

# Butterfly Valve

## Product Training Presentation

Danfoss Flomatic Corporation





# Butterfly Valve

**SYLAX™**

**SERIES 149G BUTTERFLY VALVES**

Wafer and Lug Type Butterfly Valve 2" trough 24"



# SYLAX SERIES 149G BUTTERFLY VALVES

Wafer Type Butterfly Valve 2" through 12"

With 10 position lockable handle (2"-6") or Gear Box (8"-12")

*Danfoss*



## Applications and features

06.29.2001 REV: 2

Designed for water supply, HVAC and general industries.

- Body types: wafer style with four centering lugs for easy installation.
- Epoxy coating: internally and externally.
- Ease of maintenance: interchangeable parts including discs, shafts, and liners - simplifying service and reduces maintenance costs



Note: Other type and styles available 2" (50 mm) through 24" (600 mm)



# SYLAX™

## SERIES 149G BUTTERFLY VALVES



### Technical Features:

Description	Material
<b>Valve Body</b>	Cast Iron ASTM A126 Class GG25
<b>Valve Disc</b>	Stainless Steel AISI 316 or Ductile Iron GGG40, Epoxy Coating
<b>Valve Seat</b>	EPDM Standard or Buna-N and other seat material available
<b>Valve Shaft</b>	Stainless Steel AISI 420
<b>Shaft Bushings</b>	PTFE lubricated plated steel
<b>Top Flange</b>	ISO 5211 standards
<b>Face to face</b>	API 609 table1 (ISO 5752 class 20, DIN 3202 part 3 K1 BS 5155 table6 col.4)
<b>Pressure rating</b>	200 PSI / 16 bar for ANSI 125/150 Flange
<b>Temperature rating (EPDM Seat)</b>	Working temp: Min +46°F (+8°C) Max +230°F (+110° C) Design temperature rating: Min -4°F (-20°C) Max + 248°F (+120° C)



# SYLAX™

## SERIES 149G BUTTERFLY VALVES



### BUTTERFLY VALVE Cv RATING

#### RESILENT SEATED

#### Cv Values - Valve Flow and Sizing Coefficient

The Cv factor is defined as the volume of water that will flow through the valve in US GPM at a pressure drop of one (1) PSI at room temperature.

The recommended butterfly disc angle for controlling water flow is between 25°-70° disc opening.

For butterfly valve sizing use a valve disc angle of 60°-65° disc opening.

Valves Size		Valve Disc Position (in degrees°) (Cv Flow in US GPM)								
Inches	mm	90°	80°	70°	60°	50°	40°	30°	20°	10°
2"	50	144	114	84	61	43	27	16	7	1
2 1/2"	65	282	223	163	107	67	43	24	11	2
3"	80	461	364	267	154	96	61	35	15	2
4"	100	841	701	496	274	171	109	62	27	3
5"	125	1,376	1,146	775	428	268	170	98	43	5
6"	150	1,850	1,542	1,025	567	354	225	129	56	6
8"	200	3,316	2,842	1,862	1,081	680	421	241	102	12
10"	250	5,430	4,525	2,948	1,710	1,076	667	382	162	19
12"	300	8,077	6,731	4,393	2,563	1,594	1,005	555	235	27
14"	350	10,538	8,874	5,939	3,384	2,149	1,320	756	299	34
16"	400	13,966	11,761	7,867	4,483	2,847	1,749	1,001	397	45
18"	450	17,214	14,496	10,065	5,736	3,643	2,237	1,281	507	58
20"	500	22,339	18,812	12,535	7,144	4,536	2,786	1,595	632	72

*Cv = Flow of water at 15C at 1 PSI (=0.069 bar) headloss.*

**FLOMATIC® VALVES**



# SYLAX™

## SERIES 149G BUTTERFLY VALVES

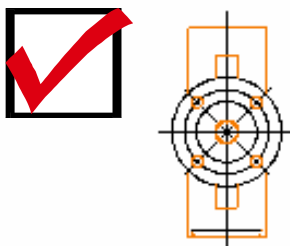


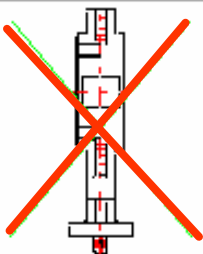


### INSTALLATION

- The SYLAX butterfly valve is designed to be installed with ANSI 125# or 150# flanges (flat faced or raised face flanges).  
No gasket shall be used, SYLAX incorporates two “O”-ring seals on the flange face.
- Before installing insure clean flange surfaces and proper pipe alignment.
- Center valve body within flange with bolts hand-tightened only.  
Open valve disc slowly to insure free disc movement without restriction from Internal diameters on both flange connections.
- Tighten bolts according to instructions and torque specifications.

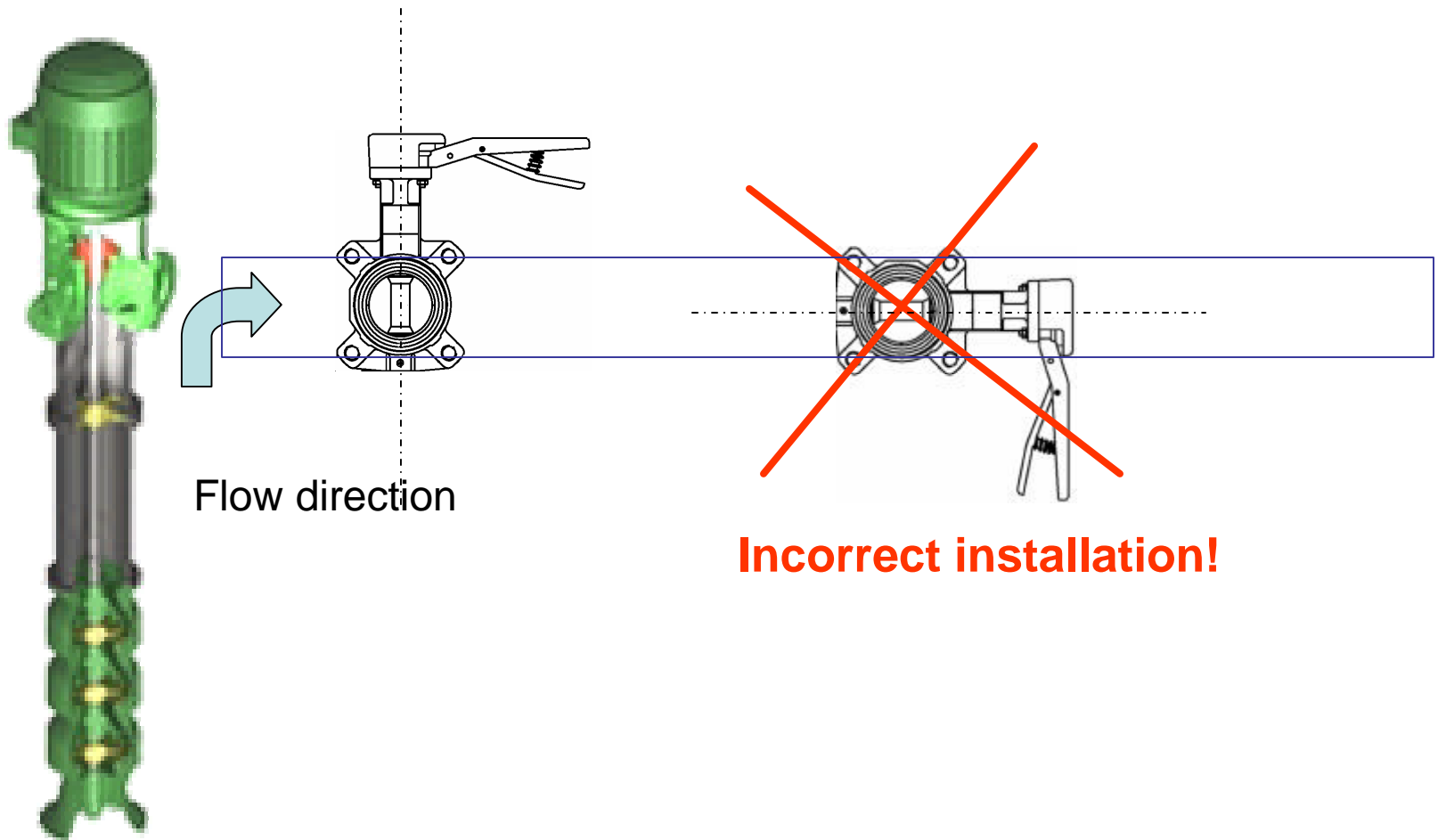
# Butterfly Valve

General installation in a pipe line

			
Recommended	Possible	Possible	Not recommended

# Butterfly Valve Installation

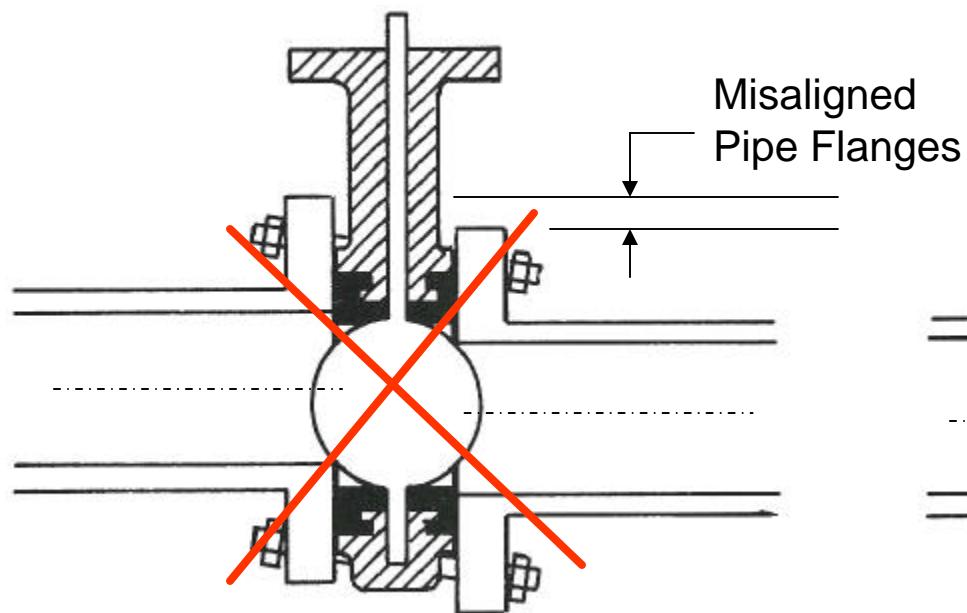
Axial flow pumps – Pump shaft and valve stem are vertical.





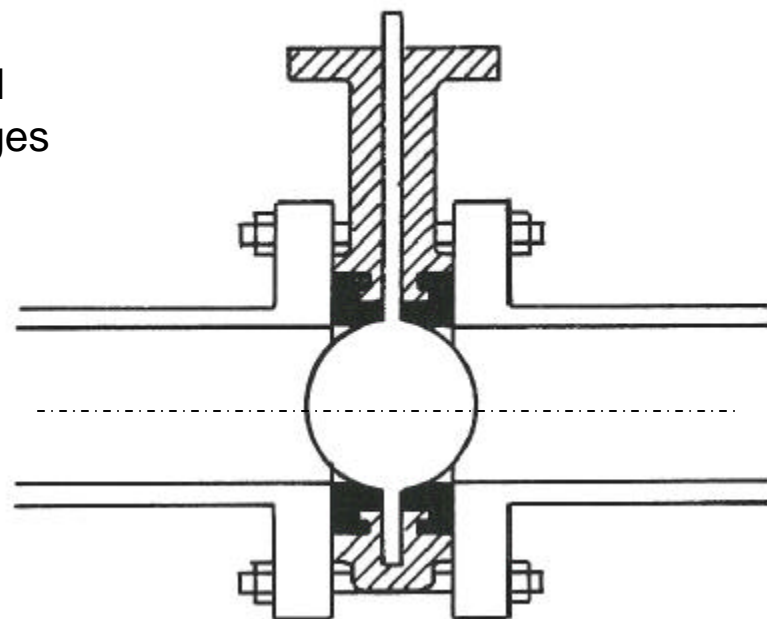
# Butterfly Valve Installation

## Pipe Flange Connections



### **Incorrect installation!**

*Pipe flanges are misaligned.  
Butterfly disc edge will hit pipe flange  
Resulting in valve damage and leakage.*

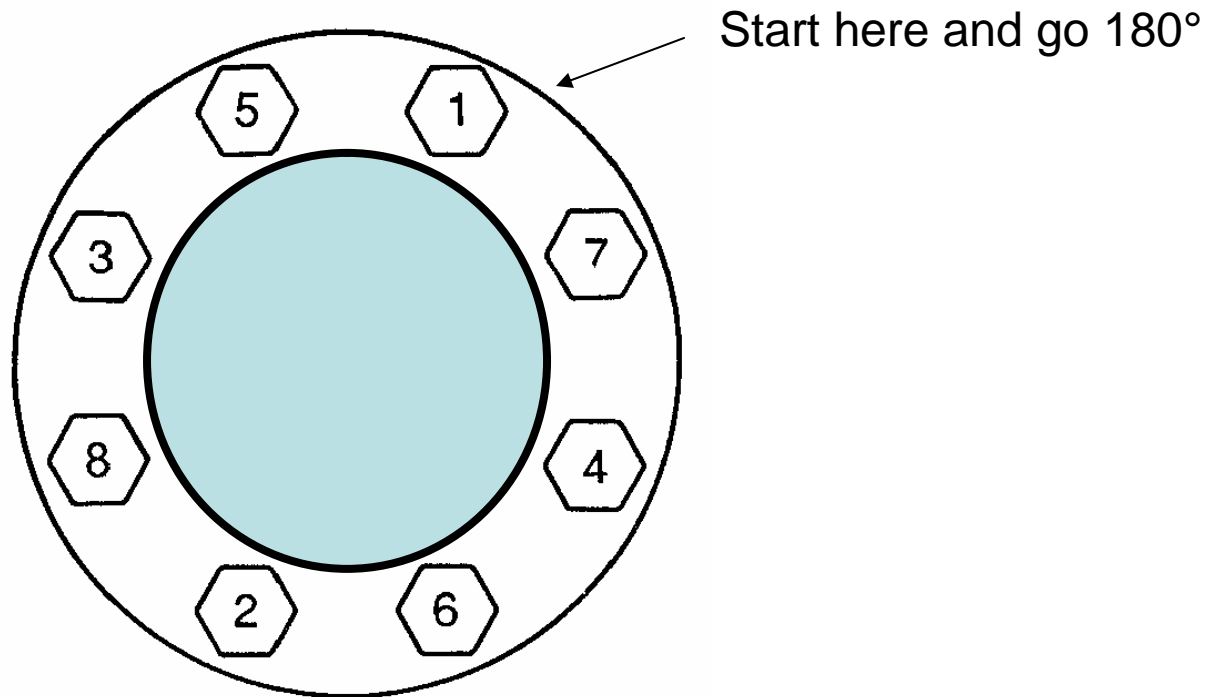


### **Correct Installation**

*Pipe flanges are aligned and centered.*

# Butterfly Valve Installation

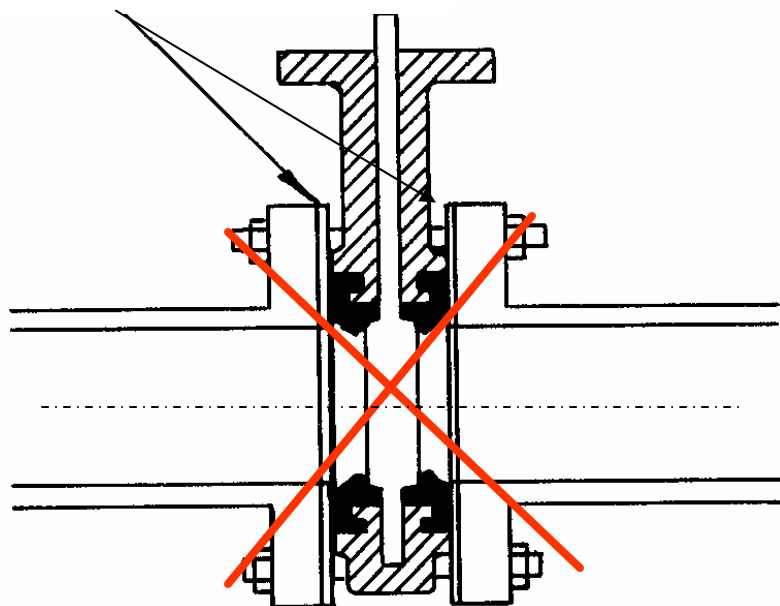
**Follow Flange Bolt Tightening Sequence**



# Butterfly Valve Installation

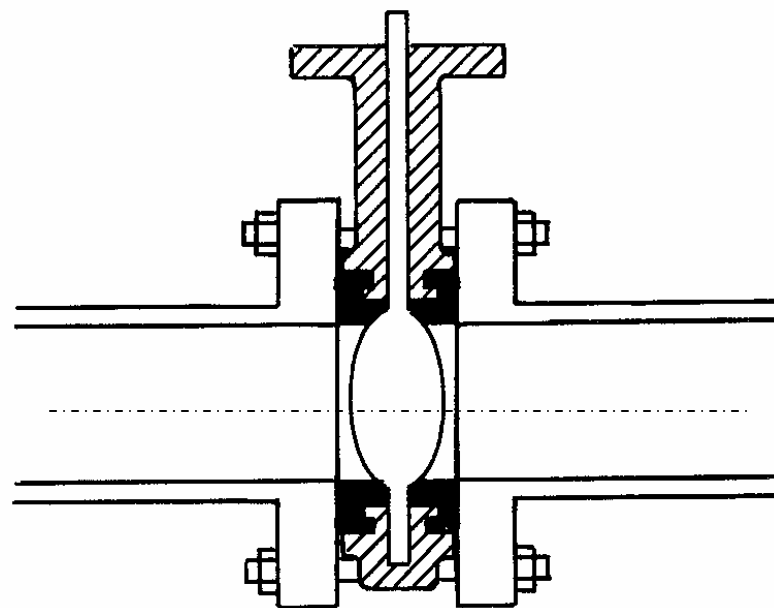
Simple pipe flange connection

**NO GASKETS!**



**Incorrect installation!**

*This will result in seat distortion causing high unseating torque problems.*

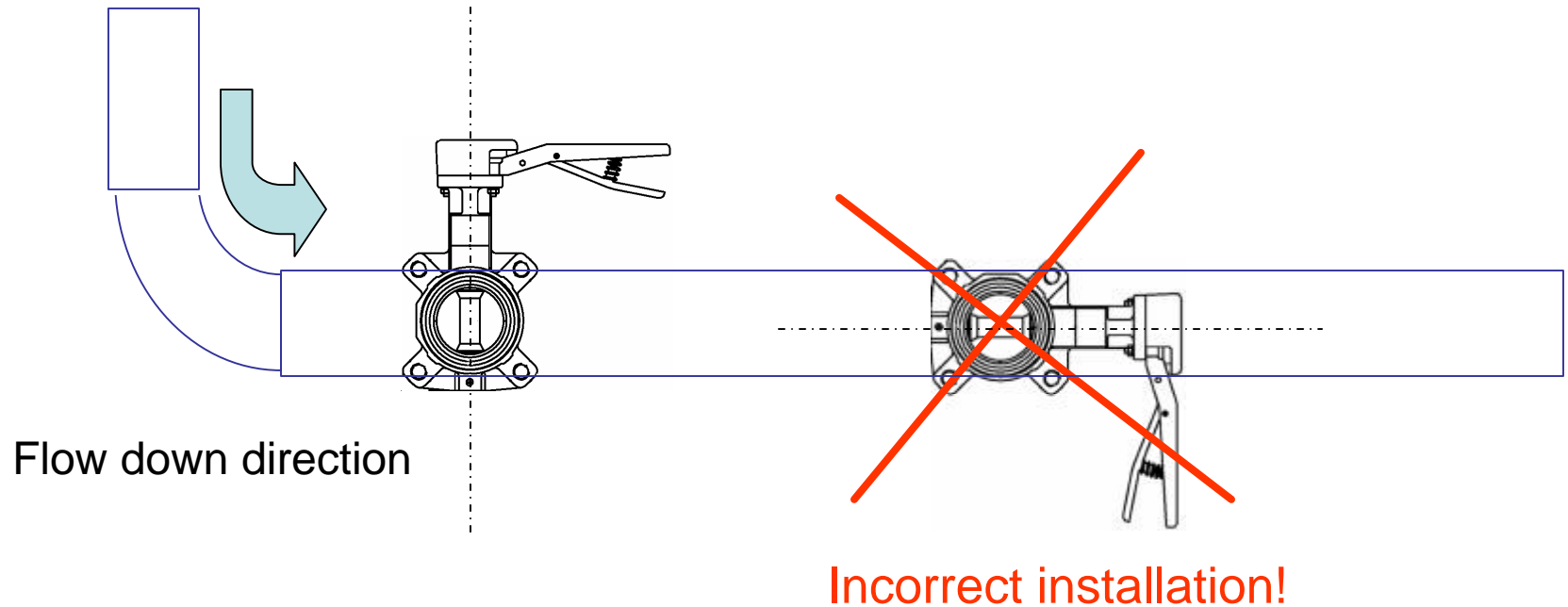


**Correct Installation**

*Butterfly “O” –ring seals centered within pipe flanges.*

# Butterfly Valve Installation

Locate butterfly valve stem vertical downstream of a pipe bend.





# SYLAX™

## SERIES 149G BUTTERFLY VALVES



### O&M (Operating & Maintenance)

- Butterfly valves are pre-lubricated during manufacturing and no routine lubrication is required.
- All butterfly valve parts are field replaceable and require no field adjustments.

### DISSASSEMBLY (and assembly)

- After pipe line have been depressurized and drained, remove butterfly from line.
- Follow detailed Danfoss Flomatic instructions.

### STORAGE

- It is good practice to store the SYLAX butterfly valve open with the handle in the first position or a disc opening of about 10°.



# SYLAX BUTTERFLY VALVE TORQUE

EPDM and NBR seat liner



Valve Size	Torque for EPDM		Torque for NBR	
	ANSI 125/150 PN6 (in pounds)	ANSI 250 PN16 (in pounds)	ANSI 125/150 PN6 (in pounds)	ANSI 250 PN16 (in pounds)
1	88	88	88	88
1 1/4	133	133	133	133
1 1/2	133	133	133	133
2	159	212	159	212
2 1/2	204	310	204	310
3	266	354	266	354
4	443	584	443	584
5	620	761	620	761
6	797	974	797	974
8	1328	1947	1328	1947
10	2257	3009	2257	3009
12	3363	4425	3363	4425
14	4956	6373	4956	6373
16	7966	8851	9736	11063
18	11063	12391	14161	15931
20	14161	15931	19472	23012
24	19472	22127	26552	30978

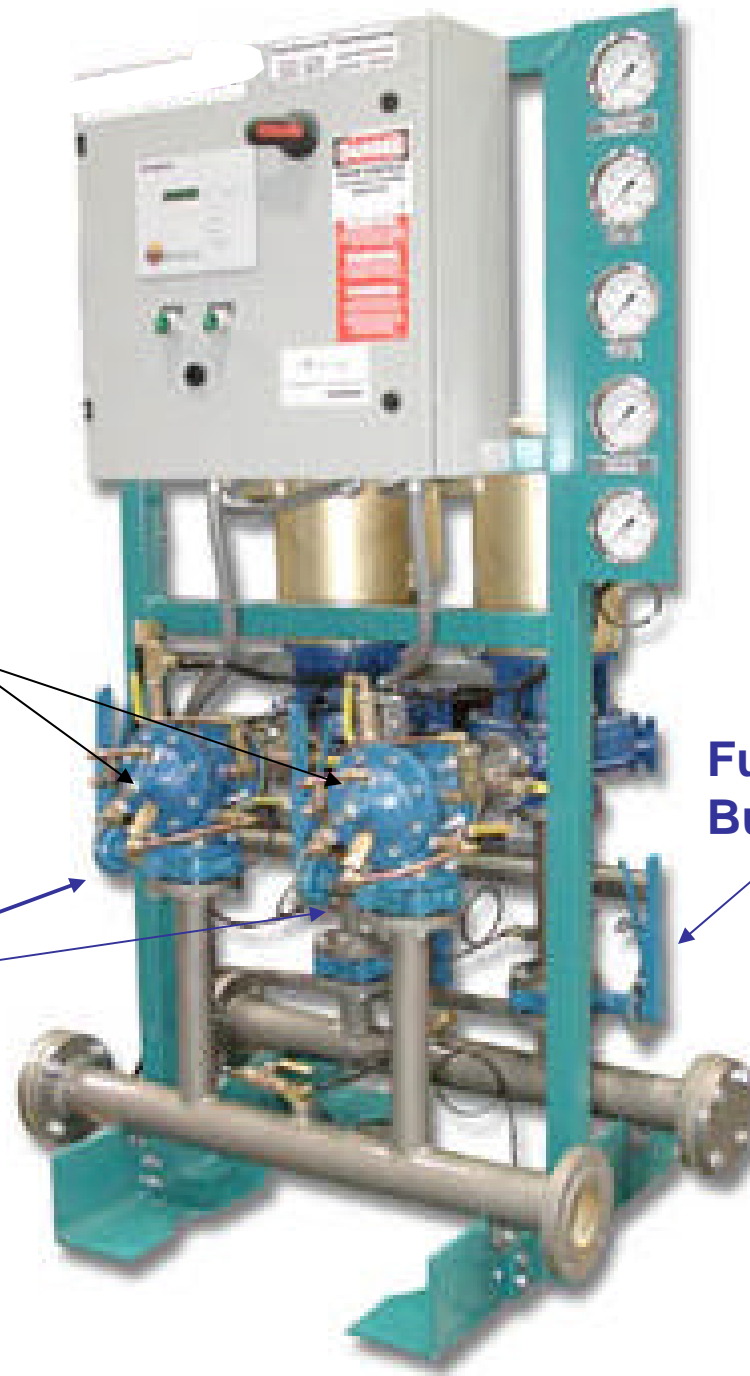
# Butterfly Valve Installation

Booster System

Model C101  
Automatic Control Valve

Full Lug Type  
Butterfly Valve

Full Lug Type  
Butterfly Valve



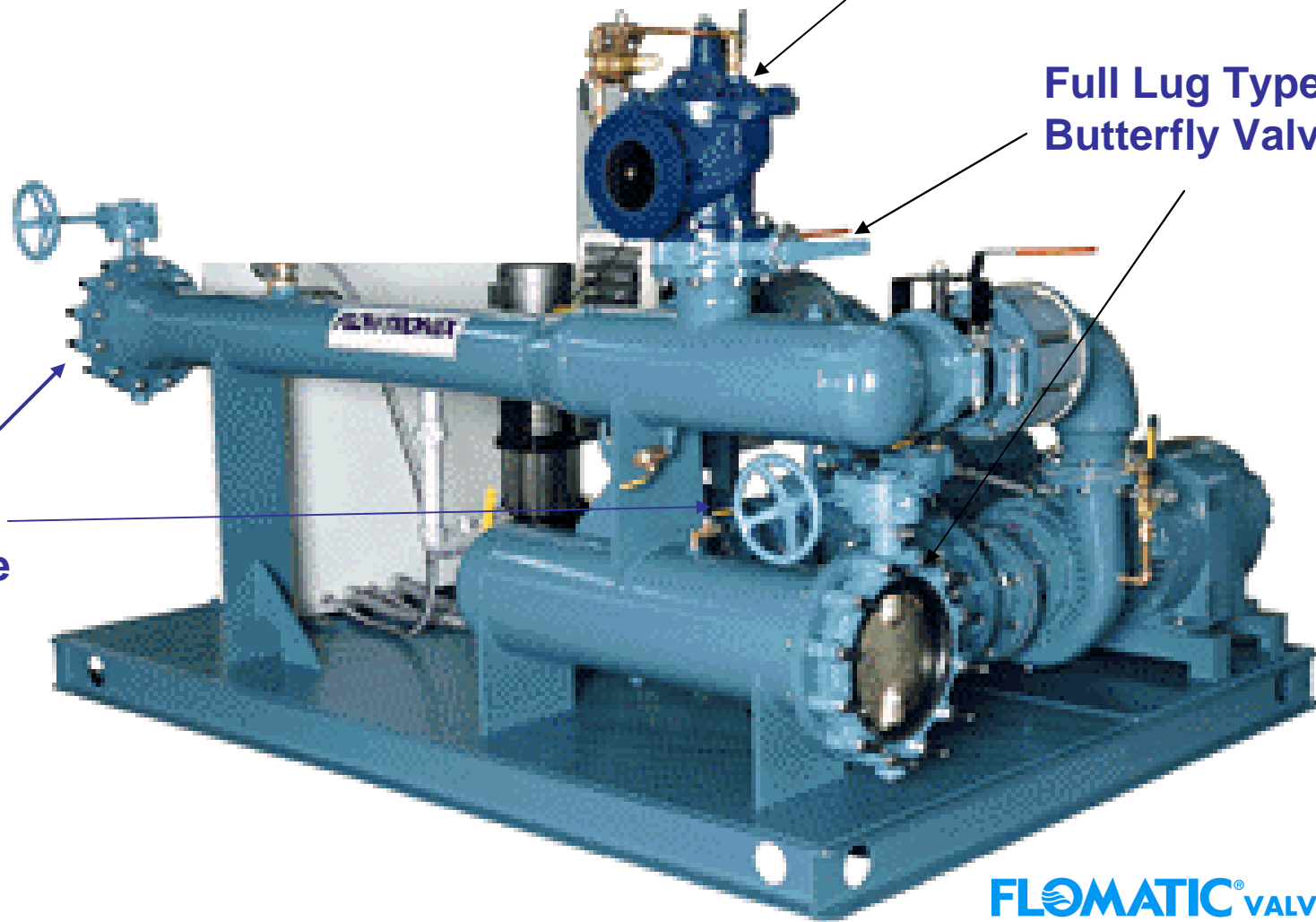
# Butterfly Valve Installation

Package Filter System

Model C101  
Automatic Control Valve

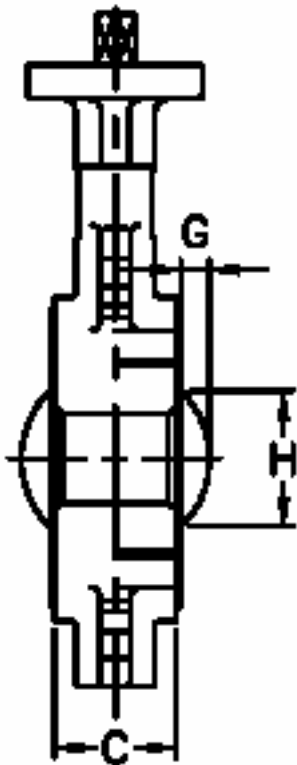
Full Lug Type  
Butterfly Valve

Full Lug Type  
Butterfly Valve

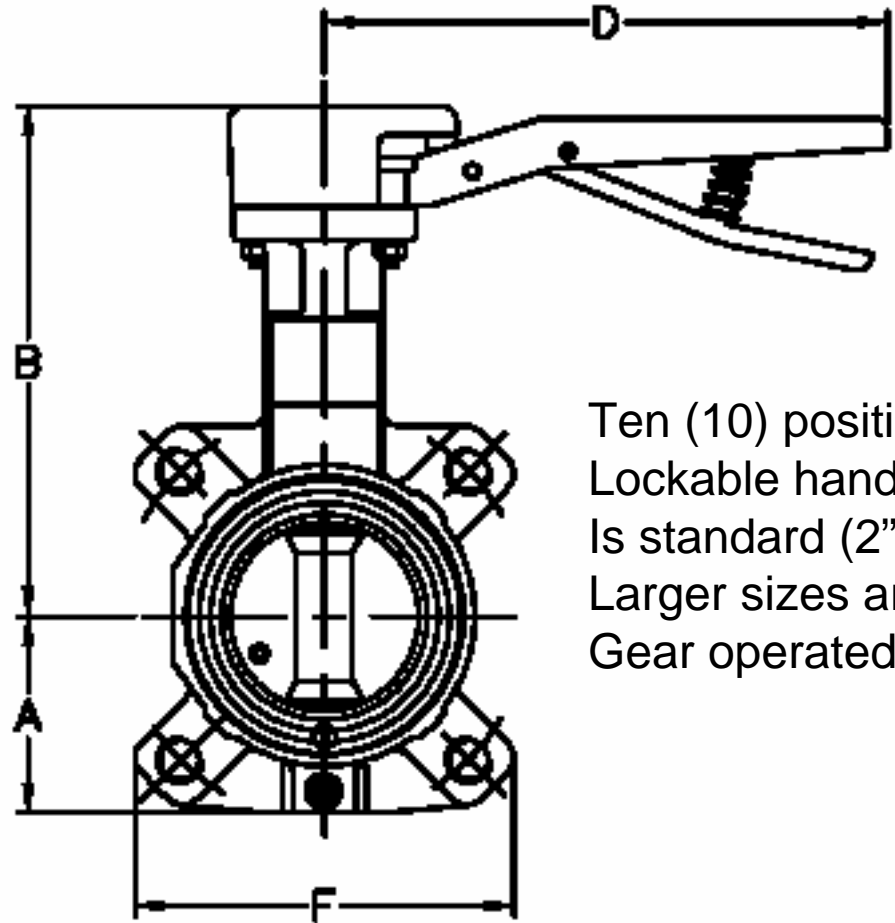




# Butterfly Valve Operators and Actuators

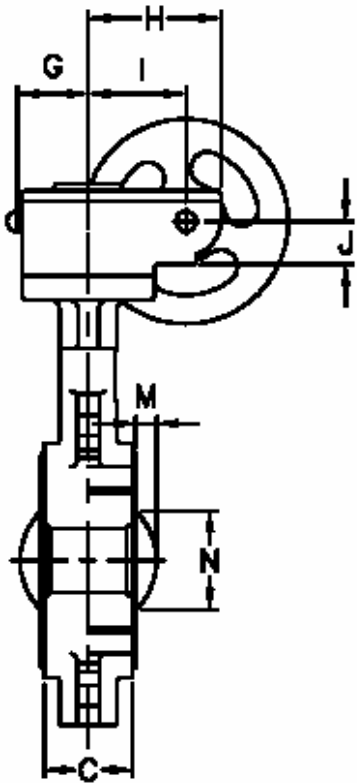


Top flange (ISO) allowing  
Easy changing of operators.

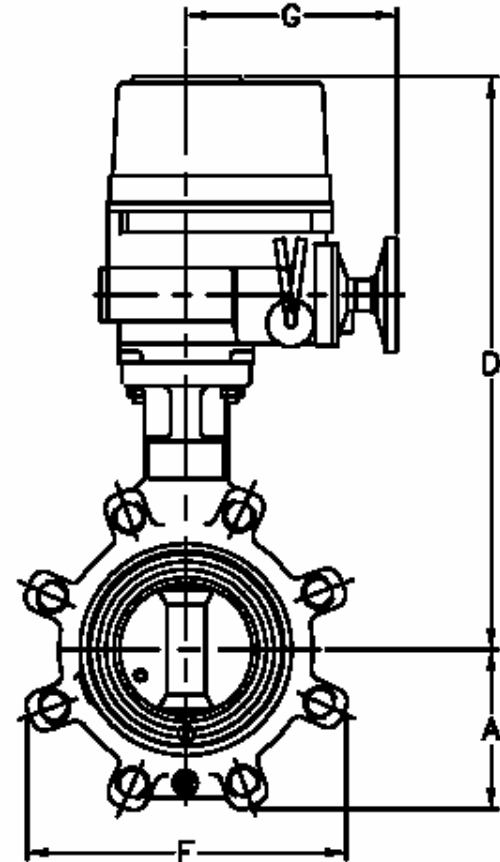
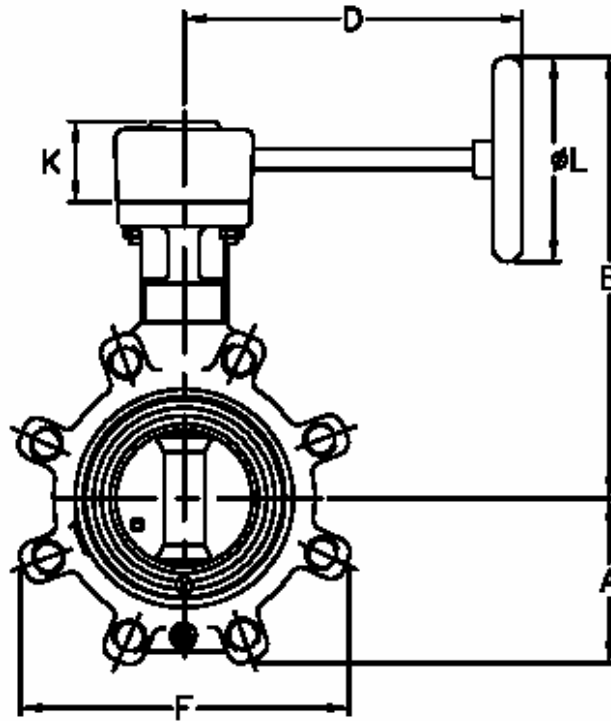


Ten (10) position  
Lockable handle  
Is standard (2"-6").  
Larger sizes are  
Gear operated.

# Butterfly Valve Operators and Actuators



Gear operated butterfly valve  
(Standard 8" and larger sizes)



Electric operated butterfly valve  
(Several different Models and types)

# DANFOSS FLOMATIC VALVES

FLOMATIC-THE MOST COMPLETE PRODUCT LINE



## Butterfly Valve Cross Reference Guide

This is a guide to similarity and specifications may vary and should be checked.

### Wafer and Lug Type Butterfly Valves

Type	DANFOSS FLOMATIC	WATTS	Grinnell	Conbraco	Crane	Centerline	Milwaukee	NIBCO	Mueller Steam	Stockham	Hammond	Bray
<b>Wafer</b> (Resilient Seated) Ductile Iron Disc	<b>SYLAX</b> Model 011 Style DI	DBF 04- 111	WC 8201-6	130-C	42-FXZ- TL	A1021052	MW222E	WD 3010-3	51-ANI -61	LG512 -DS4	6101 -01	30
<b>Wafer</b> (Resilient Seated) Stainless Steel Disc	<b>SYLAX</b> Model 010 Style SS	DBF 04- 131	WC	130-S	42-SSZ- TL	A1044052	MW224E	WD 3022-3	51-AHH -61	LG512 -SS1	6121 -01	
<b>Full Lug</b> (Resilient Seated) Ductile Iron Disc	<b>SYLAX</b> Model 049 Style DI	DBF 03 -111	LC8201 -6	132-C	44-FXZ -TL	B102	ML222	LD3010 -3	52-ANI -61	LG712 -DS4	6201 -01	31
<b>Full Lug</b> (Resilient Seated) Stainless Steel Disc	<b>SYLAX</b> Model 049 Style SS	DBF 03 -131	LC8271 -7	132-S	-	B104	ML224	LD3022 -3	52-AHH -61	LG712 -SS1	6220 -01	

### Danfoss Flomatic Corporation

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Revised: March 27, 2003

*High Quality Valves Built to Last . . .*

**FLOMATIC® VALVES**

## Butterfly Valve Cross Reference Guide

This is a guide to similarity and specifications may vary and should be checked.

### Flanged Butterfly Valves

Type	DANFOSS FLOMATIC	DeZurik	Henry Pratt	M&H Kennedy	Crane	Keystone	Val-Matic	Milliken	Mueller	SPX K-Flow	KSB AMRI	Clow
Flanged (Double Flanged)	SYLAX Model 049	-	-	-	-	Fig 106	-	Fig 500	-	Series 47	ISORIA Type 5	-
Flanged (AWWA C504)	AZURE* Model 045	BAW	2FII	Style 4500 & 1450	-	-	BFV Series 2000	-	Lineaseal	Series 500	-	F 5369

\* Note: Available in September 2004

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**FLOMATIC® VALVES**

*Thank you.*

## **Suggested Specifications AWWA Butterfly valves**

Rubber Seated Butterfly Valve, Sizes 3 through 20 Inches:

### General

Butterfly valves shall be manufactured in accordance with the latest revision of AWWA C504, Class 150B and conform to NSF Standard 61. The manufacturer shall have produced AWWA butterfly valves for a minimum of five years. All valves shall be \_\_\_\_\_ and comply with the following details.

### Valve Bodies

Valve bodies shall be constructed of ASTM A126, Class B cast iron for flanged valves or ASTM A48, Class 40 for wafer style. Flanged valves shall be fully faced and drilled in accordance with ANSI Standard B16.1, Class 125.

### Valve Seats

Rubber body seats shall be of one-piece construction, simultaneously molded and bonded into a recessed cavity in the valve body. Seats may not be located on the disc or be retained by segments and/or screws. For wafer style valves, the seat shall cover the entire inner surface of the valve body and extend over the outside face of the valve body to form a flange gasket.

### Valve Bearings

Valve bearings shall be of a self-lubricating, nonmetallic material to effectively isolate the disc-shaft assembly from the valve body. Metal-to-metal thrust bearings in the flow stream are not allowed.

## Suggested Specifications AWWA Butterfly valves

### Valve Disc

The disc shall be a lens-shaped design to afford minimal pressure drop and line turbulence. Materials of construction shall be:

- ASTM A126, Class B cast iron disc with a stainless steel type 316 edge
- Discs shall be retained by stainless steel pins, which extend through the full diameter of the shaft to withstand the specified line pressure up to valve rating and the torque required to operate the valve. Disc stops located in the flow stream are not allowed.

### Valve Shafts

Valve shafts shall be of stainless steel type 304. At the operator end of the valve shaft, a packing gland utilizing "V" type chevron packing shall be utilized. "O" ring and "U" cup packing is not allowed.

### Painting

All surfaces of the valve interior shall be clean, dry and free from grease before painting. The valve surfaces except for disc edge, rubber seat and finished portions shall be evenly coated with asphalt varnish in accordance with Federal Specification TT-C-494 and AWWA Standard C504. The exterior valve surfaces and actuator shall be evenly coated with a suitable primer to match field coatings.



## **Suggested Specifications AWWA Butterfly valves**

### Testing

Hydrostatic and seat leakage tests shall be conducted in strict accordance with AWWA Standard C504.

### Proof of Design

The manufacturer furnishing valves under the specification shall be prepared to provide Proof of Design Test reports to illustrate that the valves supplied meet the design requirements of AWWA C504.

Manual Actuators: Manual actuators shall be of the traveling nut, self-locking type and shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. Actuators shall be equipped with mechanical stop-limiting devices to prevent overtravel of the disc in the open and closed positions. Actuators shall be fully enclosed and designed to produce the specified torque with a maximum pull of 80 lbs. on the handwheel or chainwheel. Actuator components shall withstand an input of 450 ft. lbs. at extreme operator position without damage. Manual actuators shall conform to AWWA C504 and shall be Pratt MDT or an approved equal.

Power Actuators: Refer to Cylinder suggested specifications and detailed information regarding cylinder actuators. For electric actuators, see electric actuator specification.