

# "Apollo" Valves

Manufactured by Conbraco Industries, Inc.

**NEW!**



**2-Year  
Warranty**

**BUTTERFLY VALVES**

# BUTTERFLY VALVES

## Apollo® Butterfly Valves That Meet MSS SP-67 And API 609 Standards

Apollo® LD/WD 141 Series ductile iron butterfly valves offer an economical design that's ideal for use in industrial and HVAC/ mechanical applications. Rated at 200 psig (2"-12") and 150 psig (14"-24") bubble-tight shut-off between flanges, these general purpose valves offer reliable performance in all types of water: hot and cold, treated and untreated and for such tasks as ON/OFF and throttling, control isolation, flow balancing and diversion.

WD141 Model: One-piece wafer-style, sizes 2" to 12"  
LD141 Model: Lug valves, sizes 2" to 24".

Both models come equipped with an extended neck to assure a minimum 2" clearance between the valve top plate and pipe flange to allow ease of insulation installation.

### (1) Body Design

Ductile Iron ASTM A536

WD141 Model: a one-piece wafer design with flange locating holes in 8", 10", and 12";

LD141 Model: valves are full lug with tapped lugs, to ANSI 125/150 drillings. Face-to-face dimensions meet universal interchangeability standards outlined in MSS SP-67 and API 609.

### (2) Phenolic Backed Seat

The valves are equipped with a stretch-resistant, non-collapsible blowout-proof seat.

(Aluminum backing 14" to 24")

### (3) Seat Facing

Design of the seat facing eliminates the need to use flange gaskets with the valves.

### (4) Mounting Flange For Actuator

The valve's cast-in top plate is universally designed to ISO 5211 standard dimensions for mounting of Apollo® actuators and manual operators.

### (5) Single-Piece Through Shaft

To assure positive disc positioning and dependable performance, the valves feature a one-piece "Double D" shaft design.

### (6) Weather Seal

All models are equipped with a shaft weather seal (below bushing on some sizes).

### (7) Smooth Finish Disc Flats Top and Bottom

Interfacing with seat flats assures a high efficiency seal and prevents shaft-area leaking.

### (8) Splined Shaft

Splines provide a positive shaft-to-disc connection.

### (9) Four Bushings

Support shaft at three locations to enhance shaft alignment and absorb actuator side thrusts.

### (10) Profiled Disc Design

Precision disc assures bubble-tight shut-off with minimal torque and longer seat life.

### (11) Shaft Seal

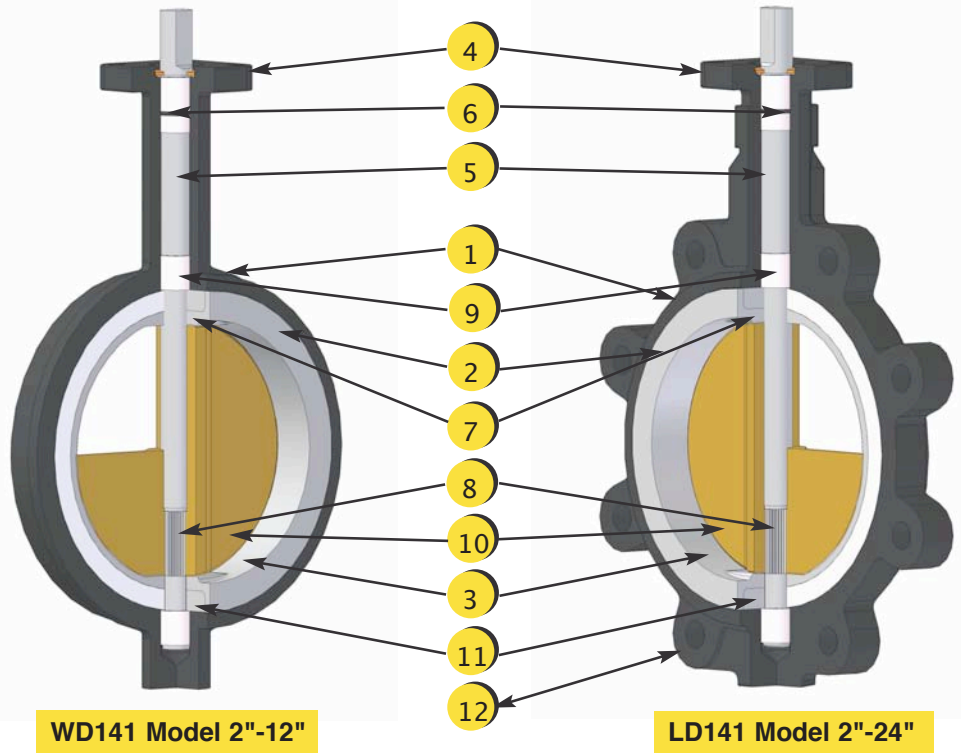
Bonding the elastomer to the phenolic backing ring guards against distortion, a frequent cause of shaft leakage.

### (12) End of Line Service

All 2" to 24" LD Model valves are equipped with retainer screws for dead end service; 2" through 12" to 200 psig, 14" through 24" to 150 psig.

### Testing

All valves are 100 percent factory tested in both operational directions before shipping.



WD141 Model 2"-12"

LD141 Model 2"-24"

# BUTTERFLY VALVES

## Self Locking Gear Operators

Self locking manual gear operators are available for all Apollo® WD141 and LD141 Series butterfly valves for heavy duty ON/OFF and throttling service. Gear operators are completely weatherproof and self-lubricating; they're equipped with position indicators and adjustable travel stops. Chainwheel operators are available. All units feature 12" handwheels with gearing for each size to keep rim pull at 50# or less.

## Handle And Notch Plate Kits

Handle and notch plate kits are supplied for manual operation, ON/OFF and throttling service. Kit provides positive disc position indication for 2" to 12" WD141 and LD141 Series butterfly valves. Locking handle and infinite position handle are also available.

## Apollo® Actuators

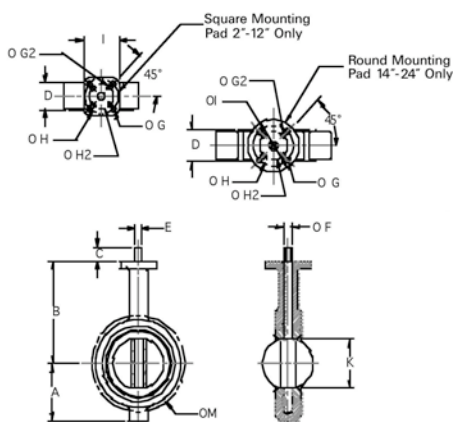
Apollo® Actuators are available as double acting or as spring return and come with a wide variety of corrosion resistant coatings for use in most any application. Standard features include external travel stop adjustments, high temperature, low friction bearings and seals. Mounting kits are available for ease of installation.



### WD141 & LD141 Series Dimensions

Valve Size (in.) (mm)	A	B	C	D	E	F	G	G2	Key
2	50	3.250	6.375	1.250	1.750	.394	.496	.375	--
2.5	65	3.750	6.875	1.250	1.875	.394	.496	.375	--
3	80	4.000	7.125	1.250	1.875	.394	.496	.375	--
4	100	4.875	7.875	1.250	2.125	.472	.621	.375	--
5	125	5.375	8.375	1.250	2.250	.551	.745	.375	--
6	150	5.875	8.875	1.250	2.250	.551	.745	.375	--
8	200	7.125	10.250	1.750	2.500	.669	.870	.563	.438
10	250	8.250	11.500	1.875	2.750	.866	1.120	.563	.438
12	300	9.750	13.250	1.875	3.125	.945	1.244	.563	--
14	350	11.000	14.500	1.875	3.125	.945	1.244	.563	--
16	400	12.000	15.750	2.000	3.500	--	1.313	.563	.313 SQ
18	450	14.375	16.625	2.000	4.250	--	1.500	.813	.375 SQ
20	500	14.625	18.875	2.500	5.250	--	1.625	.813	.375 SQ
24	600	18.000	22.125	2.750	6.125	--	2.000	.813	.500 SQ

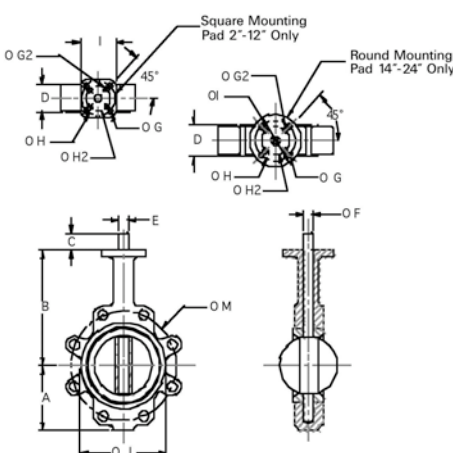
### WD Model



### WD141 & LD141 Series Dimensions

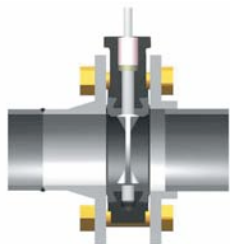
Valve Size (in.) (mm)	H	H2	I	J	K	L	N (141)	Tapped Lug Data (LD141)			
								M	#Holes	Tap NC.	
2	50	2.756	--	3.540	4.000	2.090	1.133	.6880	4.750	4	.625-11
2.5	65	2.756	--	3.540	4.750	2.540	1.706	.6880	5.500	4	.625-11
3	80	2.756	--	3.540	5.130	3.090	2.450	.6880	6.000	4	.625-11
4	100	2.756	--	3.540	6.750	4.090	3.488	.6880	7.500	8	.625-11
5	125	2.756	--	3.540	7.750	4.850	4.296	.8130	8.500	8	.750-10
6	150	2.756	--	3.540	8.630	6.130	5.697	.8130	9.500	8	.750-10
8	200	4.921	4.015	5.910	10.560	7.890	7.468	.8130	11.750	8	.750-10
10	250	4.921	4.015	5.910	13.060	9.890	9.484	.9380	14.250	12	.875-9
12	300	4.921	--	5.910	16.000	11.890	11.456	.9380	17.000	12	.875-9
14	350	4.921	--	5.910	17.130	13.380	13.000	1.060	18.750	12	1.000-8
16	400	4.921	--	5.910	20.000	15.380	14.970	1.060	21.250	16	1.000-8
18	450	6.496	--	8.270	21.380	17.380	16.847	1.250	22.750	16	1.125-7
20	500	6.496	--	8.270	23.310	19.380	18.650	1.250	25.000	20	1.125-7
24	600	6.496	--	8.270	27.880	23.380	22.558	1.380	29.500	20	1.250-7

### LD Model



# BUTTERFLY VALVES

Apollo® butterfly valves are designed for installation between ANSI Class 125/150 lb. weld-neck or slip-on flanges. While we suggest use of weld neck flanges, Apollo® models are configured to also accept slip-on flanges that eliminate failures associated with conventional butterfly valves. Be sure to properly align flange and valve when using raised face flanges. Type C stub end flanges are not recommended.



## PRESSURE RATINGS

When the valve is placed between the flanges for bi-directional bubble-tight shut-off, disc in closed position:

All Disc and Seat Combos  
 2" - 12" (50mm - 300mm)  
 200 psig (14 bar)  
 14" - 24" (350mm-600mm)  
 150 psig (10 bar)

## DEAD-END SERVICE

Without downstream flanges on lugged butterfly valve, dead-end pressure rating for valves 2" to 12" is 200 psig (14 bar) and 14" to 24" is 150 psig (10 bar).

## VELOCITY LIMITS

For ON/OFF Services  
 Non-abrasive liquids - 30 feet/seconds (9m/second)  
 Gases - 175 feet/second (54m/second)

## WD141 & LD141 Series Rated Flow Coefficient (Cv)

Valve Size (in.) (mm)	Angle of Disc Opening (degrees)									
	10°	20°	30°	40°	50°	60°	70°	80°	90°	
2 50	0.06	3	7	15	27	44	70	105	115	
2.5 65	0.10	6	12	25	45	75	119	178	196	
3 80	0.20	9	18	39	70	116	183	275	302	
4 100	0.30	17	36	78	139	230	364	546	600	
5 125	0.50	29	61	133	237	392	620	930	1022	
6 150	0.80	45	95	205	366	605	958	1437	1579	
8 200	2	89	188	408	727	1202	1903	2854	3136	
10 250	3	151	320	694	1237	2047	3240	4859	5340	
12 300	4	234	495	1072	1911	3162	5005	7507	8250	
14 350	6	338	715	1549	2761	4568	7230	10844	11917	
16 400	8	464	983	2130	3797	6282	9942	14913	16388	
18 450	11	615	1302	2822	5028	8320	13168	19752	21705	
20 500	14	791	1674	3628	6465	10698	16931	25396	27908	
24 600	22	1222	2587	5605	9989	16528	26157	39236	43116	

This chart should be used as a general guide.

For additional Cv information, consult the **Engineering and Application Data Section**. Cv = the volume of water in U.S. gallons per minute that will pass through a given valve opening with a pressure drop of 1 psig at room temperature.

## Torque Rating (in. lbs.)

Valve Size (in.) (mm)	Full Rated Pressures (psig)			
	ΔP50	ΔP100	ΔP150	ΔP200
2 50	100	106	111	117
2.5 65	150	163	176	189
3 80	207	220	232	244
4 100	290	323	357	390
5 125	423	481	540	598
6 150	599	691	783	875
8 200	1060	1183	1307	1430
10 250	1671	1872	2074	2275
12 300	2568	2795	3023	3250
14 350	2640	3070	3500	N/A
16 400	4260	4880	5500	N/A
18 450	6287	7243	8200	N/A
20 500	8360	9180	10000	N/A
24 600	15427	16813	18200	N/A

### Special Notations:

All torque values shown on chart are for wet (water and other non-lubricating media) on-off service. For dry service (non-lubricating, dry gas media), multiply values by 1.15. For lubed service (clean, nonabrasive lubricating media), multiply values by 0.85.

Under certain conditions, hydrodynamic torque can meet or exceed seating and unseating torques. When designing valve systems, hydrodynamic torque must be considered to help ensure correct selection of actuation.

# BUTTERFLY VALVES

## Apollo WD141/LD141 Series: 2"-24" Materials and Specifications

- Available in wafer and lug bodies.
- Compatible with ANSI 125/150 class flanges.
- Wafer body (8" to 12") features four alignment holes.
- Blow-out proof shaft
- Pressure ratings for bubble tight shut-off at temperatures up to maximum limit of the seat material:  
2" to 12" - 200 psig  
14" to 24" - 150 psig
- Ideal for ON/OFF and throttling service.
- Through-Stem design with splines connecting stem to disc.
- Encapsulated disc and stem: no exposure of body or stem to line media.
- Designed to fully comply with MSS SP-25, MSS-SP 67 and API 609. (See dimensional table for exact valve measurements.)
- Valves 3" to 24" meet the intent and have passed AWWA C-504 Section 5 proof of design tests.
- Maintaining optimum performance requires no field adjustment.

## WD141/LD141 Temperature Range of Seats

Type	Max	Min
Buna-N	+180°F (82°C)	+10°F (-12°C)
EPDM	+275°F (135°C)	-30°F (-34°C)

The WD/LD141 Series is not rated for steam service

## WD141/LD141 Series

No.	Name	Qty
1	Body	1
2	Seat	1
3	Shaft	1
4	Disc	1
5	Bushing	3
6	Stem Seal	1
7	Retaining rings	2

## Valve Construction 2" - 24" (50mm-600mm)

### Body

- Ductile Iron  
ASTM A536, (65-45-12)

### Seat

- EPDM
- Buna-N

### Bushings

- PTFE

### Stem Seal

- Buna-N

### Disc

- Nickel Plated Ductile Iron  
ASTM A536 (65-45-12)
- Aluminum-Bronze  
ASTM B148, C95400
- 316 Stainless Steel  
ASTM A351, Type CF8M

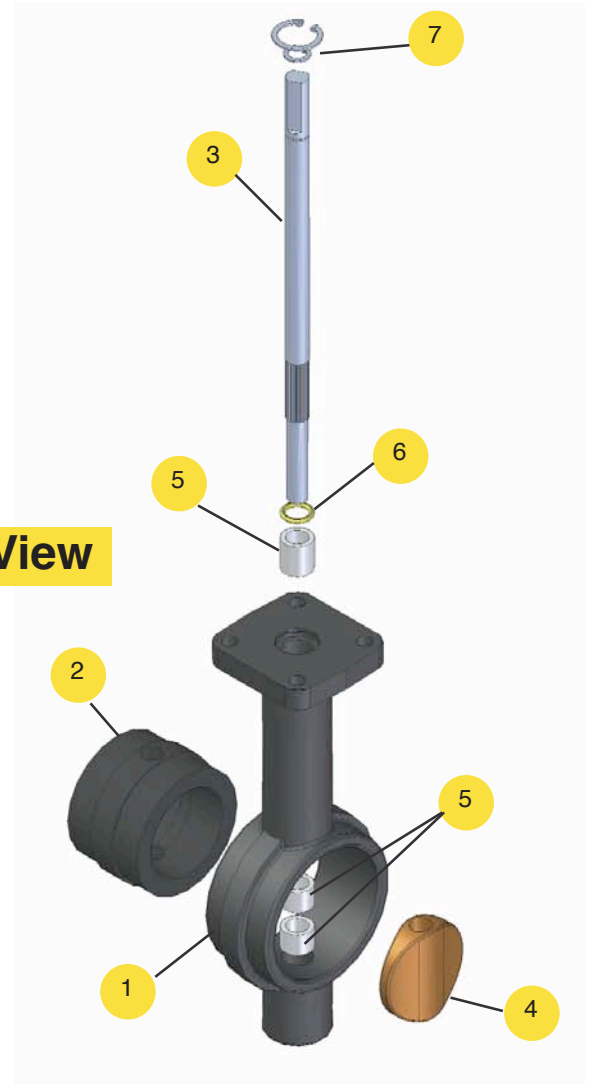
### Shaft

- 416 Stainless Steel  
ASTM A564, Type 416

## Weight(lbs)

Valve Size (in.)	Valve Size (mm)	WD141 Model	LD141 Model
2"	50	6	8
2.5"	65	6	10
3"	80	7	11
4"	100	11	17
5"	125	13	20
6"	150	16	23
8"	200	29	39
10"	250	44	62
12"	300	70	97
14"	350		148
16"	400		206
18"	450		277
20"	500		410
24"	600		592

## Exploded View



## Installation

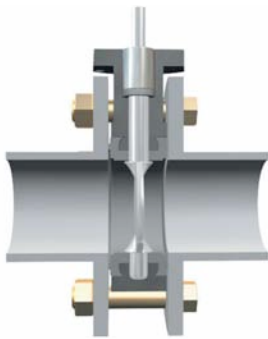
Installing WD/LD141 Series Valves

Begin by positioning the disc at partially open; maintain the disc within the body face-to-face. After positioning the valve body between flanges, install flange bolts. Don't use flange gaskets. Before tightening flange bolts, adjust disc to the full open position. This helps assure proper alignment and clearance between the outside diameter of the disc and the inside diameter of the pipe. Tighten bolts to spec with disc in full open position. After tightening, rotate disc carefully to closed position to assure proper outside diameter clearance.

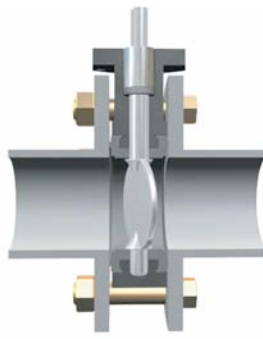
Maintenance

Apollo® butterfly valves are designed for extended service with minimal wear and servicing. No regular lubrication is needed. In case of replacement, put disc in a near closed position and remove from line, spread flanges and support the valve while removing flange bolts.

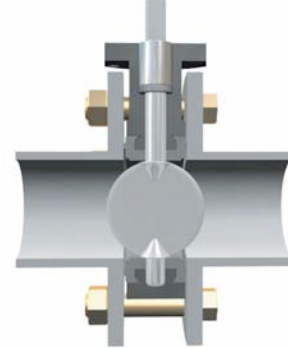
*Note: Always depressurize a piping system when removing a manual or power actuator or performing valve maintenance.*



Closed



Partially open



Open

### How To Specify Apollo® WD/LD141 Series Butterfly Valves

EXAMPLE: WD141-06-BE-11; 6" WD141 Series, Ductile Iron Wafer Body, Aluminum Bronze Disc, EPDM Seat, 416 SS Shaft with 10 Position Handle

XX		141	-	XX	-	X	X	-	1	X
SERIES	SIZE (in.)	DISC MATERIAL	SEAT MATERIAL	OPERATOR						
WD141	Wafer	02 2"	B Aluminum Bronze	E EPDM -30°F	0	None				
	Body	25 2.5"	D Ductile Iron A536	to +275°F	1	10 Position Handle				
LD141	Lug	03 3"	Nickel Plated	N BUNA-N +10°F	2	Gear Operator				
	Body	04 4"	S Stainless Steel, CF8M	to +180°F	3	Infinite Position Handle				
		05 5"			4	Locking Handle				
		06 6"			5	Gear Operator w/Chainwheel				
		08 8"			7	Locking Gear Operator				
		10 10"			8	Locking Gear Operator w/Chainwheel				
		12 12"								
		14 14"								
		16 16"								
		18 18"								
		20 20"								
		24 24"								