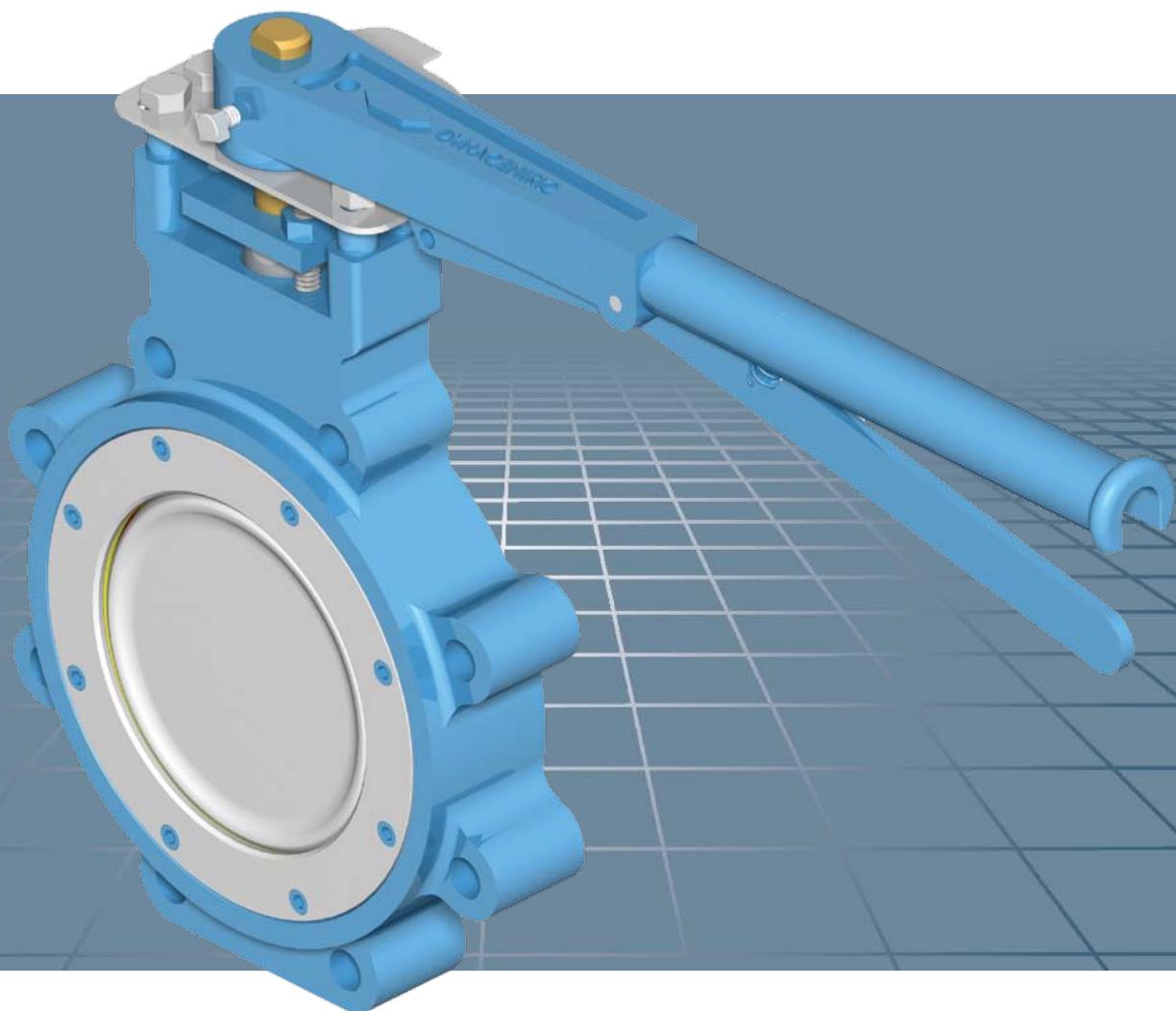


WKM® DynaCentric® High Performance Butterfly Valves



WKM®

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Oklahoma City, OK

Cameron's Valves & Measurement (V&M) group is a leading provider of valves and measurement systems to the oil and gas industry. The group's products are primarily used to control, direct and measure the flow of oil and gas as it is moved to refineries, petrochemical plants and industrial centers for processing.

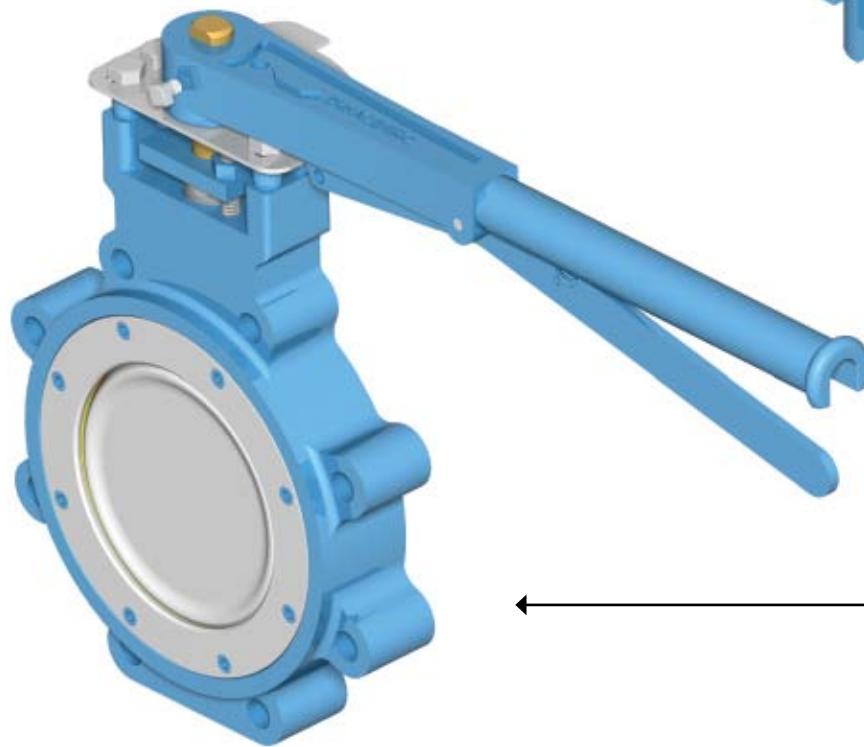
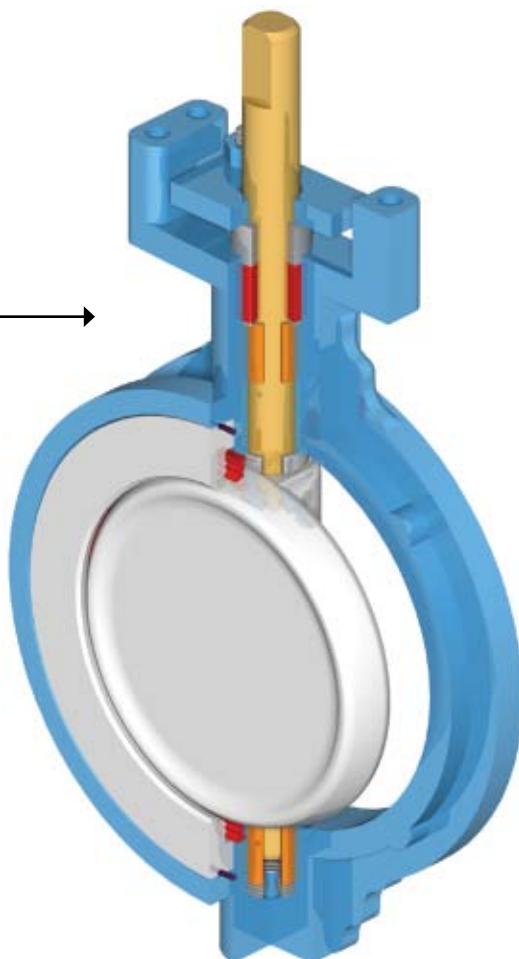
The Distributed Valves division provides valves products that are sold through distributor networks worldwide, for use in both oil and gas and industrial applications and include such widely recognized brand names as WKM®, DEMCO®, NAVCO®, NUTRON®, TEXSTEAM™, THORNHILL CRAVER®, TECHNO® and WHEATLEY®.

The WKM brand is recognized throughout the world for durable, reliable and flexible valves built for many challenging situations. The WKM product line offers a broad line of valves including ANSI gate valves, DynaSeal ball valves and Dynacentric and Series E butterfly valves, all built to exacting standards for demanding applications.

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

FEATURES AND BENEFITS

Model MB-1 (Wafer)



Model MB-1 (Lug)



WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

The DynaCentric High Performance Butterfly Valve brings low cost and light weight to high pressure water, oil, steam, gas and slurry applications.

These valves satisfy a wide range of industrial applications and are available in carbon steel or stainless steel as well as lug and wafer body styles.

DynaCentric high performance butterfly valves offer the high performance of ball and gate valves with the low-cost, lightweight benefits of a butterfly valve design.

Engineered for heavy-duty, maintenance free performance, the DynaCentric high performance butterfly valve is most commonly selected for the following applications:

- Chemical and petrochemical processing
- Utilities
- Pulp and paper
- Oil and gas production
- Fuel handling systems
- Air conditioning and refrigeration
- Marine

FEATURES AND BENEFITS

Two Body Styles

Flangeless wafer and threaded lug styles are available.

Heavy Duty Disc

Designed to withstand the higher stresses associated with high pressure applications. Wide disc edge provides greater sealing area.

Thrust Bearing / Disc Spacer

A corrosion resistant, single component thrust bearing / disc spacer reduces body wear and assures positive centering of disc in the valve bore.

Internal Stop

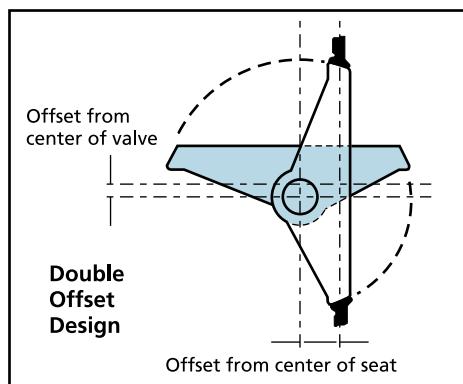
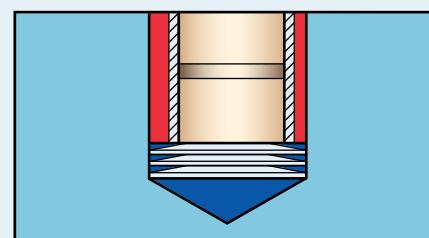
Prevents disc over-travel and seat damage caused by disc over-travel. Assures proper disc alignment in closed position.

Deep stuffing box for extended life

Deep stuffing box design includes stainless steel fasteners as standard and is available with TFE Chevron or high temperature compression packing for long life and positive stem seal. Live loaded packing assemblies available upon special request.

Lower Stem Disc Spring

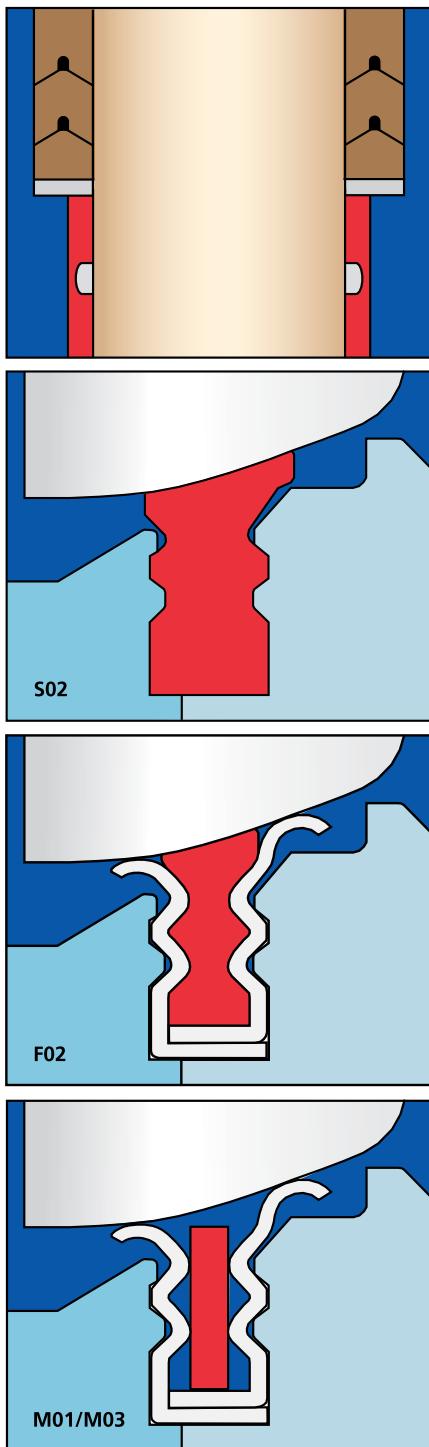
Lower stem disc springs allow for thermal expansion and provides constant grounding.



Disc Design Reduces Seat Wear

Precision machined from carbon or alloy steels, the rugged valve disc is designed for gradual engagement into seat to prevent pinching or cutting. Eccentric positioning of stem allows disc to swing free of seat in open position, reducing operating torque and wear. Special surface coatings such as Stellite overlay are available for critical or severe service conditions.

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES



Positively Retained Stem Prevents Blowouts

The tamper-proof design not only meets but exceeds the requirements of ASME B16.34. The disc, disc pins and stem design meet ASME requirements for maximum torsional and bending stress. Additional blowout prevention is provided by stem retainer pins inserted in the stem below the stuffing box.

Three Seat Designs

The standard TFM™ seat (S02) is bi-directional with an extended pressure responsive sealing lip. The S02 seat design is capable of drop tight sealing to 740 psi.

The patented fire tested, bi-directional metallic seats with TFM™ seat insert (F02) provide a metal-to-metal pressure responsive triple seal. DynaCentric high performance butterfly valves with the F02 seat design and high temperature seals have been fire tested and are qualified to meet the stringent requirements of API 607 4th edition. This unique design provides fire test capabilities regardless of flow direction. The F02 seat design is capable of drop tight sealing to 1480 psi.

DynaCentric high performance butterfly valves constructed of 316 stainless steel and assembled with the proper trims and Ni-Cr alloy (UNS 6625) seats (M03) are capable of handling temperatures to 1000° F (538° C). Metal seats of 316 SS (M01) and are suitable for temperatures to 750° F (399° C).

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES ARE READILY AUTOMATED



Specifications

See page 9 for technical specifications

Sizes

- 2 1/2 in. through 36 in. (65 mm through 900 mm)
- Working pressure ASME Class 150, 2 1/2 in. through 36 in. (65 mm through 900 mm)
- ASME class 300, 2 1/2 in. through 24 in. (65 mm through 600 mm)
- ASME class 600, 3 in. through 12 in. (80 mm through 300 mm)

Operating Temperatures

- Up to 1000° F (538° C)

Body Styles

- Flangeless Wafer, threaded lug

Standard Materials

- Body – Carbon steel, stainless steel
- Stem – 17-4 Stainless steel
- Disc – Stainless steel
- Seat – S02 - TFM™
F02 - Fire tested
M01/ M03 - Metal seat

Optional Materials

- Seat / seal trims available for hundreds of different loadings. Additional materials listed on page 9.

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

SPECIAL SERVICE VALVES

High Temperature

DynaCentric high performance butterfly valves for high temperature service are equipped with a 316 stainless steel seat (M01), 316 stainless steel stem bearings and high temperature seals.

This seat / seal combination is rated up to 750° F (399° C) in carbon steel bodies. Ni-Cr alloy (UNS 6625) seats (M03) and stainless steel bodies can be utilized up to 1000° F (538° C). Leakage rates for metal seated valves can be provided within the service limits of ASME / FCI 70-2 class V on request.

Standard leakage rate of metal seated valves is less than .005 ml / psi / NPS.

Valves furnished with this seat perform well in steam, hot oil and heat transfer fluids.

Vacuum Service

The drop-tight sealing capabilities of these valves make them an excellent selection for vacuum service.

S01, S02, and F02 seat-seal codes are suitable for vacuum service to 20 microns absolute.

Inverted packing configuration is available on request.

Sour Oil and Gas Service

DynaCentric high performance butterfly valves with sour gas trims are available for H2S service in accordance with NACE MR0175, 2002.

Low Temperature Service

DynaCentric high performance butterfly valves for temperatures to -50° F (-46° C) are available in both 316 stainless steel construction and low temperature carbon steel.

Oxygen Service

DynaCentric high performance butterfly valves provide the positive shut-off and tight sealing necessary for gaseous oxygen service. Due to the risk of explosion and fire inherent in such service, positive grounding for the disc and stem with the belleville disc springs are standard.

Positive safeguards have been established in order to conform to the requirement that valves for oxygen service must be completely free of oil, grease, combustible material, slag, metal shavings, paint, rust or various fibers.

All parts are cleaned of contaminates with solvent and inspected under black light.

After assembly and testing with nitrogen, each valve is individually tagged and sealed in a polyethylene bag.

Valves for such service may be supplied in most materials, but 316 stainless steel or Ni-Cu alloy (UNS 5500) are recommended.

Steam Service

DynaCentric high performance butterfly valves are ideally suited for applications in steam service. Reinforced TFM™ seats (S02) with high temperature packing are the standard stem service seal materials.

For higher saturation pressures, 316 stainless steel seats with TFM™ inserts (F02) are available.

The combination of rotary operation, streamlined flow and positive shut-off can result in years of maintenance free service without the seizures on cool-down, flashing or stem leakage associated with conventional globe or gate valves.

Enhanced Fugitive Emission Control

The valve stuffing box can be modified for live loaded packing assemblies.

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

STANDARDS AND COMPLIANCE

DynaCentric High Performance Butterfly valves comply with the following design and testing standards:

- ASME B16.5 (Steel pipe flanges and flange fittings)
- ASME B16.34 (Steel valves)
- ASME/FCI 70-2 (Control valve seat leakage)
- MSS-SP-6 (Standard finishes for pipe flanges)
- MSS-SP-25 (Standard marking system for valves)
- MSS-SP-55 (Quality standard for steel castings)
- MSS-SP-68
- United States Coast Guard category (A) acceptance

In addition, DynaCentric high performance butterfly valves can be supplied to comply with these standards:

- ASME B31.1 (Power piping)
- ASME B31.3 (Chemical plant and petroleum refinery piping)
- MSS-SP-61 (Pressure testing of steel valves)
- API 609, API 598 (Valve inspection and testing)
- API 607 4th Edition (Fire test specifications)
- CE PED (Pressure equipment directive) 97 / 23 / EC

DynaCentric high performance butterfly valves trimmed for sour gas service in accordance with NACE MR0175, 2002 are available in both carbon steel and alloy construction.

HOW TO ORDER

X X	A5* X X X	X X	X X X	X X	X X
Size in. (mm)	B5* X X X	Trim Group	Seal Group	Packing Group ⁴	Actuation
2 1/2 (65)	Body Group	CS Disc ⁵ 17-4 Stem	S01	TFE VEE	Bare Stem 00
3 (80)	Class 1 = 150	SS Disc 17-4 Stem	S02	TFM™	Handle HL
4 (100)	1 = CS	SS Disc Ni-Cr ⁶ Stem	F02	High Temp Graphitized	Handwheel WG
5 (125)	03	Ni-Cu ⁷ Disc & Stem	04	Grafoil	Less Gear with Flange FG
6 (150)	3 = 300	SS Disc 316 Stem ²	05	Ni-Cr ⁶ Alloy (UNS 6625) / TFM™	Chainwheel CH
8 (200)	2 = SS	316 SS	M01		
10 (250)	06	SS Disc HF-6 O/L ⁸ 17-4 Stem	06	Ni-Cr ⁶ Alloy (UNS 6625)	
12 (300)	10	SS Disc HF-6 O/L ⁸	07		
14 (350)	12	CS/QPQ Disc 17-4 Stem	08		
16 (400)	14	SS/QPQ Disc 17-4 Stem	09		
18 (450)	16	CS/QPQ Disc Ni-Cr ⁶ Stem	10		
20 (500)	18	SS/QPQ Disc Ni-Cr ⁶ Stem	11		
24 (600)	20	CS/QPQ Disc 17-4/QPQ Stem	12		
30 (750)	24	CS/QPQ Disc 316/QPQ Stem	13		
36 (900)	30				
	3 = CS2 ¹				
		3 = Lug Model B Bolted Seat Retainer			
		3 = Lug Model A Bolted Seat Retainer			
		4 = CS/ENC			
		5 = LCC			

* MODEL / SIZE AVAILABILITY:

Model B 2 1/2 in. and 5 in. (65 mm and 125 mm)

class 150 and class 300 lug

4 in. and 6 in. (100 mm and 150 mm)

through 24 in. (600 mm) class 150 and class

300 lug and wafer

3 in. (80 mm) class 150, class 300 and class

600 lug and wafer 36 in. (900 mm) class 150 lug

Model A 4 in. and 6 in. (100 mm and 150 mm) through 12 in. (300 mm)

class 600 lug and wafer 30 in. (750 mm) class 150 lug

lug

¹ Controlled hardness carbon steel (H2S service).

² Valves equipped with 316 SS stems may require derating depending on size and class. See page 13 for actual valve ratings.

Model Numbers

MA-1 / MB-1 Standard HPBFV Assembly

MA-2 / MB-2 Standard HPBFV Assembly with MTR's

MA-3 / MB-3 CE compliant HPBFV Assembly

³ Standard seat for class 600 valves.

⁴ Stainless steel packing adjustment studs and nuts are standard.

⁵ Carbon steel discs 14 in. (350 mm) & larger - consult factory.

⁶ Reference Inconel.

⁷ Reference Monel.

⁸ Reference Stellite overlay.

NOTE: Other materials of construction and valve options are available on application.

****** Wafer valves 2 1/2 in. - 12 in. (65 mm - 300 mm) come standard with an unbolted inset seat retainer, held firmly in place for shipping and handling by an interference fit O-ring retention design (see page 10). By design, the seat retainer is secured in place by the piping flange during normal installation procedure.

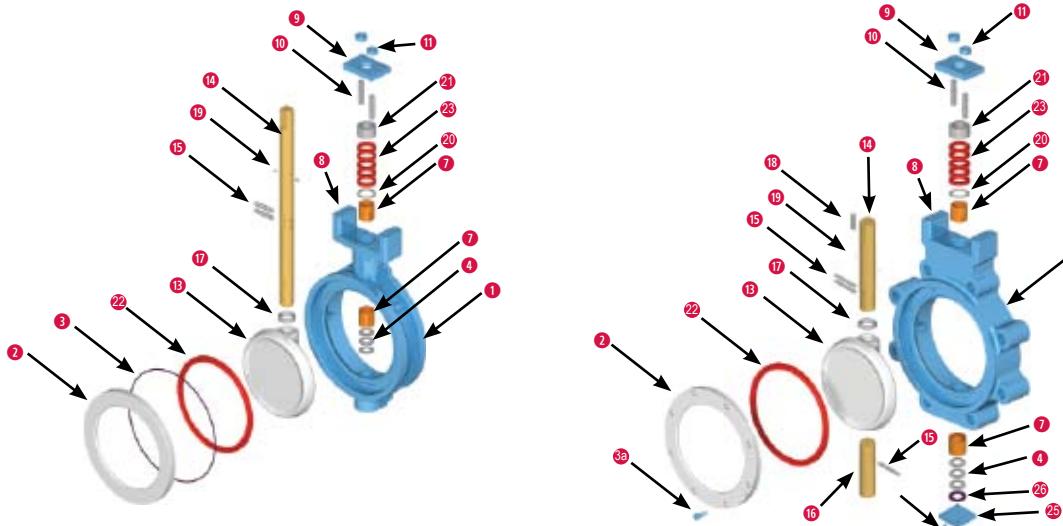
WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

MB-1 DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

2 1/2 in. through 24 in. (65 mm through 600 mm) ASME CLASSES 150 & 300

3 in. (80 mm) ASME CLASS 600, 36 in. (900 mm) ASME CLASS 150

Material List



Body Group Trim Number

No.	PART	CARBON STEEL	STAINLESS STEEL	CARBON STEEL (H_2S)
1	Body	A216 Gr. WCC	A351 Gr. CF8M	A216 Gr. WCC RC-22
2	Seat Retainer	A516 Gr. 70	A276 Type 316	A516 Gr. 70 RC-22
3	Seat Retainer O-Ring		Nitrile	
3a	Seat Retainer Screw	A193 Gr. B7	18-8 SS	18-8 SS
4	Stem/Disc Spring		18-8 SS	
7	Stem Bearing	TFE/Steel	Teflon/316 SS	Teflon/316 SS
8	Nameplate		18-8 SS	
9	Gland Retainer	Carbon Steel	Stainless Steel	Carbon Steel
10	Gland Retainer Stud		18-8 SS	
11	Gland Retainer Nut		18-8 SS	
■25	Bottom Cover	Carbon Steel	Stainless Steel	Carbon Steel RC-22
■26	Bottom Cover Gasket		Composite Fiber	
■27	Bottom Cover Screw	A193 Gr. B7	18-8 SS	A193 Gr. B7

Internal Group Trim Number

13	Disc	A351 Gr. CF8M*
▲14	Upper Stem	A564 Type 630, H1150 + H1150
15	Stem Pins	A564 Type 630, H1150 + H1150
▲16	Lower Stem	A564 Type 630, H1150 + H1150
17	Disc Spacer	316 SS
18	Stem Key (8 in. (200 mm) and larger)	Carbon Steel
19	Stem Retainer Pins	316 SS
20	Packing Spacer	316 SS
21	Gland Ring	316 SS

Seal Group Trim Code (Note Pressure Classes)

22	Seat	See Note (1)
23	Packing Set	TFE VEE, High Temperature, Graphitized or Grafoil

NOTE (1) Seat assemblies consist of the following:

TYPE S - Class 150 - Virgin TFE (available in class 150 only) Standard class 150 and 300 - TFM™

TYPE F - Metal, fire tested, class 150, 300 and 600 - Stainless steel with TFM™ Insert - STD Seat for all class 600 valves

TYPE M - Metal, high temperature, class 150, 300 and 600 - 316 Stainless steel with 316 Stainless steel insert

* Hard chrome plated on F02, M01 and M03

One-piece stem 2 1/2 in. (65 mm) through 12 in. (300 mm) class 300

▲ Two-piece stem 12 in. (300 mm) class 600 through 36 in. (900 mm) class 150

■ 10 in. (250 mm) class 300, 12 in. (300 mm) class 150 and 300, 14 in. (350 mm) - 36 in. (900 mm) class 150

TYPICAL VALVE CONSTRUCTION SHOWN - SOME SIZES MAY VARY

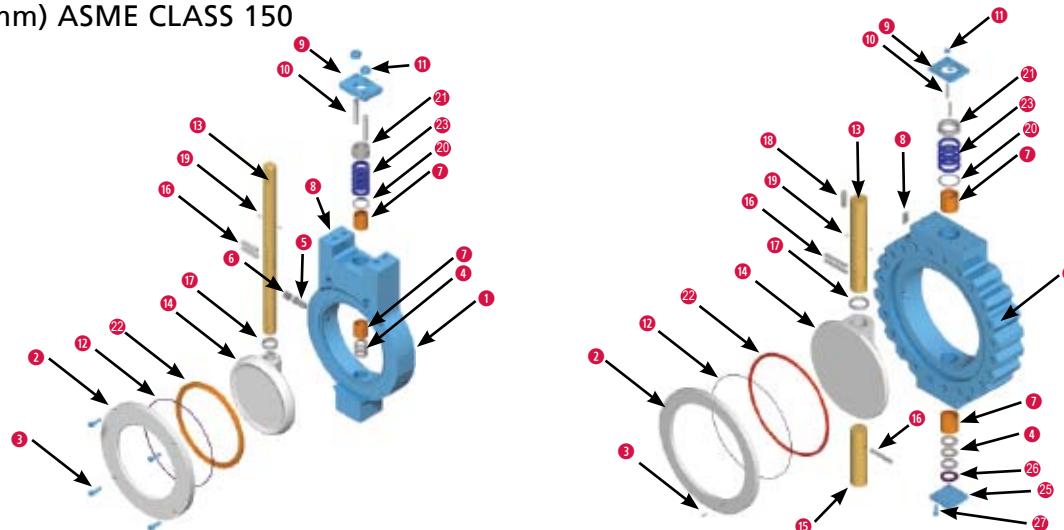
WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

MA-1 DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

4 in., 6 in., 8 in., 10 in., 12 in. (100 mm, 150 mm, 200 mm, 250 mm, 300 mm) ASME CLASS 600

30 in. (750 mm) ASME CLASS 150

Material List



Body Group Trim Number

No.	PART	CARBON STEEL	STAINLESS STEEL	CARBON STEEL (H ₂)
1	Body	A216 Gr. WCC	A351 Gr. CF8M	A216 Gr. WCC RC-22
2	Seat Retainer	A516 Gr. 70	A276 Type 316	A516 Gr. 70 RC-22
3	Seat Retainer Screw	A193 Gr. B7	18-8 SS	18-8 SS
4	Stem/Disc Spring		18-8 SS	
5	Stop Pin (4 in. (100 mm) through 10 in. (250 mm) only)		316 SS	
6	Stop Pin Plug (4 in. (100 mm) through 10 in. (250 mm) only)	Carbon Steel	316 SS	316 SS
7	Stem Bearing	TFE/Steel	Teflon/316 SS	Teflon/316 SS
8	Nameplate		18-8 SS	
9	Gland Retainer	Carbon Steel	Stainless Steel	Carbon Steel
10	Gland Retainer Stud		18-8 SS	
11	Gland Retainer Nut		18-8 SS	
12	Body Gasket		See Note (2)	
■25	Bottom Cover Plate	Carbon Steel	Stainless Steel	Carbon Steel RC-22
■26	Bottom Cover Gasket		Composite Fiber	
■27	Bottom Cover Screw	A193 Gr. B7	18-8 SS	A193 Gr. B7

Internal Group Trim Number

▲13	Upper Stem	A564 Type 630, H1150 + H1150
14	Disc	A216 Gr. WCC** A351 Gr. CF8M*
▲15	Lower Stem	A351 Gr. CF8M*
16	Stem Pins	A564 Type 630, H1150 + H1150
17	Disc Spacer	A564 Type 630, H1150 + H1150
18	Stem Key (6 in. (150 mm) and larger)	316 SS
19	Stem Retainer Pins	Carbon Steel
20	Packing Spacer	316 SS
21	Gland Ring	316 SS

Seal Group Trim Code (Note Pressure Classes)

22	Seat	See Note (1)
23	Packing Set	TFE VEE, High Temperature, Graphitized or Grafoil

NOTE (1) Seat assemblies consist of the following:

TYPE S - Class 150 only - Virgin TFE, class 150 and 300 - TFM™

TYPE F - Metal, fire tested, class 150, 300 and 600 - Stainless steel with TFM™ Insert - STD seat for all class 600 valves

TYPE M - Metal, high temperature, class 150, 300 and 600 - 316 Stainless steel with 316 Stainless steel insert

NOTE (2) Standard valves do not require body gaskets. F02 fire tested, fire safe and high temperature, M01/M03 valves are equipped with composite fiber body gaskets.

* Hard chrome plated on F02, M01 and M03

** Electroless Nickel plated 14 in. through 30 in. (350 mm through 750 mm)

▲ One-piece stem 2 1/2 in. (65 mm) through 12 in. (300 mm) class 300. Two-piece stem 12 in. (300 mm) class 600 through 36 in. (900 mm) class 150

■ 8 in. (200 mm), 10 in. (250 mm), 12 in. (300 mm) class 600, 30 in. (750 mm) class 150

TYPICAL VALVE CONSTRUCTION SHOWN - SOME SIZES MAY VARY

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

SEAT SEAL MATERIAL CODES AND RATINGS

Material Codes

This chart is an abbreviated guide to the chemical resistance and pressure temperature limitations of seat seal materials used in DynaCentric high performance butterfly valves.

Complete ratings curves are shown below.
For additional information, please consult your
DynaCentric representative or the factory.

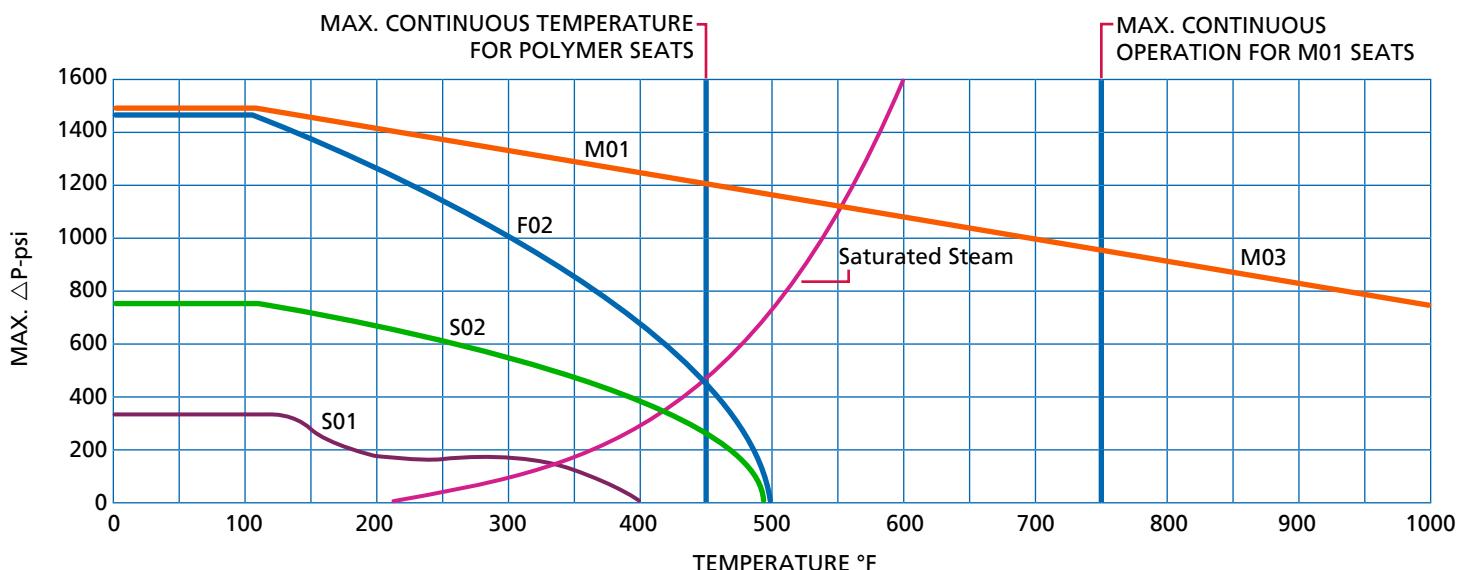
SEAL CODE	SEAT MATERIAL	ASME/FCI 70-2 SHUTOFF CLASS	SERVICE APPLICATION
S01	TFE	6 (VI)	Seats are virgin TFE. Use where lading contamination from glass or other fillers is not desirable, such as in food service. Available in class 150 valves only. Temperature range is -50° F to 400° F (-46° C to 204° C). Drop tight.
S02	TFM™	6 (VI)	Seat material is TFM™ with inert materials for use at elevated temperatures and pressures. Same chemical resistance as Virgin TFE except slightly affected by hot alkaline solutions. Suitable for saturated steam to 200 psig.** Temperature range is -50° F to 500° F (-46° C to 260° C). Drop tight.
F02	SS / TFM™	6 (VI)	Seat consists of stainless steel rings with a TFM™ insert. Recommended trim for fire test applications and for higher pressure steam service.** Temperature is -50° F to 500° F (-46° C to 260° C). Drop tight.
F03	Ni-Cr Alloy (UNS 6625) / TFM™	6 (VI)	Seat consists of Ni-Cr alloy (UNS 6625) with a TFM™ insert. Recommended trim for fire test applications and for higher pressure steam service.** Temperature range is -50° F to 500° F (-46° C to 260° C). Drop tight.
M01	316 SS	*	Recommended trim for superheated steam above 250 psi, hot oils and gases and temperatures to 750° F (399° C). Pressure / temperature range is same as body rating. Meets ASME/FCI 70-2.
M03	Ni-Cr Alloy (UNS 6625)	*	Same as M01 but for temperatures from 750° F to 1000° F (399° C to 538° C).

* Standard leakage rate of metal seated valves is less than .005 ml / psi / NPS. Class V Shut-Off can be furnished on request.

** Consult factory for steam applications with higher pressure.

SEAT PRESSURE / TEMPERATURE LIMITATIONS

Seat ratings are based on differential pressures with the disc in the FULLY CLOSED position and refer to seat only.
Body pressure / temperature ratings appear on page 13.



WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

VALVE BODY PRESSURE RATINGS

Pressure / Temperature Ratings For Dynacentric
Valves Bodies* All pressures are PSIG

TEMP °F	CLASS 150			CLASS 300			CLASS 600		
	CS	LCC	316 SS	CS	LCC	316 SS	CS	LCC	316 SS
■ -20 to 100	285	290	275	740	750	720	1480	1500	1440
■ 200	260	260	235	675	750	620	1350	1500	1240
■ 300	230	230	215	655	730	560	1315	1455	1120
■ 400	200	200	195	635	705	515	1270	1410	1025
■ 500	170	170	170	600	665	480	1200	1330	955
■ 600	140	140	140	550	605	450	1095	1210	900
■ 650	125	125	125	535	590	445	1075	1175	890
▲ 700	110	—	110	535	—	430	1065	—	870
▲ 750	95	—	95	505	—	425	1010	—	855
▲ 800	80	—	80	410	—	420	825	—	845
▲ 850	—	—	65	—	—	420	—	—	835
▲ 900	—	—	50	—	—	415	—	—	830
▲ 950	—	—	35	—	—	385	—	—	775
▲ 1000	—	—	20	—	—	350	—	—	700

* In accordance with ASME B16.34

Ratings shown above are maximum working pressure ratings for the valve body at various temperatures. Partial pressure limitations according to actual service conditions are determined by seat, trim and packing ratings.

Following are recommended temperatures limits for standard materials available in WKM DynaCentric high performance butterfly valves.

SEAL GROUP	
S01-TFE	350° F (400° F intermittent)
S02-TFM™	450° F (500° F intermittent)
F02-SS / TFM™	450° F (500° F intermittent)
F03-Ni-Cr / TFM™	450° F (500° F intermittent)
M01-316 SS	750° F
M03-Ni-Cr	1000° F

TRIM GROUP	
01-Cs Disc/17-4 Stem	650° F
02-SS Disc/17-4 Stem	650° F
03-SS Disc/Ni-Cr Stem	700° F
04-Ni-Cu Disc/Ni-Cu Stem	750° F
05-SS Disc/316 Stem	700° F
06-SS Disc HF-6/17-4 Stem	650° F
07-SS Disc HF-6/Ni-Cr Stem	1000° F

NOTE: Cold working pressures for DynaCentric butterfly valves with 316 SS stems are derated per table to the right. These derated pressures are based on torque with FO / MO seats downstream. Ni-Cr stems are available for those applications requiring higher working pressure with maximum corrosion resistance.

PACKING GROUP		
11 - TFE "V"	450° F	
13 - High Temp Graphitized	700° F	
14- Grafoil	1000° F	

Stem Materials:

- ASTM A564 Type 630, H1150 + H1150, Ni-Cr Alloy UNS 7718, or Ni-Cu alloy UNS 5500.
- ▲ Ni-Cr Alloy UNS 7718 or Ni-Cu alloy UNS 5500.

NOTE: Valve with 17-4 PH stems are only recommended up to a maximum temperature of 650° F (343° C).

Ni-Cr alloy UNS 7718 stems are required for temperatures above 650° F (343° C).

Ni-Cu alloy UNS 5500 stems can be furnished for applications requiring high corrosion resistance and full ASME ratings.

Body Materials:

Carbon steel - ASTM A516 Gr. 70, ASTM A216 Gr. WCB
Low temperature CS- ASTM A352 Gr. LCC
Stainless steel - ASTM A351 Gr. CF8M

NOTE: Carbon steel listed is not recommended for prolonged usage above 800° F (427° C).

Maximum shut-off pressures for DynaCentric valves with 316 SS Stems (CWP)

Size in.	ΔP MAX - 316 SS STEMS		
	Class 150	Class 300	Class 600
2 1/2	285	740	—
3	285	740	650
4	285	285	650
5	285	720	—
6	285	400	650
8	285	450	650
10	180	500	650
12	250	740	650
14	200	740	—
16	285	740	—
18	285	740	—
20	285	740	—
24	285	740	—
30	285	—	—
36	285	—	—

* For trim group 08 through 13 consult factory for temperature limitations.

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

VALVE SIZING FORMULAS

Proper valve selection is dependent on several factors for both liquid and gas flow, as well as the physical limitations of the valve as established by the manufacturer.

The following information is presented for handy and quick reference. The flow coefficient (C_v) is the most universally accepted measure of a valve's capacity to handle flow.

For Liquid Service:

$$C_v = Q_L \sqrt{\frac{S_G}{\Delta P}}$$

$$Q_L = C_v \sqrt{\frac{\Delta P}{S_G}}$$

$$\Delta P = S_G \left(\frac{Q_L}{C_v} \right)^2$$

For Steam Service (Superheated):

$$C_v = \frac{W (1 + 0.0007 T_s)}{2.1 \sqrt{\Delta P (P_1 + P_2)}}$$

$$W = \frac{2.1 C_v \sqrt{\Delta P (P_1 + P_2)}}{(1 + 0.0007 T_s)}$$

Cavitation

DynaCentric high performance butterfly valves, because of their inherently high flow capacities, have a greater tendency to cavitate at high pressure drops.

Cavitation occurs in liquids if the static pressure of the flowing liquid decreases to a value less than the fluid under pressure. This phenomenon can create accelerated wear and deterioration of valves and piping as well noise and vibration problems.

To avoid cavitation in piping, the following formula should be employed:

$$\Delta P_{max} = 0.33 (P_1 - P_2)$$

This formula can also be safely used where reducers are employed.

NOTE: Valve sizing program available at www.c-a-m.com under Transact Cameron Commerce.

A dimensionless entity, C_v is defined as the number of gallons per minute of water at standard conditions (60° F (16° C) and 14.7 psia) which will flow through a given flow restriction with a pressure drop of 1 psi.

Once determined, the C_v of a valve provides a capacity index by which one is able to readily estimate the required size of a flow restriction for controlling the fluid flow of any system.

For Gas Service:

$$C_v = \frac{Q_G}{1360} \sqrt{\frac{S_G T_R}{\Delta P \times P_1}}$$

$$Q_G = 1360 C_v \sqrt{\frac{\Delta P \times P_1}{S_G T_R}}$$

$$\Delta P = \frac{S_G T_R}{P_1} \left(\frac{Q_G}{1360 C_v} \right)^2$$

For Steam Service (Saturated):

$$C_v = \frac{W}{2.1 \sqrt{\Delta P (P_1 + P_2)}}$$

$$W = 2.1 C_v \sqrt{\Delta P (P_1 + P_2)}$$

Where:

C_v	= valve flow coefficient
P_1	= upstream pressure, psia
P_2	= downstream pressure, psia
ΔP	= pressure drop $P_1 - P_2$, psi
Q_G	= gas flow rate, SCFH
Q_L	= liquid flow rate, U.S. gpm
S_G	= specific gravity of fluid
T_R	= temperature, °R (460 + °F)
T_s	= steam superheat, °F
W	= flow rate, lbs / hr
P_v	= vapor pressure, psia

These formulas are generally accurate for gas flow where $\Delta P \leq .1P_1$. For $\Delta P > .1P_1$, consult factory for assistance in sizing.

Reducers

When valves are mounted between pipe reducers, a loss in valve capacity occurs with an additional pressure drop across the system due to contractions and sudden enlargements. This arrangement is often employed with DynaCentric high performance butterfly valves where the desired C_v for the control valve results in a valve size that is smaller than the line size.

Use the following equation to obtain the corrected flow coefficients for the DynaCentric high performance butterfly valve when installed in combination with reducers.

$$R = \frac{1}{\sqrt{1 + \frac{1.5 \left(1 - \frac{d^2}{D^2}\right)^2}{890} \left(\frac{C_v}{d^2}\right)^2}} C_{vR} = C_v R$$

Where:

C_v	= sizing coefficient determined by standard calculations
d	= nominal valve size, inches
D	= line size, inches
C_{vR}	= corrected flow coefficient for valve between reducers

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

FLOW CHARACTERISTICS (C_v)

The practical control range of this type of valve occurs where continuous throttling can be effected without significant loss of accuracy or valve life.

The usable range for DynaCentric high performance butterfly valves is between 20° and 70° opening, resulting in a ratio of 10:1.

In sizing the DynaCentric high performance butterfly valve for throttling applications, a full open CV should be selected that is approximately 1.8 times the CV determined from calculations.

Under normal flow conditions, this selection will provide a valve opening of 50°-60°.

CV values equal the flow of water in U.S. gallons per minute per 1 psi pressure drop.

Series 5100 Class 150

VALVE SIZE		DISC ANGLE, DEGREES OPEN							
in.	(mm)	20	30	40	50	60	70	80	90
2 1/2	(65)	8	17	31	46	66	82	97	103
3	(80)	14	31	54	81	115	144	169	180
4	(100)	31	66	117	176	250	312	367	400
5	(125)	54	114	201	302	429	536	630	670
6	(150)	85	180	317	476	677	846	995	1058
8	(200)	174	371	654	981	1395	1744	2049	2180
10	(250)	300	638	1125	1688	2401	3001	3526	3751
12	(300)	440	936	1651	2477	3523	4403	5174	5504
14	(350)	523	1110	1959	2939	4180	5225	6139	6531
16	(400)	659	1401	2473	3709	5276	6594	7748	8243
18	(450)	886	1883	3323	4985	7089	8862	10412	11077
20	(500)	1066	2266	3998	5998	8530	10662	12528	13328
24	(600)	1554	3302	5828	8741	12432	15540	18260	19425
30	(750)	2752	5848	10320	15480	22016	27520	32336	34400
36	(900)	3963	8421	14861	22291	31703	39629	46564	49536

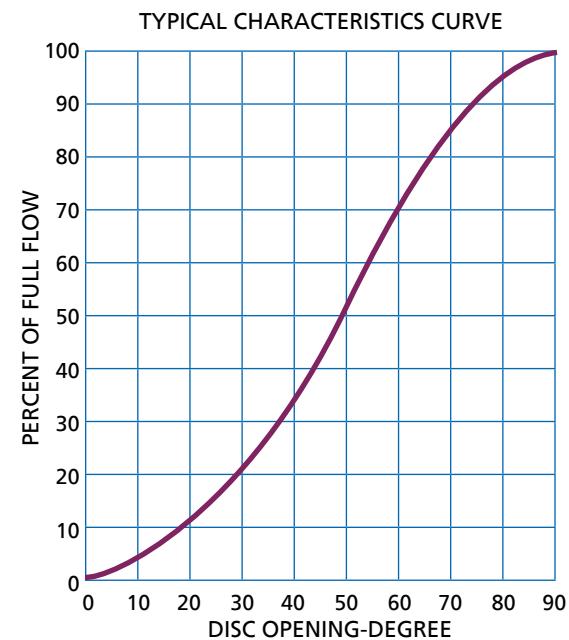
Series 5300 Class 300

VALVE SIZE		DISC ANGLE, DEGREES OPEN							
in.	(mm)	20	30	40	50	60	70	80	90
2 1/2	(65)	8	17	31	46	66	82	97	103
3	(80)	14	31	54	81	115	144	169	180
4	(100)	31	66	117	176	250	312	367	400
5	(125)	54	114	201	302	429	536	630	670
6	(150)	85	180	317	476	677	846	995	1058
8	(200)	174	371	654	981	1395	1744	2049	2180
10	(250)	268	570	1005	1508	2145	2681	3150	3351
12	(300)	399	849	1498	2247	3196	3995	4693	4993
14	(350)	428	910	1606	2409	3426	4282	5032	5353
16	(400)	609	1295	2285	3428	4876	6094	7161	7618
18	(450)	848	1730	2983	4504	6303	7594	8379	8855
20	(500)	906	1926	3378	5098	7250	9062	10648	11328
24	(600)	1290	2629	4534	6847	9580	11542	12738	15520

Series 5600 Class 600

VALVE SIZE		DISC ANGLE, DEGREES OPEN							
in.	(mm)	20	30	40	50	60	70	80	90
3	(80)	14	31	54	81	115	144	169	180
4	(100)	23	50	88	132	188	234	275	293
6	(150)	67	141	249	374	532	665	781	831
8	(200)	155	330	583	874	1243	1554	1826	1942
10	(250)	241	512	904	1356	1929	2411	2833	3014
12	(300)	336	714	1260	1890	2688	3360	3948	4200

NOTE: Valve sizing program available at www.c-a-m.com under Transact Cameron Commerce.

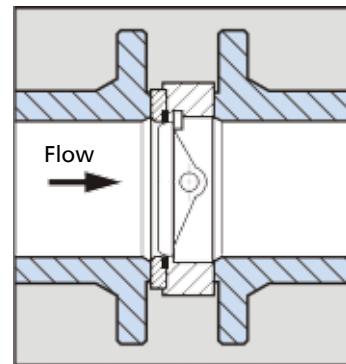


WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

TORQUE VALUES

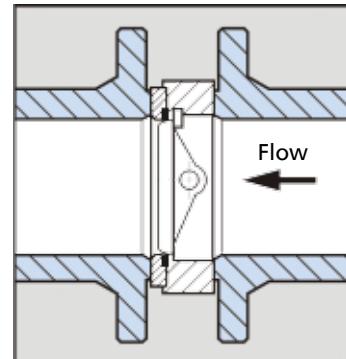
The torque values shown in these tables are net required operating torques for actuator sizing.

An appropriate safety factor is included for normal wet operating torque.



50 Seats Upstream - Valve Torque (in. lb.)

Size in. (mm)	2 1/2 (65)	3 (80)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)	30 (750)	36 (900)
0-50 psi	111	155	348	503	728	1125	2154	3291	4277	6334	8129	11685	15770	23040	36030
100 psi	136	190	395	583	860	1290	2430	3790	5050	7469	9533	13556	18540	26980	44450
200 psi	179	250	490	737	1110	1600	2990	4790	6610	9740	12340	17297	24080	35390	61520
285 psi	214	300	570	871	1330	1900	3460	5640	7930	11670	14276	20477	28790	43200	75000
300 psi	225	315	590	899	1370	1950	3550	5790	8160	12010	15147	21038	29620	—	—
400 psi	271	380	680	1053	1630	2280	4100	6800	9720	14281	17955	24780	35160	—	—
500 psi	318	445	780	1205	1880	2610	4660	7800	11270	16551	20762	28521	40700	—	—
600 psi	364	510	875	1368	2140	2940	5220	8800	12820	18821	23570	32262	46240	—	—
700 psi	411	575	970	1526	2400	3270	5780	9800	14380	21092	26377	36003	51780	—	—
740 psi	429	600	1020	1597	2500	3400	6000	10200	15000	22000	27500	37500	54000	—	—



50 Seats Downstream - Valve Torque (in. lb.)

Size in. (mm)	2 1/2 (65)	3 (80)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)	30 (750)	36 (900)
0-50 psi	111	155	348	503	728	1125	2154	3291	4277	6334	8129	11685	15770	23040	36030
100 psi	143	200	419	618	911	1364	2563	4013	5380	7947	10131	14371	19714	30000	46580
200 psi	208	291	561	846	1276	1841	3381	5458	7586	11174	14134	19743	27603	43820	70000
285 psi	263	368	681	1040	1587	2247	4077	6686	9462	13917	17536	24309	34308	55980	90000
300 psi	272	381	702	1074	1642	2319	4200	6903	9793	14401	18137	25114	35491	—	—
400 psi	337	472	844	1302	2007	2796	5018	8348	11999	17628	22140	30486	43379	—	—
500 psi	402	563	986	1530	2373	3274	5836	9793	14205	20855	26143	35858	51268	—	—
600 psi	466	653	1128	1757	2738	3751	6654	11237	16411	24082	30146	41230	59156	—	—
700 psi	531	744	1269	1985	3104	4229	7473	12682	18618	27309	34149	46601	67045	—	—
740 psi	557	780	1326	2076	3250	4420	7800	13260	19500	28800	35750	48750	70200	—	—

For severe service, additional safety factor should be added:

Dry gas or slurry..... 1.25 Low temperature..... 1.20
Emergency shutdown..... 1.60

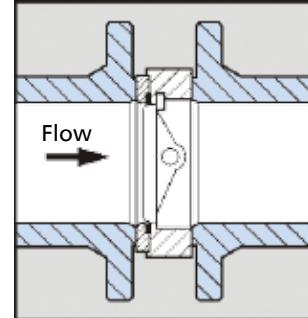
WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

TORQUE VALUES

The torque values shown in these tables are net required operating torques for actuator sizing. An appropriate safety factor is included for normal wet operating torque.

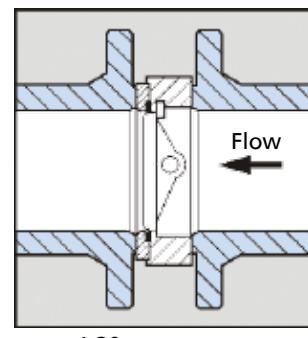
F0 / M0 Seats Upstream - Valve Torque (in. lb.)

Size in. (mm)	2 1/2 (65)	3 (80)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)	30 (750)	36 (900)
0-50 psi	238	333	609	920	1389	2710	4422	6547	7728	9709	13116	18395	25623	36600	53610
100 psi	261	366	694	1046	1578	3050	5043	7595	8956	11218	15432	21289	29746	42805	62660
200 psi	308	431	863	1300	1957	3729	6286	9689	11412	14235	20063	27079	37991	55130	78620
285 psi	348	487	1006	1514	2278	4307	7343	11470	13500	16800	24000	32000	45000	64980	90000
300 psi	355	497	1032	1552	2335	4409	7531	11784	13868	17253	24695	32868	46237		
400 psi	401	562	1201	1805	2714	5089	8773	13878	16325	20270	29326	38658	54482		
500 psi	449	628	1370	2058	3092	5769	10016	15973	18781	23288	33958	44447	62728		
600 psi	495	693	1539	2311	3470	6448	11259	18068	21237	26305	38589	50237	70974		
700 psi	542	759	1707	2563	3849	7128	12503	20162	23693	29323	43221	56026	79219		
740 psi	561	785	1775	2665	4000	7400	13000	21000	24675	30530	48074	58342	82518		
800 psi	589	824	1876	2816	4227	7808	13746	22257							
900 psi	636	890	2045	3069	4605	8488	14989	24351							
1000 psi	682	955	2214	3322	4984	9167	16232	26446							
1100 psi	729	1021	2383	3575	5382	9847	17476	28541							
1200 psi	776	1086	2552	3828	5741	10527	18719	30635							
1300 psi	823	1152	2721	4080	6119	11206	19962	32730							
1400 psi	870	1218	2890	4333	6497	11886	21205	34824							
1480 psi	907	1270	3025	4535	6800	12430	22200	36500							



F0 / M0 Seats Downstream - Valve Torque (in. lb.)

Size in. (mm)	2 1/2 (65)	3 (80)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)	30 (750)	36 (900)
0-50 psi	238	333	609	920	1389	2710	4422	6547	7728	9709	13116	18395	25623	36600	53610
100 psi	274	383	733	1105	1665	3211	5326	8051	9314	11660	16085	22135	30942	45080	66020
200 psi	344	482	979	1474	2218	4212	7134	11059	12485	15562	22023	29616	41579	61750	91710
285 psi	405	567	1188	1787	2687	5063	8672	13615	15181	18880	27070	35974	50621	75000	115000
300 psi	416	582	1225	1842	2770	5214	8943	14066	15656	19465	27961	37096	52216		
400 psi	487	682	1471	2211	3322	6215	10751	17074	18828	23367	33899	44577	62854		
500 psi	558	781	1717	2579	3875	7216	12560	20082	21999	27270	39837	52057	73491		
600 psi	629	881	1963	2948	4427	8218	14368	23089	25171	31172	45775	59538	84129		
700 psi	701	981	2209	3316	4979	9219	16177	26097	28342	35075	51713	67018	94766		
740 psi	729	1021	2308	3464	5200	9620	16900	27300	29611	36636	54088	70011	99021		
800 psi	771	1080	2455	3685	5531	10221	17985	29105							
900 psi	843	1180	2701	4054	6084	11222	19794	32112							
1000 psi	914	1280	2947	4422	6636	12224	21602	35120							
1100 psi	985	1379	3193	4791	7188	13225	23410	38127							
1200 psi	1056	1479	3440	5160	7741	14227	25219	41135							
1300 psi	1128	1579	3686	5529	8293	15228	27027	44143							
1400 psi	1199	1678	3932	5897	8845	16230	28836	47150							
1480 psi	1256	1758	4129	6192	9287	17031	30283	49557							

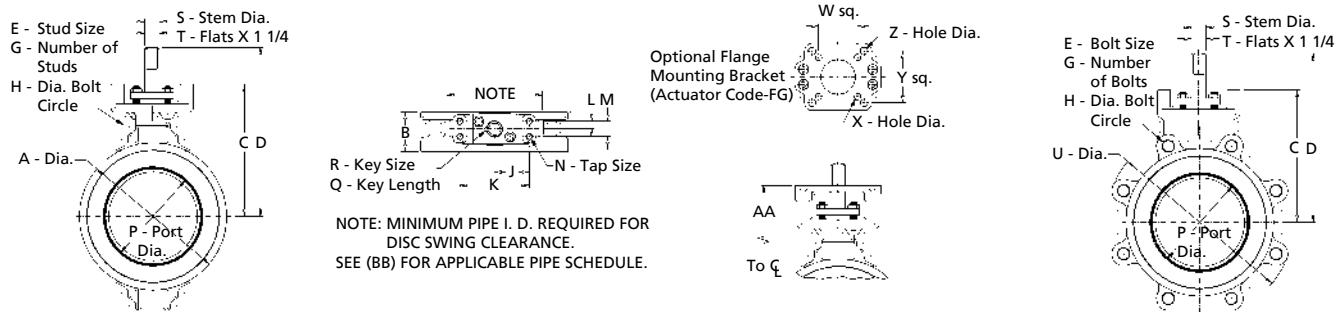


For Severe service, additional safety factor should be added:

Dry gas or slurry.....	1.25	High temperature 600° F - 700° F (316° C - 371° C).....	1.30
Emergency shutdown.....	1.60	Extended high temp. 750° F - 1000° F (399° C - 538° C).....	1.50
Low temperature	1.20		

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

DIMENSIONAL DATA



Series B5300, Class 300, 740 psi CWP*

in. (mm)	A	B	C	D	E	F	G**	H	J	K	L	M	N	P
2 1/2 (65)	4.13 (105)	1.87 (48)	5.81 (148)	7.94 (202)	3/4-10	3/4	8	5.58 (142)	2.00 (51)	4.00 (102)	0.44 (11)	0.88 (22)	3/8-16	2.09 (53)
3 (80)	5.00 (127)	2.00 (51)	5.50 (140)	7.63 (194)	3/4-10	3/4	8	6.63 (168)	2.00 (51)	4.00 (102)	0.44 (11)	0.88 (22)	3/8-16	2.62 (53)
4 (100)	6.19 (157)	2.12 (54)	6.38 (162)	8.50 (216)	3/4-10	3/4	8	7.88 (200)	2.00 (51)	4.00 (102)	0.44 (11)	0.88 (22)	3/8-16	3.63 (92)
5 (125)	7.31 (186)	2.25 (57)	7.50 (191)	9.63 (245)	3/4-10	3/4	8	9.25 (235)	2.00 (51)	4.00 (102)	0.44 (11)	0.88 (22)	3/8-16	4.50 (114)
6 (150)	8.50 (216)	2.28 (58)	7.63 (194)	9.75 (248)	3/4-10	3/4	12	10.63 (270)	2.00 (51)	4.00 (102)	0.44 (11)	0.88 (22)	3/8-16	5.62 (143)
8 (200)	10.62 (270)	2.88 (73)	8.88 (226)	11.58 (294)	7/8-9	7/8	12	13.00 (330)	2.13 (54)	4.25 (108)	0.63 (16)	1.25 (32)	3/8-16	7.61 (193)
10 (250)	12.75 (324)	3.25 (83)	10.88 (276)	14.41 (366)	1 1/8	1	16	15.25 (387)	2.75 (70)	5.50 (140)	0.81 (21)	1.62 (41)	1/2-13	9.50 (241)
12 (300)	15.00 (381)	3.62 (92)	12.25 (311)	16.48 (419)	1 1/8-8	1 1/8	16	17.75 (451)	2.75 (70)	5.50 (140)	0.81 (21)	1.62 (41)	1/2-13	11.50 (292)
14 (350)	16.25 (413)	4.62 (117)	13.62 (346)	19.98 (507)	1 1/8-8	1 1/8	20	20.25 (514)	4.75 (121)	9.50 (241)	1.00 (25)	2.00 (51)	0.69 thru	12.50 (318)
16 (400)	18.50 (470)	5.25 (133)	14.62 (371)	21.00 (533)	1 1/4-8	1 1/4	20	22.50 (572)	4.75 (121)	9.50 (241)	1.00 (25)	2.00 (51)	0.69 thru	14.37 (365)
18 (450)	21.00 (533)	5.88 (149)	16.16 (410)	23.16 (588)	1 1/4-8	1 1/4	24	24.75 (629)	4.75 (121)	9.50 (241)	1.00 (25)	2.00 (51)	0.69 thru	16.25 (413)
20 (500)	23.00 (584)	6.25 (159)	17.14 (435)	24.15 (613)	1 1/4-8	1 1/4	24	27.00 (686)	4.75 (121)	9.50 (241)	1.00 (25)	2.00 (51)	0.69 thru	18.03 (458)
24 (600)	27.25 (692)	7.25 (184)	19.62 (498)	27.69 (703)	1 1/2-8	1 1/2	24	32.00 (813)	6.00 (152)	12.00 (305)	1.50 (38)	3.00 (76)	3/4-10	21.40 (544)

Weight

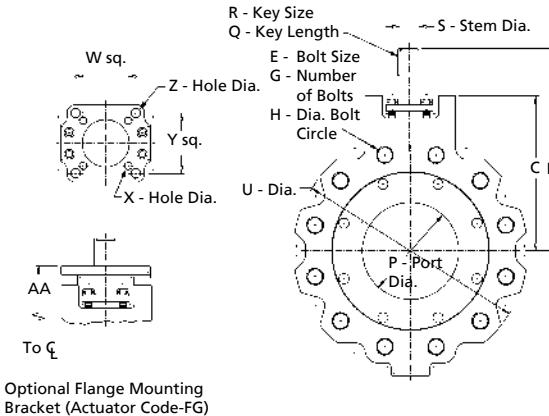
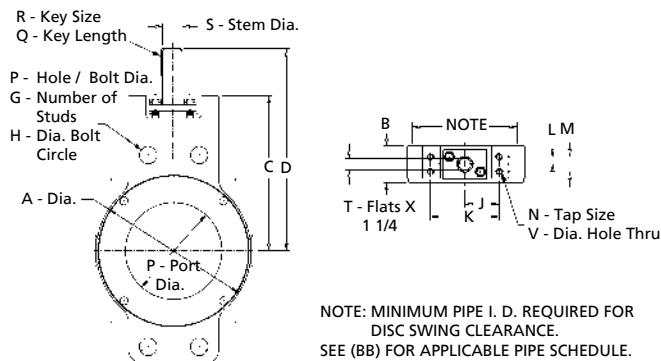
in. (mm)	Q	R	Lug Body				Wafer Body				
			S	T	U	W	X	Y	Z	AA	BB
2 1/2 (65)	–	–	0.500 (13)	0.375 (10)	7.38 (187)	2.25 (57)	0.34 (9)	3.00 (76)	0.41 (10)	6.69 (170)	Sch 160
3 (80)	–	–	0.625 (16)	0.437 (11)	8.12 (206)	2.25 (57)	0.34 (9)	3.00 (76)	0.41 (10)	6.38 (162)	Sch 160
4 (100)	–	–	0.625 (16)	0.437 (11)	9.38 (238)	2.25 (57)	0.34 (9)	3.00 (76)	0.41 (10)	7.26 (184)	Sch 80
5 (125)	–	–	0.875 (22)	0.625 (16)	10.75 (273)	2.25 (57)	0.34 (9)	3.00 (76)	0.41 (10)	8.38 (213)	Sch 80
6 (150)	–	–	0.875 (22)	0.625 (16)	12.12 (308)	2.25 (57)	0.34 (9)	3.00 (76)	0.41 (10)	8.50 (216)	Sch 40
8 (200)	1.56 (40)	0.250 (6.35) Sq.	1.125 (29)	–	14.75 (375)	–	–	3.50 (89)	0.56 (14)	10.00 (254)	Sch 40
10 (250)	2.00 (51)	0.312 (7.92) Sq.	1.375 (35)	–	17.25 (438)	3.50 (89)	0.56 (14)	5.31 (135)	0.69 (18)	12.38 (314)	Sch 40
12 (300)	2.75 (70)	0.375 (9.53) Sq.	1.750 (44)	–	20.00 (508)	3.50 (89)	0.56 (14)	5.31 (135)	0.69 (18)	13.75 (349)	Sch 40
14 (350)	3.00 (76)	0.500 (12.70) Sq.	2.000 (51)	–	22.50 (572)	4.78 (121)	0.81 (21)	2.88 x 6.94	0.94 (24)	16.62 (422)	Sch 80
16 (400)	3.00 (76)	0.500 (12.70) Sq.	2.000 (51)	–	25.00 (635)	4.78 (121)	0.81 (21)	2.88 x 6.94	0.94 (24)	17.62 (448)	Sch 80
18 (450)	3.75 (95)	0.625 (15.88) Sq.	2.500 (64)	–	27.25 (692)	4.78 (121)	0.81 (21)	2.88 x 6.94	0.94 (24)	19.16 (487)	Sch 80
20 (500)	3.75 (95)	0.625 (15.88) Sq.	2.500 (64)	–	29.50 (749)	4.78 (121)	0.81 (21)	2.88 x 6.94	0.94 (24)	20.14 (512)	Sch 80
24 (600)	3.62 (92)	0.625 x 0.875	3.500 (89)	–	35.00 (889)	–	–	3.92 x 9.47	0.81 (21)	23.62 (600)	Sch 80
										1325 (601)	815 (370)

* Pressure ratings are in accordance with ASME B16.34 for group 1.1 carbon steel valves. Pressure ratings will vary with different body materials.

** Installation manual is available with complete flange bolt / stud information.

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

DIMENSIONAL DATA

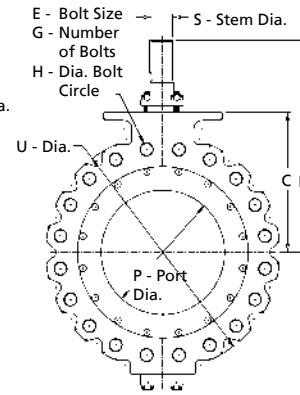
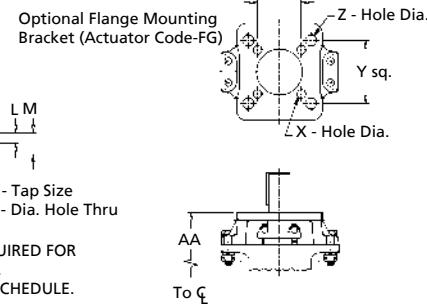
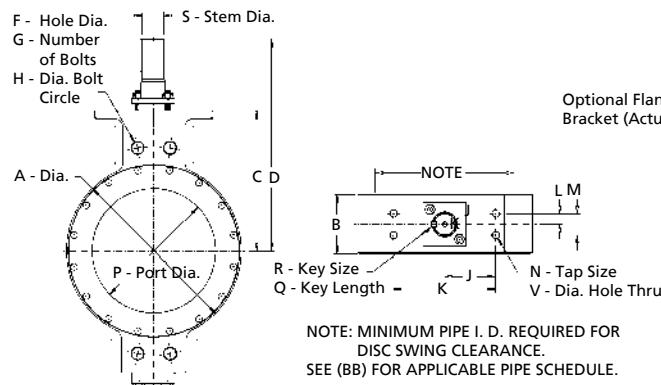


Series A5600, Class 600, 1480 psi CWP*

in. (mm)	A	B	C	D	E	F	G**	H	J	K	L	M	N	P
3 (80)	5.38 (137)	1.93 (49)	5.50 (140)	7.63 (194)	3/4-10	3/4	8	6.63 (168)	2.00 (51)	4.00 (102)	0.44 (11)	0.88 (22)	3/8-16	2.62 (67)
4 (100)	6.88 (175)	2.37 (60)	6.75 (171)	8.88 (226)	7/8-9	7/8	8	8.50 (216)	2.00 (51)	4.00 (102)	0.44 (11)	0.88 (22)	3/8-16	3.63 (92)
6 (150)	9.00 (229)	2.91 (74)	9.00 (229)	11.68 (297)	1-8	1	12	11.50 (292)	2.13 (54)	4.25 (108)	0.63 (16)	1.25 (32)	3/8-16	5.62 (143)
8 (200)	11.50 (292)	3.65 (93)	9.88 (251)	13.36 (339)	1 1/8-8	1 1/8	12	13.75 (349)	2.75 (70)	5.50 (140)	0.81 (21)	1.62 (41)	1/2-13	7.61 (193)
10 (250)	13.50 (343)	4.65 (118)	12.00 (305)	16.18 (411)	1 1/4-8	1 1/4-8	12	17.00 (432)	2.75 (70)	5.50 (140)	0.81 (21)	1.62 (41)	1/2-13	9.50 (241)

Weight

in. (mm)	Q	R	S	T	U	W	X	Y	Z	AA	BB	Lug Body lb. (kg)	Wafer Body lb. (kg)
3 (80)	—	—	0.625 (16)	0.437 (11)	8.12 (206)	2.25 (57)	0.34 (9)	3.00 (76)	0.41 (10)	6.38 (162)	Sch 160	25 (11)	11 (5)
4 (100)	—	—	0.875 (22)	0.625 (16)	10.50 (267)	2.25 (57)	0.34 (9)	3.00 (76)	0.41 (10)	7.63 (194)	Sch 120	53 (24)	30 (14)
6 (150)	1.56 (40)	0.250 (6.35) Sq.	1.125 (29)	—	13.63 (346)	—	—	3.50 (89)	0.56 (14)	10.12 (257)	Sch 120	85 (39)	52 (24)
8 (200)	2.00 (51)	0.312 (7.92) Sq.	1.375 (35)	—	16.12 (409)	3.50 (89)	0.56 (14)	5.31 (135)	0.69 (18)	11.38 (289)	Sch 80	165 (75)	105 (48)
10 (250)	2.75 (70)	0.375 (9.53) Sq.	1.750 (44)	—	19.50 (495)	3.50 (89)	0.56 (14)	5.31 (135)	0.69 (18)	13.50 (343)	Sch 120	329 (149)	225 (102)



Series A5600, Class 600, 1480 psi CWP

in. (mm)	A	B	C	D	E	F	G**	H	J	K	L	M	N	P
12 (300)	16.25 (413)	5.53 (140)	12.94 (329)	19.58 (497)	1 1/4-8	1 1/4-8	20	19.25 (489)	4.75 (121)	9.50 (241)	1.00 (25)	2.00 (51)	-	11.50 (292)

Weight

in. (mm)	Q	R	S	U	V	W	X	Y	Z	AA	BB	Lug Body lb. (kg)	Wafer Body lb. (kg)
12 (300)	3.00 (76)	0.500 (12.7) Sq.	2.00 (51)	21.75 (552)	0.69 (18)	4.78 (121)	0.81 (21)	2.88 x 6.94	0.94 (24)	15.94 (405)	Sch 80	520 (236)	360 (163)

* Pressure ratings are in accordance with ASME B16.34 for group 1.1 carbon steel valves. Pressure ratings will vary with different body materials.

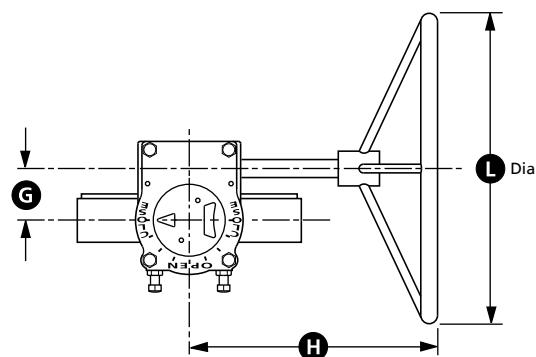
** Installation manual is available with complete flange bolt / stud information.

WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

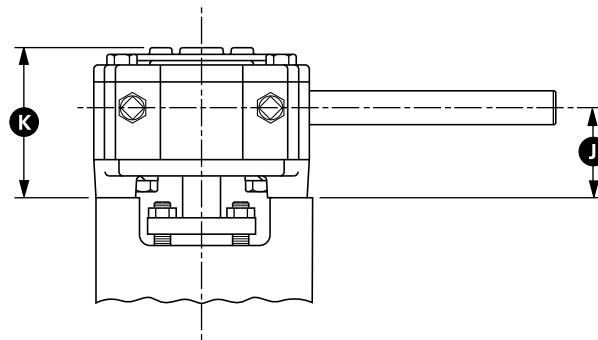
MANUAL ACTUATORS

Worm Gear Actuators

Worm gear actuators are available as optional equipment, for DynaCentric high performance butterfly valves sizes 2 1/2 in. through 8 in. (65 mm - 200 mm). All larger size valves require worm gear actuators or power actuation.



Handle operated valves, sizes 2 1/2 in. through 8 in. (65 mm through 200 mm), can be converted in the field to worm gear operation. No modification is required to accommodate the addition of the worm gear unit.



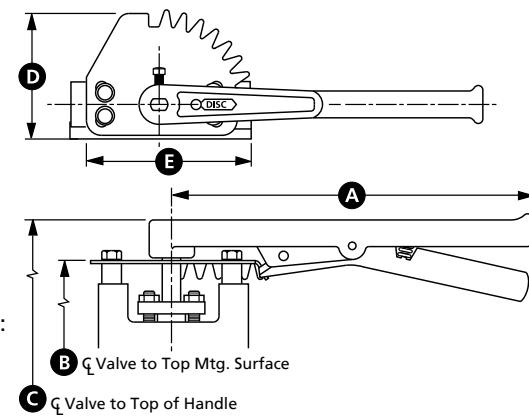
Valve Size in.	ASME Class	G	H	J	K	L Dia.	Weight lb.	Weight (kg)
2 1/2 (65)	150/300	1.75 (44)	7.25 (184)	1.75 (44)	3.5	8.00 (203)	11	(5)
3 (80)	150/300/600	1.75 (44)	7.25 (184)	1.98 (50)	3.45 (87)	8.00 (203)	15	(7)
4 (100)	150/300/600	1.75 (44)	7.25 (184)	1.98 (50)	3.45 (87)	8.00 (203)	15	(7)
5 (125)	150/300	1.75 (44)	7.25 (184)	1.98 (50)	3.45 (87)	8.00 (203)	15	(7)
6 (150)	150/300	1.75 (44)	7.25 (184)	1.98 (50)	3.45 (87)	8.00 (203)	15	(7)
6 (150)	600	2.51 (64)	10.28 (261)	2.49 (63)	4.29	12.00 (305)	23	(10)
8 (200)	150/300	2.51 (64)	10.28 (261)	2.49 (63)	4.29	12.00 (305)	23	(10)
8 (200)	600	3.00 (76)	14.02 (356)	3.00 (76)	4.68 (118)	18.00 (457)	39	(18)
10 (250)	150	2.51 (64)	10.28 (261)	2.49 (63)	4.29	12.00 (305)	23	(10)
10 (250)	300	3.00 (76)	14.02 (356)	3.73 (95)	4.68 (118)	18.00 (457)	39	(18)
10 (250)	600	3.63 (92)	16.38 (416)	3.73 (95)	6.01 (153)	24.00 (610)	49	(22)
12 (300)	150	3.00 (76)	14.02 (356)	3.00 (76)	4.68 (118)	18.00 (457)	39	(18)
12 (300)	300	3.63 (92)	16.38 (416)	3.73 (95)	6.01 (153)	24.00 (610)	49	(22)
12 (300)	600	3.63 (92)	18.95 (481)	5.23 (133)	7.14 (181)	30.00 (762)	51	(23)
14 (350)	150	3.00 (76)	14.02 (356)	4.25 (108)	5.93 (150)	18.00 (457)	39	(18)
14 (350)	300	4.63 (118)	18.95 (481)	5.25 (133)	7.83 (198)	30.00 (762)	51	(23)
16 (400)	150	3.63 (92)	16.38 (416)	4.98 (126)	7.26 (184)	24.00 (610)	49	(22)
16 (400)	300	4.63 (118)	18.95 (481)	5.25 (133)	7.83 (198)	30.00 (762)	51	(23)
18 (450)	150	3.63 (92)	18.95 (481)	5.23 (133)	7.14 (181)	30.00 (762)	51	(23)
18 (450)	300	4.63 (118)	19.90 (505)	5.25 (133)	8.33	30.00 (762)	106	(48)
20 (500)	150	4.63 (118)	18.95 (481)	5.25 (133)	7.83	30.00 (762)	51	(23)
20 (500)	300	4.63 (118)	18.95 (481)	5.25 (133)	8.33	30.00 (762)	51	(23)
24 (600)	150	4.63 (118)	19.90 (505)	5.25 (133)	8.33	30.00 (762)	106	(48)
24 (600)	300	7.30 (185)	20.56 (522)	9.19 (233)	10.57 (268)	30.00 (762)	160	(73)
30 (750)	150	7.30 (185)	20.56 (522)	9.19 (233)	10.57 (268)	30.00 (762)	160	(73)
36 (900)	150	5.93 (151)	20.56 (522)	9.00 (228)	10.57 (268)	30.00 (762)	163	(74)

Handle Actuators

Valve Size in. (mm)	ASME Class	Handle Number	A	B	C	D	E	Weight lb. (kg)
2 1/2 (65)	150/300	H-06	12 (305)	6.69 (170)	7.94 (202)	4.5 (114)	5.56 (141)	5 (2.3)
3 (80)	150/300/600	H-16	12 (305)	6.38 (162)	7.62 (194)	4.5 (114)	5.56 (141)	5 (2.3)
4 (100)	150/300	H-16	12 (305)	7.25 (184)	8.50 (216)	4.5 (114)	5.56 (141)	5 (2.3)
4 (100)	600	H-36	18 (457)	7.63 (194)	8.88 (226)	4.5 (114)	5.56 (141)	9 (4.1)
5 (125)	150/300	H-36	18 (457)	8.37 (213)	9.62 (244)	4.5 (114)	5.56 (141)	9 (4.1)
6 (150)	150/300	H-36	18 (457)	8.50 (216)	9.75 (248)	4.5 (114)	5.56 (141)	9 (4.1)
6 (150)	600	H-46	18 (457)	10.13 (257)	11.75 (298)	4.5 (114)	5.56 (141)	9 (4.1)
8 (200)	150	H-46	18 (457)	10.00 (254)	11.50 (292)	4.5 (114)	5.56 (141)	9 (4.1)

CAUTION: Handle should only be used up to the following differential pressures:

- | | |
|-----------------------------|-------------------------|
| 2 1/2 in. valves to 450 psi | 5 in. valves to 200 psi |
| 3 in. valves to 400 psi | 6 in. valves to 150 psi |
| 4 in. valves to 300 psi | 8 in. valves to 50 psi |



WKM DYNACENTRIC HIGH PERFORMANCE BUTTERFLY VALVES

MATERIAL SELECTION GUIDE

A selection of body, disc, stem and seat/seal materials for DynaCentric high performance butterfly valves are available. The following list is intended as a guide in the selection of materials for corrosive service.

No material can be expected to resist the corrosive action of all the many ladings found in modern industry. Experience has shown, however, that certain materials can perform satisfactorily within certain limits.

The physical properties of a material are affected differently by each corrosive medium. Therefore, it sometimes becomes necessary to sacrifice value in another property. As a result, the user must decide which property is of prime importance for his application.

LADINGS	MATERIALS OF CONSTRUCTION													
	BODY GROUPS			TRIM GROUPS				SEAL GROUPS						
	1	2	3	01*	02	03	04	05	S01	S02	F02	M01		
Acetaldehyde	C	A	C	C	C	A	A	A	A	A	A	A	A	A
Acetate Solvents	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Acetic Acid	D	A	D	D	B	A	A	B	A	A	A	A	A	A
Acetic Acid, crude	C	A	C	C	B	A	A	B	A	A	A	A	A	A
Acetic Anhydride	D	B	D	D	B	B	A	B	A	A	B	B		
Acetone	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Acetylene, dry only	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Acrylonitrile	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Alcohols-methyl, ethyl	B	A	B	B	A	A	A	A	A	A	A	A	A	A
Alcohols-amyl, butyl	B	A	B	B	B	A	A	B	A	A	A	A	A	A
Aluminum chloride, dry	B	A	B	B	D	A	A	D	A	A	A	A	A	A
Aluminum Sulfate, alums	C	A	C	C	C	A	A	C	A	A	A	A	A	A
Amines	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ammonia	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Ammonia Solutions	B	A	B	B	A	A	B	A	A	A	A	A	A	A
Ammonium Bicarbonate	C	B	C	C	B	B	B	B	A	A	B	B		
Ammonium Carbonate	B	B	B	B	B	B	B	B	A	A	B	B		
Ammonium Chloride	D	C	D	D	C	B	D	A	A	C	C			
Ammonium Hydroxide	C	B	C	C	B	B	D	B	A	C	C	B		
Ammonium Monophosphate	D	B	D	D	B	B	C	B	A	A	B	B		
Ammonium Nitrate	D	A	D	C	A	A	D	A	A	A	A	A		
Ammonium Phosphate	D	B	D	D	B	B	C	B	A	A	B	B		
Ammonium Sulfate	C	B	C	B	B	B	C	B	A	A	B	B		
Amyl Acetate	C	B	C	B	B	B	B	B	A	A	B	B		
Aniline	A	B	A	C	B	B	B	B	A	A	B	B		
Aniline Dyes	C	A	C	C	A	A	A	A	A	A	A	A		
Antimony Trichloride	D	D	D	D	D	B	D	D	A	A	D	D		
Arsenic Acid	D	B	D	D	B	B	D	B	A	A	B	B		
Asphalt, emulsion/liquid	A	A	A	A	A	A	A	A	A	A	A	A		
Barium Carbonate	B	B	B	B	B	B	B	B	A	A	B	B		
Barium Chloride	C	C	C	D	C	C	B	C	A	A	C	C		
Barium Hydroxide	C	B	C	C	B	B	B	B	A	A	B	B		
Barium Sulfate	B	B	B	C	B	B	A	B	A	A	B	B		
Barium Sulfide	B	B	B	C	B	B	B	B	A	A	B	B		
Beer	C	A	C	B	A	A	A	A	A	A	A	A		
Beet Sugar Liquors	B	A	B	B	A	A	A	A	A	A	A	A		

NOTE: All ladings at ambient temperatures except as noted.

* Size 14 in. (350 mm) and larger, class 150 / 300 valves are available with CS trim.
For trim group 08 thru 13 consult factory for material compatibility.

Internal moving parts, in contact with the lading, should always carry an "A" rating. Body materials with exposure to corrosive ladings can sometimes carry "B" rating because metal loss due to corrosion is not as critical.

The following information is designed for use by technically qualified individuals at their own discretion and risk. We strongly recommend that tests be run under actual operating conditions to obtain a material's performance ability in any one corrosive medium.

RATING INTERPRETATION:

- "A" - excellent
- "B" - good (slightly attacked)
- "C" - fair (moderately attacked, probably unsuitable)
- "D" - not recommended

LADINGS	MATERIALS OF CONSTRUCTION													
	BODY GROUPS			TRIM GROUPS				SEAL GROUPS						
	1	2	3	01*	02	03	04	05	S01	S02	F02	M01		
Benzene, Benzoil	B	A	B	B	B	A	A	A	A	A	A	A	A	A
Benzaldehyde	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Benzoic Acid	D	B	D	D	B	B	B	B	A	A	B	B		
Borax Liquors	C	B	C	C	B	B	A	B	A	A	B	B		
Boric Acid	D	B	D	C	B	B	A	B	A	A	B	B		
Brines	C	B	C	C	C	B	A	C	A	A	B	B		
Bromine, dry	D	D	D	D	D	A	D	A	A	A	D	D		
Bromine, wet	D	D	D	D	D	B	D	A	A	A	D	D		
Butadiene	B	A	B	B	A	A	C	A	B	B	A	A		
Butane	A	A	A	A	A	A	A	A	A	A	A	A		
Butylene	A	A	A	A	A	A	A	A	A	A	A	A		
Buttermilk	D	A	D	B	A	A	D	A	A	A	A	A		
Butyric Acid	D	B	D	D	B	B	B	B	A	A	B	B		
Calcium Bisulfide	D	B	D	D	B	B	B	B	B	B	A	A		
Calcium Carbonate	D	B	D	B	A	B	B	A	A	A	B	B		
Calcium Chloride	C	B	C	B	B	B	A	B	A	A	B	B		
Calcium Hydroxide, 20%	B	B	B	C	B	B	A	B	A	A	B	B		
Calcium Hypochlorite	D	C	D	C	C	C	C	C	A	A	C	C		
Calcium Sulfate	C	B	C	C	B	B	B	B	A	A	B	B		
Carbolic Acid	D	B	D	B	B	B	B	B	B	A	A	B		
Carbon Bisulfide	B	-	B	B	B	-	A	B	B	A	A	-		
Carbon Dioxide, dry	A	A	A	A	A	A	A	A	A	A	A	A		
Carbonic Acid	D	B	D	C	B	B	A	B	A	A	B	B		
Carbon Tetrachloride, dry	B	A	B	A	A	A	A	A	A	A	A	A		
Carbon Tetrachloride, wet	D	B	D	B	B	B	B	B	B	B	A	B		
Carbonated Water	B	A	B	B	A	A	A	A	A	A	A	A		
China Wood Oil, Tung Oil	C	A	C	C	A	A	A	A	A	A	A	A		
Chlorinated Solvents, dry	C	B	C	C	B	B	B	B	B	A	A	B		
Chlorine Gas, dry	B	B	B	B	C	B	B	C	A	A	B	B		
Chlorine, wet	D	D	D	D	D	C	D	A	A	D	D			
Chloroacetic Acid	D	C	D	C	C	B	C	A	A	C	C			
Chlorobenzene, dry	B	A	B	B	B	A	A	B	A	A	A	A		
Chloroform, dry	B	A	B	B	A	A	A	A	A	A	A	A		
Chlorosulphonic Acid, dry	B	B	B	B	B	B	A	B	A	A	B	B		
Chlorosulphonic Acid, wet	D	D	D	D	D	C	D	A	A	A	A	A		
Chrome Alum	B	A	B	B	A	A	B	A	A	A	A	A		

AFTERMARKET SERVICES



Cameron's Aftermarket Services' goal is to help our customers lower the total cost of valve ownership. To that end we offer a full range of services from over twenty-five service centers worldwide and can provide experienced personnel trained to meet the specific service requirements of each valve type.

Aftermarket Services

- Supplies replacement valves and parts:
 - Maintains a full inventory of new and reconditioned valves for immediate delivery
 - Provides factory warranty support for all Cameron OEM brands as well as service for most other valves
- Field Service & Technical Support
 - Field service technicians on call 24 hours a day 7 days a week to handle service issues wherever they arise
 - Provides equipment installation, field repairs, as well as track and perform scheduled maintenance

- Customer Property Repair
 - The Customer Property Repair program allows Cameron valve customers to store assets at our service centers throughout the world
 - Valves tracked in electronic database accessible through the Internet
- Remanufactured Products
 - Offers a broad range of API-compliant reconditioned equipment with fast delivery
- Total Valve Management
 - Supply and service automation and control packages
 - Assist with valve installation, commissioning and start-up



TRADEMARK INFORMATION

WKM® is a registered trademark which is owned by Cameron.

This document contains references to registered trademarks or product designations, which are not owned by Cameron.

Trademark	Owner	Common Name	Comparable Cameron Abbreviated Name (in Trim Charts)
AFLAS	Asahi Glass Company	TFE Propylene	FXM
CELCON	Hoechst Celanese Corporation		
DELRIN	E.I. DuPont De Nemours & Company		
INCONEL	INCO Nickel Sales, Inc.		
MONEL	INCO Alloys International, Inc		
PEEK	Victrex PLC Corp. United Kingdom	Polyetheretherketone	PK
STELLITE	Stoody Deloro Stellite, Inc.		
TEFLON	E.I. Dupont De Nemours & Company	Poly Tetra Fluoro Ethylene	PTFE
VITON	Dupont Dow Elastomers L.L.C.	Fluoroelastomer	FKM
17-4PH	Armco Advanced Materials Corp.	17-4PH Stainless Steel Electroless Nickel Plating	Type 630 ENP
TFM™	DYNEON™ L.L.C.	Modify Poly Tetra Fluoro Ethylene	MTFE



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