



# VALVE-TECH INDUSTRIES

“Materials that Create Solutions”

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”

# Fabricated Valve Product Catalogue

VALVE-TECH reigns in the manufacturing of large size fabricated valves that have various application in steel plants, water treatment plants, oil & gas, power plant, fertilizer, chemical & pharmaceutical industries.

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## DOUBLE DISC GATE VALVE

VTI make Fabricated Gate Valves are used for applications where high degree of precision and expertise is required. VTI with the help of its experience in large number of plants over the previous supplies is able to maintain the technical knowhow and engineering for intended application.

- ▶ Used in wide application including CO and BF Gas, Mixed Gas, High temperature application, Oil mediums involving acidic application.
- ▶ Steel Plant Service.
- ▶ Available in material like Carbon Steel, Stainless Steel and other proprietor and commercial alloys.
- ▶ Custom design and dimensions available for different application as per request.
- ▶ High precision dimensional accuracy provided.
- ▶ Sizing Calculation available.
- ▶ Available in sizes 8" to 240"
- ▶ Available in various actuated combinations including Manual, Electric and Hydraulic.
- ▶ Selection of Trim and Seat according to Service Temperature.
- ▶ Specially designed roller to avoid misalignment and smooth travel.
- ▶ Available in Variable pressure Class with zero leakage testing as per



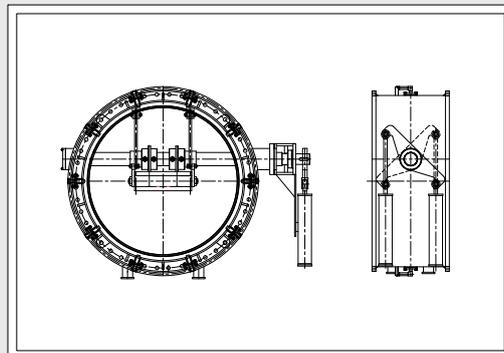
## TWO LEVER VALVE

These Valves are referred as pure shut-off valve for gaseous media, especially when used with high operating frequency. It finds its usage where gaseous media have to be isolated and the valve is operated under quite low differential pressures (up to approximately 200 mbar) whereas the static pressure can be higher in the opened or closed position.

It is majorly used in the Iron and Steel industry, air separation units, gas-fired power plants, chemical industries and other plants with similar shut-off requirements for gaseous media.

The Valve Disc is pressed against the body seat by the force of actuator through the help of linkages and shaft by actuator force to keep the valve sealed in closed position, possibly supported by the medium pressure. When the valve is opened, the disc is moved parallel first to avoid frictional

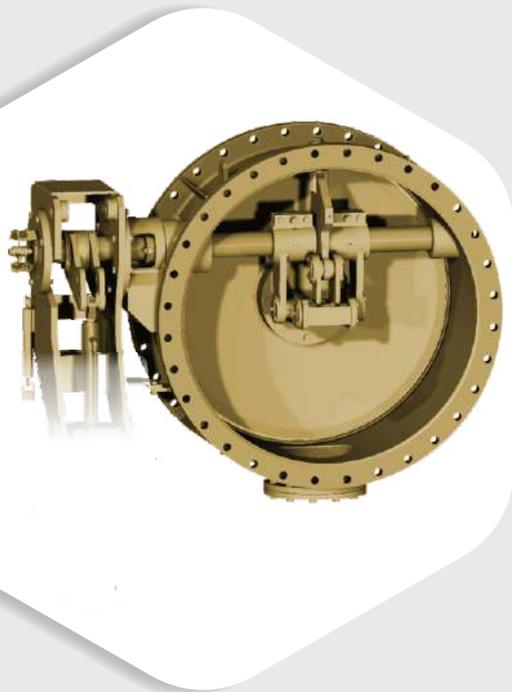
- ▶ Available in size 18" to 320".
- ▶ Seat Cleaning with the help of spraying option available.
- ▶ Single/Double cylinder option for quick operation.
- ▶ User specific dimension available



## THREE LEVER VALVE

Three Lever Valves are highly efficient valves where multiple linkages are used to provide positive isolation in case of Gaseous media. The valve disc is centrally suspended transfer the clamping forces at the periphery uniformly onto the seat.

- ▶ Available in size 18" to 320".
- ▶ Greasing Points easily accesible for ease of greasing.
- ▶ Seat Cleaning with the help of spraying option available.
- ▶ Single/Double cylinder option for quick operation.
- ▶ User specific dimension available.
- ▶ Available in Gear, Pneumatic, Electrical, Hydraulic & Electro Hydraulic Operation



Dimensional Table for Two lever/Three Lever Valve							
DN	LENGTH	OD	PCD	THICKNESS	HOLE DIA.	NO. OF HOLES	APP. WEIGHT
200	152	340	295	27	23	8	96
250	165/203	395	350	29	23	12	120
300	178/203	445	400	31	23	12	145
350	190/203	505	460	32	23	16	195
400	216/203	565	515	34	28	16	256
450	222/203	615	565	35	28	20	288
500	229/203	670	620	36	28	20	353
600	267/203	780	725	40	31	20	545
700	292/305	895	840	46	3	24	582
800	318/305	1015	950	49	34	24	686
900	330/305	1115	1050	51	34	28	1052
1000	410/305	1230	1160	55	37	28	1280
1100	450/343	1368	1270	61	37	32	1720
1200	470/381	1470	1387	63	37	32	2210
1300	530/381	1642	1470	68	38	36	2650
1400	530/381	1720	1552	68	38	36	2820
1500	530/381	1800	1710	74	38	36	3480
1600	530/457	2080	1860	48	48	40	4100
1800	550/457	2115	2020	50	48	44	5250
2000	550	2325	2440	54	48	48	5950
2200	550	2550	2550	58	56	52	7140
2400	550	2760	2760	62	56	56	8105
2500	580	2860	2860	64	56	56	9320
2600	580	2960	2960	66	56	60	10250
2800	600	3180	3180	70	56	64	10975
3000	600	3405	3405	75	62	68	11600

Dimensional Table for Two lever/Three Lever Valve							
DN	OD	PCD	RF DIA.	THICKNESS	HOLE DIA.	NO. OF HOLES	APP. WEIGHT
300	440	395	365	24	22	12	280
350	450	445	415	26	22	12	300
400	540	495	465	28	22	16	330
500	645	600	570	30	22	20	380
600	755	705	670	32	26	20	420
800	975	920	880	44	30	24	680
1000	1175	1120	1080	52	30	28	1180
1100	1305	1240	1190	56	33	28	1490
1200	1405	1340	1295	60	33	32	1600
1300	1530	1460	1410	66	36	36	1750
1400	1630	1560	1510	72	36	36	1800
1600	1830	1760	1710	80	36	40	2100
1800	2045	1970	1920	88	39	44	2600
2000	2265	2180	2125	96	42	48	3200
2200	2475	2390	2335	104	42	52	4000
2400	2685	2600	2545	112	42	56	5200

*Note: Customised option available for different dimensions.*

## DOUBLE OFFSET BUTTERFLY VALVE

VTI make High performance fabricated Butterfly Valves are manufactured to provide robust sealing in reduced torque. The design is available in AWWA, API, BS, and other relevant applicable standards.

The Offset Valve is designed to provide ease of operation along with provision for replacement of seal in case of wear and tear. VTI Double Offset Butterfly Valves are available in various sealing options depending upon the service condition. The selection of the Seal is done on the basis of the maximum pressure-temperature and nature of media.

VTI Double offset valves finds its application in services like Mixed Gas, High Pressure Dam application, CO Gas Application, Slurry line, Highly Corrosive application, Abrasive application and application including acidic and high temperature medium. Our range also includes double sealing product with the use of service and maintenance sealing design available in single seating valve service and maintenance sealing design available in single seating valve used for maintenance of seal under pressurized condition. Available in special grades for Sea Water



- ▶ Positive Isolation.
- ▶ Lower Break Torque.
- ▶ Quick Support for Maintenance and Troubleshooting.
- ▶ Available in size 2" to 320".
- ▶ Various pressure class option available in the range PN1 to PN50.
- ▶ Available in various material combination.
- ▶ Various dimension option available in customizable form as per the requirement.
- ▶ Options available for Manual, Pneumatic, Electric and Hydraulic combinations.

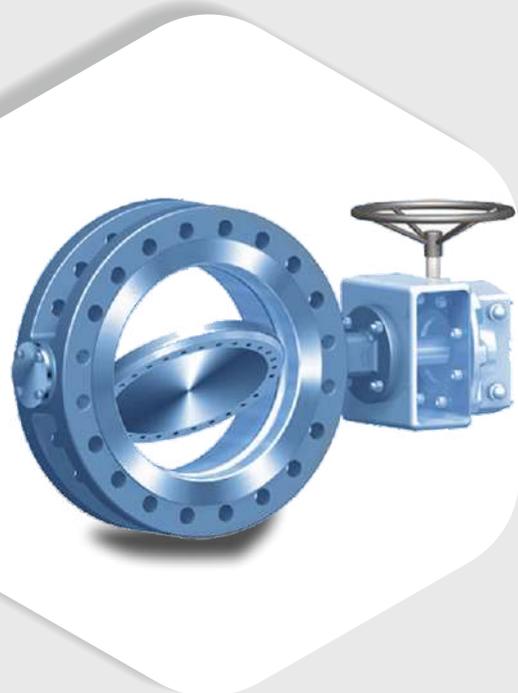
## TRIPLE OFFSET BUTTERFLY VALVE

TOBFV exhibit usefulness across diverse industries, including oil & gas, water & waste treatment, and others. Considering this, increasing exploration of new oil & gas fields has encouraged its usage in the past few years. Facing challenges such as high pressure and high temperature efficiencies has always been one of the prime concerns of end users. Choosing the correct triple offset butterfly valve for specific application has been difficult for industries, and VTI plays a vital role over selection of right material of intended application.

VTI make Triple Offset valves outperform traditional valves with increased durability, reliability, and lower ownership cost. The seat of the triple offset butterfly valve is designed to minimize wear, provide lower maintenance cost, and extend service life. Also, zero leakage sealing capabilities of VTI make triple offset butterfly valves allows processes to operate reliably at top efficiency, even in extreme conditions.

A Triple Offset Butterfly Valve has 3 separate offsets. Two of the offsets apply to the location of the shaft in respect to the centerline of the bore and the centerline of the disc/seat sealing surfaces. The third offset is the design in the axis of the seat cone angle. The third offset is the geometry design of the sealing components. The sealing components are each machined into an offset conical profile resulting in a right-angled cone. This ensures friction free stroking throughout its operating cycle. Contact is only

- ▶ Meant for application involving High Pressure and Temperature and where media is expected to be highly corrosive.
- ▶ Available in size 2" to 320".
- ▶ Various pressure class option available in the range PN1 to PN50.
- ▶ Actuation available as per the requirement
- ▶ Repeatable sealing and a vastly extended valve life.
- ▶ Suitability to harsh media – construction of the valve features no elastomers or materials typically affected by corrosion.
- ▶ Seat friction is insignificant because sealing is by contact pressure. As a result, the valve seat enjoys much longer operational life.



## GOGGLE VALVE

VTI makes goggle valves finds its use in gas lines for furnace, converter and coke-oven gas. With various design for varied working pressure and available in different metallurgical selection as per the suited temperature and media category.

Technical description: Goggle valve is comprised of one closed body and two side covers screwed to the body, a moving closing slide, gripping and traversing of actuator. The sealing surfaces are pressed onto the closing slide by means of Belleville washers. Movement of the gate is controlled by a ratchet and cog wheels. The end surfaces of the gate are optically visible.

Operation: Operation is ensured by gear boxes and electric actuator. The valve may be controlled by hand wheel in the case of emergency.

- ▶ Available in Open and Closed Design Option.
- ▶ Complete Positive Isolation.
- ▶ Selection of Belows and hydraulic system are requirement specific.
- ▶ Available from DN 300 to DN 6000.
- ▶ Available in both LP and HP option



## HOT BLAST / COLD BLAST VALVE

This kind of valve finds its application in Combustion Gas and Air, Fuel Gases, Hot Blast Stove, Cold Air Blast, Oxygen and Hot Air Blast, Blast Furnace Gases, etc.

This valve is intended for complete separation of a hot blast stove from a hot blast main under 'on-gas' operation of the stove. This valve is also effectively being used as a shut-off valve and back drafting valve. Hot blast valve normally consists of a water cooled disc resting on a water cooled seat, and moving vertically within a water cooled valve body and bonnet, and other supporting members and mechanisms which maintains a smooth, exact seating and non-stick release of the disc.

The electro-mechanical actuator is designed for heavy duty equipment and is motor protected by a built-in torque device and externally mounted limit switches. It has motor overload relays for safety and a hand or chain wheel and de-clutch lever for manual operation in case of power failures.

This valve is to pass and shut off a hot blast of 1,000 deg C to 1,400deg C, and hence has a refractory lining to the interior of its body. All the elements of the valve exposed to heat except disc contact surfaces and housing thrust rings are protected with refractory lining. Reinforced alumina castables are normally used for the refractory lining.

Cold blast valves are installed at the hot blast stove end of the hot blast main. These valves are normally not lined since the temperature of the cold blast is generally in the range of 150 deg C to 250 deg C, which is the temperature resulting from the heat of compression at the blower.

- Available in size range DN 800 to DN 3000
- Available in various metallurgies and designs according to application.





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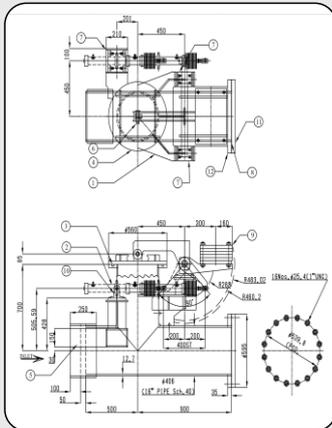
**Butterfly Damper**



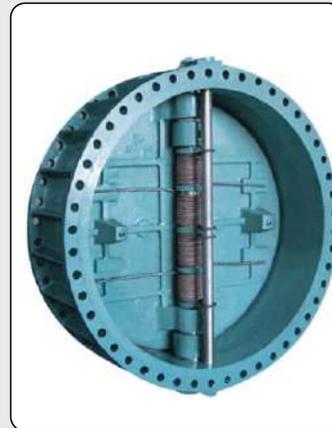
**Damper Check Valve**



**Fab. Butterfly Valve**



**Customization**



**Dual Plate Check Valve**



# Comparison List for Casting & Forging

General classification	CASTINGS			FORGINGS		
	ASTM	JIS	BS	ASTM	JIS	BS
Cast Iron	A216 Class A	A216 Class A	1452-14	-	-	-
	-Class B	-Class B	-17	-	-	-
	-Class C	-Class C	-20	-	-	-
Malleable Iron	A 197	A 197	310-B 18/6	-	-	-
	A 47-32510	A 47-32510	-B 22/14	-	-	-
	35018	35018	-	-	-	-
Ductile Iron	A395	A395	-	-	-	-
	-	-	-	-	-	-
	A536	A536	-	-	-	-
Carbon Steel	A216-WCA	A216-WCA	-	A105	G3201-SF45	1503-161B
	-	-	1504-161	-	-	-
	A216WCB	A216WCB	-B	A105	G3201-SF50	1503-161C
	-WCC	-WCC	-	-	-	-
Carbon-1/2 MO	A217-WC1	A217-WC1	1504-240	A182-F1	-	1503-240B
1/2 Cr-1/2 Mo 1/2 Ni	-WC4	-WC4	-	-	-	-
1Cr-1/2 MO-1/2 Ni	wc5	wc5	-	A182-F12	-	1503-620
1 1/4 Cr-1/2 MO	wc6	wc6	1504-621	-F11	-	-
2 1/4 Cr-1Mo	wc9	wc9	1504-622	-F22	-	1503-662
3Cr-1MO	-	-	-	-F21	-	-
5Cr-1/2Mo(C0.15)	-	-	-	-F5	-	-
5Cr-1/2 Mo(C0.25)	A217-C5	A217-C5	1504-625	-F5a	-	1503-625
7Cr-1/2 MO	-	-	-	-F7	-	-
9Cr-1 Mo	A217-C12	A217-C12	1504-629	F9	-	-
Carbon Steel for Low Temp	A352-LCB	A352-LCB	4242-GR4	A350-LF1	-	-
Carbon-Si	-	-	-	-LF2	-	-
Carbon-1 MO for Low Temp	A352-LC1	A352-LC1	-	-	-	-
2 1/2 Ni	LC2	LC2	-	-	-	-
3 1/2 Ni	-LC3	-LC3	-	A350-LF3	-	-
Cr-Ni-Cu-Al	-	-	-	LF4	-	-
13Cr	A217-CA15	A217-CA15	-	A182-6	64303-SUS51B	1503713
18Cr-8Ni(C0.03)	A351-CF3	A351-CF3	-	-F304L	SUS328	-
18Cr-8Ni(C0.08)	-CF8	-CF8	-	-F304	-SUS27B	1504601
18Cr-8Ni(C0.10)	-	-	1504-801	F304H	-	-
18Cr-8Ni-2Mo(C0.03)	A351-CF3M	A351-CF3M	-	-F316L	G4303 SUS33B	-
18Cr-8Ni-2Mo(C0.08)	-CF8M	-CF8M	1632-GRC	-	-SUS32B	1503-845B
18Cr-8Ni-2Mo(C0.10)	-	-	-	-F316H	-	-
18Cr-8Ni-Ti(C0.08)	-	-	-	-F321	G4303-SUS29B	-
18Cr-8Ni-Ti(C0.10)	-	-	1504-821TI	-	-F321H	1503821TI
18Cr-8Ni-Cb(C0.08)	A351-CF8C	A351-CF8C	-	F347	G4303 SUS43B	821 Nb
18Cr-8Ni-Cb(C0.10)	-	-	1504-821 NB	F347H	-	-
18Cr-8Ni-Ta-Cb(C0.08)	-	-	-	F348	-	-
18Cr-8Ni-Ta-Cb(C0.10)	-	-	-	F348 H	-	-
25Cr-2Ni(C0.15)	-	-	-	F310	-	-
22Cr-12Ni(C0.08)	A351	A351	-	-	-	-
22Cr-12Ni(C0.10)	CH10	CH10	-	-	-	-
22Cr-12Ni(C0.20)	CH20	CH20	-	-	-	-
23Cr-19Ni(C0.20)	CK20	CK20	-	-	-	-
23Cr-19Ni(C0.35)	HK30	HK30	-	-	-	-
23Cr-19Ni(C0.45)	HK40	HK40	-	-	-	-
13Cr-33Ni-Mo(C0.35)	HT30	HT30	-	-	-	-
15Cr-13Ni-2Mo-Cb(C0.10)	CF10MC	CF10MC	-	-	-	-
19Cr-27Ni-2Mo-3Cu(C0.07)	CN7M	CN7M	-	-	-	-
8Cr-20Ni(C0.20)	-	-	-	A182 F10	-	-
HASTELLOY B	A494N-12MV	A494N-12MV	-	-	-	-

ANSI B16.5 CLASS (150 mm)							
Nominal Size. (inches)	D	C	g	f	h	Bolt	
						NUMBER	DIAM.
1/2	88.9	60.5	35.1	11.2	15.8	4	1/2
3/4	98.6	69.9	42.9	12.7 (11.2)	15.8	4	1/2
1	108	79.2	50.8	14.3 (11.2)	15.8	4	1/2
1 1/2	127	98.6	73.2	17.6 (14.3)	15.8	4	1/2
2	152.4	120.7	91.9	19.1 (15.8)	19.1	4	5/8
2 1/2	177.8	139.7	104.6	22.4 (17.6)	19.1	4	5/8
3	190.5	152.4	127	23.9 (19.1)	19.1	4	5/8
4	228.6	190.5	157.2	23.9	19.1	8	5/8
5	254	215.9	185.7	23.9	22.4	8	3/4
6	279.4	241.3	215.9	25.4	22.4	8	3/4
8	342.9	298.5	269.7	28.5	22.4	8	3/4
10	406.4	362	323.9	30.3	25.4	12	7/8
12	482.6	431.8	381	31.8	25.4	12	7/8
14	533.4	476.3	412.8	35.1	28.4	12	1
16	596.9	539.8	469.9	36.6	28.4	16	1
18	635	577.9	533.4	39.7	31.8	16	1 1/8
20	698.5	635	584.2	43	31.8	20	1 1/8
24	812.8	749.3	692.2	47.8	35.1	20	1 1/4

Includes 1.6 raised face. Dimension in ( ) are for valve flanges

ANSI B16.5 CLASS (300 mm)							
Nominal Size. (inches)	D	C	g	f	h	Bolt	
						NUMBER	DIAM.
1/2	95.3	66.5	35.1	14.3	15.8	4	1/2
3/4	117.3	82.6	42.9	15.8	19.1	4	1/2
1	124	88.9	50.8	17.6	19.1	4	1/2
1 1/2	155.4	114.3	73.2	20.6	22.4	4	1/2
2	165.1	127	91.9	22.4	19.1	8	5/8
2 1/2	190.5	149.4	104.6	25.4	22.4	8	5/8
3	209.6	168.1	127	28.5	22.4	8	5/8
4	254	200.2	157.2	31.8	22.4	8	5/8
5	279.4	235	185.7	35.1	22.4	8	3/4
6	317.5	269.7	215.9	36.6	22.4	12	3/4
8	381	330.2	269.7	41.2	25.4	12	3/4
10	444.5	387.4	323.9	47.8	28.4	16	7/8
12	520.7	450.9	381	50.8	31.8	16	7/8
14	584.2	514.4	412.8	53.9	31.8	20	1
16	647.7	571.5	469.9	57.2	35.1	20	1
18	711.2	628.7	533.4	60.5	35.1	24	1 1/8
20	774.7	685.8	584.2	63.5	35.1	24	1 1/8
24	914.4	812.8	692.2	69.9	41.2	24	1 1/4

Includes 1.6 raised face.

ANSI B16.5 CLASS (600 mm)							
Nominal Size. (inches)	D	C	g	f	h	Bolt	
						NUMBER	DIAM.
1/2	95.3	66.5	44.5	14.3	15.8	4	1/2
3/4	117.3	82.6	52.3	15.8	19.1	4	5/8
1	124.0	88.9	57.2	17.6	19.1	4	5/8
1 1/2	155.4	114.3	73.2	22.4	22.4	4	3/4
2	165.1	127.0	91.9	25.4	19.1	8	5/8
2 1/2	190.5	149.4	104.6	28.5	22.4	8	3/4
3	209.6	168.1	127	31.8	22.4	8	3/4
4	273.1	215.9	157.2	38.1	25.4	8	7/8
5	330.2	266.7	185.7	44.5	28.4	8	1
6	355.6	292.1	215.9	47.28	28.4	12	1
8	419.1	349.3	269.7	55.7	31.8	12	1 1/8
10	508.0	431.8	323.9	63.5	35.1	16	1 1/4
12	558.8	489.0	381	66.6	35.1	20	1 1/4
14	603.3	527.1	412.8	69.9	38.1	20	1 3/8
16	685.8	603.3	469.9	76.2	41.2	20	1 1/2
18	743.0	654.1	533.4	82.6	44.5	20	1 5/8
20	812.8	723.9	584.2	88.9	44.5	24	1 5/8
24	939.8	838.2	692.2	101.6	50.8	24	1 7/8

6.4 raised face not included

ANSI B16.5 CLASS (900 mm)							
Nominal Size. (inches)	D	C	g	f	h	Bolt	
						NUMBER	DIAM.
1/2	120.7	82.6	44.5	22.4	22.4	4	3/4
3/4	130.0	88.9	52.3	25.4	22.4	4	3/4
1	149.4	101.6	57.2	28.5	25.4	4	7/8
1 1/2	177.8	124.0	73.2	31.28	28.4	4	1
2	215.9	165.1	91.9	38.1	25.4	8	7/8
2 1/2	244.3	190.5	104.6	41.2	28.4	8	1
3	241.3	190.5	127	38.1	25.4	8	7/8
4	292.1	235.0	157.2	44.5	31.8	8	1 1/8
5	349.3	279.4	185.7	50.8	35.1	8	1 1/4
6	381.0	317.5	215.9	55.7	31.8	12	1 1/4
8	469.9	393.7	269.7	63.5	38.1	12	1 3/8
10	546.1	469.9	323.9	69.9	38.1	16	1 3/8
12	609.6	533.4	381	79.3	38.1	20	1 3/8
14	641.4	558.8	412.8	85.9	41.2	20	1 1/2
16	704.9	616.0	469.9	89.9	44.5	20	1 5/8
18	787.4	685.8	533.4	101.6	50.8	20	1 7/8
20	857.3	749.3	584.2	108.0	53.9	20	2
24	1041.4	901.7	692.2	139.7	66.6	20	2 1/2

6.4 raised face not included

# Technical Conversion Table

WORKING PRESSURE PSIG.										
CLASS	TEMP °F	A216WCB A105	A217C5 A182F5a	A217WC6 A182 F11	A217WC9 A182 F22	A352L3 A350LF3	A351CF8M A182 F315	A351CF3M	A351CF8 A182F304	A351CF3
Class 150	-20 to 100 °C	285	290	290	290	290	275	275	275	275
	200	260	260	260	260	240	240	235	235	235
	300	230	230	230	230	215	215	205	205	205
	400	200	200	200	200	195	195	180	180	180
	500	170	170	170	170	170	170	170	170	170
	600	140	140	140	140	140	140	140	140	140
	650	125	125	125	125	125	125	125	125	125
	700	110	110	110	110	110	110	110	110	110
	750	95	95	95	95	95	95	95	95	95
	800	80	80	80	80	80	80	80	80	80
	850	65	65	65	65	65	65	65	65	65
	900	50	50	50	50	50	50	50	50	50
	950	35	35	35	35	35	35	35	35	35
	1000	20	20	20	20	20	20	20	20	20
	1050	20	20	20	20	20	20	20	20	20
1100	20	20	20	20	20	20	20	20	20	
1150	20	20	20	20	20	20	20	20	20	
1200	20	20	20	20	20	20	20	20	20	
1250	-	-	-	-	20	20	20	-	-	-
1300	-	-	-	-	20	20	20	-	-	-
1350	-	-	-	-	20	20	20	-	-	-
1400	-	-	-	-	20	20	20	-	-	-
1450	-	-	-	-	20	20	20	-	-	-
1500	-	-	-	-	15	15	10	-	-	-
Class 300	-20 to 100 °C	740	750	750	750	750	720	720	720	720
	200	675	750	710	715	750	620	620	600	600
	300	655	730	675	675	730	560	560	530	530
	400	635	705	660	650	705	515	515	470	470
	500	600	665	640	640	685	480	480	435	435
	600	550	605	605	605	605	450	450	415	415
	650	535	590	590	590	590	445	445	410	410
	700	535	570	570	570	-	430	430	405	405
	750	505	530	530	530	-	425	425	400	400
	800	410	500	510	510	-	415	415	395	395
	850	270	440	485	485	-	405	405	390	-
	900	170	355	460	450	-	395	-	385	-
	950	105	260	380	380	-	385	-	375	-
	1000	50	190	225	270	-	365	-	325	-
	1050	-	140	140	200	-	360	-	310	-
1100	-	105	95	115	-	325	-	260	-	
1150	-	70	-	-	-	275	-	195	-	
1200	-	45	-	-	-	205	-	155	-	
1250	-	-	-	-	-	180	-	110	-	
1300	-	-	-	-	-	140	-	85	-	
1350	-	-	-	-	-	105	-	60	-	
1400	-	-	-	-	-	75	-	50	-	
1450	-	-	-	-	-	60	-	35	-	
1500	-	-	-	-	-	40	-	25	-	
Class 600	-20 to 100 °C	1480	1500	1500	1500	1500	1440	1440	1440	1440
	200	1350	1500	1425	1430	1500	1240	1240	1200	1200
	300	1315	1455	1345	1355	1455	1120	1120	1055	1055
	400	1270	1410	1315	1295	1410	1030	1030	940	940
	500	1200	1330	1285	1280	1300	955	955	875	875
	600	1095	1210	1210	1210	1210	905	905	830	830
	650	1075	1175	1175	1175	1175	890	890	815	815
	700	1065	1135	1135	1135	-	885	885	805	805
	750	1010	1065	1065	1065	-	845	845	795	795
	800	825	995	1015	1015	-	830	830	790	790
	850	535	880	975	975	-	810	810	780	-
	900	345	705	900	900	-	790	-	770	-
	950	205	520	755	755	-	775	-	750	-
	1000	105	385	445	535	-	725	-	645	-
	1050	-	280	275	400	-	720	-	620	-
1100	-	205	190	225	-	645	-	515	-	
1150	-	140	-	-	-	550	-	390	-	
1200	-	90	-	-	-	410	-	310	-	
1250	-	-	-	-	-	365	-	220	-	
1300	-	-	-	-	-	275	-	165	-	
1350	-	-	-	-	-	205	-	125	-	
1400	-	-	-	-	-	150	-	95	-	
1450	-	-	-	-	-	115	-	70	-	
1500	-	-	-	-	-	85	-	50	-	

HYDROSTATIC TEST PRESSURES IN POUNDS PER SQUARE INCH GAUGE (PSIG)										
Class	SHELL	450	450	450	450	450	375	375	375	375
150	SEAT	315	315	315	315	290	260	260	260	260
Class	SHELL	1125	1125	1125	1125	1050	925	925	925	925
300	SEAT	815	825	825	825	765	675	675	675	675
Class	SHELL	2225	2250	2250	2250	2100	1875	1875	1875	1875
600	SEAT	1630	1650	1650	1650	1530	1360	1360	1360	1360

WORKING PRESSURE PSIG.										
CLASS	TEMP °F	A216WCB A105	A217C5 A182F5a	A217WC6 A182 F11	A217WC9 A182 F22	A352L3 A350LF3	A351CF8M A182 F315	A351CF3M	A351CF8 A182F304	A351CF3
Class 900	-20 to 100 °C	2250	2250	2250	2250	2250	2160	2160	2160	2160
	200	2025	2250	2135	2150	2250	1860	1850	1800	1800
	300	1970	2185	2020	2030	2185	1540	1540	1410	1410
	400	1900	2115	1975	1945	2115	1540	1540	1410	1410
	500	1795	1995	1925	1920	1995	1435	1435	1310	1310
	600	1640	1815	1815	1815	1815	1355	1355	1245	1245
	650	1610	1765	1765	1765	1765	1330	1330	1225	1225
	700	1600	1705	1705	1705	1705	1295	1295	1210	1210
	750	1510	1595	1595	1595	-	1270	1270	1195	1195
	800	1235	1490	1525	1525	-	1245	1245	1180	1180
	850	850	1315	1460	1460	-	1215	1215	1165	-
	900	515	1060	1350	1350	-	1180	-	1150	-
	950	310	190	1130	1130	-	1160	-	1125	-
	1000	155	575	670	805	-	1090	-	965	-
	1050	-	420	410	595	-	1080	-	925	-
1100	-	310	290	340	-	965	-	770	-	
1150	-	205	-	-	-	825	-	585	-	
1200	-	135	-	-	-	620	-	465	-	
1250	-	-	-	-	-	545	-	330	-	
1300	-	-	-	-	-	410	-	245	-	
1350	-	-	-	-	-	310	-	185	-	
1400	-	-	-	-	-	225	-	145	-	
1450	-	-	-	-	-	175	-	105	-	
1500	-	-	-	-	-	125	-	70	-	
Class 1500	-20 to 100 °C	3750	3750	3750	3750	3750	3600	3600	3600	3600
	200	3375	3750	3560	3580	3750	3095	3095	3000	3000
	300	3280	3640	3365	3385	3640	2795	2795	2640	2640
	400	3170	3530	3290	3240	3530	2570	2570	2350	2350
	500	2995	3325	3210	320	3325	2390	2390	2185	2185
	600	2735	3025	3025	3025	3025	2255	2255	2075	2075
	650	2685	2940	2940	2940	2940	2220	2220	2040	2040
	700	2685	2840	2840	2840	-	2160	2160	2015	2015
	750	2520	2660	2660	2660	-	2110	2110	1990	1990
	800	2060	2485	2540	2540	-	2075	2075	1970	1970
	850	1340	2195	2435	2435	-	2030	2030	1945	-
	900	860	1765	2245	2245	-	1970	-	1920	-
	950	615	1305	1885	1885	-	1930	-	1870	-
	1000	260	960	1115	1340	-	1820	-	1610	-
	1050	-	705	685	995	-	1800	-	1545	-
1100	-	515	480	565	-	1610	-	1285	-	
1150	-	345	-	-	-	1370	-	980	-	
1200	-	225	-	-	-	1030	-	770	-	
1250	-	-	-	-	-	910	-	560	-	
1300	-	-	-	-	-	685	-	410	-	
1350	-	-	-	-	-	515	-	310	-	
1400	-	-	-	-	-	380	-	240	-	
1450	-	-	-	-	-	290	-	170	-	
1500	-	-	-	-	-	205	-	120	-	
Class 2500	-20 to 100 °C	6170	6250	6250	6250	6250	6000	6000	6000	60



# Pressure Temperature Ratings

## Flow Rate Conversion Formulas

	Conversion to m <sup>3</sup> /h	
	m <sup>3</sup> /h	Gas m <sup>3</sup> /h (at 15 °C 1013 mm bar)
Gas m <sup>3</sup> /h	-	X[A]
Gas m <sup>3</sup> /h (at 15 °C 1013 mm bar)	X[B]	-
kg/h	+ SG x .001	x 23.83 + MW
kl/h	-	X[A]
l/h	+ SG	X 1000 x 23.83 + MW
Q/h	x .001	X .001 X[A]
Q/min	x .001 x 60	X .001 x 60 X[A]
t/min	+ SG x 60	X 60 x 1000 x 23.63 + MW
Lb/h	x .4536 + SG x .001	X .4536 x 23.63 + MW
CFH (ft <sup>3</sup> /h)	x .02832	X .02832 X[A]
SCFH (ft <sup>3</sup> /h)	x .0282 X[B]	X .02832
BBL/h	x .159	X .159 X[A]
BBL/min	x .159 x 60	X .159 x 60 X[A]
GPM (gallon/min)	x 3.785 x .001 x 60	X 3.785 x .001 x 60 X[A]
CFM (ft <sup>3</sup> /min)	x .02832 x 60	X .02832 x 60 X[A]
SCFM	x .02832 x 60 X[B]	X .02832 x 60 X[A]
N m <sup>3</sup> /h (at 0 °C 1013 mm bar)	x T1 x 1.033 + (P1 x 273)	x 288 + 273

[A] - PI X 288 / (TI X 1.033)      P1 - kg/cm<sup>2</sup> A inlet pressure  
 [B] - TI X 1.033 / (PI X 288)      T1 - K Fluid Temperature (°C)  
 SG - Specific Gravity              MW - Molecular Weight

## Pressure unit Conversion Formulas

Conversion to kgf/cm <sup>2</sup> A	
kgf/cm <sup>2</sup> G	+1.033
Bar G	x 1.020 +1.033
Bar A	x 1.020
mmHg • mmAq	x .0001+1.033
mmHg • Torr	+ 73.56
cmHg • cmAq	x .001+1.033
cmHg	+ 73.56
mH <sub>2</sub> O • mAq	x .1+1.033
atm	x 1.033
atg	+1.033
Pa	x .0000102+1.033
KPa G	x .0102+1.033
KPa A	x .0102
MPa G	x .0102+1.033
MPa A	x 10.20
Lb/in <sup>2</sup> G	x .0703+1.033
Lb/in <sup>2</sup> A	x .0703
psi G	x .0703+1.033
psi A	x .0703
inHg	x 25.40+735.6

## Temperature unit Conversion

°C	°F	- °F
-28.9	-20	-4.5
-26.1	-15	-5.0
-23.3	-10	14.0
-20.6	-5	23.0
-17.8	0	32.0
-15.0	5	41.0
-12.2	10	50.0
-9.4	15	59.0
-6.7	20	68.0
-3.9	25	77.0
-1.1	30	86.0
1.7	35	95.0
4.4	40	104.0
7.2	45	113.0
10.0	50	122.0
12.8	55	131.0
15.6	60	140.0
18.3	65	149.0
21.1	70	158.0
23.9	75	167.0
26.7	80	176.0
29.4	85	185.0
32.2	90	194.0
35.0	95	203.0
37.8	100	212.0
40.6	105	221.0
43.3	110	230.0
46.1	115	239.0
48.9	120	248.0
51.7	125	257.0
54.4	130	266.0
57.2	135	275.0
60.0	140	284.0
62.8	145	293.0
65.6	150	302.0
68.3	155	311.0
71.1	160	320.0
73.9	165	329.0
76.7	170	338.0
79.4	175	347.0
82.2	180	356.0
85.0	185	365.0
87.8	190	374.0
90.6	195	383.0
93.3	200	392.0
96.1	205	401.0
98.9	210	410.0
101.7	215	419.0
104.4	220	428.0
107.2	225	437.0
110.0	230	446.0
112.8	235	455.0
115.6	240	464.0
118.3	245	473.0
121.1	250	482.0
123.9	255	491.0
126.7	260	500.0
129.4	265	509.0
132.2	270	518.0
135.0	275	527.0
137.8	280	536.0
140.6	285	545.0
143.3	290	554.0
146.1	295	563.0
148.9	300	572.0
151.7	305	581.0
154.4	310	590.0
157.2	315	599.0
160.0	320	608.0
162.8	325	617.0
165.6	330	626.0
168.3	335	635.0
171.1	340	644.0
173.9	345	653.0
176.7	350	662.0
179.4	355	671.0
182.2	360	680.0
185.0	365	689.0
187.8	370	698.0
190.6	375	707.0
193.3	380	716.0
196.1	385	725.0
198.9	390	734.0
201.7	395	743.0
204.4	400	752.0
207.2	405	761.0
210.0	410	770.0
212.8	415	779.0
215.6	420	788.0
218.3	425	797.0
221.1	430	806.0
223.9	435	815.0
226.7	440	824.0
229.4	445	833.0
232.2	450	842.0
235.0	455	851.0
237.8	460	860.0
240.6	465	869.0
243.3	470	878.0
246.1	475	887.0
248.9	480	896.0
251.7	485	905.0
254.4	490	914.0
257.2	495	923.0
260.0	500	932.0
262.8	505	941.0
265.6	510	950.0
268.3	515	959.0
271.1	520	968.0
273.9	525	977.0
276.7	530	986.0
279.4	535	995.0
282.2	540	1004.0
285.0	545	1013.0
287.8	550	1022.0
290.6	555	1031.0
293.3	560	1040.0
296.1	565	1049.0
298.9	570	1058.0
301.7	575	1067.0
304.4	580	1076.0
307.2	585	1085.0
310.0	590	1094.0
312.8	595	1103.0
315.6	600	1112.0
318.3	605	1121.0
321.1	610	1130.0
323.9	615	1139.0
326.7	620	1148.0
329.4	625	1157.0
332.2	630	1166.0
335.0	635	1175.0
337.8	640	1184.0
340.6	645	1193.0
343.3	650	1202.0
346.1	655	1211.0
348.9	660	1220.0
351.7	665	1229.0
354.4	670	1238.0
357.2	675	1247.0
360.0	680	1256.0
362.8	685	1265.0
365.6	690	1274.0
368.3	695	1283.0
371.1	700	1292.0

Temperature unit conversion formulas  
 °F = (°C x 1.8) + 32  
 °C = (°F - 32) x .556

## Conversion to Specific

	Condition	Specific Gravity G
Kg/Nm <sup>3</sup>	0 °C 1013 mmbar	+1.293
Kg/Nm <sup>3</sup>	15 °C 1013 mmbar	+1.225

Gravity G

## Torque Conversion Ratios

Oz -in	Lb -in	Lb - ft	G - cm	Kg - cm	Kg - m	mN - m	cN - m	N - m
1	.0625	0.005	72	0.072	0.0007	7.062	0.706	0.007
16	1	0.83	1152.1	10152	0.0115	113	11.3	0.113
192	12	1	13826	13.83	0.138	1356	135.6	1.356
0.014	0.0009	0.00007	1	0.001	0.00001	0.098	0.01	0.0001
13.89	0.868	0.072	1000	1	0.01	98.07	9.807	0.098
1389	86.8	7.233	100000	100	1	9807	980.7	9.807
0.142	0.009	0.0007	10.2	0.01	0.0001	1	0.1	0.001
14.16	0.888	0.007	102	0.102	0.001	10	1	0.01
141.6	8.851	0.738	10197	10.20	0.102	1000	100	1

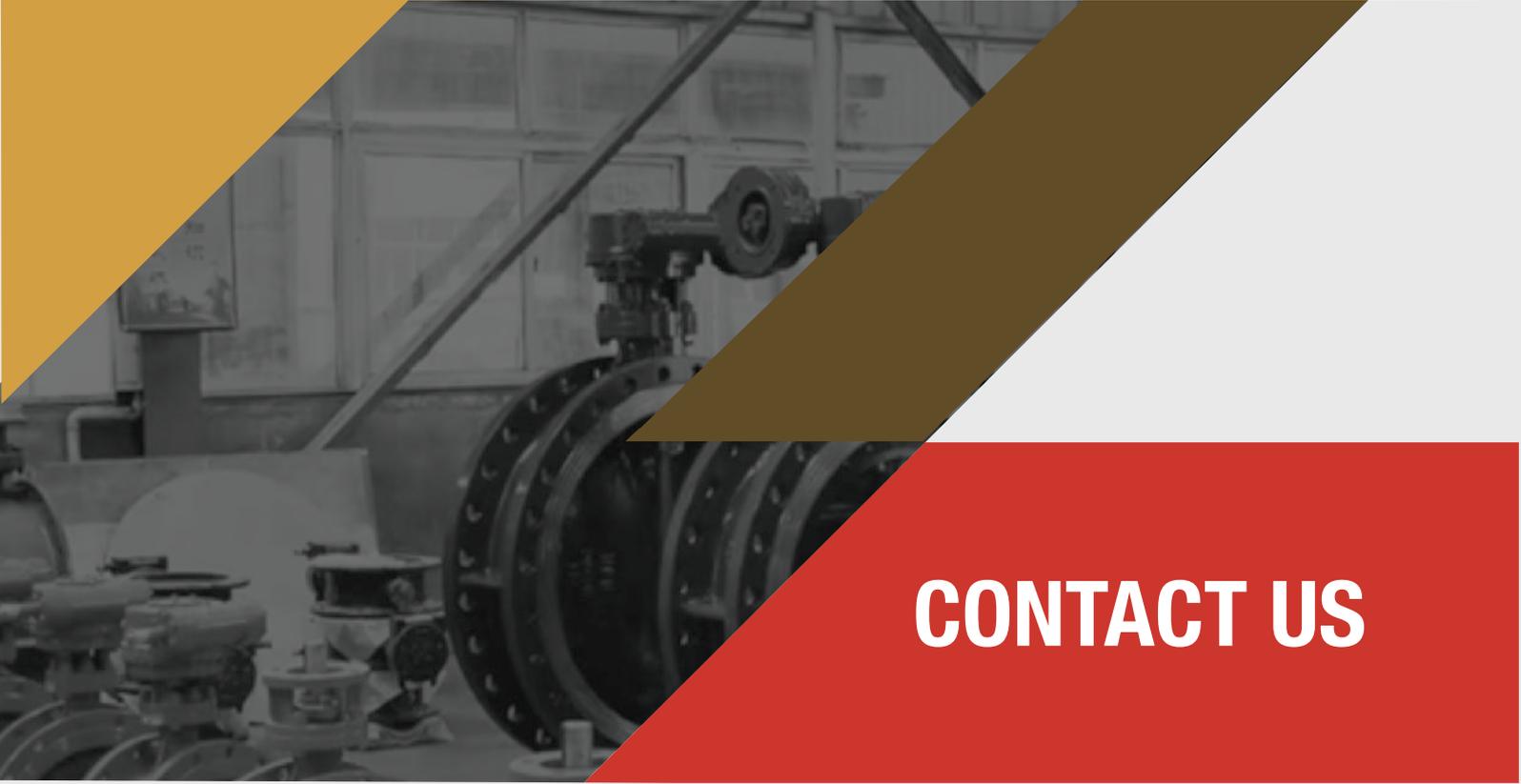
## Pressure Conversion Ratios

Pa	bar	kgf/cm <sup>2</sup>	atm	mH <sub>2</sub> O	mHg	Lbf/in <sup>2</sup>
1	1 x 10 <sup>-5</sup>	1.0197 x 10 <sup>-5</sup>	9.869 x 10 <sup>-5</sup>	1.0197 x 10 <sup>4</sup>	7.501 x 10 <sup>5</sup>	1.450 x 10 <sup>4</sup>
1 x 10 <sup>-5</sup>	1	23.0	9.869 x 10 <sup>-1</sup>	1.0197 x 10	7.501 x 10 <sup>-1</sup>	1.450 x 10
9.80665 x 10 <sup>-4</sup>	9.80665 x 10 <sup>-1</sup>	1	9.678 x 10 <sup>-1</sup>	1.0000 x 10	7.356 x 10 <sup>-1</sup>	1.422 x 10
1.01325 x 10 <sup>-5</sup>	1.01325	1.0332	1	1.033 x 10	7.60 x 10 <sup>-1</sup>	1.470 x 10
9.80665 x 10 <sup>-2</sup>	9.80665 x 10 <sup>-2</sup>	1.0000 x 10 <sup>-1</sup>	9.678 x 10 <sup>-2</sup>	1	7.355 x 10 <sup>-2</sup>	1.4222 x 10
1.3332 x 10 <sup>-5</sup>	1.3332	1.3595	1.3158	1.360 x 10	1	1.934 x 10
6.895 x 10 <sup>-3</sup>	6.895 x 10 <sup>-2</sup>	7.031 x 10 <sup>-2</sup>	6.805 x 10 <sup>-2</sup>	7.31 x 10 <sup>-1</sup>	5.171 x 10 <sup>-2</sup>	1



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