

Weco[®] Butterfly Valves and

Choice of operators, actuators

All Weco butterfly valve models can be equipped with a wide range of operators and actuators.

Outstanding flow efficiency

Streamlined disc design minimizes turbulence and pressure drop for greater flow efficiency.

Fast, simple field repair

If a valve should need repair, it can be completely reconditioned in the field using interchangeable stock parts.

Leak-proof installation

Ribbed seat face eliminates the need for flange gaskets and ensures leak-proof installation.



Weco butterfly valves offer the ultimate in dependable, economical flow control. These field-proven valves are available from stock in 2 through 24-inch sizes and can handle working pressures up to 175 psi. For pressure ratings from 176 psi up to 285 psi, consult factory. Wafer, notched, and lug-type body styles meet requirements for new or existing flowline systems. Using a variety of materials, valve bodies, discs, stems, and seats can be individually matched to specific operating conditions, including temperature range, type and concentration of fluid, and various flow conditions. All materials meet ASTM and AISI standards.

Actuators

No in-line pins, screws or bolts

Hex drive provides positive disc movement without in-line pins, screws, or bolts.

Triple seal design

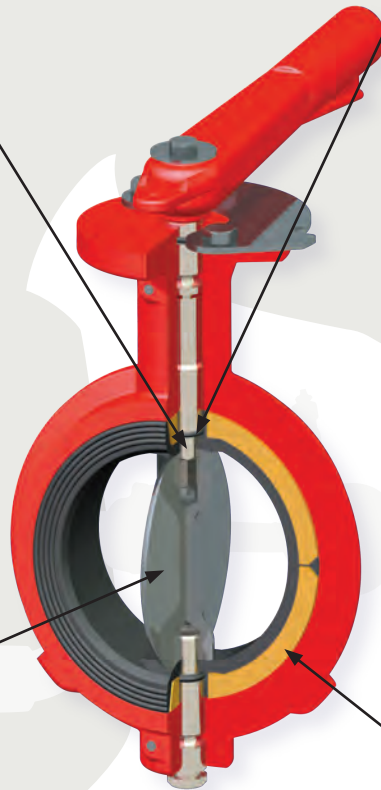
An O-ring, undersized stem holes in the seat, and corresponding flats on seat and disc hubs provide three completely independent seals. This unique feature isolates both the upper and lower stems from line fluid, allowing use of standard stem material.

Self-centering disc

Dual stem with upper and lower tangential pins allows a self-centering disc. This design provides equal sealing pressure 360° around the disc, ensuring positive shut off and extending service life.

Elastomer seat

An elastomer seat with two-piece, hard phenolic back-up eliminates seat walking and allows the seat to expand under pressure, making the valve body the pressure containing component.



Standard Materials of Construction

Valve Part	Standard Material	Optional Materials
Seat & O-ring	Nitrile (Buna N) (-20°F to 200°F)	Hypalon®, Teflon®, Viton®, EPDM, Red Natural Rubber
Body	Ductile Iron	Aluminum, Steel, Stainless Steel
Stem (upper & lower)	410 Stainless Steel	316 Stainless Steel
Disc	Ductile Iron	Aluminum, Bronze, 316 Stainless Steel, Ryton®, Kynar®, Halar, Teflon® Coated, Nickel Plated, Hastelloy®
Spirol/Retainer Pins	302 Stainless Steel	

Model 12

Short neck, wafer body; 175 psi cold working pressure, 2 to 12-inch sizes; 150 psi cold working pressure, 14 and 16-inch sizes

Recommended service

General on/off and throttling services from 1mm Hg absolute vacuum to full working pressure

Features

- Valves are self-centering and mount between 125 or 150 lb ANSI flanges



Model 12N

Short neck, notched body; 175 psi cold working pressure, 2 to 6-inch sizes

Recommended service

General on/off and throttling services from 1mm Hg absolute vacuum to full working pressure

Features

- Valves are notched to fit between lightweight flanges



Model 22

Long neck, wafer body; 175 psi cold working pressure, 2 to 12-inch sizes.

Recommended service

General on/off and throttling services from 1mm Hg absolute vacuum to full working pressure

Features

- Valves are self-centering and mount between 125 or 150 lb ANSI flanges
- Long neck allows for pipe insulation



Model 22L

Long neck, lug body, 175 psi cold working pressure, 2 to 24-inch sizes

Recommended service

General on/off and throttling services from 1mm Hg absolute vacuum to full working pressure

Features

- Tapped lugs allow independent upstream or downstream bolting to 125 or 150 lb ANSI flanges
- Long neck allows for pipe insulation.



Operators & Actuators

All models and sizes of Weco butterfly valves can be equipped with Weco operators or actuators as well as other brands of actuators. Typical options include standard and throttling handles, gear operators, chain-wheel operators, vane actuators, pneumatic actuators, special controllers, and positioners.

Pneumatic Actuators

Double-acting or fail-safe spring return; 2 through 12-inch valve sizes

Recommended service

Pneumatic actuator for on/off valve operation

Features

- Mounts directly to Weco butterfly valves without special adapters or mounting hardware
- Full 90° operation with a minimum of 30 psi, air, no adjustments required



Vane Actuators

Quarter-turn, double acting actuator; 2 through 6-inch valve sizes

Recommended service

Compact, pneumatic actuator for on/off valve operation

Features

- The only moving part, the vane, is cast integral to the shaft for sturdiness; does not require field lubrication
- Fully repairable in-line
- Mounts directly to valve in any quadrant



Gear Operators

Weatherproof, worm gear operator; 2 through 24-inch valve sizes

Recommended service

Manual on/off or throttling services

Features

- Operator has 90° travel arc with internal travel stop screws for a plus or minus 20° adjustment at either end of the travel
- Mounts on the valve in any quadrant
- Chain wheel attachment available
- Hand-wheel shaft extensions available



Standard Handle

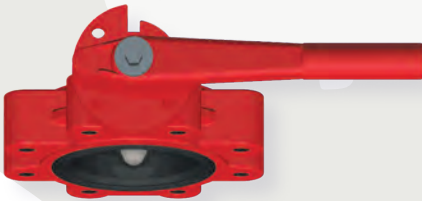
2 through 12-inch valve sizes

Recommended service

Manual on/off service

Features

- Positive-stop gripper with integral locking lug ensures full open/full closed operation
- Model 12 and 12N valves have a detent plate which bolts on the valve body in each of four quadrants
- Model 22 and 22L valve have a pre-notched top flange with on/off detent positions



Throttling Handle

2 through 12-inch valve sizes

Recommended service

Manual Throttling Service

Features

- Notched detent plate and positive-stop gripper with integral locking lug ensures positive locking in any of 10 positions from full open or full closed operation
- Detent plate bolts on the valve body in each of the four quadrants.



Weco® Butterfly Valve Specifications

Model 12

Sizes in.	2	2 ½	3	4	6	8	10	12	14	16	
Part No.	3227485	3227486	3227487	3245819	3227493	3232417	3227495	3227496	3255865	3255869	
P/N - LT	3227485-LT	3227486-LT	3227487-LT	3245819-LT	3227493-LT	3232417-LT	3227495-LT	3227496-LT	3255865-LT	3255869-LT	
Dimensions, in., mm	A	4 ³¹ / ₃₂ 126	5 ⁵ / ₈ 150	5 ²⁹ / ₃₂ 150	7 ⁷ / ₃₂ 185	7 ²⁵ / ₃₂ 198	9 ¹³ / ₃₂ 239	10 ²¹ / ₃₂ 271	12 ³ / ₃₂ 309	14 ³¹ / ₃₂ 380	17 ⁷ / ₁₆ 443
	B	3 76.2	3 ¹¹ / ₃₂ 84.9	3 ⁵ / ₈ 92.1	4 ¹ / ₄ 108	5 ⁵ / ₁₆ 135	7 178	8 ¹ / ₄ 210	9 ³ / ₄ 248	10 ³ / ₈ 264	11 ¹⁵ / ₁₆ 303
	C	4 ¹ / ₈ 105	4 ⁷ / ₈ 124	5 ³ / ₈ 137	6 ⁷ / ₈ 175	8 ³ / ₄ 222	11 279	13 ³ / ₈ 340	16 ¹ / ₈ 410	17 ¹¹ / ₁₆ 449	20 ¹ / ₈ 511
	D	2 ¹ / ₁₆ 52.4	2 ¹ / ₂ 63.5	3 ¹ / ₁₆ 77.8	4 ¹ / ₁₆ 103	6 ¹ / ₁₆ 154	8 ¹ / ₁₆ 205	10 254	12 305	13 ¹ / ₄ 337	15 ¹ / ₄ 387
	E	⁵ / ₈ Sq. 15.9	⁵ / ₈ Sq. 15.9	⁵ / ₈ Sq. 15.9	⁵ / ₈ Sq. 15.9	⁵ / ₈ Sq. 15.9	⁷ / ₈ Sq. 22.2	⁷ / ₈ Sq. 22.2	1 ¹ / ₈ Sq. 28.6	1 ¹ / ₈ Sq. 28.6	2* 50.8
	F	4 102	4 102	4 102	4 102	4 102	6 152	6 152	6 152	6 152	8 203
	G	1 ¹ / ₃₂ 26.2	1 ¹ / ₃₂ 26.2	1 ¹ / ₃₂ 26.2	1 ¹ / ₃₂ 32.5	1 ¹ / ₃₂ 32.5	1 ¹ / ₃₂ 32.5	1 ¹ / ₃₂ 32.5	1 ¹ / ₃₂ 32.5	1 ¹ / ₃₂ 32.5	3 ³ / ₁₆ 81
	H	1 ³ / ₈ 41	1 ³ / ₄ 45	1 ³ / ₄ 45	2 51	2 ¹ / ₈ 54	2 ¹ / ₂ 64	2 ¹ / ₂ 64	3 76	3 76	4 102
	I	⁷ / ₁₆ 11.1	⁷ / ₁₆ 11.1	⁷ / ₁₆ 11.1	⁷ / ₁₆ 11.1	⁷ / ₁₆ 11.1	⁹ / ₁₆ 14.3	⁹ / ₁₆ 14.3	⁹ / ₁₆ 14.3	⁹ / ₁₆ 14.3	¹ / ₃₂ 13.5
	J	3 ¹ / ₄ 82.6	3 ¹ / ₄ 82.6	3 ¹ / ₄ 82.6	3 ¹ / ₄ 82.6	3 ¹ / ₄ 82.6	5 127	5 127	5 127	5 127	6 ¹ / ₂ 165

Body: Ductile Iron Disc: Ductile Iron Stems Stainless Steel Seat: Nitrile

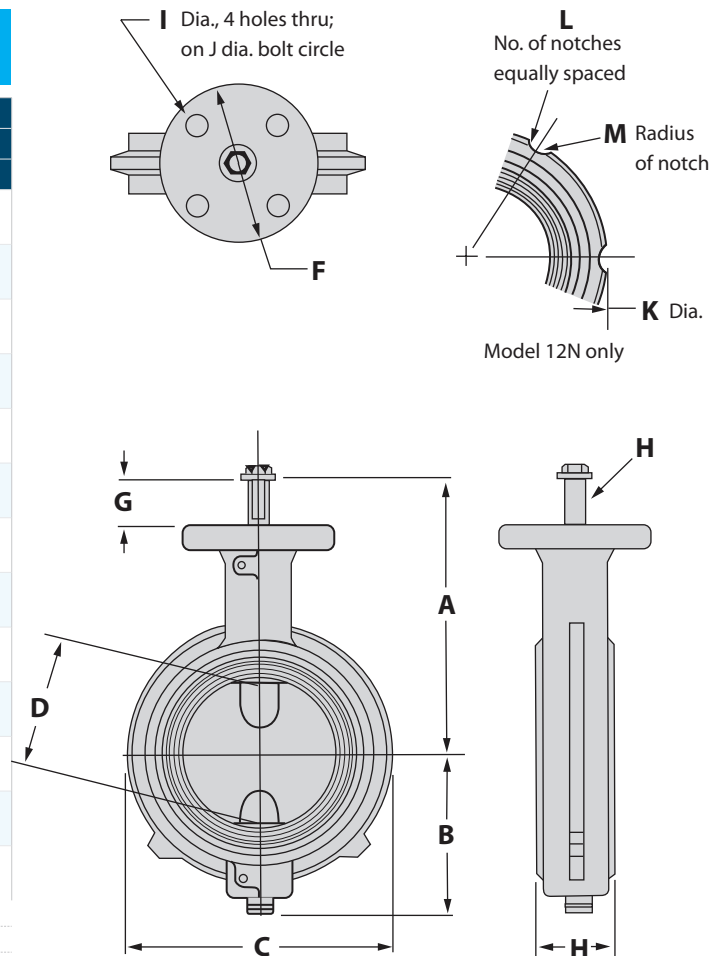
* 2 inch diameter with 1/2 inch keyway

Weco® Butterfly Valve Specifications

Model 12N (For use with lightweight industrial flanges.)

Sizes in.	2	3	4	5	6	
Part No.	3229885	3230052	3229886	3229887	3229888	
	3229885-LT	3230052-LT	3229886-LT	3229887-LT	3229888-LT	
Dimensions, in., mm	A	4 ³¹ / ₃₂ 126	5 ²⁹ / ₃₂ 150	7 ⁷ / ₃₂ 185	7 ⁷ / ₃₂ 185	7 ²⁵ / ₃₂ 198
	B	3 76.2	3 ⁵ / ₈ 92.1	4 ¹ / ₄ 108	4 ¹³ / ₁₆ 122	5 ⁵ / ₁₆ 135
	C	4 ¹ / ₈ 105	5 ³ / ₈ 137	6 ⁷ / ₈ 175	7 ³ / ₄ 197	8 ³ / ₄ 222
	D	2 ¹ / ₁₆ 52.4	3 ¹ / ₁₆ 77.8	4 ¹ / ₁₆ 103	5 ¹ / ₁₆ 129	6 ¹ / ₁₆ 154
	E	⁵ / ₈ Sq. 15.9	⁵ / ₈ Sq. 15.9	⁵ / ₈ Sq. 15.9	⁵ / ₈ Sq. 15.9	⁵ / ₈ Sq. 15.9
	F	4 101.6	4 101.6	4 101.6	4 101.6	4 101.6
	G	1 ¹ / ₃₂ 26.2	1 ¹ / ₃₂ 26.2	1 ¹ / ₃₂ 32.5	1 ¹ / ₃₂ 32.5	1 ¹ / ₃₂ 32.5
	H	1 ³ / ₈ 41.3	1 ³ / ₄ 44.5	2 50.8	2 ¹ / ₈ 54	2 ¹ / ₈ 54
	I	⁷ / ₁₆ 11.1	⁷ / ₁₆ 11.1	⁷ / ₁₆ 11.1	⁷ / ₁₆ 11.1	⁷ / ₁₆ 11.1
	J	3 ¹ / ₄ 82.6	3 ¹ / ₄ 82.6	3 ¹ / ₄ 82.6	3 ¹ / ₄ 82.6	3 ¹ / ₄ 82.6
	K	3 ³ / ₄ 82.6	4 ³ / ₈ 111	6 ³ / ₈ 162	6 ²⁹ / ₃₂ 175	8 ¹ / ₂ 216
	L	4 102	6 152	6 152	6 152	8 203
	M	⁵ / ₁₆ 7.9	⁵ / ₁₆ 7.9	³ / ₈ 9.5	³ / ₈ 9.5	³ / ₈ 9.5

Body: Ductile Iron Disc: Ductile Iron
Stems: 416 Stainless Steel Seat: Nitrile



Weco® Butterfly Valve Specifications

Model 22

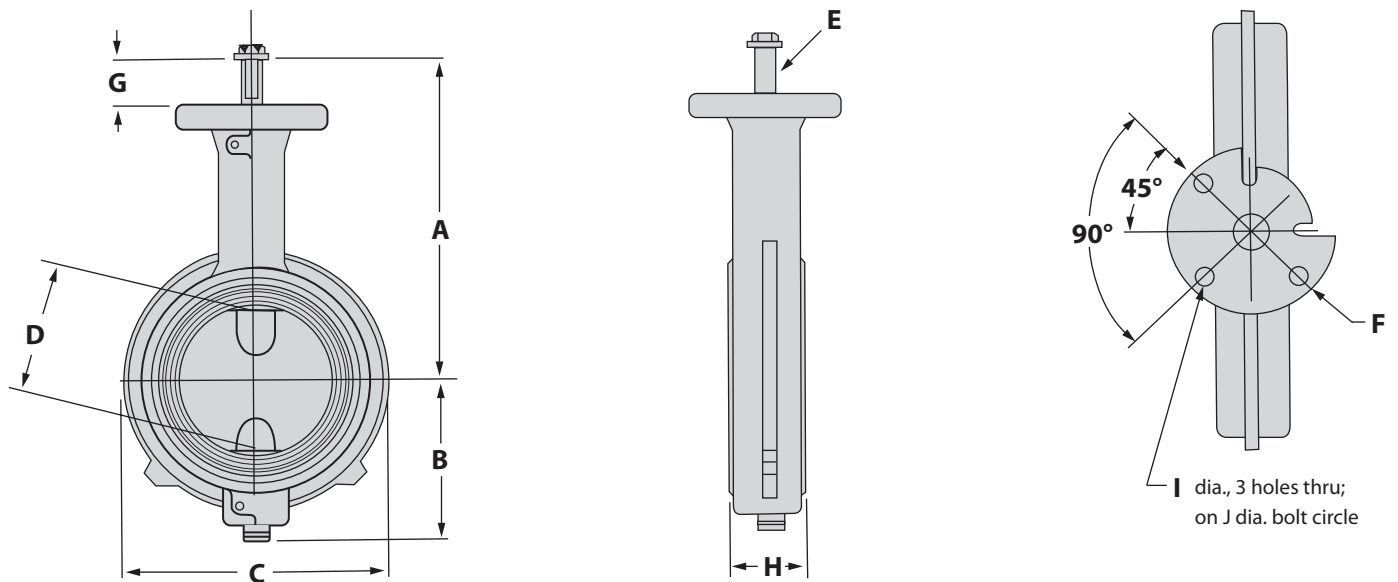
Sizes in.	2	2½	3	4	5	6	8	10	12	
Part No.	3225730	3225731	3225732	3225733	3225734	3225735	3225736	3225737	3225738	
P/N - LT	3225730-LT	3225731-LT	3225732-LT	3225733-LT	3225734-LT	3225735-LT	3225736-LT	3225737-LT	3225738-LT	
Dimensions, in., mm	A	7 ½ 185	7 25/32 198	8 1/16 205	9 5/32 233	9 21/32 245	10 5/32 258	11 19/32 294.5	12 27/32 326	14 11/32 364
	B	3 76.2	3 11/32 84.9	3 5/8 92.1	4 1/4 108	4 13/16 122	5 5/16 135	7 178	8 1/4 210	9 3/4 248
	C	4 1/8 105	4 7/8 124	5 3/8 131	6 7/8 175	7 3/4 197	8 3/4 222	11 279	13 3/8 340	16 1/16 408
	D	2 1/16 52.4	2 1/2 63.5	3 1/16 77.8	4 1/16 103	5 1/16 129	6 1/16 154	8 1/16 205	10 254	12 305
	E	5/8 Sq. 15.9	5/8 Sq. 15.9	5/8 Sq. 15.9	5/8 Sq. 15.9	5/8 Sq. 15.9	5/8 Sq. 15.9	7/8 Sq. 22.2	7/8 Sq. 22.2	1 1/8 Sq. 28.6
	F	4 101.6	4 101.6	4 101.6	4 101.6	4 101.6	4 101.6	6 152.4	6 152.4	6 152.4
	G	1 1/32 26.2	1 1/32 26.2	1 1/32 26.2	1 1/32 23.5	1 9/32 32.5	1 9/32 32.5	1 9/32 32.5	1 9/32 32.5	1 9/32 32.5
	H	1 5/8 41.3	1 3/4 44.5	1 3/4 44.5	2 50.8	2 1/4 54	2 1/4 54	2 1/2 63.5	2 1/2 63.5	3 76.2
	I	7/16 11.1	7/16 11.1	7/16 11.1	7/16 11.1	7/16 11.1	7/16 11.1	9/16 14.3	9/16 14.3	9/16 14.3
	J	3 1/4 82.6	3 1/4 82.6	3 1/4 82.6	3 1/4 82.6	3 1/4 82.6	3 1/4 82.6	5 127	5 127	5 127

Body: Ductile Iron

Disc: Ductile Iron

Stems 416 Stainless Steel

Seat: Nitrile



Weco® Butterfly Valve Specifications

Weco® Butterfly Valve Specifications

Model 22L

Sizes in.	2	2 ½	3	4	5	6	8	10	12	14	16	18	20	24		
Part No.	3225748	3225749	3225750	3222751	3225752	3225753	3225754	3225755	3225756	3255867	3255870	3255871	3255872	3255873		
P/N - LT	3225748-LT	3225749-LT	3225750-LT	3222751-LT	3225752-LT	3225753-LT	3225754-LT	3225755-LT	3225756-LT	3255867-LT	3255870-LT	3255871-LT	3255872-LT	3255873-LT		
Dimensions, in., mm	A	7 7/32 185	7 25/32 198	8 1/16 205	9 5/32 233	9 21/32 245	10 3/32 258	11 19/32 295	12 27/32 326	14 11/32 364	14 31/32 380	17 7/16 443	18 7/16 468	19 7/16 494	23 3/4 603	
	B	3 76.2	3 11/32 84.9	3 5/8 92.1	4 1/4 108	4 13/16 122	5 5/16 135	7 178	8 1/4 210	9 3/4 248	10 3/8 264	11 15/16 303	12 15/16 329	13 15/16 354	17 1/8 435	
	C	6 152	7 178	7 1/2 191	9 229	10 254	11 279	13 1/2 343	16 406	19 483	20 3/4 527	23 1/4 591	25 635	27 1/4 692	32 813	
	D	2 1/16 52.4	2 1/2 63.5	3 1/16 77.8	4 1/16 103	5 1/16 129	6 1/16 154	8 1/16 205	10 254	12 305	13 1/4 337	15 5/32 388	17 9/32 439	19 1/4 489	23 584	
	E	5/8 Sq. 15.9	5/8 Sq. 15.9	5/8 Sq. 15.9	5/8 Sq. 15.9	5/8 Sq. 15.9	5/8 Sq. 15.9	7/8 Sq. 22.2	7/8 Sq. 22.2	1 1/8 Sq. 28.6	1 1/8 Sq. 28.6	2* 50.8	2* 50.8	2* 50.8	2.5** 63.5	
	F	4 101.6	4 101.6	4 101.6	4 101.6	4 101.6	4 101.6	6 152.4	6 152.4	6 152.4	6 152.4	6 152.4	8 203.2	8 203.2	8 203.2	8 203.2
	G	1 1/32 26.2	1 1/32 26.2	1 1/32 26.2	1 1/32 32.5	1 9/32 32.5	1 9/32 32.5	1 9/32 32.5	1 9/32 32.5	1 9/32 32.5	1 9/32 32.5	1 9/32 32.5	3 3/16 81	3 3/16 81	3 3/16 81	4 3/8 111
	H	1 5/8 41.3	1 3/4 44.5	1 3/4 44.5	2 50.8	2 1/8 54	2 1/8 54	2 1/2 63.5	2 1/2 63.5	3 76.2	3 76.2	4 101.6	4 1/2 114.3	5 127	6 1/16 154	
	I	7/16 11.1	7/16 11.1	7/16 11.1	7/16 11.1	7/16 11.1	7/16 11.1	9/16 14.3	9/16 14.3	9/16 14.3	9/16 14.3	17/32 13.5	17/32 13.5	17/32 13.5	21/32 16.7	
	J	3 1/4 82.6	3 1/4 82.6	3 1/4 82.6	3 1/4 82.6	3 1/4 82.6	3 1/4 82.6	5 127	5 127	5 127	5 127	6 1/2 165.1	6 1/2 165.1	6 1/2 165.1	6 1/2 165.1	
	K	5/8-11	5/8-11	5/8-11	5/8-11	3/4-10	3/4-10	3/4-10	7/8-9	7/8-9	7/8-9	1-8	1-8	1 1/8-7	1 1/8-7	1 1/4-7
	L	4 102	4 102	4 102	8 204	8 204	8 204	8 204	12 305	12 305	12 305	16 406	16 406	20 508	20 508	
	M	4 3/4 121	5 1/2 140	6 152	7 1/2 191	8 1/2 216	9 1/2 241	11 3/4 299	14 1/4 362	17 432	18 3/4 476	21 1/4 540	22 3/4 578	25 635	29 1/2 750	

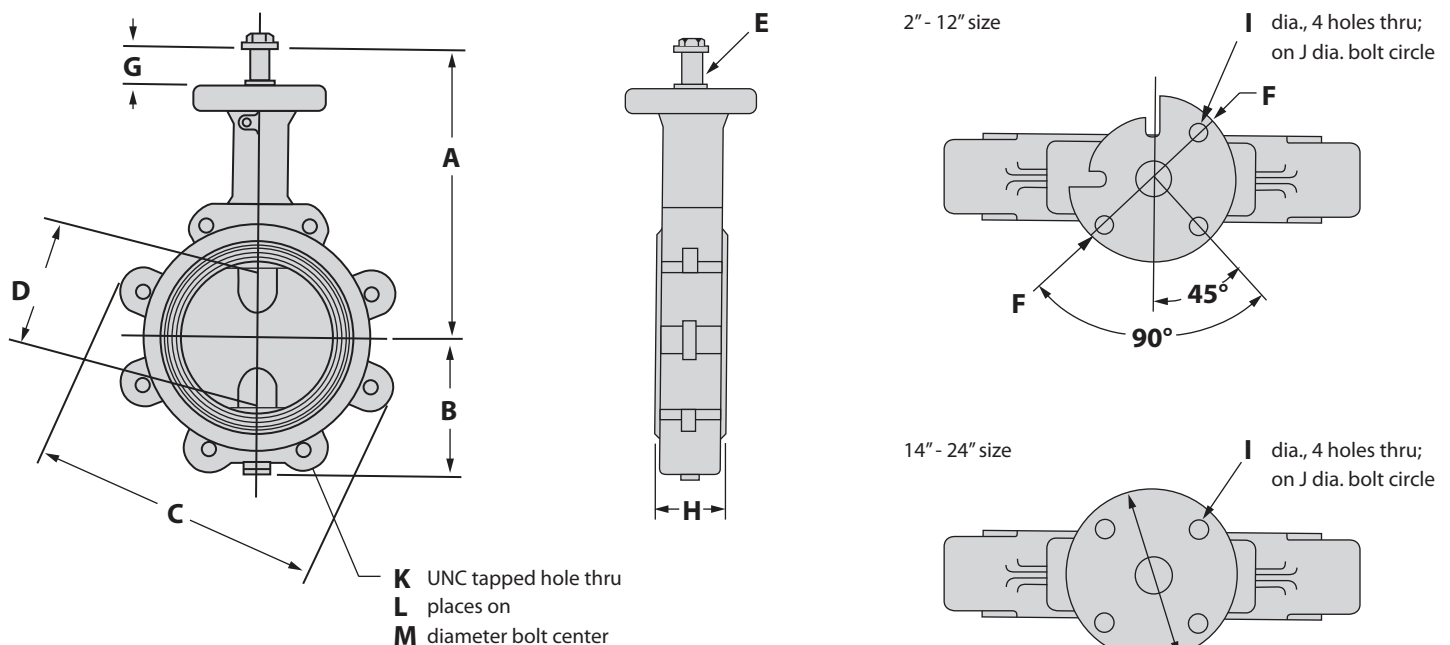
Body: Ductile Iron Disc: Ductile Iron

Stems 416 Stainless Steel

Seat: Nitrile

* 2 inch diameter with 1/2 inch keyway

** 2.5 inch diameter with 5/8 inch keyway

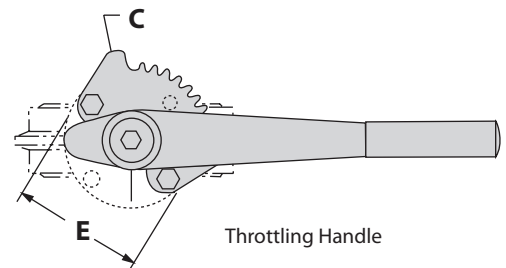
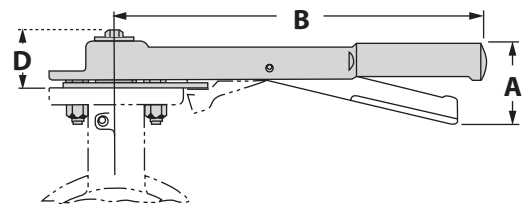
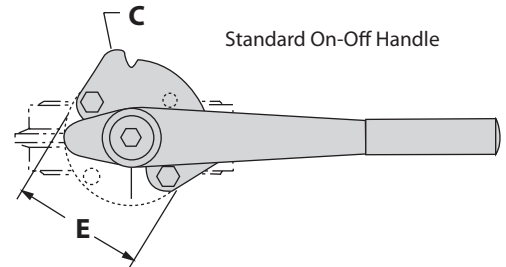


Weco® Butterfly Valve Specifications

Standard and Throttle Handles

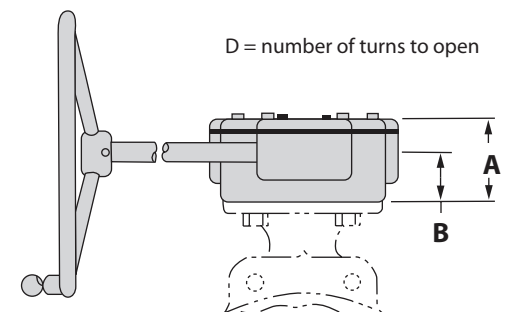
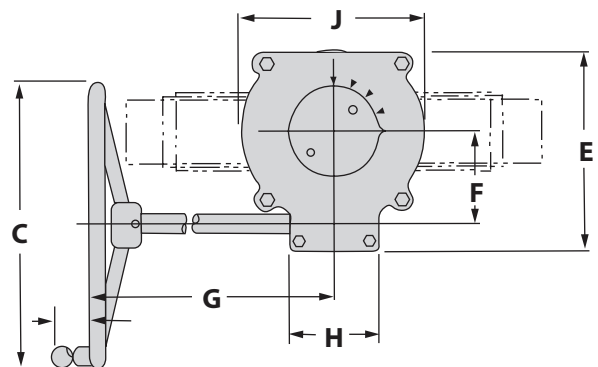
		Valve Size, in.			
		2-3	4 & 6	8 & 10	12
Standard for Models 12, 12N		3234078	3231336	3227946	3227947
Standard for Models 22, 22L		3234092	3231337	3216208	3216224
Throttling for all Models		3235577	3235578	3228018	3228019
Dimensions, in., mm	A	2 3/8 60.3	2 1/2 63.5	3 76.2	2 3/4 69.9
	B	9 1/2 241	10 7/8 276	15 381	19 483
	C	2 3/4 69.9	2 3/4 69.9	4 102	4 102
	D	1 1/16 36.5	1 11/16 42.9	1 11/16 42.9	1 11/16 42.9
	E	4 102	4 102	6 152	6 152

Note: Butterfly valve assemblies include a standard detent plate for on-off operations. Handle assemblies for throttling service include a throttling detent plate to replace the standard detent plate on the valve.



Gear Operators

		Valve Size, in.					
		2-6	8 & 10	12	14	16-20	24
Standard Handwheel		3217838	3217839	3217840	3256506	3256507	3256508
Chain-wheel Attachment		3223689	3223690	3223691	3256839	3256840	CF
Dimensions, in., mm	A	2 1/8 54	2 1/2 63.5	2 1/2 63.5	3 76.2	3 3/8 92.1	5 127
	B	1 1/16 27	1 1/4 31.8	1 1/4 31.8	1 1/2 38.1	2 3/8 60.3	2 1/2 63.5
	C	6 1/2 165	10 254	10 254	14 356	14 356	14 356
	D	5 127	7 1/2 191	7 1/2 191	15 381	15 381	15 381
	E	4 3/4 121	7 178	7 178	7 3/4 197	9 3/8 245	11 5/8 295
	F	1 3/8 41.3	2 9/16 65.1	2 9/16 65.1	3 1/8 79.4	4 1/2 111.4	4 3/8 118
	G	6 5/16 160	9 3/8 232	11 5/8 295	15 1/4 387	15 1/4 387	17 1/4 438
	H	3 1/2 88.9	4 3/4 121	4 3/4 121	5 3/8 143	5 3/4 146	9 1/2 241
	I	3 76.2	3 1/2 88.9	3 1/2 88.9	3 1/2 88.9	3 1/2 88.9	3 1/2 88.9
	J	4 102	6 1/4 159	6 1/4 159	6 1/2 165	9 229	10 1/4 260



Weco® Butterfly Valve Sizing Information

Non-Compressible Fluids

Use the following equations for sizing valves handling liquids

$$\begin{array}{ccc}
 \text{(A)} & \text{(B)} & \text{(C)} \\
 C_v = Q \sqrt{\frac{G}{\Delta P}} & Q = C_v \sqrt{\frac{\Delta P}{G}} & \Delta P = \left[\frac{Q}{C_v} \right]^2 G
 \end{array}$$

- Where: Q = Flow in gallons per minute (gpm)
 ΔP = (P₁-P₂) Pressure Drop (psi)
 P₁ = Inlet Pressure (psia)
 P₂ = Outlet Pressure (psia)
 G = Specific Gravity of Liquid (Water = 1.0)
 C_v = Valve Coefficient (Refer To Appropriate Table)

The equations listed above are the basis for the WECO sizing nomogram. The nomogram is a method of solving the equations above quickly and simply when the service fluid is water.

Cv Values Resilient Seated BFV'S – All Models

GPM @ PSI @ Various Disc Angles									
Valve Size, in.	10°	20°	30°	40°	50°	60°	70°	80°	90°
2	1.59	6.17	14.2	26.3	44.5	70.6	105	135	159
2½	2.33	9.06	20.9	38.6	65.3	104	156	215	266
3	3.50	13.6	31.4	57.9	98.0	156	240	342	457
4	6.16	23.9	55.1	102	173	274	423	625	860
5	9.56	37.2	85.6	158	268	426	656	970	1,320
6	13.7	53.3	123	227	384	610	941	1,420	2,020
8	24.2	94.3	217	401	679	1,080	1,660	2,500	3,540
10	37.3	145	334	617	1,040	1,660	2,560	3,830	5,580
12	53.7	209	481	888	1,500	2,390	3,690	5,620	8,080
14	61	166	650	1,300	2,100	3,500	5,220	8,000	13,000
16	81	477	960	1,700	2,900	4,920	7,000	11,000	17,000
18	125	535	1,120	1,960	3,500	5,800	8,000	15,000	19,000
20	161	723	1,500	2,700	4,800	7,900	12,500	18,500	27,000
24	305	921	2,000	3,640	6,175	10,350	17,500	24,000	35,000

EXAMPLE

Given: A 6" WECO Butterfly Valve is to be installed in a line handling 500 gpm of water.

Find: Maximum pressure drop across the valve when in the full open and 60° open positions.

Solution: This problem may be solved using the nomogram or equation (C).

First Using the Nomogram: Enter nomogram on right side for a flow rate of 500 gpm. Draw horizontal line until it intersects the 6" valve line. From this point draw a vertical line until it intersects the 90° open line. Project line horizontally to the left and read $\Delta P^{of} .061$ psi. Now, using same procedure as above, extend vertical line to 60° open line and project horizontally to the left to read $\Delta P^{of} .67$ psi for 60° open.

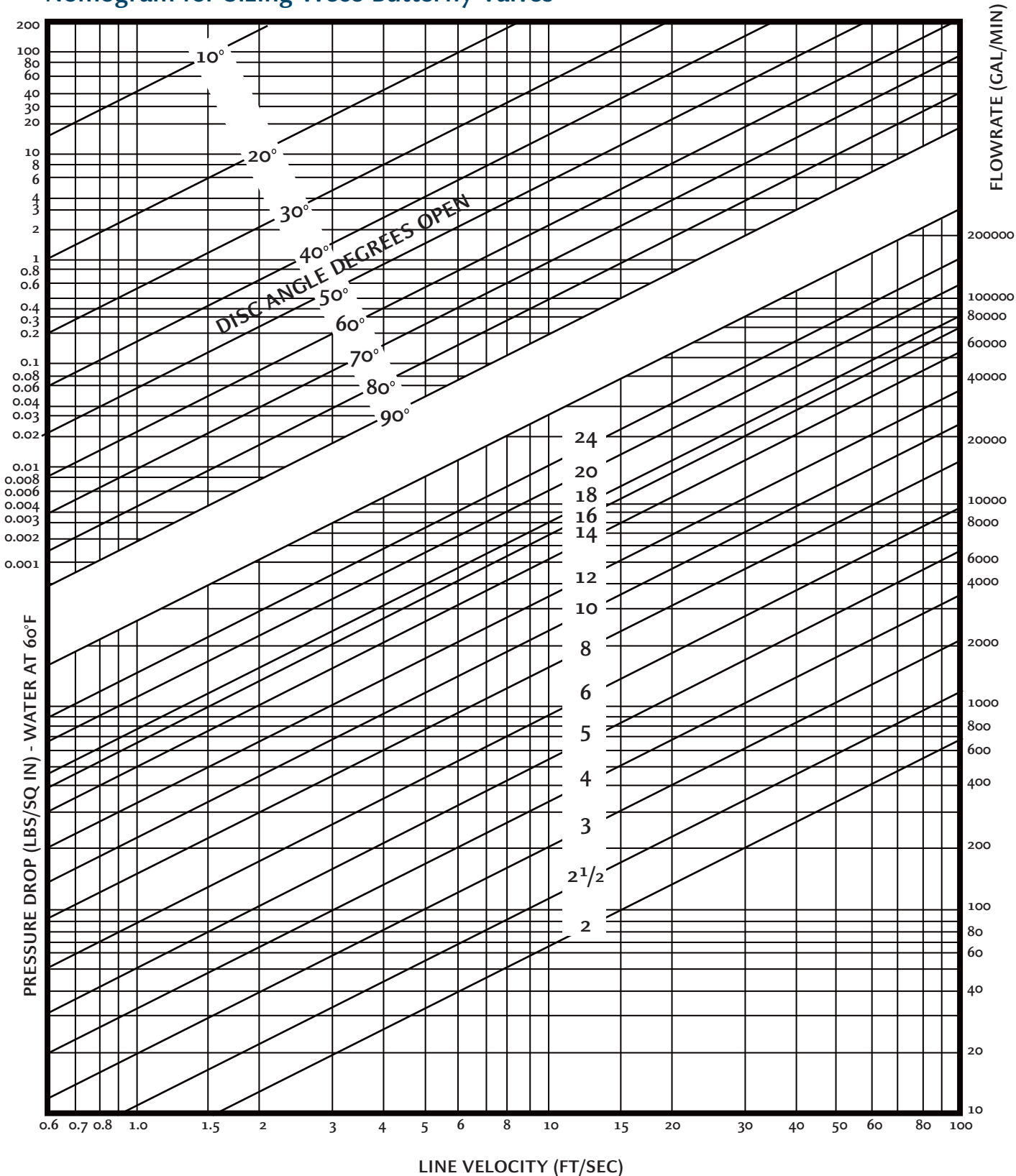
Using Equation (C): Pressure Drop = $\Delta P = \left[\frac{Q}{C_v} \right]^2 G$

- Where: C_v = 2020 @ 90° open (from tables)
 G = 1.0 (Water)
 Q = 500 gpm
 $\Delta P = 1.0 \left[\frac{500}{2020} \right]^2 = .0613$

Now: C_v = 610 gpm @ 60° open, and
 $\Delta P = 1.0 \left[\frac{500}{610} \right]^2 = .672$

Weco® Butterfly Valve Sizing Information

Nomogram for Sizing Weco Butterfly Valves



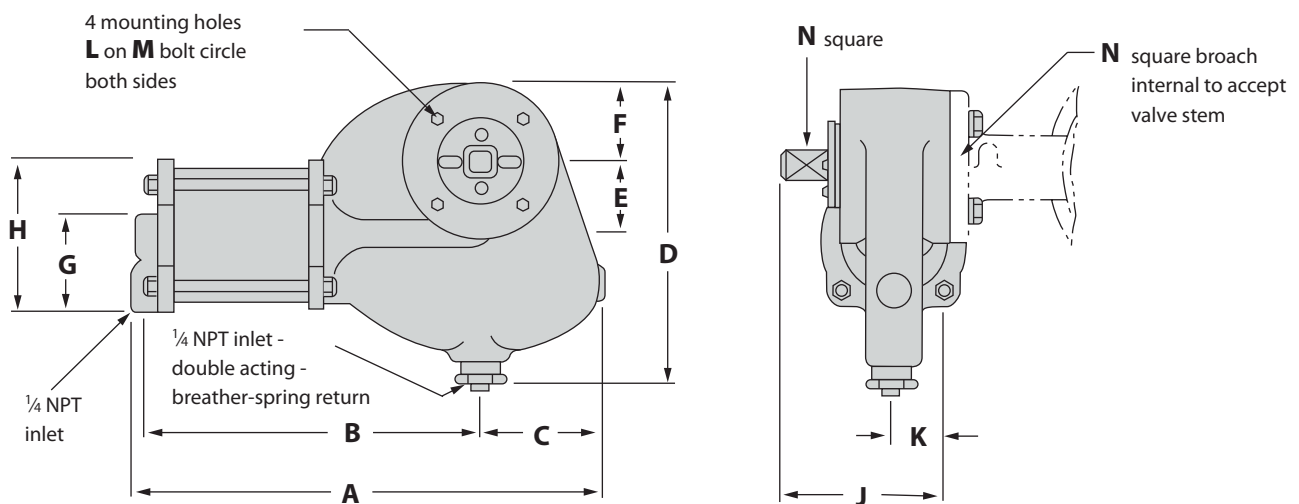
Weco® Butterfly Valve Specifications

Weco® Pneumatic Actuator Specifications

Pneumatic Actuators - Double Acting

Model	330	350	550	550A	590	590A
Sizes, in.	2 - 6	5 - 6	8 - 10	12	10	12
Part #	3235438	3237369	3236771	3237183	3237886	3237887
Weight	lb	8 ½	18	35	35	55
	kg	3.9	8.2	15.9	15.9	25
A	in.	12 ¾	16 ½	19 ¾	19 ¾	22
	mm	319	511	492	492	559
B	in.	8 ¾	12 ¾	13 11/16	13 11/16	15 7/8
	mm	222	313	348	348	403
C	in.	3 ¾	3 ¾	5 ¾	5 ¾	5 ¾
	mm	84.1	84.1	133	132	139
D	in.	7 13/16	7 13/16	12 1/16	12 1/16	12 1/16
	mm	198	198	308	308	308
E	in.	1 15/16	1 15/16	3 3/16	3 3/16	3 3/16
	mm	49.2	49.2	90.5	90.5	81
F	in.	2 1/16	2 1/16	3 3/16	3 3/16	3 3/16
	mm	52.4	52.4	77.8	77.8	77.8
G	in.	2	3 3/16	3 3/16	3 3/16	5 3/16
	mm	50.8	84.1	84.1	84.1	135
H	in.	3 7/8	6 ½	6 ½	6 ½	10 3/16
	mm	98.4	165.1	165	165	268
J	in.	4 3/16	4 3/16	5 3/16	5 3/16	5 3/16
	mm	110	110	135	135	135
K	in.	1 7/16	1 7/16	1 7/8	1 7/8	1 7/8
	mm	36.5	36.5	47.6	47.6	47.6
L	in.	¾	¾	½	½	½
		16 UNC	16 UNC	13 UNC	13 UNC	13 UNC
M	in.	3 ¼	3 ¼	5	5	5
	mm	82.6	82.6	127	127	127
N	in.	5/8	5/8	7/8	1 1/8	1 1/8
	mm	15.9	15.9	22.2	28.6	28.6

Weco® Pneumatic Actuator Specifications

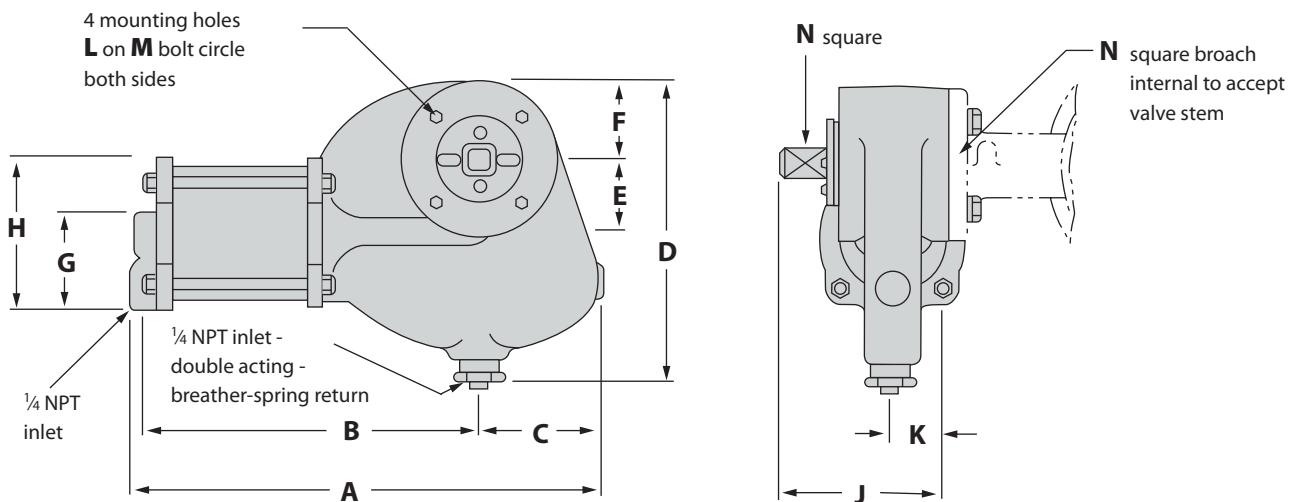


Weco® Pneumatic Actuator Specifications

Pneumatic Actuators - Spring Acting

Model		332	333	354	355	596	597A
Sizes, in.		2 - 3	3 - 4	4	5 - 6	8 - 10	12
Part #		3237525	3237368	3237373	3237515	3237865	3237866
Weight	lb	13	15	25	31	93	106
	kg	5.9	6.8	11.3	14.1	42.2	48.1
A	in.	19 ⁹ / ₁₆	19 ⁹ / ₁₆	20 ¹ / ₄	20 ¹ / ₄	30 ¹ / ₈	30 ¹ / ₈
	mm	497	497	514	514	765	765.2
B	in.	15 ³ / ₄	15 ³ / ₄	16 ⁷ / ₁₆	16 ⁷ / ₁₆	24	24
	mm	400	400	418	418	610	610
C	in.	3 ³ / ₁₆	3 ³ / ₁₆	3 ³ / ₁₆	3 ³ / ₁₆	5 ¹ / ₁₆	5 ¹ / ₁₆
	mm	84.1	84.1	84.1	84.1	129	132
D	in.	8 ⁵ / ₈	8 ⁵ / ₈	8 ⁵ / ₈	8 ⁵ / ₈	13 ¹ / ₈	13 ¹ / ₈
	mm	219	219	219	219	333	333
E	in.	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	1 ¹⁵ / ₁₆	3 ³ / ₁₆	3 ³ / ₁₆
	mm	49.2	49.2	49.2	49.2	81	81
F	in.	2 ¹ / ₁₆	2 ¹ / ₁₆	2 ¹ / ₁₆	2 ¹ / ₁₆	3 ¹ / ₁₆	3 ¹ / ₁₆
	mm	52.4	52.4	52.4	52.4	77.8	77.8
G	in.	2	2	3 ¹ / ₁₆	3 ¹ / ₁₆	5 ¹ / ₁₆	5 ¹ / ₁₆
	mm	50.8	50.8	84.1	84.1	135	135
H	in.	3 ⁷ / ₈	3 ⁷ / ₈	6 ¹ / ₂	6 ¹ / ₂	10 ⁹ / ₁₆	10 ⁹ / ₁₆
	mm	98.4	98.4	165	165	268	268
J	in.	4 ⁵ / ₁₆	4 ⁵ / ₁₆	4 ⁵ / ₁₆	4 ⁵ / ₁₆	5 ⁵ / ₁₆	5 ⁵ / ₁₆
	mm	110	110	110	110	135	135
K	in.	1 ⁷ / ₁₆	1 ⁷ / ₁₆	1 ⁷ / ₁₆	1 ⁷ / ₁₆	1 ⁷ / ₈	1 ⁷ / ₈
	mm	36.5	36.5	36.5	36.5	47.6	47.6
L	in.	³ / ₈	³ / ₈	³ / ₈	³ / ₈	¹ / ₂	¹ / ₂
		16 UNC	16 UNC	16 UNC	16 UNC	13 UNC	13 UNC
M	in.	3 ¹ / ₄	3 ¹ / ₄	3 ¹ / ₄	3 ¹ / ₄	5	5
	mm	82.6	82.6	82.6	82.6	127	127
N	in.	⁵ / ₈	⁵ / ₈	⁵ / ₈	⁵ / ₈	⁷ / ₈	1 ¹ / ₈
	mm	15.9	15.9	15.9	15.9	22.2	28.6

Weco® Pneumatic Actuator Specifications

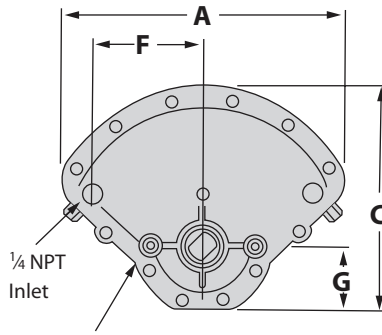


Weco® Pneumatic Actuator Specifications

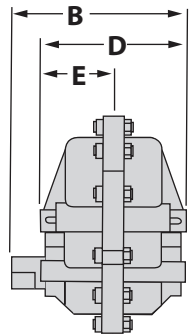
Pneumatic Vane Actuators

Fits 2" - 6" butterfly valves

Fits 2" - 6" butterfly valves		
Model	200	
Part #	3258068	
Weight	lb	10
	kg	4.54
A	in.	8.66
	mm	220
B	in.	5.56
	mm	141
C	in.	7.00
	mm	178
D	in.	4.62
	mm	117
E	in.	2.31
	mm	58.7
F	in.	3.41
	mm	86.6
G	in.	2.00
	mm	50.8



3/8 - 16 tapped hole x .56 deep
3 places on 3.25 dia. bolt circle
both sides



Weco® Pneumatic Actuator Specifications

Weco® Actuator Sizing Specifications

Required Operating Torques:

There are three torques to be considered when selecting the proper actuator for a butterfly valve:

- (1) Seating Torque - The torque required to displace a resilient seat and effect shutoff
- (2) Bearing Torque - The torque required to overcome friction forces on the valve shaft bearing surfaces
- (3) Dynamic Torque - Torque due to fluid forces which tend to close the valve.

The torques for resilient seated valves tabulated in this section are the sum of (1) and (2) above for various shutoff pressures. These tabulated values include a safety factor large enough to insure proper valve operation in most general butterfly valve applications. Where unusual service conditions exist (such as likelihood of seat swelling, or low and high temperature seat hardening), an additional safety factor may be applicable.

Dynamic Torque

Dynamic torque is torque on the valve shaft due to the fluid forces on the valve disc. This torque is a function of valve diameter, pressure drop, and a torque coefficient (C_t) which varies with angle opening. Torque is calculated by the equation:

$$T = C_t D^3 \Delta P$$

Where: T = Dynamic torque (in-lb)
 D = Valve Dia (in.)
 C_t = Dynamic torque coefficient (see table below)

		C_t vs. Angle Open									
Angle Open	0	10	20	30	40	50	60	70	80	90	
C_t	0	.007	.014	.022	.033	.050	.087	.143	.215	0	

Weco® Actuator Sizing Information

Dynamic torque is not usually of major concern in resilient seated butterfly valves unless the line velocity exceeds 20 fps. If line velocity exceeds this, a check should be made to insure that actuator output exceeds the calculated dynamic torque. Dynamic torque should be checked at 80° open for on-off applications.

Dynamic torque is of prime consideration in situations where line velocity is not recovered downstream of the valve. This situation exists on installations where there is an unlimited source and less than 6 diameters of pipe downstream of the valve. If a valve discharges to the atmosphere, the pressure drop across the valve will be equal to the height of water above the valve for all angles of valve opening. This pressure drop must not exceed the pressure drop

tabulated in Maximum ΔP vs. Angle Opening Tables for any angle. If it does, provisions must be made for velocity recovery by adding downstream piping.

Actuator Sizing For Tee Linkages:

For standard tee linkage applications where one actuator operates two butterfly valves of the same size with one valve opening as the other valve closes, the actuator sizing will be the same as for a single butterfly valve application. For the actuator sizing for other tandem linkage applications, consult the factory.

Low-Torque Valves:

Undercut discs are available for butterfly valve applications that require lower seating torques. For complete information, consult factory.

Weco® Actuator Sizing Information

Actuators Sizing Torque for Weco® Butterfly Valves

Valve Size, in.	Seating Torque In Inch-lb (N*m), @ Various Line Pressures						
	0 psi 0 kPa	50 psi 345 kPa	75 psi 517 kPa	100 psi 690 kPa	125 psi 862 kPa	150 psi 1034 kPa	175 psi 1207 kPa
2	90 10	90 10	92 10	94 11	96 11	98 11	100 11
2 1/2	130 15	130 15	134 15	138 15	142 16	146 17	150 17
3	200 23	200 23	206 23	212 24	218 25	224 25	230 26
4	350 23	350 40	366 41	382 43	398 45	414 47	430 49
5	535 60	535 60	566 64	597 67	628 71	659 74	690 78
6	770 87	770 87	823 93	876 99	929 105	982 111	1,035 117
8	1,350 153	1,350 153	1,475 167	1,600 181	1,725 195	1,850 209	1,975 223
10	2,100 237	2,100 237	2,340 264	2,580 292	2,820 319	3,060 346	3,300 373
12	3,000 339	3,000 339	3,400 384	3,800 429	4,200 475	4,600 520	5,000 565
14	3,680 416	4,240 479	4,790 541	5,350 605	5,900 667	6,480 732	
16	4,880 551	5,730 647	6,580 744	7,430 840	8,280 936	9,140 1030	
18	6,230 704	7,460 843	8,690 982	9,920 1121	11,150 1260	12,390 1400	
20	7,770 878	9,380 1060	11,000 1243	12,610 1425	14,230 1610	15,840 1790	
24	11,100 1250	14,010 1580	16,920 1910	19,830 2240	22,740 2570	25,650 2900	

NOTE: For valves using Teflon seats, use torque value at highest standard value rating even for lower pressure applications. Above figures are for values used in wet service, for dry service valves contact factory.

Weco® Actuator Sizing Information

Minimum Air Pressure for Weco® Pneumatic Actuators Operating Weco® Valves at 175 psi Rated Pressure

Double Acting Models	Actuator air pressure: psi, kPa		
	30 207	50 345	75 517
	Valve Sizes		
330	2" - 4"	2" - 5"	2" - 6"
350	2" - 6"	2" - 6"	2" - 6"
550	8"	8" - 10"	8" - 10"
550A	—	—	12"
590	8" - 10"	8" - 10"	8" - 10"
590A	12"	12"	12"

Spring Return Models	Actuator air pressure: psi (kPa) (Note 1)			
	30 (207) 40 (276)	40 (276) 50 (345)	60 (414) 70 (483)	70 (483) 80 (552)
	Valve Sizes			
332	2" - 2 1/2"	2 - 2 1/2"	2 - 2 1/2"	2 - 2 1/2"
333	—	—	—	2" - 4"
354	2" - 4"	2" - 4"	2" - 4"	2" - 4"
355	—	—	2" - 6"	2" - 6"
596	—	8" - 10"	8" - 10"	8" - 10"
597A	—	—	12"	12"

NOTES:

1. Pressure above line for air to open, spring to close. Below line for air to close, spring to open.
2. All of the above ratings are conservative for normal installations. Abnormally high torque conditions may necessitate increased actuator capability.
3. Maximum actuator air pressure: 120 psi, except 80 psi maximum pressure on Models 350, 590 and 590A.

Weco® Pneumatic Actuator Torque Ratings (note air pressure)

Double Acting Models	Displacement cu. in. cu. cm	Rated torque in. lb N*m	Pressure to achieve rated torque psi kPa
330	25 410	1,150 130	80 552
350	72 1180	1,150 130	30 207
550	120 1970	5,500 622	80 552
550A	120 1970	5,500 622	80 552
590	355 5820	5,500 622	30 207
590A	355 5820	5,500 622	30 207

Spring Return Models	Displacement cu. in. cu. cm	Spring closing torque in. lb N*m	Spring opening torque in. lb N*m	Air opening torque @ 80 psi in. lb N*m	Air Closing torque @ 80 psi in. lb N*m
332	25 410	150 17	300 34	1,000 113	850 96
333	25 40	425 48	850 96	725 82	300 34
354	72 1180	425 48	850 96	2,641 298	2,216 250
355	72 1180	1,050 119	2,100 237	2,016 228	966 109
596	355 5820	3,300 373	6,600 746	11,366 1280	8,066 911
597A	355 5820	5,000 565	10,000 1130	9,666 1100	4,666 527

NOTES: All of the above ratings are for normal installations. Abnormally high torque conditions may necessitate increased actuator air pressure.

Weco Model 200 Vane-Type Pneumatic Actuator

Operating Conditions	
Maximum Operating Pressure	120 psi (8.27 bar)
Maximum Housing Pressure	180 psi (12.41 bar)
Displacement	41 cu. in. (672 cu. cm.)/90° Stroke

Torque Data

Pressure	psi kPa	40 276	60 414	80 552	100 690	120 827
Torque Output	in. lb mm kg	800 90	1,200 136	1,600 181	2,000 226	2,400 271

Minimum Actuator Pressure for Weco Valves at 175 psi line pressure

Valve Size		2" - 4"	5"	6"
Pressure	psi kPa	30 207	45 310	60 414

NOTES: All of the above ratings are for normal installations. Abnormally high torque conditions may necessitate increased actuator air pressure.