

WBV SERIES WAFER-STYLE BUTTERFLY VALVES

APPLICATION SUMMARY:

- High performance butterfly valve for long life in agricultural, pump control and industrial applications.
- Wafer-style mounting between standard ANSI flanges
- Can be used for on/off and throttling control
- Enhanced and updated model of Waterman VBE2-W

KEY FEATURES:

DESIGNED FOR PERFORMANCE, BUILT TO LAST

Constructed to provide reliable operation, year-after-year.

RELIABLE, DRIP FREE SEATING

Bubble-tight, positive shut-off. Low operating torque for ease of operation. Disc surface is precisely machined for long life in harsh conditions. Valves tested bubble-tight to 200PSI. BUNA-N seating surface standard.

STAINLESS STEEL DISC

316 Stainless Steel. Uniform surface finish resists pitting.

REQUIRES NO FLANGE GASKETS

Integral flange seals incorporated as part of valve seat.

MULTIPLE STEM SEALS

No potential for leak path from disc to handle.
No part of the stem exposed to the water flow.

SELF-LUBRICATING, MAINTENANCE-FREE STEM BUSHING

Low friction for easy operation.

MAXIMUM OPERATING PRESSURE:

200 PSI (sizes 2"-12"), 150 PSI (14" and larger).



Lever Operated (Sizes 4" - 12")



Geared Operator (Sizes 4" - 24")

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OPERATOR TYPES:

HAND-LEVER OPERATORS

Available on sizes 4" to 12". Equipped with a 10-position stop plate to allow partial open / throttling operation.

GEARED OPERATORS

Available on sizes 4" to 24". Worm-gear type operator that is fully-enclosed. Normally handwheel operated, but can be fitted with a 2" square operating nut if specified. Gear housing is permanently lubricated at the factory for trouble-free operation.

BURIED SERVICE OPERATOR/ BONNET EXTENSION

Mounts the geared operator or handwheel above ground on the top of an extension pipe. A shaft contained within the pipe transmits opening/closing torque to the valve below.

Extensions available in 24"- 72" lengths in-stock, with custom sizes on request.

STEM EXTENSIONS

Are used when the geared operator stays mounted to the valve, with only the shaft for a handwheel or operating nut rising to ground level (or protruding above, as such is the application design). Such engineering is often used with floor boxes where flush mounting with floor or pavement is necessary for clearance or aesthetic reasons. Consult factory for details.

AUTOMATED OPERATORS

Electric, pneumatic and hydraulic actuation. Consult factory for details.



Buried Service Operator

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MATERIAL SPECIFICATIONS:

Body:	Ductile Iron ASTM 536 GR 65-45-12
Seat:	BUNA-N
Disc:	Stainless Steel ASTM A351 CF8
Stem:	Stainless Steel A276 S420
Top and Bottom Bearings:	Nylon
O-Rings	Viton

INSTALLATION:

For installation between ANSI flanges of 125# or 150# configuration. Use lugs to assure accurate centering and alignment of valve. Tighten bolts evenly to ensure proper seal compression. Valve can be installed at any angle convenient for user. Valve can be used for bi-directional service. See also page 8 for installation details.

BREAK-AWAY TORQUES FOR ACTUATOR SIZING:

This chart details the torque required (in inch-pounds) to open the valve at a given pressure differential. These values typically are used to size an actuator. These are based on a wet condition at 60 degrees Fahrenheit.

No safety factors are included. Typically multiply by 1.5 for a single valve application. Consult factory for appropriate safety factors for more complex installations.

Break-Away Torque Requirements in Inch-Pounds for Wet Service

Valve Size	Pressure Differential			
	25 PSI	100 PSI	150 PSI	200 PSI
4	232	264	285	351
6	496	595	655	705
8	1020	1265	1408	1571
10	1595	2076	2394	2700
12	2665	3465	4077	4533
14	3540	4533	5133	—
16	4993	6641	7740	—
18	6426	8546	10080	—
20	8940	12245	14570	—
24	12030	16242	19250	—



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CV VALUE FOR VALVE SIZING IN THROTTLING CONDITIONS:

Cv Value - Valve Sizing Coefficient (Water at 60°F Sp. Gr = 1.0)

Valve Size	Disc Angle Open								
	10°	20°	30°	40°	50°	60°	70°	80°	90° Full Open
4	0.5	17	36	78	139	230	354	546	650
6	2	45	101	205	366	605	958	1437	1980
8	3	89	188	408	677	1101	1803	2854	3336
10	9	151	302	670	1105	1661	2678	4859	6443
12	10	156	425	904	1636	2898	4605	7507	9400
14	13	162	567	1386	2087	3074	5005	10844	14005
16	17	206	834	1953	2938	4046	6766	12671	19665
18	20	316	1129	2247	3627	5289	8459	16234	23173
20	25	702	1574	3228	7465	8698	12931	22396	27908
24	30	922	2387	4279	6165	10243	26157	31764	41116

The valve coefficient, Cv, is a number which represents the capability of a valve to flow a fluid. The larger the Cv, the larger the flow at a given pressure differential.

The Cv tells you how to properly size your valve so it has minimal effect on the hydraulic efficiency of your system. It describes the GPM that can pass through a valve (in a fully open position) at a pressure drop of 1 PSI.

The Cv Values shown are the flow rate (GPM) of water at 60°F flowing through the valve when the disc is fully open and the differential pressure between the two ends of the valve is 1 psi (lb./in²).

For optimum throttling capability, size valves for throttling within the range of 25° to 70° of disc opening.

FLOW CALCULATIONS FOR LIQUIDS:

To determine the flow rate or pressure drop of liquid passing through a butterfly valve, use the following formula:

$$Q_L = C_V \times \sqrt{\frac{\Delta P}{S_L}}$$

$$\Delta P = S_L \times \left(\frac{Q_L}{C_V} \right)^2$$

Where:

QL = Flow of liquid in gallons per minute (GPM).

CV = Flow coefficient from above table.

P = Pressure drop across two ends of valve.

SL = Specific Gravity of liquid (1.0 for water).



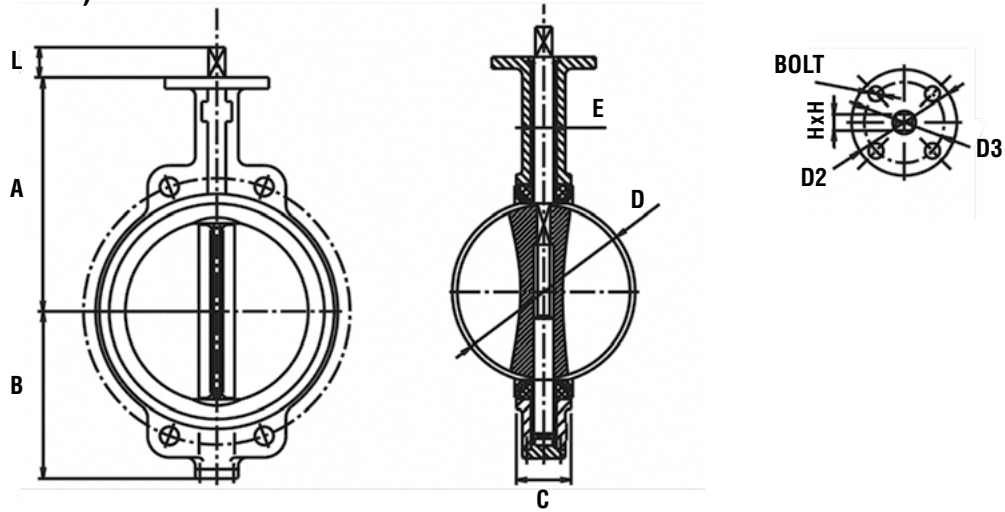
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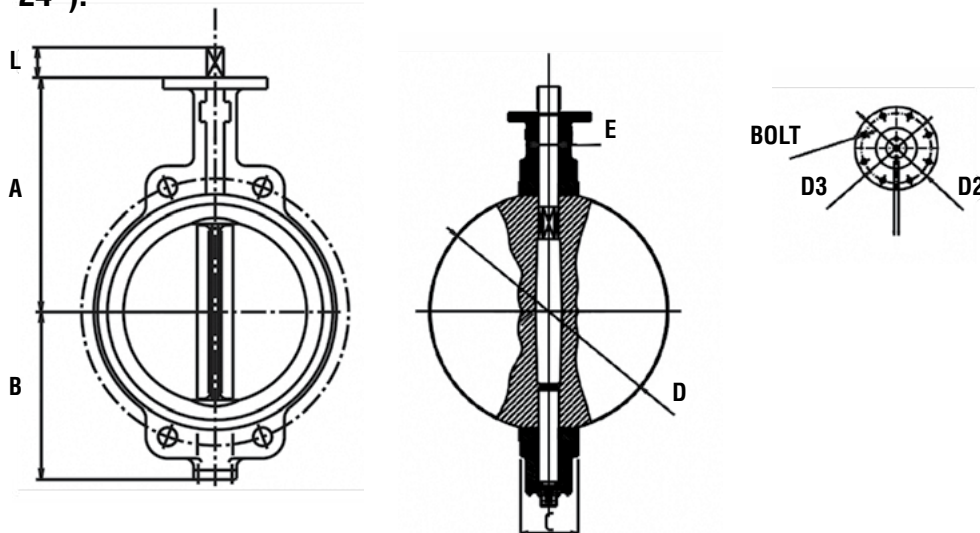
DIMENSIONS (4" - 12"):



Dimensions 4" - 12" Models

Size	A	B	C	D	E	D2	D3	BOLT	H x H	L
4"	6.9	3.6	2	4.1	0.62	3.52	2.75	4 ea. 10mm	.43 x .43	0.55
6"	8.3	4.75	2.2	6.5	0.78	3.52	2.75	4 ea. 10mm	.55 x .55	0.67
8"	9.25	6	2.4	8	0.87	4.92	4	4 ea. 12mm	.67 x .67	0.87
10"	10.4	7.3	2.7	9.8	1.12	4.92	4	4 ea. 12mm	.87 x .87	0.87
12"	12	8.3	3.1	11.9	1.25	4.92	4	4 ea. 12mm	.87 x .87	0.87

DIMENSIONS (14" - 24"):

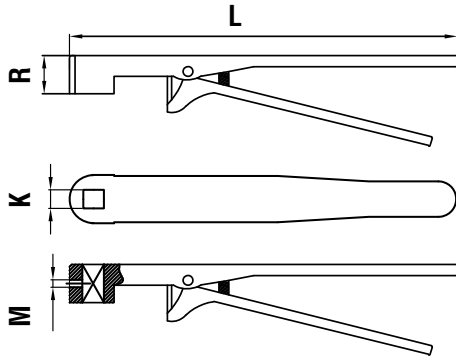


Dimensions 14" - 24" Models

Size	A	B	C	D	E	D2	D3	BOLT	H x H	L
14"	14.5	10.5	3	13.1	1.25	4.9	4	4 ea. 12mm	.87 x .87	0.87
16"	15.75	12.2	4	15.3	1.3	6.9	5.5	4 ea. 18mm	1.1 x 1.1	1.4
18"	16.6	13.4	4.5	17.3	1.5	6.9	5.5	4 ea. 18mm	1.1 x 1.1	1.4
20"	17.3	14.25	5	19.4	1.6	6.9	5.5	4 ea. 18mm	1.4 x 1.4	1.4
24"	22.25	17.8	6	23.3	2	8.3	6.5	4 ea. 22mm	1.4 x 1.4	1.8

WBV SERIES WAFER-STYLE BUTTERFLY VALVES

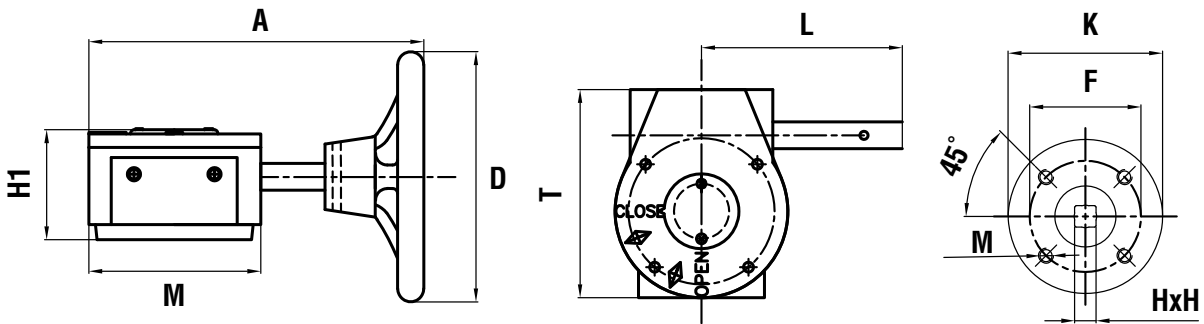
LEVER DIMENSIONS (IN):



Lever Dimensions 14" - 24"

Valve Size	L	R	K	M
4"	280	25	11	M8
6"	280	25	14	M8
8-12"	385	30	17	M8

GEAR BOX DIMENSIONS (IN) - VALVE SIZE 4" - 14" :

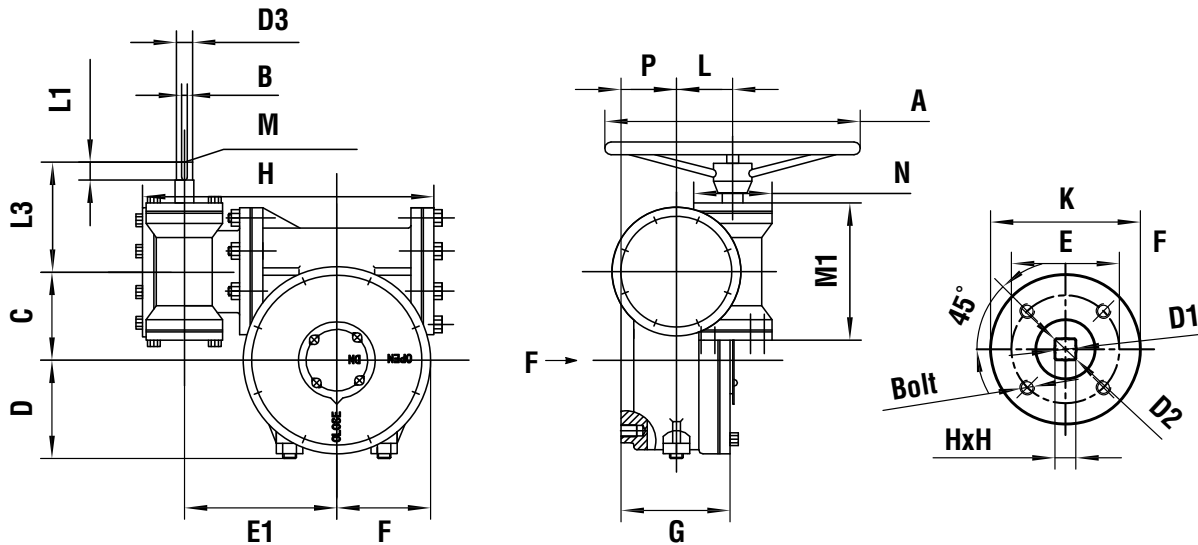


Gear Box Dimensions (in) Valve Size 4" -14"

Valve Size	Reduction Ratio	T	A	M	D	K	E	M	H X H	L
4"	24:1	5	8	4.1	5.75	3.5	2.75	M8	.43 x .43	5
6"	24:1	5	8	4.1	5.75	3.5	2.75	M8	.55 x .55	5
8" & 10"	30:1	6.75	11.8	5.75	11.5	5	4	M10	.67 x .67	8
12" & 14"	50:1	7.6	11.6	6.1	11.5	5	4	M10	.87 x .87	8

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GEAR BOX DIMENSIONS (IN) - VALVE SIZE 16" - 24":

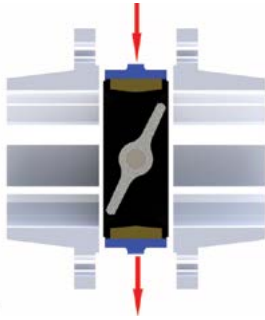


Gear Box Dimensions (in) Valve Size 16" - 24"

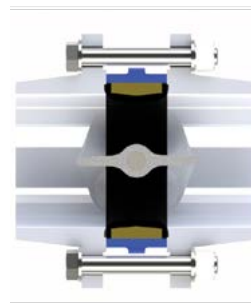
Valve Size	Reduction Ratio	A	C	D	E1	F	G	H	N	L	P	K	E (DIA)	BOLT	D3	B	L1	M	D1	D2	H X H	L3
16" & 18"	532:1	11.8	3.7	4.75	6.7	4.1	4.1	12.6	3.5	2.25	2.2	6.9	5.5	M16	0.75	0.25	1.2	M8	1.1	1.4	1.1x1.1	4.9
20"	532:1	11.8	3.7	4.75	6.7	4.1	4.1	12.6	3.5	2.25	2.2	6.9	5.5	M16	0.75	0.25	1.2	M8	1.5	1.9	1.4x1.4	4.9
24"	640:1	11.8	5	5.5	9.9	5.2	5	14.6	3.5	2.6	2.6	8.25	6.5	M16	0.75	0.25	1.2	M8	1.5	1.9	1.4x1.4	5.5

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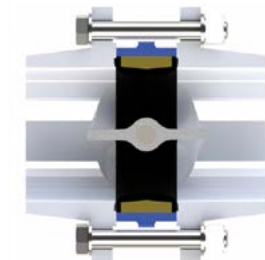
INSTALLATION



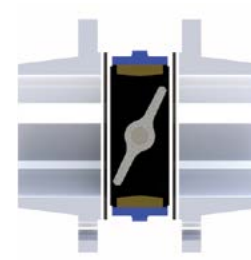
1. Leave adequate space between the flanges so the valve can be easily slid into place and removed. Be sure the flanges are positioned square to the valve body



2. Open the valve before tightening the flanges



3. Tighten bolts until the flanges are in contact with the valve body to engage the sealing surface.

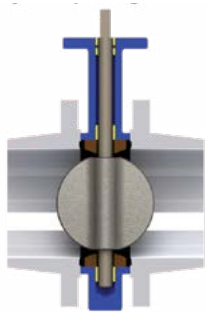


4. **Important:** Do not install other packing or gaskets between the flanges and the valve.

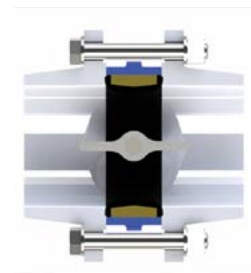
Additional notes: Remove the valve from the line when performing any welding on adjacent flanges, pipe or fittings. Flush pipelines clear of debris before installing valve to avoid any potential for damages to seats.

INSTALLATION FOR FLUIDS CONTAINING SEDIMENT

When using the valve with water containing suspended solids, install the valve on a horizontal axis as shown, so sediments flush at opening.



Incorrect: Vertical Rotation Axis



Correct: Horizontal Rotation Axis

END OF PIPE INSTALLATION

When the valve is installed at the end of a pipeline, a counter flange is needed to secure the tightness of the valve at maximum pressure.



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