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### SCOPE OF THE LINE: AWWA RUBBER SEATED BUTTERFLY VALVES



### **MODEL 511A FLANGED BUTTERFLY VALVE**

### **SIZES**

3" through 20"

### **BODY STYLE**

Flanged x flanged ends

### **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

### **ACTUATION OPTIONS**

- MDT manual actuator with AWWA nut, handwheel or chainwheel
- Hydraulic or pneumatic cylinder
- Electric actuator

### **MODEL 510A MECHANICAL JOINT BUTTERFLY VALVE**

### **SIZES**

4" through 20"

### **BODY STYLE**

MJ x MJ ends

### **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**

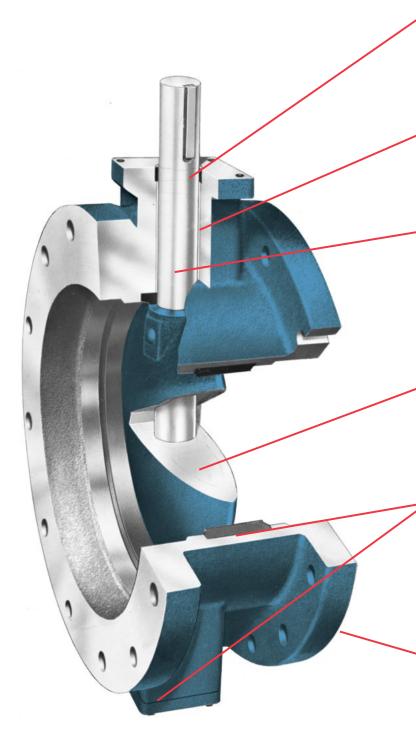
MDT manual actuator with AWWA nut

Please see the outside back cover for a listing of other Milliken products



MODEL 510A BUTTERFLY VALVE

Design Details: Models 511A and 510A — 20" and Smaller



### **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**

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 pipe line.

### **CORROSION RESISTANT SHAFTS**

Shafts in rubber seated butterfly valves, 3" through 20", are constructed of centerless, ground ASTM A276 type 304 or 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

The 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 with stand stresses imposed under a variety of operating conditions.

### **BODY SEAT**

Our standard seats are constructed of Buna N rubber and bonded to the valve body. This molding process ensures that the disc-to-seat interference will not cause excessive wear or abrasion under normal operating conditions. The seat-in-body design minimizes the effects of corrosive build up 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 Models 511A and 510A bodies are heavy duty cast iron. Model 511A flanges are fully faced and drilled in accordance with ANSI B16.1, Class 125 standard for cast iron flanges. Model 510A mechanical joint end connections are in accordance with AWWA C111 and ANSI 21.11. The actuator mounting trunnion is machined and drilled for a 4-bolt connection.

### Features and Benefits of Milliken Models 511A and 510A - 20" and Smaller

### **FEATURE**

- Seat-in-body design
- Seat molded in recessed body cavity, protected by metal on 3 sides
- Valve withstood proof-of-design testing of 100,000 cycles - AWWA only requires 10,000 cycle proof-ofdesign testing
- Through-disc pinning
- Symmetrical lens-shaped disc
- Nonmetallic bearings
- Chevron V-type packing

#### **VALVE SIZE VALVE SIZE VALVE SIZE** C, $\mathbf{C}_{\mathsf{v}}$ C, 10" 16" 323 4458 11413 18" 4" 575 12" 6420 14444 6" 1294 14" 8738 20" C<sub>v</sub> values for the 511A and 510A in the 8" 2300 full open position

### **BENEFIT**

- Reduces seat failure due to corrosive buildup in the valve and pipeline. No hard ware to loosen. No periodic maintenance required. Rubber protected from flow media to increase seat life.
- Proven reliability over the life of the valve
- Provides a tight disc-to-shaft pin connection, greatly reducing the possibility of loosening through vibration
- Higher C<sub>v</sub>: lower head loss results in energy savings for customer's system
- Prevents galvanic corrosion and provides lower coefficient of friction
- Self-adjusting, lasts the life of the valve

### TYPE OF MATERIAL

VALVE SIZE	BODY	DISC	SHAFT
3" - 4"	Ductile Iron	CF-8M	Type 304SS
6"	Cast Iron	CF-8M	Type 304SS
8"- 20"	Cast Iron	Cast Iron / 316SS Edge	Type 304SS

Other materials available upon request

### Suggested Specification for the Milliken Rubber Seated Butterfly Valve, Sizes 3" through 20"

#### **GENERAL**

Butterfly valves shall be manufactured in accordance with the latest revision of AWWA C504, Class 150B and conform to NSF Standard 61. The manufacturer shall have produced AWWA butterfly valves for a minimum of five years. All valves shall be either 511A Flanged or 510A Mechanical Joint and comply with the following details.

### **VALVE BODIES**

Valve bodies shall be constructed of ASTM A126, Class B cast iron. Flanged valves shall be fully faced and drilled in accordance with ANSI Standard B16.1, Class 125. Mechanical joint end connections are in accordance with AWWA C111 and ANSI 21.11.

#### **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.

### **VALVE BEARINGS**

Valve bearings shall be of a self-lubricating, non-metallic 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 A126, Class B cast iron disc with a stainless steel type 316 edge

Discs shall be retained by stainless steel pins which extends 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 DISC**

Valve shafts shall be of stainless steel type 304. At the operator end of the valve shaft, a packing gland utilizing "V" type chevron packing shall be utilized.

### **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 a 2-part liquid epoxy to comply with NSF61 and AWWA Standard C504.

#### **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.

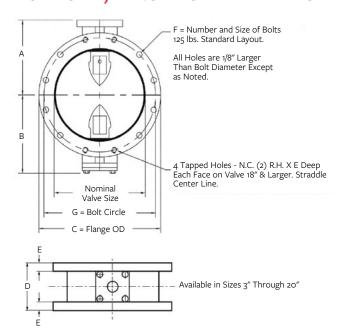
### **MANUAL ACTUATORS**

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 chain wheel. Actuator components shall with stand an input torque of 450 lb. ft. at extreme operator position without damage. Manual actuators shall conform to AWWA C504 and shall be Milliken MDT or an approved equal.



## Dimensional Data

### **MODEL 511A, FLANGED BUTTERFLY VALVE 3" - 20"**

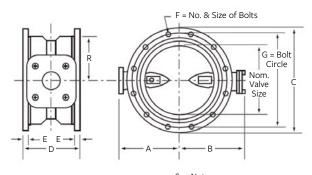


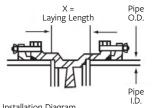
#### **NOMINAL VALVE**

SIZE	Α	В	С	D	E	F	G
3	4-3/4	3-7/8	7-1/2	5	3/4	4 - 5/8	6
4	5-1/2	4-1/8	9	5	1-5/16	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.

### MODEL 510A, MECHANICAL JOINT BUTTERFLY VALVE — 4" - 20"





Installation Diagram

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

See Note 1							
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" through 20"

### NOMINAL VALVE

SIZE	Α	В	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	11/16	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	13/16	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	15/16	10 - 3/4	18-3/4	4-1/2
16	13-1/2	14-1/2	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.

### Actuator Dimensional Data for Models 511A and 510A — 20" and Smaller

#### **MDT MANUAL ACTUATOR** All dimensions shown in inches Dia. Dia. Chainwheel Handwheel # OF TURNS VALVE SIZE MDT SIZE J L S Q TO CLOSE 3" to 12" MDT-2 4-11/16 2 2-1/8 2 4-1/2 4-1/4 8-1/4 7-7/8 7-7/8 8 9-1/8 32 14", 16" MDT-3 5-5/8 3-1/4 5-3/8 5-3/8 10-3/8 10-1/2 10-1/8 12 9-1/8 2-7/16 3-5/32 30 18", 20" MDT-4 6-3/8 22-7/32 3-3/8 4 7-5/16 6-3/4 11-5/16 11-1/2 12 9-1/8 40

### **OPTIONAL ACCESSORIES**

We offer a variety of actuator extensions to meet our customer's requirements. The choice of extension style is determined by the need for valve position indication, location of the actuator and application.

### **EXTENSION STEM WITH AWWA NUT**

Pneumatic, electric and hydraulic operation is available, complete with limit switches and solenoid valves when required.

### **EXTENSION BONNET**

The valve may be ordered with the plug positions pre-set at the factory to suit the port flow requirements. This is achieved by fitting a styling ring to the valve stem.

## INDICATING HANDWHEEL FLOORSTAND, TORQUE TUBE FLOORSTAND, MOTOR ACTUATOR ON FLOORSTAND

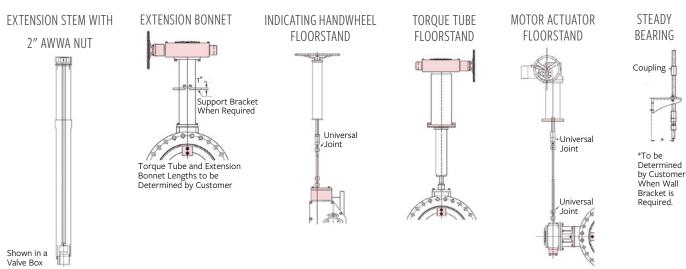
Gear operators are available for all sizes. They can be provided with  $90^{\circ}$ ,  $180^{\circ}$  or  $270^{\circ}$  travel and are fitted with travel stops.  $360^{\circ}$  travel is also available.

### **EXTERNAL PACKING BONNET**

Factory fitted locking devices are available for wrench operated and gear operated valves.

### **STEM GUIDE**

To provide  $90^{\circ}$  flow paths only, a double-style plug is available which operates through  $90^{\circ}$  travel and isolates either straight-through port (Style A90 only).



## <u>AWWA BUTTERFLY VALVES</u>

### **MILLIKEN MODEL 511 FLANGED / 510 MECHANICAL JOINT**



#### **SIZES**

24" through 72"

### **BODY STYLE**

- Flanged (24" 72")
- Mechanical Joint (24" 48")

### **PRESSURE CLASS**

Class 150B per AWWA Standard C504

### **ACTUATION OPTIONS**

- Handwheel
- Electric Motor
- Pneumatic or Hydraulic Cylinder
- Buried Service
- Chainwheel

### **MATERIALS OF CONSTRUCTION**

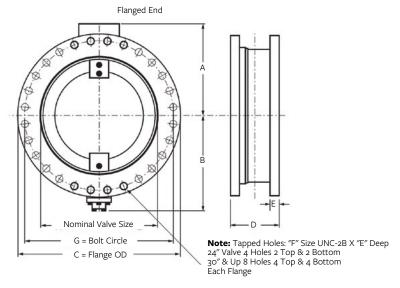
- Body ASTM A126 CLB cast iron
- Disc ASTM A536 Ductile Iron
- Disc Edge ASTM A276 Type 316 stainless steel
- Seat Buna N/EPDM rubber retained in the body
- Seat Segments ASTM A276 Type 316 stainless steel
- Shaft ASTM A276 Type 304 stainless steel
- Bearings Teflon lined fiberglass backed
- Packing Buna N/EPDM V type packing
- Paint Liquid epoxy conforming to NSF 61 (lined and coated)

### FEATURES AND BENEFITS

- Rubber seat in body
- Recessed segmented seat retention
- Mechanically adjustable seat Epoxy paint
- Flow though disc design
- Reduces the chance of seat damage from tuberculation or other solids
- Allows for simple bi-directional point adjustment on rubber seat while keeping hardware out of flowstream

- No special tools or training required to adjust and/or replace the seat
- Reduces potential corrosion and extends valve life
- Disc design results in lower head-loss than solid or hollow disc designs

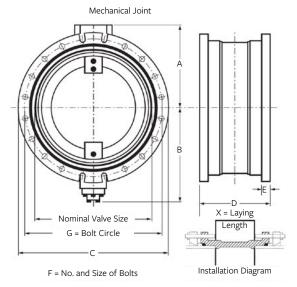
### **FIGURE 511: 24" - 72" CLASS 150 B FLANGED ENDS**



VALVE SIZE	Α	В	C	D	E	F	G
24	18-5/8	16-1/2	32	8	1-7/8	20 - 1-1/4	29-1/2
30	21-1/2	24-1/8	38-3/4	12	2-1/8	28 - 1-1/4	36
36	25-7/16	28	46	12	2-3/8	32 - 1-1/2	42-3/4
42	29-7/8	32-11/16	53	12	2-5/8	36 - 1-1/2	49-1/2
48	34-1/16	36-7/8	59-1/2	15	2-3/4	44 - 1-1/2	56
54	37-1/2	40-11/16	66-1/4	15	3	44 - 1-1/2	62-3/4
60	41-3/4	45-3/16	73	15	3-1/8	52 - 1-3/4	69-1/4
66	46-1/16	45-3/16	73	15	3-1/8	52 - 1-3/4	76
72	50	53-1/8	86-1/2	18	3-1/2	60 - 1-3/4	82-1/2

<sup>\*</sup>Contact us for larger sizes

### FIGURE 510: 24" - 48" CLASS 150 B MECHANICAL JOINT



VALVE SIZE	Α	В	C	D	E	F	G	X
24	18-5/8	16-1/2	31-9/16	14-1/8	1-5/8	16-3/4	30	7-1/8
30	21-1/2	24-1/8	39	20	1-13/16	20 - 1	36-7/8	10
36	25-7/16	28	45-7/8	22	2	24 - 1	43-3/4	14
42	29-7/8	33	53	22	2	28 - 1-1/4	50-5/8	14
48	34-1/16	36-7/8	59-7/8	24	2	32 - 1-1/4	57-1/2	16

<sup>\*</sup>Contact us for larger sizes

### **DESIGN DETAIL**







Suggested Specifications (24" and Larger)

#### **GENERAL**

All butterfly valves shall be of the tight closing, rubber seat type conforming to the design standards of ANSI / AWWA C504 latest revision. Valves shall be bubble-tight at the rated pressure in either direction and shall be suitable for throttling service and/or operation after long periods of inactivity. Manufacturer shall have a minimum of five (5) years experience producing AWWA butterfly valves.

### **BODY**

All valve bodies shall be constructed of ASTM A126 Class B cast iron. Flanged valves shall have ANSI B16.1 flanges with class 125# drilling. Mechanical Joint Valves shall have ends conforming to the ANSI / AWWA C111 / A21.11 standard.

#### **SEAT**

On 24" and larger valves the seat shall be adjustable and replaceable in the field without the use of special tools. Valve seats on valves 24" and larger will be designed for bi-directional adjustment without removal of the seat. Valve designs with the rubber seat on the disc are not acceptable.

### DISC

The discs shall be constructed of ASTM A536 Ductile Iron with a 316 stainless steel edge. 24" and larger discs will be the flow through design.

### **SHAFT**

The valve shaft shall be constructed of stainless steel ASTM A276 type 304. On valves 24'' and larger, a taper pin of 316 stainless steel will be used as the disc/shaft connection.

### **BEARINGS**

All shaft bearing shall be of the self-lubrication, corrosion-resistant sleeve type. Bearings shall be designed for horizontal and/or vertical shaft loading.

#### **PACKING**

On valves 24" and larger the packing will be V-type. All packing will be self adjusting and wear compensating. Valve packing arrangement shall be designed so that actuator removal will not result in packing seal failure.

### **PAINT**

Valves 24" and larger will be lined and coated with a liquid epoxy conforming to AWWA C550 and NSF61. Coatings will be a minimum of 8 mils DFT.

#### **TESTING**

All valves shall be hydrostatic and leak tested in accordance with ANSI / AWWA C504.

### **MANUAL ACTUATORS**

Manual actuators shall be AWWA approved worm gear actuators. The actuator incorporates a hardened worm with bronze heavy duty quadrant within a ductile iron housing. Gear must be 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. Worm gear to be rated 450 foot pounds at the stops.

Valves shall be Milliken model 511 / 510 or approved equivalent.



### **MILLIKEN®**

### **Product Guide**



- **SERIES 600/601**  Low Pressure Drop **Eccentric**
- **Plug Valve**
- Flanged and MJ
- Welded Nickel Seat Stainless Steel Bearings ANSI-B16.1 Flanges Solid Ductile Iron Plug

Flanged & MJ Ends

Sizes 2" - 72" FL

• Sizes 3" - 48" MJ

- **SERIES 601SS**

- **Eccentric Plug Valve**

- - Integral Stainless Seat • Stainless Bearings
  - Stainless Steel Body
  - ANSI B16.5 Class 150 Flanges
  - Solid Stainless Steel Plug
  - Low Pressure Drop
  - Size: 1/2" 24"



SERIES 601RL

**Eccentric Plug Valve** Rubber Lined

- Soft or Hard Rubber Lining Stainless Steel Bearings
- ANSI B16.1 Flanges • Solid Ductile Iron Plug
- Low Pressure Drop
- Sizes 3" 54"
- Metal Plugs Available - Consult Factory



SERIES 602

**Eccentric Plug Valve** High Pressure

- Ductile Iron Body ANSI B16.1 Flanges
- MJ AWWA C111
- Welded Nickel Seat
- Solid Ductile Iron Plug
- Low Pressure Drop
- Sizes 2" 72" FL
- Sizes 3" 48" MJ



- **SERIES 613A**
- Eccentric **Plug Valve** Threaded End
- Ductile Iron Construction Round Port
  - Stainless Steel Bearings
  - Low Pressure Drop
  - Memory Stop
  - NPT Fnd Connections Sizes 1/2" - 2"



**SERIES 604E** Eccentric

Plug Valve Three Way Valve

- Epoxy Seat
- Solid Ductile Iron Plug
- Stainless Steel Bearings • Low Pressure Drop
- Lift & Turn NOT Required
- · High Solids & Flow Capacity
- Sizes 3" 16"

Full / 100% PORT

Welded Nickel Seat

Stainless Steel Bearings



- **SERIES 606**
- Eccentric
- **Plug Valve**
- Grooved End
- Welded Nickel Seat • Stainless Steel Bearings AWWA C-606 Grooved
- Solid Ductile Iron Plug I ow Pressure Drop
- Ductile or Steel Pipe Sizes 3" - 24"

- Ductile Iron Body ANSI B16.1 Flanges
- MJ AWWA C111
- Welded Nickel Seat
- Solid Ductile Iron Plug
- Low Pressure Drop
- Sizes 2" 72" FI
- Sizes 3" 48" MJ





- Complies with AWWA C-504
- Class 150B Flanged or MJ
- · Cast Iron Body and Disc Seat in Body
- Flow Through Disc on
- 24" and Larger
- Epoxy Paint on All Sizes Standard



- MODEL 625 **Eccentric** Plug Valve
- Available in Threaded and Flanged Ends Rated for 175 psi
- Sizes 1/2" 4" • UL / CGA Listed
- SERIES 600FP/601FP
- **Plug Valve**
- - **Eccentric**
- ANSI-B16.1 Flanges Solid Ductile Iron Plug
  - Low Pressure Drop Flanged & MJ Ends
  - Sizes 2" 48" FL Sizes 3" - 48" MJ
- FIGURE 396/397 **General Service Butterfly Valve** 
  - - Wrench or Gear Operated Available
- Upon Request 2" - 48" Size Range

Ductile Iron Body

Other Materials

DI-NP Disc



**FIGURE 510A/511A** 

**AWWA Butterfly Valve** 

- 3" 72"



**SERIES 8500 AWWA** 

**Swing Check** 

- Full Waterway Ductile Iron
- Construction Weight or Spring
- Air Cushion SS Body Seat Ring
- Buna Disc Insert



- SERIES 8000
- **AWWA Swing Check**
- Full Waterway • Weight or Spring
  - Bronze / Buna / EPDM Disc Insert • Sizes 2" - 36"



SERIES 9000



- **AWWA Swing Check**
- Clear Waterway Weight or Spring
- Air or Oil Cushion • Bronze / SS Body Seat Ring
- Bronze / Buna / EPDM

Sizes 3" - 72"



- **SERIES 720A** Wafer **Check Valve**
- - Center Guided Check Valve • Rated for 250 psi
  - SS Disc / EPDM Seat Sizes 2" - 12"



- High Flow Capacity
- Narrow Face-to-Face

- Million Cycle Certification • Complete Ductile Iron Construction

• Bronze / SS Body Seat Ring

- 250 psi Pressure Rating · Fully Epoxy Lined Interior No Internal Shafts, Bearings
- or Bushings No External Levers. Weights or Springs
- Mechanical Indicator (3" 16")



Wafer Pattern Check Valve



 Center Guided Check Valve SS Disc / EPDM Seat and is Available



For more information about us or to view our full line of water products, please visit www.millikenvalve.com or call Milliken customer service at 1.800.423.1323.

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Global Style in Sizes 2" - 24



