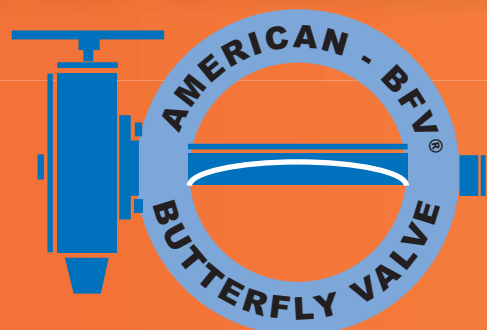


VAL-MATIC®

Proven Design

Preferred Features

Advanced Technology



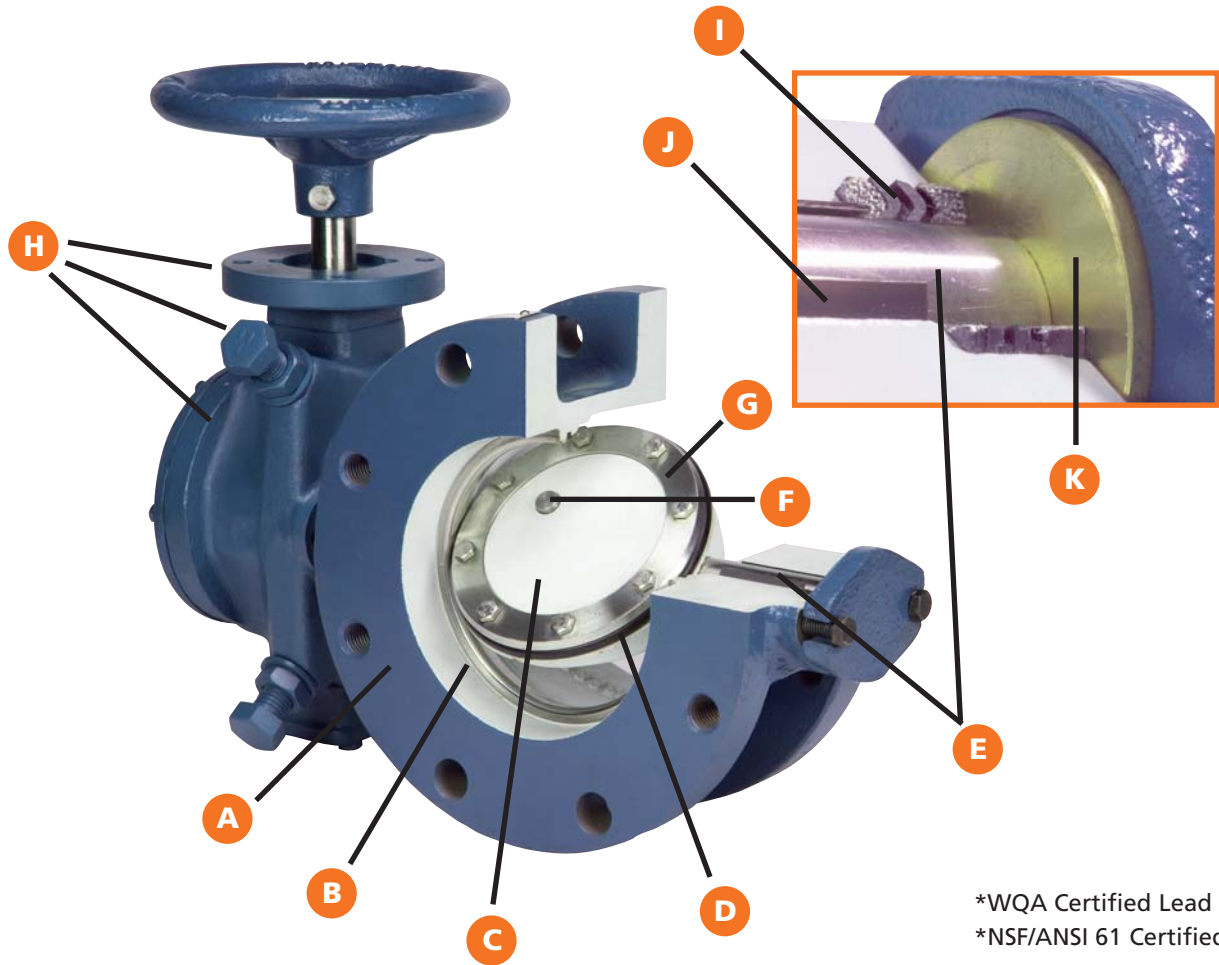
**AWWA
Rubber Seated
Butterfly Valve**



www.valmatic.com

WQA Certified Lead-Free
NSF/ANSI 61 Certified

Feature Highlights



*WQA Certified Lead Free
*NSF/ANSI 61 Certified

A. Body

Available in Wafer, Flanged, Mechanical Joint and Flange x Mechanical Joint End Connections in AWWA Classes 150B and 250B.

B. Body Seat

360° uninterrupted body seat with no shaft penetration insures leak free performance. Type 316 Stainless Steel provides long life and corrosion free mating surface for resilient seat.

C. Ductile Iron Disc

Ductile Iron provides strength and rigidity to withstand dynamic forces from flow and pressure transients. The added strength allows the disc design to have a smaller cross section providing improved headloss characteristics.

D. Rubber Seat

Special formulated elastomers for chemical resistance and long cycle

life. The 360° resilient seat is uninterrupted for positive seating.

E. Shaft

Stainless Steel shafts meet AWWA C504 diameter requirements. Through-shafts provided standard on sizes 3"- 24" and available on 30" and larger when specified.

F. Tangential Taper Pins

Stainless Steel Taper Pins with lock nut and o-ring seal utilize tangential forces of the taper pin and lock nut to provide the most secure method available of locking the disc to the shaft.

G. Tri-Loc™ Seat Retention System

With over 35 years of proven dependability the Tri-Loc™ Seating System is easily adjusted and field replaceable. All seat hardware is Type 316 Stainless Steel.

H. Traveling Nut Actuator

The traveling nut design provides characterized closure during the last half of travel. Exclusive externally adjustable stops are rated to 450 ft-lbs of input torque. Standard FA10 motor mounting flange provides ease of automation.

I. Shaft Seal

Shaft seal is a self-adjusting/wear compensating V-Type packing. Packing is easily replaced without removal of the valve from the line.

J. Sleeve Bearings

Low friction bearings are self-lubricating and non-corrosive, for a long, trouble-free life.

K. Thrust Bearing

Factory-set bronze thrust bearing assures proper centering of valve disc. Thrust bearings are field adjustable in sizes 30" and larger.

PROVEN DESIGN

The American-BFV® is designed, manufactured, and tested to meet all AWWA C504 and C516 requirements including performance tests, leakage tests, and hydrostatic testing. Third-party Proof of Design Testing was successfully completed and flow testing was performed at the Utah State Hydraulics Lab, one of the premier testing labs in the world.

With thousands of field installations throughout the world, the American-BFV® design has proven dependable since 1971.

The valves are certified for use in drinking water in accordance with NSF/ANSI 61 and are WQA Certified Lead-Free.

PREFERRED FEATURES

The American-BFV® provides the features that engineers and users have requested and are included in the AWWA C504 and C516 Butterfly Valve standards. The American-BFV® is designed to provide long life and trouble-free performance. If maintenance becomes necessary, the valve is also designed for easy field service. The shaft seal incorporates V-type packing which is easily replaced in the field without removal from the line. Adjustment of the resilient seat is easily performed with a torque wrench, as compared to epoxy filled seats that require special equipment and materials or bonded seats that cannot be replaced or adjusted in the field.

The unique Tri-Loc™ seat retention system assures seat integrity

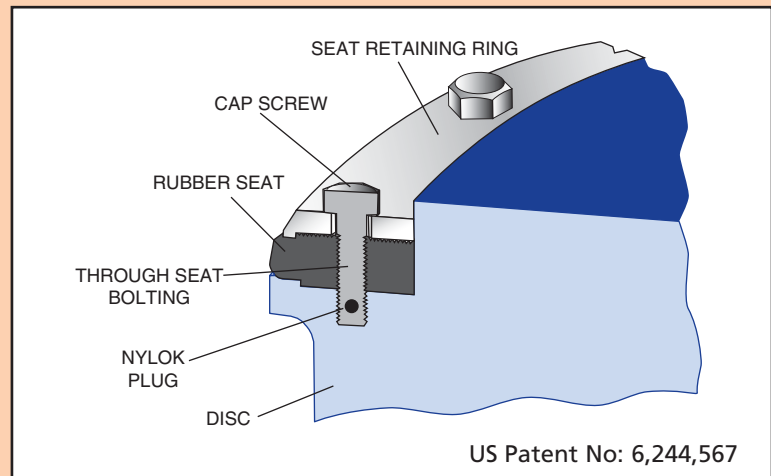
by securing the seat through three different mechanical methods to assure long-term dependable service, See Figure 1. All seat designs provide excellent seating but only the Tri-Loc™ provides ease of adjustment or replacement in the field if ever needed.

The American-BFV® disc is ductile iron in all sizes. The added strength allows the disc design to have a smaller cross section providing improved headloss characteristics. The American-BFV® will withstand flow rates and pressure transients beyond the maximum AWWA pressure rating.

ADVANCED TECHNOLOGY

Incorporating the latest in valve technology assures a high-quality valve that will provide long service. The design process utilized Solid Modeling and Finite Element Analysis (FEA) of the key structural components. Flow and torque data was derived from flow tests, mathematical models and Computational Fluid Dynamics (CFD). Manufacturing technology uses automated process control in the foundry and ISO 9001 controlled manufacturing processes. Every valve is tested in accordance with AWWA C504 and C516.

Figure 1. Tri-Loc™ Seat Retention System



The Tri-Loc™ seat retention system provides reliable sealing and positive mechanical retention of the valve seat while allowing easy adjustment or replacement in the field.

The seat is secured by three methods: 1) clamp force, 2) through the seat bolting and 3) opposing machined registers in the disc and seat retaining ring. Clamp force is provided by tightening the Nylok* cap screws. Tightening the screws applies pressure to the serrated seat retaining ring which in turn creates a "clamp force" on the rubber molded seat. These same cap screws provide through-bolting seat retention by passing through precision molded holes in the rubber seat. Finally, molded shoulders in the rubber seat are captured by machined registers in the disc and retention ring preventing outward movement of the seat.

*Nylok is a registered trademark of Nylok corporation.

Valve Construction

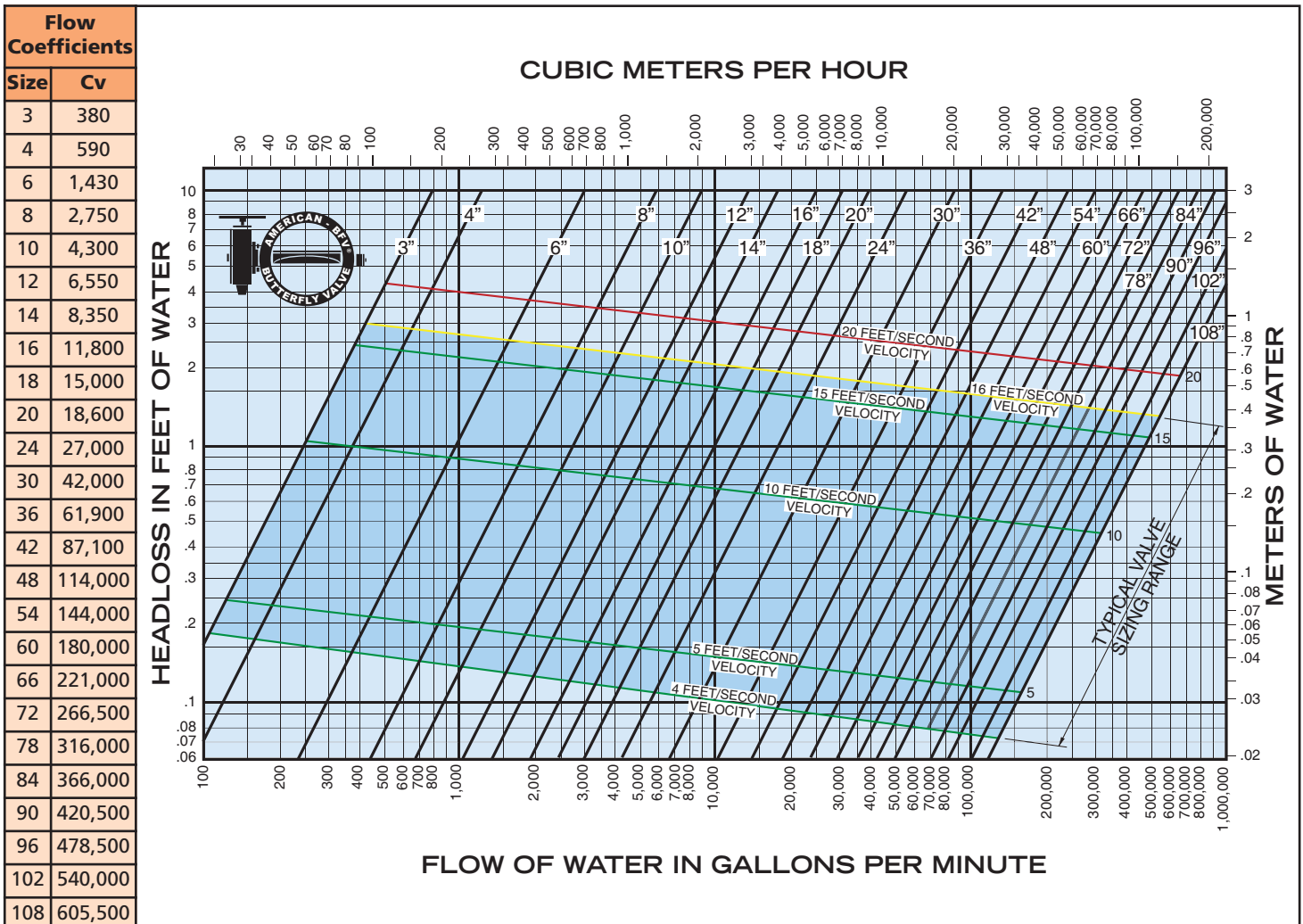
PRESSURE RATINGS

MAXIMUM PRESSURE RATINGS			
SERIES	CONNECTION	AWWA Class	CWP (psig)
2000	ANSI 125# Gray Iron Flange	150B	150
2100	AWWA MJ Gray Iron	150B	150
2200	ANSI 250# Ductile Iron Flange	250B	250
2300	AWWA MJ Ductile Iron	250B	250
2400	ANSI 125# Ductile Iron Flange	250B	250
2500	ANSI 125# Gray Iron Wafer	150B	150
2600	ANSI 125# FLG x MJ Gray Iron	150B	150

MATERIALS OF CONSTRUCTION

COMPONENT	STANDARD	OPTIONAL
150B Body 3"-72"	Cast Iron ASTM A126, Class B	Ductile Iron, Bronze Stainless Steel Steel
150B Body 78"-108"	Ductile Iron ASTM A536 Gr. 65-45-12	Bronze Stainless Steel Steel
250B Body 3"-108"		
Disc	Ductile Iron ASTM A536 Gr. 65-45-12	Bronze Stainless Steel Steel
150B Shaft 3"-72"	Stainless Steel ASTM A276 Type 304	Stainless Steel Type 316, Monel
150B Shaft 78"-108"	Stainless Steel ASTM A564 Type 630, H1150	Monel
250B Shaft 3"-108"		
Resilient Seat	Buna-N	EPDM, Viton
Body, Seat and Hardware	Type 316 Stainless Steel	Monel
Shaft Bearings 3" - 24"	Nylatron	Teflon, Bronze
Shaft Bearings 30" and Larger	Teflon-Lined, Fiberglass-Backed	Teflon-Lined, Stainless Steel or Bronze Backed

Headloss Chart



Actuation/Controls

Val-Matic manufactures a wide variety of manual and power actuators that include traveling nut actuators, worm gears, cylinders and motors. In addition Val-Matic valves are easily adaptable for mounting custom actuators such as: vane, spring-return, rack and pinion, electro-hydraulic, air/oil and other specified cylinder or electric motor actuators.

Val-Matic control systems provide reliable power and control of hydraulic actuated butterfly valves. Val-Matic control panels use the highest quality components and provide field adjustable operation of valves. Oil accumulator systems provide hydraulic power for valves even after power failure. Electrical panels provide for remote monitoring of valve operation and alarm conditions.

TRAVELING NUT ACTUATOR

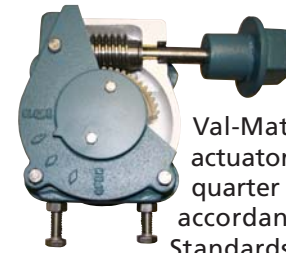
SLOTTED LEVER



LINK AND LEVER



WORM GEAR MANUAL ACTUATOR



Val-Matic's worm gear actuators provide precise quarter turn actuation in accordance with AWWA Standards. Worm gears include externally adjustable mechanical stops to control end of valve travel. Optional spur gear assemblies are provided to increase mechanical advantage thereby reducing the handwheel and nut input torques.

Val-Matic's traveling nut manual actuators are designed to specifically match the torque characteristics of Val-Matic Butterfly Valves and are built in accordance with AWWA Standards. The traveling nut actuator provides characterized closure which allows the valve to slowly close during the last half of travel to reduce pipeline surges. Val-Matic actuators have the exclusive feature of externally adjustable stops rated to 450 ft-lbs of input torque.

ELECTRIC MOTOR ACTUATION



Val-Matic's motorized traveling nut and worm gear actuators are designed to match the torque characteristics of quarter turn valves. The actuators are built in accordance with AWWA Standard C542 for Electric Actuators and are equipped with thermal overloads, torque switches and limit switches to protect the actuator and valve.

AIR, OIL AND WATER CYLINDER ACTUATOR



Val-Matic's cylinder actuators are designed and built in accordance with AWWA C541 for Hydraulic Actuators. They provide reliable characterized closure and feature externally adjustable closed stops. Cylinders are constructed of stainless steel for air, oil or water supply media to 150 psig. Cylinder actuators can be equipped with limit switches, positioners, solenoid valves, and flow control valves to provide control functions.

CONTROL SYSTEMS



Oil Accumulator Systems consist of redundant oil pumps and air compressors piped to an ASME certified air-over-oil accumulator tank. The system provides a clean and reliable oil supply to operate all of the pump control valves even after power outages.



Hydraulic Control Panels operate pump control valves using air, oil, or water and include solenoid and flow control valves for slow open, slow close, and emergency shutdown. The panels feature rugged corrosion resistant piping in a NEMA 4X enclosure with window, shutoff valve, and supply pressure gauge.



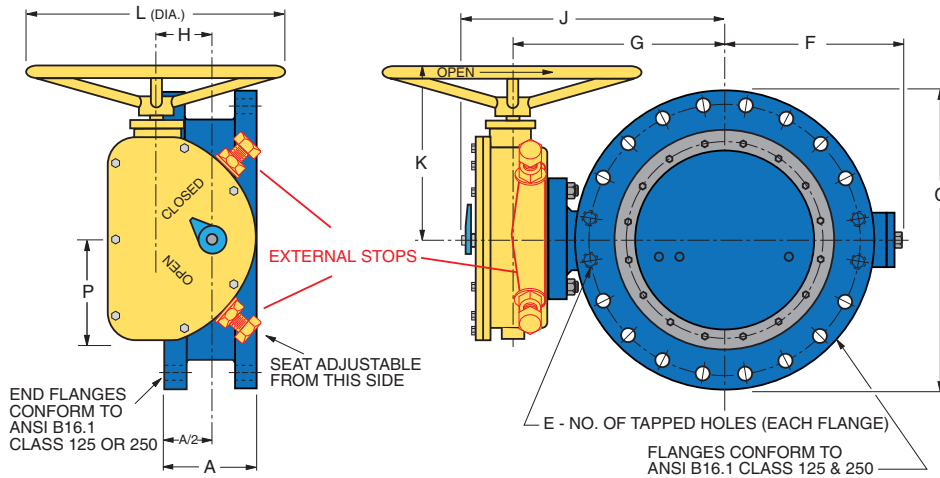
Electric Control Panels provide the interface between the hydraulic control panel and the pump motor controls. The NEMA 4X panel displays valve position and alarm conditions with heavy-duty pilot lights and controls critical system functions with socket-type relays and timers.

Installation Dimensions

FLANGED END CONNECTION

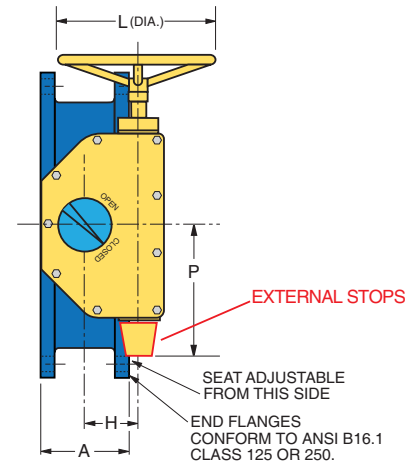
3" - 24"

Actuator Orientation



30" - 36"

Actuator Orientation



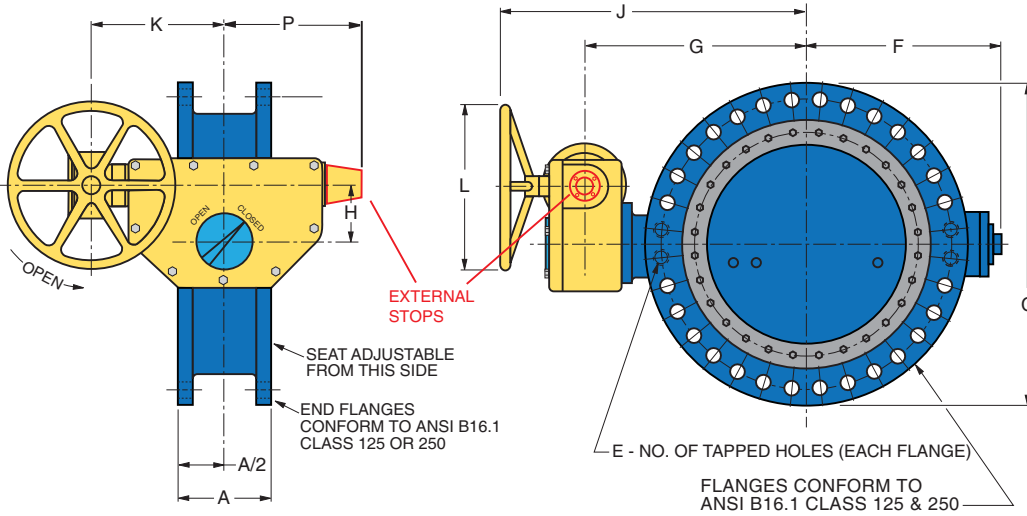
Dimensions in Inches

Valve Size	Pressure Class	A	C	E	F	G	H	J	K	L	P	Turns to Open	Actuator Size	Weight
3	150B	5.00	7.50	4	6.00	7.56	1.50	9.62	9.38	8	5.65	15	LS-1A	66
	250B	5.62	8.25	8										75
4	150B	5.00	9.00	0	6.00	7.56	1.50	9.62	9.38	8	5.65	15	LS-1A	71
	250B	5.62	10.00											80
6	150B	5.00	11.00	4	7.00	8.25	1.50	10.38	9.38	8	5.65	15	LS-1A	90
	250B	5.88	12.50			8.50								130
8	150B	6.00	13.50	0	8.00	9.18	1.50	11.25	9.38	8	5.65	15	LS-1A	125
	250B	7.00	15.00			4								9.75
10	150B	8.00	16.00	0	10.00	11.69	2.00	14.12	10.38	12	6.50	20	LS-2A	200
	250B	9.38	17.50											225
12	150B	8.00	19.00	0	11.06	12.75	2.00	15.25	10.38	16	6.50	20	LS-2A	250
	250B	9.50	20.50			13.00								300
14	150B	8.00	21.00	0	13.50	15.69	3.50	19.00	15.06	24	9.15	35	LS-3A	400
	250B	9.50	23.00											4
16	150B	8.00	23.50	0	14.62	16.69	3.50	20.00	15.06	24	9.15	35	LS-3A	480
	250B	9.62	25.50											4
18	150B	8.00	25.00	4	15.50	18.12	5.00	21.62	18.25	24	10.80	50	LS-4A	640
	250B	9.62	28.00											750
20	150B	8.00	27.50	4	17.50	20.12	5.00	23.62	18.25	24	10.80	50	LS-4A	775
	250B	9.62	30.50											900
24	150B	8.00	32.00	4	20.50	23.12	5.00	26.62	18.25	24	10.80	50	LS-4A	1085
	250B	9.75	36.00											30
30	150B	12.00	38.75	4	27.38	29.12	8.50	34.50	31.00	24.00	17.75	63	LS-5A	2435
	250B	13.75	43.00											2800
36	150B	12.00	46.00	4	29.50	31.88	8.50	37.25	31.00	24.00	17.75	63	LS-5A	3425
	250B	14.00	50.00											4000

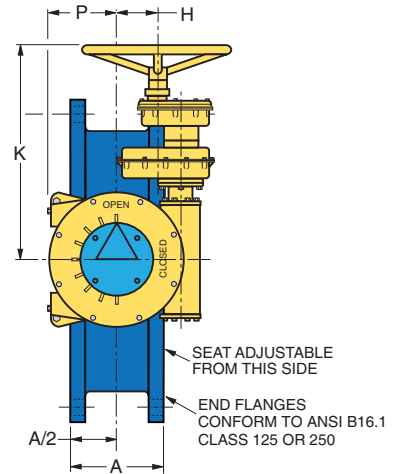
Installation Dimensions

FLANGED END CONNECTION

42" - 90"
LS Actuator Orientation



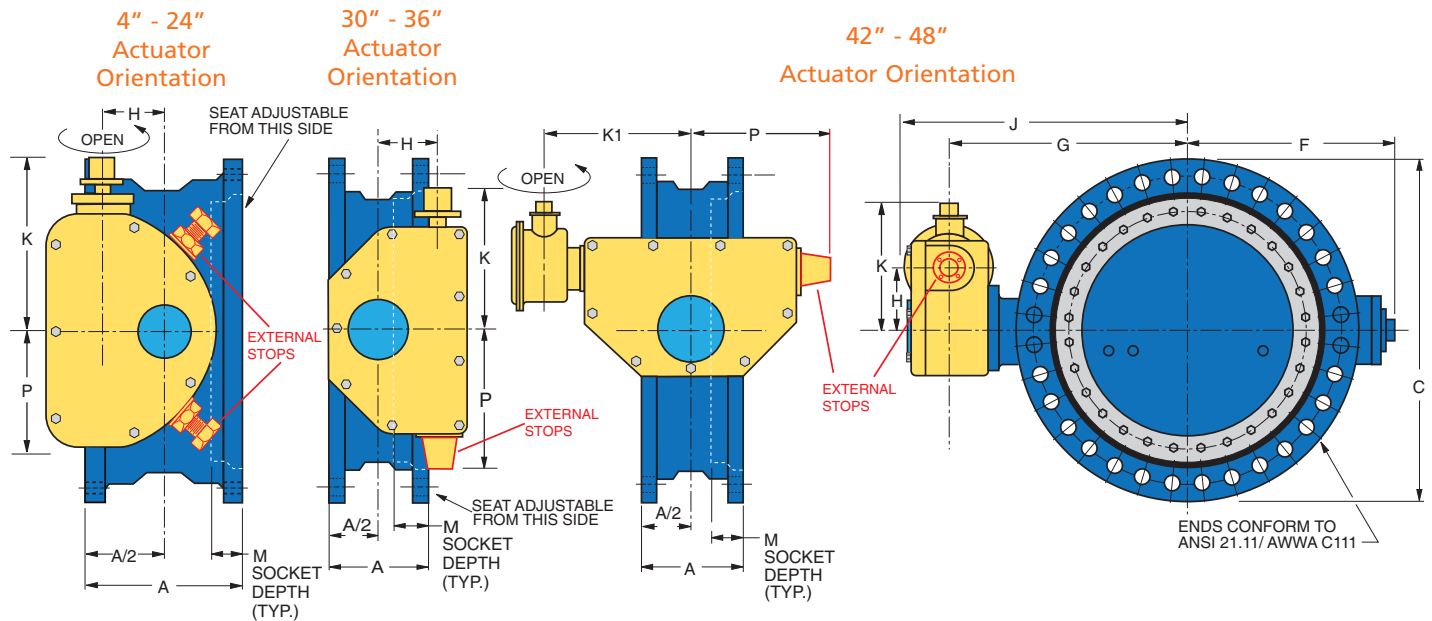
96" - 108"
Worm Gear
Actuator Orientation



Dimensions in Inches														
Valve Size	Pressure Class	A	C	E	F	G	H	J	K	L	P	Turns to Open	Actuator Size	Weight
42	150B	12.00	53.00	4	35.25	35.88	8.50	49.50	19.50	24.00	17.75	187	LS-5.2A	4544
	250B	14.12	57.00											5200
48	150B	15.00	59.50	4	39.31	41.44	10.50	57.75	24.88	24.00	21.88	290	LS-6A	6925
	250B	17.50	65.00											8100
54	150B	15.00	66.25	8	44.25	45.44	10.50	61.75	24.88	24.00	21.88	290	LS-6A	9255
	250B		73.00											12880
60	150B	15.00	80.00	8	53.31	59.38	10.50	76.38	24.88	24.00	21.88	290	LS-6A	14820
	250B		86.50											17800
72	150B	18.00	93.00	8	54.50	73.63	14.00	94.38	32.25	24.00	28.75	579	LS-7.3A	15300
	250B		99.75											16400
78	150B	18.00	106.50	8	62.88	82.50	14.00	105.75	32.25	36.00	28.75	579	LS-7A	19700
84	150B	19.00	113.25	8	68.50	72.00	19.69	92.47	50.00	24.00	21.3	416	3500	24000
90	150B	20.00	120.00	8	71.70	76.10	19.69	96.57	54.00	30.00	21.3	832	3T00	28000
96	150B	21.00	126.75	8	75.38	79.53	19.69	100.00	56.00	36.00	21.3	832	3T00	32000

Installation Dimensions

MECHANICAL JOINT END CONNECTION

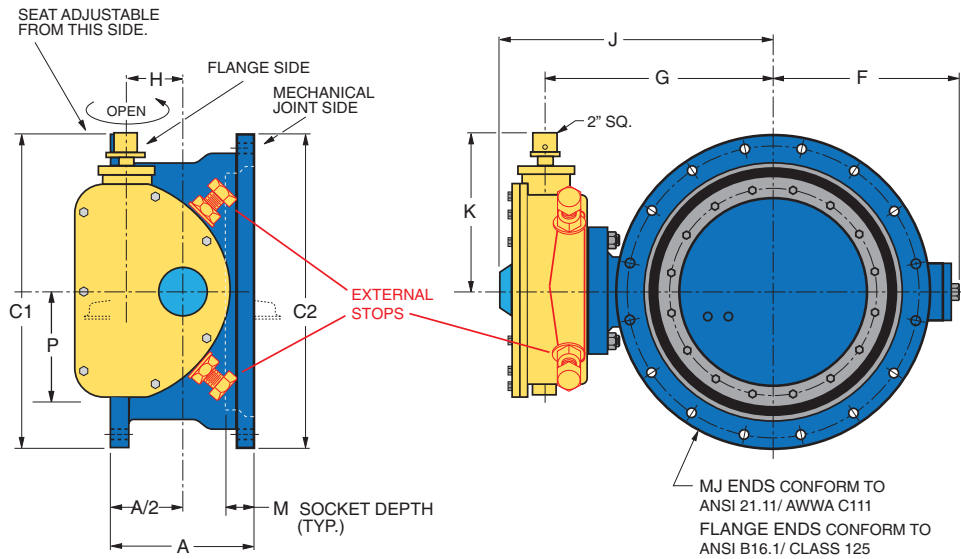


Dimensions in Inches

Valve Size	Pressure Class	A	C	F	G	H	J	K	K1	M	P	Actuator Size	Weight
4	150B	7.50	9.38	6.00	7.62	1.50	9.62	7.62	-	2.50	5.65	LS-1A	90
	250B												
6	150B	8.00	11.12	7.03	8.25	1.50	10.25	7.62	-	2.50	5.65	LS-1A	135
	250B												
8	150B	8.25	13.37	8.00	9.18	1.50	11.25	7.62	-	2.50	5.65	LS-1A	190
	250B												
10	150B	8.88	15.81	10.00	11.68	2.00	14.12	8.62	-	2.50	6.50	LS-2A	265
	250B												
12	150B	10.00	17.93	11.06	12.75	2.00	15.25	8.62	-	2.50	6.50	LS-2A	345
	250B												
14	150B	13.00	20.31	13.50	15.68	3.50	19.12	12.06	-	3.50	9.15	LS-3A	560
	250B												
16	150B	14.00	22.56	14.62	16.75	3.50	20.12	12.06	-	3.50	9.15	LS-3A	670
	250B												
18	150B	14.13	24.81	15.50	18.18	5.00	21.87	13.75	-	3.50	10.80	LS-4A	875
	250B												
20	150B	14.00	27.12	17.50	20.18	5.00	23.87	13.75	-	3.50	10.80	LS-4A	1070
	250B												
24	150B	15.63	31.56	20.50	23.18	5.00	26.87	13.75	-	3.50	10.80	LS-4A	1395
	250B												
30	150B	18.12	39.12	27.37	29.18	8.50	35.00	19.50	-	4	17.75	LS-5A	2480
	250B												
36	150B	19.25	46.00	29.50	31.87	8.50	37.75	19.50	-	4	17.75	LS-5A	3775
	250B												
42	150B	19.75	53.12	35.25	35.87	8.50	41.75	17.50	19.50	4	17.75	LS-5.2A	5800
	250B												
48	150B	21.31	60.00	39.31	41.50	10.50	50.25	22.25	24.87	4	21.88	LS-6A	8600
	250B												

Installation Dimensions

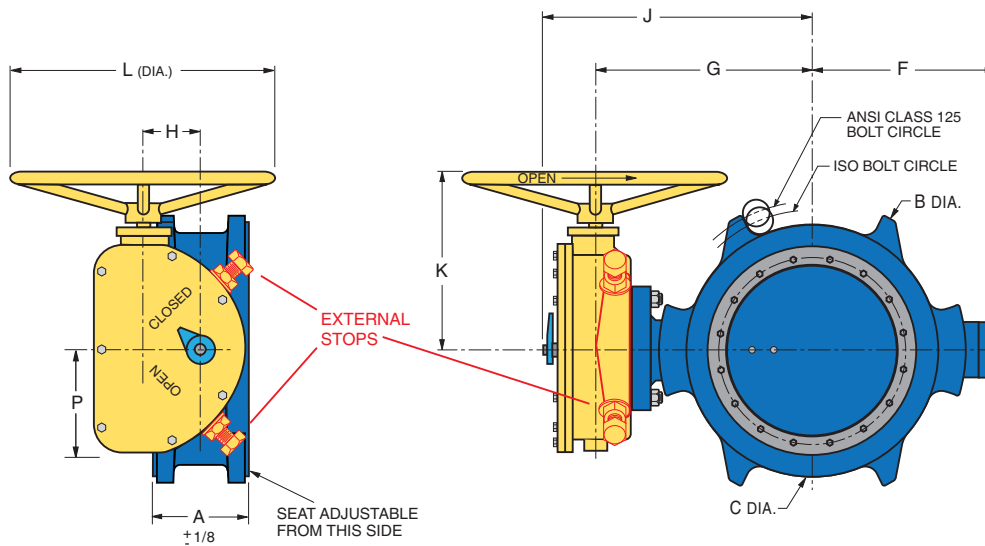
FLANGE X MECHANICAL JOINT END CONNECTION



Dimensions in Inches

Valve Size	Pressure Class	A	C1	C2	F	G	H	J	K	M	P	Actuator Size	Weight
6	150B	6.75	11.00	11.12	7.03	8.25	1.50	10.25	7.62	2.50	5.65	LS-1A	110
8	150B	7.50	13.50	13.38	8.00	9.18	1.50	11.25	7.62	2.50	5.65	LS-1A	165
12	150B	8.62	19.00	17.94	11.06	12.75	2.00	15.25	8.62	2.50	6.50	LS-2A	300
16	150B	10.00	23.50	22.56	14.62	16.75	3.50	20.12	12.06	3.50	9.15	LS-3A	600

WAFER END CONNECTION



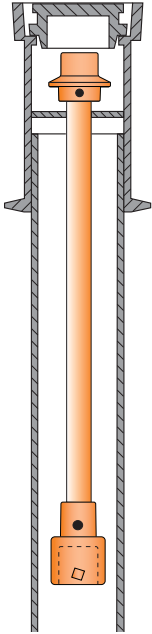
Dimensions in Inches

Valve Size	Pressure Class	A	B	C	F	G	H	J	K	L	P	Turns to Open	Actuator Size	Weight
4	150B	2.25	7.88	6.41	6.00	7.56	1.50	9.62	9.38	8	5.65	15	LS-1A	48
6	150B	2.81	9.70	8.59	7.00	8.25	1.50	10.38	9.38	8	5.65	15	LS-1A	64
8	150B	2.94	12.50	10.75	8.00	9.18	1.50	11.25	9.38	8	5.65	15	LS-1A	70
10	150B	3.13	14.75	12.94	10.00	11.69	2.00	14.12	10.38	12	6.50	20	LS-2A	110
12	150B	3.38	17.38	14.88	11.06	12.75	2.00	15.25	10.38	16	6.50	20	LS-2A	125

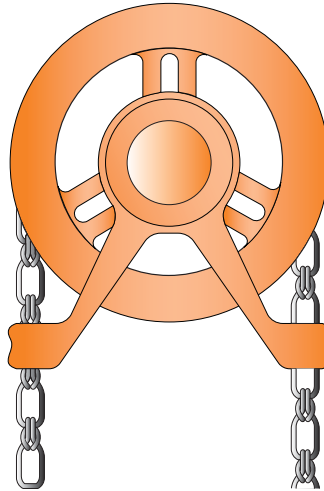
Accessories

Space limitations and application specifics often require special accessories. In addition to those shown below, Val-Matic offers a wide range of accessories to meet your application requirements. Please consult factory for assistance.

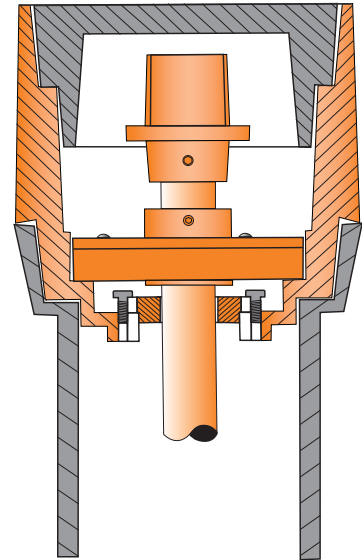
Extension Stem



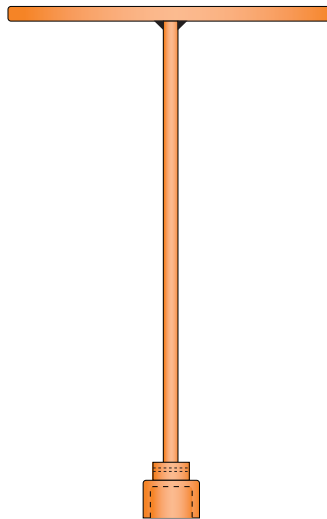
Chainwheel



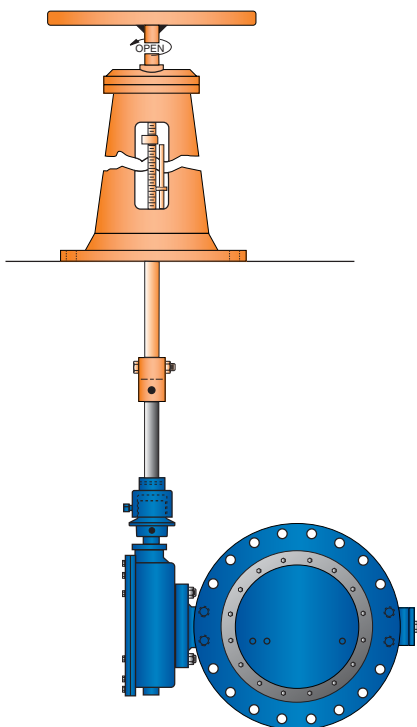
Ground Level Position Indicator



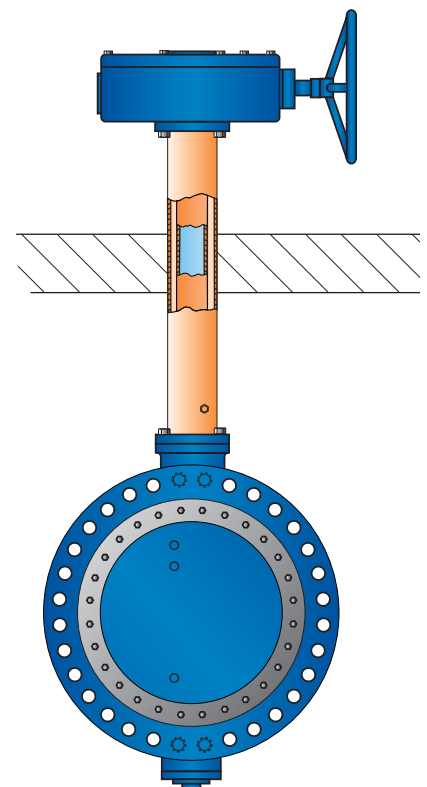
"T" Wrench



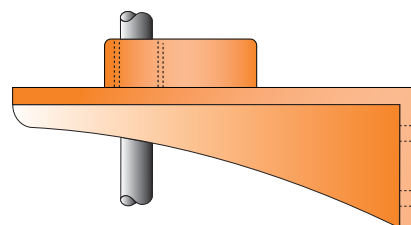
Floor Stand



Extended Bonnet



Stem Guide



SCOPE

- 1.1 This specification is designed to cover the design, manufacture, and testing of AWWA Class 150B (3"-108") and AWWA Class 250B (3"-48") butterfly valves.

STANDARDS AND APPROVALS

- 2.1 The valves shall be designed, manufactured and tested in accordance with American Water Works Association Standard ANSI/AWWA C504 and C516.
- 2.2 Valves shall be proof of design tested in accordance with ANSI/AWWA C504 and C516, and certified to NSF/ANSI 61 Drinking Water System Components - Health Effects and certified to be Lead-Free in accordance with NSF/ANSI 61 - Annex G.
- 2.3 Manufacturer shall have a quality management system that is certified to ISO 9001:2008 by an accredited, certifying body.

CONNECTIONS

- 3.1 Flanged end connections shall fully conform with ANSI B16.1 for Class 125, Class 250 iron flanges, or AWWA C207 Class D. Both 125 and 250 flanges shall be flat faced.
- 3.2 Mechanical Joint end connections shall fully conform with ANSI/AWWA C111/A21.11.
- 3.3 Wafer end connections shall be designed for installation between ANSI B16.1 Class 125 iron flanges or between ISO 7005-2 PN10 or PN16 flanges.

DESIGN

- 4.1 Valve shafts shall be of the through-type for sizes 3"-24". 30" and larger shall be of the stub type design. Shafts shall be locked to the disc by o-ring sealed taper pins retained with stainless steel nuts. Through-type shafts shall be supplied on 30" and larger valves when specified.
- 4.2 Valve discs shall be of the solid type without external ribs or vanes to obstruct flow.
- 4.3 Resilient seats shall be located on the valve disc and shall provide a 360° continuous, uninterrupted seating surface. Seats shall be mechanically retained with a stainless steel retaining ring and stainless steel Nylok® cap screws which shall pass through both the resilient seat and the retaining ring. The retaining ring shall be continuous or investment cast with overlapping sections, serrated grooves, and shoulders providing a Tri-Loc™ system. The resilient seat's mating surface shall be to a 360° continuous, uninterrupted stainless steel body seat ring. Resilient seats shall be field adjustable and replaceable without removing the valve from the line and shall not require epoxy, syringes, needles or pressure vessels to replace or adjust.
- 4.4 Sleeve bearings shall be provided in the valve hubs and shall be nylatron or woven teflon, fiberglass backed. They shall be self-lubricating.
- 4.5 Thrust bearings shall be provided and shall be adjustable on valves 30" and larger.
- 4.6 Shaft seals shall be of the V-type and shall be replaceable without removal of the valve from the line or the shaft from the valve.

MATERIALS

- 5.1 Body: Class 150B valve bodies shall be ASTM A126, Class B gray iron or ASTM A536 Grade 65-45-12 ductile iron. Class 250B valve bodies shall be ASTM A536 Grade 65-45-12 ductile iron.
- 5.2 Disc: Valve disc shall be ASTM A536 Grade 65-45-12 ductile iron.
- 5.3 Shafts: Shafts shall be ASTM A276 type 304, or ASTM A564, Type 630 Stainless Steel.
- 5.4 Seat: Resilient seat shall be Buna-N and mate to a Type 316 Stainless Steel body seat ring.
- 5.5 Hardware: All seat retaining hardware shall be Type 316 stainless steel.

ACTUATION

- 6.1 Manual, electric or cylinder actuation shall be provided as specified.
- 6.2 Manual actuators shall be of the traveling nut design with characterized closure per AWWA C504 and equipped with externally adjustable closed position stops capable of withstanding 450 ft-lbs. Actuators shall be lubricated with EP-2 grease and fully enclosed in an iron housing sealed against the entry of water.
- 6.3 Cylinder actuators shall be traveling nut design with characterized closure sized to position the valve with an air, water or oil supply pressure of 80-150 psi and built in accordance with AWWA C541. The rotating mechanism will consist of a slotted lever and traveling nut directly connected to the cylinder rod. The cylinder rod, heads and barrel shall be constructed of stainless steel or non-metallic material for water service. Rod and piston seals shall be of the self-adjustable, wear-compensating type. The piston shall be one-piece with a wear strip.
- 6.4 Motor actuators shall be furnished in accordance with AWWA C542 for Power Actuators and factory tested on the production valve. The motor unit shall be mounted to a self-locking traveling nut actuator with characterized closure and externally adjustable closed stop. The motor actuator assembly shall be designed for open/close service with a minimum operating time of 60 sec. Electrical operation shall include Local-Off-Remote selector switch, local Open/Close push buttons and position indication lamps.

MANUFACTURE

- 7.1 Valve exteriors for above ground service shall be coated with a universal, alkyd primer. Valve exteriors for buried service shall be coated with an epoxy coating. Valve interiors shall be coated with an NSF/ANSI 61 epoxy coating approved for potable water. Fusion bonded epoxy shall be supplied on the exterior and interior when specified.
- 7.2 Valve shall be Val-Matic® Series 2000 or equal.

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VAL-MATIC®

Val-Matic's quality of design and meticulous workmanship has set the standards by which all others are measured. Quality design features such as an Ener•G® efficient AWWA Ball Valve with fusion bonded epoxy and adjustable resilient seating....Cam-Centric® Plug Valves with more requested features than any other eccentric plug valve....the American-BFV® Butterfly Valve that provides field replaceable seat without the need for special tools....high strength and wear resistant aluminum bronze trim as standard for Tilted Disc® Check Valves....combined resilient/metal to metal seating for Silent Check Valves....heavy duty stainless steel screened inlet on Sure Seal Foot Valves....unrestricted full flow area through Swing-Flex® and Surgebuster® Check Valves....and stabilized components that provide extended life of the Dual Disc® Check Valves....Type 316 stainless steel trim as standard on Air Release, Air/Vacuum and Combination Air Valves....the VaultSafe® family of products includes the FloodSafe® Inflow Preventer, FrostSafe® two-way damper and the VentSafe® vent pipe security cage. These features coupled with our attention to detail put Val-Matic Valves in a class by themselves.

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