106
	A216 Gr WCC	A105N
Low Temperature Carbon Steel	A352 Gr LCB	A350 Gr LF2 CL.1
	A352 Gr LCC	
	A352 Gr LC1 / LC2	
	A352 Gr LC3	A350 Gr LF3 CL.1
Alloy Steel	A217 Gr WC1	A182 Gr F1
	A217 Gr WC5	
	A217 Gr WC6	A182 Gr F11 CL.2
	A217 Gr WC9	A182 Gr F22 CL.3
	A217 Gr C5	A182 Gr F5a
	A217 Gr C12	A182 Gr F9
	A217 Gr C12A	A182 Gr F91
Stainless Steel	A217 Gr CA15	A182 Gr F6A / ANSI 410
	A351 Gr CF10M	A182 Gr F304H
	A351 Gr CF8A	A182 Gr F347H
	A351 Gr CF8	A182 Gr F304
	A351 Gr CF3	A182 Gr F304L
	A351 Gr CF8M	A182 Gr F316
	A351 Gr CF3M	A182 Gr F316L
	A351 Gr CF8C	A182 Gr F347
Duplex / Super Duplex	A890 Gr CD4MCuN (1B)	
	A890 Gr CD3MCuN (1C)	
	A890 Gr CE8MN (2A)	
	A890 Gr CD3MN (4A)	A182 Gr F51
	A890 Gr CE3MN (5A)	A182 Gr F53
	A890 Gr CD3MWCuN (6A)	A182 Gr F55
Nickel / Super Nickel Alloys	A494 Gr CY40	Inconel 600
	A494 Gr CZ100	
	A494 Gr CW6MC	Inconel 625
	A494 Gr M 35 -1	Monel 400
		Monel K-500
	A494 Gr CW6M / CW12MW	Hastalloy C / C-276
Aluminum Bronze	B148 Gr C95200	
	B148 Gr C95400	
	B148 Gr C95500	
	B148 Gr C95800	
Titanium	B367 Gr C2	B381 Gr F2
	B367 Gr C3	B381 Gr F3
Special Materials	A351 Gr CN7M	Alloy 20
	A351 Gr CN2MCuN	904L
	A351 Gr CK3MCuN	SMO 254 / A182 Gr F44
	CB7CU -1	17 - 4 PH

Note: - Wrought names are given as a reference for commonly accepted equivalent material. "INVACO" cannot hold any liability for any damages incurred due to this table. For more information kindly contact "INVACO".



Material Specification for Fastener's:-

Bolting Material	Nut Materials	Temperature Range	Body Material
ASTM A193 Gr. B7	ASTM A194 Gr. 2H	-40°C to +538°C	Carbon Steel
ASTM A193 Gr B7M	ASTM A194 Gr. 2HM	-50°C to +538°C	Low Alloy Steel
ASTM A320 Gr. L7	ASTM A194 Gr. 7/4	-100°C to +371°C	Low Temp. Carbon Steel
ASTM A320 Gr. L7M	ASTM A194 Gr. 7M	-75°C to +538°C	Low Temp. Carbon Steel
ASTM A193 Gr. B8	ASTM A194 Gr. 8	-200°C to +538°C	Stainless Steel
ASTM A193 Gr. B8M	ASTM A194 Gr. 8M / 8MA	-200°C to +538°C	Stainless Steel/Nickel Alloys / AL-Br / Duplex
A453 Gr 660 CL A	A453 Gr 660 CL A	-30°C to +538°C	Duplex

<p>NOTE:-</p> <ul style="list-style-type: none"> ➤ Above temperature range is for BOLTING, not body materials. ➤ Welding repair on Bolting is strictly not allowed. ➤ Temperature range & use may vary with requirement like NACE, Impact Test. ➤ For more information refer ASME B31.3, B16.34, A193, A194, A320 & A453. ➤ Other Bolt & Nut material available on request. ➤ INVACO cannot hold any liability for any damages incurred to this table. 	<p>Coating for Fastener's</p> <ul style="list-style-type: none"> ➤ ENP ➤ Hot Deep Galvanized ➤ Hot Zinc ➤ Red Xylem ➤ PTFE Coating ➤ Cadmium ➤ Cadmium with PTFE
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Static and Dynamic Seals (Gaskets & Packing):-

- Graphite Packing / Gasket.
- PTFE, R-PTFE Packing / Rings.
- Spiral Wound Gasket (Soft + Metal filled)
- Metal Gasket (RTJ, BX, T type seal ring).
- Lip Seal (U/O type, radial or face seal).

Testing Pressure:-

ASME CLASS	Working Pressure			Body Test (Hydro)			Seat Test (Hydro)			Seat Test (Air)		
	psi	bar	Kg/cm ²	psi	bar	Kg/cm ²	psi	bar	Kg/cm ²	psi	bar	Kg/cm ²
150	285	19.6	20	464	32	33	333	23	23.5	100	6	7
300	741	51.1	52	1145	79	81	842	58	59	100	6	7
400	988	68.1	69	1523	105	107	1189	82	84	100	6	7
600	1480	102.1	104	2262	156	159	1653	114	116	100	6	7
800	2001	138	141	3046	210	214	2248	155	158	100	6	7
900	2222	153.2	156	3423	236	240	2494	172	175	100	6	7
1500	3703	255.3	260	5685	392	400	4177	288	293	100	6	7
2500	6171	425.5	434	945	652	665	6932	478	487	100	6	7

Note: - Rating Pressure may be change for different materials.

Spares part list:-

Spares for Swing Check Valve			
Part No	Part	Quantity for Start up	Quantity for 2 years Operation
2	Seat Ring (For Soft Seat Only)	1	3 nos
10	Gasket	1 Set	3 Set

Swing Check Valve



Model - 6000

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www.invacovalves.com

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We are 70Km away from Mumbai International Airport.