



**PDHonline Course M180 (2 PDH)**

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**Specifying and the Technical Evaluation  
of Butterfly Valves Used in the Oil &  
Gas Industry**

*Instructor: Peter Smith, HNC (Mech)*

**2020**

**PDH Online | PDH Center**

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[www.PDHonline.com](http://www.PDHonline.com)

An Approved Continuing Education Provider

# NIBCO®

AHEAD OF THE FLOW™



## Butterfly Valves

NIBCO flow-control solutions are everywhere you look, including on our website. We offer a wide range of metal and plastic valves and fittings that keep residential, commercial and industrial operations flowing smoothly throughout the world.



The "Valve Selection & Specification Guide" includes valuable information to assist in product selection.

★ *Major features include:*

- Design characteristic of each valve type
- Recommended applications & requirements
- Manufacturers cross-reference section
- Drill-down capabilities to recommended options
- E-mail access to technical support



The "New Products" page is a continuously updated showcase for new products by NIBCO.

★ *Current highlights include:*

- Commercial & light-industrial bronze ball valves
- TruConnect® fittings for Chem-Aire®
- Just Right® hot-water circulation device
- PEXlink® copper fittings for PEX applications
- Turf Bubbler Wick Irrigation® system for residential and commercial landscaping



The "Valves & Actuation" homepage at [www.nibco.com](http://www.nibco.com) provides easy access to valuable reference tools.

★ *Key information includes:*

- Price sheets (PDF & Excel format) —also accessible from home page
- Downloadable catalogs (PDF format)
- On-line product listings with spec. sheets
- Valve Selection & Spec. Guide
- Technical library



### Real-Time Information



Exclusive, secure web applications that allow quick access to customer specific information—and even on-line order processing.

Real-Time information accessible anytime, anywhere

# General Index

## Butterfly Valves

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### Key to Butterfly Valve Figure Number System\*

<b>L</b>	<b>D</b>	<b>-</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>0</b>
<b>Body Type</b>	<b>Body Material</b>	<b>Pressure Rating</b>	<b>Seat Material</b>	<b>Disc Material</b>	<b>Stem &amp; Bushing Combinations</b>		<b>Operating Mechanism</b>
L-Lug	D-Ductile Iron <sup>4</sup>	L-Actuated	0-EPDM	0-Aluminum Bronze	<b>Stem</b>	<b>Upper &amp; Lower</b>	<b>Collar</b>
W-Wafer	C-Cast Iron	1-150 psi	1-Buna-N (Nitrile)	1-Ductile Iron <sup>1</sup>	0-416SS	Copper Alloy	Brass
G-Grooved		2-200 psi	2-Fluoroelastomer	2-CF8M	1-416SS	316SS	Brass
F-Flanged		3-250 psi	5-UL/FM	6-EPDM Coated	2-17-4PH <sup>3</sup>	316SS <sup>3</sup>	316SS
		4-300 psi	7-Polyimid	Ductile Iron <sup>2</sup>	5-416SS	TFE/Bronze	-
		5-285 psi		7-Buna-N Coated	7-416SS	TFE	-
				Brass or Ductile Iron <sup>2</sup>	8-316SS		

\*This key is a guide only, it is not intended to infer that all combinations can or will be produced.

<sup>1</sup> Electro Nickel Plated. <sup>2</sup> Grooved and flanged end only.

<sup>3</sup> Lug style 14" and larger are 316SS stem with bronze bushings

<sup>4</sup> Lug style 30" and larger are cast iron bodies

### Key to N150 and N200 Butterfly Valves

<b>Series</b>	<b>Body Style</b>	<b>Seat Material</b>	<b>Disc Material</b>	<b>Operator</b>
N150 = 14"-24"	1 = Wafer	3 = EPDM	5 = Aluminum Bronze	LH = Lever
N200 = 2"-12"	2 = Lug	4 = Buna	6 = Ductile Iron	GO = Gear

# how to order

State quantity, figure number and size for each valve you wish to order. See individual valve catalog pages for specific or special product designations.

### HOW MANY TO ORDER –

NIBCO valves are decimal packed for your convenience in handling, shipping and stock-keeping. Number in master carton varies with item.

### POLICY ON RETURNS TO FACTORY –

NO NIBCO valves are to be returned without prior written agreement. Transportation must be prepaid. A 20% charge will be made to cover cost of rehandling and reinspection.

### TECHNICAL ASSISTANCE –

Engineers, contractors, wholesalers or manufacturers may obtain special or technical assistance from any factory representative of NIBCO. Write, fax or phone.

NIBCO INC.  
World Headquarters  
1516 Middlebury Street  
Elkhart, IN 46516-4740  
USA

Phone 1.574.295.3000  
Fax 1.574.295.3307  
Technical Service Phone 1.888.446.4226  
Fax 1.888.336.4226

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# Warranty

**NIBCO INC. 125% LIMITED WARRANTY**  
***Applicable to NIBCO INC. Pressure Rated Metal Valves***

NIBCO INC. warrants each NIBCO pressure rated metal valve to be free from defects in materials and workmanship under normal use and service for a period the lesser of one (1) year from the date put in service or two (2) years from the date of purchase.

In the event any defect occurs which the owner believes is covered by this warranty, the owner should immediately contact NIBCO Technical Services, either in writing or by telephone at (888) 446-4226 or (574) 295-3000. The owner will be instructed to return said product, at the owner's expense, to NIBCO INC., or an authorized representative for inspection. In the event said inspection discloses to NIBCO INC.'s satisfaction that said valve is defective, it will be replaced at NIBCO INC.'s expense. Replacements shall be shipped free of charge to the owner. In the event of the replacement of any valve, NIBCO INC. shall further pay the owner the greater of Twenty-Five (25%) Percent of the price of the valve according to NIBCO INC.'s published suggested list price schedule in effect at the time of purchase, or Ten (\$10.00) Dollars, to apply on the cost of the installation of said replacement valve.

TO THE EXTENT PERMITTED BY LAW, THIS WARRANTY SPECIFICALLY EXCLUDES INCIDENTAL AND CONSEQUENTIAL DAMAGES OF EVERY TYPE AND DESCRIPTION RESULTING FROM ANY CLAIMED DEFECT IN MATERIAL OR WORKMANSHIP, INCLUDING BUT NOT LIMITED TO, PERSONAL INJURIES AND PROPERTY DAMAGES. Some states or countries do not allow the exclusion or limitation of incidental or consequential damages so these limitations may not apply to you. TO THE EXTENT PERMITTED BY LAW, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state and country to country.

**NIBCO**<sup>®</sup> NIBCO INC. World Headquarters • 1516 Middlebury St. • Elkhart, IN 46516-4740 USA • [www.nibco.com](http://www.nibco.com)

# Butterfly Valves

## Factors to Consider When Choosing Butterfly Valves

### Operating Life

Butterfly valves can provide many maintenance free cycles and still provide "bubble tight" shut off.

### Pressure Drop

Energy costs go up with **excessive** pressure drop. Point to keep in mind—the valve or valves are but one factor in a piping system that contribute to pressure drop. Of equal concern are these factors:

- Flow area of piping.
- Friction loss against pipe walls.
- Change of flow direction via fittings.

Butterfly valves have flow characteristics three times better than globe valves and approximately 75% of an equivalent size gate valve.

### Versatility

Butterfly valves can be used for on/off service and throttling/balancing. They are superior in "versatility" as compared to a gate or globe valve. Butterfly valves have a wider range of chemical resistance due to the trim options and choice of elastomeric liners.

### Weight

Installation dollars saved with lightweight butterfly valves as compared to heavyweight cast iron valves; i.e. a 10" butterfly may weigh 55 pounds, whereas a 10" iron gate may weigh 490 pounds. This can be an important savings when it is calculated over an entire system. The heavier the system, the stronger the pipe hangers, and the more expensive they become. So by considering the weight of a valve one can also **reduce** piping system costs.

### Physical Size

Butterfly valves take up approximately 1/6 the space of a gate valve. Every cubic foot of a building costs money.

I.E.: 10" butterfly is about 21" high  
10" iron gate is about 43" high

### Bubble Tight Shut-Off

Gate and globe (metal to metal) seats cannot provide bubble tight shut-off. Resilient seated butterfly valves are bubble tight by design.

### Ease of Operation

Butterfly valves offer 1/4 turn (90°) open to close. Gates and globes require multiple turns to open and close. Ease of opening or closing means that butterfly valves can employ less expensive operators.

### Cost

A butterfly valve is generally 40% the cost of an iron gate. Not only low initial cost but low installation costs also.

### Maintenance

Properly installed butterfly valves are virtually self cleaning and are less susceptible to failure due to trash material in the line.

## 2000/3000 Series Butterfly Valves

\* **Threaded Collar Bushing** for positive stem retention (blow-out proof)

**Body and Stem O-ring Seals** of EPDM, Buna-N or Fluorocarbon.

**Extended Neck** for insulation up to 2".

**Molded-in Liner** fully supported by valve body at flange seals. Eliminates leakage between body and liner as in cartridge or boot type liners. Provides dead-end service without the need for a flange on the downstream side.

\* **Do not remove collar bushing with valve under pressure.**



**High-Strength Stem** materials with one-piece thru-disc design.

**Upper and Lower Bushings** are standard for smooth valve operation.

**Streamlined Spherical Disc** with high flow capacity.

**Internal Stem/Disc Drive** eliminates the need for pins or bolts which create additional leak paths, turbulence in the waterway or flow reduction.

**Ductile Iron Body** more durable than cast iron (reduces breakage).

**"Blind-Hole"** lower bushing prevents leakage.

### A High-Pressure Resilient-Seated Butterfly Valve Featuring:

- Pressure rating to 250 PSI, Vacuum to 28" Mercury
- Wide choice of materials to suit customer's application
- Bubble-tight shutoff at full pressure rating
- Dead-end service at 200 PSI, no down-stream flange required

### Operation

Bare shaft, lever-lock flow control handle, worm gear operator, electric and pneumatic actuators





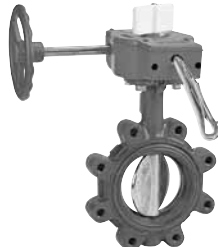






### Body Styles

Tapped full lug or wafer

# Butterfly Valves

## Illustrated Index

Visit [www.nibco.com](http://www.nibco.com) for on-line listing of information contained in this catalog.

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<p>Ductile Iron Body 250 PSI Lug Style Butterfly Valve</p>  <p><b>LD3000 Series</b> Sizes 2" thru 12" Molded-in Liner Ductile Iron or SS Disc Pages 10 - 12</p>	<p>UL Listed, FMRC Approved Ductile Iron Body Gear Operated with Flag Indicator</p>  <p><b>LD3510-8/WD3510-8</b> Sizes 2" thru 12" Ductile Iron Body Page 13</p>	<p>Ductile Iron Body 150 PSI Lug Style Butterfly Valve</p>  <p><b>LD1000 Series</b> Sizes 14" thru 48" Cartridge Liner Aluminum Bronze, DI or SS Disc Pages 14 - 16</p>	<p>Cast Iron Body 200 PSI Wafer/Lug Style Butterfly Valve</p>  <p><b>N200</b> Sizes 2" thru 12" Pages 17 - 19</p>
<p>Cast Iron Body 150 PSI Wafer/Lug Style Butterfly Valve</p>  <p><b>N150</b> Sizes 14" thru 24" Pages 20 - 21</p>	<p>Ductile Iron Body Polymid Coating 300 PSI Grooved End Butterfly Valve</p>  <p><b>GD4765/4775</b> Sizes 2" thru 12" Elastomer Coated Disc Pages 22 - 23</p>	<p>UL Listed, FMRC Approved Polymid Coated Ductile Iron Body Gear Operator with Flag 300 lb. W.W.P.</p>  <p><b>GD4765-8N</b> Grooved Mechanical Type Sizes 2½" thru 10" Page 24</p>	<p>CI or DI Body 200/285 PSI Flanged Butterfly Valve</p>  <p><b>FC2000/FD5000 Series</b> Sizes 2" thru 12" Elastomer Coated Disc Pages 25 - 27</p>



# 200 PSI Butterfly Valves

Ductile Iron Body • Extended Neck • Geometric Drive  
Molded-in Seat Liner • Lug and Wafer Style

**Sizes 2" through 12"**

Install between Std. ANSI Class 125/150 Flanges

CONFORMS TO MSS-SP67 • MSS-SP25 • API-609

## MATERIAL LIST

PART	SPECIFICATION
1. Stem	Stainless Steel ASTM A 582 Type 416
2. Collar Bushing	Brass ASTM B 124
3. Stem Seal	EPDM Rubber
4. Body Seal	EPDM Rubber
5. Nameplate	Aluminum
6. Upper Bushing	Copper CDA 122
7. Liner	EPDM Rubber
8. Disc	Alum. Brz. ASTM B 148 Alloy 954/955
9. Lower Bushing	Copper CDA 122
10. Body Wafer	Ductile Iron ASTM A 536
11. Body Lug	Ductile Iron ASTM A 536

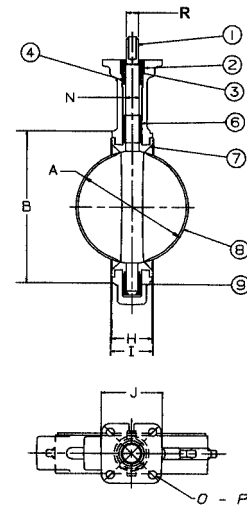


**WD 2000**  
Wafer Style  
EPDM Liner  
and Aluminum  
Bronze Disc

**LD 2000**  
Lug Style  
EPDM Liner  
and Aluminum  
Bronze Disc

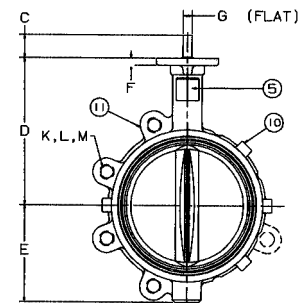
## DIMENSIONS — WEIGHTS

Size	A		B		C		D		E		F		G	Metal	Rubber	J	N
In. mm.	A	B	C	D	E	F	Flat	H	I	Square	Dia.						
2	50	2.53	4.00	1.25	5.38	2.88	.38	.312	1.688	1.812	3.25	.500					
2½	65	2.90	4.69	1.25	5.88	3.27	.38	.370	1.812	1.938	3.25	.562					
3	80	3.15	5.12	1.25	6.12	3.40	.38	.370	1.812	1.938	3.25	.562					
4	100	4.09	6.12	1.25	6.88	4.00	.38	.403	2.062	2.188	3.25	.625					
5	125	5.13	7.25	1.25	7.38	4.75	.38	.496	2.188	2.312	3.25	.750					
6	150	6.13	8.25	1.25	8.00	5.29	.38	.496	2.188	2.312	3.25	.750					
8	200	8.13	10.41	1.25	9.25	6.50	.50	.560	2.375	2.500	3.25	.875					
10	250	10.13	12.52	1.25	10.50	8.00	.50	.686	2.688	2.812	4.75	1.125					
12	300	12.13	15.00	1.25	12.00	9.25	.50	.748	3.000	3.125	4.75	1.250					



## Capscrew/Stud Data

Size	O	P	R	K	L	Wafer	Lug	M	Lug	Wafer	Wafer	Wafer	
In. mm.	B.C.	Dia.	Dia.	No.	Dia.	Length	Length	B.C.	Weight	Weight	Weight	Weight	
									Lbs.	Kg.	Lbs.	Kg.	
2	50	3.25	.437	.437	4	5/8-11unc	4	1½	4¾	7	3.2	5.5	2.5
2½	65	3.25	.437	.500	4	5/8-11unc	4¼	1½	5½	9	4.1	7.5	3.4
3	80	3.25	.437	.500	4	5/8-11unc	4¼	1¾	6	9.5	4.3	8	3.6
4	100	3.25	.437	.562	8	5/8-11unc	5	1¾	7½	15	6.8	11	5.0
5	125	3.25	.437	.656	8	¾-10unc	5¼	2	8½	21	9.5	15	6.8
6	150	3.25	.437	.656	8	¾-10unc	5¼	2	9½	24	10.9	18	8.2
8	200	3.25	.437	.781	8	¾-10unc	5¾	2¼	11¼	34	15.4	28	12.7
10	250	5.00	.562	1.000	12	7/8-9unc	6¼	2¼	14¼	62	28.1	45.5	20.7
12	300	5.00	.562	1.062	12	7/8-9unc	6¾	2½	17	90	40.9	70	31.8



For actuated service where a lower torque is required use NIBCO Fig. No. WDLXXX-0 or LDLXXX-0 series, sizes 2" thru 12" only. Maximum pressure rating of 100 PSI for wet application and 50 PSI for dry application

NOT RECOMMENDED  
FOR STEAM SERVICE

# 200 PSI Butterfly Valves

Ductile Iron Body • Extended Neck • Geometric Drive  
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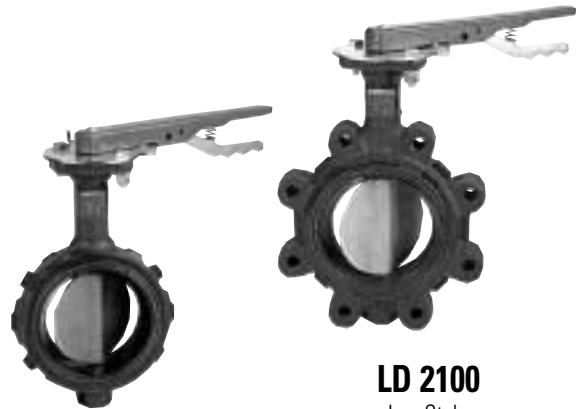
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Install between Std. ANSI Class 125/150 Flanges

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4. Body Seal	Buna-N Rubber Nitrile
5. Nameplate	Aluminum
6. Upper Bushing	Copper CDA 122
7. Liner	Buna-N Rubber Nitrile
8. Disc	Alum. Brz. ASTM B 148 Alloy 954/955
9. Lower Bushing	Copper CDA 122
10. Body Wafer	Ductile Iron ASTM A 536
11. Body Lug	Ductile Iron ASTM A 536

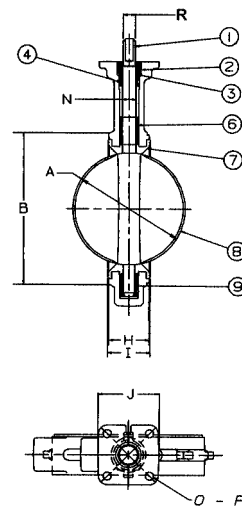


**WD 2100**  
Wafer Style  
Buna-N Liner  
and Aluminum  
Bronze Disc

**LD 2100**  
Lug Style  
Buna-N Liner  
and Aluminum  
Bronze Disc

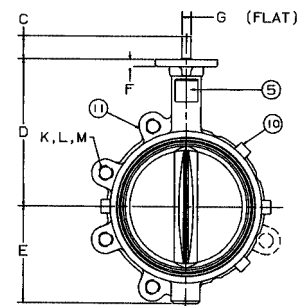
## DIMENSIONS — WEIGHTS

Size		A	B	C	D	E	F	G	Metal	Rubber	J	N
In.	mm.							Flat	H	I	Square	Dia.
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3	80	3.15	5.12	1.25	6.12	3.40	.38	.370	1.812	1.938	3.25	.562
4	100	4.09	6.12	1.25	6.88	4.00	.38	.403	2.062	2.188	3.25	.625
5	125	5.13	7.25	1.25	7.38	4.75	.38	.496	2.188	2.312	3.25	.750
6	150	6.13	8.25	1.25	8.00	5.29	.38	.496	2.188	2.312	3.25	.750
8	200	8.13	10.41	1.25	9.25	6.50	.50	.560	2.375	2.500	3.25	.875
10	250	10.13	12.52	1.25	10.50	8.00	.50	.686	2.688	2.812	4.75	1.125
12	300	12.13	15.00	1.25	12.00	9.25	.50	.748	3.000	3.125	4.75	1.250



## Capscrew/Stud Data

Size	O	P	R	K	L	Wafer Length	Lug Length	M	Lug Weight		Wafer Weight		
									Lbs.	Kg.	Lbs.	Kg.	
2	50	3.25	.437	.437	4	5/8-11unc	4	1½	4¾	7	3.2	5.5	2.5
2½	65	3.25	.437	.500	4	5/8-11unc	4¼	1½	5½	9	4.1	7.5	3.4
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8	200	3.25	.437	.781	8	¾-10unc	5¾	2¼	11¾	34	15.4	28	12.7
10	250	5.00	.562	1.000	12	7/8-9unc	6¼	2¼	14¼	62	28.1	45.5	20.7
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4. Body Seal	EPDM Rubber
5. Nameplate	Aluminum
6. Upper Bushing	Copper CDA 122
7. Liner	EPDM Rubber
8. Disc	Ductile Iron ASTM A 395 (plated)
9. Lower Bushing	Copper CDA 122
10. Body Wafer	Ductile Iron ASTM A 536
11. Body Lug	Ductile Iron ASTM A 536

### DIMENSIONS — WEIGHTS

Size		A	B	C	D	E	F	G	Metal	Rubber	J	N
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3	80	3.15	5.12	1.25	6.12	3.40	.38	.370	1.812	1.938	3.25	.562
4	100	4.09	6.12	1.25	6.88	4.00	.38	.403	2.062	2.188	3.25	.625
5	125	5.13	7.25	1.25	7.38	4.75	.38	.496	2.188	2.312	3.25	.750
6	150	6.13	8.25	1.25	8.00	5.29	.38	.496	2.188	2.312	3.25	.750
8	200	8.13	10.41	1.25	9.25	6.50	.50	.560	2.375	2.500	3.25	.875
10	250	10.13	12.52	1.25	10.50	8.00	.50	.686	2.688	2.812	4.75	1.125
<b>12</b>	<b>300</b>	<b>12.13</b>	<b>15.00</b>	<b>1.25</b>	<b>12.00</b>	<b>9.25</b>	<b>.50</b>	<b>.748</b>	<b>3.000</b>	<b>3.125</b>	<b>4.75</b>	<b>1.250</b>

### Capscrew/Stud Data

Size	O	P	R	K	L	Wafer Length	Lug Length	M	Lug Weight		Wafer Weight		
									Lbs.	Kg.	Lbs.	Kg.	
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3	80	3.25	.437	.500	4	5/8-11unc	4¼	1⅝	6	9.5	4.3	8	3.6
4	100	3.25	.437	.562	8	5/8-11unc	5	1⅞	7½	15	6.8	11	5.0
5	125	3.25	.437	.656	8	¾-10unc	5¼	2	8½	21	9.5	15	6.8
6	150	3.25	.437	.656	8	¾-10unc	5¼	2	9½	24	10.9	18	8.2
8	200	3.25	.437	.781	8	¾-10unc	5¾	2¼	11¾	34	15.4	28	12.7
10	250	5.00	.562	1.000	12	7/8-9unc	6¼	2¼	14¼	62	28.1	45.5	20.7
12	300	5.00	.562	1.062	12	7/8-9unc	6¾	2½	17	90	40.9	70	31.8

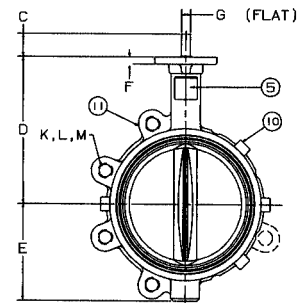
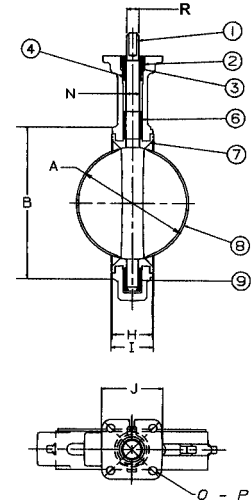


**LD 3010**

Lug Style  
EPDM Liner  
and Ductile Disc

**WD 3010**

Wafer Style  
EPDM Liner  
and Ductile Disc



For actuated service where a lower torque is required use NIBCO Fig. No. WDLXXX-0 or LDLXXX-0 series, sizes 2" thru 12" only. Maximum pressure rating of 100 PSI for wet application and 50 PSI for dry application

NOT RECOMMENDED  
FOR STEAM SERVICE

# 250 PSI Butterfly Valves

Ductile Iron Body • Extended Neck • Geometric Drive  
Molded-in Seat Liner • Lug and Wafer Style

**Sizes 2" through 12"**

Install between Std. ANSI Class 125/150 Flanges

CONFORMS TO MSS-SP67 • MSS-SP25 • API-609

## MATERIAL LIST

PART	SPECIFICATION
1. Stem	Stainless Steel ASTM A 582 Type 416
2. Collar Bushing	Brass ASTM B 124
3. Stem Seal	Buna-N Rubber
4. Body Seal	Buna-N Rubber
5. Nameplate	Aluminum
6. Upper Bushing	Copper CDA 122
7. Liner	Buna-N Rubber
8. Disc	Ductile Iron ASTM A 395 (Plated)
9. Lower Bushing	Copper CDA 122
10. Body Wafer	Ductile Iron ASTM A 536
11. Body Lug	Ductile Iron ASTM A 536

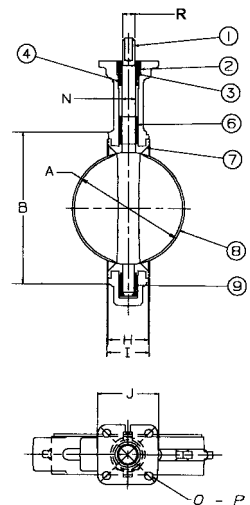


**WD 3110**  
Wafer Style  
Buna-N Liner  
and Ductile Disc

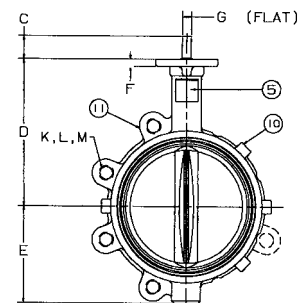
**LD 3110**  
Lug Style  
Buna-N Liner  
and Ductile Disc

## DIMENSIONS — WEIGHTS

Size		G						Metal	Rubber	J	N	
In.	mm.	A	B	C	D	E	F	Flat	H	I	Square	Dia.
2	50	2.53	4.00	1.25	5.38	2.88	.38	.312	1.688	1.812	3.25	.500
2½	65	2.90	4.69	1.25	5.88	3.27	.38	.370	1.812	1.938	3.25	.562
3	80	3.15	5.12	1.25	6.12	3.40	.38	.370	1.812	1.938	3.25	.562
4	100	4.09	6.12	1.25	6.88	4.00	.38	.403	2.062	2.188	3.25	.625
5	125	5.13	7.25	1.25	7.38	4.75	.38	.496	2.188	2.312	3.25	.750
6	150	6.13	8.25	1.25	8.00	5.29	.38	.496	2.188	2.312	3.25	.750
8	200	8.13	10.41	1.25	9.25	6.50	.50	.560	2.375	2.500	3.25	.875
10	250	10.13	12.52	1.25	10.50	8.00	.50	.686	2.688	2.812	4.75	1.125
12	300	12.13	15.00	1.25	12.00	9.25	.50	.748	3.000	3.125	4.75	1.250



Size	Capscrew/Stud Data							Lug Weight		Wafer Weight			
	In.	mm.	O B.C.	P Dia.	R Dia.	K No.	L Dia.	Wafer Length	Lug Length	M B.C.	Lbs.	Kg.	Lbs.
2	50	3.25	.437	.437	4	5/8-11unc	4	1½	4¾	7	3.2	5.5	2.5
2½	65	3.25	.437	.500	4	5/8-11unc	4¼	1½	5½	9	4.1	7.5	3.4
3	80	3.25	.437	.500	4	5/8-11unc	4¼	1⅝	6	9.5	4.3	8	3.6
4	100	3.25	.437	.562	8	5/8-11unc	5	1⅞	7½	15	6.8	11	5.0
5	125	3.25	.437	.656	8	¾-10unc	5¼	2	8½	21	9.5	15	6.8
6	150	3.25	.437	.656	8	¾-10unc	5¼	2	9½	24	10.9	18	8.2
8	200	3.25	.437	.781	8	¾-10unc	5¾	2¼	11¾	34	15.4	28	12.7
10	250	5.00	.562	1.000	12	7/8-9unc	6¼	2¼	14¼	62	28.1	45.5	20.7
12	300	5.00	.562	1.062	12	7/8-9unc	6¾	2½	17	90	40.9	70	31.8



For actuated service where a lower torque is required use NIBCO Fig. No. WDLXXX-0 or LDLXXX-0 series, sizes 2" thru 12" only. Maximum pressure rating of 100 PSI for wet application and 50 PSI for dry application

NOT RECOMMENDED  
FOR STEAM SERVICE

# 250 PSI Butterfly Valves

Ductile Iron Body • Extended Neck • Geometric Drive • 316 S.S. Trim  
Molded-in Seat Liner • Lug and Wafer Style

**Sizes 2" through 12"**

Install between Std. ANSI Class 125/150 Flanges

CONFORMS TO MSS-SP67 • MSS-SP25 • API-609

## MATERIAL LIST

PART	SPECIFICATION
1. Stem	Stainless Steel ASTM A 564 Type 17-4PH
2. Collar Bushing	Stainless Steel ASTM A 276 Type 316
3. Stem Seal	Options: See Below*
4. Body Seal	Options: See Below*
5. Nameplate	Aluminum
6. Upper Bushing	Stainless Steel ASTM A 276 Type 316
7. Liner	Options: See Below*
8. Disc	Stainless Steel ASTM A 743 Grade CF8M
9. Lower Bushing	Stainless Steel ASTM A 276 Type 316
10. Body Wafer	Ductile Iron ASTM A 536
11. Body Lug	Ductile Iron ASTM A 536

\*Optional Liners/Seals: **0** - EPDM  
**1** - Buna-N (Nitrile)  
**2** - Fluoroelastomer

## DIMENSIONS — WEIGHTS

Size		A	B	C	D	E	F	G	Metal	Rubber	J	N
In.	mm.							Flat	H	I	Square	Dia.
2	50	2.53	4.00	1.25	5.38	2.88	.38	.312	1.688	1.812	3.25	.500
2½	65	2.90	4.69	1.25	5.88	3.27	.38	.370	1.812	1.938	3.25	.562
3	80	3.15	5.12	1.25	6.12	3.40	.38	.370	1.812	1.938	3.25	.562
4	100	4.09	6.12	1.25	6.88	4.00	.38	.403	2.062	2.188	3.25	.625
5	125	5.13	7.25	1.25	7.38	4.75	.38	.496	2.188	2.312	3.25	.750
6	150	6.13	8.25	1.25	8.00	5.29	.38	.496	2.188	2.312	3.25	.750
8	200	8.13	10.41	1.25	9.25	6.50	.50	.560	2.375	2.500	3.25	.875
10	250	10.13	12.52	1.25	10.50	8.00	.50	.686	2.688	2.812	4.75	1.125
12	300	12.13	15.00	1.25	12.00	9.25	.50	.748	3.000	3.125	4.75	1.250

Size	Capscrew/Stud Data							Lug Weight		Wafer Weight		
	O	P	R	K	L	Wafer Length	Lug Length	M	Lbs.	Kg.	Lbs.	Kg.
In. mm.	B.C.	Dia.	Dia.	No.	Dia.			B.C.				
2 50	3.25	.437	.437	4	⅝-11unc	4	1½	4¾	7	3.2	5.5	2.5
2½ 65	3.25	.437	.500	4	⅝-11unc	4¼	1½	5½	9	4.1	7.5	3.4
3 80	3.25	.437	.500	4	⅝-11unc	4¼	1⅝	6	9.5	4.3	8	3.6
4 100	3.25	.437	.562	8	⅝-11unc	5	1⅞	7½	15	6.8	11	5.0
5 125	3.25	.437	.656	8	¾-10unc	5¼	2	8½	21	9.5	15	6.8
6 150	3.25	.437	.656	8	¾-10unc	5¼	2	9½	24	10.9	18	8.2
8 200	3.25	.437	.781	8	¾-10unc	5¾	2¼	11¾	34	15.4	28	12.7
10 250	5.00	.562	1.000	12	⅞-9unc	6¼	2¼	14¼	62	28.1	45.5	20.7
12 300	5.00	.562	1.062	12	⅞-9unc	6¾	2½	17	90	40.9	70	31.8

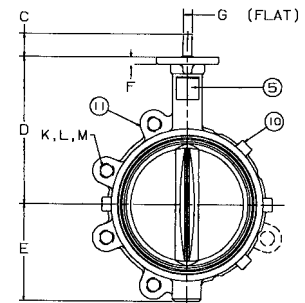
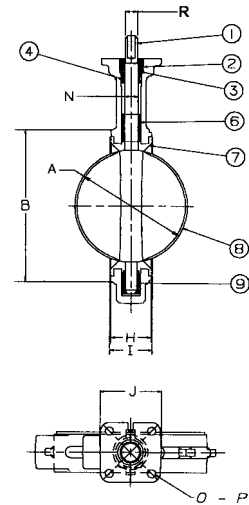
For actuated service where a lower torque is required use NIBCO Fig. No. WDLXXX-0 or LDXXX-0 series, sizes 2" thru 12" only. Maximum pressure rating of 100 PSI for wet application and 50 PSI for dry application



**WD 3\*22**  
Wafer Style  
Optional Liner  
and CF8M Disc

**LD 3\*22**

Lug Style  
Optional Liner  
and CF8M Disc



NOT RECOMMENDED  
FOR STEAM SERVICE

# 250 lb. WWP UL/FM Butterfly Valves

Fire Protection Valve • Wafer or Lug Style Body • Molded in Seat •  
Accepts internal and external supervisory switches

## 250 PSI/17.2 Bar Non-Shock Cold Water

- CONFORMS TO MSS SP-67 • UL LISTED • FMRC APPROVED •
- 2" - 8" UL LISTED FOR INDOOR AND OUTDOOR SERVICE •
- 10" & 12" FOR INDOOR SERVICE ONLY •
- APPROVED BY NEW YORK CITY B.S.A. 612-87-SM •
- CALIFORNIA STATE FIRE MARSHAL LISTING NO. 7770-1243:104

### MATERIAL LIST

PART	SPECIFICATION
1. Stem	Stainless Steel ASTM 582 Type 416
2. Collar Bushing	Brass ASTM B 124
3. Upper Bushing	Copper Alloy CDA 122
4. Stem Seal	EPDM
5. Body Seal	EPDM
6. Disc	Ductile Iron ASTM 395 (Nickel Plated)
7. Liner	EPDM
8. Lower Bushing	Copper Alloy CDA 122
9. Nameplate	Aluminum
10. Body	Ductile Iron ASTM A 536
11. Gear Operator	Cast Iron and Steel
12. Indicator Flag	Cast Iron
13. Handwheel	Cast Iron
14. Switch Box	Aluminum (10" and 12" only) (not shown)

\*\*-8 version has two factory mounted internal supervisory switches. 2" thru 8" uses switch TS-3. 10" thru 12" uses switch TS-1.  
-4 version less switches.

Note: Wafer body will mate with ANSI or ISO flanges. O.D. of wafer body notched to fit ISO bolt circle.

Lug body available with ISO flange dimensions and metric bolt hole threads.

For dead-end service use lug style (rated 200 PSI for this service).

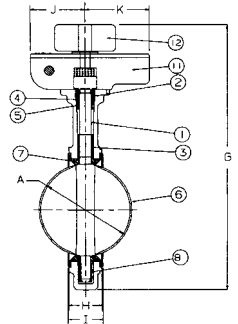
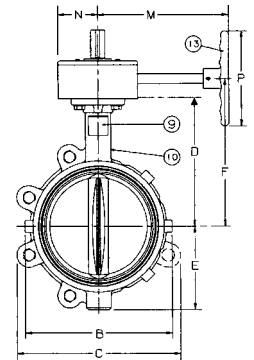


**WD3510-8\*\***

Wafer  
(4" Shown)

**LD3510-8\*\***

Lug  
(Not Shown)



(10" Shown)

## DIMENSIONS—WEIGHTS—QUANTITIES

Size	Dimensions											Flange/Stud Data				Weight					
	A	B	C	D	E	F	G	H	I	J	Dia.	Wafer	Lug	BC	Lug	Wafer	Lbs.	Kg.	Lbs.	Kg.	
In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	No.	In. mm.	In. mm.	In. mm.	In. mm.	Lbs.	Kg.	Lbs.	Kg.		
2	50	2.53	64	4.88	124	4.62	117	5.38	137	2.88	73	6.89	175	12.75	324	1.68	43	1.81	46	2.91	74
2½	65	2.90	74	5.62	143	5.12	130	5.88	149	3.25	83	7.36	187	13.63	346	1.81	46	1.94	49	2.91	74
3	80	3.17	81	6.12	155	5.50	140	6.12	155	3.38	86	7.60	193	14.00	356	1.81	46	1.94	49	2.91	74
4	100	4.17	106	7.00	178	8.25	210	6.88	175	4.00	102	8.39	213	15.38	391	2.06	52	2.19	56	2.91	74
5	125	5.17	131	8.25	210	9.38	238	7.38	187	4.75	121	8.86	225	16.63	422	2.19	56	2.31	59	2.91	74
6	150	6.17	157	9.25	235	10.25	260	8.00	203	5.25	133	9.49	241	17.75	451	2.19	56	2.31	59	2.91	74
8	200	8.17	208	11.62	295	12.38	314	9.25	235	6.50	165	10.75	273	20.25	514	2.38	60	2.50	64	2.91	74
10	250	10.17	258	14.25	362	15.50	394	10.50	267	8.00	203	12.28	312	23.50	597	2.68	69	2.81	71	3.90	99
12	300	12.17	309	16.75	425	18.25	464	12.00	305	9.25	235	13.78	350	26.25	667	3.00	76	3.12	79	3.90	99

Note - For use with cast iron class 125/steel class 150 flanges



# Large Diameter Butterfly Valves

## LD1000 Series

### Ductile Iron

Lug body

### EPDM or Buna-N liner materials

- 14" thru 36" size range
- 150 PSI WOG
- Vacuum service to 28"
- Bubble tight shut off at full rated pressure
- Bidirectional dead end service
- Extended neck for 2" of insulation
- Aluminum bronze, 316SS, nickel plated ductile iron disc
- 416 stainless steel stem
- Meets or exceeds the requirements of MSS-SP67



# 150 PSI Butterfly Valves

Ductile Iron Body • Cartridge Liner • Lug Style

Sizes 14", 16", 18", 20", and 24"

Install between Std. ANSI Class 125/150 Flanges

CONFORMS TO MSS-SP67 • MSS-SP25 • API-609

## MATERIAL LIST

PART	SPECIFICATION
1. Bottom Plate	Steel ASTM A-108 Grade 1035
2. Bolt	Steel ASTM A 307/ASTM A 307 (2 for 14"-20", 4 for 24")
3. O-Ring	Buna-N Rubber Nitrile
4. Bushing	Bronze ASTM B 584 Grade C83600
5. O-Ring (2)	Buna-N Rubber Nitrile
6. Body	Ductile Iron ASTM A 536
7. Seat	EPDM Rubber Buna-N Rubber Nitrile
8. Disc	Alum. Brz. ASTM B-148 Alloy C95400 Ductile Iron ASTM A 536 Grade 65-45-12 (plated) Stainless Steel ASTM A 351 Grade CF8M
9. Stem	Stainless Steel ASTM A 582 Type 416 or Stainless Steel ASTM A 276 316SS
10. Taper Pin (2)	Stainless Steel ASTM A 564 Type 17-4PH
11. Bushing	Bronze ASTM B-584 Grade C83600
12. Nameplate	Aluminum
13. Bushing	Bronze ASTM B-584 Grade C83600
14. Key	Steel ASTM A 108 Grade 1045
15. Seat Back Ring	Phenolic Resin, Aluminum B 26 (16" & larger) 14" - 24" six set screws in backing (not shown)

## DIMENSIONS — WEIGHTS

Size	A	Min.	B	C				G	H	I	
In. mm.	Dia.	Pipe I.D.	Dia.	Dia.	D	E	F	Body	Seat	Dia.	
14	350	13.1	13.0	14.8	17.2	14.5	1.77	26.77	3.01	3.13	1.244
16	400	15.3	15.2	17.3	19.2	15.7	2.02	29.94	3.38	3.54	1.305
18	450	17.3	17.1	19.3	21.2	16.6	2.02	31.55	4.12	4.29	1.496
20	500	19.4	18.9	21.1	23.3	18.9	2.53	35.65	5.14	5.31	1.632
24	600	23.3	23.1	25.7	32.1	22.1	2.76	40.20	5.98	6.14	1.994

## DIMENSIONS — WEIGHTS

Size	J	K	L	Q		Cap Screw	S	Lug Weight		
In. mm.	Dia.	Dia.	Dia.	P	Dia.	Length	Dia.	Lbs.	Kg.	
14	350	5.50	4.25	0.56	12	1-8UNC	2.75	18.75	121	54.9
16	400	7.75	6.25	0.81	16	1-8UNC	3.25	21.25	211	95.8
18	450	7.75	6.25	0.81	16	1½-7UNC	3.50	22.75	268	122.6
20	500	7.75	6.25	0.81	20	1½-7UNC	4.00	25.00	444	201.6
24	600	10.87	8.50	0.87	20	1¼-7UNC	4.75	29.50	594	269.7

NOT RECOMMENDED  
FOR STEAM SERVICE

### LD 1000/LD 1100

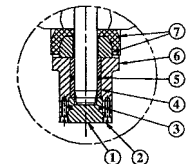
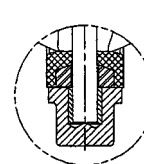
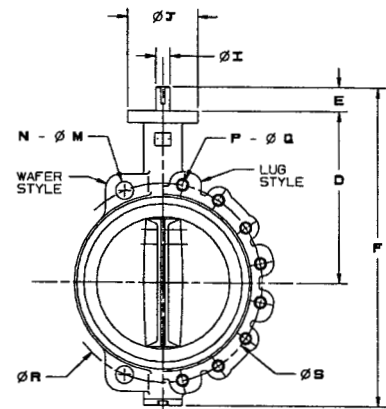
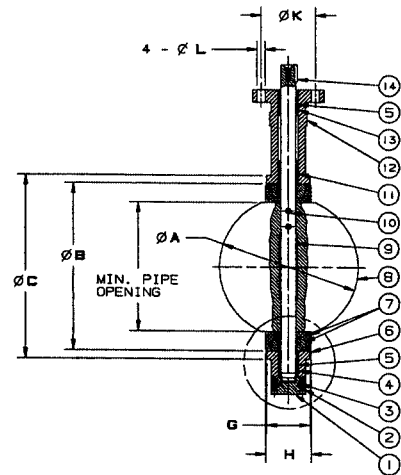
Lug Style  
EPDM or Buna-N Liner  
Aluminum Bronze Disc

### LD 1010/LD 1110

Lug Style  
EPDM or Buna-N Liner  
Ductile Iron Disc

### LD 1022/LD 1122

Lug Style  
EPDM or Buna-N Liner  
Stainless Steel Disc



14" Reference

16"-24" Reference



# 150 PSI Butterfly Valves

Cast Iron Body • Cartridge Liner • Double Flanged

Sizes 30", 36", 42" and 48"

Install between Std. ANSI Class 125/150 Flanges

CONFORMS TO MSS-SP67

## MATERIAL LIST

PART	SPECIFICATION
1. Body	Cast Iron ASTM A 126 Class B
2. Bushing	Bronze ASTM B 584 Grade C83600
3. Lower Stem	Stainless Steel ASTM A 582 Type 416 Stainless Steel ASTM A 276 Type 316SS
3a. Upper Stem	Stainless Steel ASTM A 582 Type 416 Stainless Steel ASTM A 276 Type 316SS
4. Seat Back Ring	Phenolic Resin, Aluminum B26 30" - 36" eight set screws in backing 42" - 48" ten set screws in backing
5. Seat	Rubber - BUNA (NBR) Rubber - EPDM
6. Disc	Aluminum Bronze ASTM B 148 C95400 Ductile Iron ASTM A 536 65-45-12 Stainless Steel ASTM A 351 Grade CF8M
7. Taper Pin(3)	Stainless Steel ASTM A 582 Type 416
8. Rivet	Steel
9. Nameplate	Aluminum
10. Bushing	Bronze ASTM B 584 C83600
11. Flat Key	Steel ASTM A 108 1045
12. Bushing	Bronze ASTM B 584 C83600
13. Socket Bolt	Steel ASTM A 307
14. O-Ring	Rubber BUNA (NBR)
15. Bottom Plate	Steel ASTM A-108 1035
16. Thrust Bearing	Bearing Steel
17. Washer	Steel

## LD 1000/LD 1100

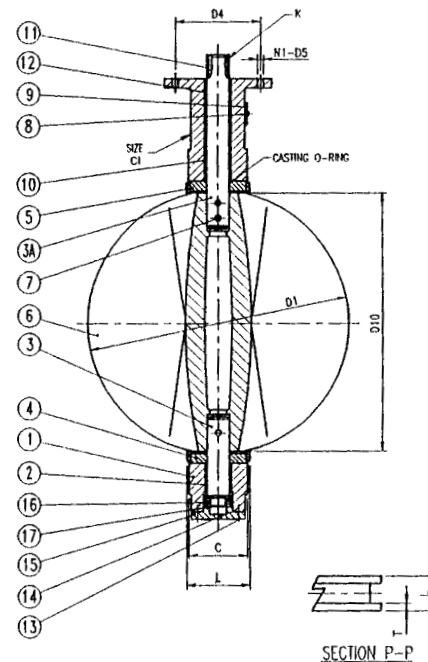
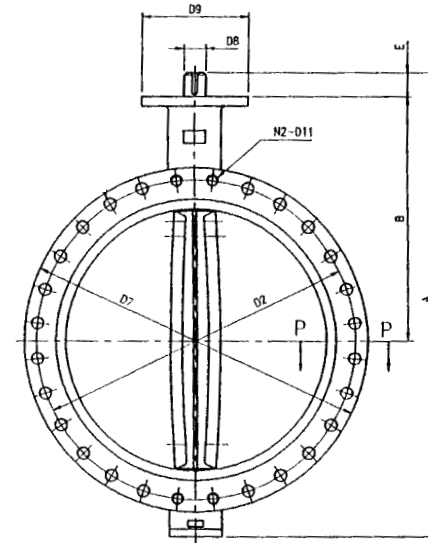
Lug Style  
EPDM or Buna-N Liner  
Aluminum Bronze Disc

## LD 1010

Lug Style  
EPDM Liner  
Ductile Iron Disc

## LD 1022

Lug Style  
EPDM Liner  
Stainless Steel Disc



## DIMENSIONS — WEIGHTS

Size	D8									
In. mm.	D1	D2	D4	D5	D7	Dia.	D9	D10	D11	
30	750	29.30	36.00	10.00	0.71	38.74	2.50	11.81	28.56	1¼-7UNC
36	900	34.04	42.75	10.00	0.71	43.00	2.95	11.81	33.09	1½-6UNC
42	1050	40.55	49.50	10.00	0.71	53.00	3.74	11.81	39.33	1½-6UNC
48	1200	45.67	56.00	11.75	0.87	59.50	4.13	13.78	44.35	1½-6UNC

Size	Lug										Weight	
In. mm.	C	L	A	B	E	N1	N2	T	Key Size	Lbs.	Kg.	
30	750	6.57	6.81	50.63	26.00	2.60	8	28	2.12	.71 x 2.50	926	420
36	900	8.00	8.31	58.82	28.35	4.65	8	32	2.38	.79 x 3.94	1482	660
42	1050	9.88	10.28	70.28	33.78	5.91	8	36	2.62	.98 x 5.51	1971	896
48	1200	10.88	11.26	76.96	37.04	5.91	8	44	2.75	1.10 x 5.51	2816	1280

NOT RECOMMENDED  
FOR STEAM SERVICE

# Cast Iron Butterfly Valves

## N200 and N150 Series

### Cast Iron

Lug or wafer body

- EPDM or Buna-N liner materials
- 2" thru 24" size range
- 200 PSI WOG (2" thru 12")
- 150 PSI WOG (14" thru 24")
- Bubble tight shut off at full rated pressure
- Aluminum bronze or nickel plated ductile iron disc
- 416 stainless steel stem



# 200 PSI Butterfly Valves

Cast Iron Body • Extended Neck  
Cartridge Seat Liner • Lug Style

**Sizes 2" through 12"**

Install between Std. ANSI Class 125/150 Flanges

CONFORMS TO MSS-SP67

## MATERIAL LIST

PART	SPECIFICATION
1. Body	Cast Iron ASTM A-126 CL.B
2. Body Bushing	Bronze ASTM B-584 Grade C83600
3. Liner	EPDM Rubber w/Phenolic Backing Buna-N Rubber Nitrile w/Phenolic Backing
4. Stem	Stainless Steel ASTM A 582 Type 416
5. Disc	Alum. Brz. ASTM B-148 Alloy C95400 Ductile Iron ASTM A 536 Grade 65-45-12 (plated)
6. Taper Pin (2 pin 6" - 12")	Stainless Steel ASTM A 582 Type 416
7. Name Plate	Aluminum
8. Shaft Bushing	Bronze ASTM B 584 Grade C83600
9. Stem Seal	Buna-N Rubber Nitrile

## DIMENSIONS — WEIGHTS

Size In. mm.	A Dia.	Min. Pipe I.D.	B Dia.	C Dia.	D	E	F	G Body	H Seat	I Dia.
2 50	2.08	1.38	3.00	3.94	6.34	1.26	10.75	1.655	1.772	0.496
2½ 65	2.54	1.95	3.50	4.72	6.89	1.26	11.65	1.759	1.874	0.496
3 80	3.10	2.66	4.09	5.00	7.13	1.26	12.12	1.780	1.929	0.496
4 100	4.10	3.67	5.32	6.14	7.87	1.26	13.62	2.050	2.154	0.621
5 125	4.85	4.48	6.26	7.48	8.39	1.26	14.65	2.140	2.283	0.745
6 150	6.12	5.84	7.42	8.35	8.90	1.26	15.62	2.195	2.307	0.745
8 200	7.97	7.85	9.38	10.55	10.24	1.77	18.88	2.385	2.496	0.870
10 250	9.86	9.76	11.51	12.79	11.50	1.77	21.26	2.584	2.756	1.120
12 300	11.87	11.72	13.55	15.87	13.27	1.77	24.57	3.029	3.154	1.244

Size In. mm.	J Dia.	B.C. Dia.	L Dia.	M Dia.	R Dia.	P	Q Dia.	S Dia.	T Flats	Lug Weight Lbs. Kg.
2 50	3.00	2.25	0.26	0.75	4.75	4	5/8-11UNC	4.75	.350	8.5 3.9
2½ 65	3.03	2.25	0.26	0.75	5.50	4	5/8-11UNC	5.50	.350	9 4.1
3 80	3.03	2.25	0.26	0.75	6.00	4	5/8-11UNC	6.00	.350	10.5 4.8
4 100	3.62	2.75	0.41	0.75	7.50	8	5/8-11UNC	7.50	.437	20 9.1
5 125	3.62	2.75	0.41	0.88	8.50	8	3/4-10UNC	8.50	.500	24 10.9
6 150	3.62	2.75	0.41	0.88	8.50	8	3/4-10UNC	9.50	.500	31.5 14.3
8 200	4.50	3.50	0.56	0.88	11.75	8	3/4-10UNC	11.75	.625	40 18.2
10 250	4.50	3.50	0.56	1.00	14.25	12	7/8-9UNC	14.25	.812	59 26.8
12 300	5.50	4.25	0.56	1.00	17.00	12	7/8-9UNC	17.00	.875	87 39.5

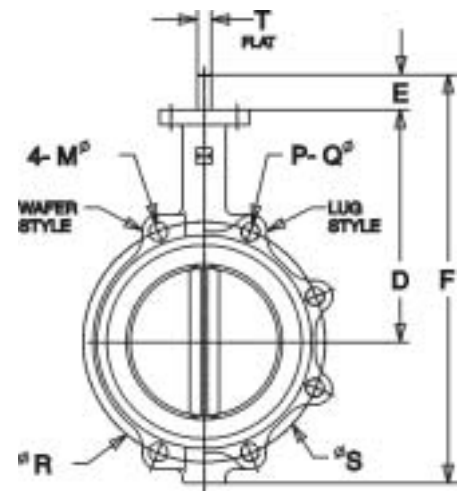
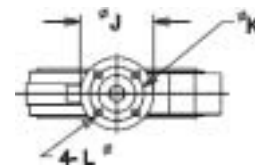
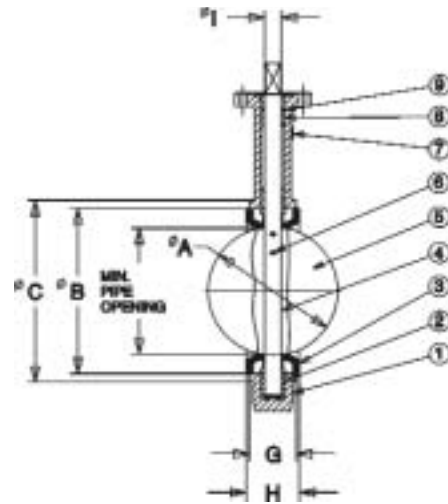
NOT RECOMMENDED  
FOR STEAM SERVICE

**N200235**  
Lug Style  
EPDM Liner  
Aluminum Bronze Disc

**N200236**  
Lug Style  
EPDM Liner  
Ductile Iron Disc

**N200245**  
Lug Style  
Buna Liner  
Aluminum Bronze Disc

**N200246**  
Lug Style  
Buna Liner  
Ductile Iron Disc



# 200 PSI Butterfly Valves

Cast Iron Body • Extended Neck  
Cartridge Seat Liner • Wafer Style

**Sizes 2" through 12"**

Install between Std. ANSI Class 125/150 Flanges

CONFORMS TO MSS-SP67

## MATERIAL LIST

PART	SPECIFICATION
1. Body	Cast Iron ASTM A-126 CL.B
2. Body Bushing	Bronze ASTM B-584 Grade C83600
3. Liner	EPDM Rubber w/Phenolic Backing Buna-N Rubber Nitrile w/Phenolic Backing
4. Stem	Stainless Steel ASTM A 582 Type 416
5. Disc	Alum. Brz. ASTM B-148 Alloy C95400 Ductile Iron ASTM A 536 Grade 65-45-12 (plated)
6. Taper Pin (2 pin 6" - 12")	Stainless Steel ASTM A 582 Type 416
7. Name Plate	Aluminum
8. Shaft Bushing	Bronze ASTM B 584 Grade C83600
9. Stem Seal	Buna-N Rubber Nitrile

## DIMENSIONS — WEIGHTS

Size	A	Min.	B	C	D	E	F	G	H	I	
In. mm.	Dia.	Pipe I.D.	Dia.	Dia.				Body	Seat	Dia.	
2	50	2.08	1.38	3.00	3.94	6.34	1.26	10.75	1.655	1.772	0.496
2½	65	2.54	1.95	3.50	4.72	6.89	1.26	11.65	1.759	1.874	0.496
3	80	3.10	2.66	4.09	5.00	7.13	1.26	12.12	1.780	1.929	0.496
4	100	4.10	3.67	5.32	6.14	7.87	1.26	13.62	2.050	2.154	0.621
5	125	4.85	4.48	6.26	7.48	8.39	1.26	14.65	2.140	2.283	0.745
6	150	6.12	5.84	7.42	8.35	8.90	1.26	15.62	2.195	2.307	0.745
8	200	7.97	7.85	9.38	10.55	10.24	1.77	18.88	2.385	2.496	0.870
10	250	9.86	9.76	11.51	12.79	11.50	1.77	21.26	2.584	2.756	1.120
12	300	11.87	11.72	13.55	15.87	13.27	1.77	24.57	3.029	3.154	1.244

Size	J	B.C.	L	M	R	P	Q	S	T	Wafer Weight
In. mm.	Dia.	Dia.	Dia.	Dia.	Dia.		Dia.	Dia.	Flats	Lbs. Kg.
2	50	3.00	2.25	0.26	0.75	4.75	4	¾-11UNC	4.75 .350	5.5 2.5
2½	65	3.03	2.25	0.26	0.75	5.50	4	¾-11UNC	5.50 .350	7.0 3.2
3	80	3.03	2.25	0.26	0.75	6.00	4	¾-11UNC	6.00 .350	8.0 3.6
4	100	3.62	2.75	0.41	0.75	7.50	8	¾-11UNC	7.50 .437	11.0 5.0
5	125	3.62	2.75	0.41	0.88	8.50	8	¾-10UNC	8.50 .500	15.5 7.0
6	150	3.62	2.75	0.41	0.88	8.50	8	¾-10UNC	9.50 .500	17.5 7.9
8	200	4.50	3.50	0.56	0.88	11.75	8	¾-10UNC	11.75 .625	29.0 13.2
10	250	4.50	3.50	0.56	1.00	14.25	12	¾-9UNC	14.25 .812	42.5 19.3
12	300	5.50	4.25	0.56	1.00	17.00	12	¾-9UNC	17.00 .875	71.5 32.5

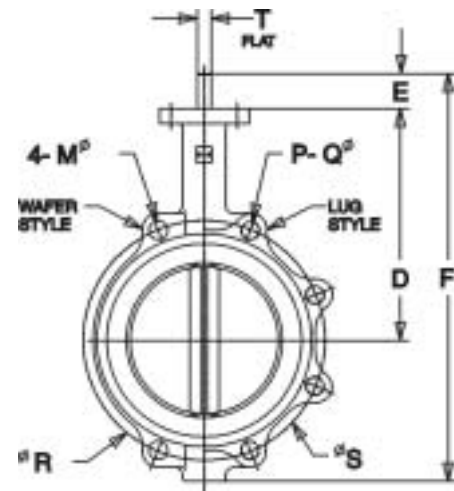
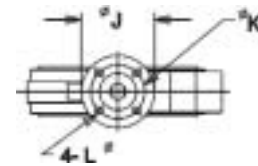
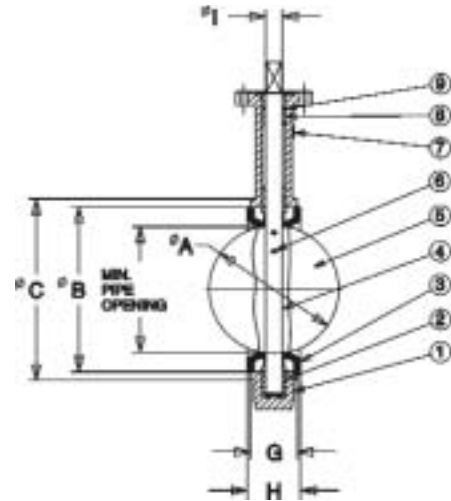
NOT RECOMMENDED  
FOR STEAM SERVICE

**N200135**  
Wafer Style  
EPDM Liner  
Aluminum Bronze Disc

**N200136**  
Wafer Style  
EPDM Liner  
Ductile Iron Disc

**N200145**  
Wafer Style  
Buna Liner  
Aluminum Bronze Disc

**N200146**  
Wafer Style  
Buna Liner  
Ductile Iron Disc



# 150 PSI Butterfly Valves

Cast Iron Body • Extended Neck  
Cartridge Seat Liner • Lug Style

**Sizes 14" through 24"**

Install between Std. ANSI Class 125/150 Flanges

CONFORMS TO MSS-SP67

## MATERIAL LIST

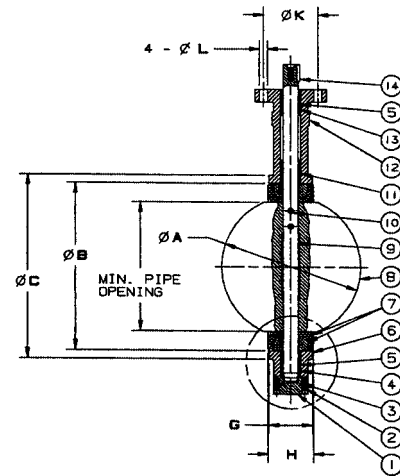
PART	SPECIFICATION
1. Bottom Plate	Steel ASTM A-108 Grade 1035
2. Bolt (2 for 14"-20"; 4 for 24")	Steel ASTM A-307
3. O-Ring	Buna-N Rubber Nitrile
4. Bushing	Bronze ASTM B-584 Grade C83600
5. O-Ring (2)	Buna-N Rubber Nitrile
6. Body	Cast Iron ASTM A-126 CL. B
7. Liner	EPDM Rubber w/Phenolic Backing Buna-N Rubber Nitrile w/Phenolic Backing
8. Disc	Alum. Brz. ASTM B 148 Alloy C95400 Ductile Iron ASTM A 536 Grade 65-45-12 (plated)
9. Stem	Stainless Steel ASTM A 582 Type 416
10. Taper Pin (2)	Stainless Steel ASTM A 582 Type 416
11. Bushing	Bronze ASTM B-584 Grade C83600
12. Nameplate	Aluminum
13. Bushing	Bronze ASTM B 584 Grade C83600
14. Key	Steel ASTM A 108 Grade 1045

**N150235**  
Lug Style  
EPDM Liner  
Aluminum Bronze Disc

**N150236**  
Lug Style  
EPDM Liner  
Ductile Iron Disc

**N150245**  
Lug Style  
Buna Liner  
Aluminum Bronze Disc

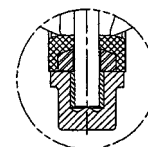
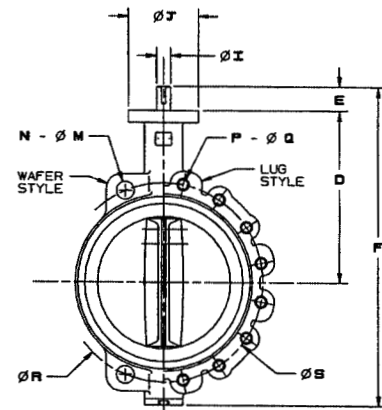
**N150246**  
Lug Style  
Buna Liner  
Ductile Iron Disc



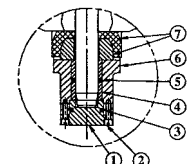
## DIMENSIONS — WEIGHTS

Size	A	Min.	B	C				G	H	I
In. mm.	Dia.	Pipe I.D.	Dia.	Dia.	D	E	F	Body	Seat	Dia.
14 350	13.1	13.0	14.8	17.2	14.5	1.77	26.77	3.01	3.13	1.244
16 400	15.3	15.2	17.3	19.2	15.7	2.02	29.94	3.38	3.54	1.305
18 450	17.3	17.1	19.3	21.2	16.6	2.02	31.55	4.12	4.29	1.496
20 500	19.4	18.9	21.1	23.3	18.9	2.53	35.65	5.14	5.31	1.632
24 600	23.3	23.1	25.7	32.1	22.1	2.76	40.20	5.98	6.14	1.994

Size	J	K	L	Q	Cap Screw	S	Lug Weight	
In. mm.	Dia.	Dia.	Dia.	Dia.	Length	Dia.	Lbs.	Kg.
14 350	5.50	4.25	0.56	12	1-8UNC	2.75	18.75	121 54.9
16 400	7.75	6.25	0.81	16	1-8UNC	3.25	21.25	211 95.8
18 450	7.75	6.25	0.81	16	1½-7UNC	3.50	22.75	268 121.7
20 500	7.75	6.25	0.81	20	1½-7UNC	4.00	25.00	444 201.6
24 600	10.87	8.50	0.87	20	1¼-7UNC	4.75	29.50	594 269.7



14" Reference



16"-24" Reference

NOT RECOMMENDED  
FOR STEAM SERVICE

# 150 PSI Butterfly Valves

Cast Iron Body • Extended Neck  
Cartridge Seat Liner • Wafer Style

**Sizes 14" through 24"**

Install between Std. ANSI Class 125/150 Flanges

CONFORMS TO MSS-SP67

## MATERIAL LIST

PART	SPECIFICATION
1. Bottom Plate	Steel ASTM A-108 Grade 1035
2. Bolt	Steel ASTM A-307 (2 for 14"-20"; 4 for 24")
3. O-Ring	Buna-N Rubber Nitrile
4. Bushing	Bronze ASTM B-584 Grade C83600
5. O-Ring (2)	Buna-N Rubber Nitrile
6. Body	Cast Iron ASTM A-126 CL. B
7. Liner	EPDM Rubber w/Phenolic Backing Buna-N Rubber Nitrile w/Phenolic Backing
8. Disc	Alum. Brz. ASTM B 148 Alloy C95400 Ductile Iron ASTM A 536 Grade 65-45-12 (plated)
9. Stem	Stainless Steel ASTM A 582 Type 416
10. Taper Pin (2)	Stainless Steel ASTM A 582 Type 416
11. Bushing	Bronze ASTM B-584 Grade C83600
12. Nameplate	Aluminum
13. Bushing	Bronze ASTM B 584 Grade C83600
14. Key	Steel ASTM A 108 Grade 1045

## DIMENSIONS — WEIGHTS

Size	A	Min. B	C	D	E	F	G	H	I	
In. mm.	Dia.	Pipe I.D.	Dia.	Dia.	Dia.	Dia.	Body	Seat	Dia.	
14 350	13.1	13.0	14.8	17.2	14.5	1.77	26.77	3.01	3.13	1.244
16 400	15.3	15.2	17.3	19.2	15.7	2.02	29.94	3.38	3.54	1.305
18 450	17.3	17.1	19.3	21.2	16.6	2.02	31.55	4.12	4.29	1.496
20 500	19.4	18.9	21.1	23.3	18.9	2.53	35.65	5.14	5.31	1.632
24 600	23.3	23.1	25.7	32.1	22.1	2.76	40.20	5.98	6.14	1.994

Size	J	K	L	M	N	R	P	Q	Cap Screw Length	S	Wafer Weight	
In. mm.	Dia.	Dia.	Dia.	Dia.	Dia.	Dia.	Dia.	Dia.		Dia.	Lbs.	Kg.
14 350	5.50	4.25	0.56	1.12	4	18.75	12	1-8UNC	2.75	18.75	91	41.3
16 400	7.75	6.25	0.81	1.12	4	21.25	16	1-8UNC	3.25	21.25	134	60.8
18 450	7.75	6.25	0.81	1.25	4	22.75	16	1½-7UNC	3.50	22.75	174	79.0
20 500	7.75	6.25	0.81	1.25	4	25.00	20	1½-7UNC	4.00	25.00	282	128.0
24 600	10.87	8.50	0.87	1.37	20	29.50	20	1¼-7UNC	4.75	29.50	414	188.0

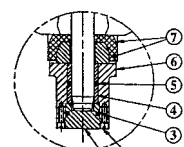
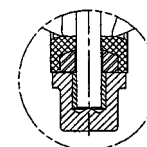
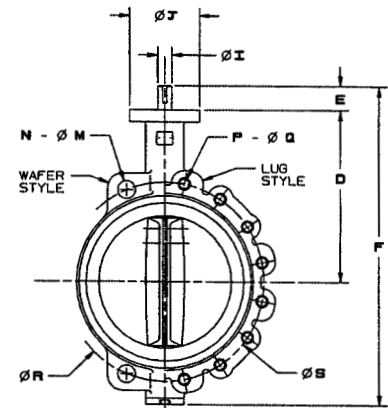
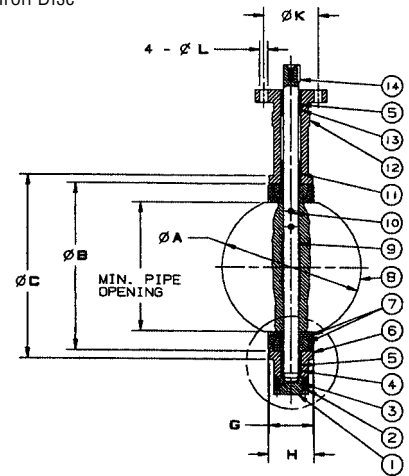
NOT RECOMMENDED  
FOR STEAM SERVICE

**N150135**  
Wafer Style  
EPDM Liner  
Aluminum Bronze Disc

**N150136**  
Wafer Style  
EPDM Liner  
Ductile Iron Disc

**N150145**  
Wafer Style  
Buna Liner  
Aluminum Bronze Disc

**N150146**  
Wafer Style  
Buna Liner  
Ductile Iron Disc



14" Reference

16"-24" Reference

# Grooved Butterfly Valve

## GD4765 Series

**Polymid coated ductile**  
Iron body

**Elastomer encapsulated disc**  
(EPDM or Buna-N)

- 416 stainless steel stem
- 300 PSI WOG 2" thru 8"
- 200 PSI WOG 10" thru 12"
- 175 PSI WOG 10" UL/FM
- UL listed, FMRC approved
- 2½" thru 8" UL listed for indoor and outdoor service
- UL/FM version accepts internal and external supervisory switches
- Meets or exceeds the requirements of MSS-SP67
- Polymide coating has NSF certification



# 300 PSI Grooved End Butterfly Valves

Polymid Coated Ductile Iron Body • Extended Neck  
Elastomer Encapsulated Disc • Grooved Mechanical Style

Sizes 2" through 12"

CONFORMS TO MSS-SP67

## MATERIAL LIST

PART	SPECIFICATION
1. Upper Stem	Stainless Steel ASTM A 582 Type 416
2. Upper Bearing	Split Metal
3. O-Ring	EPDM or Buna-N
4. Body	Ductile Iron ASTM A 395 w/Polymide Coating
5. Disc	Ductile Iron ASTM A 395 w/EPDM or Buna-N Encapsulation
6. Lower Bearing	Split Metal
7. Lower Stem	Stainless Steel ASTM A 582 Type 416
8. Dust Plug	PVC
9. Name Plate	Aluminum

Polymide coating has NSF certification

## DIMENSIONS — WEIGHTS

SIZE		A	B	C	D	E	F	G	J
In.	mm.								
2	50	2.38	2.32	.33	.63	3.33	2.42	.46	1.31
2½	65	2.88	2.72	.31	.63	3.85	2.42	.46	1.22
3	80	3.50	3.34	.31	.63	3.85	2.86	.46	1.18
3 O.D.	76.1	3.00	2.84	.31	.63	3.85	2.42	.46	1.22
4	100	4.50	4.33	.38	.63	4.56	3.84	.46	1.24
5	125	5.56	5.39	.38	.63	5.86	4.79	.46	1.24
6	150	6.63	6.45	.38	.63	5.86	5.73	.46	1.29
6 O.D.	165.1	6.51	6.32	.38	.63	5.86	5.73	.46	1.29
8	200	8.63	8.44	.44	.75	5.26	7.71	.46	1.32
10	250	10.75	10.56	.50	.75	6.29	9.56	.70	1.38
12	300	12.76	12.51	.50	.75	6.52	11.55	.70	1.38

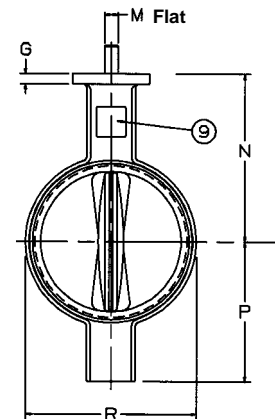
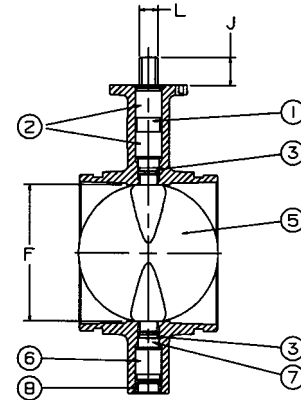
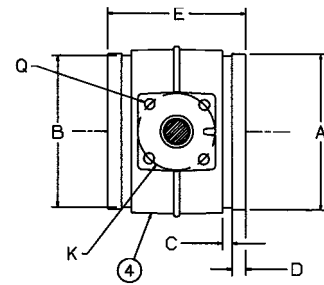
Size		Weight								
In.	mm.	K	L	M	N	P	Q	R	Lbs.	Kg.
2	50	3.25	.50	.37	4.00	3.14	.437	2.89	6.7	3.0
2½	65	3.25	.50	.37	4.19	3.25	.437	3.46	7.5	3.4
3	80	3.25	.50	.37	4.44	3.54	.437	3.97	8.7	3.9
3 O.D.	76.1	3.25	.50	.37	4.19	3.25	.437	3.46	8.7	3.9
4	100	3.25	.66	.50	5.33	4.35	.437	5.03	12.2	5.5
5	125	3.25	.66	.50	5.83	4.84	.437	6.27	17.3	7.8
6	150	3.25	.78	.56	7.11	5.93	.437	7.25	27.4	12.4
6 O.D.	165.1	3.25	.78	.56	7.11	5.93	.437	7.25	27.4	12.4
8	200	3.25	.78	.56	8.05	6.87	.437	9.25	32.5	14.7
10	250	5.00	1.06	.75	9.86	9.17	.562	11.25	69.6	31.6
12	300	5.00	1.06	.75	10.85	10.17	.562	13.14	88.0	39.9

\*Note: 10" and 12" rated 200 PSI.

NOT RECOMMENDED  
FOR STEAM SERVICE

**GD 4765**  
w/EPDM Liner

**GD 4775**  
w/Buna-N Liner





# 300 lb. WWP UL/FM Butterfly Valves

Fire Protection Valve • Grooved Mechanical Style • Nylon Coated Ductile Iron • Extended Neck • Elastomer Encapsulated Disc • Accepts Internal and External Supervisory Switches

**300 PSI/20.7 Bar Non-Shock Cold Water 2½" - 8"**  
**175 PSI/12.1 Bar Non-Shock Cold Water 10"**

UL LISTED • FMRC APPROVED • 2½" - 8" UL LISTED FOR INDOOR AND OUTDOOR SERVICE • 10" FOR INDOOR SERVICE ONLY • CALIFORNIA STATE FIRE MARSHALL APPROVAL NO. 7770-1243:101  
• APPROVED BY THE NEW YORK CITY MEA 9-97-E

## MATERIAL LIST

PART	SPECIFICATION
1. Upper Stem	Stainless Steel ASTM A 582 Type 416
2. Upper Bushing	PTFE Bronze Sintered on Steel
3. "O" Ring	Buna-N
4. Body	Ductile Iron ASTM A 395 with Polyimide Coating
5. Disc	Ductile Iron ASTM A 395 with EPDM Encapsulation
6. Lower Bushing	PTFE Bronze Sintered on Steel
7. Lower Stem	Stainless Steel ASTM A 582 Type 416
8. Dust Plug	PVC
9. Nameplate	Aluminum
10. Gear Operator	Cast Iron and Steel
11. Indicator Flag	Cast Iron
12. Handwheel	Cast Iron

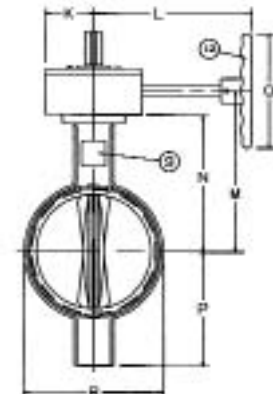
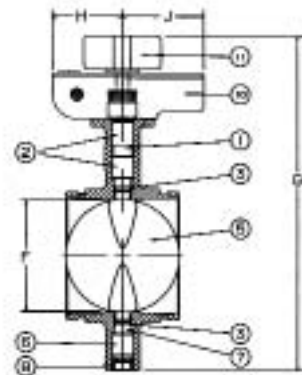
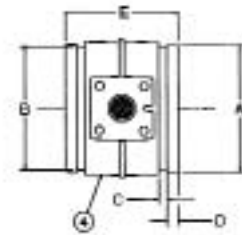
\*-8N version has two factory mounted internal supervisory switches.  
-4N version is gear operated only

Uses NIBCO model #TS-4 Switch Kit.  
Polyimide coating has NSF certification.



**GD-1765-8N**  
10"  
(not shown)

**GD-4765-8N\***  
Grooved  
2½" thru 8"



## DIMENSIONS—WEIGHTS—QUANTITIES

Size	Dimensions															
	A		B		C		D		E		F		G		H	
In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	
2½	65	2.88 73	2.72 69	0.31 8	0.63 16	3.85 98	2.42 61	11.94 303	2.91 74							
3 O.D.	76.1	3.00 76	2.84 72	0.31 8	0.63 16	3.85 98	2.42 61	11.94 303	2.91 74							
3	80	3.50 89	3.34 85	0.31 8	0.63 16	3.85 98	2.86 73	12.48 317	2.91 74							
4	100	4.50 114	4.33 110	0.38 10	0.63 16	4.56 116	3.84 98	14.18 360	2.91 74							
5	125	5.56 141	5.39 137	0.38 10	0.63 16	5.86 149	4.79 122	15.17 385	2.91 74							
6	150	6.63 168	6.45 164	0.38 10	0.63 16	5.86 149	5.73 146	17.54 446	2.91 74							
6 O.D.	165.1	6.51 165	6.32 161	0.38 10	0.63 16	5.86 149	5.73 146	17.54 446	2.91 74							
8	200	8.63 219	8.44 214	0.44 11	0.75 19	5.26 134	7.71 196	19.42 493	2.91 74							
10	250	10.75 273	10.56 268	0.50 13	0.75 19	6.29 160	9.56 243	24.03 610	3.90 99							

Size	Dimensions										Weight						
	J		K		L		M		N		P		Q		R		Lbs.
In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.	In. mm.		
2½	65	3.54 90	2.13 54	5.82 148	5.67 144	4.19 106	3.25 83	5.9 150	3.46 88	22	10.0						
3 O.D.	76.1	3.54 90	2.13 54	5.82 148	5.67 144	4.19 106	3.25 83	5.9 150	3.46 88	22	10.4						
3	80	3.54 90	2.13 54	5.82 148	5.94 151	4.44 113	3.54 90	5.9 150	3.97 101	23	10.4						
4	100	3.54 90	2.13 54	7.64 194	6.31 173	5.33 135	4.35 110	5.9 150	5.03 128	28	12.7						
5	125	3.54 90	2.13 54	7.64 194	7.32 186	5.83 148	4.84 123	5.9 150	6.27 159	31	14.1						
6	150	3.54 90	2.13 54	7.64 194	8.62 219	7.11 181	5.93 151	5.9 150	7.25 184	41	18.6						
6 O.D.	165.1	3.54 90	2.13 54	7.64 194	8.62 219	7.11 181	5.93 151	5.9 150	7.25 184	41	18.6						
8	200	3.54 90	2.13 54	7.91 201	9.80 249	8.05 204	6.87 174	9.8 250	9.25 235	53	24.1						
10	250	3.98 101	3.03 77	9.49 241	11.61 295	9.86 250	9.17 233	11.8 300	11.25 286	88	40.0						



# 4 Valves in one

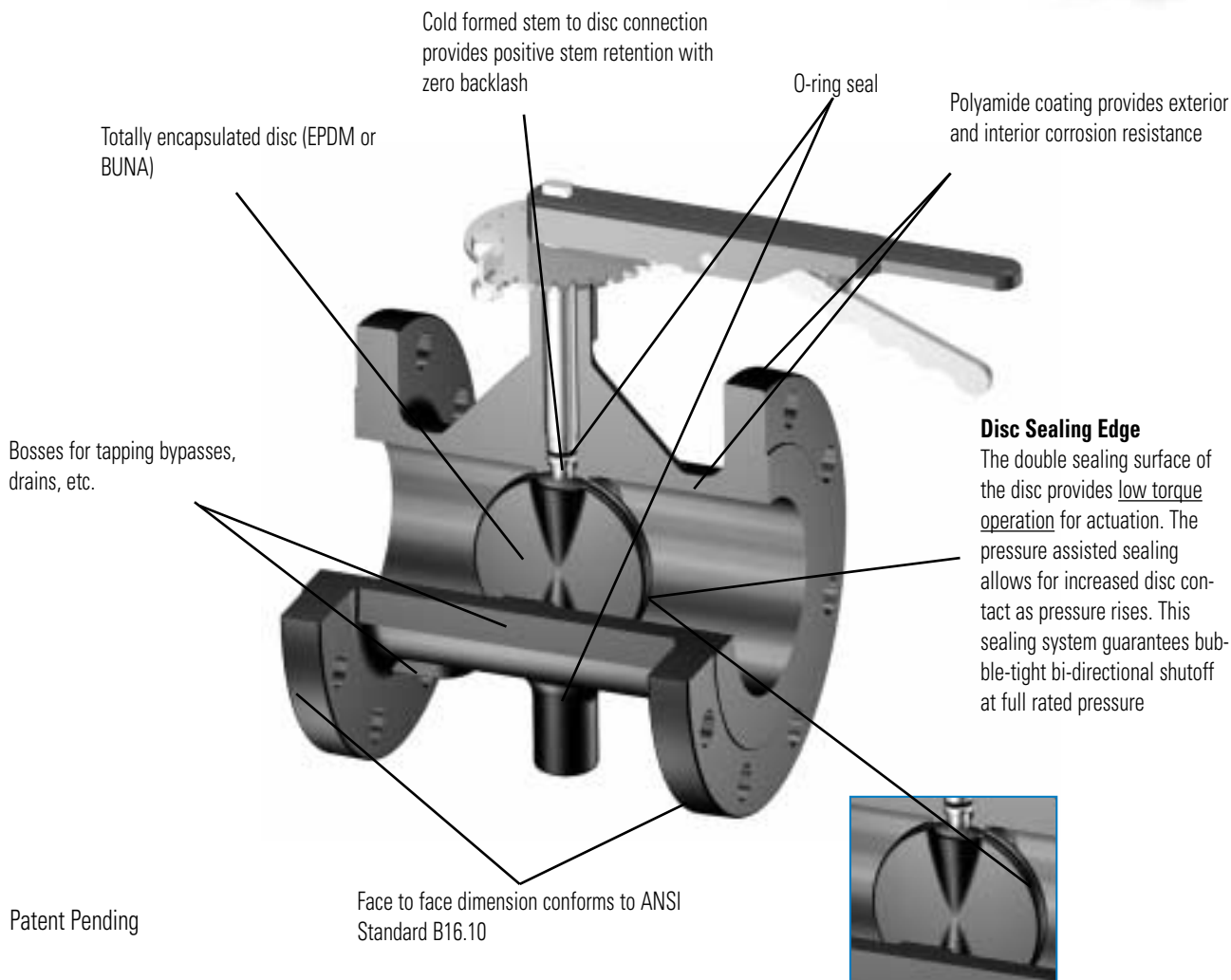
## FC2000 Series FD5000 Series

Sizes 2"-12"

Your *Best* Valve Replacement Option

NIBCO's Flanged Butterfly Valve dimensionally replaces the:

- Gate Valve
- Ball Valve
- Plug Valve
- Spooled Butterfly Valve



# 200 PSI Flanged End Butterfly Valves

Polyamide Coated Cast Iron Body • Extended Neck • Cold Form Stem Drive •  
Elastomer Encapsulated Disc • Flanged Ends  
• ANSI B16.10 Face-to-face dimensions

Patent Pending  
Sizes 2" through 12"

CONFORMS TO MSS-SP67 • MSS-SP25

## MATERIAL LIST

PART	SPECIFICATION
1. Upper Stem	Stainless Steel, ASTM A 582 Type 416
2. Upper Bushing	TFE over Porous Bronze, Steel Backed
3. O-Ring	EPDM or BUNA-N
4. Body	Cast Iron ASTM A-126 Class B with Polyamide Coating
5. Disc	Ductile Iron ASTM A 395 with EPDM or BUNA-N Encapsulation
6. Lower Bushing	TFE over Porous Bronze, Steel Backed
7. Lower Stem	Stainless Steel, ASTM A 582 Type 416
8. Dust Plug	PVC
9. Nameplate	Aluminum

Class 125 flange ends are standard

Polyamide coating has NSF certification

## DIMENSIONS — WEIGHTS

Size		A	B	C	D	E	F	G	J
In.	mm.								
2	50	2.11	6.0	0.62	5.69	3.16	6.94	7.00	0.437
2½	63	2.59	7.0	0.69	5.78	3.25	7.03	7.50	0.437
3	80	3.07	7.5	0.75	5.99	3.54	7.24	8.00	0.437
4	100	4.03	9.0	0.94	6.99	4.35	8.24	9.00	0.437
5	125	5.05	10.0	0.94	7.47	4.85	8.72	10.00	0.437
6	150	6.07	11.0	1.00	8.28	5.94	9.53	10.50	0.437
8	200	7.98	13.5	1.12	9.25	6.87	10.50	11.50	0.437
10	250	10.02	16.0	1.19	11.03	9.18	12.28	13.00	0.562
12	300	12.00	19.0	1.25	12.01	10.16	13.26	14.00	0.562

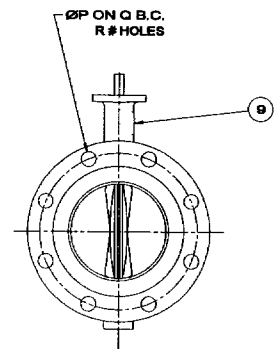
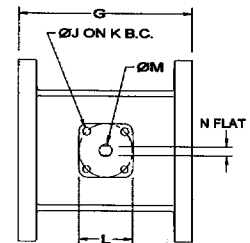
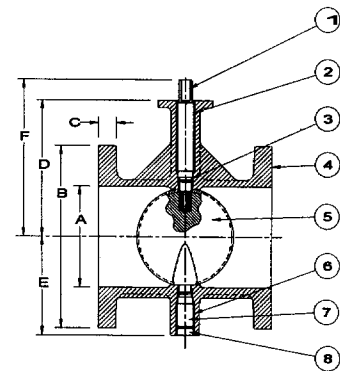
Size		Weight								
In.	mm.	K	L	M	N	P	Q	R	Lbs.	Kg.
2	50	3.25	3.25	0.50	0.37	0.75	4.75	4	16.5	7.5
2½	63	3.25	3.25	0.50	0.37	0.75	5.50	4	24	10.9
3	80	3.25	3.25	0.50	0.37	0.75	6.00	4	28	12.7
4	100	3.25	3.25	0.66	0.50	0.75	7.50	8	44	20.0
5	125	3.25	3.25	0.66	0.50	0.88	8.50	8	53	24.1
6	150	3.25	3.25	0.78	0.56	0.88	9.50	8	65	30.0
8	200	3.25	3.25	0.78	0.56	0.88	11.75	8	94	42.7
10	250	5.00	4.75	1.06	0.75	1.00	14.25	12	155	70.4
12	300	5.00	4.75	1.06	0.75	1.00	17.00	12	214	97.6

NOT RECOMMENDED  
FOR STEAM SERVICE



**FC-27\*5-0**

\*Optional disc  
EPDM (6)  
or BUNA (7)



# 285 PSI Flanged End Butterfly Valves

Polyamide Coated Ductile Iron Body • Extended Neck • Cold Form Stem Drive •  
Elastomer Encapsulated Disc • Flanged Ends  
• ANSI B16.50 Face-to-face dimensions

Patent Pending  
Sizes 2" through 12"

CONFORMS TO MSS-SP67 • MSS-SP25

## MATERIAL LIST

PART	SPECIFICATION
1. Upper Stem	Stainless Steel, ASTM A 582 Type 416
2. Upper Bushing	TFE over Porous Bronze, Steel Backed
3. "O" Ring	EPDM or BUNA-N
4. Body	Cast Iron ASTM A 536 with Polyamide Coating
5. Disc	Ductile Iron ASTM A 395 with EPDM or BUNA-N Encapsulation
6. Lower Bushing	TFE over Porous Bronze, Steel Backed
7. Lower Stem	Stainless Steel, ASTM A 582 Type 416
8. Dust Plug	PVC
9. Nameplate	Aluminum

Optional flange ends Class 150 is standard. PN10, PN16 available.  
Sizes 2" through 8", 285 psi - 10" to 12", 200 psi  
Polyamide coating has NSF certification

## DIMENSIONS — WEIGHTS

Size		A	B	C	D	E	F	G	H
In.	mm.								
2	50	2.11	6.0	0.62	5.69	3.16	6.94	7.00	3.62
2½	65	2.59	7.0	0.69	5.78	3.25	7.03	7.50	4.12
3	80	3.07	7.5	0.75	5.99	3.54	7.24	8.00	5.00
4	100	4.03	9.0	0.94	6.99	4.35	8.24	9.00	6.19
5	125	5.05	10.0	0.94	7.47	4.85	8.72	10.00	7.31
6	150	6.07	11.0	1.00	8.28	5.94	9.53	10.50	8.50
8	200	7.98	13.5	1.12	9.25	6.87	10.50	11.50	10.62
10	250	10.02	16.0	1.19	11.03	9.18	12.28	13.00	12.75
12	300	12.00	19.0	1.25	12.01	10.16	13.26	14.00	15.00

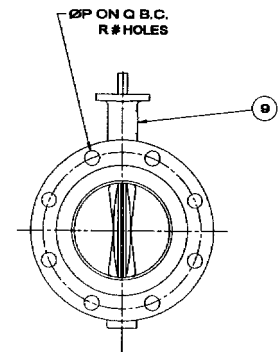
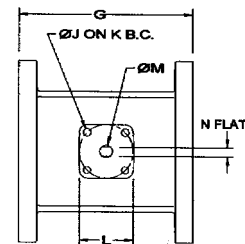
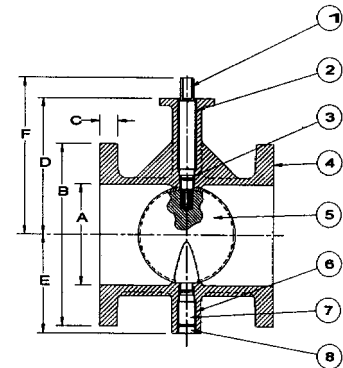
Size		J	K	L	M	N	P	Q	R	Weight	
In.	mm.									Lbs.	Kg.
2	50	0.437	3.25	3.25	0.50	0.37	0.75	4.75	4	16	7.3
2½	65	0.437	3.25	3.25	0.50	0.37	0.75	5.50	4	23	10.4
3	80	0.437	3.25	3.25	0.50	0.37	0.75	6.00	4	27	12.3
4	100	0.437	3.25	3.25	0.66	0.50	0.75	7.50	8	43	19.5
5	125	0.437	3.25	3.25	0.66	0.50	0.88	8.50	8	52	23.6
6	150	0.437	3.25	3.25	0.78	0.56	0.88	9.50	8	65	29.5
8	200	0.437	3.25	3.25	0.78	0.56	0.88	11.75	8	93	42.2
10	250	0.562	5.00	4.75	1.06	0.75	1.00	14.25	12	154	69.9
12	300	0.562	5.00	4.75	1.06	0.75	1.00	17.00	12	210	95.3

NOT RECOMMENDED  
FOR STEAM SERVICE



**FD-57\*5-0**

\*Optional disc  
EPDM (6)  
or BUNA (7)

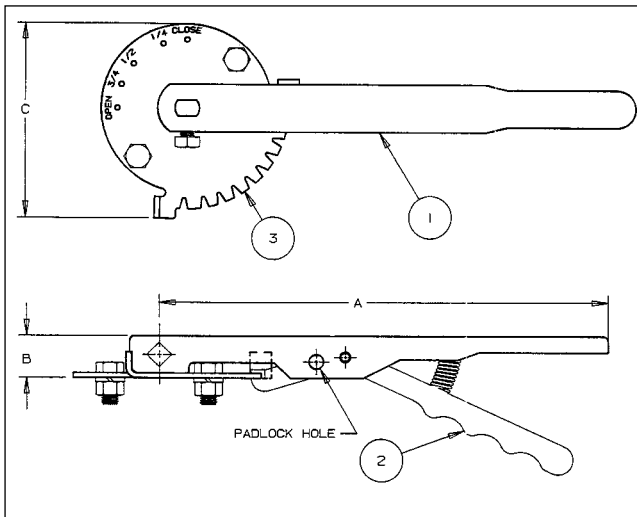


# Options and Accessories Index

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## Lever-Lock Operator (Standard)

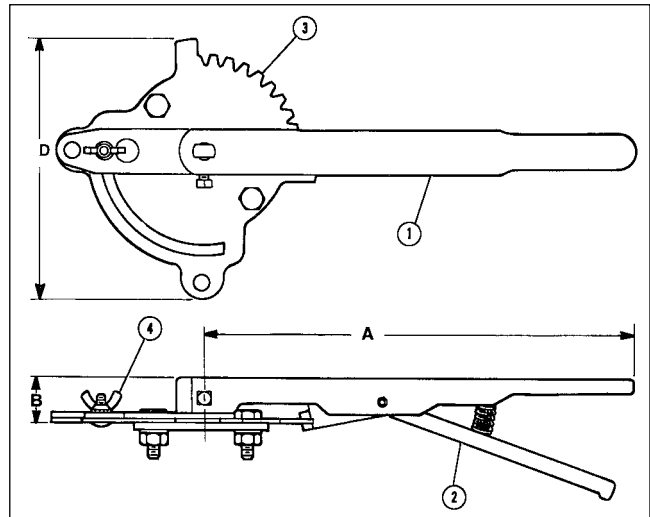
LD/WD2000/3000



The lever-lock handle and throttling plate provide throttling notches every 10° for excellent manual control in balancing up to 90° or shut off service. The valve may be padlocked in any one of the positions including opened or closed by virtue of a locking hole located in the handle and lever.

## Position-Lock Operator (Optional)

LD/WD2000/3000



The position-lock can be used to set the valve in any position or as a memory stop so the valve may be reopened to the previous position. The valve may be padlocked in full open or full closed position.

Ordering: Sold as a field retrofitable kit only.

### MATERIAL LIST

PART	SPECIFICATION
1. Handle	Polymer Coated Iron
2. Lever-Lock	Zinc Plated Steel
3. Throttle Plate	Zinc Plated Steel

### DIMENSIONS — WEIGHTS

LD/WD Valve Size	FC/FD GD Valve Size	Lever (STD)	Throttle Plate (STD)	Throttle Plate/Infinite Pos. Kit	Dimensions				Torque Rated Output in Inch-Pounds	
					A	B	C	D	At 60 pounds Pull	At 100 pounds Pull
2"		T115106PP	T115138PP	T114840FG	10½	1	4⅝	6¾	540 In-Lbs.	900 In-Lbs.
2½"-3"	2"-2½"-3"	T115107PP	T115138PP	T114841FG	10½	1	4⅝	6¾	540 In-Lbs.	900 In-Lbs.
4"		T115108PP	T115138PP	T114842FG	10½	1	4⅝	6¾	540 In-Lbs.	900 In-Lbs.
5"-6"	4"-5"	T115109PP	T115138PP	T114843FG	13¾	1	4⅝	6¾	735 In-Lbs.	1225 In-Lbs.
	6"	T115110PP	T115138PP	T114844FG	13¾	1	4⅝	6¾	735 In-Lbs.	1225 In-Lbs.

\*Not recommended for 8", 10" and 12" valves

# Butterfly Valves

## Options and Accessories

Gear Operator options and accessories (2" through 12" 2000/3000 series only)

2" Square Operating Nut



Memory Stop



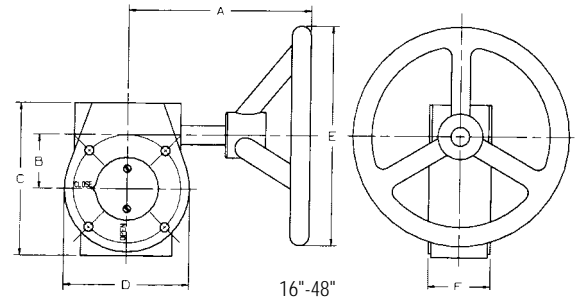
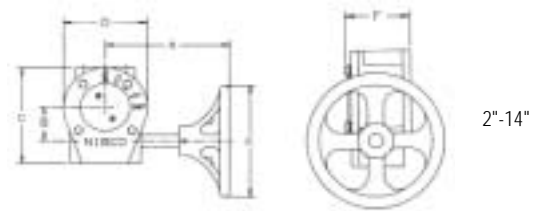
Flag Indicator



Consult factory for: Square Operating Nut, Memory Stop and Flag Indicator

### Cast Iron Gear Operator

The NIBCO butterfly valve can be provided with heavy-duty operator and indicator. Recommended for valves 8" and larger, for trouble-free operation in all moisture and weather conditions (not submersible). Operator is a self-locking worm gear type. Equipped with adjustable stops at open and shut positions. Ordering: Specify by adding (-5) to Fig. No., i.e., WD2000-5. Babbit Sprocket may be added to handwheel. See below for sizing information. Available options: Memory Stop Gear Operator Kit, 2" Square Operating Nut, Flag Indicator and Handwheel for GO.



Gear Operator Detail for Sizes 2" to 48" (1000/2000/3000 series only)

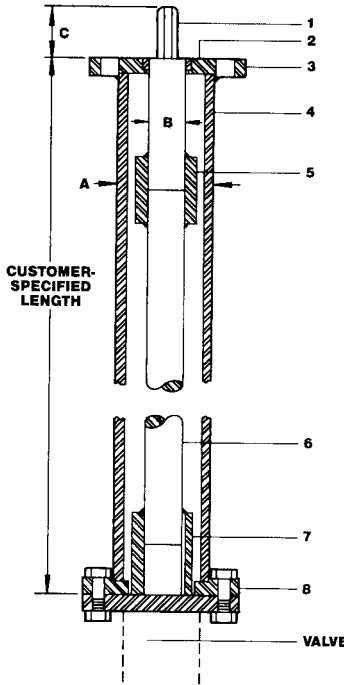
LD/WD Valve Size	FC/FD & GD Valve Size	Gear Operator Number	Gear Operator Handwheel	Sprocket Rim	Ratio	Dimensions (inches)						LD/WD Adapter Bushing	FC/FD/GD Adapter Bushing	Square Operating Nut	Flag Indicator	Memory Stop Kit	Weight (Lbs.)
						A	B	C	D	E	F						
2"	—	T117118PP	T117122PP	#1½	24:1	7.64	1.77	5.04	4.24	5.91	2.79	T046652PP	—	T117792FC	T116682PP	T118040PP	10.1
2½"-3"	2"-2½"-3"	T117118PP	T117122PP	#1½	24:1	7.64	1.77	5.04	4.24	5.91	2.79	T046653PP	T046653PP	T117792FC	T116682PP	T118040PP	10.1
3"	—	T117118PP	T117122PP	#1½	24:1	7.64	1.77	5.04	4.24	5.91	2.79	T046653PP	—	T117792FC	T116682PP	T118040PP	10.1
4"	—	T117118PP	T117122PP	#1½	24:1	7.64	1.77	5.04	4.24	5.91	2.79	T046654PP	—	T117792FC	T116682PP	T118040PP	10.1
5"	4", 5"	T117118PP	T117122PP	#1½	24:1	7.64	1.77	5.04	4.24	5.91	2.79	T046655PP	T046655PP	T117792FC	T116682PP	T118040PP	10.1
6"	—	T117118PP	T117122PP	#1½	24:1	7.64	1.77	5.04	4.24	5.91	2.79	T046655PP	—	T117792FC	T116682PP	T118040PP	10.1
8"	6", 8"	T117119PP	T117123PP	#2½	24:1	9.53	1.77	5.04	4.24	9.84	2.79	T046656PP	T046656PP	T117792FC	T116682PP	T118040PP	10.3
10"	—	T117120PP	T117124PP	#2½	30:1	11.54	2.48	6.93	6.06	9.84	3.26	—	—	T117793FC	T116682PP	T118042PP	23.3
—	10"	T117121PP	T117124PP	#2½	30:1	11.54	2.48	6.93	6.06	9.84	3.26	—	—	T117793FC	T116682PP	T118041PP	23.2
12"	12"	T117121PP	T117124PP	#2½	30:1	11.54	2.48	6.93	6.06	9.84	3.26	—	—	T117793FC	T116682PP	T118041PP	23.2
14"	—	T116697PP	T117169PP	#2½	50:1	11.46	3.08	7.48	6.28	11.81	3.26	—	—	T117778FC	—	—	26.8
16"	—	T116698PP	—	#2½	80:1	10.63	4.72	11.42	10.24	11.81	4.92	—	—	T117795FC	—	—	76.0
18"	—	T116699PP	—	#3½	80:1	11.02	4.72	11.42	10.24	15.75	4.92	—	—	T117795FC	—	—	77.0
20"	—	T116696PP	—	#2½	290:1	13.31	4.72	12.32	10.87	11.81	6.06	—	—	T117795FC	—	—	108.0
24"	—	T116695PP	—	#2½	290:1	13.31	4.72	12.32	10.87	11.81	6.06	—	—	T117795FC	—	—	108.0
30"	—	—	—	#3½	704:1	12.20	8.98	17.05	15.43	15.75	9.61	—	—	—	—	—	213.0
36"	—	—	—	#3½	704:1	14.25	13.27	22.56	17.28	15.75	9.61	—	—	—	—	—	259.0
42"	—	—	—	#3½	800:1	17.17	12.36	24.96	20.04	17.72	11.85	—	—	—	—	—	510.0
48"	—	—	—	#3½	800:1	17.17	12.36	24.96	20.04	17.72	11.85	—	—	—	—	—	510.0

# Butterfly Valves

## Options and Accessories

### Stem Extensions

Stem extensions can be furnished to permit remote operation of butterfly valves in any required length. The top flange of an extension stem, plug shaft diameter, and distance across flats on plug shaft are the same size as the valve selected. This allows interchangeability of gear operators, actuators, and adapter bushings from valve mounting flange to extension stem top flange. When ordering, specify valve size, figure number, and the exact distance from the valve flange to the top of extension flange (customer-specified length shown at right). Stem extensions are available in lengths up to 10 feet. For stem extensions in excess of 10 feet consult factory.



### MATERIAL LIST

PART	SPECIFICATION
1. Plug	Steel
2. Top Flange Bushing	Bronze
3. Top Flange	Steel
4. Housing	Steel
5. Plug and Rod Coupling	Steel
6. Rod	Steel
7. Rod and Stem Coupling	Steel
8. Bottom Flange	Steel

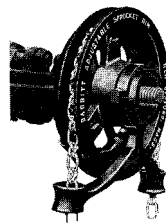
### DIMENSIONS

SIZE	A	B	C
2"-12"	2.38	1.125	1.12

14"-24" consult factory

### Adjustable Sprocket Rim

The Babbitt Adjustable Sprocket Rim will provide for remote operation of butterfly valves in high, normally out-of-reach locations. When ordering specify either the sprocket and chain number or the NIBCO valve figure number and size. The chain length must also be specified.



### DIMENSIONS - SPECIFICATIONS

Size No.	Dia. of Sprocket Wheel in Inches	Weight in Lbs.	Dia. of Valve Rim Will Fit	Chain Size No.	Chain Weight per 100' in Lbs.	Butterfly Valve Size
1	5 7/8	4	4 1/8 to 5 7/8	1/0	17 1/2	—
1 1/2	7 1/2	5	6 to 7 1/2	1/0	17 1/2	2-6"
2	9	8	7 3/4 to 9	1/0	17 1/2	—
2 1/2	12 1/2	15	9 1/4 to 12 1/2	4/0	30	8-16", 20", 24"
3	15 1/2	21	12 3/4 to 15 1/2	4/0	30	—
3 1/2	19	25	15 3/4 to 19	4/0	30	18", 30"- 48"
4	22	34	19 1/4 to 22	5/0	35	—

### No Silicone Used - Silicone Free Issue

All butterfly valves may incorporate the use of silicone in either grease or aerosol form during the assembly. LD/WD series butterfly valves can be special ordered as "Assemble-Dry" without test." These valves will be assembled not using silicone in the form of grease or aerosol spray.

Note: Even though provisions are made to assemble valves and not incorporate the use of silicone lubricants, the potential for it to be present as air-borne particles prevents us from certifying that our valves are 100% silicone free

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# Flow Data

## Cv Values for Valves

### VALVE SIZE

Size (mm.)	4	8	10	15	20	25	32	40	50	65	80	90	100	125	150	
Size (In.)	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	
<b>GATES</b>																
S/T-29	.5	2	4.9	9.1	22	40	65	95	175							
S/T-111, 113, 131, 133 134, 135, 136, 154, 174, 176	-	5.6	10.7	17.6	32	54	97	135	230	337	536	710	960	1,525	2,250	
T/F-617, 619, 667, 669, 607, 609																
F-637, 639									215	335	510	710	945	1,525	2,250	
<b>GLOBES</b>																
S/T-211, 235, 256																
275-Y	.61	1.16	2.2	3.64	6.65	11.1	20	28	48	70	111	-	198			
T-275-B	-	1.16	2.21	3.64	6.65	11.1	20	28	48	70	111					
F-718, F-738									45	70	105	-	195	315	465	
<b>CHECKS</b>																
S/T-413, 433, 473 (Swing)	-	1.3	2.5	4.8	14.3	24	43	60	102	150	238	315	435	675	1,000	
S/T-480 (Poppet)	-	-	3.70	6.86	16.3	30	49	72	130							
F-908 (Swing)									150	243	356	-	665	1,073	1,584	
T/F-918, 968, 938 (Swing)									137	221	327	-	605	975	1,440	
KW-900-W									60	105	184	-	354	577	801	
F-910, 960 (Poppet)										111	155	-	278	431	625	
W-910, 960 (Poppet)									66	88	130	-	228	350	520	
W-920-W									71	108	178	-	330	560	840	
<b>BALL</b>																
F-510, 530	-	-	-	11	25	45	-	137	217	-	482	-	790	-	1,144	
F-515, 535	-	-	-	25	50	85	-	259	440	840	1,400	-	2,350	-	5,200	
F-565	-	-	-	-	-	75	-	235	400	-	1,180	-	2,040	-	-	
T-560-BR/CS/S6	-	4.0	4.0	5	12	22	35	52	95	-	-					
T-570	-	-	-	7	12	25	38	52	95	-	-					
T/S-580	-	-	-	5.8	13.9	27	44	64	100	-	-					
T/S-580-70	-	-	-	-	-	-	38.5	76	101.4	183	390					
T/S-585-70	-	4.2	6.2	15.3	30.4	48.8	103	143	245	-	-					
TM-585-70-66	-	-	-	15.3	30.4	48.8	103	143	245	-	-					
AT-585-70-66	-	-	-	-	-	-	-	-	-	183	-					
T-580-70-W3	-	-	-	-	-	-	21.6	38	48.5	-	-					
T/S-585-70-W3	-	-	-	6	12	19.5	-	-	-	-	-					
T-580 (CS-S6)	-	6	12	15	23	36	44	64	114	-	-					
T/S-590-Y	-	-	-	-	-	-	44	64	100	183	390					
T/S-595-Y	-	5.9	11.4	18.7	34	57	103	143	245	310	-					
TM/KM-595 (CS-S6)	-	6	12	19	37	64	103	143	245	-	-					
T/K-595 (CS-S6)	-	6	12	19	37	64	103	143	245	-	-					
<b>BUTTERFLY</b>																
LD/WD-2000, 3000									166	247	340	-	660	1,080	1,613	
GD-4765, 4775 FC-2700, FD-5700									145	195	290	-	600	930	1,600	

NOTE: Flow data for angle valves use globe Cv times 1.25:  
Bronze Angles - 311, 335, 375, 376-AP  
Iron Angles - 818, 869, 831

**Liquid Flow:**

$$Q = C_v \sqrt{\frac{\Delta P}{S}} \quad \text{or} \quad \Delta P = S \left( \frac{Q}{C_v} \right)^2$$

where... Q = flow rate (gallons per minute)  
 ΔP = pressure drop across valve (psi)  
 S = specific gravity of media

This equation is good for turbulent flow and for liquids with viscosities near that of water.

(Cv is defined as the flow in GPM that a valve will carry with a pressure drop of 1.0 psi when the media is water at 60°F.) (The specific gravity of water is 1 (one). )

**Gas Flow:**

$$Q = 1360 C_v \sqrt{\frac{\Delta P \times P_1}{ST}}$$

where... Q = gas flow (SCFH—std. cu. ft/hr)  
 S = specific gravity of gas (air = 1.0)  
 T = temp—degrees Rankine (°F + 460)  
 ΔP = pressure drop across valve (psi)  
 P<sub>1</sub> = upstream pressure (psia) absolute

**NOTE:** ΔP must be less than .5 P<sub>1</sub>. (Flow is critical when ΔP is greater than .5 P<sub>1</sub>.)

											<b>(THROTTLING FACTORS)</b>													
											For throttling use with disc partially open. Multiply Cv by factor.													
											<b>NOTE:</b> Gate valves are not throttled.													
200	250	300	350	400	450	500	600	750	900	0	10	20	30	40	50	60	70	80	90	100				
8	10	12	14	16	18	20	24	30	36	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	1.00				
4,150	6,700	9,925	13,800	18,375	23,600	29,600	43,570																	
											0	.35	.65	.90	.93	.96	.98	.99	1.00	1.00	1.00			
860	1,390	0	.03	.035	.06	.1	.16	.24	.32	.47	.68	1.00	0	.35	.65	.90	.93	.96	.98	.99	1.00	1.00	1.00	
											<b>WARNING</b>													
											The Fluid Flow factors contained herein are calculated values. They are, therefore, approximations and cannot be used for highly critical flow or pressure drop calculations. For very precise flow measurements, tests must be conducted on any valve mentioned within this catalog. Throttling of ball valves is not recommended when valves are less than 45° open.													
2,937	4,730	6,985	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00
2,670	4,300	6,350	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00
1,500	2,357	3,742	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00
1,115	1,770	2,500	3,400	4,400	5,600	6,900	10,000	15,400	22,400	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00				
900	1,450	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00	
1,600	2,700	4,000	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00
2,164	3,507	5,516	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00
10,200	14,400	25,300	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00
											0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00			
3,759	5,300	7,969	11,917	16,383	21,705	27,908	43,116	60,922	86,375	0	.01	.05	.16	.30	.37	.45	.58	.71	.87	1.00				
3,450	5,800	8,950																						

# Properties of Valve Materials

ALLOY	ASTM NO.	OTHER ALLOY DESIGNATION	NOMINAL OR MAXIMUM CHEMICAL COMPOSITION									
			CARBON AL	CHROME C	COBALT Cr	COBALT Co	COPPER Cu	IRON Fe	LEAD Pb	MANGANESE Mn	MOLYBDENUM Mo	
Commercial Aluminum 380	SC 84 A (modified)	UNS A38000	87.0					1.0	1.3		.35	
Free Cutting Brass	B 16	UNS C36000						61.5		3.0		
Navy "M" (Steam Bronze)	B 61	UNS C92200	.005					88.0	.25	1.5		
Composition Bronze (Ounce Metal)	B 62	UNS C83600	.005					85.0	.30	5.0		
Copper-Silicon Alloy B	B 98/B 99	UNS C65100						96.0	.8	.05	.7	
Forging Brass	B 124	UNS C37700						60.0	.3	2.0		
Brass Wire (Red Brass)	B 134	UNS C23000						85.0	.05	.05		
Leaded Red Brass	B 140	UNS C31400						89.0	.10	1.9		
Aluminum Bronze (Cast)	B 148	UNS C95400	11.0					85.0	4.0			
Aluminum Bronze (Rod)	B 150	UNS C64200	7.0					91.0	.30	.05	.10	
Silicon Red Brass	B 371	UNS C69400						81.5	.20	.30		
Leaded Semi-Red Brass	B 584	UNS C84400	.005					81.0	.40	7.0		
Leaded Red Brass		UNS C84500	.005					78.0	.40	7.0		
Leaded Nickel Bronze	B 584	UNS C97600						64.0		4.0		
Copper (Wrot)	B 75	UNS C12200						99.9				
Gray Iron	A 126	Class B										
3% Ni Gray Iron	A 126 (modified)	Class B										
Austenitic Gray Iron (Ni-Resist)	A 436	Type 2		3.00	2.0			.5			1.0	
Ductile Iron (Ferritic)	A 395			3.20								
Austenitic Ductile Iron (Ductile) (Ni-Resist)	A 536 A 439 D2C			2.9	.5						2.4	1.0

NOMINAL OR MAXIMUM CHEMICAL COMPOSITION								NOMINAL PHYSICAL PROPERTIES			
NICKEL Ni	PHOS P	SILICON Si	SULFUR S	TIN Sn	TITAN- IUM Ti	TUNG- STEN W	ZINC Zn	TENSILE STRENGTH Psi	YIELD STRENGTH Psi	% ELONGATION	HARDNESS
.50		12.0		.15			.50	42,000	19,000	3.5	
							35.5	50,000	20,000	15	75 HRB
1.0	.05	.005	.05	6.0			4.5	34,000	16,000	22	65 HB *500 kg
1.0	.05	.005	.08	5.0			5.0	30,000	14,000	20	60 HB 500 kg
		1.6					1.5	86,000**	20,000	11	65 HRB
							38.0	52,000	20,000	45	80 HRB
							15.0	56,000			60 HRB
.7							9.1	50,000	30,000	7	60 HRB
								75,000	30,000	12	170 HB *3000 kg
.25		2.0		.20			.50	90,000	45,000	9	80 HRB
		4.0					14.5	80,000	40,000	15	85 HRB
	.02	.005	.08	3.0			9.0	29,000	13,000	18	55 HB *500 kg
1.0	.02	.005	.08	3.0			12.0	29,000	13,000	16	55 HB *500 kg
20.0				4.0			8.0	40,000	17,000	10	80 HB
	.02							36,000	30,000	25	45 T
	.75		.15					31,000			195 HB
3.00	.75		.15					31,000			195 HB
20.0		2.0	.12					25,000			118 HB
	.08	2.50						60,000	40,000	18	167 HB
	.08	2.50						80,000	55,000	6	160 HB
24.0	.08	3.0						58,000	28,000	20	146 HB

\*Load Applied During Testing  
\*\*Allowable Range is 75,000 to 95,000

# Properties of Valve Materials

ALLOY	ASTM NO.	OTHER ALLOY DESIGNATION	NOMINAL OR MAXIMUM CHEMICAL COMPOSITION									
			CARBON		CHROME	COBALT	COPPER	IRON	LEAD	MANGA-NESE	MOLYB-DENUM	
			AL	C	Cr	Co	Cu	Fe	Pb	Mn	Mo	
Wrot 304	A 167 304	UNS S30400		.08	19						2	
Cast 316	A 351 CF8M	UNS S31600		.08	20						1.5	2.5
Cast 316	A 743 CF16F			.16	20						1.5	1.5
Cast 316	A 743 CF8M			.08	20						1.5	2.5
Wrot 316	A 276 316	UNS S31600		.08	17						2	
Cast 410	A 217 CA 15			.15	13						1	2.5
Forged 410	A 182 F6A2			.15	13						1	
Wrot 410	A 276 410	UNS S41000		.15	13						1	
Wrot 416	A 582	UNS S41600		.15	13						1.25	
Wrot 420	A 276 420	UNS S42000		.15	13						1	
Cast Alloy 20	A 743 CN7M			.07	20			3.5			1.5	2.5
Wrot Alloy 20	B 473 20C63	UNS N08020		.07	20			3.5			2	2.5
Wrot 17-4PH	A 564 630	UNS S17400		.07	16			3.5			1	
Forged Carbon Steel	A 105			.35							1	
Cast Carbon Steel	A 216 WCB			.3							1.1	
1¼ Cast Cr. Moly Steel	A 217 WC6			.2	1.2						.7	.55
Cast Cr. Moly Steel	A 217 C5			.2	5						.55	.55
Cast Low Carbon Steel	A 352 LCB			.3							1.0	
Nickel-Low Carbon Steel	A 352 LC2			.25							.65	
B-7 Alloy Steel Studs	A 193 B7			.4	1						.85	.2
304 SS Nuts	A 194 GR8			.08	19						2	
2-H Alloy Steel Nuts	A 194 2H			.4								
Reg. Steel Bolting	A 307 Gr. B			.2							.45	
Steel Bolting	A 449			.4							.6	
304SS Bolting	A 493 304	UNS S30400		.08	19						2	
Eyebolts	A 489			.48							1.0	
Gland Nuts	A 563 Gr. A			.37	.55			.35			1.0	
H/W Nuts	A 108 1020	UNS G10200		.20							.45	
Swing Bolt Pin	A 108 1212	UNS G12120		.13							.85	
Yoke Bushing Caps	A108 12L14			.15						.25	1.0	
Seat Ring Base	A 519 1026			.25							.75	
Monel H.F.	(Trademark Materials like, Stellite 6*, Stoddy 6, and Wallex 6)	AWS 5.13		1.25	29	55		2.5				
Cast Monel		QQ-N-288-E	.5	.3			30	3.5			1.5	
Wrot Monel (K-500)		QQ-N-286-C1B	3.0	.1			24	2.0			1.5	

\*Trademark by Cabot Corp.

NOMINAL OR MAXIMUM CHEMICAL COMPOSITION								NOMINAL PHYSICAL PROPERTIES			
NICKEL Ni	PHOS P	SILICON Si	SULFUR S	TIN Sn	TITAN- IUM Ti	TUNG- STEN W	ZINC Zn	TENSILE STRENGTH Psi	YIELD STRENGTH Psi	% ELONGATION	HARDNESS
9	.045	1.0	.03					75,000	30,000	40	202 HB
11	.04	2.0	.04					70,000	30,000	25	
11	.04	2.0	.04					70,000	30,000	30	
12	.045	1.0	.03					75,000	30,000	30	
12	.045	1.0	.03					75,000	30,000	30	
1	.04	1.5	.04					90,000	65,000	18	
	.04	1.0	.03					85,000	55,000	18	200/225 HB
.5	.04	1.0	.03					100,000	80,000	15	
	.06	1.0	.15					114,000	95,000	17	235 HB
	.04	1.0	.03								250/450 HB
28	.04	1.5	.04					62,000	25,000	35	
35	.045	1.0	.035					85,000	35,000	30	
4	.04	1.0	.03					115,000	75,000	18	255 HB
	.04	.035	.05					70,000	36,000	22	187 HB
	.04	.6	.045					70,000	36,000	22	
	.04	.06	.045								
	.04	.75	.045								
	.04	.6	.045					65,000	35,000	24	
2.5	.04	.6	.045					70,000	40,000	24	
	.035	.25	.04					125,000	105,000	16	
9	.045	1.0	.03								126/300 HB
	.04		.05								250/300 HB
	.04		.05					100,000		18	121/212 HB
	.04		.05					120,000	92,000	14	
9	.045	1.0	.03					90,000			
	.04	.25	.05					75,000	30,000	30	
.35	.04	.2	.05								
	.04		.05								120/300 HB
	.10		.20								
	.07		.3					55,000	35,000	25	
	.04		.05								
3						5		105,000		10	350 HB
60		1.5						65,000	32,500	25	125/150 HB
67		.5	.01		.5			135,000	95,000	20	255 HB

# Specifications

NIBCO butterfly valves are designed and manufactured to give maximum performance on recommended service at the lowest possible initial and upkeep cost. They meet or exceed the following specifications developed through years of experience, research and laboratory tests.

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## American Petroleum Institute

API 609 (Supplied upon request)

## Manufacturers Standardization Society of the Valve and Fitting Industry, Inc.

MSS SP 25 MS SP 67

## United States Coast Guard — CG190

Now called "CIMDTINST — M16714.3"

"Equipment List"

"Items approved, certified or accepted under Marine Inspection and Navigation Laws"

NIBCO valves, fittings and flanges are listed in this document.

Code of Federal Regulations Title 46 Shipping Parts 41 to 69

The Code of Federal Regulations is a codification of the general and permanent rules published in the Federal Regulations by the Executive Departments and Agencies of the Federal Government.

This regulation is constantly revised to reference the latest ANSI, ASTM & MSS Standards to which NIBCO conforms to when building products.

## NAVY — APL, CID, NSN

"Department of the Navy"

"Navy Ships Parts Control Center"

Mechanicsburg, PA

The Department of the Navy, when using standard commodity type valves, assigns APL-CID numbers to each individual valve manufactured by a company. Valves of the same figure number, but of different size get different CID numbers.

The (APL) Allowance Parts List, (CID) Code Identification Numbers and (NSN) National Stock Numbers are used by the Navy in the Parts Control Center to order replacement valves or parts of valves that are installed on board United States Navy vessels.

When a Navy vessel is being built, the shipyard doing the construction must apply to the Parts Control Center for CID numbers for all valves before the Navy will accept delivery of the vessel.

On many NIBCO valves, the CID and NSN numbers have been assigned. Consult NIBCO for more information.

## American Bureau of Shipping — Rules for Building

The American Bureau of Shipping states in Article 36.15.1: All valves are to be constructed and tested in accordance with a recognized standard, such as ANSI, MSS or other, acceptable to the Bureau. They are to bear the trademark of the manufacturer legibly stamped or cast on the exterior of the valve, as well as the pressure rating class for which the manufacturer guarantees the valve will meet the requirements of the standards.

The following NIBCO butterfly valves are approved by ABS for marine service: LD or WD 2000 and 3000 series.

ABS Certificate No.: 00N09621-X Manufacturers Federal Code: NIBCO — 12168

## Lloyd's Register of Shipping

NIBCO iron valves are approved by Lloyd's Register. Certificate No.: NOS 9603021

## Det Norske Veritas

NIBCO DI Butterfly valves are in compliance with DNV Rules for classification of ships and mobile offshore units. DNV standards for Certification 2.09 No. 101. approved for fresh water, sea water, sanitary water, water ballast, cargo oil transfer and bilge lines

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## Sample Butterfly Valve Specification

### Line Control Valves 2" or larger

**Butterfly Valves:** Valve shall be full lug or wafer body style. Valves to be manufactured in accordance with MSS SP 67. The valves shall be rated at least 200 PSI (2" - 12") and 150 PSI (14" - 48") bi-directional differential pressure. **Body** to have 2" extended neck for insulation and **shock resistant ductile iron**. Valves to have aluminum bronze disc and **molded in or cartridge seat** of EPDM rubber. Stem shall be 400 series stainless steel. Top and bottom stem bushings of dissimilar material are required with a positive stem retention mechanism. Sizes 2" - 6" shall be lever operated with a 10 position throttling plate; sizes 8" and larger shall be gear operated. **Lug style valves shall be capable of providing bi-directional "Dead End Service" at full pressure without the need for down stream blind flange.**

Acceptable valves:

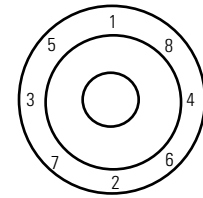
NIBCO LD-2000 (2" - 12"), LD-1000 (14" - 48")

# Butterfly Valve Technical Information

## Installation Guide

1. This Butterfly Valve is bi-directional and may be installed in either direction.
2. Install this valve between any ANSI Class 125 or 150 flange. Cast iron, bronze, plastic or steel flanges may be used. No flange gaskets are required.
3. The stem can be installed in any position, but if a choice of stem positions exists, good practice dictates that the valve be installed with the stem horizontal. This will minimize liner wear by distributing stem and disc weight evenly.
4. Valves should be installed with the disc in the closed or almost closed position. This will prevent damage to the disc sealing edge.
5. Before any flange bolts are tightened, valves should be centered within the flanges and then carefully opened to assure free, unobstructed disc movement. Disc interference may result when valves are installed in pipelines having smaller than normal inside diameters, such as heavy wall pipe, plastic lined pipe, or as cast flanges. Suitable corrective measures must be taken to remove these obstructions, such as taper boring the pipe or installing a spacer.
6. After proper operation has been verified, tighten all bolts using the crossover method. Recommended tightening torques pattern is listed below.

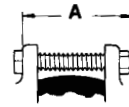
Flange Size	Recommended Min. Bolt Torque	Flange Size	Recommended Min. Bolt Torque
2 - 4"	20 - 30 ft. lbs.	18 - 20"	150 - 210 ft. lbs.
6 - 8"	33 - 50 ft. lbs.	24 - 30"	215 - 300 ft. lbs.
10"	53 - 75 ft. lbs.	36"	300 - 375 ft. lbs.
12"	80 - 110 ft. lbs.	42 - 48"	350 - 425 ft. lbs.
14- 16"	140 - 200 ft. lbs.		



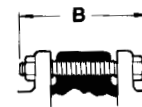
7. Interference may also occur when butterfly valves are bolted directly to the outlet flange of a swing check, silent check, or reducing flange. Check valve and butterfly valve combinations are very popular; normally a short spool piece is required between the valves.

### Caution

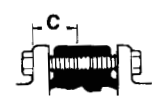
1. Class 250 cast iron and Class 300 steel flanges **can not** be used on these valves.
2. Rubber faced or mechanical flanges are **not** recommended.
3. This valve is **not recommended** for steam service.
4. Valves should **not** be assembled to the flanges and then welded into the piping system.
5. Lever-lock handles are **not** recommended for use on 8" and larger valves.
6. Do not install EPDM liner in compressed air lines.



WAFER STYLE



LUG STYLE



LUG STYLE

## Capscrew and Bolt Data

Valve Size	Diameter	Number		Bolt Length "A" Rounded Length	Stud Length "B" Rounded Length	Cap Screw Length "C" Rounded Length
		Machine & Stud	Cap Screw			
2"	.625	4	8	4.00	5.00	1.25
2½"	.625	4	8	4.25	5.25	1.50
3"	.625	4	8	4.50	5.25	1.50
4"	.625	8	16	5.00	6.00	1.75
5"	.750	8	16	5.50	6.50	1.75
6"	.750	8	16	5.50	6.75	2.00
8"	.750	8	16	6.00	7.00	2.25
10"	.875	12	24	6.75	8.00	2.25
12"	.875	12	24	7.00	8.25	2.50
14"	1.000	12	24	7.50	8.50	2.75
16"	1.000	16	32	8.00	9.50	3.25
18"	1.125	16	32	9.00	10.50	3.50
20"	1.125	20	40	9.50	11.00	4.00
24"	1.250	20	40	11.00	12.50	4.75
30"	1.250	—	56	—	—	3.50
36"	1.500	—	64	—	—	4.00
42"	1.500	—	72	—	—	4.50
48"	1.500	—	88	—	—	4.75

**Notes: All valves are suitable for installation with pipe flanges conforming to ANSI B-16.1 (Class 125 iron flanges) and ANSI B-16.5 (Class 150 steel flanges). All screw threads are according to ANSI B-1.1 coarse thread.**

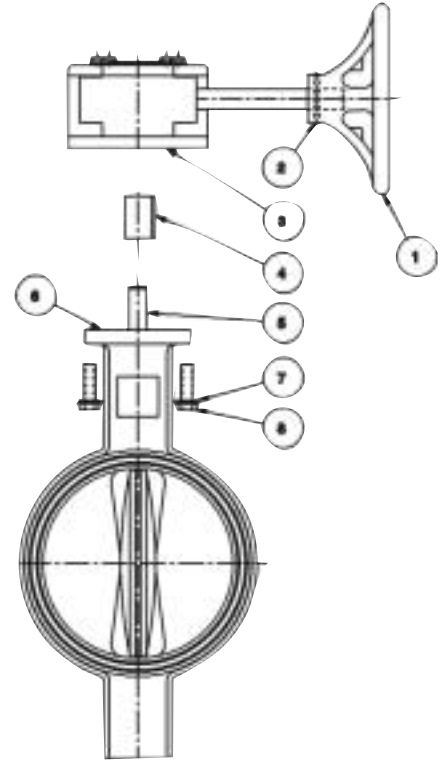


# Butterfly Valve Technical Information

## Gear Operator Installation Instructions (2" thru 18" 1000/2000/3000/4000/5000 series)

### INSTALLATION

- a) Install handwheel (1) onto gear operator shaft and secure with pin (2). (If not already attached)
- b) Turn the handwheel (1) counter-clockwise until in full OPEN position.
- c) Turn valve stem (5) until valve is in full OPEN position.
- d) Assure both mounting base of gear operator (3) and valve top flange (6) are clean and dry.
- e) Insert adapter bushing into gear operator (3) bore. (If necessary)
- f) Align adapter bushing or gear operator (3) bore with valve stem (5). Note that on Fire Protection models adaptor bushings may differ from illustration.
- g) Secure gear operator (3) to valve top flange (6) using a minimum of two supplied fasteners (7 & 8).
- h) Install flag and secure with Allen screw. (Fire Protection gear operators only)
- i) Rotate handwheel from full OPEN to full SHUT positions several times to assure proper operation. See Stop Adjustment Procedure if alignment adjustment is necessary.



Tools Required		
Fire Protection (UL/FM)	2" — 8"	9/16" hex wrench & 1/8" hex allen wrench
	10" — 12"	3/4" hex wrench and 1/8" hex allen wrench
Commercial	2" — 8"	9/16" hex wrench
	10" — 14"	3/4" hex wrench
	16" — 18"	1 1/8" hex wrench

For Fire Protection, gear operators, it is critical to use only key (8) supplied with gear operator to conform to UL, FM, and ULC specifications.

**NOTE: Connection of gear operator to valve stem varies depending on gear operator model, size, and style. The adapter bushing and key may be different from illustration shown.**

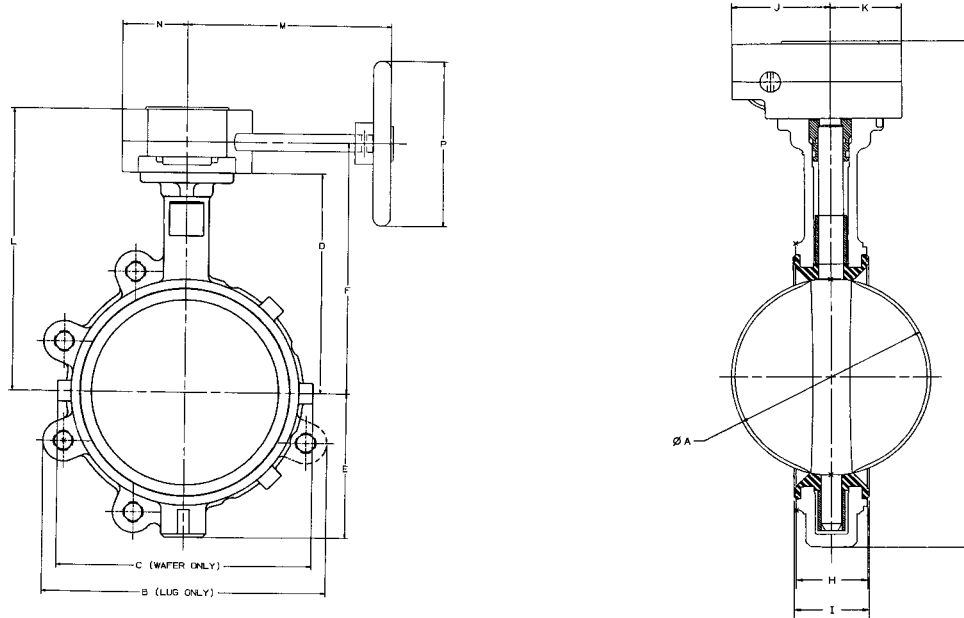
### MAINTENANCE AND REPAIR

All gear operators are lubricated for life at assembly and should not require service. In the event of a gear operator suffering damage or excessive wear, it is suggested that the complete gear operator be replaced. Only the handwheel (1), pin (2), and some adapter bushings (4) are available for repair parts.

*NOTE: The gear operators are shipped from the factory, "pre-set" for mounting to valves that are in the closed position*

# 2000/3000 Series Technical Information

## Valve with Gear Mounted



### Typical LD/WD2000-5

#### DIMENSIONS — WEIGHTS

Size	A	B (Lug)	C (Wafer)	D	E	F	G
2"	2.53	4.62	4.88	5.38	2.88	6.51	10.64
2½"	2.90	5.62	5.62	5.88	3.25	7.01	11.51
3"	3.17	6.12	6.12	6.12	3.38	7.25	11.88
4"	4.17	8.25	7.00	6.88	4.00	8.01	13.26
5"	5.17	9.38	8.25	7.38	4.75	8.51	14.51
6"	6.17	10.25	9.25	8.00	5.25	9.13	15.63
8"	8.17	12.38	11.62	9.25	6.50	10.38	18.13
10"	10.17	15.50	14.25	10.50	8.00	11.63	20.88
12"	12.17	18.25	16.75	12.00	9.25	13.13	23.63

Size	H (Metal)	I (Rubber)	J	K	L	M	N	P
2"	1.68	1.81	2.91	2.13	7.87	7.64	2.12	5.91
2½"	1.81	1.94	2.91	2.13	8.37	7.64	2.12	5.91
3"	1.81	1.94	2.91	2.13	8.62	7.64	2.12	5.91
4"	2.06	2.19	2.91	2.13	9.37	7.64	2.12	5.91
5"	2.19	2.31	2.91	2.13	9.87	7.64	2.12	5.91
6"	2.19	2.31	2.91	2.13	10.50	7.64	2.12	5.91
8"	2.38	2.50	2.91	2.13	11.75	9.53	2.12	9.84
10"	2.69	2.81	3.90	3.03	13.46	11.54	3.03	9.84
12"	3.00	3.12	3.90	3.03	14.96	11.54	3.03	9.84

# Butterfly Valve Technical Information

## Resilient Liner Materials

**EPDM** – EPDM is a terpolymer elastomer made from ethylene-propylene diene monomer. EPDM has good abrasion and tear resistance and offers excellent chemical resistance to a variety of acids and alkalines. It is susceptible to attack by oils and is not recommended for applications involving petroleum oils, strong acids, or strong alkalines. EPDM should not be used on compressed air lines. It has exceptionally good weather aging and ozone resistance. It is fairly good in ketones and alcohols.

**BUNA-N (Nitrile) (NBR)** – Buna-N is a general purpose oil resistant polymer known as nitrile rubber. Nitrile is a copolymer of butadiene and acrylonitrile. Buna-N has good solvent, oil, water and hydraulic fluid resistance. It displays good compression set, abrasion resistance and tensile strength. Buna-N should not be used in highly polar solvents such as acetone and methyl ethyl ketone, nor should it be used in chlorinated hydrocarbons, ozone or nitro hydrocarbons. Some aviation fuels may not be compatible.

**Fluoroelastomer (VITON\*) (FKM)** – Fluoroelastomers are inherently compatible with a broad spectrum of chemicals. Because of this extensive chemical compatibility which spans considerable concentration and temperature ranges, fluoroelastomers have gained wide acceptance as a material of construction for butterfly valve O-rings and seats. Fluoroelastomer can be used in most applications involving mineral acids, salt solutions, chlorinated hydrocarbons and petroleum oils. It is particularly good in hydrocarbon service. FKM is not recommended for use in high temperature water.

\*Trademark of E.I. Dupont Co.

### Liner Temperature Ratings

Liner Material	Temperature
EPDM**	-20°F to + 250°F
Nitrile (Buna-N)	-20°F to + 180°F
Fluoroelastomer	-20°F to + 300°F

\*\* EPDM is rated at 250°F intermittent service and 225°F continuous service.

Proprietary compound formulas are used for each of the elastomers to provide the right combination of seat compression, abrasion resistance, and chemical resistance to match your application. Elastomeric seat materials are not suitable for steam service.

# Butterfly Valve Technical Information

## Metals Used in Valves & Fittings

**Aluminum**—A non-ferrous metal, very lightweight, approximately one-third as much as steel. Aluminum exhibits excellent atmospheric corrosion resistance, but can be very reactive with other metals. In valves, aluminum is mainly used as an exterior trim component such as a handwheel or identification tag.

**Copper**—Among the most important properties of wrought copper materials are their thermal and electrical conductivity, corrosion resistance, wear resistance, and ductility. Wrought copper performs well in high temperature applications and is easily joined by soldering or brazing. Wrought copper is exclusively used for fittings.

**Bronze**—One of the first alloys developed in the bronze age is generally accepted as the industry standard for pressure rated bronze valves and fittings. Bronze has a higher strength than pure copper, is easily cast, has improved machinability, and is very easily joined by soldering or brazing. Bronze is very resistant to pitting corrosion, with general resistance to most chemicals less than that of pure copper.

**Silicone Bronze**—Has the ductility of copper but much more strength. Silicon bronze has equal or greater corrosion resistance to that of copper. Commonly used as stem material in pressure-rated valves, silicon bronze has greater resistance to stress corrosion cracking than common brasses.

**Aluminum Bronze**—The most widely accepted disc material used in butterfly valves, aluminum bronze is heat treatable and has the strength of steel. Formation of an aluminum oxide layer on exposed surfaces makes this metal very corrosion resistant. Not recommended for high pH wet systems.

**Brass**—Generally good corrosion resistance. Susceptible to de-zincification in specific applications; excellent machinability. Primary uses for wrought brass are for ball valve stems and balls, and iron valve stems. A forging grade of brass is used in ball valve bodies and end pieces.

**Gray Iron**—An alloy of iron, carbon and silicon; easily cast; good pressure tightness in the as-cast condition. Gray iron has excellent dampening properties and is easily machined. It is standard material for bodies and bonnets of Class 125 and 250 iron body valves. Gray iron has corrosion resistance that is improved over steel in certain environments.

**Ductile Iron**—Has composition similar to gray iron. Special treatment modifies metallurgical structure which yields higher mechanical properties; some grades are heat treated to improve ductility. Ductile iron has the strength properties of steel using similar casting techniques to that of gray iron.

**Carbon Steel**—Very good mechanical properties; good resistance to stress corrosion and sulfides. Carbon steel has high and low temperature strength, is very tough and has excellent fatigue strength. Mainly used in gate, globe, and check valves for applications up to 850°F, and in one-, two-, and three-piece ball valves.

**3% Nickel Iron**—Improved corrosion resistance over gray and ductile iron. Higher temperature corrosion resistance and mechanical properties. Very resistant to oxidizing atmospheres.

**Nickel-Plated Ductile Iron**—Nickel coatings have received wide acceptance for use in chemical processing. These coatings have very high tensile strength, 50 to 225 ksi. To some extent, the hardness of a material is indicative of its resistance to abrasion and wear characteristics. Nickel plating is widely specified as a disc coating for butterfly valves.

**400 Series Stainless Steel**—An alloy of iron, carbon, and chromium. This stainless is normally magnetic due to its martensitic structure and iron-content. 400 series stainless steel is resistant to high temperature oxidation and has improved physical and mechanical properties over carbon steel. Most 400 series stainless steels are heat-treatable. The most common applications in valves are, for stem material in butterfly valves, and backseat bushings and wedges in cast steel valves.

**316 Stainless Steel**—An alloy of iron, carbon, nickel, and chromium. A non-magnetic stainless steel with more ductility than 400SS. Austenitic in structure, 316 stainless steel has very good corrosion resistance to a wide range of environments, is not susceptible to stress corrosion cracking and is not affected by heat treatment. Most common uses in valves are: stem, body and ball materials.

**17-4 PH Stainless Steel\***—Is a martensitic precipitation/age hardening stainless steel offering high strength and hardness. 17.4 PH withstands corrosive attack better than any of the 400 series stainless steels and in most conditions its corrosion resistance closely approaches that of 300 series stainless steel. 17.4 PH is primarily used as a stem material for butterfly and ball valves.

**Alloy 20Cb-3\***—This alloy has higher amounts of nickel and chromium than 300 series stainless steel and with the addition of columbium, this alloy retards stress corrosion cracking and has improved resistance to sulfuric acid. Alloy 20 finds wide use in all phases of chemical processing. Commonly used as interior trim on butterfly valves.

**Monel\***—Is a nickel-copper alloy used primarily as interior trim on butterfly and ball valves. One of the most specified materials for corrosion resistance to sea and salt water. Monel is also very resistant to strong caustic solutions.

**Stellite\***—Cobalt base alloy, one of the best all-purpose hard facing alloys. Very resistant to heat, abrasion, corrosion, impact, galling, oxidation, thermal shock and erosion. Stellite takes a high polish and is used in steel valve seat rings. Normally applied with transfer plasma-arc; Stellite hardness is not affected by heat treatment.

**Hastelloy C\***—A high nickel-chromium molybdenum alloy which has outstanding resistance to a wide variety of chemical process environments including strong oxidizers such as wet chlorine, chlorine gas, and ferric chloride. Hastelloy C is also resistant to nitric, hydrochloric, and sulfuric acids at moderate temperatures.

*Note: See NIBCO's "Chemical Resistance Guide Catalog" for specific questions.*

*\*Alloy 20Cb-3 is a registered trademark of Carpenter Technology*

*\*Hastelloy C is a registered trademark of Cabot Corporation*

*\*Stellite is a registered trademark of Cabot Corporation*

*\* Monel is a registered trademark of International Nickel*

*\*17-4 PH Stainless Steel is a registered trademark of Armco Steel Company*

# Butterfly Valve Technical Information

## Torque Data

### LD/WD 2000 Series Torque Data

Size	100 PSI	200 PSI	250 PSI
2"	140	180	195
2½"	190	235	255
3"	250	300	325
4"	430	530	580
5"	590	790	845
6"	795	1,035	1,155
8"	1,850	2,350	2,600
10"	2,350	2,900	3,125
12"	3,875	5,390	6,145

### LD/WD 1000 Series Torque Data

Size	50 PSI	75 PSI	100 PSI	150 PSI
14"	—	3,837	—	4,870
16"	—	5,003	—	6,685
18"	—	6,567	—	8,958
20"	—	8,540	—	11,950
24"	—	13,220	—	18,680
30"	28,320	29,782	30,864	33,336
36"	40,624	41,875	43,480	46,528
42"	69,744	72,076	74,632	79,864
48"	96,648	100,520	103,840	111,112

### N200 Series Torque Data

Size	100 PSI	200 PSI
2	120	220
2½	130	320
3	180	480
4	280	820
5	360	1,162
6	600	1,560
8	1,100	2,890
10	2,040	5,270
12	4,500	8,050

### N150 Series Torque Data

Size	100 PSI	150 PSI
14	4,125	4,870
16	5,590	6,685
18	7,354	8,958
20	9,670	11,950
24	14,860	18,680

Note: Torque Data shown is for general service (clean water, ambient temperatures). For non-lubricating, high temperatures or aggressive media, consult Nibco Technical Service.

### Butterfly Valve Torque Data

**Torque** is the rotary effort required to operate a valve. This turning force in a butterfly valve is determined by three factors. (1) Friction of the disc to seat for sealing (2) Bearing friction (3) Dynamic torque.

**Breakaway Torque** is the total of the torques resulting from bearing friction and seat/disc interference friction at a given pressure differential. This value is normally the highest required torque to operate a valve, and is used in sizing actuators. The values listed at the left are based on performance tests and include a safety factor. The torques listed are valid for water and lubricating fluids at ambient temperature. For dry and non-lubricating fluids, contact your NIBCO customer service representative.

Butterfly valves, sizes 8" and larger, when used on liquids, show a marked increase in dynamic torque which tends to close the valve. For this reason, gear operated or actuated valves are recommended.

Torque listed for EPDM. When calculating torques for Buna-N, or Fluoroelastomer multiply listed torque by 1.25. Consult factory for dry service valves.

### FC/FD27\*5/57\*5 GD4765/4775 Torque Data

Size	100 PSI	200 PSI	300 PSI
2	48	67	83
2½	48	67	83
3	100	134	168
4	185	251	317
5	294	410	499
6	520	705	890
8	1,070	1,495	1,798
10	1,550	2,214	2,654
12	2,150	3,024	3,662

# Butterfly Valve Actuation Data Sheet

To actuate all valves it is necessary to provide certain data to assure proper sizing and prevent damage to the system. Please supply as much data as possible.

**I. Valve Information:**

A. **Type:** Butterfly  Ball

B. **Fig. No.** \_\_\_\_\_ **Size** \_\_\_\_\_ **Qty.** \_\_\_\_\_

C. **Type of Fluid in Valve:** \_\_\_\_\_ **Inlet Pressure:** \_\_\_\_\_ **Is Fluid:** Dry  Wet

**Differential Pressure:** \_\_\_\_\_ **System Velocity:** \_\_\_\_\_

**System GPM:** \_\_\_\_\_ **Temperature:** \_\_\_\_\_

**II. Actuator Information:**

A. **Electric:** Voltage: \_\_\_\_\_ Time for 90° rotation: \_\_\_\_\_

Type Enclosure: NEMA 4  NEMA 7  Other \_\_\_\_\_

Special Requirements: Brake  Thermostat  Heater and Thermostat

Manual Override  Extended Duty Motor

Modulating Control  Position Transmitter

Extra SPDT Switches  Potentiometer

B. **Pneumatic:** Air supply to actuator: \_\_\_\_\_ PSI (**Min. 40 psi, Max. 120 psi**)

Actuator Type: Air-to-Air

Air-to-Spring  Failsafe: Open  Closed

Solenoid: NEMA 4  NEMA 7

Switch Box: If so: NEMA 4  NEMA 7

Type: SPDT  DPDT  (two each is standard)

Pneumatic Positioner: 3-15  4-20 MA

**III. Special Notes:** \_\_\_\_\_

Note: If special features are required for actuators such as modulating positioners either for electric or pneumatic actuators, consult factory.

# Figure Number Comparisons\*

## Butterfly Valves

### DUCTILE IRON

NIBCO	WD2000	LD2000	WD2100	LD2100	WD3010	LD3010	WD3110	LD3110	WD3022	LD3022
Bray	30-11010-120	31-11010-120	30-11010-684	31-11010-684	30-11010-119	31-11010-119	30-11010-713	31-11010-713	30-11010-124	31-11010-124
Centerline	A2-061-05	B2-061-05	A2-061-01	B2-061-01	A2-021-05	B2-021-05	A2-021-01	B2-021-01	A2-044-05	B2-044-05
Demco	NEC1114351	NEC5114351	NEC1114311	NEC5114311	NEC1115351	NEC5115351	NEC1115311	NEC5115311	NEC1122351	NEC5122351
Grinnell	WD-8281-3	LD-8281-3	WD-8181-3	LD-8181-3	WD-8201-3	LD-8201-3	WD-8101-3	LD-8101-3	WD-8271-4	LD-8271-4
Keystone	HS-1	HS-2	HS-1	HS-2	HS-1	HS-2	HS-1	HS-2	HS-1	HS-2
Milwaukee	MW-233-E	ML-233-E	MW-233-B	ML-233-B	MW-232-E	ML-232-E	MW-232-B	ML-232-B	MW-234-E	ML-234-E
Mueller Steam	55-ANK6-1	56-ANK6-1	55-ANK3-1	56-ANK3-1	55-ANI6-1	56-ANI6-1	55-ANI3-1	56-ANI3-1	55-AHH6-1	56-AHH6-1
Watts	DBF-04-121-15	DBF-03-121-15	DBF-04-121-25	DBF-03-121-25	DBF-04-111-15	DBF-03-111-15	DBF-04-111-25	DBF-03-111-25	DBF-04-131-25	DBF-03-131-25

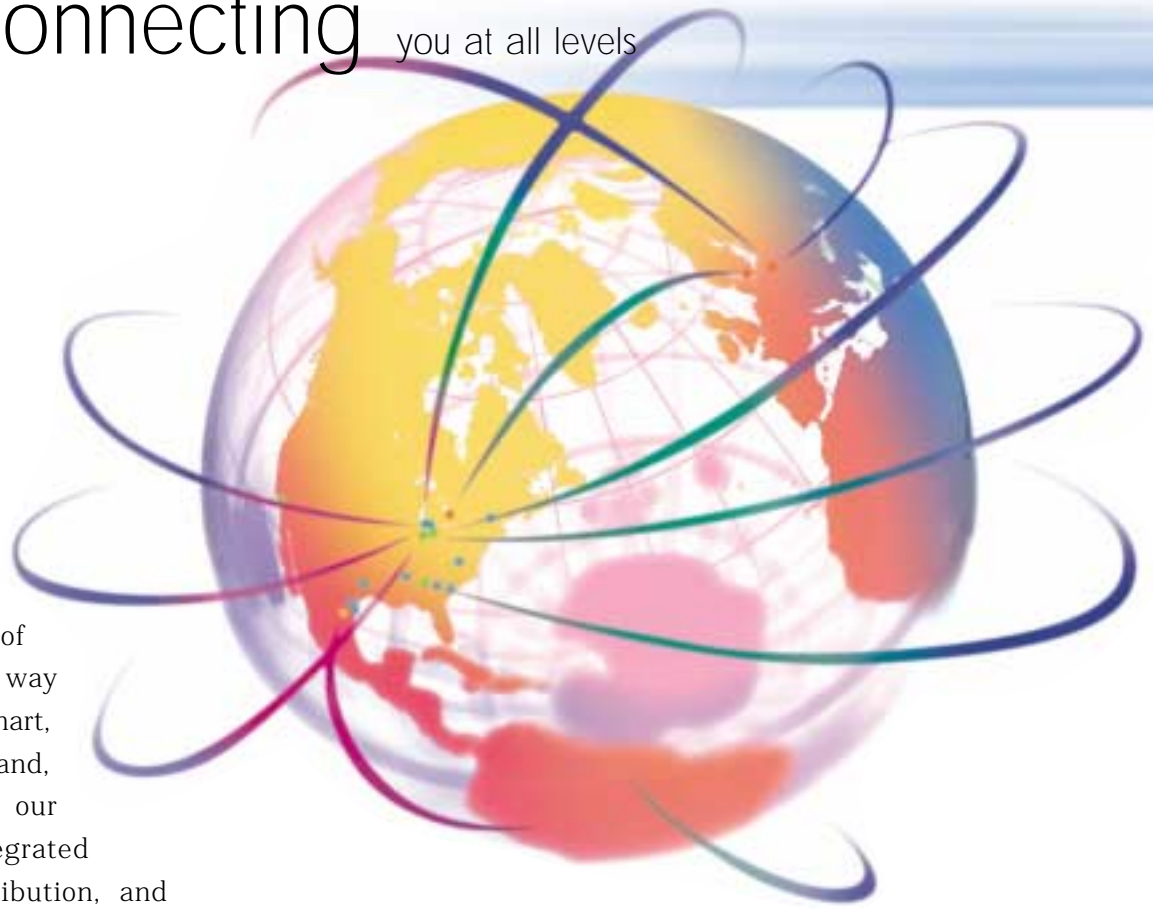
**NOTE:** NIBCO lug style butterfly valves are fully rated for dead end service without a downstream flange. All valves listed above as comparable may not have this rating.

### CAST IRON

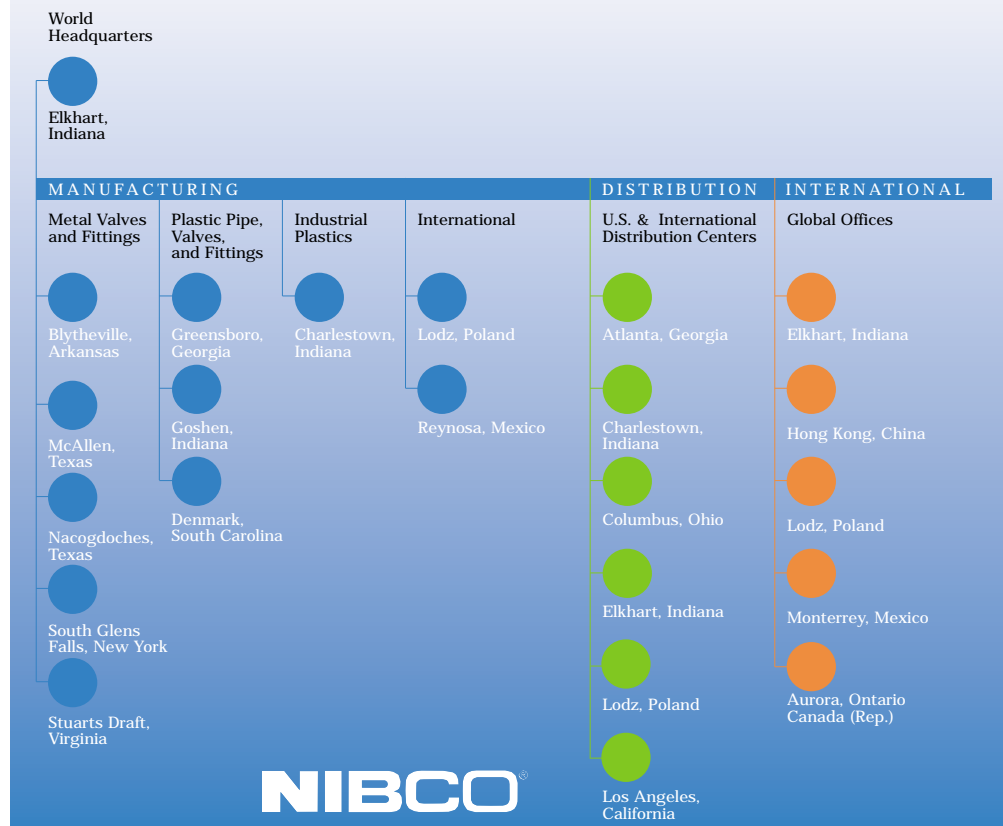
NIBCO	N200235	N200135	N200245	N200145	N200236	N200136	N200246	N200146
Grinnell	LC128*3	WC128*3	LC118*3	WC118-3	LC120*3	WC120*3	LC110*3	WC110*3
Centerline	B106135	A106145	B106161	A106131	B102135	A102135	B102131	A102131
Watts	BF03-121-1	BF04-121-1	BF03-121-2	BF04-121-2	BF03-111-1	BF04-111-1	BF03-111-2	BF04-111-2
Milwaukee	CL223E	CW223E	CL223B	CW223B	CL222E	CW222E	CL222B	CW222B

\*To be used as a guide only. Some variation in detail is possible.  
Information subject to change.

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