COOPER CAMERON VALVES

Installation, Operation and Maintenance Manual

W-K-M® Model MA-1 DynaCentric® Butterfly Valve

W-K-M PRODUCTS

Publication TC1508 Published January 2003

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Bill of Materials

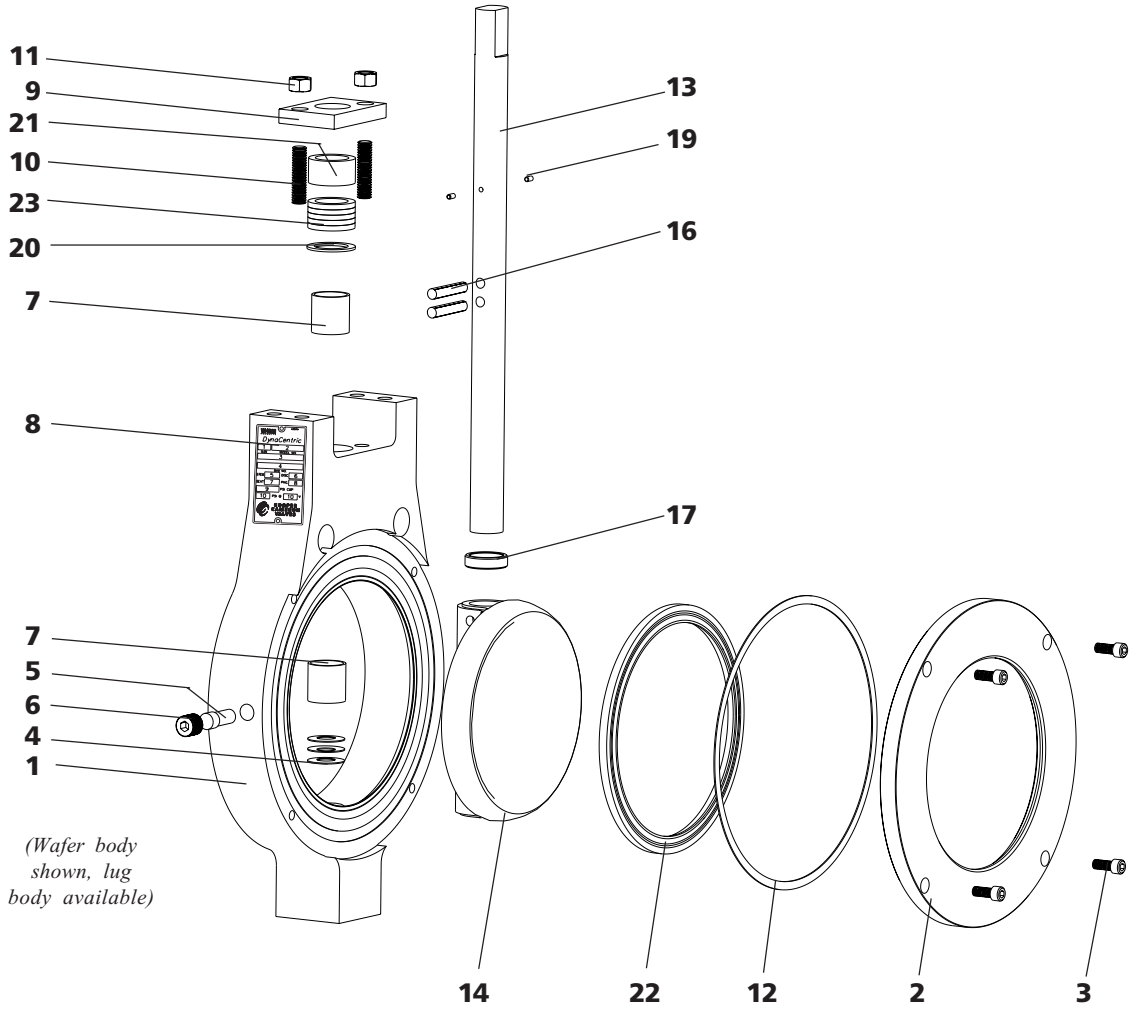
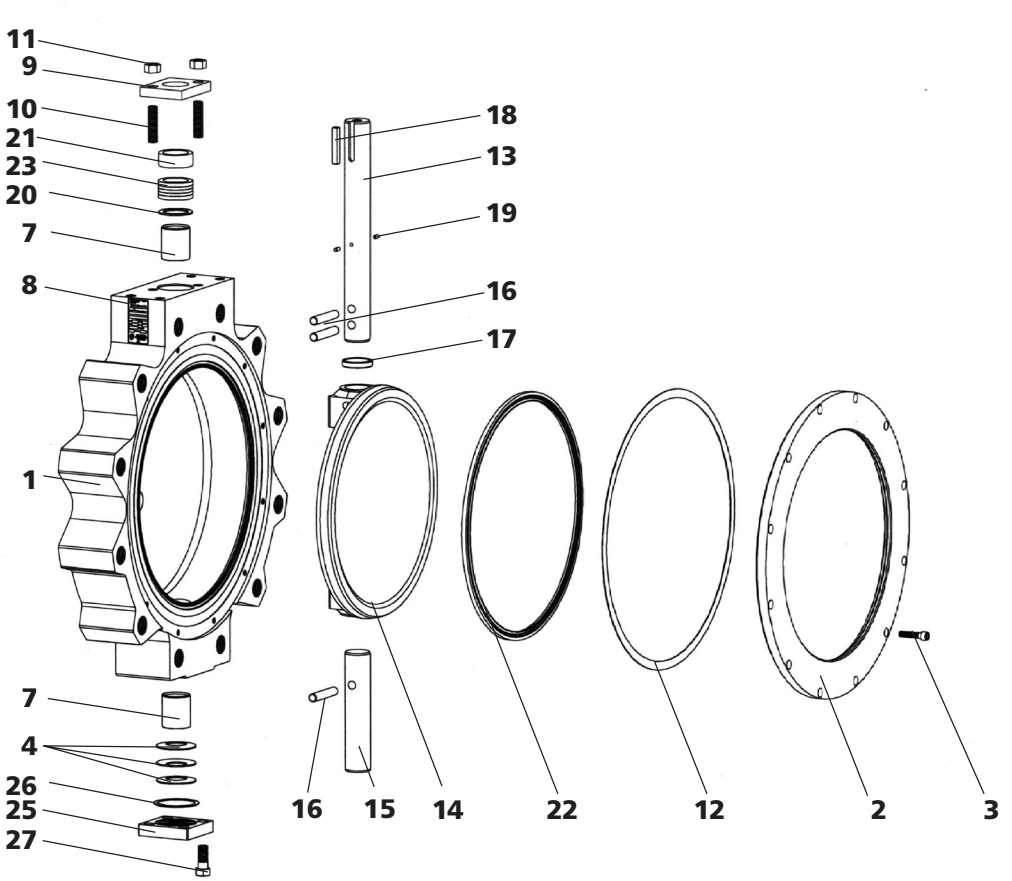


Figure 1 - Cooper Cameron Valves' W-K-M 3"-12" Class 150, 3"-10" Class 300, 3"-8" Class 600 DynaCentric Valve Components.

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1.	Body	14.	Disc
2.	Seat Retainer	15.	Lower Stem
3.	Seat Retainer Screw	16.	Stem Pins
4.	Stem/Disc Spring	17.	Disc Spacer
5.	Stop Pin	18.	Key
6.	Stop Pin Plug	19.	Stem Retainer Pins
7.	Stem Bearing	20.	Packing Spacer
8.	Nameplate	21.	Gland Ring
9.	Gland Retainer	22.	Seat
10.	Gland Retainer Stud	23.	Packing Set
11.	Gland Retainer Nut	25.	Bottom Cover
12.	Body Gasket	26.	Bottom Cover Gasket
13.	Upper Stem	27.	Bottom CoverScrew



(Lug body shown, wafer body available)

Figure 2 - Cooper Cameron Valves' W-K-M 14"-30" Class 150, 12"-24" Class 300, 10"-12" Class 600 DynaCentric Butterfly Valve Components.

Catalog Number Information

X X	-	A5 X X X	-	X X	-	X X X	-	X X	-	X X
Size Inches		**Body Group**		**Trim Group**		**Seal Group**		**Packing Group[4]**		**Actuation**

3"	03
4"	04
6"	06
8"	08
10"	10
12"	12
14"	14
16"	16
18"	18
20"	20
24"	24
30"	30

Class	Material	Style
1=150	1=CS	0=Wafer
3=300	2=SS	1=Lug
6=600	3=CS2[1]	
	4=CS/ENC	
	5=LCC	

CS Disc* 17-4 Stem	01
SS Disc 17-4 Stem	02
SS Disc Ni-Cr[5] Stem	03
Ni-Cu[6] Disc & Stem	04
SS Disc 316SS Stem[2]	05
SS Disc HF-6 O/L[7] 17-4 Stem	06
SS Disc HF-6 O/L[7] Ni-Cr Stem[5]	07

TFE	S01
RTFE	S02
SS/RTFE	F02[3]
Ni-Cr[5] Alloy (UNS No. 6625)/RTFE	F03
316SS	M01
Ni-Cr[5] Alloy (UNS No. 6625)	M03

TFE VEE	11
High Temp Graphitized	13
Grafoil	14

Bare Stem	00
Handle	HL
Handwheel Worm Gear	WG
Chainwheel Worm Gear	CH

Note: Valves with optional materials of construction are available on application.
[1] Controlled hardness carbon steel (H_2S Service).
[2] Valves equipped with 316 SS stems may require derating depending on size and class.
[3] Standard seat for class 600 valves.
[4] SS packing adjustment studs and nuts are standard.
* Cabon steel discs (14" and larger – consult factory).
[5] Ref. "inconel"
[6] Ref. "monel"
[7] Ref. "Stellite" overlay

Nameplate Information

ITEM	STAMP
1	Valve Size.
2	Model Number
3	Optional Information
4	Basic Model Number/ Type Actuation
5	Stem Material
6	Disc Material
7	Seat Material
8	Packing Material
9	Maximum CWP
10	Seat Ratings

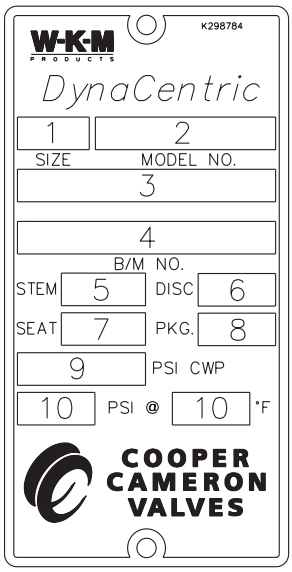


Figure 3 - Typical Dynacentric Nameplate.

Scope

The W-K-M DynaCentric high performance butterfly valve offers all the benefits of a wafer valve - smaller size, lower price, lighter weight and throttling capabilities - and the high performance characteristics of ball and gate valves. Because of their quarter turn operation, they are easily and economically adapted to power actuation.

The DynaCentric butterfly valve is available in 3"-12" 150, 300 and 600 pressure classes and 14"-24" 150 and 300 pressure classes and 30" 150. The valve is available in both flangeless wafer style and single flanged tapped lug style bodies.

Stem packing is adjustable. Seats are easily replaced in the field.

Storage

After assembly and test, Dynacentric butterfly valves are placed in the closed position. Carbon steel valve internals are coated with rust preventative and painted on the external surfaces. Flange protection is provided for all valves. Valves should be stored in a clean, dry location. Outdoor storage is permissable, but should be off the ground and protected from the elements. For long term storage, contact your CCV representative.

Installation

Although DynaCentric butterfly valves have bi-directional sealing capabilities and will operate in any position, the following positions are recommended for certain installations:

Flow Direction –
Normally the preferred position is seat upstream (Figure 4) where the seat retainer provides protection for the seat against erosion due to line flow. This position also reduces operating torque and provides better throttling characteristics.

For handle operated valves or valves in fail-closed service, the seat should be downstream (Figure 5) with the stem side of the disc facing the flow.

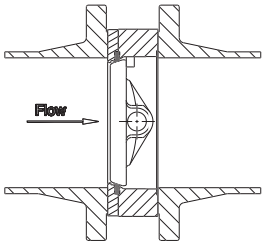


Figure 4 - Preferred Position - Seat Upstream

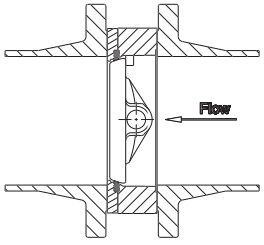


Figure 5 - Seat Downstream (Fail Close)

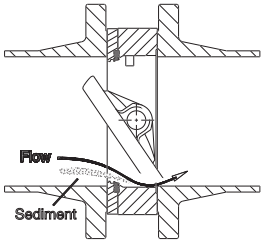


Figure 6 - Stem Horizontal

This position results in positive closing torque with increasing pressure and reduces hazards associated with handle operation.

Stem Position –
DynaCentric valves perform equally well with the stem in the vertical or horizontal position. However, the stem horizontal position is always preferred. When the lading contains solids, which can build up over long periods of closure, it is particularly important that this position be used. A flushing action of the flow media during opening and closing cycles cleans sediment from the bottom of the line by a jetting action. When such action is desired, the valve should be installed seat upstream (flow from the seat side of the valve) with the stop pin in the vertical up postion. (Figure 6)

Disc/Pipe Clearance

Threaded style lug valves are recommended for end-of-line or equipment isolation service. The DynaCentric butterfly valve can handle flow from either direction in such services.

Valve Size and Class	Sched 40	Sched XS (extra strong)	Sched 120	Diameter (in.)
3" – 150	X	X	X	2.75
3" – 300	X	X	X	2.75
3" – 600	X	X	X	2.75
4" – 150	X	X		3.85
4" – 300	X	X		3.85
4" – 600	X	X	X	3.65
6" – 150	X	X		5.90
6" – 300	X	X		5.90
6" – 600	X	X	X	5.50
8" – 150	X			7.90
8" – 300	X	X		7.90
8" – 600	X	X	X	7.40
10" – 150	X			10.00
10" – 300	X	X		9.80
10" – 600	X	X	X	9.06
12" – 150	X			11.90
12" – 300	X	X		11.75
12" – 600	X	X	X	11.75
14" – 150	X			13.06
14" – 300	X	X		13.00
16" – 150	X			15.00
16" – 300	X	X		14.68
18" – 150	X			16.87
18" – 300	X	X		16.50
20" – 150	X			18.81
24" – 150	X			22.62
24" – 300	X	X		22.06
30" – 150				28.02

Table 1 -Disc Clearance

Before beginning installation, note the following:
Disc/pipe clearance should be checked before beginning installation to avoid the possibility of scraping the disc edge on the pipe ID and damaging the sealing surface.
Minimum pipe I.D. required for disc swing clearance:

Class 150 valves – Schedule 40 pipe or equivalent
Class 300 valves – Scedule XS pipe or equivalent
Class 600 valves – Schedule 120 pipe or equivalent

Consult Table 1 for required flange modifications for other pipe schedules.

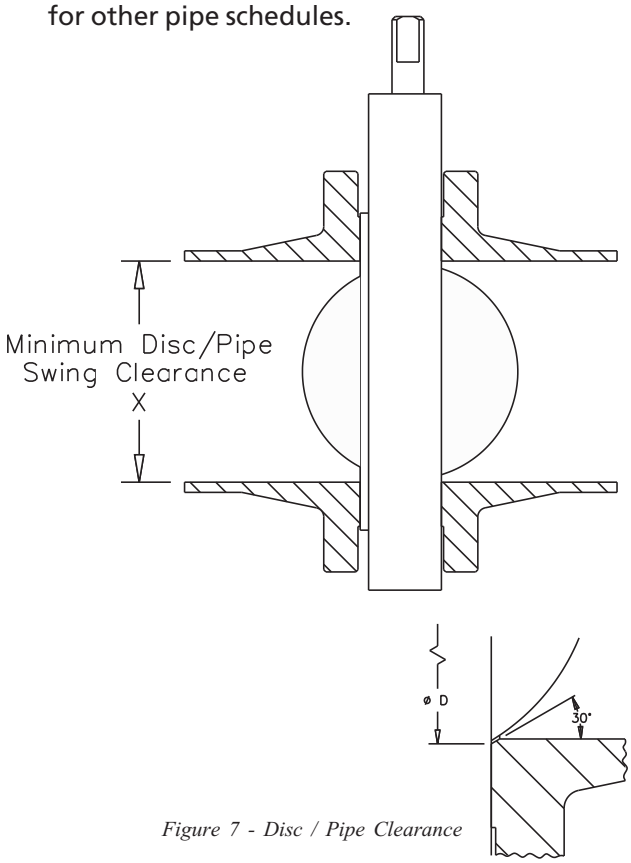


Figure 7 - Disc / Pipe Clearance

COOPER CAMERON VALVES

Gaskets

Non-asbestos gaskets made in accordance with ANSI B16.5 Group 1a and 1b are standard for the DynaCentric butterfly valve. API 601 standard spiral wound gaskets may also be used.

Flange Bolts

Recommended bolt and stud lengths for installation in ANSI flanges are provided in Table 2.

Valve Size	Bolt Circle Dia. (in.)	Bolt Size	Wafer Body			Lug Body	
			Qty.	Stud Length 'A'	Screw Length 'B'	Qty.	Screw Length 'B'
3" – 150	6	5/8-11 UNC	4	5.50	–	8	1.75
3" – 300	6-5/8	3/4-10 UNC	8	6.25	–	16	2.00
3" – 600	6-5/8	3/4-10 UNC	8	6.50	–	16	2.25
4" – 150	7-1/2	5/8-11 UNC	8	5.75	–	16	2.00
4" – 300	7-7/8	3/4-10 UNC	8	6.50	–	16	2.25
4" – 600	8-1/2	7/8-9 UNC	8	7.50	–	16	2.50
6" – 150	9-1/2	3/4-10 UNC	8	6.25	–	16	2.00
6" – 300	10-5/8	3/4-10 UNC	12	7.25	–	24	2.50
6" – 600	11-1/2	1-8 UNC	12	9.50	–	24	3.25
8" – 150	11-3/4	3/4-10 UNC	8	6.75	–	16	2.25
8" – 300	13	7/8-9 UNC	12	8.25	–	24	3.00
8" – 600	13-3/4	1-1/8-8 UN	12	11.00	–	24	4.00
10" – 150	14-1/4	7/8-9 UNC	12	7.25	–	24	2.50
10" – 300	15-1/4	1-8 UNC	16	9.50	–	32	3.25
10" – 600	17	1-1/4-8 UN	12 (8)	13.00	(4.00)	32	4.00
12" – 150	17	7/8-9 UNC	12	7.75	–	24	2.75
12" – 300	17-3/4	1-1/8-8 UN	16	10.50	–	32	3.75
12" – 600	19-1/4	1-1/4-8 UN	16 (8)	14.00	(4.00)	40	4.00
14" – 150	18-3/4	1-8 UNC	12	9.25	–	24	3.00
14" – 300	20-1/4	1-1/8-8 UN	16 (8)	11.75	(3.50)	40	3.50
16" – 150	21-1/4	1-8 UNC	16	9.75	–	32	3.00
16" – 300	22-1/2	1-1/4-8 UN	16 (8)	13.00	(3.75)	40	3.75
18" – 150	22-3/4	1-1/8-8 UN	16	10.50	–	32	3.25
18" – 300	24-3/4	1-1/4-8 UN	20 (8)	14.00	(4.00)	48	4.00
20" – 150	25	1-1/8-8 UN	20	12.00	–	40	3.75
20" – 300	27	1-1/4-8 UN	20 (8)	14.50	(4.00)	48	4.00
24" – 150	29-1/2	1-1/4-8 UN	20	13.00	–	40	4.00
24" – 300	32	1-1/2-8 UN	20 (8)	16.50	(4.25)	40 (8)	5.00 (4.25)
30" – 150	36	1-1/4-8 UN	40 (16)	16.50	(4.25)	48 (8)	5.00 (4.25)

Table 2

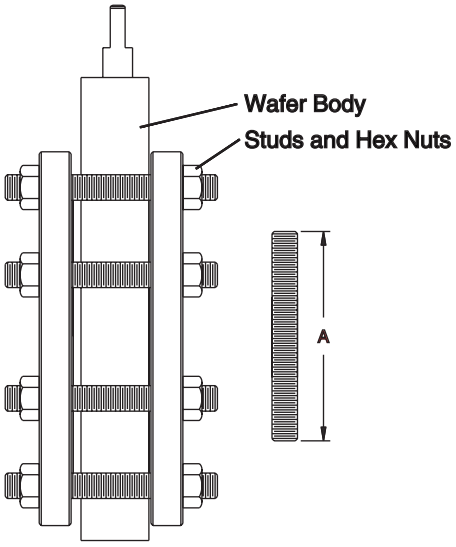


Figure 8

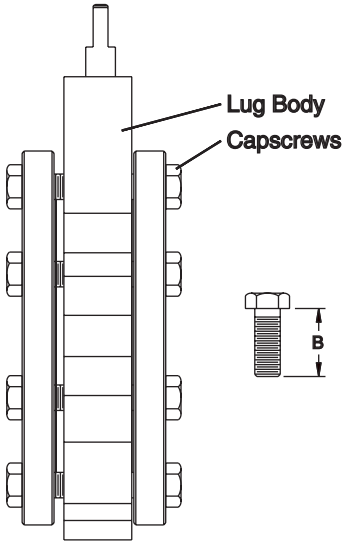


Figure 9

Procedure

The following procedure applies to new installation between standard ANSI pipe flanges. When replacing a valve from an existing installation, clean flange faces of any residual gasket material before starting.

Actuation should not be removed from the valve for installation unless the actuator must be transferred during replacement.

1. Remove protective covers from valve. Be sure valve is completely closed.
2. When installing wafer body valves, install lower flange bolts without tightening (Figure 10). Position valve and flange gaskets between flanges, within the pocket formed by the flange bolts. Install the remaining flange bolts, taking care that the gaskets are centered on the flange faces.
   Note: While the DynaCentric butterfly valve has bi-directional sealing capabilities, the preferred position is seat upstream (Figure 4). Handle operated valves or fail closed valves should be installed seat downstream (stem side facing flow).
3. Lug body valves should be positioned between the flanges with gaskets properly centered, and then the cap-screws inserted (Figure 12).
4. Carefully check disc clearance by placing the valve in the full open position. Should automated valves be difficult or impossible to cycle, check that the raised face of the flange matches the raised area on the valve face.
5. Tighten all bolts or cap-screws in a crossover or star pattern to insure even sealing (Figure 11 and 12).
6. Packing gland tightness is pre-tested at the factory. Should stem leakage occur at start-up, the gland can be adjusted to stop the leak. Avoid over tightening which may result in excessive operating torque or premature packing wear.

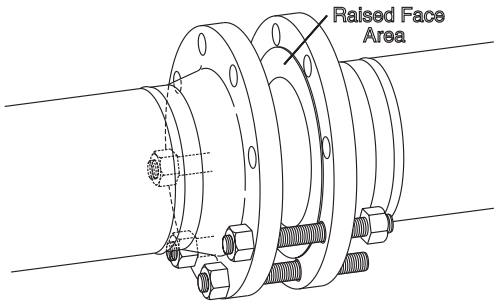


Figure 10

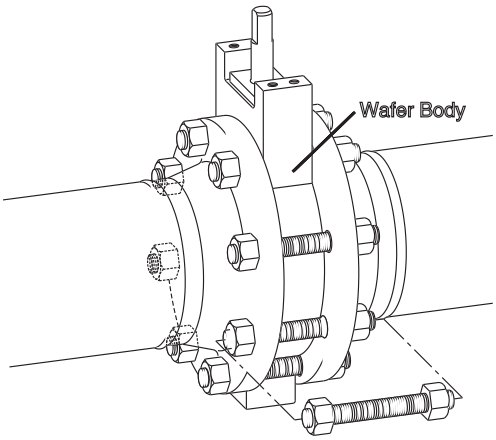


Figure 11

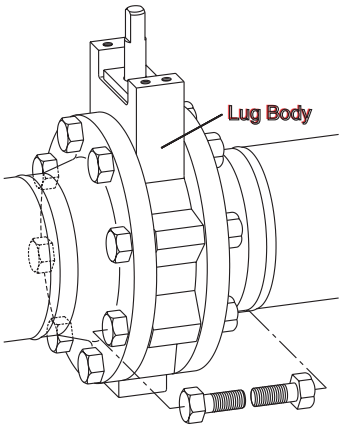


Figure 12

COOPER CAMERON VALVES

Operation

Manually operated -
The DynaCentric butterfly valve operates from fully open to fully closed by a 90° turn of the handle. Visual "OPEN-CLOSED" indicators on the stop plate and handle enable the valve's position to be determined at a glance.
The smaller sized DynaCentric valves (3"-6" Class 150 and 300, 3" and 4" Class 600) have flats on the stem. Larger valve sizes have a single square key. Both stem flats and keyway indicate valve position. When they are in line with the flow stream, the valve is open. When perpendicular, the valve is closed.
In all cases, when the valve is closed, the handle is perpendicular to the run of the pipe (Figure 13), and when the valve is open, the handle is parallel to the pipe (Figure 14).

Maximum recommended pressure differential for handle operated valves:

3"……..400psi
4"……..300psi
6"……..150psi
8"……50psi

Worm Gear operated –
Worm gear operators, available as standard equipment on all valves 8" and larger, which are not power actuated, have an arrow on top of the operator that indicates the "OPEN - CLOSED" position of the disc (Figure 15). Counter-clockwise rotation of the handwheel opens the valve; clockwise rotation closes the valve.

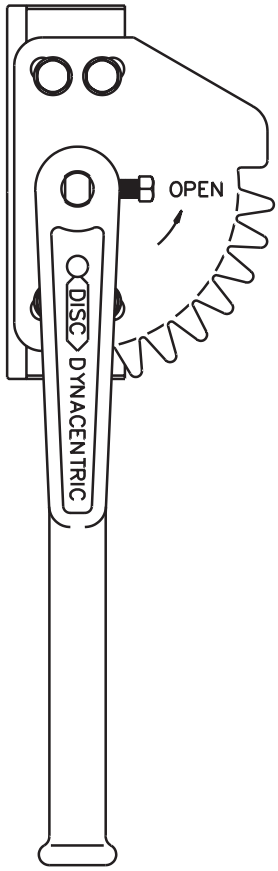


Figure 13

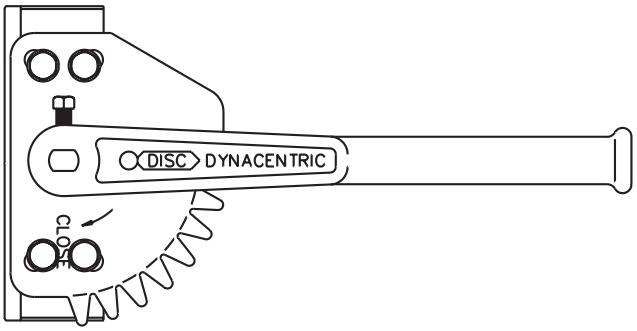


Figure 14

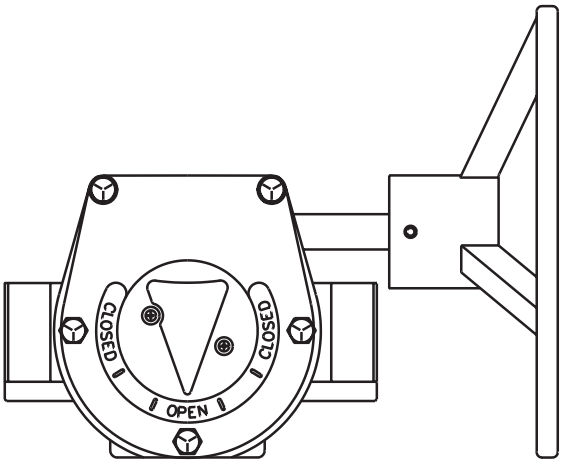


Figure 15

Routine Maintenance

Because of the simple design and operation, the DynaCentric butterfly valve requires virtually no maintenance. Its non-lubricated construction and protected seat design provides reliable leak free performance without routine servicing.

The only preventative maintenance recommended for the valve is to periodically inspect for leaks around the stem packing. Should a leak appear, the packing can be adjusted by tightening the gland retainer nuts slightly. Avoid excessive tightening which may result in excessive valve torque or premature packing wear.

Troubleshooting

Trouble	Probable Cause	Remedy
The valve will not seal properly.	The seat and/or disc is worn or damaged.	Replace worn parts.*
	Foreign matter is present between seat and disc.	Operate several times to wipe clean.
	Operator stops are not set properly.	Adjust stops to proper setting.
The valve is hard to operate.	Build up of solids or roughness is on edge of disc.	Operate several times to wipe clean or disassemble valve and clean disc edge.*
	Stem packing is too tight.	Tighten packing only sufficiently to stop leaks.
	Operator is not installed properly.	Reinstall operator in proper alignment with valve stem.
The valve will not open.	Disc hits on side of pipe.	Check for proper pipe clearance.
The valve leaks between body and seat retainer.	Seat retainer screws are not tight.	Tighten seat retainer screws.
	Body gasket is damaged. (FO and MO seats only)	Replace body gasket.*
	Seat is damaged.	Replace seat.
The valve is leaking around stem.	Gland nuts are loose.	Tighten gland nuts.
	Packing is damaged or worn.	Replace packing.
The valve opens and closes with line flow.	Handle or actuator does not provide proper restraint.	Restrain handle or actuator when in static position.

*Contact your CCV representative for technical information or repair manual

Additional information is also available on-line at http://www.ccvalve.com

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