

## DeZURIK VPB V-PORT BALL VALVES



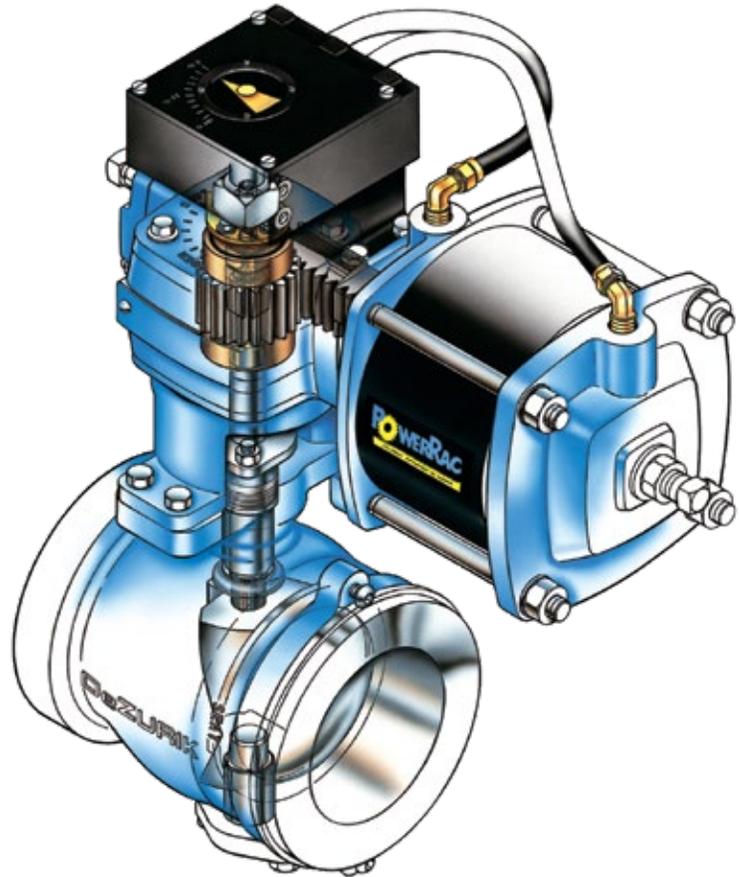
# VPB V-Port Ball Valves

## Design and Construction

DeZURIK V-Port Ball valves deliver superior performance and reliability required to optimize process performance. This versatile valve is designed for control of fibrous suspension applications, plus clean, dirty, viscous and corrosive liquids and gases.

The VPB has an ASME 150 class valve in size range 1-20" and an ASME 300 class valve in size range 1-12". DeZURIK V-Port Ball valves feature one-piece body construction and are available in flanged or flangeless end connections. They conform to or exceed North American and International Standards for control valves. Superior control performance is designed into the geometry of the ball for critical management of flow. A locked ball-to-shaft connection ensures no lost motion for critical control. Bearings, covers and fasteners are designed for maximum valve reliability.

When operated by a high quality DeZURIK actuator and controlled by one of many high performing positioners, the DeZURIK V-Port Ball control valve can deliver control accuracy exceeding 0.5% as measured by the Benchmark Control Valve Diagnostics™ System. Control accuracy will increase process plant efficiency, improve overall profitability and reduce control valve life-cycle costs.



In the event maintenance is needed, DeZURIK's unique design facilitates fast, easy breakdown and assembly of valve components with no special tools required. The result is reduced maintenance time and the lowest overall cost of ownership.

Drop-in-place, self-aligning and interchangeable seat options offer ease in maintenance. Available seat options include reinforced PTFE, flexible metal, rigid metal and clearance.





### **Streamlined Flow Passages**

DeZURIK V-Port Ball valves feature a streamlined flow passage, providing maximum efficiency (Cv/Kv per valve size) and minimizing erosion inside the valve body.

### **Rugged, Easy-to-Maintain Construction**

The heavy-duty cast body is a one-piece design for increased installed-pipe integrity and minimal potential leak paths. Stainless steel construction combined with drop-in seats and a splined shaft and ball connection makes the DeZURIK V-Port Ball valve easy to maintain.

### **Carbon Steel and High Alloy Valves Available**

VPB valve bodies are available in 316 and 317 stainless steel, carbon steel and Hastelloy C.

### **Laying Length Flexibility**

DeZURIK VPB valves offer the ultimate in face-to-face flexibility. The solid one-piece body is available in either ASME B16.10 or ANSI/ISA take-out dimensions. V-Port Ball valves are available in flanged or flangeless construction to meet individual requirements and common piping standards. For added versatility, these valves meet IEC, ISO and EN face-to-face dimensions. In plants that have an installed base of both ASME B16.10 and ANSI/ISA control valves, VPB users have been able to minimize storeroom inventory by stocking valve bodies, ANSI/ISA retainers and ASME B16.10 retainers. A replacement valve with either face-to-face dimension can be quickly installed. DeZURIK also offers an integrally flanged one-piece ASME B16.10 body. Laying length flexibility is just another example of how the VPB can save money.

### **International Flange Drilling**

DIN 10, 16, 25 and 40, and JIS 10, 16 and 20 flange drilling bolt circle options are available in addition to ASME B16.5.



## Uninterrupted Gasket Surface

V-Port Ball valves feature a full, uninterrupted, raised-face gasket surface that provides maximum gasket integrity. The gasket surface provides full seal contact area with ASME B16.20 gaskets.

## Self-Aligning Ball and Seat

The self-aligning ball and seat on the VPB valve reduces lengthy setup time during repair and reassembly. Valves can easily be returned to like-new performance without time-consuming special procedures. And, because of the spring-loaded metal seat design, the ball and seat self-compensate for wear on either surface.



## Common Valve Components

DeZURIK's V-Port Ball valve was designed to share a majority of valve components with the DeZURIK RCV Rotary Control valve. The two valves use the same bodies, packing components, bearings, brackets and fasteners. The common components reduce spare parts in inventory requirements and associated costs for plants utilizing both styles of DeZURIK control valves.

## Stainless Steel Fasteners

As standard, all DeZURIK V-Port Ball valve fasteners are stainless steel, providing easy disassembly. An additional maintenance feature is a bottom access cover for valve disassembly and reassembly.

## Streamlined Maintenance

DeZURIK V-Port Ball valves feature the simplest maintenance procedures among control valves available. There are no threaded trim parts. The seat retainer and trim components drop in place ensuring precise alignment of plug and seat. Disassembly and reassembly are easily completed with no special wrenches or other tools required. On viscous and suspended fibrous services where routine maintenance is expected, the VPB's drop-in trim, optional sealed bearings and self-aligning ball/seat reduce maintenance costs and minimize lost production.





## V-Ball Design

Utilizing computer-aided design and extensive flow-loop testing, the v-orifice was designed to provide the high rangeability and precision throttling required on fibrous suspension applications, as well as clean or dirty liquids and gases.

The straight through flow passage provides maximum efficiency and excellent erosion resistance. The ball can be furnished with a range of high-alloy materials, all provided with a heat-treated nickel overlay. This overlay provides a non-porous and lubricous surface, resulting in greater corrosion resistance and less sliding friction. For abrasive and high temperature applications, a 317 stainless steel ball can be furnished with a tungsten carbide overlay or a Hastelloy C ball with nickel overlay can be provided.

## Sealed Bearings

The sealed-bearing option prevents media from entering the bearing areas, which can hinder valve operation. PFA Fluoropolymer or FFKM Perfluoroelastomer seals are available for bearings that need exceptional protection from scaling, plating, abrasive or polymerizing media.



## Corrosion-Resistant Bearings

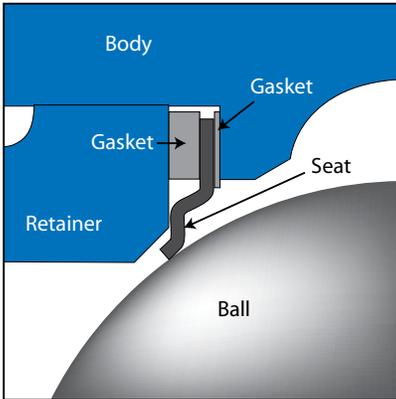
The one-piece bearing provides a large area of radial support to the shaft. The shaft is fully supported, greatly reducing shaft fatigue. The 317 stainless steel wire mesh reinforced PTFE bearing has a low coefficient of friction that minimizes operating torques and reduces actuator sizing requirements. For severe-service applications, a cobalt-chromium alloy bearing is available. A sealed-bearing option is also available.



## Splined Shaft with Solid Ball-to-Shaft Connection

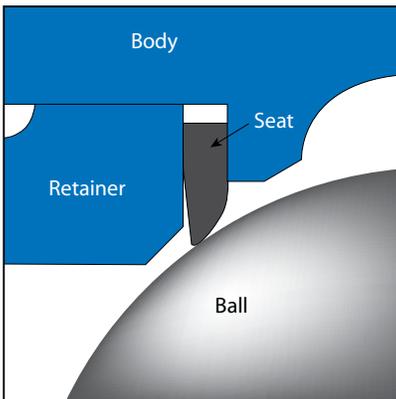
The splined shaft and ball with locking torque screw on DeZURIK V-Port Ball valves provide a high-strength, positive connection that effectively eliminates mechanical backlash and hysteresis. The splined connection with locking torque screw ensures accurate, precise positioning of the ball. The machined diameter of the shaft provides blow-out proof protection.

# Seat Options



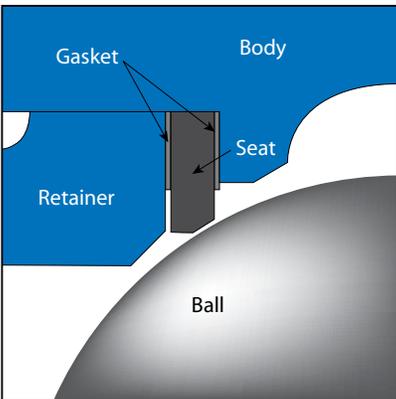
## Flexible Metal Seat

The flexible metal seat is designed to shear fibrous fluids and provides shutoff up to ANSI/FCI 70.2 Class IV standard. Flexible metal seats are rated to the full valve pressure rating with the valve installed in the flow-to-open direction and rated to 150 psi (1030 kPa) pressure differential when installed in the flow-to-close direction.



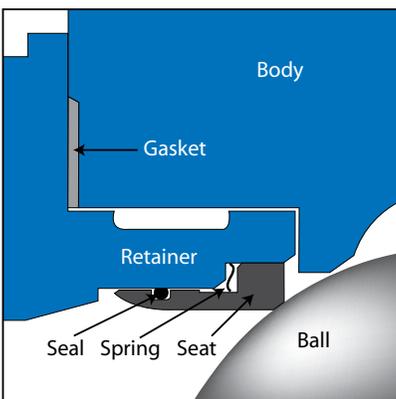
## Reinforced PTFE Seat

Reinforced PTFE seats are typically used on clean fluid applications where ANSI/FCI 70.2 Class VI shutoff is required. DeZURIK V-Port Ball valves feature a reinforced PTFE seat, designed for flow-to-open operation, rated to 285 psi (1895 kPa) pressure differential. For added versatility, all V-Port Ball valve seat options are field-interchangeable.



## Clearance Seat

The clearance seat provides maximum controllability and minimum hysteresis in applications that do not require tight shutoff. This bi-directional seat eliminates seat friction. Shutoff is 5% of valve's maximum flow when closed.



## Rigid Seat

Rigid seats are available for abrasive application including reclaimed fiber systems and applications with suspended chemical solids. The rigid seat provides shutoff performance to ANSI/FCI 70.2 Class IV. Materials include 317 stainless steel and Hastelloy C, all with heat treated nickel overlay. For enhanced abrasion resistance, a 317 stainless steel seat with tungsten carbide seating surface and solid Cobalt-Chromium alloy bearing is available.

An optional nickel-chromium spring can be substituted for the 17-7 PH stainless steel seat spring when added corrosion resistance is required.

The rigid seat is designed for flow-to-open operations and is field-interchangeable with the reinforced PTFE, flexible metal and clearance seats.

## Intelligent Positioners

Digital positioners can be used in a conventional 4-20 mA, analog control environment. They can also be used with HART, Foundation Fieldbus, or Profibus communication protocols bringing you access to diagnostic capabilities that will allow you to ensure your process is operating at its peak effectiveness.



DeZURIK P30A



DeZURIK P85

## Throttling Control

The V-Port Ball valve design ensures unsurpassed accuracy over the 90° range of operation. Splined and locked ball-to-shaft connection, computer-designed ball, characterized v-port, low-friction bearings and low-friction packing combine to give superior control, including fast, accurate response to signal changes. These rigid connections effectively eliminate mechanical backlash and hysteresis.

The V-Port Ball valve with a high quality DeZURIK actuator and one of many high performing positioners will exceed 0.5% control accuracy, delivering over 200 discrete positions. This exceeds industry valve dynamic performance standards as well as the accuracy levels of most alternative pneumatically actuated control valves.

To enhance accuracy of the VPB in real world process systems, the control valve assembly can be fitted with a smart digital positioner that not only provides near zero air bleed but also can be used in control systems using HART, Foundation Fieldbus, or Profibus protocols. This allows precise control and feedback of valve performance to the Distributed Control System (DCS).

## Performance Testing

Control valve performance is tested with a BenchMark Control Valve Diagnostic™ system. Each valve has a discrete test result that can be referenced through the valve's serial number. V-Port Ball valve performance accuracy provides in excess of 200 repeatable positions. With routine maintenance, field monitoring or monitoring through a digital positioner, this performance level can be maintained throughout the life of the valve.

## Control Valve Test Report

All VPB valve/actuator/positioner assemblies are tested for accuracy. The optional CVT Control Valve Test Report can be ordered which documents the response measurement from step inputs per ISA-75.25.01-2000 (R2010).

## **Actuator Flexibility Options**

V-Port Ball valves are available with DeZURIK PowerRac® or Diaphragm actuators. The actuator top mounting pads or adapter brackets of currently manufactured DeZURIK rotary control and isolation valves (RCV, VPB, BHP) are compatible with the ISO 5211 standard. This common actuator platform increases flexibility and helps reduce spare parts inventory.



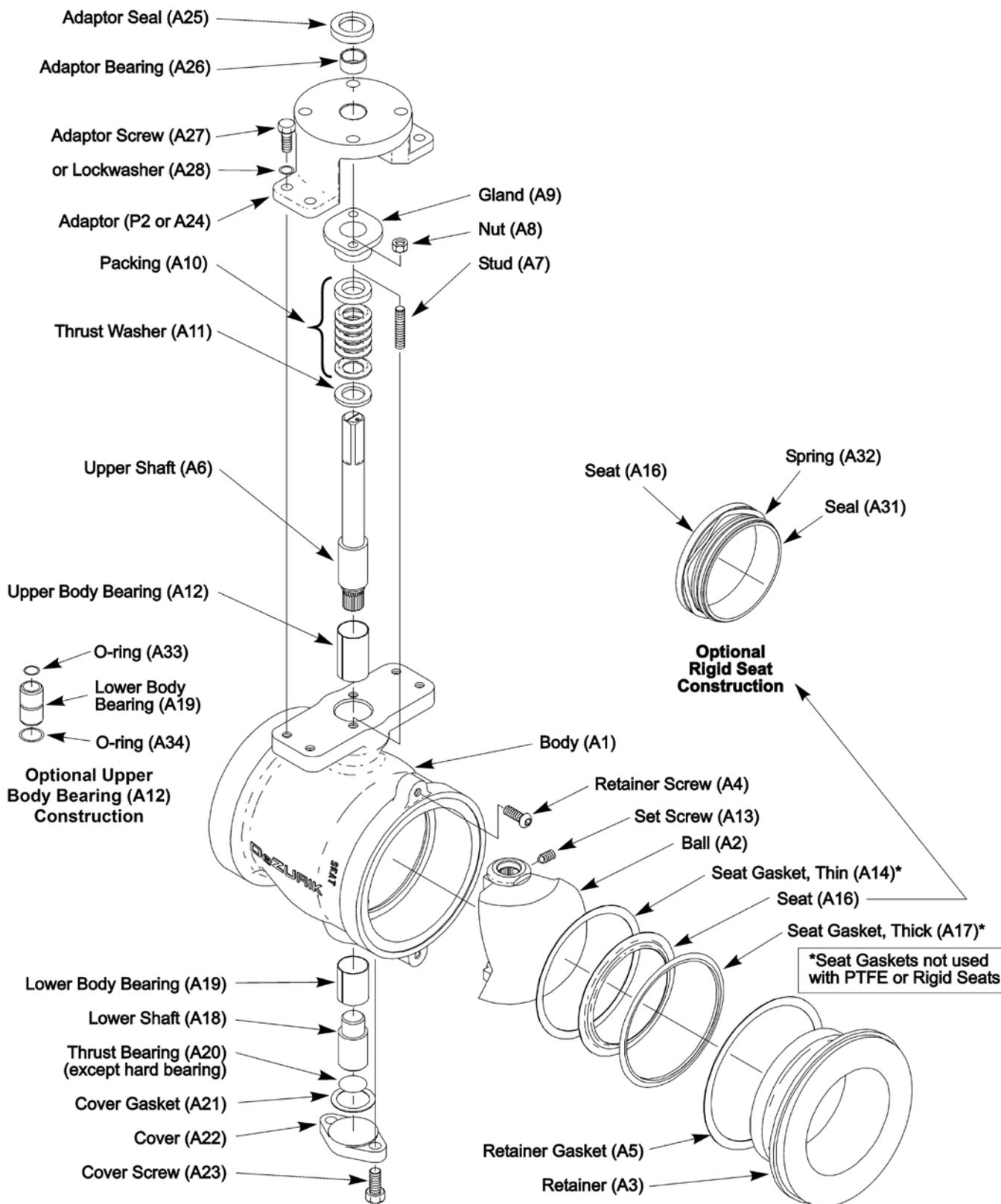
## **Close Coupling of Actuator to Valve**

DeZURIK Diaphragm and PowerRac® actuators rigidly connect to the valve and the positioner on the actuator housing. This accurately feeds exact valve position directly to the positioner. In addition, the close coupling of the actuator to the valve makes the total package as compact as possible.

## **Accessories**

A full line of accessories integrated to the actuator system is available to meet your individual mill/plant requirements.

# Materials of Construction

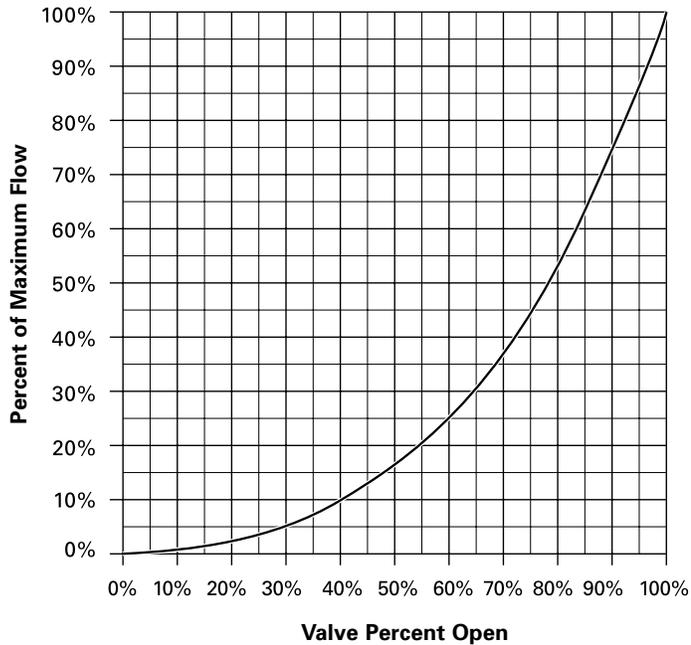


# Materials of Construction

Item	Description	Order Code	Material
A1	Body	S2	316 Stainless Steel, ASTM A 351, Grade CF8M
		S3	317 Stainless Steel, ASTM A 351, Grade CG8M
		CS	Carbon Steel, ASTM A 216, Grade WCB
		HC	Hastelloy C, ASTM A 494, Grade CW2M
A2	Ball	S3NH	317 Stainless Steel, ASTM A 351, Grade CF8M, with Heat Treated Nickel Overlay
		S3S	317 Stainless Steel, ASTM A 351, Grade CF8M, with Tungsten Carbide Overlay
		HCNH	Hastelloy C, ASTM A494, Grade CW2M with Heat Treated Electroless Nickel Overlay
A3	Retainer	S2	316 Stainless Steel, ASTM A 351, Grade CF8M
		S3	317 Stainless Steel, ASTM A 351, Grade CG8M
		CS	Carbon Steel, ASTM A 216, Grade WCB
		HC	Hastelloy C, ASTM A 494, Grade CW2M
A4	Screw, Retainer	All	18-8 Stainless Steel
A5	Gasket, Retainer	All	Flexible Graphite
A6	Shaft, Upper	S10	2205 Duplex Stainless Steel
		S5	17-4 PH Stainless Steel
		HCC	Hastelloy C, ASTM B 574, Alloy N06022 Ceramic Coated
		TNC	Titanium, Ceramic Coated
A7	Stud, Packing	All	18-8 Stainless Steel
A8	Nut, Packing	All	18-8 Stainless Steel
A9	Gland	S2, CS	316 Stainless Steel, ASTM A 351, Grade CF8M
		S3	317 Stainless Steel, ASTM A 351, Grade CG8M
		HC	Hastelloy C, ASTM A 494, Grade CW2M
A10	Packing	TC	PTFE Chevron
		G2	Braided Carbon Graphite
A11	Thrust Washer	S2, CS	316 Stainless Steel, ASTM A 276, Type 316
		S3	317 Stainless Steel, ASTM A 276, Type 317
		HC	Hastelloy C, ASTM B 574 or B 575
A12	Bearing, Upper	FT	317 Stainless Steel Wire Mesh Reinforced PTFE
		HC	Hastelloy C
		SL	Cobalt Chromium Alloy
		S9	440C Stainless Steel
A13	Set Screw	S2, CS	316 Stainless Steel
		S3, HC	Alloy 20 Stainless Steel
A14	Gasket, Seat	S2, S3, HC	Flexible Graphite
A16	Seat	S3	317 Stainless Steel, Electroless Nickel Overlay, Heat Treated
		RT	Reinforced PTFE, Filled 15% Glass, 5% Molybdenum
		S3S, S3SI	317 Stainless Steel, ASTM A 351, Grade CF8M, Tungsten Carbide Overlay
		S3R, S3RI	317 Stainless Steel, ASTM A 743, Grade CG8M, Electroless Nickel Overlay, Heat Treated
		S5C	17-4 PH Stainless Steel , H1150
		HCRI	Hastelloy C, ASTM A 494, Grade CW2M, Heat Treated, Electroless Nickel Overlay
A17	Gasket, Seat	S3	317L Stainless Steel, Flexible Graphite Filled
		HC	Hastelloy C, Flexible Graphite Filled
A18	Shaft, Lower	S10	2205 Duplex Stainless Steel
		S5	17-4 PH Stainless Steel
		HCC	Hastelloy C, ASTM B 574, Alloy N06022 Ceramic Coated
		TNC	Titanium, Ceramic Coated
A19	Bearing, Lower	FT	317 Stainless Steel Wire Mesh Reinforced PTFE
		HC	Hastelloy C
		SL	Cobalt Chromium Alloy
		S9	440C Stainless Steel
A20	Bearing, Thrust	FT	PTFE Fabric Bonded to 317 SS
		FT, HC	PTFE Fabric Bonded to Hastelloy C
		SL	Graphite
A21	Gasket, Cover	All	Graphite
A22	Cover	S2	316 Stainless Steel, ASTM A 351, Grade CF8M
		S3	317 Stainless Steel, ASTM A 351, Grade CG8M
		CS	Carbon Steel, ASTM A 216, Grade WCB
		HC	Hastelloy C, ASTM A 494, Grade CW2M
A23	Screw, Cover	All	316 Stainless Steel
A24	Adaptor	All	Ductile Iron
A25	Seal, Adaptor	DR, PR	Nitrile Rubber, Carbon Steel Case
A26	Bearing, Adaptor	DR55, 85	Oil-Impregnated Bronze
A27	Screw, Adaptor	All	18-8 Stainless Steel
A28	Lockwasher, Adaptor	All	18-8 Stainless Steel
A31	Seal, O-Ring	All	Fluoro Rubber, Encapsulated in PFA
A32	Spring	All	Fluoro Rubber, Encapsulated in PFA
A33	O-ring	S9VS, SLVS, HCVS	Fluoropolymer Seal
		SLKS, HCKS	FFKM Perfluoroelastomer Seal
A34	O-ring	S9VS, SLVS, HCVS	Fluoropolymer Seal
		SLKS, HCKS	FFKM Perfluoroelastomer Seal

# Valve Selection

## Flow Characteristic



## Applicable Standards

**DeZURIK VPB V-Port Ball Valves are designed and/or tested to meet the following standards:**

ASME B16.10	Face-to-Face dimensions, short pattern requirements
ASME B16.34	Body Wall Thickness and Pressure/temperature ratings for Class 150 and 300 Valves
ASME B16.5	Flange dimensions conform to Pipe flanges and Flanged Fittings for Class 150 and 300
ANSI/FCI 70.2	Control valve seat leakage
EN 558-1 PN 10/16	Basic Series 3, Face-to-Face dimensions
IEC 534-3-2 F-F	Face-to-Face dimensions, Industrial Process Control Valves
ANSI/ISA-75.02	Control Valve Capacity Test Procedures
ANSI/ISA-75.08.02	Face-to-Face dimensions for Flanged and Flangeless Rotary Control Valves
ISO 5211/1 & 2	Part-turn valve actuator attachment, Part 1: Flange dimensions and Part 2: Flange and Coupling performance characteristics
ISO 5752 PN 10/16	Basic Series 3, Face-to-Face dimensions
MSS-SP-25	Data Plate and body identification conform to marking requirements

## Flow Parameters

Valve Size	Cv*/Kv* 100% Open	
	Flexible Metal & Rigid Metal Seats	Reinforced PTFE & Clearance Seats
1"	36	40
25mm	31	35
1.5"	120	135
40mm	104	117
2"	210	235
50mm	182	203
2.5"	260	295
65mm	225	255
3"	360	420
80mm	311	363
4"	600	690
100mm	519	597
6"	1230	1290
150mm	1064	1116
8"	2015	2190
200mm	1743	1894
10"	3000	3180
250mm	2595	2751
12"	4225	4390
300mm	3655	3797
14"	5830	6060
350mm	5043	5242
16"	7500	7770
400mm	6488	6721
18"	9500	9840
450mm	8218	8512
20"	12000	12430
500mm	10380	10752

\*Cv = Flow in GPM of water at 1 psi pressure drop.  
Kv = Flow in m<sup>3</sup>/hr. of water at 100 kPa pressure drop.

## Valve Weights

Valve Size	Class 150			Class 300
	Flanged (F1S & F1A)	Flangeless (W1S)	Add for Long Body (F1L)	Flanged (F2S)
1"	12	9	0.5	15
25mm	6	5	1	7
1.5"	17	12	2.0	24
40mm	8	6	1	11
2"	21	13	2.8	27
50mm	10	6	2	13
2.5"	32	20	—	40
65mm	15	10	—	19
3"	47	35	3.3	58
80mm	22	16	2	27
4"	63	42	3.5	79
100mm	29	20	2	36
6"	95	74	10.5	142
150mm	44	34	5	65
8"	152	116	15.3	208
200mm	69	53	7	95
10"	236	182	17.5	342
250mm	108	83	8	156
12"	368	314	11.3	516
300mm	167	143	6	235
14"	560	—	—	—
350mm	255	—	—	—
16"	695	—	—	—
400mm	316	—	—	—
18"	890	—	—	—
450mm	404	—	—	—
20"	1105	—	—	—
500mm	501	—	—	—

Pounds  
Kilograms

# Valve Selection

## Shut-Off Capabilities

Seat type	Flow	Shut-Off Class (ANSI /FCI 70-2)
Flexible Metal*	Bi-Directional	IV
Rigid Metal	Uni-Directional	IV
Reinforced PTFE**	Uni-Directional	VI
Clearance Seat	Bi-Directional	5% of max flow when closed

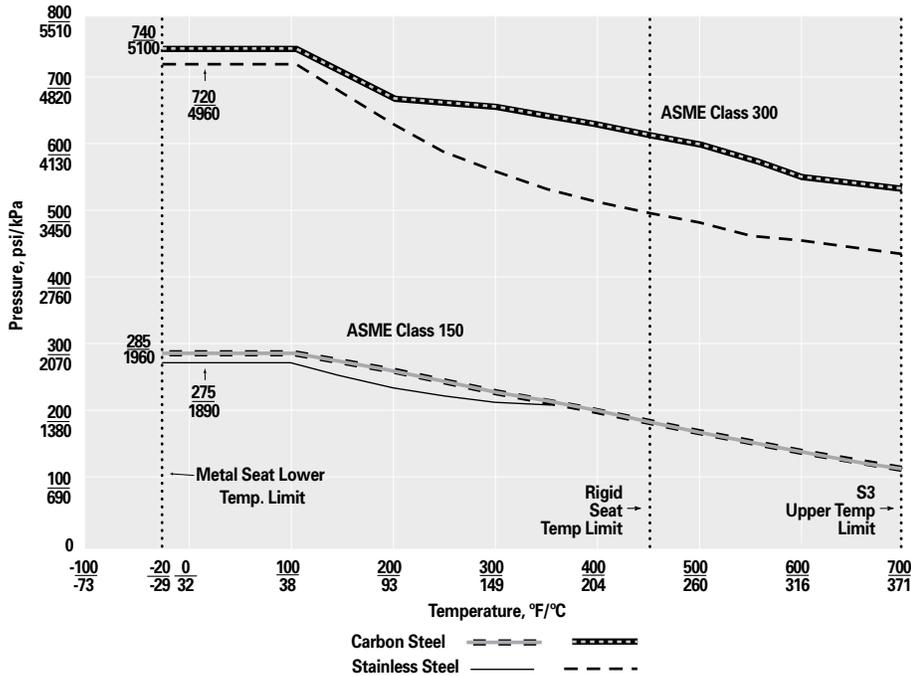
NOTE: Uni-directional valves must be installed with flow-to-open (forward flow; flow into the convex side of ball). Flow-to-open is the preferred direction for bi-directional valves. Seats are rated to the full valve pressure rating unless noted below.

\* Flexible metal seats are rated to 150 psi (1030kPa) pressure differential when installed in the flow-to-close direction.

\*\* Reinforced PTFE seats are rated to 285 psi (1895 kPa) maximum shutoff pressure differential.

## Pressure Ratings

### Flex Metal\*, Rigid Metal and Clearance Seats (S3, S3R, S35, S3RI, S3SI, HCRI)



# Ordering

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

<b>Valve Style</b> Give valve style code as follows:	
VPB	= V-Port Ball Valve

<b>Valve Size</b> Give valve size code as follows:			
1	=	1"	(25mm)
1.5	=	1.5"	(40mm)
2	=	2"	(50mm)
2.5	=	2.5"	(65mm)
3	=	3"	(80mm)
4	=	4"	(100mm)
6	=	6"	(150mm)
8	=	8"	(200mm)
10	=	10"	(250mm)
12	=	12"	(300mm)
14	=	14"	(350mm)
16	=	16"	(400mm)
18	=	18"	(450mm)
20	=	20"	(500mm)

<b>End Connection</b> Give end connection code as follows:	
<b>Flangeless</b>	
W1S	= Class 150, ANSI/ISA-75.08.02 and IEC 534-3-2-F 1-12" valves
<b>Flanged</b>	
F1S	= Class 150, ANSI/ISA-75.08.02 and IEC 534-3-2F-F 1-20" valves
F2S	= Class 300, ANSI/ISA-75.08.02 and IEC 534-3-2F-F 1-12" valves
F1L	= Class 150, ASME B16.10, ISO 5752 and EN 558-1 PN 10/16, 1-12" valves
F1A	= Class 150, ASME B16.10, ISO 5752 and EN 558-1 PN 10/16 (Long body) 1-12" excluding 2.5" valve size.

<b>Body Material</b> Give body material code as follows:	
S3	= 317 stainless steel (Class 150 only) S3 bodies must be ordered with S3NH or S3S ball, S10 shaft and S3, S3S, S3R or RT seat.
CS	= Carbon Steel. CS bodies must be ordered with S3NH or S3S ball, S10 shaft, and S3, S3S, S3R or RT seat.
S2	= 316 stainless steel (Class 300 only). S2 bodies must be ordered with S3NH or S3S ball, S5 or S10 shaft, and either S3, S3S, S3R or RT seat.
HC	= Hastelloy C. HC body must be ordered with HCNH ball, HCC or TNC shaft, HCRI or RT seat, and HC, HCVS or HCKS bearings.

<b>Packing Material</b> Give packing material code as follows:	
TC	= PTFE Chevron, to 500°F (260°C)
G2	= Braided carbon graphite, to 1000°F (540°C) (Available with S3 seat and S9 or SL bearings)

<b>Trim Combination</b> Give ball, shaft, seat and bearing codes as follows:	
S3NH	= 317 stainless steel heat treated nickel overlay, to 700°F (370°C)
S3S	= 317 stainless steel with tungsten carbide overlay, to 1000°F (540°C) (Available with S3S, S3SI or S3 seats only)
HCNH	= Hastelloy C with heat treated electroless nickel overlay, to 700°F (370°C)

<b>Shaft Material</b>	
S10	= 2205 Duplex stainless steel
S5	= 17-4 PH stainless steel
HCC	= Hastelloy C Ceramic Coated (HC Bearings only)
TNC	= Titanium Ceramic Coated

<b>Seat Material</b>	
RT	= Reinforced PTFE, to 500°F (260°C)
S3	= Flexible 317 stainless steel with heat treated electroless nickel overlay, to 700°F (370°C)
S5C	= Clearance Seat, 17-4PH Stainless Steel to 1000°F (540°C)
S3R	= Rigid 317 stainless steel with heat treated nickel overlay, to 450°F (230°C)
S3S	= Rigid 317 stainless steel with tungsten carbide overlay, to 450°F (230°C) (Available with S3S Ball only)
S3RI	= Rigid 317 stainless steel with heat treated electroless nickel overlay and nickel-chromium spring, to 450°F (230°C)
S3SI	= Rigid 317 stainless steel with tungsten carbide overlay and nickel-chromium alloy spring, to 450°F (230°C)
HCRI	= Rigid Hastelloy C with heat treated electroless nickel overlay and nickel-chromium alloy spring, to 450°F (230°C)

<b>Bearing Material</b>	
FT	= 317 stainless steel wire mesh reinforced PTFE, to 500°F (260°C)
S9	= 440C stainless steel bearings, to 1000°F (540°C)
S9VS	= 440C stainless steel bearings with PFA Fluoropolymer seal to 450°F (230°C)
SL	= Solid Cobalt-Chromium Alloy, to 1000°F (540°C)
SLVS	= Solid Cobalt-Chromium Alloy with PFA Fluoropolymer seal, to 450°F (230°C)
SLKS	= Solid Cobalt-Chromium Alloy with FFKM Perfluoroelastomer seal, to 550°F (288°C)

<b>On Application</b>	
HC	= Hastelloy C 1000°F (540°C)
HCVS	= Hastelloy C with PFA Fluoropolymer seal, to 450°F (230°C)
HCKS	= Hastelloy C with FFKM Perfluoroelastomer seal, to 550°F (288°C)

<b>On Application</b> Give options code as follows:	
BAA	= Buy American Act
CMC	= Certificate of Material Conformance
CRT	= Certified Material Physical & Chemical Test Report
DTR	= DeZURIK Standard Certified Production Hydrostatic Shell & Seat Test Report
ST3	= Pennsylvania Steel Procurement Act
G1	= DIN 10 or BS4504/10 Drilling (W1S, F1L & F1S only)
G2	= DIN 16 or BS4504/16 Drilling (W1S, F1L & F1S only)
G3	= DIN 25 or BS4504/25 Drilling (F2S only)
G4	= DIN 40 or BS4504/40 Drilling (F2S only)
J1	= J1S 10 Flange Drilling (F1L or F1S only)
J6	= J1S 16 Flange Drilling (F1L or F1S only)
J2	= J1S 20 Flange Drilling (F2S only)
<b>On Application</b> Pressure Equipment Directive (CE Mark)	

## Ordering Example

VPB,4,F1L,S3,TC,S3NH-S10-RT-FT,G1\*PR-R1A-PC4

# Actuators

## Manual Gear Actuators

Manual gear actuators with handwheel or chainwheel input are available in cast iron construction. They feature sintered bronze bearings on each end of the input shaft for durability and performance.



## Cylinder Actuators

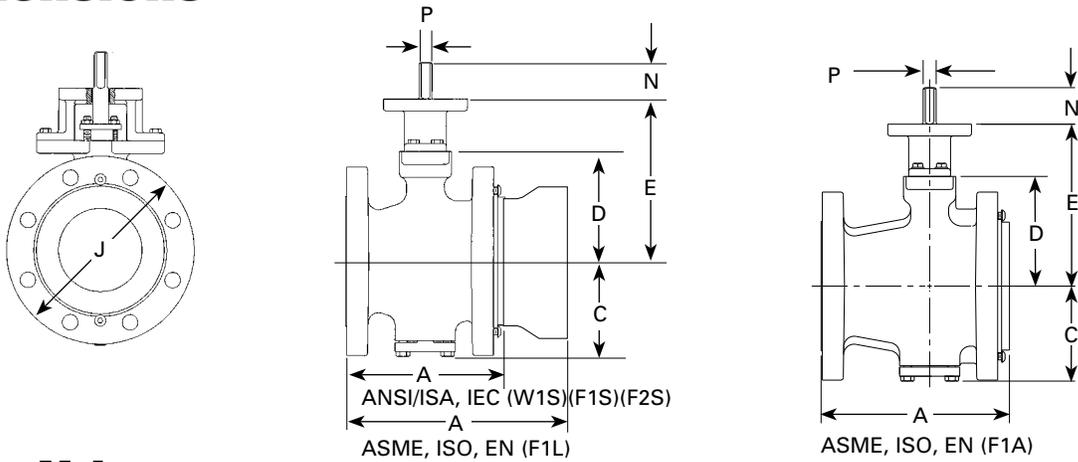
PowerRac® Cylinder actuators are available as double-acting or spring return. They feature a high opening torque for on-off applications and also maintain a high operating torque throughout the full stroke for modulating service.

## Diaphragm Actuators

Diaphragm actuators may be specified also. They're available with 40, 55, 85, 125, 145 and 250 square inch (0.026m<sup>2</sup>, 0.036m<sup>2</sup>, 0.055m<sup>2</sup>, 0.094m<sup>2</sup>, 0.161m<sup>2</sup>) sizes and with 20, 35 or 60 psi (140, 240 or 410 kPa) spring options.



# Dimensions



## Basic Valve

Inches  
Millimeters

Valve Size	A		C	D	E	J			N	P Diameter	P Square
	ANSI/ISA IEC	ASME ISO EN				Flanged Class 150	Flangeless Class 150	Flanged Class 300			
1" 25mm	4.00 102	5.00 127	2.75 70	3.25 83	5.62 143	4.25 108	2.44 62	4.88 124	1.75 44	.62 16	.50 13
1.5" 40mm	4.50 114	6.50 165	2.94 75	3.47 88	5.84 148	5.00 127	3.06 78	6.12 155	1.75 44	.62 16	.50 13
2" 50mm	4.88 124	7.00 178	3.22 82	3.75 95	6.12 155	6.00 152	3.81 97	6.50 165	1.75 44	.62 16	.50 13
2.5" 65mm	5.50 140	7.50 191	3.75 95	4.44 113	6.94 176	7.00 178	4.38 111	7.50 190	1.75 44	.75 19	.62 16
3" 80mm	6.50 165	8.00 203	4.00 102	4.69 119	7.19 183	7.50 191	5.19 132	8.25 210	1.75 44	.75 19	.62 16
4" 100mm	7.62 194	9.00 229	4.56 116	5.25 133	7.75 197	9.00 229	6.38 162	10.00 254	1.75 44	.75 19	.62 16
6" 150mm	9.00 229	10.50 267	5.72 145	6.50 165	9.50 241	11.00 279	8.50 216	12.50 317	1.75 44	1.25 32	.94* 24
8" 200mm	9.56 243	11.50 292	7.28 185	8.12 206	11.12 282	13.50 343	10.62 270	15.00 381	1.75 44	1.50 38	1.19 30
10" 250mm	11.69 297	13.00 330	8.91 226	9.50 241	13.38 340	16.00 406	13.12 333	17.50 444	1.75 44	2.00 51	1.62** 41
12" 300mm	13.31 338	14.00 356	9.91 252	10.50 267	14.38 365	19.00 483	15.38 391	20.50 521	1.75 44	2.00 51	1.62 41
14" 350mm	15.75 400	—	10.86 276	11.47 291	15.34 390	21.00 533	—	—	1.75 44	2.00 51	1.62 41
16" 400mm	15.75 400	—	13.25 337	14.06 375	18.56 471	23.50 597	—	—	1.75 44	2.50 64	1.81 46
18" 450mm	18.00 457	—	14.44 367	15.25 387	19.75 502	25.00 635	—	—	1.75 44	2.50 64	1.81 46
20" 500mm	20.00 508	—	15.56 395	16.38 416	20.38 518	27.50 686	—	—	1.75 44	2.50 64	1.81 46

Note: All dimensions are subject to change without notice.  
Request certified drawings for use in preparing piping layouts.

\*6" (150mm)  $\frac{.88}{22}$  for DR-40 actuators

\*\*10" (250mm)  $\frac{1.19}{30}$  for DR-85 actuators

## Sales and Service

For information about our worldwide locations, approvals, certifications and local representative:

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