

APCO CVS-6000 SWING CHECK VALVES

Design and Construction

APCO CVS-6000 Swing Check Valves are engineered for dependable performance in both clean and dirty services, including water, sewage and a wide range of industrial applications. With a premium, heavy-duty construction and full waterway flow area, APCO CVS-6000 valves deliver maximum efficiency, exceptional durability, and reliable operation under elevated flow rates, high pressures, and demanding conditions.

To meet comprehensive system requirements, the CVS design is offered in two body styles:

- **6000D** - Ideal for most applications, the 6000D meets AWWA C508-25 and accommodates multiple closure control options, including Lever & Weight, Lever & Spring, Air Cushioned Cylinder & Oil Cushion.
- **6000A/6000** - This body style incorporates Oil Control closure options with either a Side Mounted Cylinder or a Bottom Buffer with adjustable closing time (within system limits) that is specifically designed to gradually decelerate the reverse flow after pump shutdown.

Available in sizes 2-66" (50-1700mm), the CVS-6000 Swing Check Valves are available with Acrylonitrile-Butadiene (NBR) or Terpolymer of Ethylene, Propylene and A Diene (EPDM) resilient disc seat and the body seat is long-wearing centrifugally cast 316 stainless steel for durability. Additional resilient disc seat and body seat materials are available on body style 6000A/6000.

High Strength Shaft

The one-piece shaft is constructed from 316 stainless steel, delivering exceptional strength and corrosion resistance. The pivot shaft with key and bearing effectively eliminates axial movement and enhances overall stability and reliability. Additional shaft materials are available on body style 6000A/6000.



**Body Style 6000D
with Lever & Weight**



**Body Style 6000
with Oil Control
Bottom Mounted
Buffer**

Full Waterway Flow Area

The valves feature a full waterway flow-through area for low head loss and inherent slam minimization.

Internals Removable Without Removing Valve from the Line

Top entry design allows all internal parts, including the body seat, to be easily replaced in the field by removing the cover without removing the valve body from the pipeline. The seat ring is field replaceable without the use of special tools.

Body Style 6000D

Single-Piece Disc and Disc Arm - Enhance Strength and Reliability

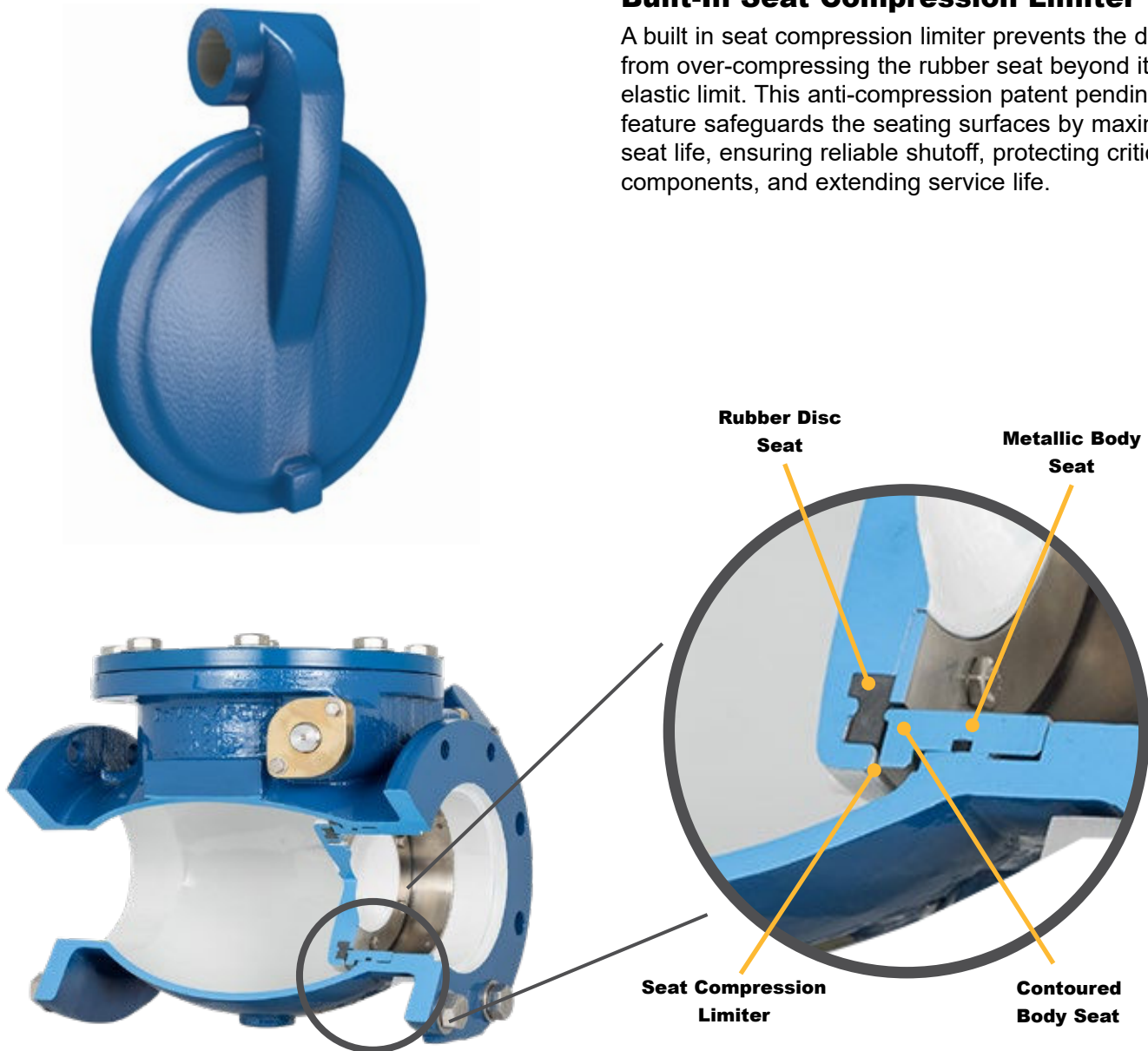
The single-piece disc and disc arm design provides a stronger, more reliable connection than assemblies that use an articulated single pin connection to attach the disc to the disc arm. By eliminating pins and joints, it removes common failure points that can loosen, wear, or misalign. This results in improved sealing integrity, extended service life, and reduced maintenance, delivering greater reliability and lower total cost of ownership.

Advanced Seat Sealing Technology

The valve's seat design (patent pending) combines a precision machined contoured metallic body seat with a self-aligning molded elastomeric disc seat. The contoured body seat enhances low-pressure sealing while the self-aligning seat allows the elastomer to flex and adapt under variable load conditions. Together, these features provide superior sealing performance, reduce the risk of leakage, extend service life, and minimize maintenance requirements. This advanced seating technology eliminates the need for an articulated disc to disc arm joint.

Built-In Seat Compression Limiter

A built in seat compression limiter prevents the disc from over-compressing the rubber seat beyond its elastic limit. This anti-compression patent pending feature safeguards the seating surfaces by maximizing seat life, ensuring reliable shutoff, protecting critical components, and extending service life.



Closure Control Devices

Body Style 6000D

Lever & Weight (LW)

For systems with gradual flow reversals, a lever and weight configuration is a commonly used economical solution. In this setup, the weighted lever arm applies additional force to assist in closing the valve disc to minimize slam. This force can be fine-tuned by adjusting the position of the weight, offering precise control over the valve's closing speed to match specific system dynamics.

Lever & Spring (LS)

In contrast, applications that have sudden flow reversal may benefit from a lever and spring mechanism. The spring delivers a faster closure than a lever and weight design further reducing the risk of slamming. Like the weighted configuration, the spring tension is adjustable, allowing operators to tailor the valve's closing characteristics for optimal performance and system protection. Lever and spring valves may sacrifice head loss to prevent slam as the pump must overcome the additional closing force of the spring.



Closure Control Devices

Body Style 6000D

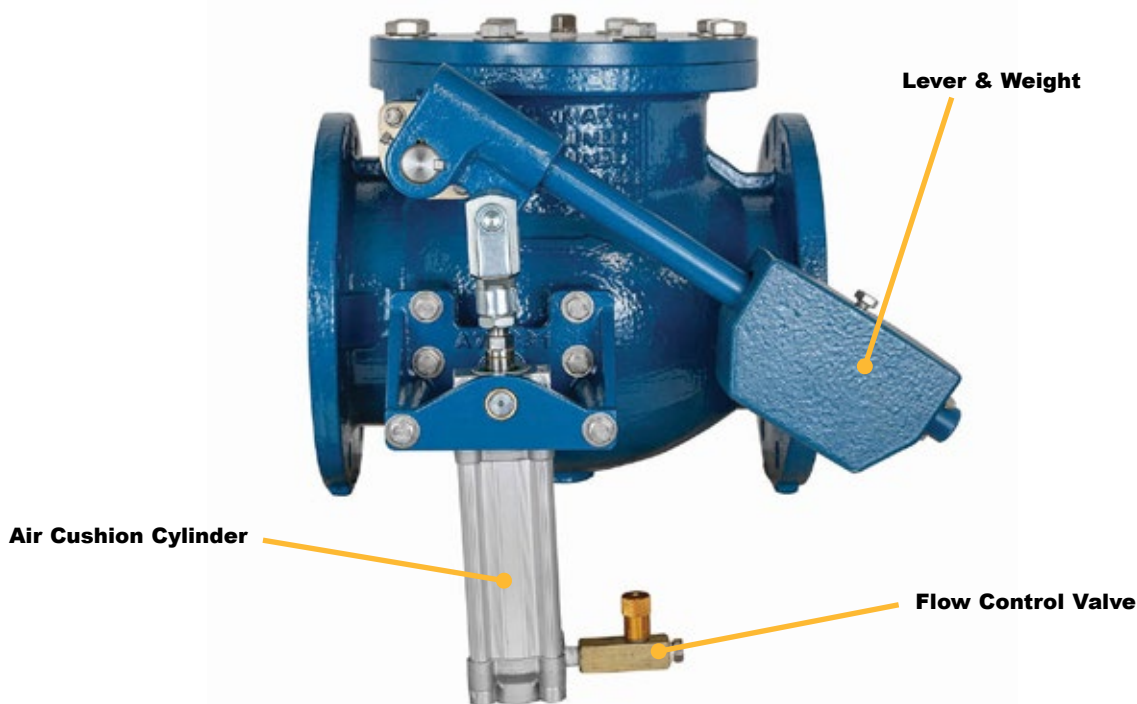
Lever & Weight with Air Cushion Cylinder (AC)

For Free Open, Fast Close applications, the air cushioned check valve utilizes a totally enclosed cushion cylinder externally mounted to the side of the main valve body. A heavy outside lever, positively clamped to a pivot shaft, forces the disc to close quickly and quietly upon pump shut down and before reverse flow takes place in most applications. The weighted lever drives the piston into the cushion chamber, compressing the trapped air and creating a cushion during valve closure.



Principle of Operation

1. Discharge velocity head from the pump against the disc opens the disc and raises the weighted lever outside of the valve upward. At the same time, the piston inside the cushion cylinder is pulled upward, drawing free air into the cushion cylinder through the one-way control check valve.
2. When the pump is shut down and the flow decelerates, the lever and weight forces the valve disc toward the closed position as the piston is simultaneously forced downward in the cushion cylinder. Moving downward, the piston compresses the air in the cushion cylinder because the air cannot readily escape through the one-way control check valve. By restricting the air escape through the adjustable control check air cushioned closing is accomplished.
3. Air cushioning is field adjustable by adjusting the flow control valve for increased or decreased cushioning, and/or moving the weights on the pivot shaft for more or less rapid disc closure.



Closure Control Devices

Body Style 6000D

Lever & Weight with Oil Cushion (OB)

The oil cushion is a precision-engineered shock absorber, securely mounted to a dedicated bracket on the valve's side. Designed to work in conjunction with the lever and weight assembly, it plays a critical role in absorbing impact forces generated during valve closure. While it does not regulate the speed of closure, the oil cushion effectively eliminates shaft rebound and vibration, ensuring smooth, stable valve operation and enhancing overall system reliability. This component is essential for protecting mechanical integrity and extending the service life of the valve under dynamic load conditions.



Principle of Operation

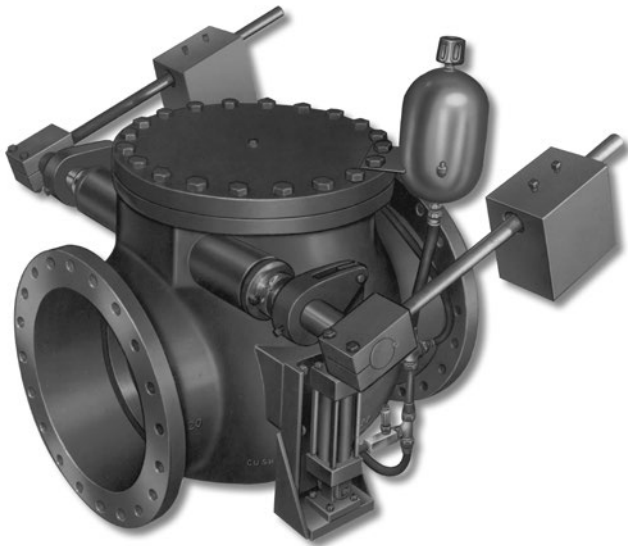
1. The discharge velocity head generated by the pump acts against the valve disc, initiating disc opening and simultaneously lifting the external weighted lever upward. As the counterweight rises, the oil cushion system extends accordingly, preparing to absorb impact forces upon valve closure. This coordinated motion ensures responsive valve operation while preserving mechanical stability through controlled energy absorption.
2. When the pump is shut down and the flow decelerates, the lever and weight forces the valve disc toward the closed position. During reverse flow conditions, pressure on the backside of the disc may also drive the disc rapidly to the closed position. As the valve nears full closure, the counterweight engages with the integrated shock absorber. This precision designed component absorbs the kinetic energy of the counterweight, effectively preventing rebound or "bounce" of the lever arm. By minimizing impact and vibration, the shock absorber reduces mechanical fatigue and wear on critical components such as the pivot shaft and bushings, enhances valve longevity and ensures reliable, low maintenance operation under dynamic flow conditions.
3. The oil cushion is fully adjustable, allowing precise control of engagement by setting its height via locknuts. This adjustment enables optimization of how much of the shock absorber's stroke is utilized by the counterweight during operation. To ensure optimal performance and protection, the oil cushion should be precisely adjusted to maintain continuous contact with the counterweight in the closed position. If the position is modified, such as being moved closer to the pivot shaft, the oil cushion must be repositioned accordingly, using the appropriate mounting hole to maintain correct alignment and functional engagement. This control range ensures consistent impact absorption and long-term mechanical reliability.

Closure Control Devices

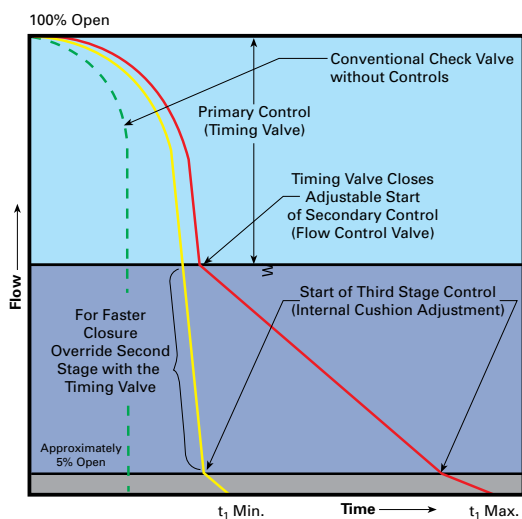
Body Style 6000A/6000

Oil Controlled, Side Mounted Cylinder (OC)

For Free Open, Slow Close applications, CVS-6000A/ 6000 Swing Check Valves are available with an Oil Controlled, Side Mounted Cylinder closure control device on valves 2-20" (50-500mm). The totally enclosed oil cylinder is protected from the elements. Three stage closure provides characterizable, adjustable closing time (within system limits) and is specifically designed to gradually decelerate the reverse flow after pump shutdown.



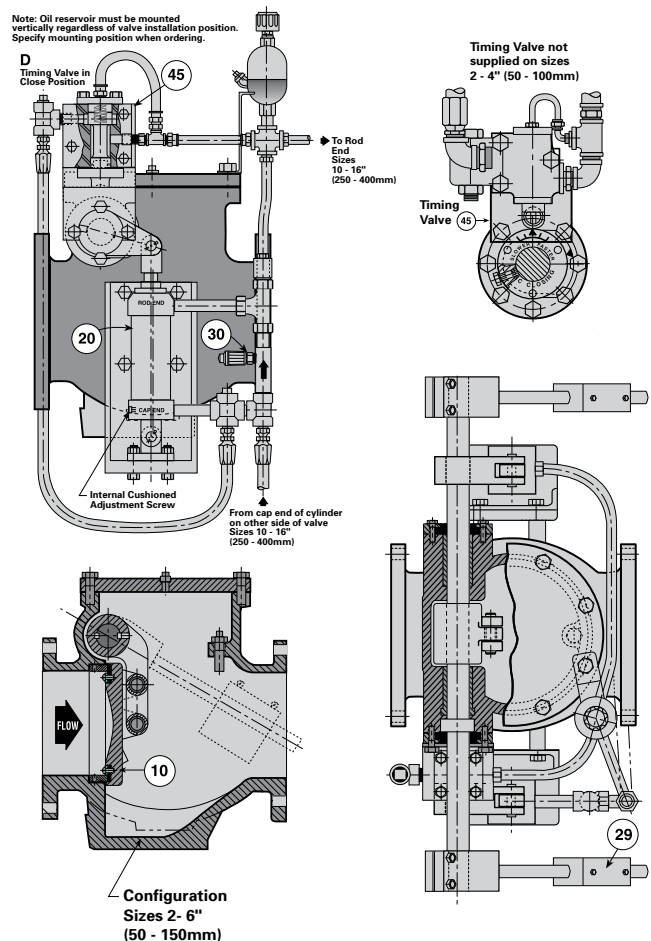
Three Stage Closing Characteristics



The graph shows flow rate as a function of closing time and illustrates the superiority of the APCO three stage Oil Controlled Side Mounted Cylinder over two stage closure devices.

Principle of Operation

1. Discharge velocity head from the pump causes the disc (10) to open and raises the outside weighted lever (29). Except for frictional resistance, the disc is free opening.
2. Three-stage closing is achieved by the oil dashpot/timing valve system which minimizes damaging water hammer. Each stage is independently adjustable.
 - a. The initial stage of closure is provided by the timing valve (45). The timing valve allows very fast closure of the disc from full open to any degree of closure. This feature greatly reduces the volume of backflow and flow reversal that occurs on valves with only two stages of closure.
 - b. The second stage of closure is provided by the Flow Control Valve (30) that varies speed toward final closure.
 - c. The final stage of closure is provided by internal adjustment of the cylinder (20) that controls variable speed closure to shut-off.
 - d. Additional disc closing adjustments can be made by moving the weight on the pivot shaft.



Closure Control Devices

Body Style 6000A/6000

Oil Controlled, Bottom Mounted Buffer (BMB)

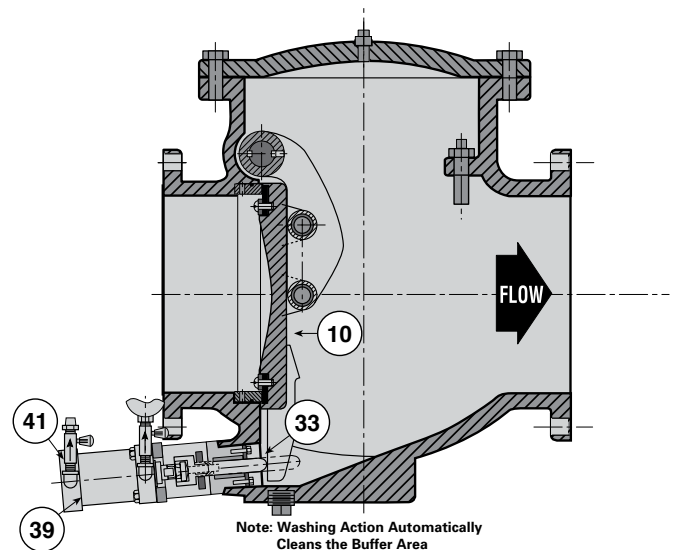
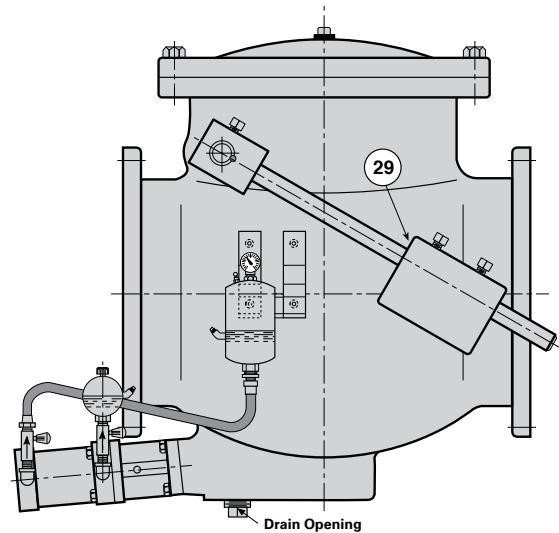
Bottom Mounted Buffers have been used successfully for decades to provide adjustable closing time (within system limits) and is specifically designed to gradually decelerate the reverse flow after pump shutdown on tough applications that would slam or damage other check valve designs. For Free Open, Controlled Close applications, CVS-6000 Swing Check Valves sizes 6-66" (150-1700mm) are available with an Oil Controlled, Bottom Mounted Buffer closure control device.



Bottom Mounted Buffers are recommended for larger sized valves and for vertical upward flow installations. They are also recommended where instantaneous flow reversal caused by a hydro pneumatic surge tank or open line discharge is so fast that other check valves may not perform well.

Principle of Operation

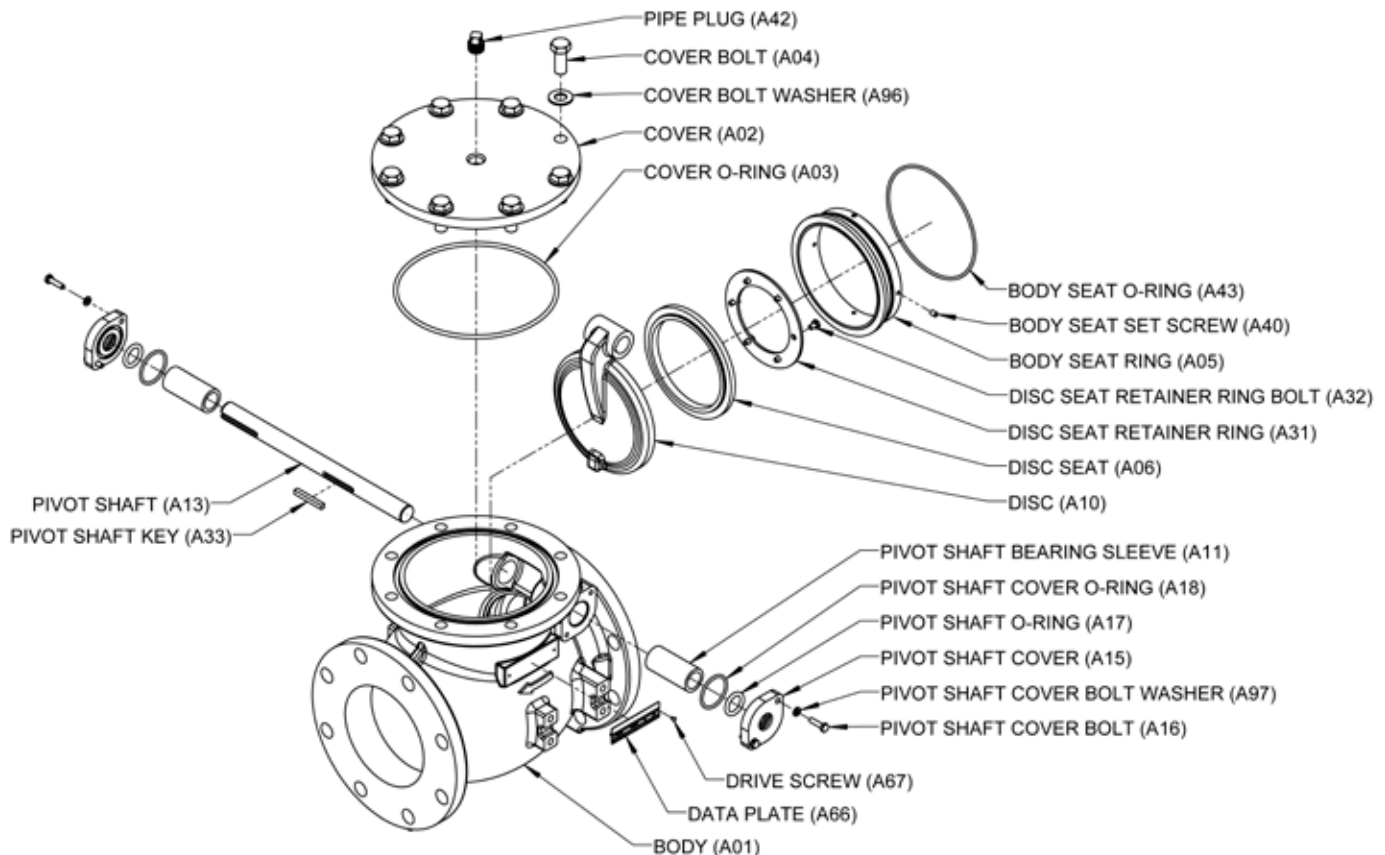
1. The unique buffer arrangement allows the valve disc (10) to open fully without interference and to close freely for approximately 90% of its stroke.
2. After the disc is 90% closed, the disc comes in contact with the buffer rod (33). The oil hydraulic buffer makes contact with the disc and controls closure during the final 10% of the stroke.
3. The flow control valve (41) on the cylinder (39) easily adjusts closing time (within system limits) to suit flow conditions. The color-coded micrometer type control valve adjusts the final closure and has a locking set screw that is used to secure the final setting.



Materials of Construction

Body Style 6000D

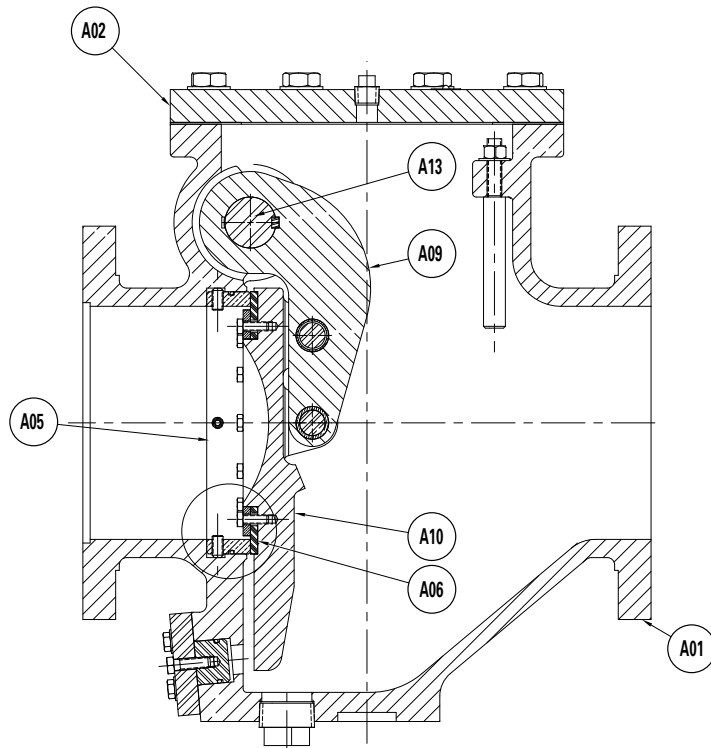
Item	Description	Material
A01	Body	Ductile Iron, ASTM A536
A02	Cover	Steel, ASTM A36
A03	Cover O-Ring	Acrylonitrile - Butadiene (NBR) Terpolymer of Ethylene, Propylene and A Diene (EPDM)
A04	Cover Bolt	316 Stainless Steel, ASTM F593G/H
A05	Body Seat Ring	316 Stainless Steel, ASTM A351
A06	Disc Seat	Acrylonitrile - Butadiene (NBR) Terpolymer of Ethylene, Propylene and A Diene (EPDM)
A10	Disc	Ductile Iron, ASTM A536
A11	Pivot Shaft Bearing Sleeve	Bronze
A13	Pivot Shaft	304 Stainless Steel, ASTM A276 316 Stainless Steel, ASTM A276
A15	Pivot Shaft Cover	Aluminum Bronze, ASTM B150
A16	Pivot Shaft Cover Bolt	316 Stainless Steel, ASTM F593G/H
A17	Pivot Shaft O-Ring	Acrylonitrile - Butadiene (NBR) Terpolymer of Ethylene, Propylene and A Diene (EPDM)
A18	Pivot Shaft Cover O-Ring	Acrylonitrile - Butadiene (NBR) Terpolymer of Ethylene, Propylene and A Diene (EPDM)
A31	Disc Seat Retainer Ring	316 Stainless Steel, ASTM A276
A32	Disc Seat Retainer Ring Bolt	316 Stainless Steel, ASTM F593G/H
A33	Pivot Shaft Key	316 Stainless Steel, ASTM A276
A40	Body Seat Set Screw	316 Stainless Steel, ASTM F593G/H
A42	Pipe Plug	316 Stainless Steel, ASTM F593G/H
A43	Body Seat O-Ring	Acrylonitrile - Butadiene (NBR) Terpolymer of Ethylene, Propylene and A Diene (EPDM)
A66	Data Plate	316 Stainless Steel
A67	Drive Screw	18-8 Stainless Steel
A96	Cover Bolt Washer	316 Stainless Steel, ASTM F593G/H
A97	Pivot Shaft Cover Bolt Washer	316 Stainless Steel, ASTM F593G/H



Materials of Construction

Body Style 6000A/6000

Item	Description	Material
A01	Body	Ductile Iron, ASTM A536
A02	Cover	Ductile Iron, ASTM A536 or Steel, ASTM A36 or ASTM A105
A05	Body Seat Ring	Aluminum Bronze, ASTM B148 with Acrylonitrile - Butadiene (NBR)
		316 Stainless Steel, ASTM A276 with Acrylonitrile - Butadiene (NBR)
		Aluminum Bronze, ASTM B148
		316 Stainless Steel, ASTM A276
A06	Disc Seat	Acrylonitrile-Butadiene (NBR)
		Terpolymer of Ethylene, Propylene and A Diene (EPDM)
		Fluoro Rubber (FKM)
		Ultra-High Molecular Weight Polyethylene (UHMW)
		Aluminum Bronze, ASTM B148
A09	Disc Arm	Ductile Iron, ASTM A536
A10	Disc	Ductile Iron, ASTM A536
A13	Pivot Shaft	Stainless Steel, Type 303, ASTM A582
		17-4 PH Stainless Steel, ASTM 564 Type 630



Valve Selection

Body Style 6000D

Shut-Off Capabilities

Seat Type	Shut-Off
Acrylonitrile-Butadiene (NBR)	Drip-Tight
Terpolymer of Ethylene, Propylene and A Diene (EPDM)	

Pressure Ratings

End Connection	Valve Size	
	2-12" (50-300mm)	14-66" (350-1700mm)
F1	200 psi (1379 kPa)	150 psi (1034 kPa)

Temperature Ratings

NBR Disc Seat Material	180°F (83°C)
EPDM Disc Seat Material	250°F (121°C)

Contact application engineering if the valve is required to operate above this temperature.

Applicable Standards

DeZURIK CVS-6000D Swing Check Valves are designed and/or tested to meet the following standards:	
AWWA C508	AWWA C508-25 Swing Check Valves for Waterworks Service 2-In Through 48-In (50-mm Through 1200-mm) NPS
ASME B16.42	Conforms to Bolt Pattern and Drilling

Body Style 6000A/6000

Shut-Off Capabilities

Seat Type	Shut-Off
Acrylonitrile-Butadiene (NBR)	Drip-Tight
Terpolymer of Ethylene, Propylene and A Diene (EPDM)	
Fluoro Rubber (FKM)	
Ultra-High Molecular Weight Polyethylene (UHMW)	

Pressure Ratings

End Connection	Valve Size	
	2-16" (51-406mm)	18-66" (450-1700mm)
F1	250 psi (1724 kPa)	150 psi (1034 kPa)

Temperature Ratings

UHMW Disc Seat Material	175°F (80°C)
Other Disc Seat Materials	250°F (121°C)

Contact application engineering if the valve is required to operate above this temperature.

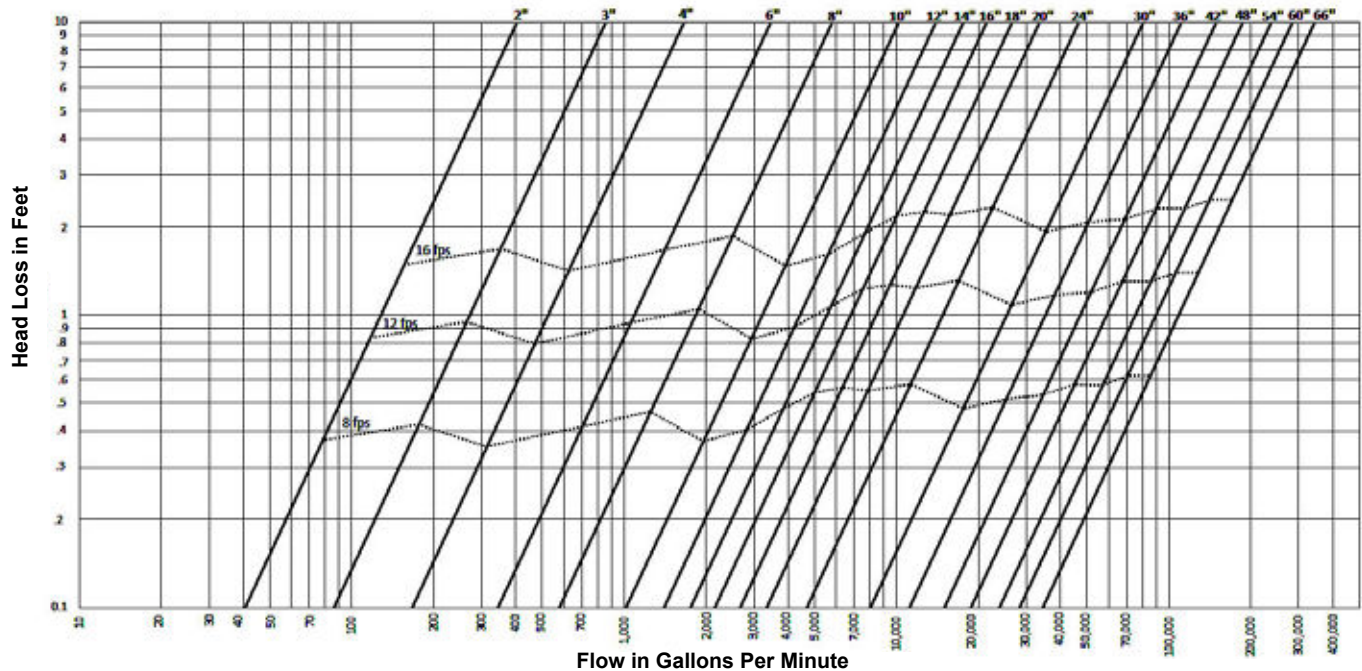
Applicable Standards

DeZURIK CVS-6000/6000A Swing Check Valves are designed and/or tested to meet the following standards:	
AWWA C508	Testing AWWA C508-25 Swing Check Valves for Waterworks Service 2-In Through 48-In (50-mm Through 1200-mm) NPS
ASME B16.42	Conforms to Bolt Pattern and Drilling

Valve Selection

Body Style 6000D

Head Loss Characteristics for Swing Check Valves



Flow Parameters

Valve Size	Cv* Kv* 100% Open
2"	195
50mm	168
3"	412
80mm	356
4"	799
100mm	690
6"	1658
150mm	1433
8"	2788
200mm	2409
10"	4895
250mm	4229
12"	6729
300mm	5814
14"	8435
350mm	7288
16"	10324
400mm	8920
18"	12823
450mm	11079
20"	16037
500mm	13856
24"	22458
600mm	19404
30"	38657
750mm	33400
36"	53573
900mm	46287
42"	71944
1100mm	62160
48"	89960
1200mm	77725
54"	114274
1350mm	98733
60"	136076
1500mm	117570
66"	164831
1650mm	142414

*Cv = Flow in GPM of water at
1 psi pressure drop.
*Kv = Flow in m³/hr. of water at
100 kPa pressure drop.

Weights

Valve Size	Closure Control			
	Lever & Weight	Lever & Spring	Air Cushion	Oil Cushion
2"	53	50	59	57
50mm	24	23	27	26
3"	64	62	71	68
80mm	29	28	32	31
4"	97	87	108	101
100mm	44	39	49	46
6"	131	121	142	135
150mm	59	55	64	62
8"	227	217	238	231
200mm	103	98	108	105
10"	430	411	454	446
250mm	195	186	206	202
12"	615	596	641	633
300mm	279	270	291	287
14"	760	730	803	790
350mm	345	331	364	358
16"	950	918	991	979
400mm	431	416	450	444
18"	1196	1156	1235	1226
450mm	543	524	560	556
20"	1416	1376	1456	1446
500mm	642	624	660	656
24"	2288	2266	2368	2364
600mm	1038	1028	1074	1072
30"	4125	4050	4205	4226
750mm	1871	1837	1907	1917
36"	6109	6025	6270	6311
900mm	2771	2733	2844	2863
42"	8395	8245	8555	8596
1100mm	3808	3740	3880	3899
48"	12290	12170	12500	12530
1200mm	5575	5520	5670	5684
54"	17300	17120	17515	17690
1350mm	7847	7765	7945	8024
60"	24810	24530	25170	25280
1500mm	11254	11127	11417	11467
66"	31110	30830	31470	31580
1650mm	14111	13984	14275	14324

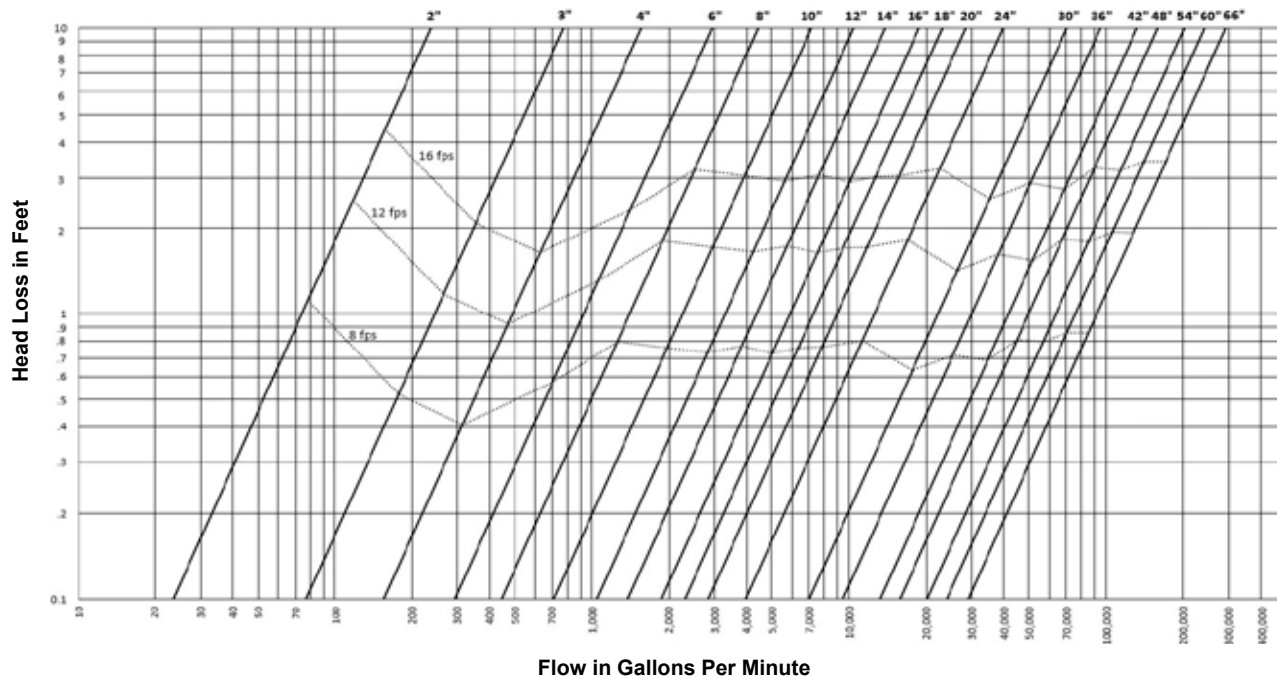
Pounds
Kilograms

Note: Weights are approximate and do not include crating.

Valve Selection

Body Style 6000A/6000

Head Loss Characteristics for Swing Check Valves



Flow Parameters

Valve Size	C_v^* K_v^* 100% Open
2"	113
50mm	98
3"	371
80mm	321
4"	744
100mm	643
6"	1409
150mm	1217
8"	2129
200mm	1839
10"	3410
250mm	2946
12"	5008
300mm	4327
14"	6649
350mm	5745
16"	8933
400mm	7718
18"	11076
450mm	9570
20"	13631
500mm	11777
24"	19078
600mm	16483
30"	33640
750mm	29065
36"	45537
900mm	39344
42"	63406
1100mm	54783
48"	76111
1200mm	65760
54"	97133
1350mm	83923
60"	115665
1500mm	99935
66"	140106
1650mm	121052

Weights

Valve Size	Oil Controlled
2"	130
50mm	59
3"	200
80mm	91
4"	280
100mm	127
6"	460
150mm	209
8"	560
200mm	254
10"	1090
250mm	494
12"	1580
300mm	717
14"	2470
350mm	1120
16"	3420
400mm	1551
18"	4140
450mm	1878
20"	4930
500mm	2236

Pounds
Kilograms

Valve Size	Bottom Mounted Buffer
6"	425
159mm	193
8"	539
200mm	245
10"	795
250mm	361
12"	1150
300mm	522
14"	1803
350mm	819
16"	2500
400mm	1135
18"	3022
450mm	1372
20"	3600
500mm	1634
24"	5320
600mm	2414
30"	9000
750mm	4084
36"	11340
900mm	5146
42"	17265
1100mm	7834
48"	25000
1200mm	11344
54"	34649
1400mm	15721
60"	44300
1500mm	20100

* C_v = Flow in GPM of water at 1 psi pressure drop.

* K_v = Flow in m³/hr. of water at 100 kPa pressure drop.

Ordering

To order, simply complete the valve order code from information shown. An ordering example is shown for your reference.

Valve Style

Give valve style code as follows:

CVS = Swing Check Valves

Valve Size

Give valve size code as follows:

2 = 2" (50mm)	20 = 20" (500mm)
3 = 3" (80mm)	24 = 24" (600mm)
4 = 4" (100mm)	30 = 30" (750mm)
6 = 6" (150mm)	36 = 36" (900mm)
8 = 8" (200mm)	42 = 42" (1100mm)
10 = 10" (250mm)	48 = 48" (1200mm)
12 = 12" (300mm)	54 = 54" (1400mm)
14 = 14" (350mm)	60 = 60" (1500mm)
16 = 16" (400mm)	66 = 66" (1700mm)
18 = 18" (450mm)	

Body Style

Give body style code as follows:

6000A = Series 6000A (2-14")
6000D = Series 6000D (2-66")
6000 = Series 60000 (16-66")

End Connection

Give end connection code as follows:

F1 = Flanged ASME 125/150

Body Material

Give body material code as follows:

DI = Ductile Iron

Trim Combination

Disc Material

Give disc material code as follows:

DI = Ductile Iron

Shaft Material

Give shaft material code as follows:

Body Style 6000D

S2 = 316 Stainless Steel

Body Style 6000A/6000

S11 = 303 Stainless Steel (6-48" BMB)

S5 = 17-4PH Stainless Steel (2-20" OC, 54-66" BMB)

Body Seat Material

Give seat material code as follows:

Body Style 6000D

S2 = 316 Stainless Steel

Body Style 6000A/6000

For NBR, EPDM, FKM, or UHMW Disc Seat

ALB = Aluminum Bronze

S2 = 316 Stainless Steel

For ALB or S2 Disc Seat

ALBNB = Aluminum Bronze with NBR Seal

S2NB = 316 Stainless Steel with NBR Seal

Disc Seat Material

Give disc material code as follows:

NBR = Acrylonitrile-Butadiene

EPDM = Terpolymer of Ethylene Propylene & A Diene

Body Style 6000A/6000

FKM = Fluoro Rubber

UHMW = Ultra-High Molecular Weight Polyethylene (2-36")

ALB = Aluminum Bronze

S2 = 316 Stainless Steel

Options

Give options code as follows:

AIS = American Iron and Steel. Valves conform to Consolidated Appropriations Act, 2014 section 436 (EPA, Clean Water and Drinking Water State Revolving Funds) and Consolidated Appropriations Act, 2017 section 746 (USDA RUS Water & Environmental Programs (WEP)).

BABA = Build America, Buy America (LW, LS, AC closure control devices only)

NSF = NSF approved (Certification for Body Style 6000A/6000 is limited to S2 body seat with NBR disc seat, sizes 2-48" only)

DTR = DeZURIK Standard Certified Production Hydrostatic

Shell & Seat Test Report

VP = Vertical Flow Up Position Installation

(Not required with LS Closure Control Device)

Body Style 6000A/6000

SB16 = 316 Stainless Steel Bolting

Closure Control Devices

Give closure control device code as follows:

Body Style 6000D

LW = Lever & Weight

LS = Lever & Spring

AC = Lever & Weight Air Cushion Cylinder

OB = Lever & Weight with Oil Cushion

Body Style 6000A/6000

BMB = Oil Controlled Bottom Mounted Buffer (Series 6000B, 6-66")

OC = Oil Controlled Side Mounted Cylinder (Series 6100, 2-20")

Note: Series 6000B=Body Styles 6000 BMB, Series 6100=Body Styles 6000 OC

Accessories

Give accessory code as follows:

SEL22 = (1) Limit Switch - DPDT AB H802T-DTP

SEL30 = (1) Proximity Switch - SPDT GO 73-13526-B2

SEL32 = (1) Proximity Switch - DPDT GO 7G-23523-B2, Only Body Style 6000A/6000

Ordering Example:

CVS,16,6000D,F1,DI,DI-S2-S2-NBR*OB,SEL22

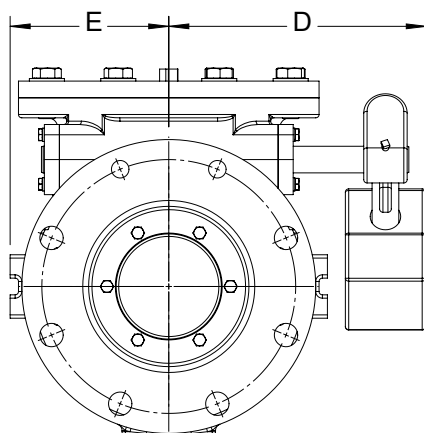
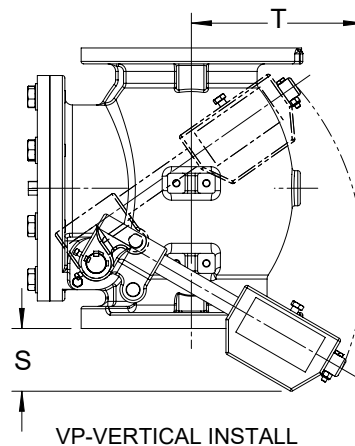
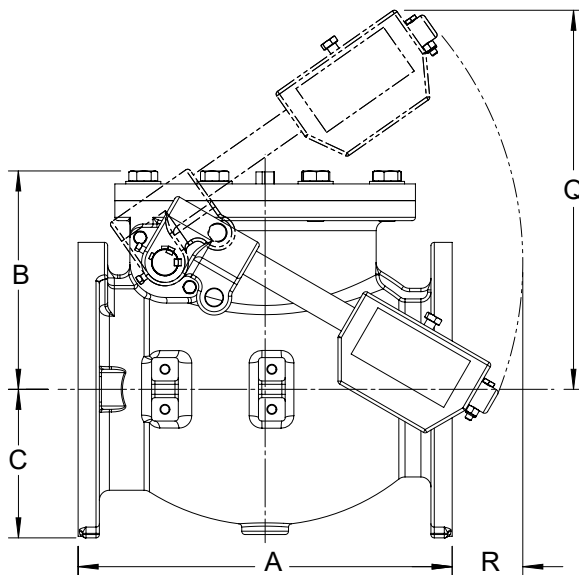
Dimensions

Body Style 6000D

2-30" (50-750mm) Lever and Weight (LW)

Valve Size	A	B	C	D	E	R	S	T	Q
2	8.00	5.88	3.06	7.00	3.88	5.75	3.50	8.50	11.00
50	203	149	78	178	99	146	89	216	279
3	9.50	6.25	3.82	7.00	5.13	5.00	2.62	8.75	11.25
80	241	159	97	178	130	127	67	222	286
4	11.50	7.25	4.56	9.61	5.06	4.63	3.50	9.50	13.06
100	292	184	116	244	129	117.6	89	241	332
6	14.00	8.17	5.56	9.64	5.94	2.64	3.12	8.59	14.19
150	356	208	141	245	151	67.1	79	218	360
8	19.50	10.42	6.81	11.35	7.69	-2.00	2.00	7.50	15.06
200	495	265	173	288	195	-51	51	191	383
10	24.50	14.18	9.07	14.18	9.50	1.00	5.36	12.25	22.02
250	622	360	230	360	241	25	136	311	560
12	27.50	15.32	10.46	15.65	11.00	-1.50	5.00	12.25	23.00
300	699	389	266	398	279	-38	127	311	584
14	31.00	16.82	11.92	18.17	12.25	3.00	7.47	14.48	29.86
350	787	427	303	462	311	76	190	368	758
16	36.00	18.00	13.42	19.67	13.75	.28	5.72	16.35	31.00
400	914	457	340	500	349	7.1	145	415	787
18	40.00	20.06	15.00	22.00	15.50	-2.90	5.28	16.00	32.47
450	1016	510	381	559	394	-74	134	406	825
20	40.00	21.12	16.49	23.36	16.88	-3.90	6.28	14.85	33.50
500	1016	536	419	593	429	-99	160	377	851
24	48.00	24.71	19.33	27.61	20.50	-4.70	7.73	18.25	39.50
600	1219	628	491	701	521	-119	196	464	1003
30	56.00	30.38	23.15	31.78	24.38	1.38	11.45	25.25	51.34
750	1422	772	588	807	619	35	291	641	1304

Inches
Millimeters



Dimensions

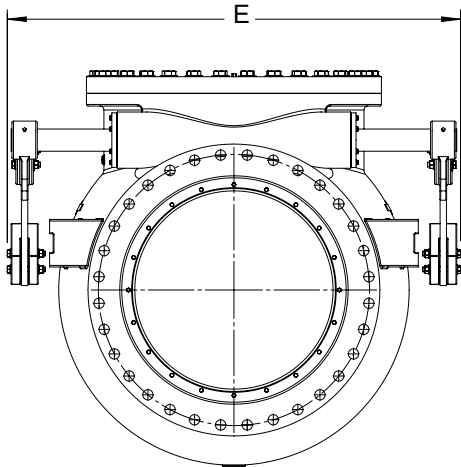
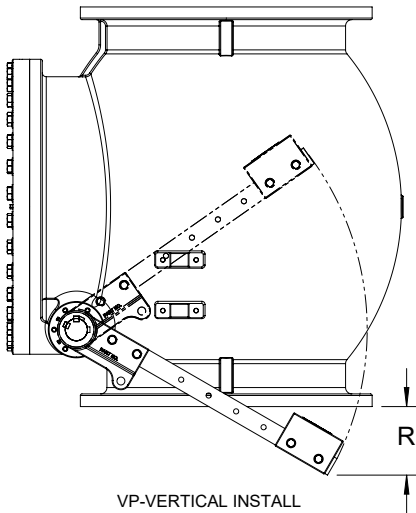
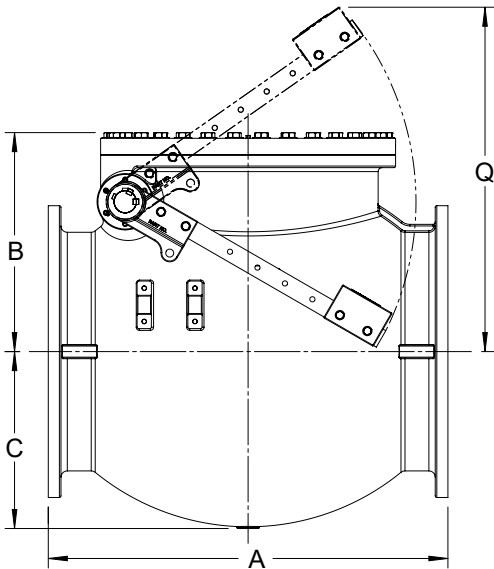
Body Style 6000D

36-66" (900-1700mm) Lever and Weight (LW)

Valve Size	A	B	C	E	R	Q
36	63.00	34.52	27.89	71.46	10.80	54.29
900	1600	878	708	1815	274	1379
42	70.00	38.58	35.52	80.94	11.10	58.79
1100	1778	978	826	2056	282	1493
48	76.00	42.95	37.18	91.70	14.30	66.27
1200	1930	1091	944	2329	363	1683
54	87.00	48.32	41.77	101.38	16.18	76.50
1400	2210	1227	1061	2575	411	1943
60	97.00	54.78	47.00	104.75	14.66	82.00
1500	2464	139	1194	2661	372	2083
66	108.00	59.03	51.65	124.38	12.16	85.15
1700	2743	1499	1312	3159	309	2163

Inches
Millimeters

Note: 36" (900mm) & larger have two lever arms, one on each side.



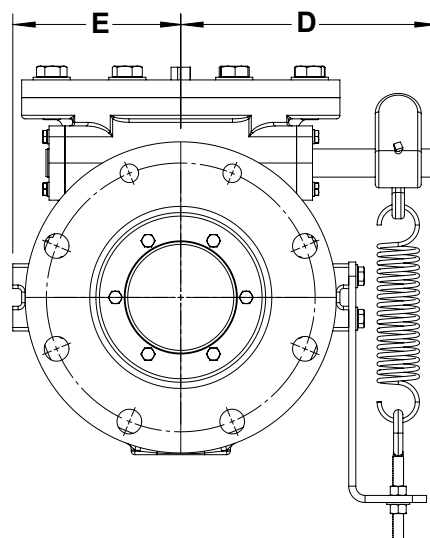
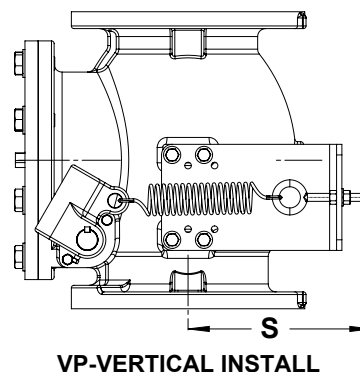
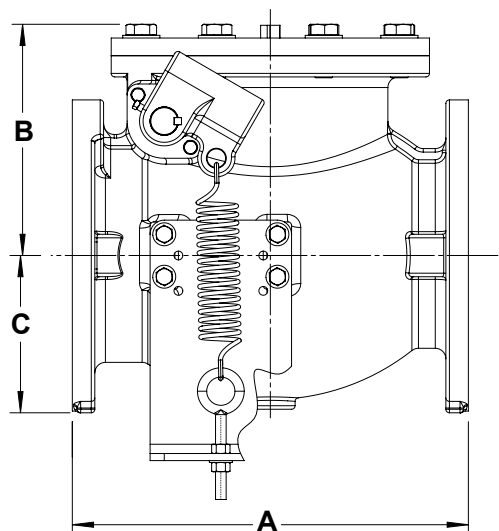
Dimensions

Body Style 6000D

2-30" (50-750mm) Lever and Spring (LS)

Valve Size	A	B	C	D	E	S
2	8.00	5.88	3.06	6.86	3.88	10.25
50	203	149	78	174	99	260
3	9.50	6.25	3.82	6.94	5.13	10.00
80	241	159	97	176	130	254
4	11.50	7.25	4.56	9.00	5.06	10.75
100	292	184	116	229	129	273
6	14.00	8.17	5.56	9.00	5.94	9.75
150	356	208	141	229	151	248
8	19.50	10.42	6.81	10.74	7.69	8.75
200	495	265	173	273	195	222
10	24.50	14.18	9.07	13.52	9.50	12.56
250	622	360	230	343	241	319
12	27.50	15.32	10.46	15.06	11.00	11.56
300	699	389	266	383	279	294
14	31.00	16.82	11.92	17.56	12.25	12.56
350	787	427	303	446	311	319
16	36.00	18.00	13.40	19.06	13.75	11.44
400	914	457	340	484	349	291
18	40.00	20.06	15.00	20.81	15.50	16.31
450	1016	510	381	529	394	414
20	40.00	21.12	16.49	22.18	16.88	13.31
500	1016	536	419	563	429	338
24	48.00	24.71	19.33	26.56	20.50	24.56
600	1219	628	491	675	521	624
30	56.00	30.38	23.15	30.50	24.38	19.82
750	1422	772	588	775	619	503

Inches
Millimeters



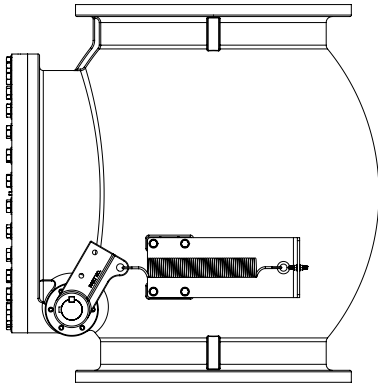
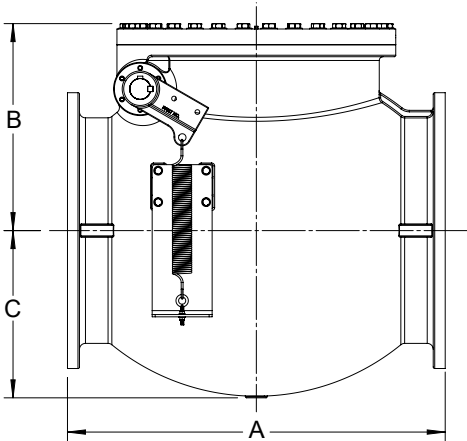
Dimensions

Body Style 6000D

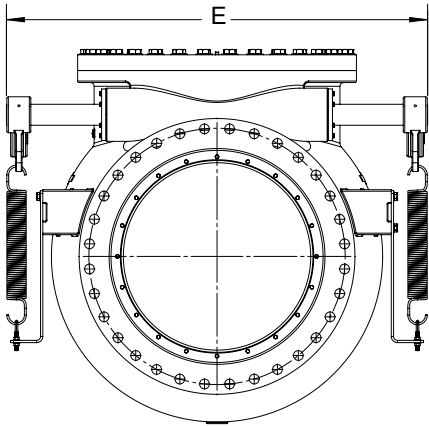
36-66" (900-1700mm) Lever and Spring (LS)

Valve Size	A	B	C	E
36 900	63.00 1600	34.52 877	27.89 708	70.25 1784
42 1100	70.00 1778	38.58 980	32.52 826	78.25 1988
48 1200	76.00 1930	42.95 1091	37.18 944	90.30 2296
54 1400	87.00 2210	48.32 1227	41.77 1061	101.00 2565
60 1500	97.00 2464	54.78 1391	47.00 1194	114.13 2899
66 1700	108.00 2743	59.03 1499	51.65 1312	123.75 3143

Inches
Millimeters



VP-VERTICAL INSTALL



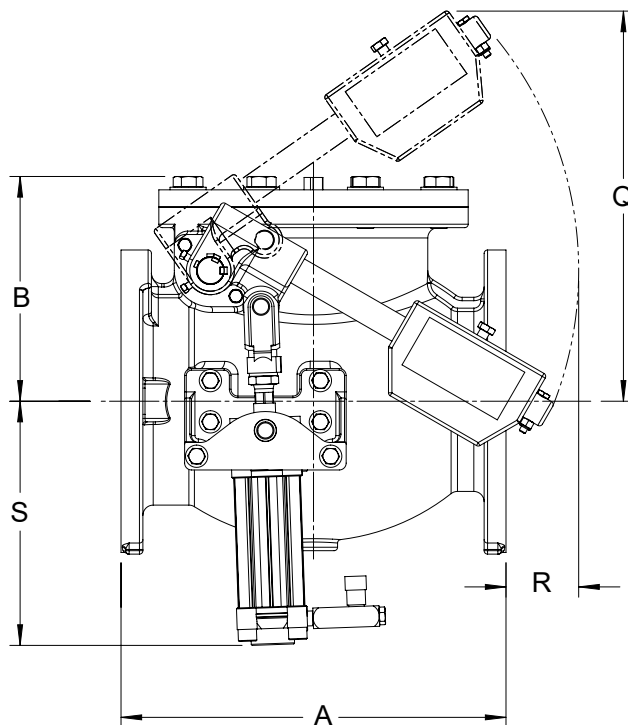
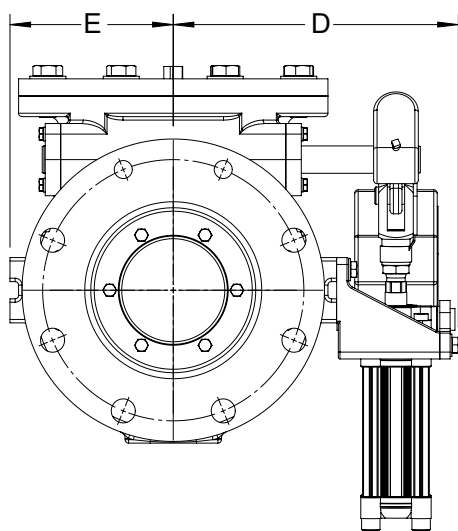
Dimensions

Body Style 6000D

2-30" (50-750mm) Lever & Weight with Air Cushion Cylinder (AC)

Valve Size	A	B	D	E	Q	R	S
2	8.00	5.88	7.53	3.88	11.00	5.75	9.96
50	203	149	191	99	279	146	253
3	9.50	6.25	7.84	5.13	11.25	5.00	9.71
80	241	159	199	130	286	127	247
4	11.50	7.25	9.48	5.06	13.06	4.63	9.88
100	292	184	241	129	332	117.6	251
6	14.00	8.17	10.37	5.94	14.19	2.64	8.88
150	356	208	263	151	360	67.1	226
8	19.50	10.42	12.11	7.69	15.06	-2.00	7.88
200	495	265	308	195	383	-51	200
10	24.50	14.18	15.59	9.50	22.02	1.00	11.71
250	622	360	396	241	560	25	297
12	27.50	15.32	17.09	11.00	23.00	-1.50	10.71
300	699	389	434	279	584	-38	272
14	31.00	16.82	19.35	12.25	29.86	3.00	13.34
350	787	427	492	311	758	76	339
16	36.00	18.00	20.85	13.75	31.00	.28	12.25
400	914	457	530	349	787	7.1	311
18	40.00	20.06	22.60	15.50	32.47	-2.90	15.12
450	1016	510	574	394	825	-74	384
20	40.00	21.12	23.97	16.88	33.50	-3.90	14.25
500	1016	536	609	429	851	-99	362
24	48.00	24.71	29.00	20.50	39.50	-4.70	22.00
600	1219	628	737	521	1003	-119	559
30	56.00	30.38	32.85	24.38	51.34	1.38	17.20
750	1422	772	834	619	1304	35	437

Inches
Millimeters



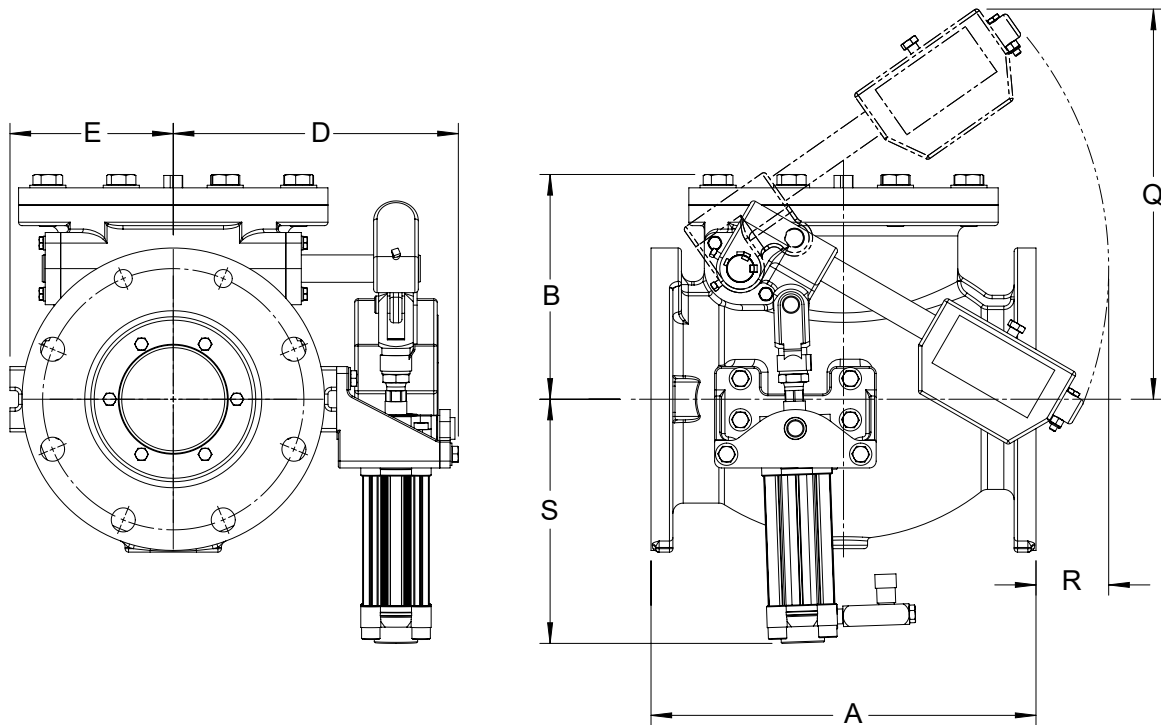
Dimensions

Body Style 6000D

36-66" (900-1700mm) Lever & Weight with Air Cushion Cylinder (AC)

Valve Size	A	B	C	E	Q
36	63.00	34.52	27.89	71.46	54.29
900	1600	877	708	1815	1379
42	70.00	38.58	32.52	80.94	58.79
1100	1778	980	826	2056	1493
48	76.00	42.95	37.18	91.70	66.27
1200	1930	1091	944	2329	1683
54	87.00	48.32	41.77	101.38	76.50
1400	2210	1227	1061	2575	1943
60	97.00	54.78	47.00	104.12	82.00
1500	2464	1391	1194	2661	2083
66	108.00	59.03	51.65	124.38	85.15
1700	2743	1499	1312	3159	2163

Inches
Millimeters



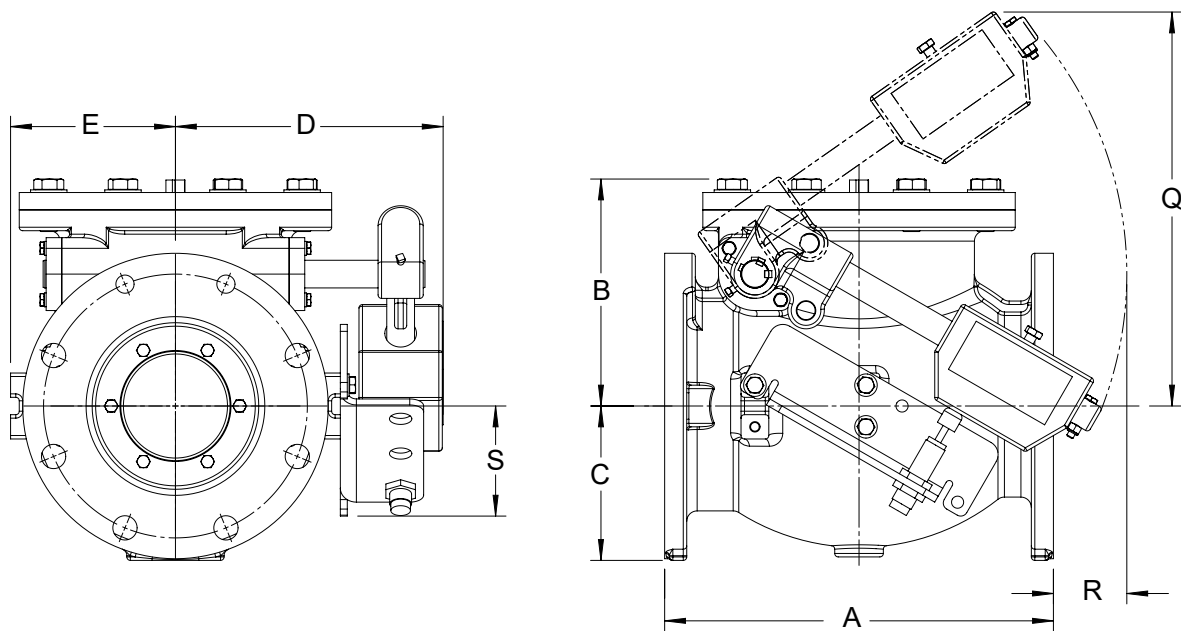
Dimensions

Body Style 6000D

2-30" (50-750mm) Lever & Weight with Oil Cushion (OB)

Valve Size	A	B	C	D	E	Q	R	S
2	8.00	5.88	3.06	7.00	3.88	11.00	5.75	5.09
50	203	149	78	178	99	279	146	129
3	9.50	6.25	3.82	7.00	5.13	11.25	5.00	4.85
80	241	159	97	178	130	286	127	123
4	11.50	7.25	4.56	9.61	5.06	13.06	4.63	5.00
100	292	184	116	244	129	332	117.6	127
6	14.00	8.17	5.56	9.64	5.94	14.19	2.64	4.00
150	356	208	141	245	151	360	67.1	102
8	19.50	10.42	6.81	11.35	7.69	15.06	-2.00	3.00
200	495	265	173	288	195	383	-51	76
10	24.50	14.18	9.07	14.18	9.50	22.02	1.00	8.64
250	622	360	230	360	241	560	25	219
12	27.50	15.32	10.46	15.65	11.00	23.00	-1.50	7.64
300	699	389	266	398	279	584	-38	194
14	31.00	16.82	11.92	18.17	12.25	29.86	3.00	12.27
350	787	427	303	462	311	758	76	312
16	36.00	18.00	13.40	19.67	13.75	31.00	.28	11.15
400	914	457	340	500	349	787	7.1	283
18	40.00	20.06	15.00	22.00	15.50	32.47	-2.90	11.05
450	1016	510	381	559	394	825	-74	281
20	40.00	21.12	16.49	23.36	16.88	33.50	-3.90	10.05
500	1016	536	419	593	429	851	-99	255
24	48.00	24.71	19.33	27.61	20.50	39.50	-4.70	14.13
600	1219	628	491	701	521	1003	-119	359
30	56.00	30.38	23.15	31.78	24.38	51.34	1.38	14.13
750	1422	772	588	807	619	1304	35	359

Inches
Millimeters



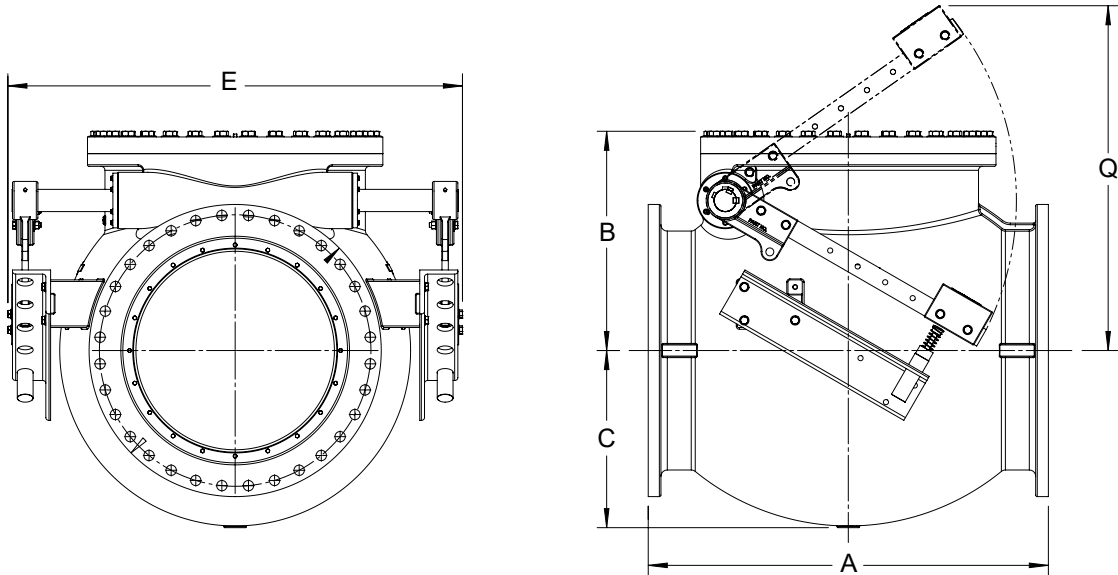
Dimensions

Body Style 6000D

36-66" (900-1700mm) Lever & Weight with Oil Cushion (OB)

Valve Size	A	B	C	E	Q
36	63.00	34.52	27.89	71.46	54.29
900	1600	877	708	1815	1379
42	70.00	38.58	32.52	80.82	58.79
1100	1778	980	826	2053	1493
48	76.00	42.95	37.18	91.70	66.27
1200	1930	1091	944	2329	1683
54	87.00	48.32	41.77	101.00	76.50
1400	2210	1227	1061	2565	1943
60	97.00	54.78	47.00	104.12	82.00
1500	2464	1391	1194	2645	2083
66	108.00	59.03	51.65	123.75	85.15
1700	2743	1499	1312	3143	2163

Inches
Millimeters



Dimensions

Body Style 6000A/6000

Oil Controlled Side Mounted Cylinder (OC)

Valve Size	F1											
	A	B	C	D	E	F	K	W	X	Y	G	H
2	8.00	6.00	3.50	13.25	10.75	5.00	7.50	9.00	9.50	6.25	6.00	0.63
50	203	152	89	337	273	127	191	229	241	159	152	16
3	9.50	7.00	4.13	13.75	10.13	5.50	8.13	9.50	8.50	5.13	7.50	0.75
80	241	178	105	349	257	140	207	241	216	130	191	19
4	11.50	7.63	5.00	14.00	9.13	6.00	8.94	10.75	8.00	5.00	9.00	0.94
100	292	194	127	356	232	152	227	273	203	127	229	24
6	14.00	10.13	6.50	17.00	14.00	8.38	22.50	16.50	14.25	11.63	11.00	1.00
150	356	257	165	432	356	213	572	419	362	295	279	25
8	19.50	12.00	10.25	16.75	12.50	8.50	24.00	18.00	13.00	9.25	13.50	1.13
200	495	305	260	425	318	216	610	457	330	235	343	29
10	24.50	14.50	12.63	21.00	8.63	10.00	28.00	20.50	13.50	8.50	16.00	1.19
250	622	368	321	533	219	254	711	521	343	216	406	30
12	27.50	16.00	14.00	22.00	8.88	11.50	29.50	25.00	18.00	11.25	19.00	1.25
300	699	406	356	559	226	292	749	635	457	286	483	32
14	31.00	19.88	15.75	26.00	11.00	13.75	33.00	29.00	20.00	14.50	21.00	1.38
350	787	505	400	660	279	349	838	737	508	368	533	35
16	36.00	22.38	19.75	27.50	9.75	14.50	35.50	30.75	20.00	14.00	23.50	1.44
400	914	569	502	699	248	368	902	781	508	356	597	37
18	40.00	24.12	20.25	29.00	8.25	16.00	37.50	35.00	24.50	15.00	25.00	1.56
450	1016	613	514	737	210	406	953	889	622	381	635	40
20	40.00	25.00	21.50	32.00	8.88	17.50	39.00	36.00	23.50	15.00	27.50	1.69
500	1016	635	546	813	226	445	991	914	597	381	699	43

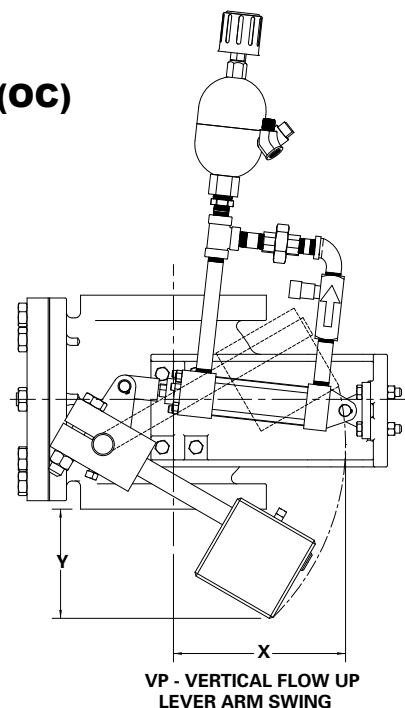
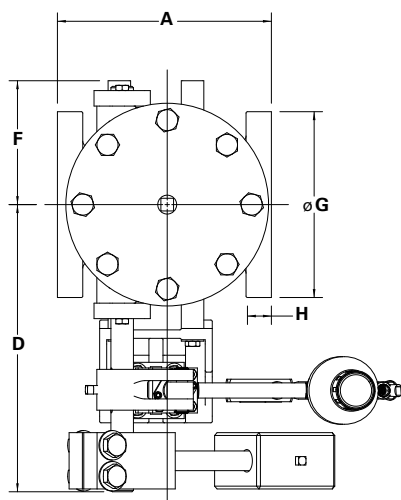
Inches
Millimeters

Dimensions

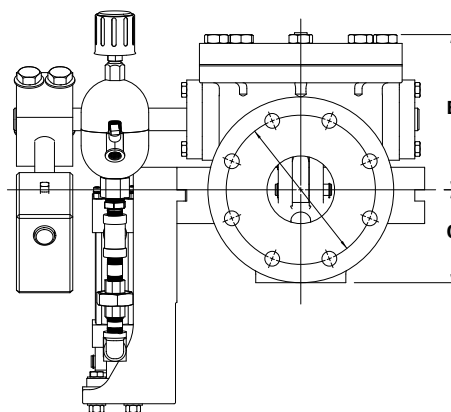
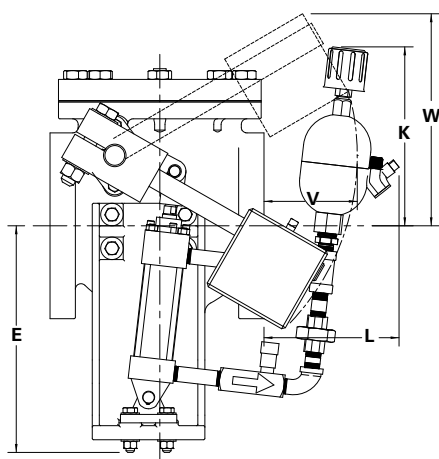
Body Style 6000A/6000

Oil Controlled Side Mounted Cylinder (OC)

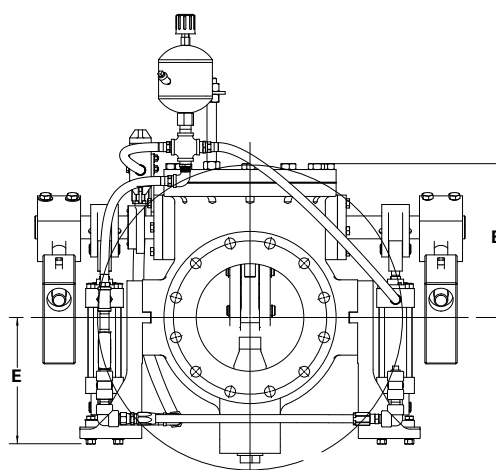
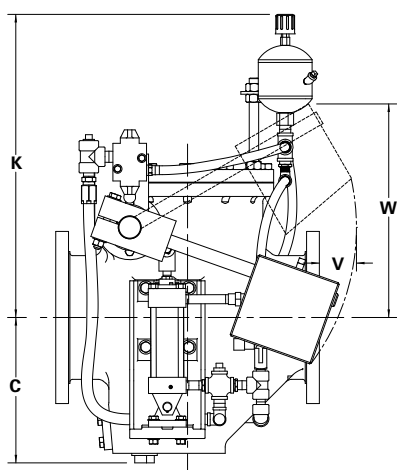
All Sizes



Size 2-8" (50-200mm)



Size 10-20" (250-500mm)



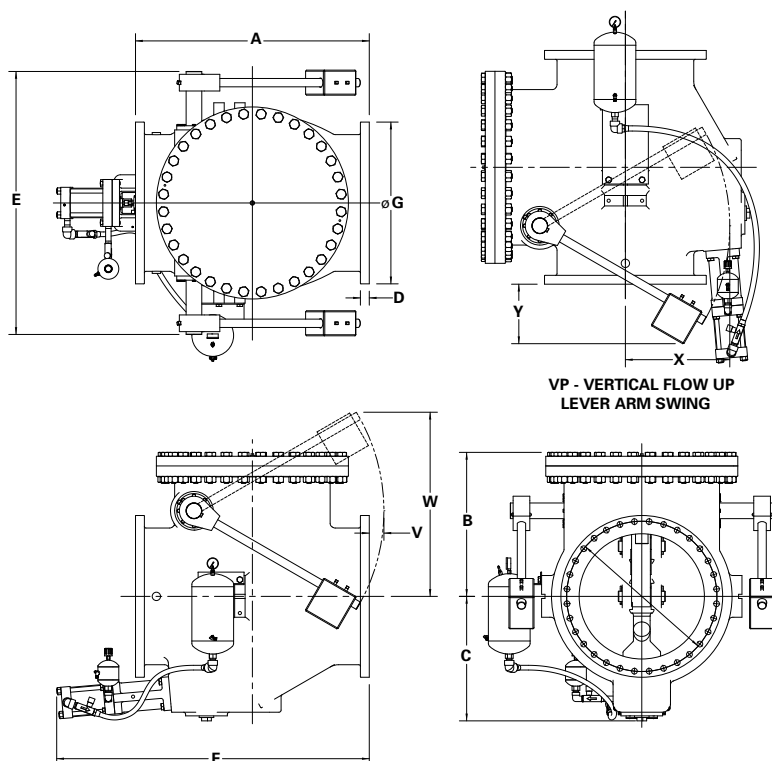
Dimensions

Body Style 6000A/6000

Valve & Oil Controlled Bottom Mounted Buffer (BMB)

Valve Size	F1										
	A	B	C	D	E	F	G	V	W	X	Y
6	14.00	10.13	9.13	1.00	25.00	25.63	11.00	9.38	16.50	14.25	11.63
150	356	257	232	25	635	651	279	238	419	362	295
8	19.50	12.00	11.75	1.13	25.00	28.00	13.50	6.25	18.00	13.00	9.25
200	495	305	298	29	635	711	343	159	457	330	235
10	24.50	14.50	14.13	1.19	30.00	33.50	16.00	7.00	20.50	13.50	8.50
250	622	368	359	30	762	851	406	178	521	343	216
12	27.50	16.00	15.50	1.25	31.50	42.00	19.00	8.00	25.00	18.00	11.25
300	699	406	394	32	800	1067	483	203	635	457	286
14	31.00	19.88	17.25	1.38	46.00	48.00	21.00	8.25	29.00	20.00	14.50
350	787	505	438	35	1168	1219	533	210	737	508	368
16	36.00	22.38	21.25	1.44	46.00	50.00	23.50	7.00	30.75	20.00	14.00
400	914	569	540	37	1168	1270	597	178	781	508	356
18	40.00	24.12	21.75	1.56	58.00	56.00	25.00	8.25	35.00	24.50	15.00
450	1016	613	552	40	1473	1422	635	210	889	622	381
20	40.00	25.00	23.00	1.69	64.00	60.00	27.50	8.25	36.00	23.50	15.00
500	1016	635	584	43	1626	1524	699	210	914	597	381
24	48.00	28.25	26.00	1.88	67.00	65.00	32.00	10.00	43.75	28.00	18.00
600	1219	718	660	48	1702	1651	813	254	1111	711	457
30	56.00	34.75	29.25	2.13	77.00	76.00	38.75	5.00	48.00	24.00	15.50
750	1422	883	743	54	1956	1930	984	127	1219	610	394
36	63.00	40.38	33.79	2.38	83.00	86.00	46.00	2.00	51.00	21.00	15.00
900	1600	1026	858	60	2108	2184	1168	51	1295	533	381
42	70.00	50.63	37.91	2.63	98.00	95.00	53.00	15.00	65.00	41.00	26.00
1100	1778	1286	963	67	2489	2413	1346	381	1651	1041	660
48	78.00	50.63	42.16	2.75	115.00	108.00	59.50	17.50	75.00	47.50	29.25
1200	1981	1286	1071	70	2921	2743	1511	445	1905	1207	743
54	87.00	62.13	53.16	3.00	130.00	120.00	66.25	18.00	84.00	50.50	39.50
1400	2210	1578	1350	76	3302	3048	1683	457	2134	1283	1003
60	97.00	72.00	59.25	3.13	140.00	130.00	73.00	10.50	88.50	45.50	35.50
1500	2464	1829	1505	80	3556	3302	1854	267	2248	1156	902
66	108.00	66.63	65.16	3.44	152.00	140.00	80.00	3.50	91.00	43.00	33.50
1700	2743	1692	1655	87	3861	3556	2032	89	2311	1092	851

Inches
Millimeters



Sales and Service

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