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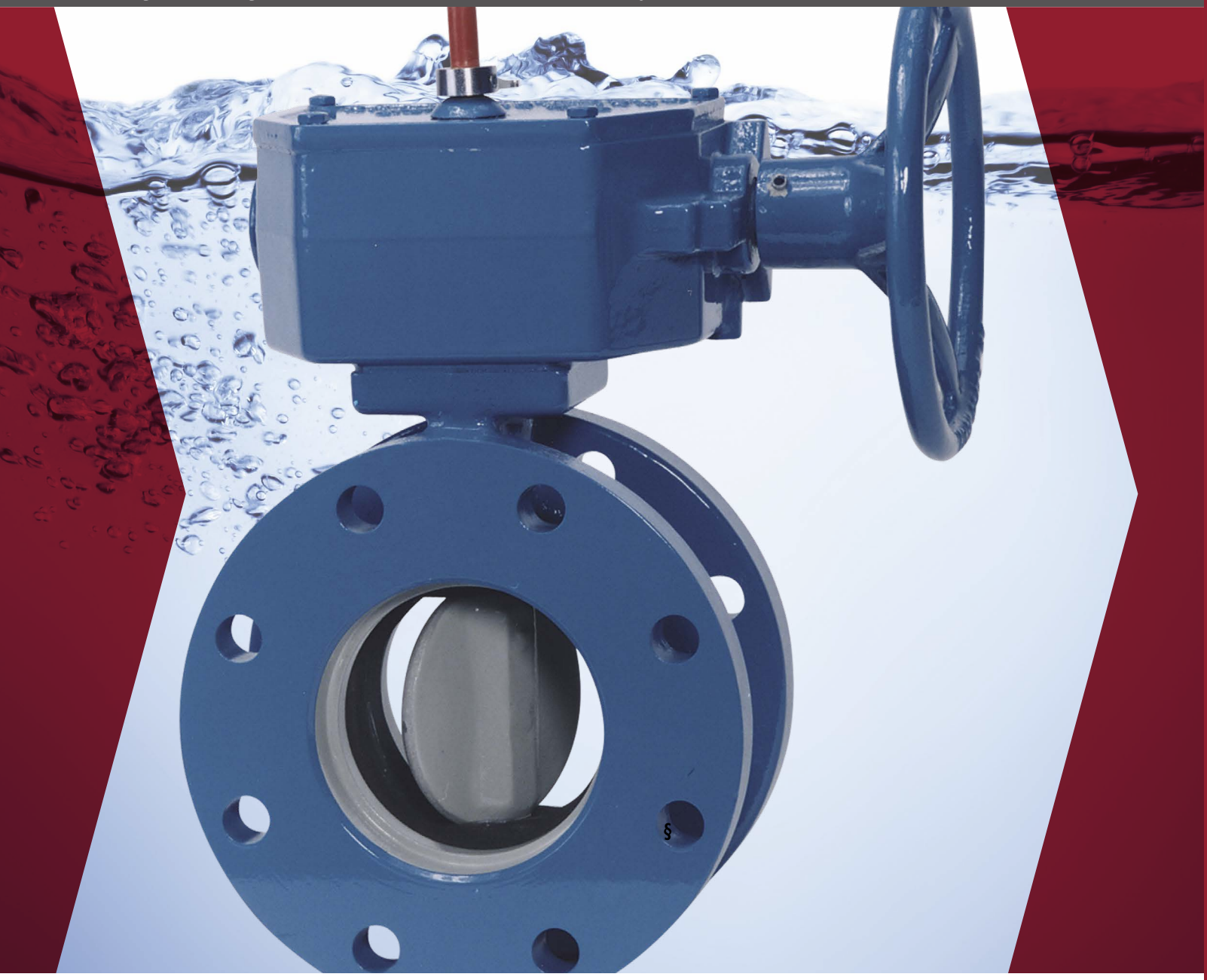
AWWA BUTTERFLY VALVES 3" – 20"

Engineering Creative Solutions for Fluid Systems Since 1901



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AWWA BUTTERFLY VALVE 3 - 20”

SCOPE OF LINE

AWWA In-Plant Rubber Seated Butterfly Valves

MODEL 2FII FLANGED BUTTERFLY VALVE

SIZES	3″ - 20″
BODY STYLE	Flanged x Flanged Ends
OTHER BODY STYLE OPTIONS	Mechanical Joint Flanged & Mechanical Joint
PRESSURE CLASS	Class 150B per AWWA Standard C504
WORKING PRESSURE	150 psig
FLANGES	Flat faced and drilled in accordance with ANSI B16.1, Class 125 standards.
RUBBER SEAT	Bonded seat-in-body for complete coverage of interior waterway
ACTUATION OPTIONS	• Pratt® hand lever • MDT manual actuator with AWWA nut, handwheel or chainwheel • Pratt Dura-Cyl hydraulic or pneumatic cylinder

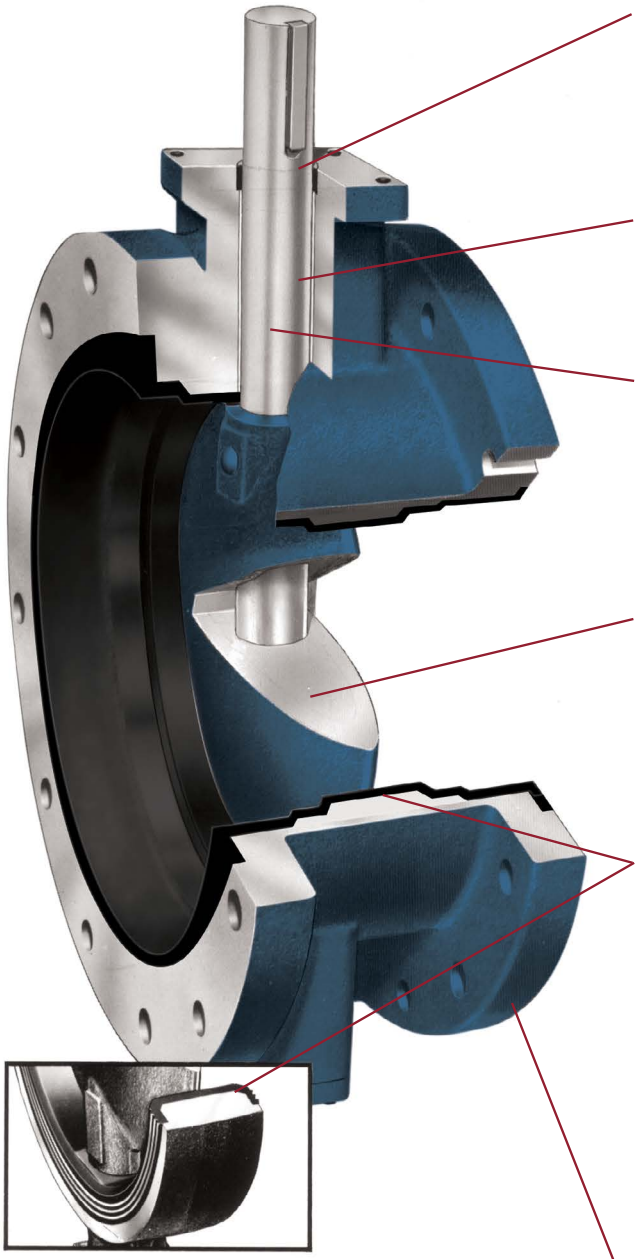
MODEL 2FII BUTTERFLY VALVE

MONOFLANGE MKII WAFER BUTTERFLY VALVE

SIZES	3″ - 20″
BODY STYLE	Wafer Type
PRESSURE CLASS	Class 150B per AWWA Standard C504
WORKING PRESSURE	150 psig
RUBBER SEAT	Bonded seat-in-body extends over inner surface to form self-gasketing feature
ACTUATION OPTIONS	• Pratt hand lever • MDT manual actuator with AWWA nut, handwheel or chainwheel • Pratt Dura-Cyl hydraulic or pneumatic cylinder

MONOFLANGE MKII BUTTERFLY VALVE

DESIGN DETAILS
Models 2FII and MKII



SELF ADJUSTING PERMANENT PACKING

Chevron type packing increases sealing force as line pressure increases. The self adjusting packing bears on turned, ground and polished stainless steel, minimizing wear and assuring long life. Packing is accessible for replacement without dismantling the valve per AWWA Standard C504.

LIFETIME BEARINGS

Our chemically inert nylon bearings are sized to meet or exceed AWWA specification pressure loads. They are self-lubricating, require no periodic maintenance and are designed to outlast the life of the pipeline.

CORROSION RESISTANT SHAFTS

The shafts in the Pratt® rubber seated butterfly valves, 3″ through 20″, are constructed of centerless, ground ASTM A276 type 316 stainless steel bar and thus are not susceptible to corrosion as are carbon steel or other similar materials. Shafts are one-piece, through-shaft construction, sized to meet or exceed the requirements of AWWA Standard C504 for Class 150B butterfly valves.

STREAMLINED DISCS

Our lens-shaped discs are designed to minimize pressure drop and turbulence. In the full open position, the disc creates no more friction loss than a 45° elbow. Discs are secured to shafts by stainless steel pins to transmit required torques and withstand stresses imposed under a variety of operating conditions.

BODY SEAT

Our standard seats are constructed of EPDM rubber and bonded to the valve body in Pratt manufacturing facilities using a unique thermal process. This molding process ensures that the disc-to-seat interference will not cause excessive wear or abrasion under normal operating conditions. On the 2FII and wafer MKII bodies, the rubber seat covers the entire inner surface and a portion of the outside face of the valve body, providing an additional gasketing feature. On the 2MII bodies, the rubber seat covers the entire inner surface and extends out beyond the pipe facing connection point. The Pratt seat-in-body designs minimizes the effects of corrosive buildup on the inside of the valve because deposits are swept away by the hard sealing edge of the disc each time the valve is exercised.

HEAVY DUTY BODIES

Both Monoflange MKII and Model 2FII bodies are heavy duty ductile iron. Model 2FII flanges are fully faced and drilled in accordance with ANSI B16.1, Class 125 standard for cast iron flanges. The actuator mounting trunnion is machined and drilled for a 4-bolt connection.

THE PRATT® SEAT ON BODY DESIGN ADVANTAGE

A key aspect of butterfly valve design relates to location of the rubber seat. Essentially the seat can be positioned on the body or on the disc per AWWA C504.

But the sum of the Pratt design, testing, and field experience has proven conclusively that seat on body design is preferred because it provides maximum reliability.

The major advantage of seat on body design is that the risk of damage to the rubber seat is minimized because the sealing edge of the disc is much harder than any corrosion deposits built up within the valve body or pipeline. (See Figures 1 and 2) This is important because build up can interfere with the swing radius of the disc. Additionally, seats on body are recessed and thus more protected than seat on disc designs.

Seat on disc designs are much more susceptible to damage because it is the relatively soft rubber seat on the disc that comes into contact with corrosion deposits and build up. Also any solid materials flowing in the fluid can impinge on a rubber seat located on the disc. (See Figure 3)

Another disadvantage of seat on disc design is that since the maximum velocity in a pipeline occurs at the upstream and downstream leading edges of the disc, the rubber seat on disc designs are much more susceptible to wear, vibration and potential loosening of hardware.

Conclusion: Pratt seat on body designs which do not depend on retaining hardware in the waterway for seat retention have recognized these potential problems and addressed them in advance. Successful field performance has substantiated the credibility of this design approach!!

PRATT – RUBBER SEAT ON BODY DESIGNS

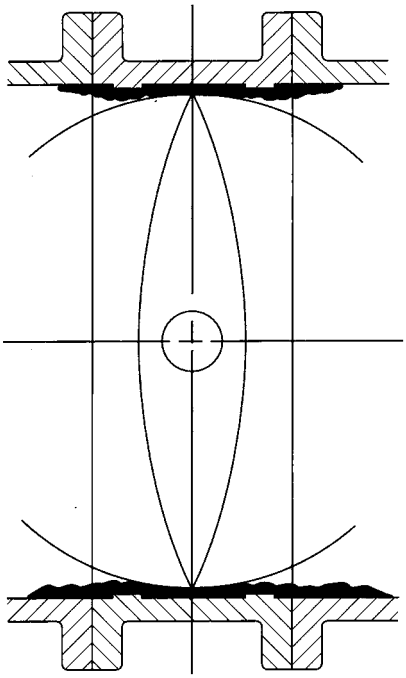


FIGURE 1

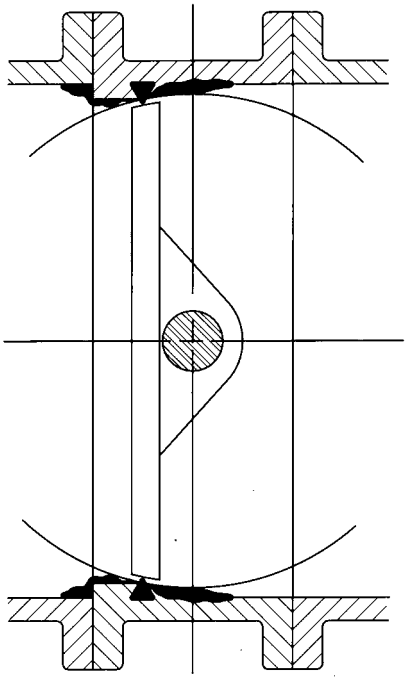


FIGURE 2

RUBBER SEAT ON DISC

DESIGN BY OTHERS

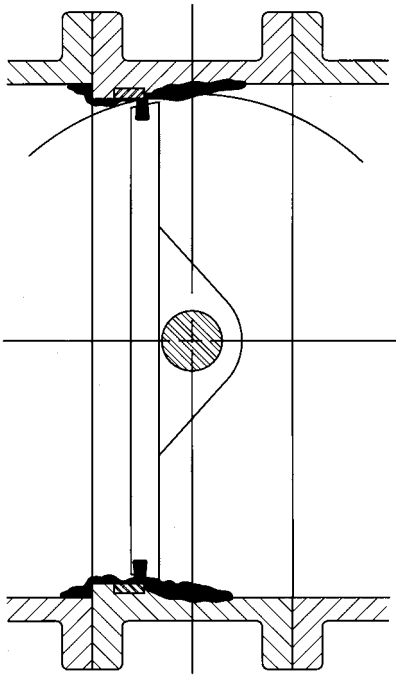


FIGURE 3

FEATURES AND BENEFITS

Models 2FII and MKII

FEATURE	BENEFIT
Seat-in-body design. Seat molded in recessed body cavity, protected by metal on 3 sides	Reduces seat failure due to corrosive buildup in the valve and pipeline. No hardware to loosen. No periodic maintenance required. Rubber protected from flow media to increase seat life.
Valve withstood proof-of-design testing of 100,000 cycles — AWWA only requires 10,000 cycle proof-of-design testing	Proven reliability over the life of the valve
Through-disc pining	Provides a tight disc-to-shaft pin connection, greatly reducing the possibility of loosening through vibration
Symmetrical lens-shaped disc	Higher C_V : lower head loss results in energy savings for customer's system
Nonmetallic bearings	Prevents galvanic corrosion and provides lower coefficient of friction
Chevron V-type packing	Self-adjusting, lasts the life of the valve

VALVE SIZE	C_V	VALVE SIZE	C_V	VALVE SIZE	C_V
3″	323	10″	4458	16″	11413
4″	575	12″	6420	18″	14444
6″	1294	14″	8738	20″	17832
8″	2300	C_V values for the 2FII and MKII in the full open position			

VALVE MODEL	BODY	SEAT	DISC	SHAFT
2FII / MKII 3″ - 6″	ASTM A536 (65-45-12) Ductile Iron	EPDM	CF8M or Nickel Al / Bz (6″)	Stainless Steel, Type 316
2FII 8″ - 20″	ASTM A536 Ductile Iron	EPDM	Ductile Iron / 316 Edge or Nickel Al/Bz	Stainless Steel, Type 316
MKII 8″ - 20″	ASTM A536, (65-45-12) Ductile Iron	EPDM	Ductile Iron / 316 Edge	Stainless Steel, Type 316

SUGGESTED SPECIFICATIONS

Pratt® Rubber Seated Butterfly Valve, Sizes 3" - 20"

GENERAL

Butterfly valves shall be manufactured in accordance with the latest revision of AWWA C504, Class 150B and conform to ANSI / NSF 61 and ANSI NSF 372. The manufacturer shall have produced AWWA butterfly valves for a minimum of five years. All valves shall be either Pratt Model 2FII or Monoflange MKII and comply with the following details.

VALVE BODIES

Valve bodies shall be constructed of ASTM A536 Ductile Iron. Flanged valves shall be fully faced and drilled in accordance with ANSI Standard B16.1, Class 125.

VALVE SEATS

Rubber body seats shall be of one piece construction, simultaneously molded and bonded into a recessed cavity in the valve body. Seats may not be located on the disc or be retained by segments and / or screws. For flanged ends and wafer style valves, the seat shall cover the entire inner surface of the valve body and extend onto the outside face of the valve body to form an additional gasket (traditional face gasket still recommended). For mechanical joint style valves ends, the rubber seat shall cover the entire inner surface and extend out beyond the pipe facing connection point.

VALVE BEARINGS

Valve bearings shall be of a self-lubricating, nonmetallic material to effectively isolate the disc-shaft assembly from the valve body. Metal-to-metal thrust bearings in the flow stream are not allowed.

VALVE DISC

The disc shall be a lens-shaped design to afford minimal pressure drop and line turbulence. Materials of construction shall be:

- 3" - 6" — ASTM A351 Gr. CF8M stainless steel disc
- 8" - 20" — ASTM A536 Ductile iron disc with a stainless steel type 316 edge

Discs shall be retained by stainless steel pins which should extend through the full diameter of the shaft to withstand the specified line pressure up to valve rating and the torque required to operate the valve. Disc stops located in the flow stream are not allowed.

VALVE SHAFTS

Valve shafts shall be of stainless steel type 316. At the operator end of the valve shaft, a packing gland utilizing "V" type chevron packing shall be utilized. "O" ring and / or "U" cup packing is not allowed.

PAINTING

All surfaces of the valve interior shall be clean, dry and free from grease before painting. The valve interior and exterior, except for disc edge, rubber seat and finished portions shall be evenly coated with an NSF61 approved 2-part liquid or fusion-bonded epoxy. Minimum dry film thickness shall be 8 Mils.

TESTING

Hydrostatic and seat leakage tests shall be conducted in strict accordance with AWWA Standard C504.

PROOF OF DESIGN

The manufacturer furnishing valves under the specification shall be prepared to provide Proof of Design Test reports to illustrate that the valves supplied meet the design requirements of AWWA C504.

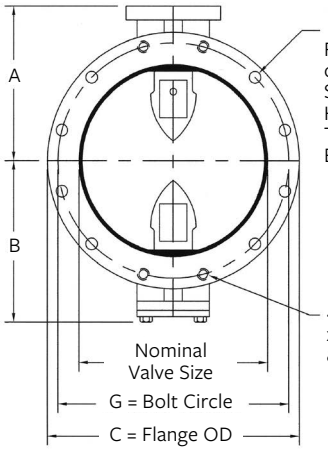
Manual Actuators: Manual actuators shall be of the traveling nut, self-locking type and shall be designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. Actuators shall be equipped with mechanical stop-limiting devices to prevent overtravel of the disc in the open and closed positions. Actuators shall be fully enclosed and designed to produce the specified torque with a maximum pull of 80 lb. on the handwheel or chainwheel. Actuator components shall withstand an input torque of 450 Lb. Ft. at extreme operator position without damage. Manual actuators shall conform to AWWA C504 and shall be Pratt MDT or an approved equal.

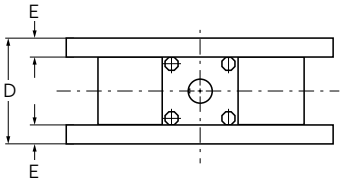
Powered Actuators:
Refer to the Pratt Butterfly Valve Actuator brochure for suggested specifications and detailed information regarding cylinder actuators and electric actuators.

DIMENSIONAL DATA

Model 2FII, Flanged Butterfly Valve & Monoflange MKII Wafer Butterfly Valve

MODEL 2FII, FLANGED BUTTERFLY VALVE





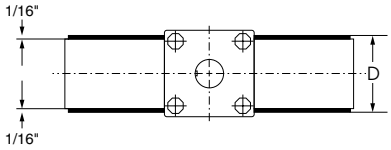
Available in Sizes 3″ - 20″

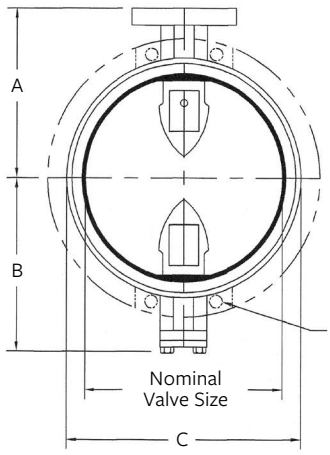
NOMINAL VALVE

SIZE	A	B	C	D	E	F	G
3	4 3/4	3 1/4	7 1/2	5	3/4	4 – 5/8	6
4	5 1/2	3 1/2	9	5	15/16	8 – 5/8	7 1/2
6	6 1/2	5 1/8	11	5	1	8 – 3/4	9 1/2
8	7 3/4	6 1/2	13 1/2	6	1 1/8	8 – 3/4	11 3/4
10	9	9 7/8	16	8	1 3/16	12 – 7/8	14 1/4
12	10 1/2	11 3/8	19	8	1 1/4	12 – 7/8	17
14	11 7/8	12 3/4	21	8	1 3/8	12 – 1	18 3/4
16	13 1/2	14 3/8	23 1/2	8	1 7/16	16 – 1	21 1/4
18	14 3/8	15 1/4	25	8	1 9/16	16 – 1 1/8	22 3/4
20	16	16 7/8	27 1/2	8	1 11/16	20 – 1 1/8	25

All dimensions shown in inches.

MONOFLANGE MKII WAFER BUTTERFLY VALVE





VALVE SIZE (IN.)	DISC O.D. (IN.)	MINIMUM MATING PIPE I.D. (IN.)*
3	3.089	2.41
4	4.074	3.44
6	6.070	5.38
8	8.078	7.53
10	10.098	9.62
12	12.108	11.64
14	13.339	12.86
16	15.336	14.79
18	17.370	16.75
20	19.380	18.71

NOMINAL VALVE

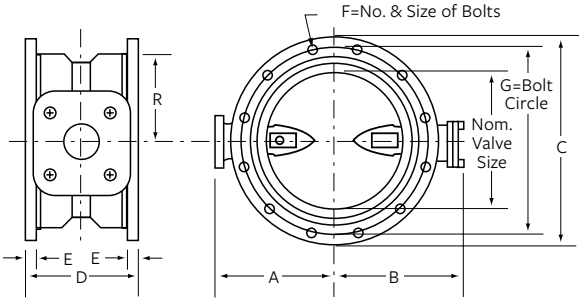
SIZE	A	B	C	D
3	4 3/4	3 1/4	5 1/4	2 1/16
4	5 1/2	3 1/2	6 3/4	2 5/16
6	6 1/2	5 1/8	8 5/8	2 15/16
8	7 3/4	6 1/2	10 7/8	3 1/16
10	9	9 7/8	13 1/4	3 3/16
12	10 1/2	11 5/16	16	3 7/16
14	11 7/8	12 3/4	17 5/8	3 11/16
16	13 1/2	14 3/8	20 1/8	4 3/16
18	14 3/8	15 1/4	21 1/2	4 11/16
20	16	16 13/16	23 3/4	5 3/16

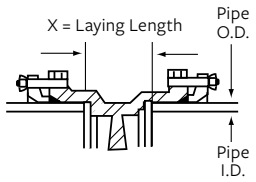
All dimensions shown in inches.

DIMENSIONAL DATA

Models 2MII & 2MFII Butterfly Valves

MODEL 2MII MECHANICAL JOINT END BUTTERFLY VALVE





INSTALLATION DIAGRAM

Note: The following items to be furnished by others unless otherwise specified in contract: Bolts, Glands, Nuts, Gaskets

NOMINAL VALVE

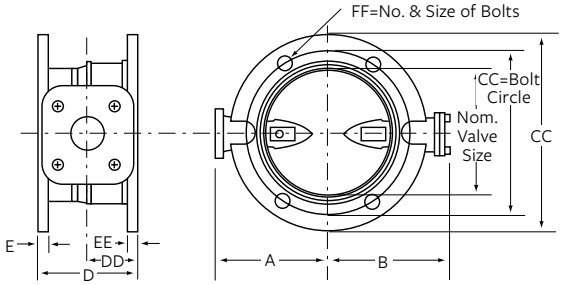
SIZE	A	B	C	D	E	F	G	X
4	5 1/2	3 1/2	9	8 1/8	1	4 – 3/4	7 1/2	3 1/8
6	6 1/2	5 1/8	11	8 1/2	1 1/16	6 – 3/4	9 1/2	3 1/2
8	7 3/4	6 1/2	13 1/4	8 5/8	1 1/8	6 – 3/4	11 3/4	3 5/8
10	9	9 3/4	15 9/16	9 1/4	1 3/16	8 – 3/4	14	4 1/4
12	10 1/2	11 3/8	17 15/16	9 1/4	1 1/4	8 – 3/4	16 1/4	4 1/4
14	11 7/8	12 3/4	20 5/16	11 1/2	1 5/16	10 – 3/4	18 3/4	4 1/2
16	13 1/2	14 5/16	22 9/16	12	1 3/8	12 – 3/4	21	5
18	14 3/8	15 3/8	24 11/16	12 1/4	1 3/8	12 – 3/4	23 1/4	5 1/4
20	16	17	27 3/32	12 1/2	1 1/2	14 – 3/4	25 1/2	5 1/2

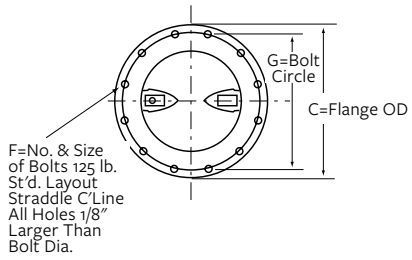
All dimensions shown in inches.
Mechanical joint end is in compliance with ANSI 21.11.

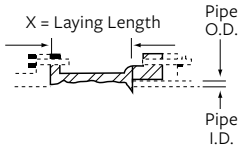
PIPE SIZE	PIPE O.D.	PIPE I.D. MIN.
4	4.80	3.10
6	6.90	5.69
8	9.05	7.65
10	11.10	9.93
12	13.20	11.70
14	15.30	12.91
16	17.40	14.91
18	19.50	16.95
20	21.60	18.96

Available in sizes 4″ - 20″
See Note 1

MODEL 2MFII MECHANICAL JOINT AND FLANGE END BUTTERFLY VALVE







INSTALLATION DIAGRAM

NOTE: Bolts, Nuts, Glands and Gaskets furnished by others unless otherwise specified in contract.

NOMINAL VALVE

SIZE	A	B	C	CC	D	DD	E	EE	F	FF	G	GG	X
6	6 1/2	5 1/8	11	11	6 3/4	4 1/4	1 1/16	1 1/16	8 – 3/4	6 – 3/4	9 1/2	9 1/2	4 1/4
8	7 3/4	6 1/2	13 1/2	13 1/4	7 5/16	4 5/16	1 1/8	1 1/8	8 – 3/4	6 – 3/4	11 3/4	11 3/4	4 13/16
10	9	9 7/8	16	15 9/16	8 5/8	4 5/8	1 1/4	1 3/16	12 – 7/8	8 – 3/4	14 1/4	14	6 1/8
12	10 1/2	11 3/8	19	17 15/16	8 5/8	4 5/8	1 1/4	1 1/4	12 – 7/8	8 – 3/4	17	16 1/4	6 1/8
14	11 7/8	12 3/4	21	20 5/16	9 3/4	5 3/4	1 3/8	1 5/16	12 – 1	10 – 3/4	18 3/4	18 3/4	6 1/4
16	13 1/2	14 3/8	23 1/2	22 9/16	10	6	1 7/16	1 3/8	16 – 1	12 – 3/4	21 1/4	21	6 1/2
18	14 3/8	15 1/4	25	24 11/16	10 1/8	6 1/8	1 9/16	1 7/16	16 – 1 1/8	12 – 3/4	22 3/4	23 1/4	6 5/8
20	16	16 7/8	27 1/2	27 3/32	10 1/4	6 1/4	11 1/16	1 1/2	20 – 1 1/8	14 – 3/4	25	25 1/2	6 3/4

All dimensions shown in inches.

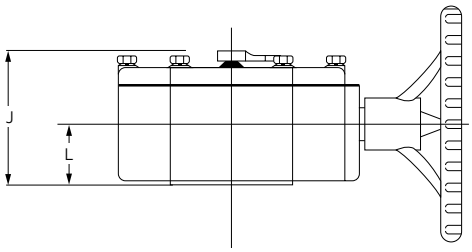
PIPE SIZE	PIPE O.D.	PIPE I.D. MIN.
4	4.80	3.10
6	6.90	5.69
8	9.05	7.65
10	11.10	9.93
12	13.20	11.70
14	15.30	12.91
16	17.40	14.91
18	19.50	16.95
20	21.60	18.96

Available in sizes 6″ - 20″
See Note 1

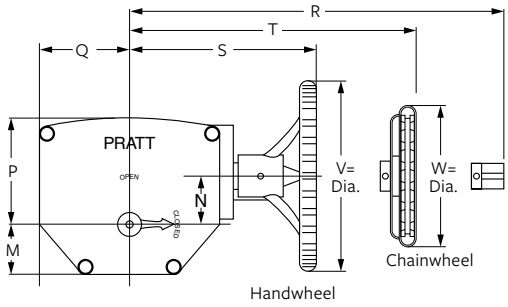
Note 1: Min. Pipe I.D. value has zero clearance between mating pipe and valve disc. Properly sized piping must include appropriate clearance.

ACTUATOR DIMENSIONAL DATA

Models 2FII and MKII Pratt® MDT Manual Actuator



All Dimensions
Shown in Inches



VALVE SIZE	MDT SIZE	J	L	M	N	P	Q	R	S	T	V	W	# TURNS TO CLOSE
3 to 10″	MDT-2S	4 7/8	2	2 1/8	2	4 1/2	4 1/4	7 5/8	7 7/8	7 7/8	8	9 1/8	32
12″	MDT-2S	4 7/8	2	2 1/8	2	4 1/2	4 1/4	7 5/8	7 7/8	7 7/8	12	9 1/8	32
14, 16″	MDT-3S	5 5/8	2 7/16	3 1/4	3 5/32	5 5/8	5 3/8	9 1/4	10 1/2	10	12	9 1/8	30
18, 20″	MDT-4S	6 3/8	2 13/16	3 3/8	4	7 5/16	6 3/4	10 1/2	11 1/2	11	12	9 1/8	40

For further information regarding manual actuators, refer to our Butterfly Valve Actuator brochure.

NOTES

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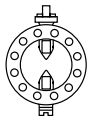
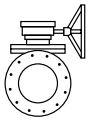
PRATT®
Product Guide

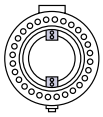


MODEL 2FII

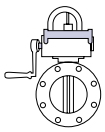
MONOFLANGE MKII



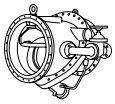
PLUG VALVES



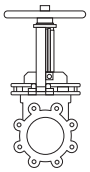
TRITON® XR70



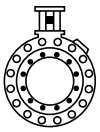
INDICATING BUTTERFLY VALVES UL & FM APPROVED



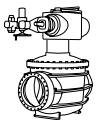
TILTING DISC CHECK VALVES



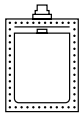
KNIFE GATE VALVES



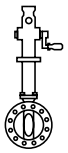
N-STAMP NUCLEAR BUTTERFLY VALVES



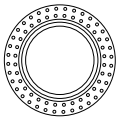
CONE VALVES



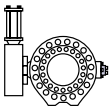
RECTANGULAR



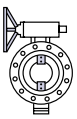
PIVA POST INDICATING VALVES ASSEMBLY UL & FM APPROVED



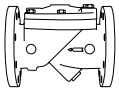
SLEEVE VALVES



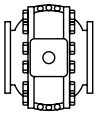
RUBBER SEATED BALL VALVES



TRITON® 250

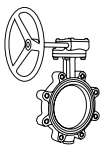


CHECK VALVES

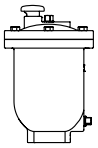


METAL SEATED BALL VALVE

CONTROL SYSTEMS



INDUSTRIAL VALVES



AIR VALVES

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