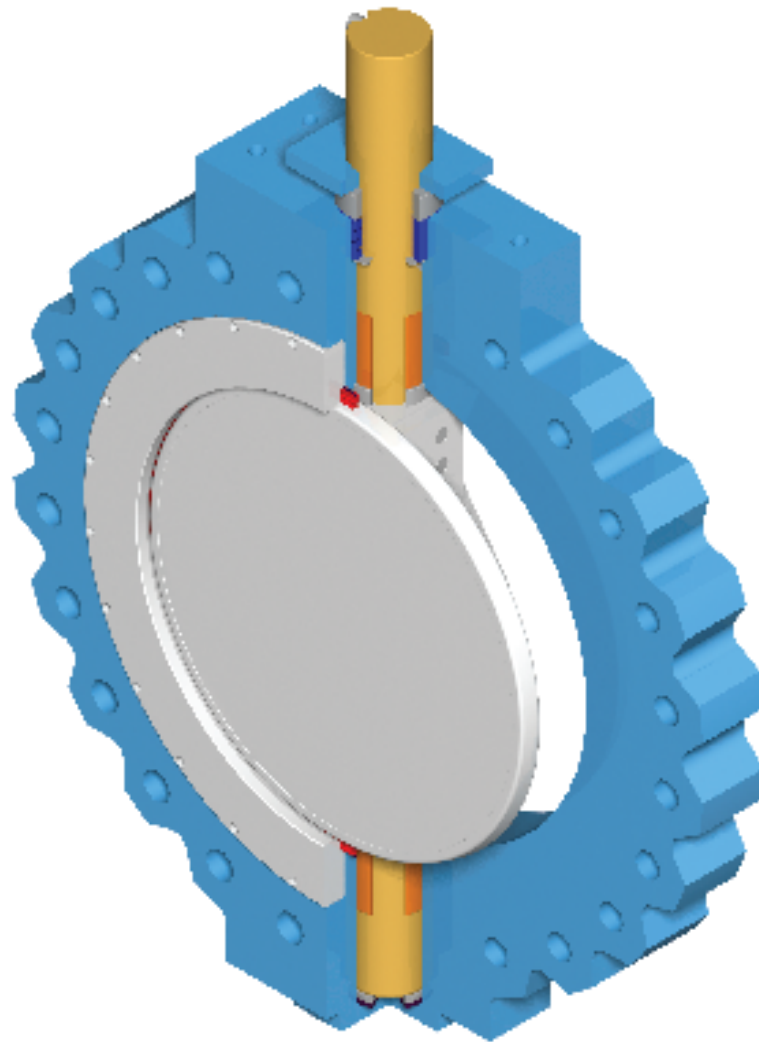


Installation, Operation and Maintenance Manual

WKM[®] MODEL MA DYNACENTRIC[®] HIGH PERFORMANCE BUTTERFLY VALVE



WKM[®]

TABLE OF CONTENTS**WKM DYNACENTRIC MA HIGH PERFORMANCE BUTTERFLY VALVE**

Bill of Materials	1
Catalog Number Information	3
Nameplate Information	3
Scope	4
Storage	4
Installation	4
End-of-Line Service	5
Disc/Pipe Clearance	5
Gaskets	6
Flange Bolt and Stud Size	6
Procedure	7
Operation	8
Routine Maintenance	9
Trouble Shooting	9

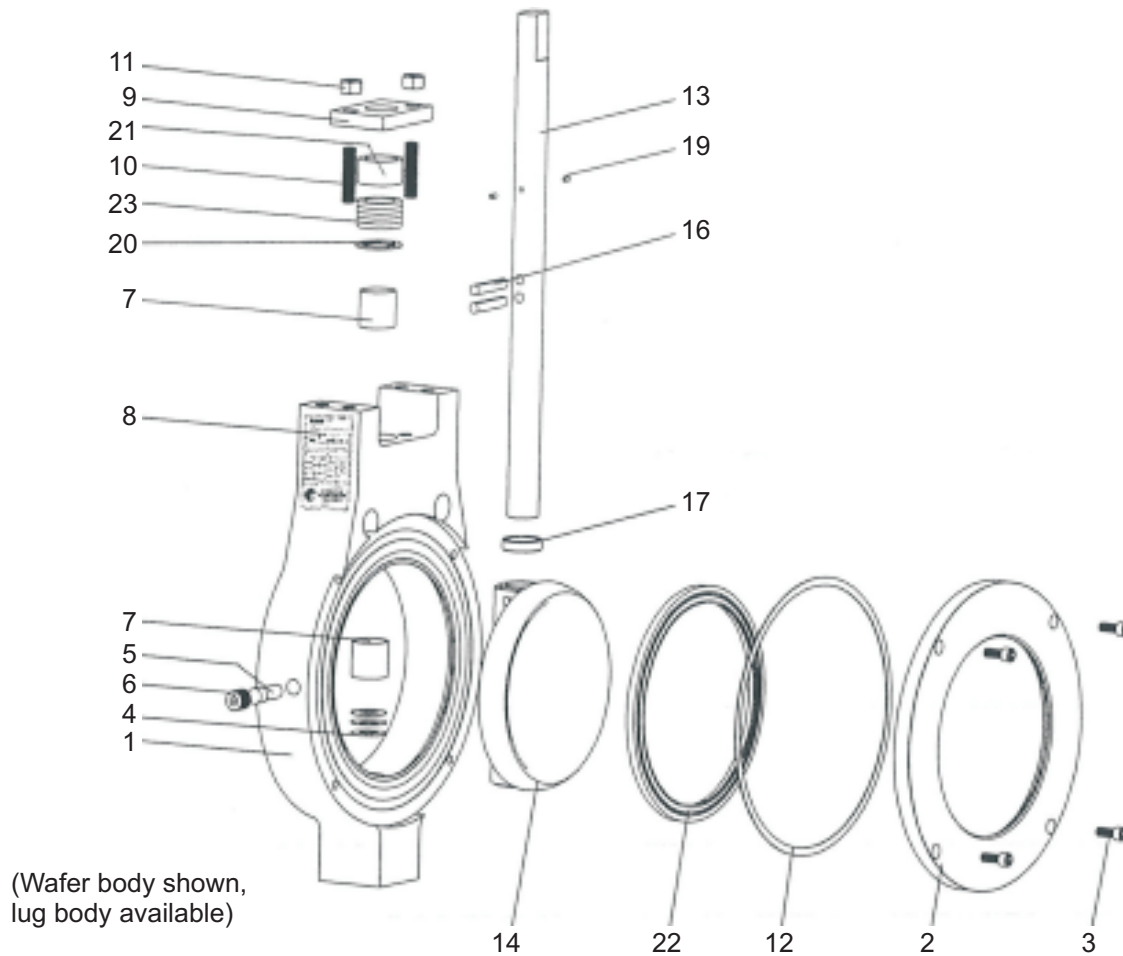
Bill of Materials


Figure 1 - Cameron Valves' WKM 3" - 12" Class 150, 3" - 10" Class 300, 3" - 8" Class 600 DynaCentric Butterfly 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 Cover Screw

Bill of Materials

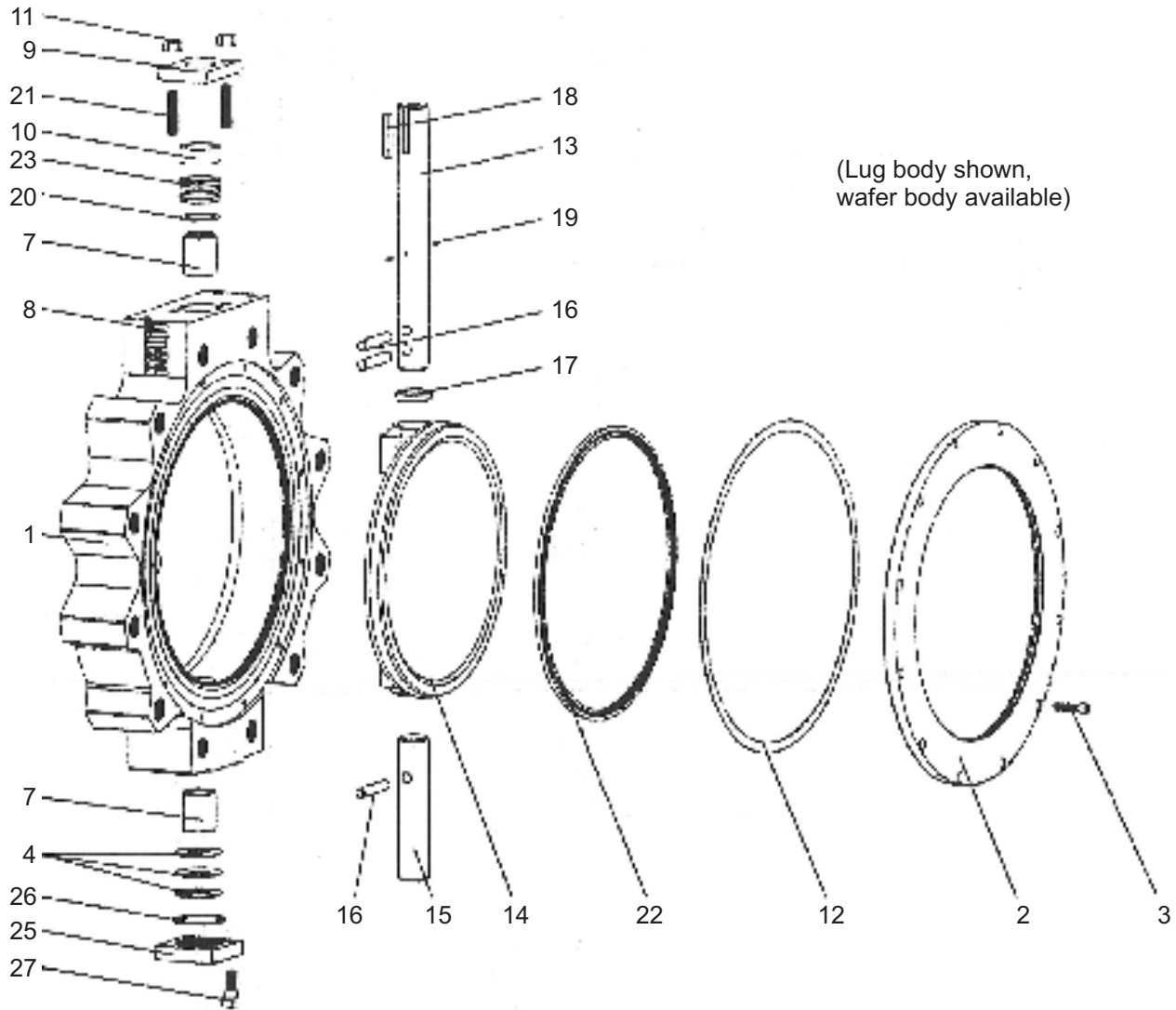


Figure 2 - Cameron Valves' WKM 14" - 30" Class 150, 12" - 24" Class 300, 10" - 12" Class 600 DynaCentric Butterfly Valve Components.

Catalog Number Information

XX	-	A5XXX	-	XX	-	XXX	-	XX	-	XX
Size Inches		Body Group		Trim Group		Seal Group		Packing Group		Packing Group

3"	03	<table border="1"> <thead> <tr> <th>Class</th><th>Material</th><th>Style</th></tr> </thead> <tbody> <tr> <td>1=150</td><td>1-CS</td><td>0-Wafer</td></tr> <tr> <td>3=300</td><td>2=SS</td><td>1=Lug</td></tr> <tr> <td>6=600</td><td>3=CS2¹</td><td></td></tr> <tr> <td></td><td>4=CS/ENC</td><td></td></tr> <tr> <td></td><td>5=LCC</td><td></td></tr> </tbody> </table>	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		<table border="1"> <tbody> <tr> <td>CS Disc* 01</td><td>17-4 Stem</td></tr> <tr> <td>SS Disc 02</td><td>17-4 Stem</td></tr> <tr> <td>SS Disc 03</td><td>Ni-Cr⁵ Stem</td></tr> <tr> <td>Ni-Cu⁶ Stem 04</td><td>Disc & Stem</td></tr> <tr> <td>SS Disc 05</td><td>316 SS Stem⁶</td></tr> <tr> <td>SS Disc 06</td><td>HF-6 O/L⁷ 17-4 Stem</td></tr> <tr> <td>SS Disc 07</td><td>HF-6 O/L⁷ Ni-Cr Stem⁵</td></tr> </tbody> </table>	CS Disc* 01	17-4 Stem	SS Disc 02	17-4 Stem	SS Disc 03	Ni-Cr ⁵ Stem	Ni-Cu ⁶ Stem 04	Disc & Stem	SS Disc 05	316 SS Stem ⁶	SS Disc 06	HF-6 O/L ⁷ 17-4 Stem	SS Disc 07	HF-6 O/L ⁷ Ni-Cr Stem ⁵
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Handwheel Worm Gear	WG																
Chainwheel Worm Gear	CH																
RTF	S02																
SS/RTFE	F02 ³																
Ni-Cr ⁵ (UNS 6625) /RTFE	F03																
316SS	M01																
Ni-Cr ⁵ Alloy (UNS 6625)	M03																

Note: Valves with optional materials of construction are available on application.

- ¹ Controlled hardness carbon steel (H₂S Service).
- ² Valves equipped with 316 SS stems may require derating depending on size and class.
- ³ With seat for Class 600 valves.
- ⁴ SS packing adjustment studs and nuts are standard.
- * Carbon steel disc (14" and larger - consult factory).
- ⁵ Ref. "Inconel"
- ⁶ Ref. "Monel"
- ⁷ Ref. "Stellite" overlay

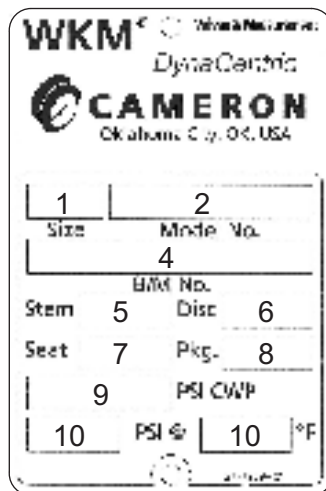
The WKM DynaCentric MA High Performance Butterfly Valves are available in three levels of certification:

- MA-1: Standard Valve.
- MA-2: Standard with MTR package.
- MA-3: P.E.D. compliant with CE marking.

Nameplate Information

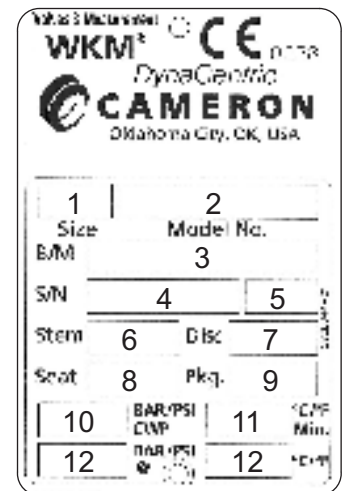
Standard Nameplate

- | | |
|-------------|-------------------------|
| Item | Stamp |
| 1 | Valve Size |
| 2 | Model Number |
| 4 | Bill of Material Number |
| 5 | Stem Material |
| 6 | Disc Material |
| 7 | Seat Material |
| 8 | Packing Material |
| 9 | Maximum CWP |
| 10 | Seat Ratings |



P.E.D. Compliant Nameplate

- | | |
|-------------|----------------------------|
| Item | Stamp |
| 1 | Valve Size |
| 2 | Model Number |
| 3 | Bill of Material Number |
| 4 | Serial Number |
| 5 | Manufacture Date |
| 6 | Stem Material |
| 7 | Disc Material |
| 8 | Seat Material |
| 9 | Packing Material |
| 10 | Maximum CWP |
| 11 | Min. Operating Temperature |
| 12 | Seat Ratings |



Scope

The WKM DynaCentric MA 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 WKM DynaCentric MA High Performance 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, WKM DynaCentric MA High Performance 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 permissible, but should be off the ground and protected from the elements. For long term storage, contact your Cameron representative.

Installation

Although WKM DynaCentric MA High Performance Butterfly Valves have Bi-directional sealing capabilities and will operate in any position, the following positions are generally recommended for certain applications.

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

Stem Position -

WKM DynaCentric MA High Performance Butterfly 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 integral stop pin in the vertical up position. (Figure 6).

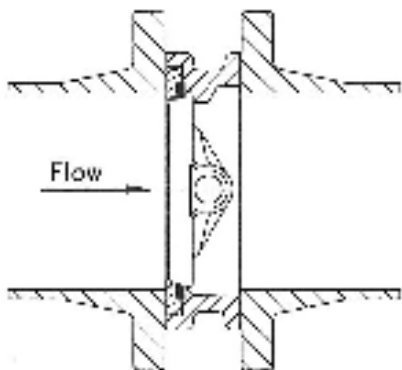


Figure 4
Preferred Position - Seat Upstream

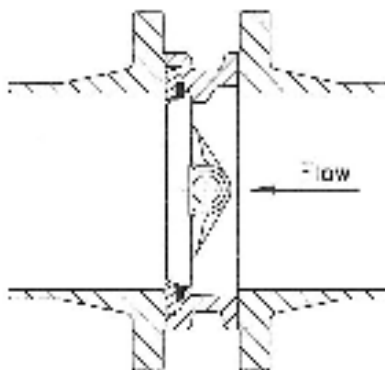


Figure 5
Seat Downstream (Fail Close)

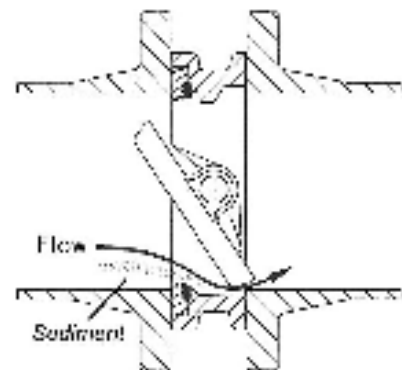
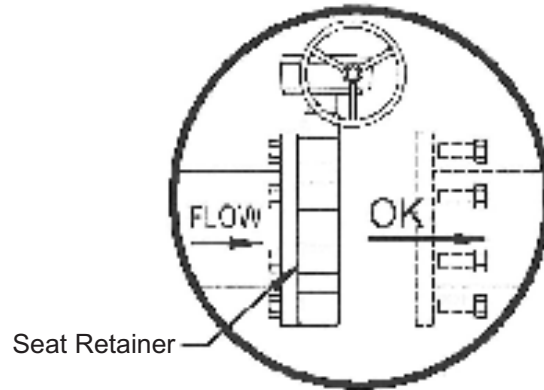


Figure 6
Stem Horizontal

End-of-Line Service

Threaded style lug valves are recommended for end-of-line or equipment isolation service. The WKM DynaCentric MA High Performance Butterfly Valve can handle flow from either direction in end-of-line service.

To prevent unintentional removal of the seat retainer with pressure on the valve, it is recommended that the valve be installed with the seat retainer against the upstream flange if possible.



Disc/Pipe Clearance

Before beginning installation, note the following: Disc/pipe clearance should be checked before beginning installation to avoid the possibility of scraping on the disc edge on the pipe I.D. 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 - Schedule XS pipe or equivalent

Class 600 valves - Schedule 120 pipe or equivalent

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

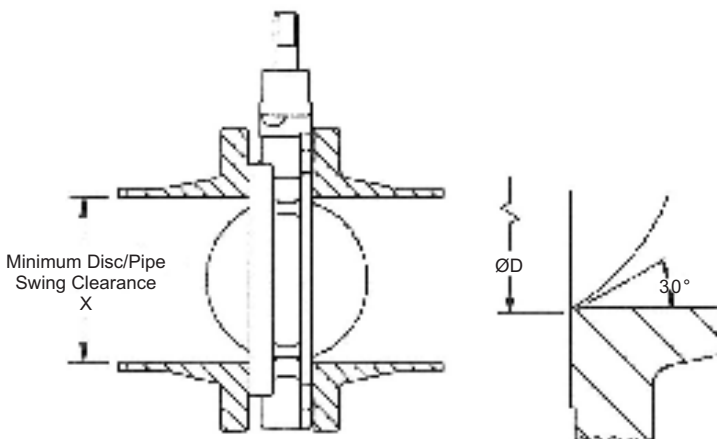


Figure 7 - Disc / Pipe Clearance

Valve Size and Class	Schd 40	Schd XS (extra strong)	Schd 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	X	X	X	28.02

Table 1 - Disc Clearance

Gaskets

Non-asbestos gaskets made in accordance with ASME B16.5, Group 1a and 1b are standard for the WKM DynaCentric MA High Performance Butterfly Valve.

API 601 standard spiral wound gaskets may also be used.

Flange Bolts

Recommended bolt and stud lengths for installation in ASME B16.5 flanges are provided in Table 2.

Valve Size (in.)	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	2.50
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
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

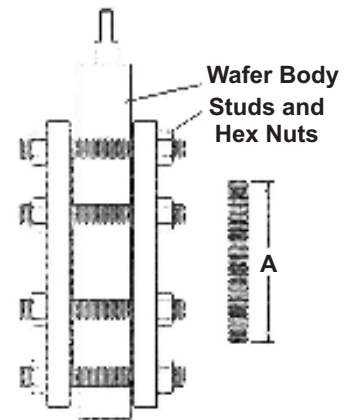


Figure 8

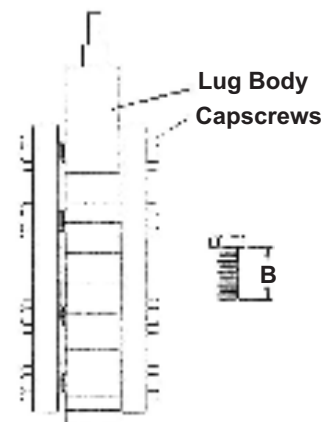


Figure 9

Procedure

The following procedure applies to new installation between standard ASME B16.5 pipe flanges.

When replacing a valve from an existing installation, clean the flange faces of any residual gasket material before starting.

Actuation should not be removed from the valve for installations 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 (Figure 11).

Note: While the WKM DynaCentric MA High Performance Butterfly Valve has bi-directional sealing capabilities, the preferred position is seat upstream (Figure 4).

Handle operated valves or fail close 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 capscrews 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 capscrews in a crossover or star pattern to insure even sealing (Figures 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.

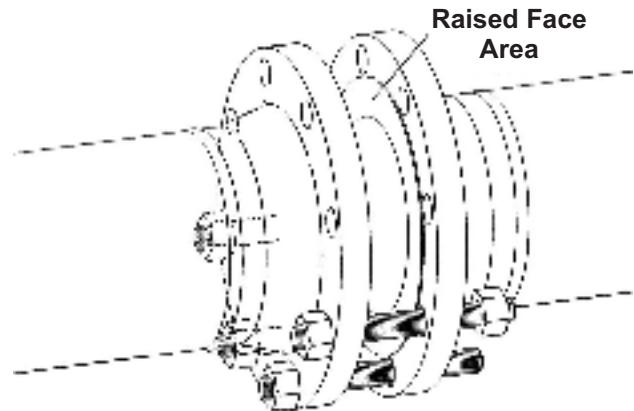


Figure 10

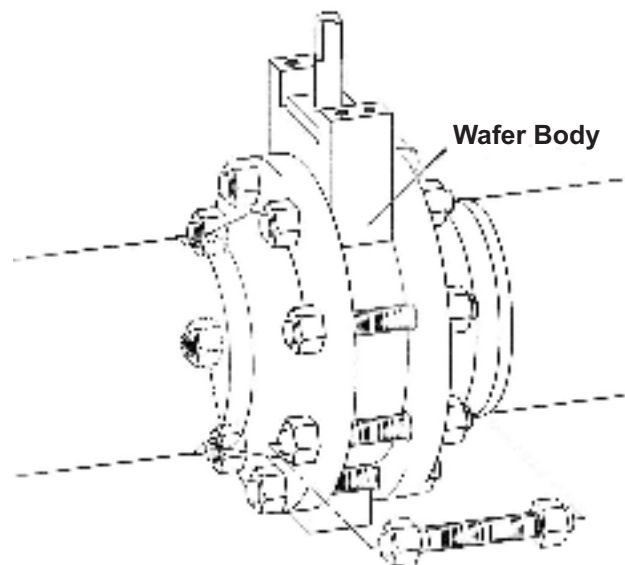


Figure 11

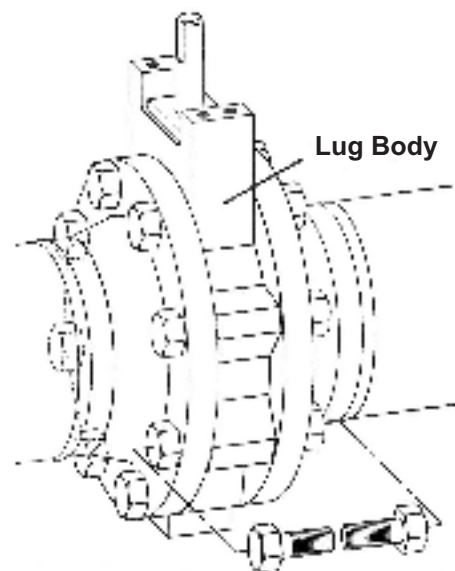


Figure 12

Operation

Manually Operated

The WKM DynaCentric MA High Performance 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 WKM DynaCentric MA High Performance Butterfly Valves (3" - 6" Class 150 and 300, 3" and 4" Class 600) have flats on the stem. The 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" 400 psi
- 4" 300 psi
- 6" 150 psi
- 8" 50 psi

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.

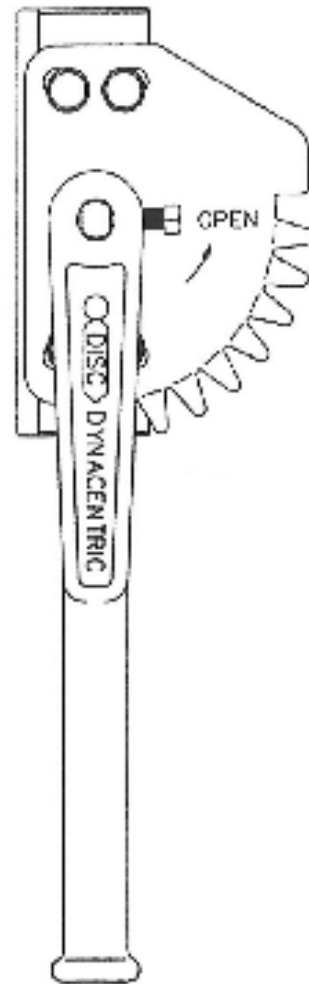


Figure 13

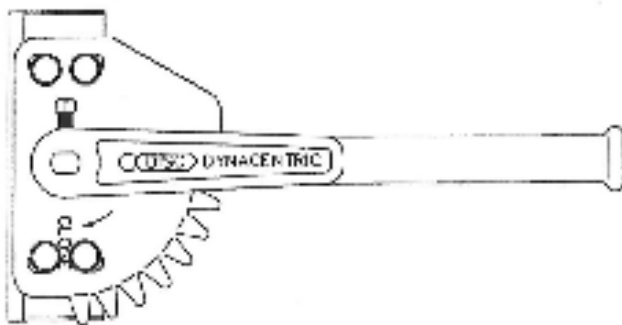


Figure 14

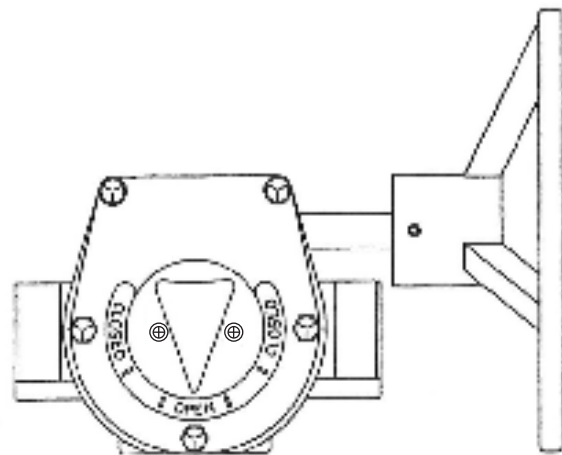


Figure 15

Routine Maintenance

Because of the simple design and operation, the WKM DynaCentric MA High Performance 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 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 Cameron representative for technical information or repair manual.

Additional information is also available on-line at www.c-a-m.com

Contact your Cameron's Valves & Measurement group representative for a Repair Manual

WKM[®]



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Houston, Texas 77042
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For the most current contact and location information go to: www.c-a-m.com

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