

WKM[®] Model MB DynaCentric[®] High Performance Butterfly Valve Installation, Operation, and Maintenance Manual

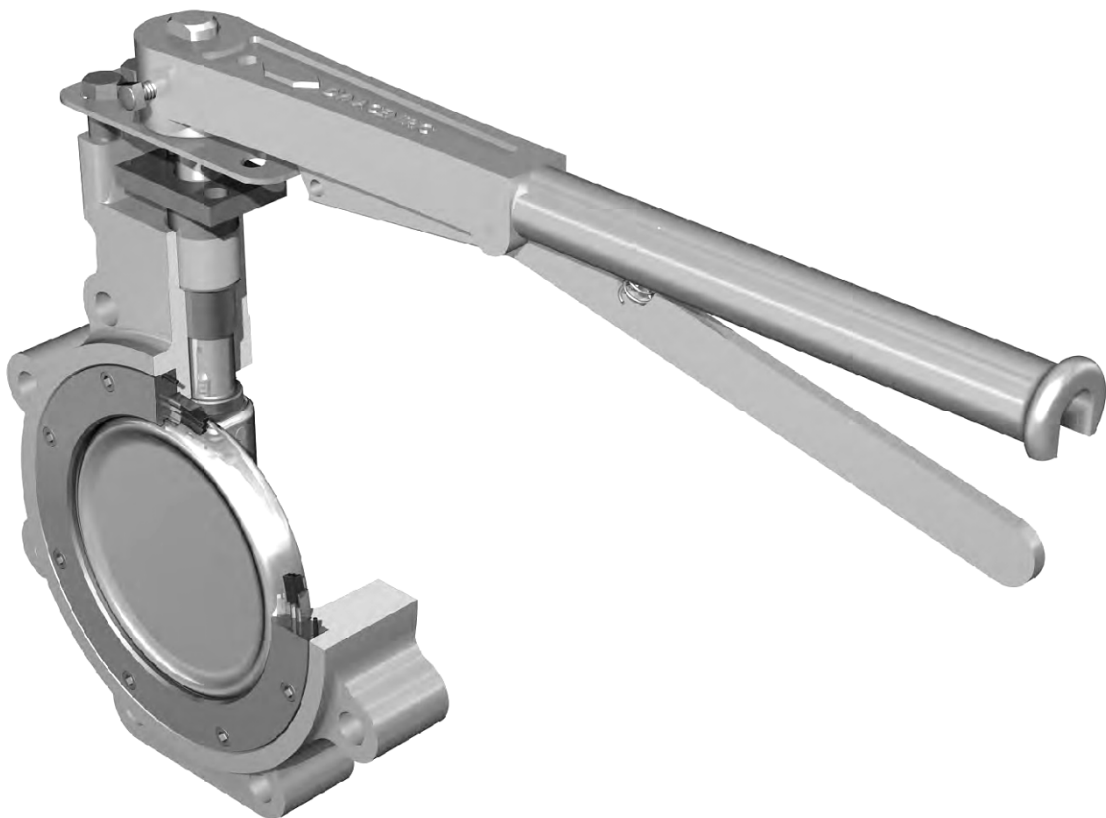


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File copies of this manual are maintained. Revisions and/or additions will be made as deemed necessary by Cameron. The drawings in this book are not drawn to scale, but the dimensions shown are accurate.

BILL OF MATERIALS

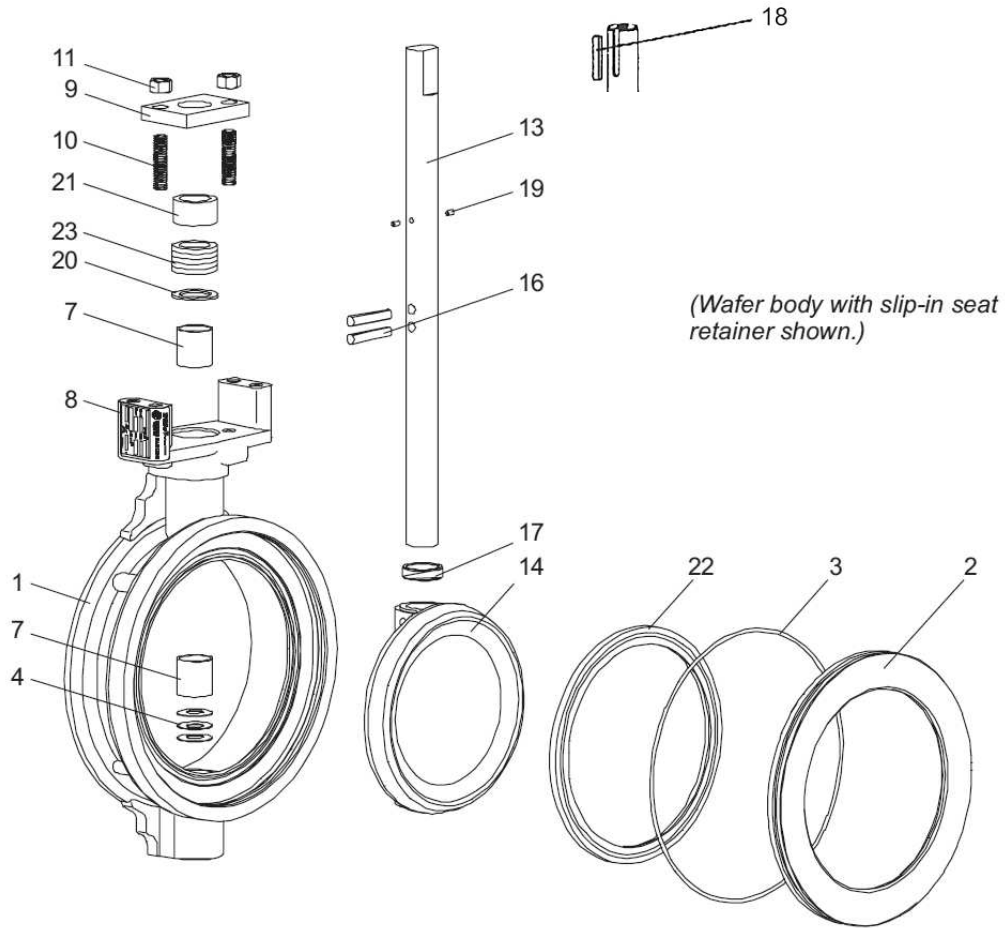


Figure 1 - Cameron Valves' WKM 2 1/2" - 24" Class 150 and 300 DynaCentric Wafer Valve Components

Table 1 - Cameron Valves' WKM 2 1/2" - 24" Class 150 and 300 DynaCentric Wafer Valve Components

Item	Description	Item	Description
1	Body	16	Stem Pins
2	Seat Retainer	17	Disc Spacer
3	Seat Retainer O-ring	18	Stem Key (8" - 24")
4	Stem/Disc Spring	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*
13	Stem	26	Bottom Cover Gasket*
14	Disc	27	Bottom Cover Screw*
15	Lower Stem*		

*(10" 300 and larger and 12" 150 and larger) see Figure 3

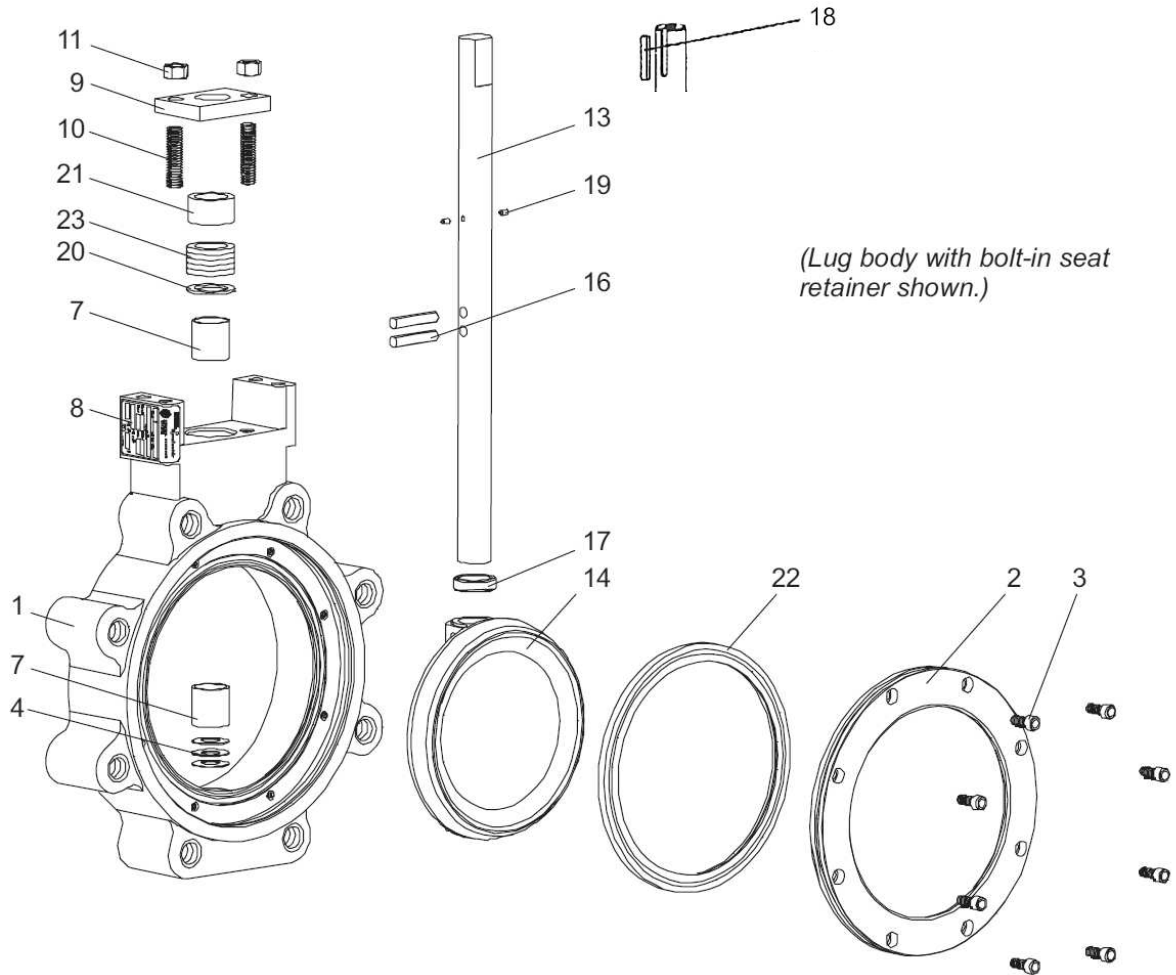


Figure 2 - Cameron Valves' WKM 2 1/2" - 36" Class
150 and 300 DynaCentric Lug Valve Components

Table 2 - Cameron Valves' WKM 2 1/2" - 36" Class 150 and 300 DynaCentric Lug Valve Components

Item	Description	Item	Description
1	Body	16	Stem Pins
2	Seat Retainer	17	Disc Spacer
3a	Seat Retainer Screw	18	Stem Key (8" - 36")
4	Stem/Disc Spring	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*
13	Stem	26	Bottom Cover Gasket*
14	Disc	27	Bottom Cover Screw*
15	Lower Stem*		

*(10" 300 and larger and 12" 150 and larger) see Figure 3

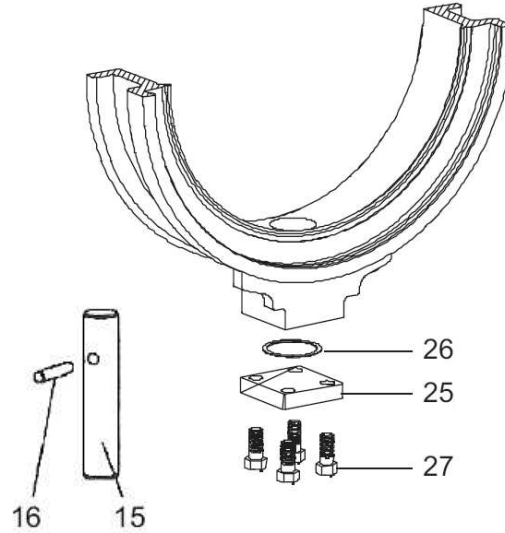


Figure 3 - Detail of Lower Stem & Bottom Cap
(10" 300 and larger and 12" 150 and larger)

CATALOG NUMBER INFORMATION

Table 3

XX	-	B5XXX	-	XX	-	XXX	-	XX	-	XX												
Size Inches		Body Group		Trim Group		Seal Group		Packing Group		Actuation												
1 1/2"	02	<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>2=Wafer³</td> </tr> <tr> <td></td> <td>3=CS2¹</td> <td>3=Lug³</td> </tr> </tbody> </table>	Class	Material	Style	1=150	1=CS	0=Wafer	3=300	2=SS	2=Wafer ³		3=CS2 ¹	3=Lug ³	SS Disc 17-4 Stem	02	TFE	S01	TFE VEE	11	Bare Stem	00
Class	Material		Style																			
1=150	1=CS		0=Wafer																			
3=300	2=SS		2=Wafer ³																			
	3=CS2 ¹		3=Lug ³																			
3"	03		SS Disc Ni-Cr ⁴ Stem	03	RTFE	S02	High Temp Galvanized	13	Handle	HL												
4"	04		Ni-Cu ⁵ Disc Ni-Cu ⁵ Stem	04	SS/RTFE	F02	Grafoil	14	Handwheel	WG												
5"	05		SS Disc 316SS Stem ²	05	Ni-Cr ⁴ (UNS 6625) /RTFE	F03			WormGear													
6"	06		SS Disc HF-6 O/L ⁶ 17-4 Stem	06	316SS ²	M01			Chainwheel													
8"	08				Ni-Cr ⁴ (UNS 6625)	M03			WormGear	CH												
10"	10																					
12"	12																					
14"	14																					
16"	16																					
18"	18																					
20"	20																					
24"	24																					
36"	36			SS Disc HF-6O/L ⁶ NI-Cr ⁴ Stem	07																	

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 bolted seat retainer.

⁴Ref. "Inconel"

⁵Ref. "Monel"

⁶Ref. "Stellite" overlay

SCOPE

The WKM DynaCentric MB 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 MB High Performance Butterfly Valve is available in 2-1/2" thru 36" 150 and 300 pressure classes. The valve is available in both flangeless wafer style and single flanged tapped lug style.

NAMEPLATE INFORMATION

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

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

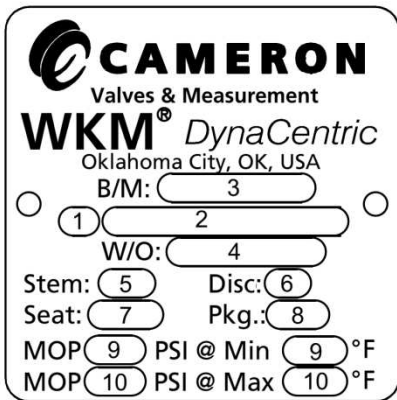


Figure 4 – Standard Nameplate

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

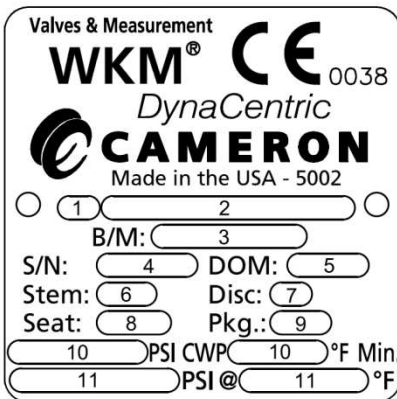


Figure 5 – CE/PED Compliant Nameplate

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 MB 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

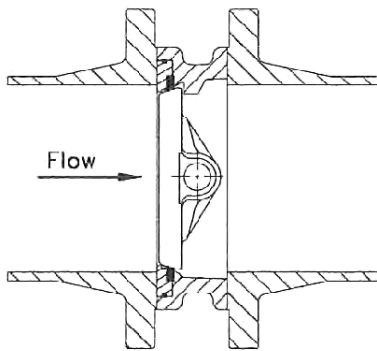
Although The WKM DynaCentric MB High Performance Butterfly Valves have Bi-directional sealing capabilities and will operate in most positions, the following positions are generally recommended for specific applications.

Flow Direction -

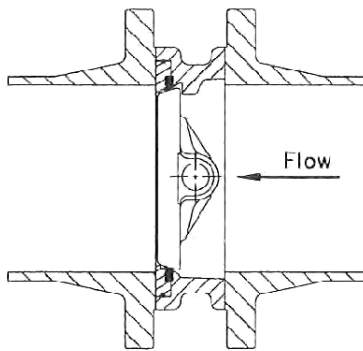
Normally the preferred position is with the seat upstream (Figure 6) where the seat retainer provides protection for the seat against erosion due to line flow. This position also reduces operating torque and provides better throttling characteristics.

For handle operated valves – or valves in fail- closed service – the seat should be downstream (Figure 7) 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.

Although The WKM DynaCentric MB High Performance Butterfly Valves will seal with flow from either direction, switching flow from side to side should be avoided. Once a flow direction is established, the seat tends to conform to the disc edge and may take a set making it difficult to establish a seal from the opposite direction.



*Figure 6 – Preferred Position
Seat Upstream*



*Figure 7 – Seat Downstream
(Fail Close)*

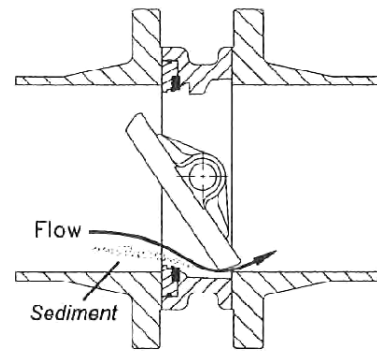


Figure 8 – Stem Horizontal

Stem Position -

The WKM DynaCentric MB 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 with the seat upstream (flow from the seat side of the valve) with the integral disc stop in the vertical up position (Figure 8).

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 9). 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 10). **Note: While the WKM DynaCentric MB High Performance Butterfly Valve has bi-directional sealing capabilities, the preferred position is seat upstream (Figure 6). 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 11).
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 10 and 11).
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 could result in excessive operating torque or premature packing wear.

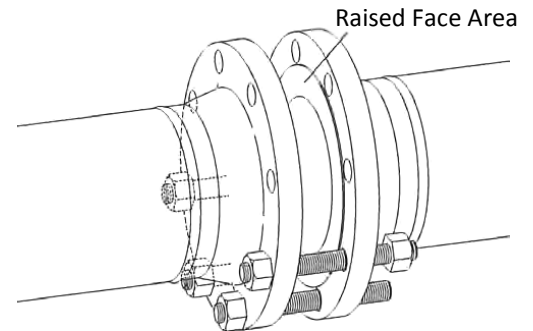


Figure 9

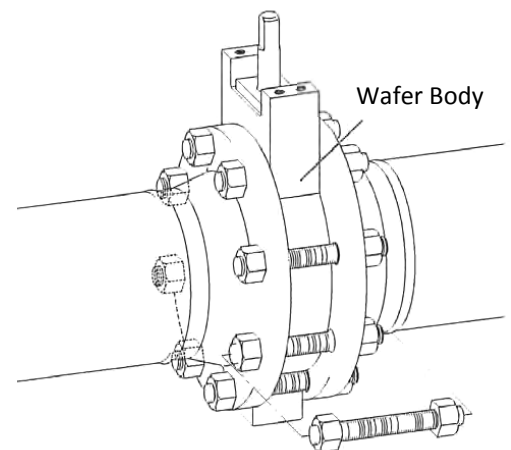


Figure 10

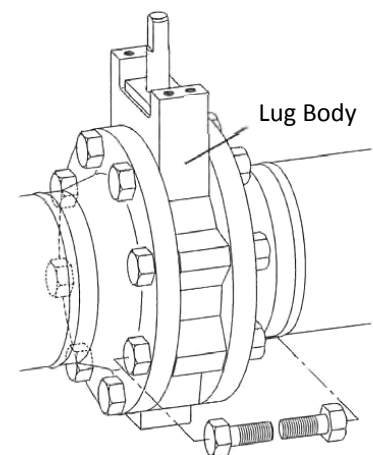


Figure 11

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 12).

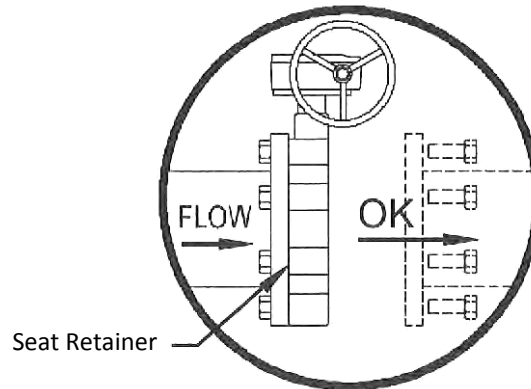


Figure 12

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 MB High Performance Butterfly Valve.

ASME 16.20 standard spiral wound gaskets may also be used. Slip-in seat retainers provide 100% gasket contact. The screw heads of bolt-in seat retainers protrude into the gasket surface less than 33%.

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'
2 1/2" - 150	5 1/2	5/8-11 UNC	4	5.25	-	8	1.75
2 1/2" - 300	5 7/8	3/4-10 UNC	8	5.75	-	16	1.75
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	6.75	-	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
5" - 150	8 1/2	3/4-10 UNC	8	6.00	-	16	2.00
5" - 300	9 1/4	3/4-10 UNC	8	7.00	-	16	2.25
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
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
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
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
14" - 150	18 3/4	1-8 UNC	12	9.00	-	24	3.00
14" - 300	20 1/4	1 1/8-8 UN	16 (8)	12.00	(3.70)	40	3.75
16" - 150	21 1/4	1-8 UNC	16	9.50	-	32	3.00
16" - 300	22 1/2	1 1/4-8 UN	16 (8)	13.00	(3.75)	32 (8)	4.00 (3.75)
18" - 150	22 3/4	1 1/8-8 UN	16	10.50	-	32	3.50
18" - 300	24 3/4	1 1/4-8 UN	20 (8)	14.00	(3.75)	40 (8)	4.00 (3.75)
20" - 150	25	1 1/8-8 UN	20	11.50	-	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	4.50
24" - 300	32	1 1/2-8 UN	20 (8)	16.50	(4.50)	40 (8)	5.00 (4.50)
36" - 150	42 3/4	1 1/2-8 UN	-	-	-	56 (8)	5.50 (5.25)

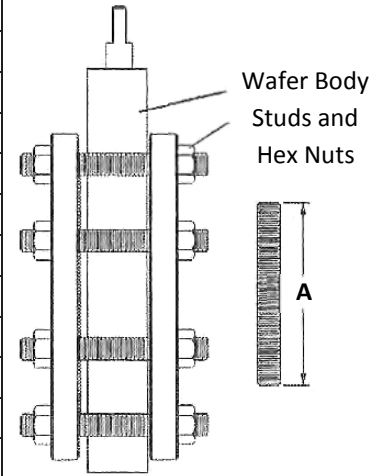


Figure 13

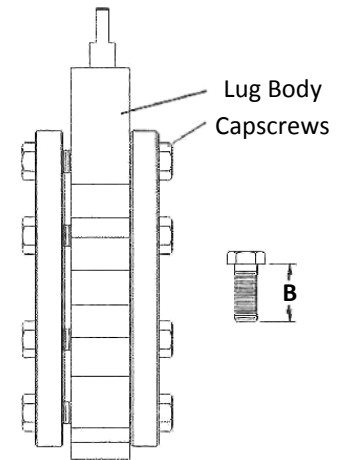


Figure 14

DISK AND PIPE CLEARANCE

Before beginning installation, note the required minimum pipe I.D. for proper disc/pipe clearance. Pipes smaller than those shown in Table 7 will require a bevel to prevent the disc edge from scraping on the pipe I.D. and causing damage to the sealing surface (Figure 15).

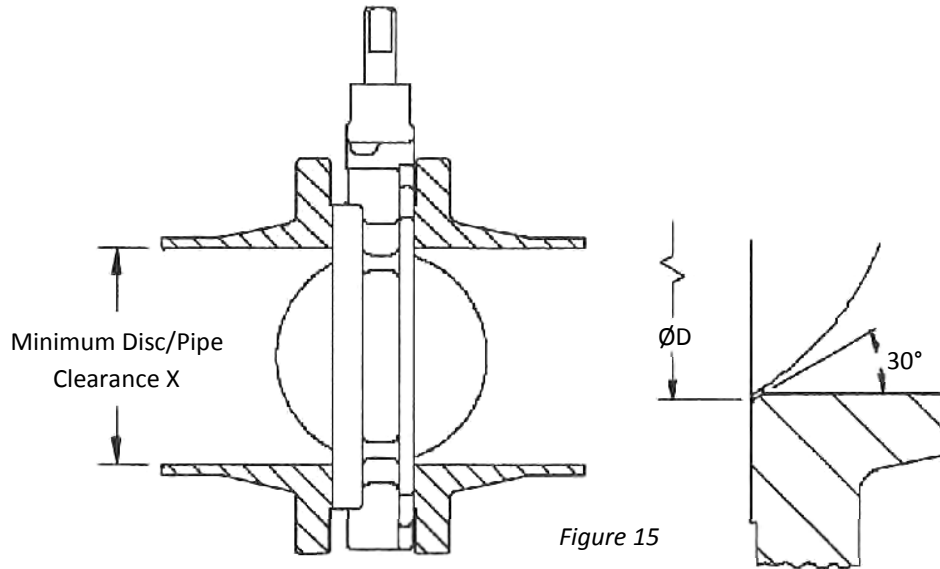


Figure 15

Table 7

Valve Size and Class	Schedule 40	Schedule 80	Minimum Pipe I.D.
2 1/2" - 150	X	X	1.69
2 1/2" - 300	X	X	1.69
3" - 150	X	X	2.63
3" - 300	X	X	2.63
4" - 150	X	X	3.65
4" - 300	X	X	3.65
5" - 150	X	X	4.61
5" - 300	X	X	4.61
6" - 150	X		5.83
6" - 300	X		5.83
8" - 150	X		7.87
8" - 300	X	X	7.65
10" - 150	X		9.85
10" - 300	X	X	9.60
12" - 150	X		11.8
12" - 300	X		11.63
14" - 150	X		12.55
14" - 300	X	X	12.4
16" - 150	X		14.45
16" - 300	X	X	14.23
18" - 150	X		16.45
18" - 300	X	X	16.05
20" - 150	X		18.12
20" - 300	X	X	17.82
24" - 150	X		21.71
24" - 300	X	X	21.5
36" - 150	X		34.12

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 3" through 6" WKM DynaCentric MB High Performance Butterfly Valves have flatted stems. The larger valves 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 16) and when the valve is open, the handle is parallel to the pipe (Figure 17).

Maximum recommended pressure differential for handle operated valves:

2 1/2"	450 psi
3"	400 psi
4"	300 psi
5"	200 psi
6"	150 psi
8"	50 psi



Figure 16

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

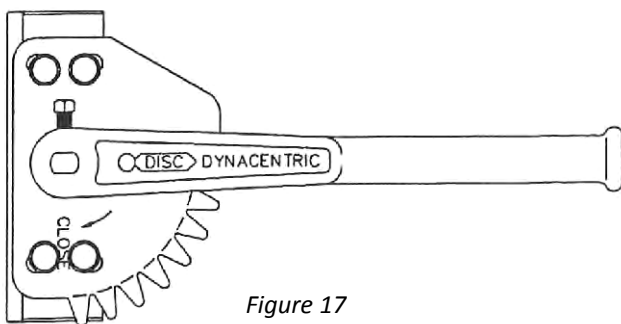


Figure 17

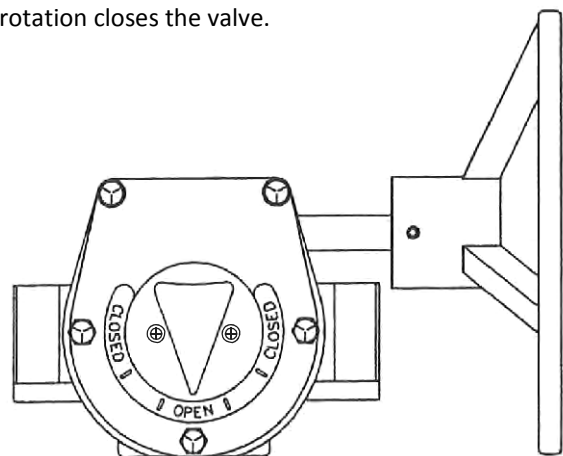


Figure 18

MAINTENANCE PROCEDURES

Because of the simple design and operation, the WKM DynaCentric MB 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.

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

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