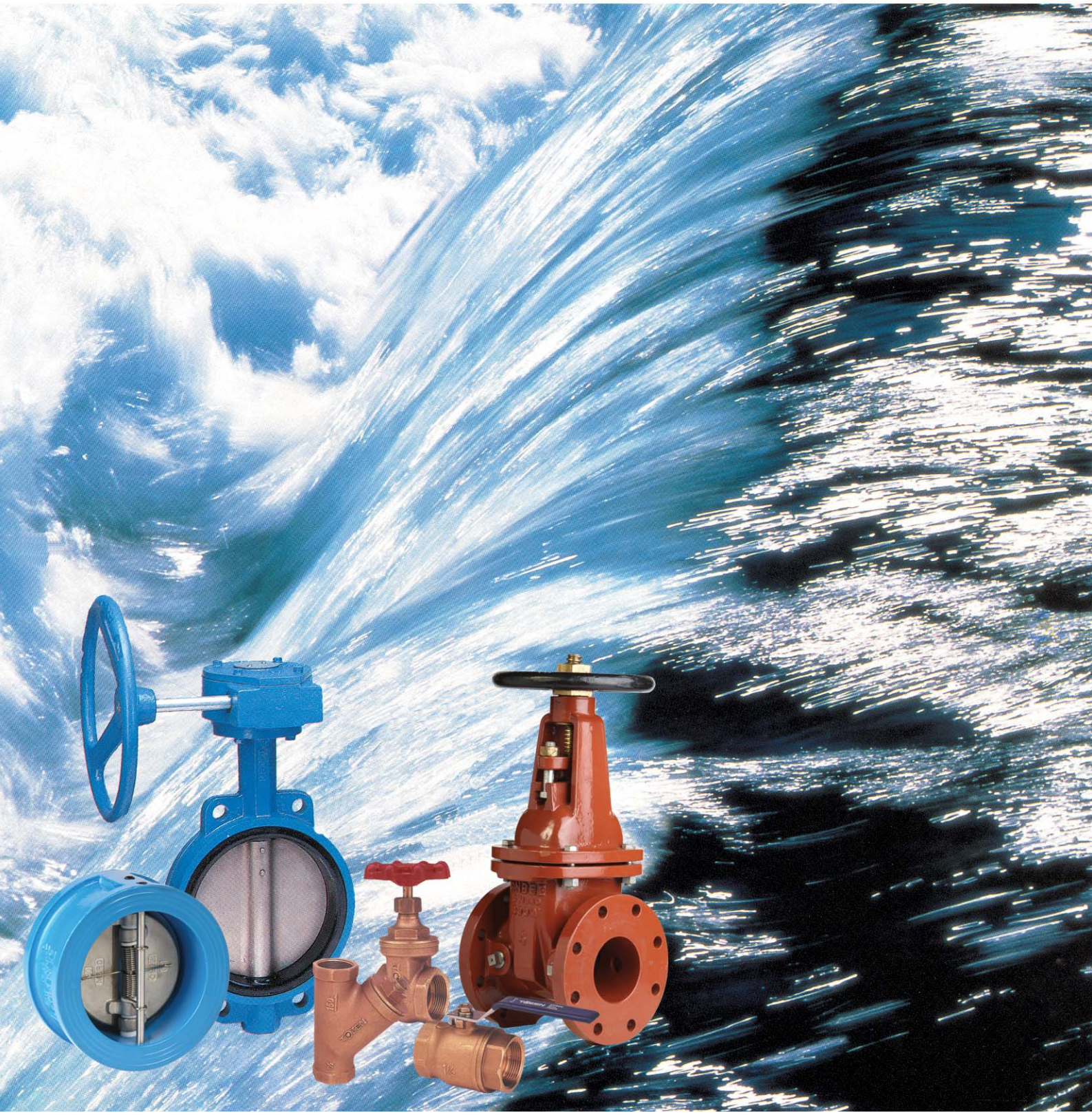
TOZEN
A joint reliance

VALVE for General Application

BUTTERFLY, CHECK, BALL, GATE, STRAINER



TOZEN BFV Series Butterfly Valve

Compared with other traditional isolating valves such as Gate Valves, Globe Valves and Ball Valves, Tozen Butterfly Valves offer the following advantages:

- They are suited for both isolation and control purposes.
- The light weighted and compact design reduces installation, storage and transport costs.
- They can be installed at any selected position.
- The centrally mounted disc and hydrodynamic design minimize pressure loss.
- Excellent flow characteristics with flow in either direction optimally achieved in the operating range between 15° and 70° opening.
- No gasket is needed for installation.
- Gas tight sealing in either direction.

BFV-W
(Wafer Type)

Technical Features

TOZEN BFV-W (Wafer Type), BFV-L (Full Lugged Type) and BFV-D (double flanged type) are soft sealing butterfly valves for installation with flanges drilled in accordance with JIS, ANSI, BS, DIN, etc.

Size range : 50mm to 350mm (2" to 14")
Working pressure : 16 bar
Working temperature : 0°C to 90°C (EPDM seat)
0°C to 70°C (NBR seat)

Overall length in accordance with ISO 5752 series 20. Actuator mounting flange in accordance with ISO 5211.

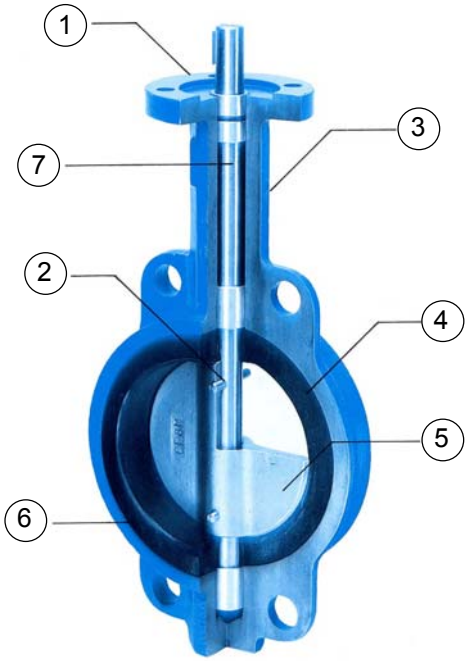
To ensure tight shut off for application in chemical processing plants, power plants, refineries, shipbuilding, pulp and paper mills and HVAC applications, Tozen butterfly valves are specially designed to strengthen the seal tolerance between the disc and the liner.

BFV-L
(Full Lugged Type)

High quality control are focused on the precision machining of valve body and disc, precise positioning of rubber liner within the body and exact positioning of shaft. Primary seal is achieved at the interface of disc and the surface of liner, particularly in the area of the shaft locations. Pressure surge seals are molded inside the seat shaft collars providing supplementary security. These multiple seals ensure that the medium comes into contact only with the disc and the rubber seat. Tozen butterfly valves are highly competitive with their absolutely tight sealing, corrosion resistance and low operation torque requirement. Thus, minimal operational wear and an extended service life are the long-term benefits committed to the users.

Summary of Product Advantages

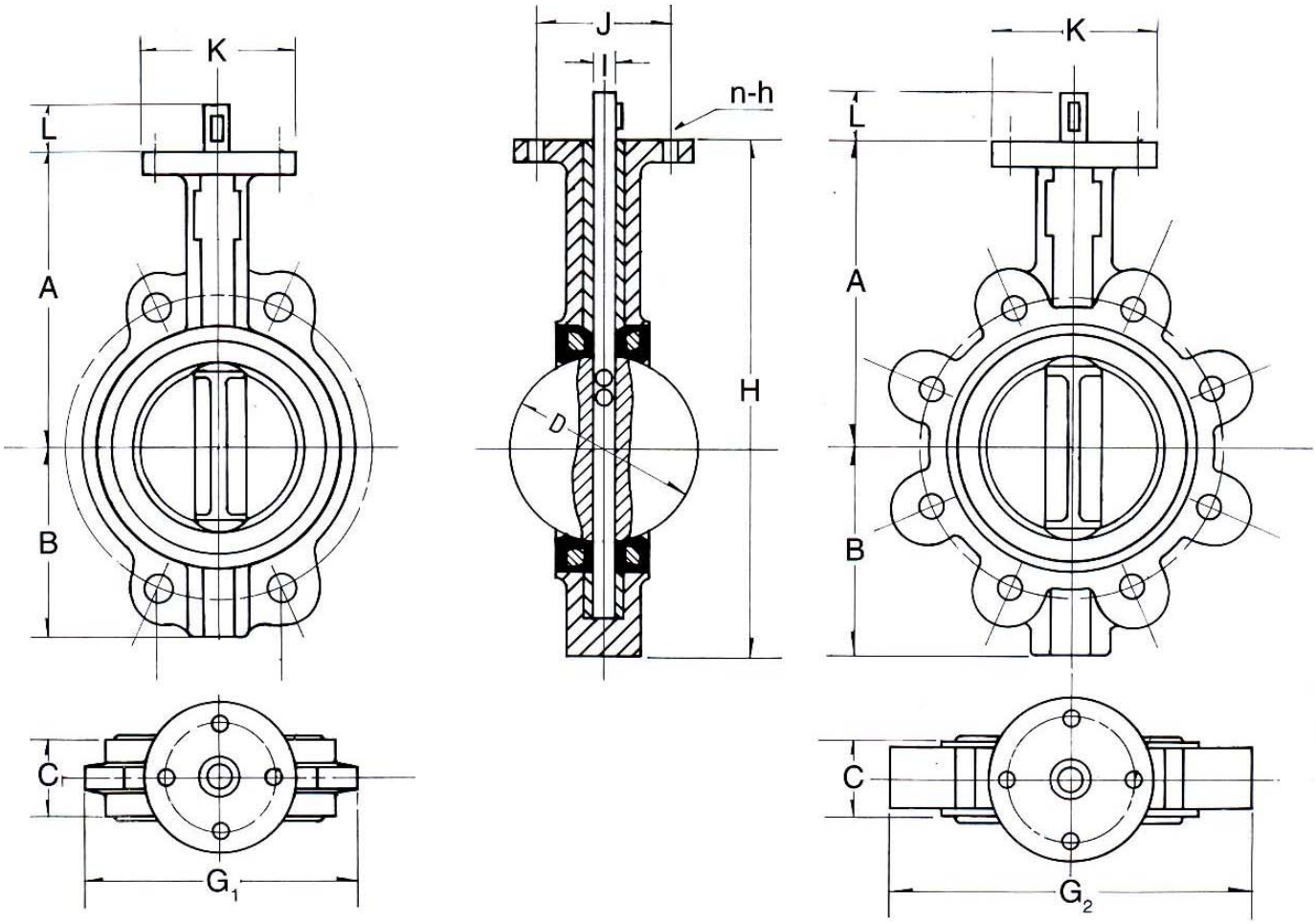
1. The operator flange conforms to ISO5211 onto which manual, pneumatic or electric actuators can be readily mounted.
2. The shaft taper pin ensures positive and vibration proof shaft to disc connection. It also prevents inadvertent shaft removal when fitting actuators or undertaking maintenance procedures.
3. The height of the valve neck is high enough to accommodate complete insulation.
4. The phenolic backed rubber seat is non-collapsible, stretch resistant, blowout proof and easily field replaceable. Supplementary gaskets are not required.
5. Precision machining of the disc guarantees the benefits of low operating torque and tight valve sealing up to a maximum working pressure of 16 bars. The hydrodynamic disc design makes a high flow characteristic.
6. The valve body is precision machined so that the value rubber seat with shaft can be accurately positioned to ensure minimal operational wear and a reliable service life.
7. The one piece shaft design with support bushings at three locations gives optimal guidance, positive shaft alignment and actuator support .



• Material Configurations

BODY	Cast Iron (FC250), Ductile Iron (FCD400)
DISC	Ductile Iron (FCD450), Stainless Steel (SUS316), Aluminum Bronze (ALBC2)
SHAFT	Stainless Steel (SUS416, SUS316)
SEAT	EPDM (Ethylene-Prophylene Rubber), NBR (Nitrile Rubber)

• Dimensions-Bar Shaft

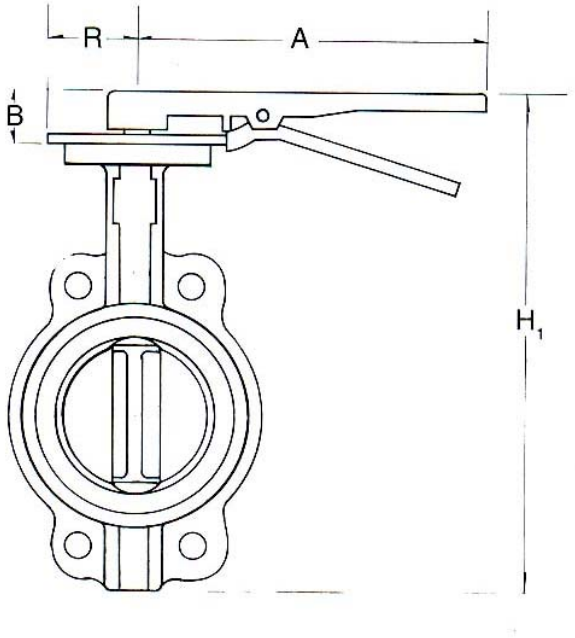


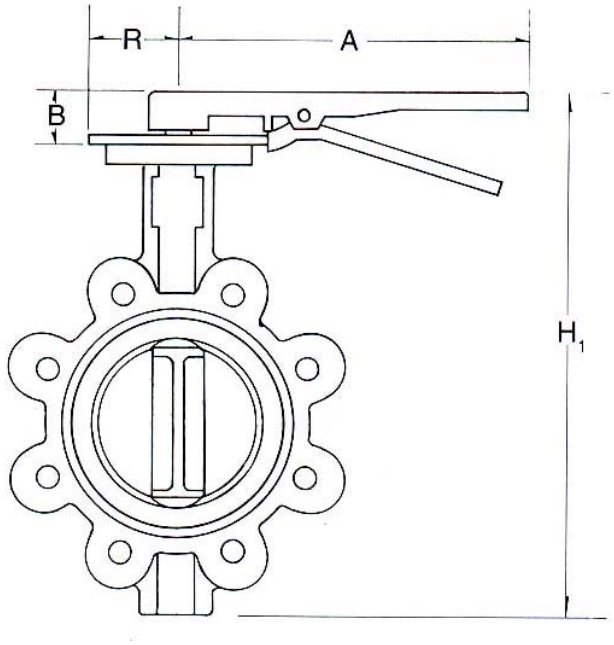
(Unit : mm)

Size (mm)	H	A	B	C	D	G_1	G_2	I	J	K	L	n	h	ISO5211
50	241	161	80	42	52.9	118	121	12.6	50	77	32	4	7	F 05
65	264	175	89	44.7	64.5	136	138	12.6	50	77	32	4	7	F 05
80	276	181	95	45.2	78.8	143	146	12.6	50	77	32	4	7	F 05
100	314	200	114	52.1	104	156	206	15.8	70	92	32	4	10	F 07
125	340	213	127	54.4	123.3	187	234	18.9	70	92	32	4	10	F 07
150	370	226	139	55.8	155.6	212	262	18.9	70	92	32	4	10	F 07
200	435	260	175	60.6	202.5	264	313	22.1	102	125	45	4	12	F 10
250	495	292	203	65.6	250.5	325	394	28.5	102	125	45	4	12	F 10
300	579	337	242	76.9	301.6	375	468	31.6	102	140	45	4	12	F 10
350	635	368	267	76.5	333.5	416	515	31.6	102	140	45	4	12	F 10

**** Slot holes structure is available for dual flange adaptability, e.g. JIS10K & ANSI150 lb. ****

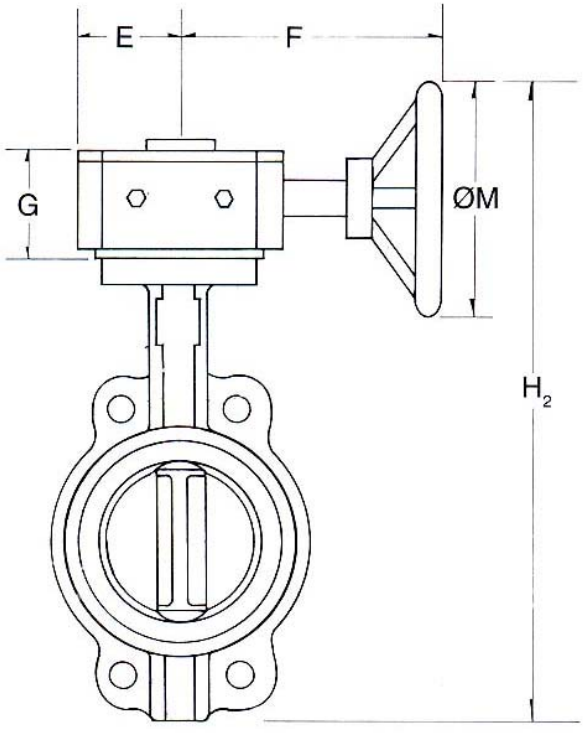
• Dimensions-Lever and Gear Operator

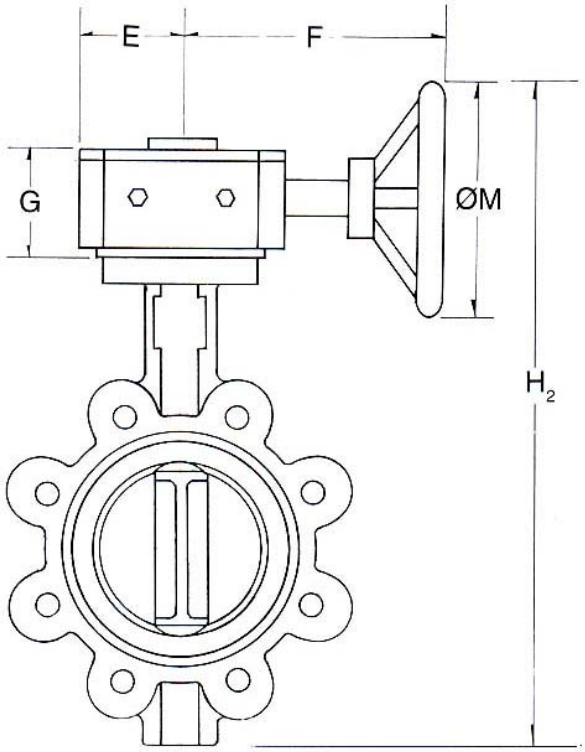




(Unit : mm)

Size (mm)	Lever Operator				Gear Operator				
	H1	A	B	R	H2	E	F	G	M
50	271	265	30	51.5	352	52.5	173.5	72	150
65	294	265	30	51.5	375	52.5	173.5	72	150
80	306	265	30	51.5	387	52.5	173.5	72	150
100	344	265	30	51.5	425	52.5	173.5	72	150
125	370	265	30	51.5	451	52.5	173.5	72	150
150	395	265	30	51.5	476	52.5	173.5	72	150
200	468	360	33	75	628	76	237	87	300
250	529	360	34	75	688	76	237	87	300
300	613	360	34	75	768	82	225	82	300
350	-	-	-	-	824	82	225	82	300





• Flow Coefficient

Flow coefficient (Kv) measures the dimensional quantity of water flow in m^3/hr at a water temperature 5°C to 30°C and the 1 bar of pressure drop across the valve.

Kv Values

Disc Opening / Size (mm)	10°	20°	30°	40°	50°	60°	70°	80°	90°
50	0.10	6.14	11.53	19.23	29.13	41.99	48.84	53.13	53.13
65	0.16	9.61	24.58	38.29	55.94	74.55	90.83	101.10	105.40
80	0.23	13.83	35.39	55.14	80.72	115.90	147.40	178.20	204.80
100	0.41	24.59	62.91	98.00	143.50	206.20	269.10	329.00	375.30
125	0.64	38.42	98.30	153.10	224.30	322.10	431.00	560.40	700.10
150	0.92	55.33	141.60	220.60	322.90	463.80	637.50	852.60	1131.00
200	1.63	98.40	251.70	392.10	574.00	824.60	1171.00	1518.00	2587.00
250	2.55	153.70	393.20	612.60	897.20	1289.00	1820.00	2506.00	3409.00
300	3.67	221.30	566.20	882.60	1291.00	1855.00	2656.00	3820.00	5842.00
350	4.75	285.90	731.60	1140.00	1668.00	2398.00	3143.00	4440.00	6218.00

For Cv valves in gallons / min at 1 lbf / in^2 pressure drop, multiply Kv by 1.167.

• Formula for the calculation of valve sizing-liquid

$$Q = Kv\sqrt{\frac{\Delta P}{G}}$$

where

Kv	:	Flow Coefficient
Q	:	Flow Rate, m^3/hr
G	:	Specific Gravity (Water = 1)
ΔP	:	Pressure Drop across the valve (P_1 - P_2)
P_1	:	Absolute Pressure at inlet, Bar
P_2	:	Absolute Pressure at outlet, Bar

• Seating Torque

(N.m)

ΔP / Size (mm)	16 Bar
50	16
65	23
80	31
100	60
125	96
150	144
200	288
250	524
300	800
350	915

Operating torque figures have included safety factors for on/off application with normal liquid media. For dry or heavy media, we recommend to increase the figures by 10%. For modulating service, the figures should be multiplied by 1.25. When in doubt, please consult our Technical Department.

The figures are given in Newton metres. If pounds feet are used, a multiplier of 0.738 will be applied.

Dynamic torque - The flow of liquid across the disc of a partly open butterfly valve produces a force on the disc tending to close the valve. The flow is said to produce a dynamic torque. The magnitude of the torque depends on the valve size, the density and velocity of the liquid. For valve size below 150mm, dynamic torque may be neglected. For valve size at or above 200mm , dynamic torque is necessary for considering a suitable operator. If the value is not working under a normal flow velocity.

• Installation Instruction

1. Fit Tozen butterfly valve between flanges with flat or standard raised faces. Set the valve disc at a partially closed position and within the confines of the valve body.
2. Check the I.D. of the flange and pipe to ensure free disc movement, especially on cement or rubber lined, or heavily scheduled pipe.
3. Firstly, position the connecting pipe flanges in line with the pipe line system, allowing sufficient space between the flanges. Secondly, position the valve carefully between two flanges. Thirdly, center the valve properly and insert bolts through the upper and lower valve alignment holes. Fourthly, cross tighten all the bolts diagonally. Finally, check flange alignment and valve to ensure disc clearance.
4. Never weld the flanges with valve installed. Do not use flange gasket or sealing compound.
5. It is recommended to install the valve with its shaft being at a horizontal position and the lower part of the disc opened to a downstream direction, particularly when on slurry or sedimentary duties.

• Mounting Flange Dimensions

(Unit : mm)

Size (mm)	JIS 5K		JIS 10K		PN 10		PN 16		ANSI 150	
	PCD of holes	Number & size of holes	PCD of holes	Number & size of holes	PCD of holes	Number & size of holes	PCD of holes	Number & size of holes	PCD of holes	Number & size of holes
50	105	4 - 15	120	4 - 19	125	4 - 18	125	4 - 18	121	4 - 19
65	130	4 - 15	140	4 - 19	145	4 - 18	145	4 - 18	140	4 - 19
80	145	4 - 19	150	8 - 19	160	8 - 18	160	8 - 18	152	4 - 19
100	165	8 - 19	175	8 - 19	180	8 - 18	180	8 - 18	191	8 - 19
125	200	8 - 19	210	8 - 23	210	8 - 18	210	8 - 18	216	8 - 22
150	230	8 - 19	240	8 - 23	240	8 - 23	240	8 - 23	241	8 - 22
200	280	8 - 23	290	12 - 23	295	8 - 23	295	12 - 23	299	8 - 22
250	345	12 - 23	355	12 - 25	350	12 - 23	355	12 - 27	362	12 - 25
300	390	12 - 23	400	16 - 25	400	12 - 23	410	12 - 27	432	12 - 25
350	435	12 - 25	445	16 - 25	460	16 - 23	470	16 - 27	476	12 - 29

• Bolting

(Unit : mm)

Size (mm)	Size & Length of bolt for BFV-W and BFV-L when valve is installed between two flanges					Length of bolt for BFV-L when valve is used as a terminal fitting				
	JIS 5K	JIS 10K	PN 10	PN 16	ANSI 150	JIS 5K	JIS 10K	PN 10	PN 16	ANSI 150
50	M12 x 95	M16 x 95	M16 x 100	M16 x 100	W5/8" x 100	35	35	40	40	40
65	M12 x 100	M16 x 105	M16 x 105	M16 x 105	W5/8" x 115	35	40	40	40	45
80	M16 x 100	M16 x 105	M16 x 110	M16 x 110	W5/8" x 120	35	40	45	45	45
100	M16 x 110	M16 x 100	M16 x 115	M16 x 115	W5/8" x 125	40	40	45	45	45
125	M16 x 115	M20 x 120	M16 x 125	M16 x 125	W3/4" x 130	40	45	50	50	50
150	M16 x 125	M20 x 130	M20 x 130	M20 x 130	W3/4" x 135	45	50	50	50	50
200	M20 x 130	M20 x 130	M20 x 135	M20 x 135	W3/4" x 145	50	50	55	55	55
250	M20 x 150	M22 x 150	M20 x 150	M24 x 155	W7/8" x 163	55	55	60	60	60
300	M20 x 160	M22 x 160	M20 x 160	M24 x 170	W7/8" x 180	60	60	60	65	70
350	M22 x 160	M22 x 160	M20 x 160	M24 x 170	W 1" x 180	60	65	65	70	70

TOZEN Double Door Silent Check Valve (Model: SCV-W)

TOZEN Wafer Type Double Door Silent Check Valve performs all regular check valve duties. It is lighter, highly secured, reliable and low flow resisted, applicable to HVAC system and in the industries of water supply, draining, processing, medicine, textile, paper making, metallurgy, energy, and light industry, etc.

Its light-weighted design avoids unnecessary loading on the casings of expensive pump and compressor, which makes the support bed and foundation work necessary. Construction works and maintenance cost are, therefore, reduced.

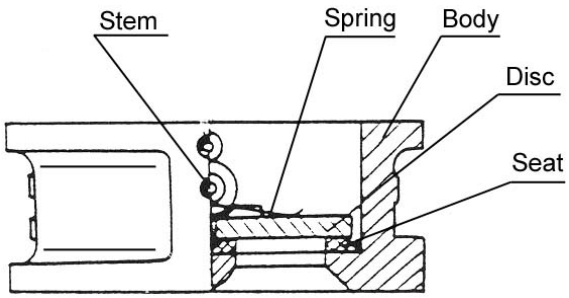
TOZEN Wafer Type Double Door Silent Check Valve is suitable for the flange mounting to JIS, ANSI, BS, etc.

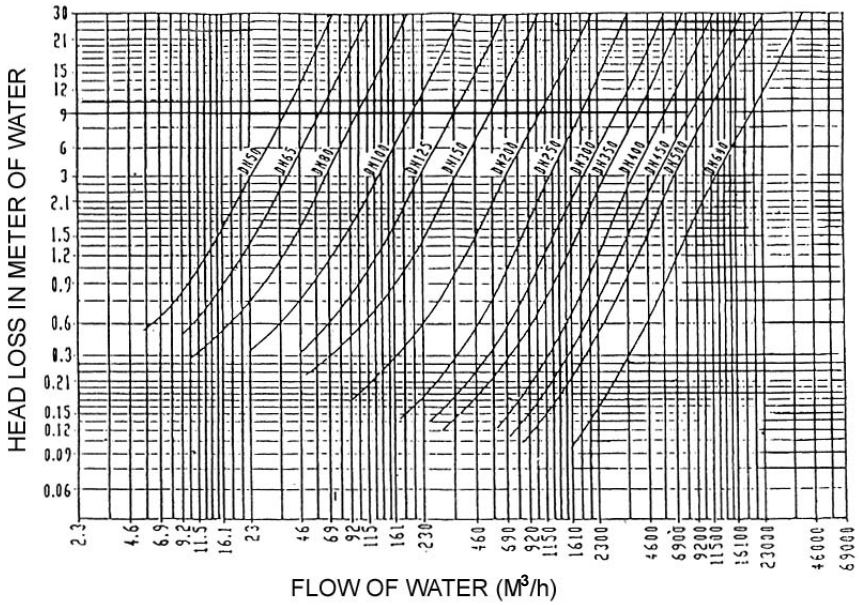
Features

1. Small in size, light in weight, compact in structure, easy in maintenance.
2. Two torsion springs are exerted on each of the valve plates, which close the plates quickly and automatically.
3. The quick-close action prevents the medium from flowing back and eliminates water hammer effect.
4. The valve is short in length, so that it is rigid and easy to mount.
5. The valve is tightly sealed with no leakage.
6. Low head loss.
7. The valve can be installed either horizontally or vertically in the piping.

● Structure

No.	Name	Material	Specification	
1	Body	Cast Iron	JIS	ASTM
			FC250 (25)	A126 CLASS B
2	Stem	Stainless Steel	SUS 316	A351 Gr. CF8M
3	Disc	Cast Iron	FC250 (25)	A126 CLASS B
		Ductile Iron	FCD450 (45)	A536 65-45-12
		Aluminium Bronze	ALBC 2	B148 C954
		Stainless Steel	SUS 316	A351 Gr. CF8M
4	Seat	EPDM Rubber		
		NBR Rubber		
5	Spring	Stainless Steel	SUS 316	A351 Gr. CF8M



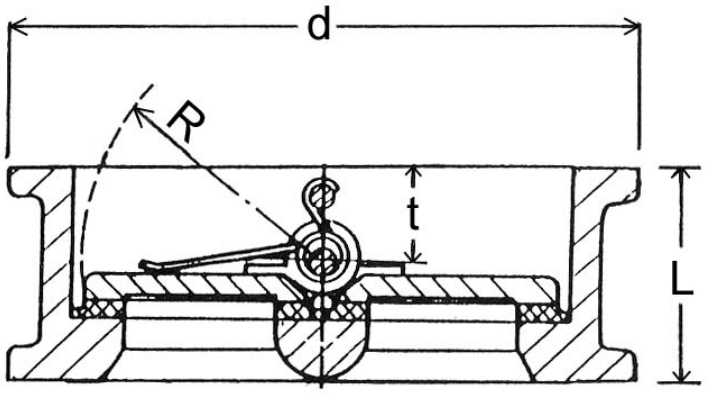


Head Loss Curve

Technical Data

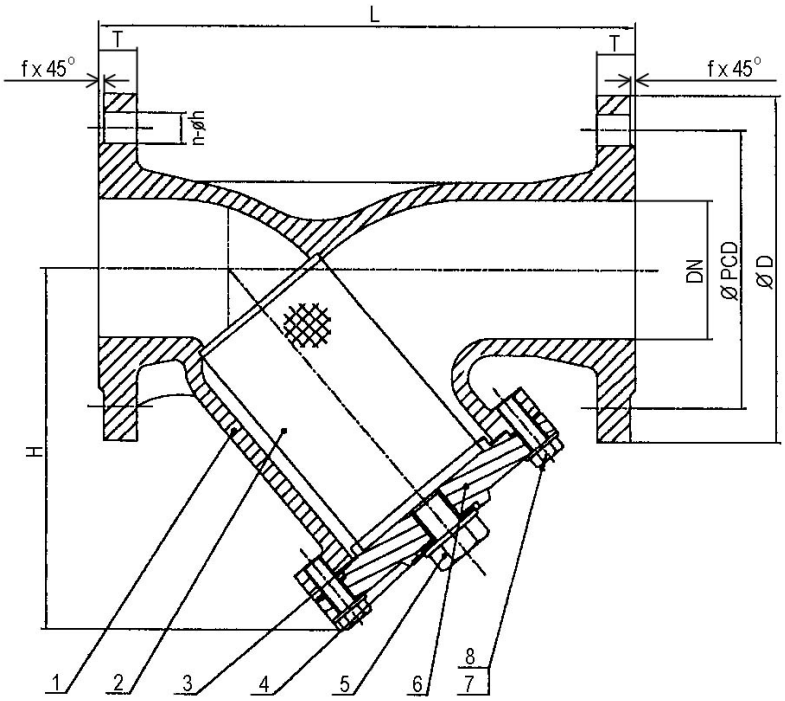
Nominal Diameter	DN50 - DN600	
Working Pressure	16 Bar	
Test Pressure	Shell	24 Bar
	Seat	17.6 Bar
Working Temperature	EPDM Seat	0°C to 90°C
	NBR Seat	0°C to 70°C

Dimensional Data



DN		L Face to Face Dimension (mm)	R Radius of Disc (mm)	t (mm)	d External Diameter (mm)			Approx. Weight (kg)
mm	inch				JIS 10K	ANSI 150	BS4504 PN16	
50	2	43	28.8	19	103	103	107	1.5
65	2 1/2	46	36.1	20	122	122	127	2.4
80	3	64	43.4	28	132	132	142	3.6
100	4	64	52.8	26	157	157	162	5.7
125	5	70	65.7	30	188	188	192	7.3
150	6	76	78.6	31	218	218	218	9.0
200	8	89	104.4	33	268	268	273	17
250	10	114	127.0	45	328	328	328	26
300	12	114	147.0	45	375	407	378	42
350	14	127	173.0	50	420	445	438	55
400	16	140	198.0	54	483	510	489	75
450	18	152	217.8	58	537	547	555	107
500	20	152	241.0	58	592	604	594	111
600	24	178	298.0	73	695	712	695	165

TOZEN YF150 CAST IRON Y-STRAINER, ANSI 150# FLANGED END



Operating Pressure : 1.6 MPa

Testing Pressure : 2.4 MPa

Operating Temperature : 200°C

Applicable Fluid : steam, water, oil

☐ **Standard Screens :**

1 1/2" - 5"	at 1.5 mm. Perforation.
6"	at 2 mm. Perforation.
8" - 14"	at 2.5 mm. Perforation.
16"	at 3.5 mm. Perforation.

No.	Part	Qty	Material	Standard
1	Body	1	Cast Iron	ASTM A126
2	Screen	1	Stainless Steel	AISI 304
3	Gasket	1	Rubber Asbestos Plate	NBR
4	Sealing Gasket	1	NBR/EPDM	NBR
5	Plug	1	Cast Iron	ASTM A126
6	Cover	1	Cast Iron	ASTM A126
7	Bolts	4	Steel with zinc	ASTM A36
8	Washer	4	Steel with zinc	ASTM A36

Size (DN)		Standard Flange ANSI 150							
mm	inch	L	H	ØD	ØPCD	n-Øh	T	f	Plug Size (inch)
40	1 1/2	200	150	127	98.5	4-16	18	3	1
50	2	230	160	152	120.5	4-19	23	3	1
65	2 1/2	290	180	178	139.5	4-19	20	3	1
80	3	310	215	191	152.5	4-19	22	3	1
100	4	350	235	229	190.5	8-19	24	3	1 1/2
125	5	400	275	254	216	8-22	26	3	1 1/2
150	6	480	305	279	241.5	8-22	26	3	1 1/2
200	8	600	390	343	298.5	8-22	30	3	2
250	10	730	540	406	362	12-25	32	3	2
300	12	850	680	483	432	12-25	32	4	2
350	14	980	740	533	476	12-29	36	4	2
400	16	1100	845	597	539.5	16-29	38	4	2

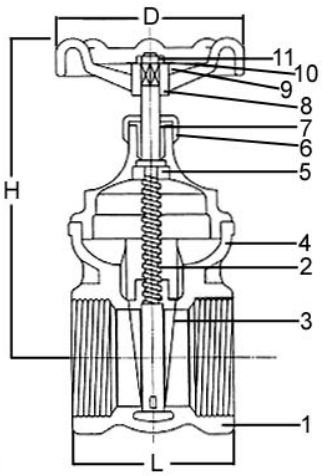
TOZEN Bronze & Brass Valve

CLASS 125 BRASS GATE VALVE

Screwed Bonnet, Non-Raising Stem, Solid Wedge Disc, Integral Seat, Asbestos Free (PTFE), Threaded BS21 or NPT

Working Pressure :
200psi for Water & Oil non-shock
125psi for Saturated Steam

PRESSURE TEST :
Shell 300psi Hydrostatic
Seat 200psi Hydrostatic
Seat 80psi Air



MATERIAL :

No.	Part	Material
1	Body	Brass
2	Stem	Brass
3	Disc	Brass
4	Bonnet	Brass
5	Lock Nut	Brass Rod
6	Packing	Teflon
7	Gland	Brass Rod
8	Packing Nut	Brass
9	Hand Wheel	Cast Iron
10	Name Plate	Aluminium
11	Handle Nut	Steel

DIMENSION : (mm)

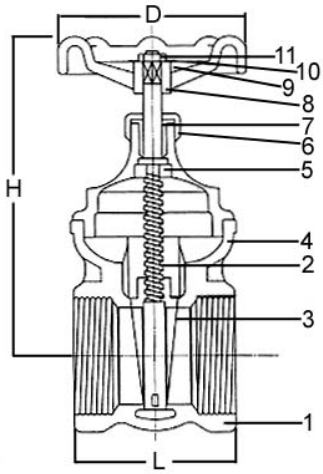
VALVE SIZE	INCH	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
	MM	15	20	25	32	40	50	65	80	100
L	End to End	43	49	53	61	63.5	72	89	100.5	116
H	Height	76.5	86.5	99.5	119	136	155	190	220	243
D	Handwheel Diametre	54	60	70	79	89	99	118	126	153

CLASS 150 BRONZE GATE VALVE

Screwed Bonnet, Non-Raising Stem, Solid Wedge Disc, Integral Seat, Asbestos Free (PTFE), Threaded BS21 or NPT

Working Pressure :
300psi for Water & Oil non-shock
150psi for Saturated Steam

PRESSURE TEST :
Shell 450psi Hydrostatic
Seat 300psi Hydrostatic
Seat 80psi Air



MATERIAL :

No.	Part	Material
1	Body	Bronze
2	Stem	Bronze
3	Disc	Bronze
4	Bonnet	Bronze
5	Lock Nut	Brass Rod
6	Packing	Teflon
7	Gland	Brass Rod
8	Packing Nut	Brass
9	Hand Wheel	Cast Iron
10	Name Plate	Aluminium
11	Handle Nut	Steel

DIMENSION : (mm)

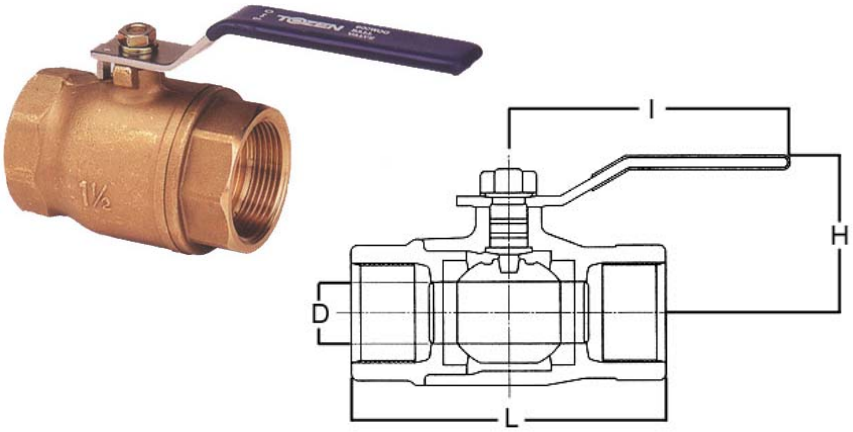
VALVE SIZE	INCH	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
	MM	15	20	25	32	40	50	65	80	100
L	End to End	43	49	53	61	64	72	89	100.5	116
H	Height	76.5	86.5	99.5	119	136	155	190	220	243
D	Handwheel Diametre	54	60	70	79	89	99	118	126	153

TYPE 400 BRASS BALL VALVE

Screwed Body Cap, Full Bore, Blow-out Proof Stem,
PTFE Seats, Threaded BS21 or NPT

Working Pressure :
400psi for Water & Oil non-shock
100psi for Water & Oil 150°C

PRESSURE TEST :
Shell 600psi Hydrostatic
Seat 80psi Air



MATERIAL :

Part	Material
Body	Brass
Cap	Brass
Stem	Brass Rod
Ball	Brass (Chrome Plated)
Seat	PTFE
O-ring	NBR
Handle	Steel (Chrome Plated)

DIMENSION :

(mm)

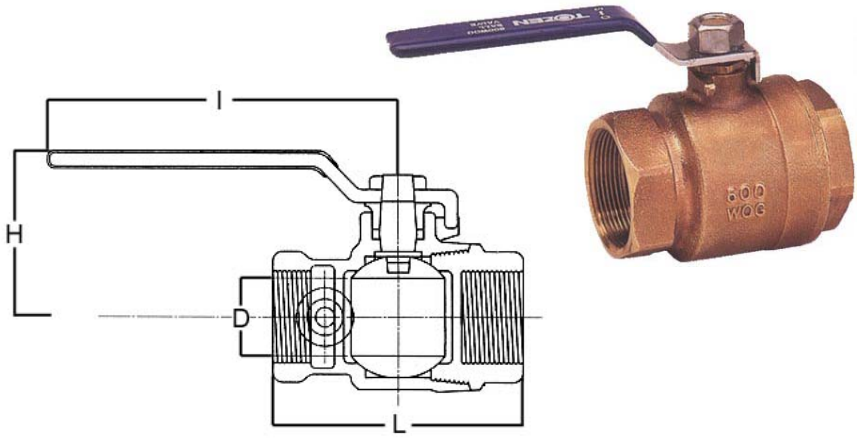
VALVE SIZE		INCH	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
		MM	15	20	25	32	40	50
D	Bore Size		10	15	20	25	32	40
L	End to End		65	68	79	86	96	109
H	Height		45	50	55	60	65	75
I	Length of Handle		102	102	132	132	153	153

TYPE 600 BRONZE BALL VALVE

Screwed Body Cap, Full Bore, Blow-out Proof Stem,
PTFE Seats, Threaded BS21 or NPT

Working Pressure :
600psi for Water & Oil non-shock
150psi for Water & Oil 150°C

PRESSURE TEST :
Shell 900psi Hydrostatic
Seat 80psi Air



MATERIAL :

Part	Material
Body	Bronze
Cap	Bronze
Stem	Brass Rod
Ball	Brass (Chrome Plated)
Ball Seat	PTFE
Stem Packing	PTFE
Handle	Steel (Chrome Plated)

DIMENSION :

(mm)

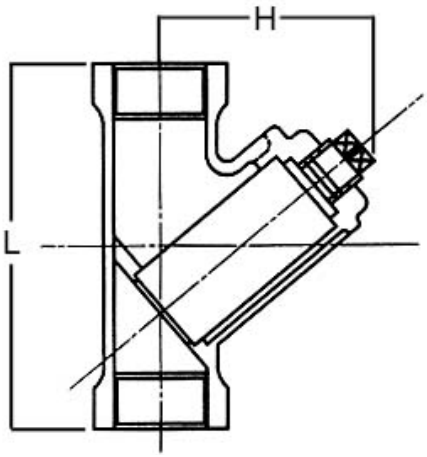
VALVE SIZE		INCH	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
		MM	15	20	25	32	40	50
D	Bore Size		13	20	25	32	40	50
L	End to End		53	61	72	81	95	112
H	Height		46	528	62	72	77	85
I	Length of Handle		85	104	104	134	134	154

CLASS 150
BRONZE Y-PATTERN STRAINER

Y-Pattern Body, Screwed Cap with Plug, SUS304 Screen, Asbestos Free, Threaded BS21 or NPT

Working Pressure :
300psi for Water & Oil non-shock
150psi for Saturated Steam

PRESSURE TEST :
Shell 450psi Hydrostatic



MATERIAL :

Part	Material
Body	Bronze
Cap	Bronze
Screen	Type 304 Stainless Steel
Gasket	Non-Asbestos Sheet
Plug	Brass

DIMENSION :

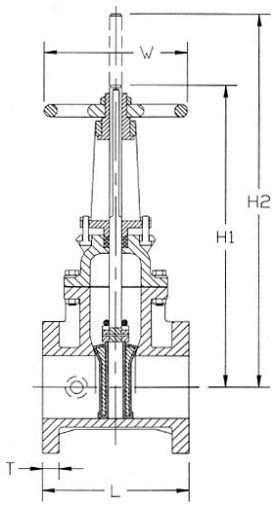
(mm)

VALVE SIZE		INCH	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
		MM	15	20	25	32	40	50	65	80
L	Threaded Ends		81.5	100.5	115	135.5	158	190.5	230	259
H	Height		55	70	75	90	98	138	150	160

ENBEE AWWA C509 UL&FM RESILIENT SEAT OS&Y RISING STEM GATE VALVE - FLANGED END

Construction & Functional Characteristics

- Type : Bolted Bonnet - Rising stem, outside screwed
- Stopper : Resilient Seat Gate
- Ends : 150# Drilled Flange x Flange (to ANSI B16.1 Specifications)
- Shutoff : Clockwise Direction
- Execution : Basic design & testing to MSS SP 70
- Epoxy Coated



UL/FM Approved

Dimensions :

Size	Fact to Face Dimension (L)	Handwheel Diameter (W)	Minimum Height * (H1)	Maximum Height * (H2)	Flange Thickness (T)	Approximate Weight (lbs)
2-1/2"	7-1/2"	7-1/2"	13-7/8"	16-3/8"	11/16"	55
3"	8"	9"	15-5/8"	18-7/8"	3/4"	70
4"	9"	10"	18-1/4"	22-3/4"	15/16"	100
6"	10-1/2"	12"	23-3/4"	30-1/8"	1"	150
8"	11-1/2"	14"	29-1/4"	37-1/4"	1-1/8"	250
10"	13"	16"	35-5/8"	45-3/4"	1-3/8"	400

* Approximate Values.

Operating Conditions :

Nominal Size	All Sizes
Working Pressure	200 psi (to 65°C) 195 psi (to 80°C)
Test Pressure - Shell	875 psi
Test Pressure - Seat	350 psi
Minimum Working Temperature	-29°C
Maximum Working Temperature	80°C

Materials :

Part	Material
Body	Cast Iron - ASTM A126 CL. B
Wedge	Cast Iron (NBR COATED) - ASTM A126 CL. B
Bonnet	Cast Iron - ASTM A126 CL. B
Stem	Brass - ASTM B16
Yoke Sleeve	Cast Bronze - ASTM B62
Handwheel	Cast Iron - ASTM A126 CL. B
Wheel Lock Nut	Brass - ASTM B16

A joint reliance

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