

WKM[®] Model MA DynaCentric[®] High Performance Butterfly Valve

Installation, Operation, and Maintenance Manual

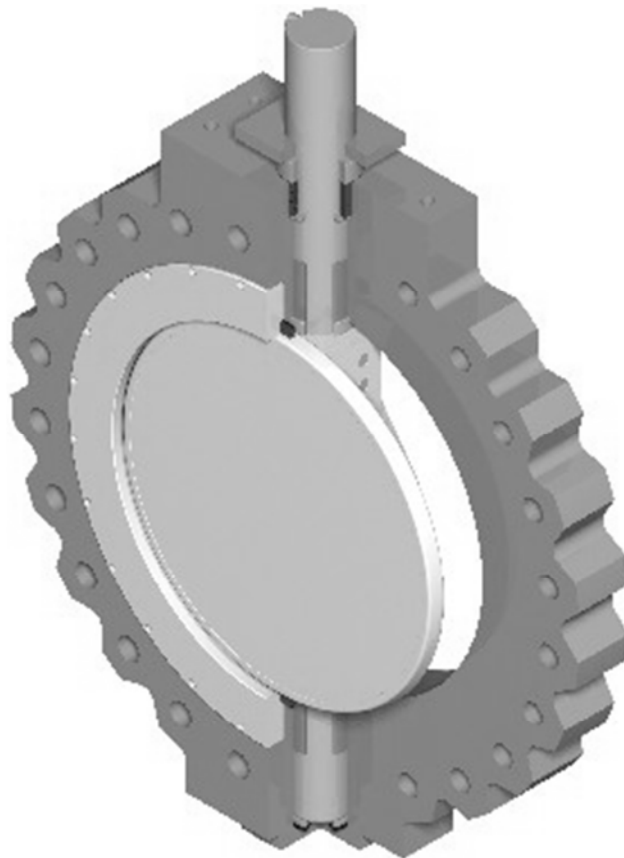


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File copies of this manual are maintained. Revisions and/or additions will be made as deemed necessary by Cameron. The drawings in this book are not drawn to scale, but the dimensions shown are accurate.

BILL OF MATERIALS

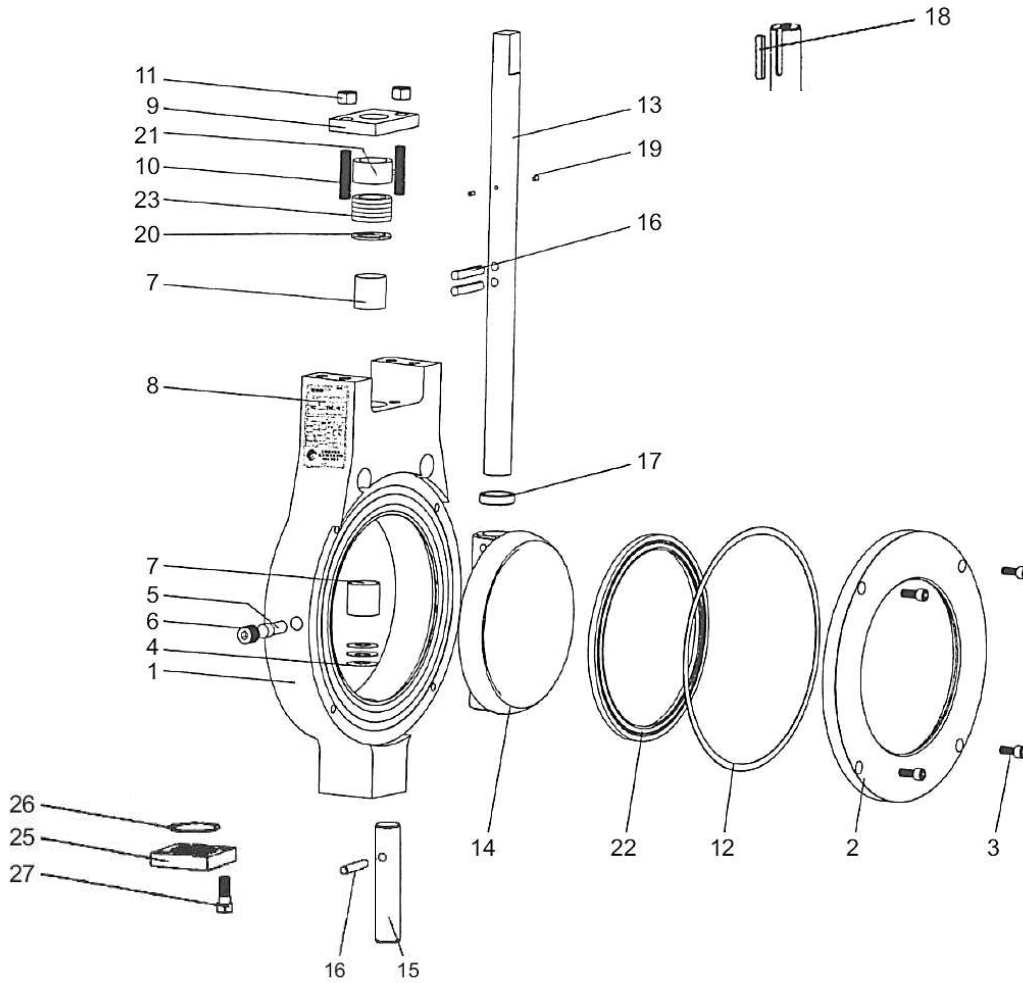


Figure 1 - Cameron Valves WKM 4" -12" Class 600 DynaCentric Butterfly Valve Components Wafer Style

Table 1 - Cameron Valves WKM 4" -12" Class 600, DynaCentric Butterfly Valve Components Wafer Style

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	Stem 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***

*5" - 12" only. **12" only. ***8"-12" only.

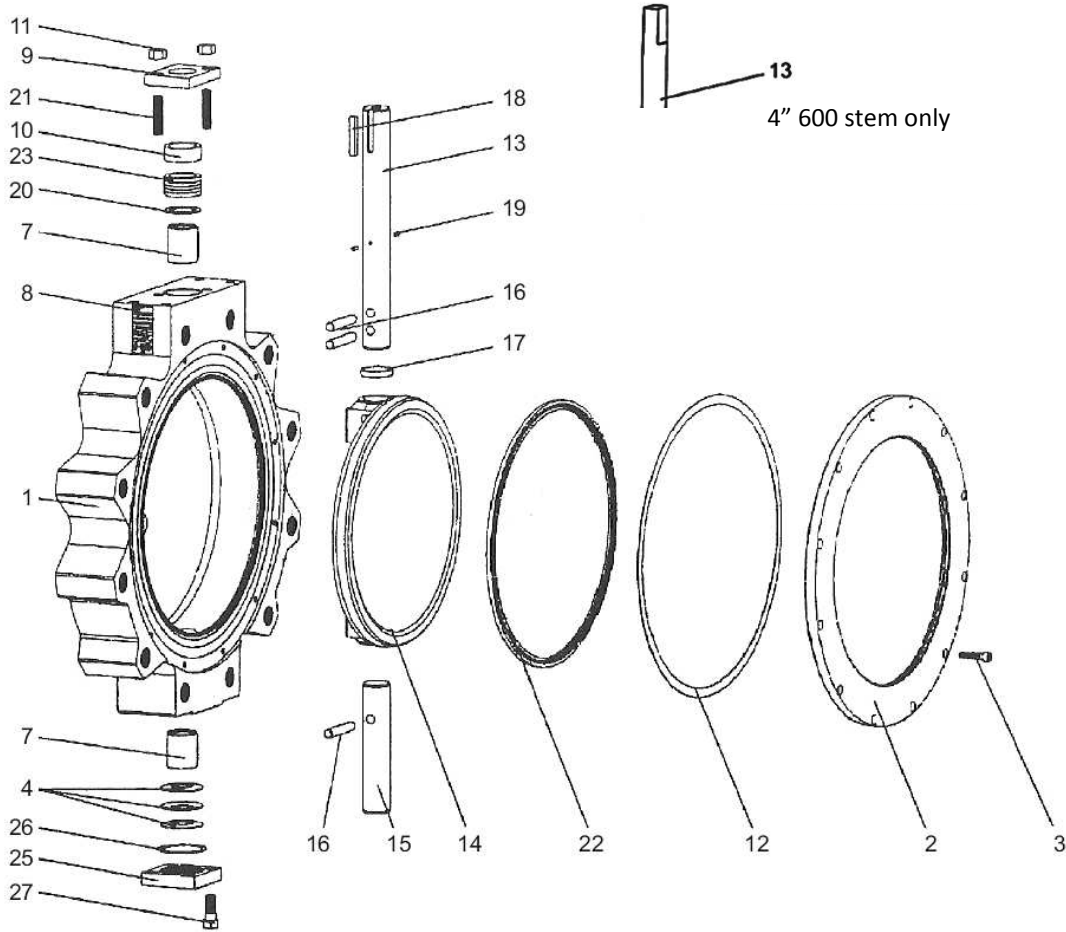


Figure 2 - Cameron Valves WKM 4" - 12" Class 600, 30" 150 DynaCentric Butterfly Valve Components Lug Style

Table 2 - Cameron Valves WKM 4" - 12" Class 600, DynaCentric Butterfly Valve Components Lug Style

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 (4"-10" only)	18	Stem Key*
6	Stop Pin Plug (4"-10" only)	19	Stem Retainer Pins
7	Stem Bearing	20	Packing Spacer
8	Nameplate	21	Gland Retainer Stud
9	Gland Retainer	22	Seat
10	Gland Ring	23	Packing Set
11	Gland Retainer Nut	25	Bottom Cover***
12	Body Gasket	26	Bottom Cover Gasket***
13	Upper Stem	27	Bottom Cover Screw***

*5" - 12" only. **12" only. ***8"-12", 30" only.

CATALOG NUMBER INFORMATION

Table 3

XX	-	A5XXX	-	XX	-	XXX	-	XX	-	XX																																																							
Size Inches		Body Group		Trim Group		Seal Group		Packing Group		Actuation																																																							
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>SS Disc[*] 17-4 Stem</td> <td>01</td> </tr> <tr> <td>SS Disc 17-4 Stem</td> <td>02</td> </tr> <tr> <td>SS Disc Ni-Cr⁵ Stem</td> <td>03</td> </tr> <tr> <td>Ni-Cu⁶ Disc Ni-Cu⁶ Stem</td> <td>04</td> </tr> <tr> <td>SS Disc 316SS Stem²</td> <td>05</td> </tr> <tr> <td>SS Disc HF-6 O/L⁷ 17-4 Stem</td> <td>06</td> </tr> <tr> <td>SS Disc HF-6O/L⁷ NI-Cr⁵ Stem</td> <td>07</td> </tr> </tbody> </table>	SS Disc [*] 17-4 Stem	01	SS Disc 17-4 Stem	02	SS Disc Ni-Cr ⁵ Stem	03	Ni-Cu ⁶ Disc Ni-Cu ⁶ Stem	04	SS Disc 316SS Stem ²	05	SS Disc HF-6 O/L ⁷ 17-4 Stem	06	SS Disc HF-6O/L ⁷ NI-Cr ⁵ Stem	07	<table border="1"> <tbody> <tr> <td>TFE</td> <td>S01</td> </tr> <tr> <td>RTFE</td> <td>S02</td> </tr> <tr> <td>SS/RTFE</td> <td>F02³</td> </tr> <tr> <td>Ni-Cr⁵ (UNS 6625) /RTFE</td> <td>F03</td> </tr> <tr> <td>316SS²</td> <td>M01</td> </tr> <tr> <td>Ni-Cr⁵ (UNS 6625)</td> <td>M03</td> </tr> </tbody> </table>	TFE	S01	RTFE	S02	SS/RTFE	F02 ³	Ni-Cr ⁵ (UNS 6625) /RTFE	F03	316SS ²	M01	Ni-Cr ⁵ (UNS 6625)	M03	<table border="1"> <tbody> <tr> <td>TFE VEE</td> <td>11</td> </tr> <tr> <td>High Temp Galvanized</td> <td>13</td> </tr> <tr> <td>Grafoil</td> <td>14</td> </tr> </tbody> </table>	TFE VEE	11	High Temp Galvanized	13	Grafoil	14	<table border="1"> <tbody> <tr> <td>Bare Stem</td> <td>00</td> </tr> <tr> <td>Handle</td> <td>HL</td> </tr> <tr> <td>Handwheel WormGear</td> <td>WG</td> </tr> <tr> <td>Chainwheel WormGear</td> <td>CH</td> </tr> </tbody> </table>	Bare Stem	00	Handle	HL	Handwheel WormGear	WG	Chainwheel WormGear	CH
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Note: Valves with optional materials of construction are available on application.

¹Controlled hardness carbon steel (H2S Service).

²Valves equipped with 316 SS stems may require de-rating depending on size and class.

³With seat for class 600 valves.

⁴SS packing adjustment studs and nuts are standard

*Carbon steel disc (14" and larger – consult factory)

⁵Ref. "Inconel"

⁶Ref. "Monel"

⁷Ref. "Stellite" overlay

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 as well as 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 4" - 12" 600 pressure classes and 30" 150 (lug only). 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.

NAMEPLATE INFORMATION

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

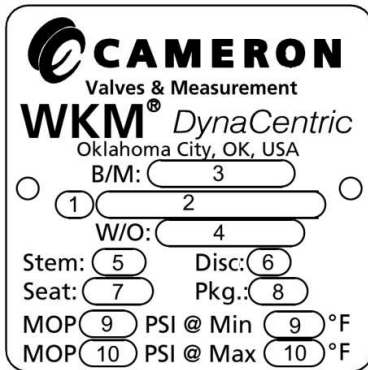


Figure 3 – Standard Nameplate

Table 4 – Standard Nameplate

Item	Description
1	Valve Size
2	Model Number
3	Bill of Material Number
4	Work Order Number
5	Stem Material
6	Disc Material
7	Seat Material
8	Packing Material
9	Max Operating Pressure @ Min Temperature
10	Max Operating Pressure @ Max Temperature

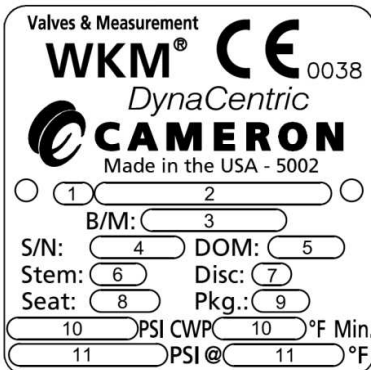


Figure 4 – P.E.D. Compliant Nameplate

Table 5 – P.E.D. Compliant Nameplate

Item	Description
1	Valve Size
2	Model Number
3	Bill of Material Number
4	Serial Number
5	Date of Manufacture
6	Stem Material
7	Disc Material
8	Seat Material
9	Packing Material
10	Max Operating Pressure @ Min Temperature
11	Max Operating Pressure @ Max Temperature

STORAGE

After assembly and test, The 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 AND OPERATION INSTRUCTIONS

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 5) 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 6) 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.

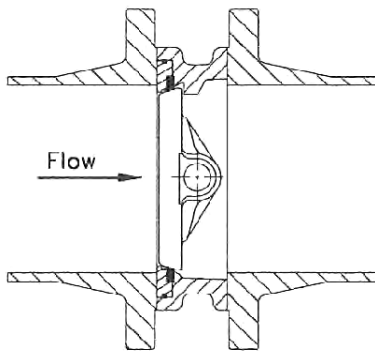


Figure 5 – Preferred Position
Seat Upstream

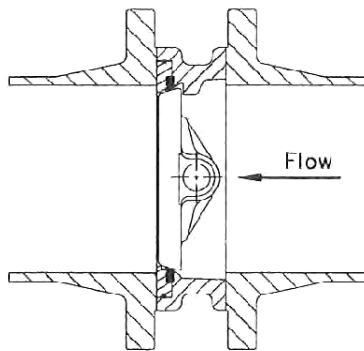


Figure 6 – Seat Downstream
(Fail Close)

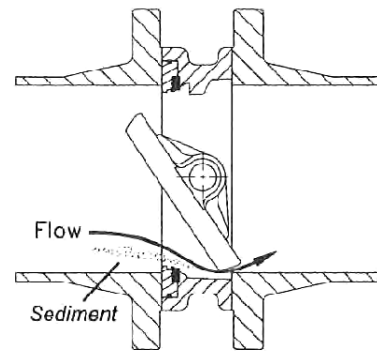


Figure 7 – Stem Horizontal
(Fail Close)

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 7).

Note: some installations may present unique circumstances that may require installation in a position different than outlined above.

INITIAL INSTALLATION

The following procedure applies to new installation between standard ASME B16.5 and B16.47 series A 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 8). 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 9). **Note: While the WKM DynaCentric MA High Performance Butterfly Valve has bi-directional sealing capabilities, the preferred position is seat upstream (Figure 5). 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 10).
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 9 and 10).
6. Packing gland tightness is set at the factory. Should stem leakage occur at start-up, the gland nuts can be adjusted to stop the leak. Avoid over tightening which may result in excessive operating torque or premature packing wear.

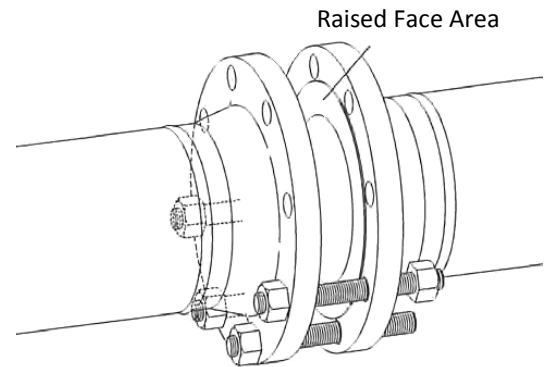


Figure 8

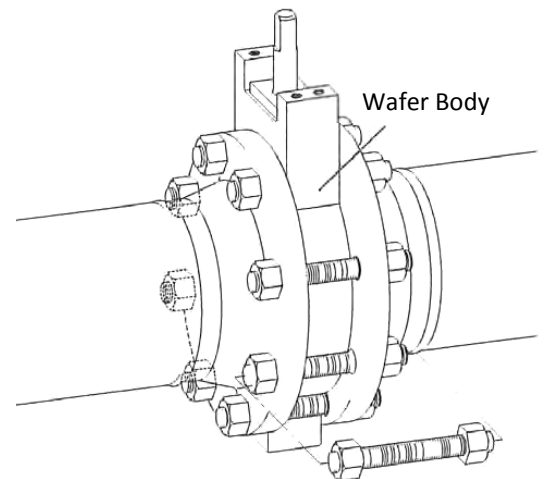


Figure 9

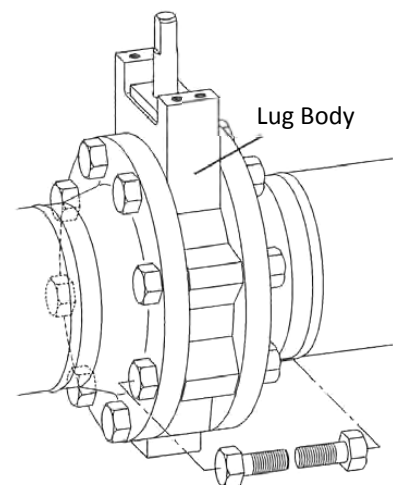


Figure 10

END-OF-LINE SERVICE

Threaded style lug valves are recommended for end-of-line or equipment isolation service. To prevent unintentional removal of the seat retainer while under pressure, the valve must be installed with the seat retainer against the upstream flange (Figure 11).

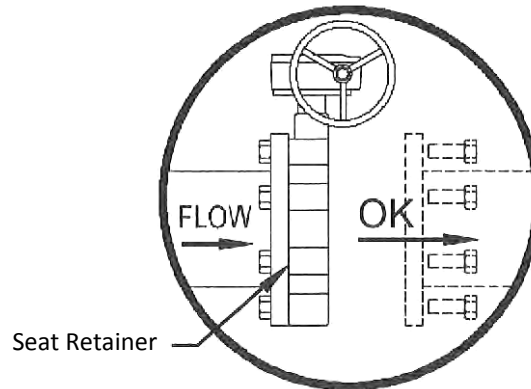


Figure 11

GASKETS

Non-asbestos gaskets made in accordance with ASME B16.5 and B16.47 series A, 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.

FLANGES

Recommended bolt and stud lengths for installation in ASME B16.5 and B16.47 series A flanges are provided in Table 6.

Table 6

Valve Size (in.)	Bolt Circle Dia. (in.)	Bolt Size	Wafer Body			Lug Body	
			Qty.	Stud Length 'A'	Capscrew Length 'B'	Qty.	Capscrew Length 'B'
4" - 600	8 1/2	7/8-9 UNC	8	7.50	-	16	2.50
6" - 600	11 1/2	1-8 UNC	12	9.50	-	24	3.25
8" - 600	13 3/4	1 1/8-8 UN	12	11.00	-	24	4.00
10" - 600	17	1 1/4-8 UN	12 (8)	13.00	(4.00)	32	4.00
12" - 600	19 1/4	1 1/4-8 UN	16 (8)	14.00	(4.00)	40	4.00
30" - 150	36	1 1/4-8 UN	NA	NA	NA	48 (8)	5.00 (4.25)

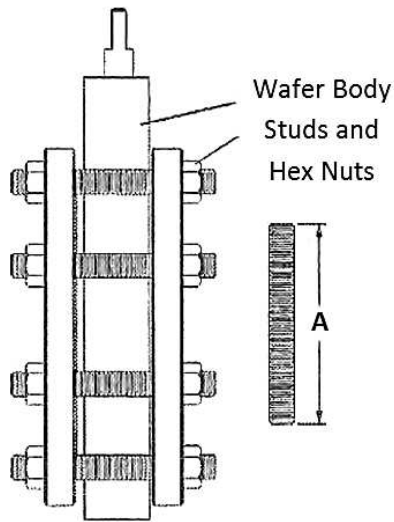


Figure 12

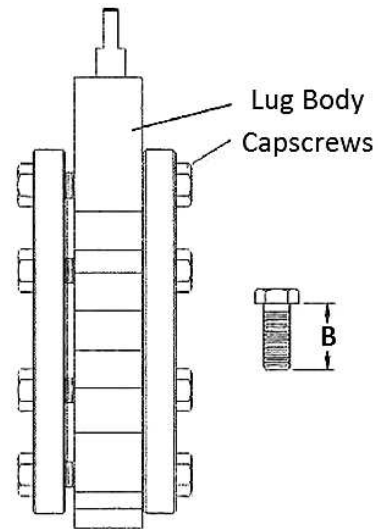


Figure 13

DISK AND PIPE CLEARANCE

Before beginning installation, note the following: disc/pipe clearance should be checked to avoid the possibility of scraping the disc edge on the pipe I.D. and causing damage to the sealing surface (Figure 14).

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 7 for required flange modifications for other pipe schedules.

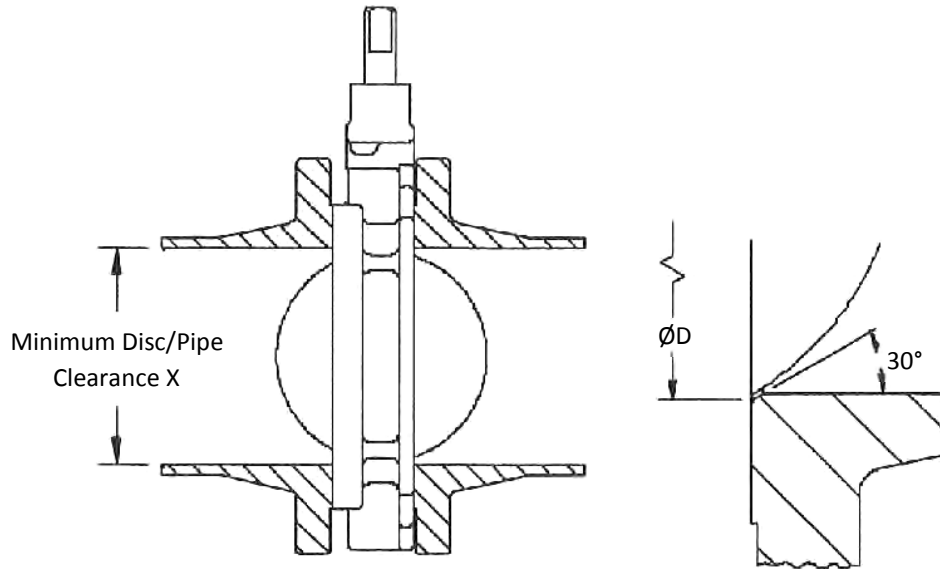


Figure 14

Table 7

Valve Size and Class	Schedule 40	Schedule 80	Schedule 120	Minimum Pipe I.D.
4" - 600	X	X	X	3.65
6" - 600	X	X	X	5.50
8" - 600	X	X	X	7.40
10" - 600	X	X	X	9.06
12" - 600	X	X	X	11.75
30" - 150	X	X	X	28.02

OPERATION

MANUALLY OPERATED

The WKM DynaCentric MB 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 they are perpendicular, the valve is closed.

In all cases, when the valve is closed, the handle is perpendicular to the run of the pipe (Figure 15) and when the valve is open, the handle is parallel to the pipe (Figure 16).

Maximum recommended pressure differential for handle operated valves:

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

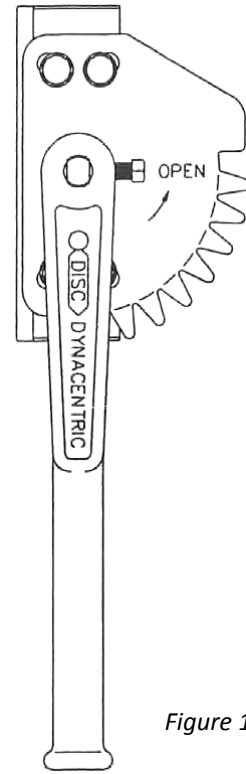


Figure 15

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 17). Counter-clockwise rotation of the handwheel opens the valve; clockwise rotation closes the valve.

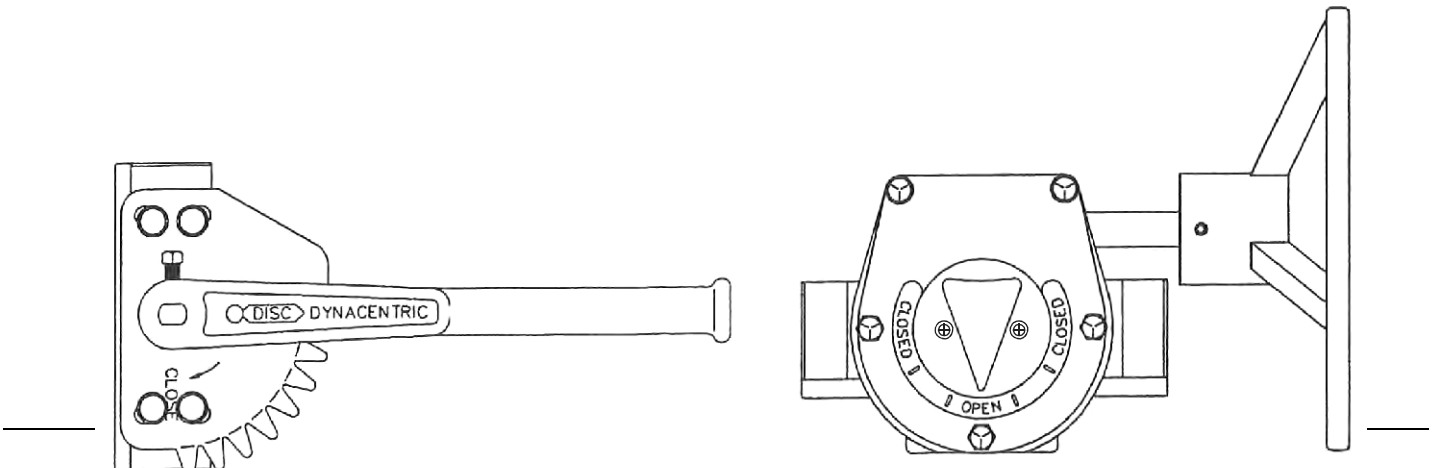


Figure 16

Figure 17

MAINTENANCE PROCEDURES

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 preventive 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

Table 8 – 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	Buildup 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 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.
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.

* Contact your Cameron representative for technical information or repair manual. Additional information is also available on-line at www.c-a-m.com

CONTACT INFORMATION**HEADQUARTERS**

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