

# Fisher™ Slurry Vee-Ball™ V150S and V300S Rotary Control Valves

The Fisher V150S and V300S Slurry Vee-Ball valve mates with CL150 and CL300 raised-face flanges. Rugged construction, highly wear-resistant trim materials, and an unrestricted straight through flow path make the design ideal for controlling the most abrasive of slurries.

A shaft with a choice of drive connections will allow a variety of power operated actuators and valve positioners or controllers to be used.

The design is particularly effective in minimizing erosive damage to the adjoining pipework, thereby providing greater operational safety and service life when compared with other valve types.

## Features

- **Fully protective trim**—The valve body, shaft, and bearings are fully protected by hard wear-resistant trim materials.
- **Pipeline and flange protection**—The throttled flow stream is guided through a specially shaped flow ring to minimize turbulence and impingement on the pipe wall. The valve can be matched to the bore size of the inlet and outlet piping in order to prevent turbulence being generated by the step resulting in scouring erosion of the flange faces, unexpected leakage, and expensive rework. In addition, both the inlet and outlet valve flange faces are protected by a portion of the hard trim.



Fisher Slurry Vee-Ball Control Valve

- **Long Service Life**—The Vee-Ball design, when used in reverse flow mode, keeps the high velocity down stream of the vena contracta within the flow ring bore at the outlet of the valve. Compared with other styles of valves, the exit flow is essentially parallel with the flow ring wall and a minimum of flow impingement occurs. Combined with a choice of hard wear-resistant materials, a significantly long life is obtained.

Easily replaceable trim parts allow the valve to be overhauled at predetermined intervals and the valve body used again during repeated operational cycles.

- **Ease of installation**—Full flanging on the valve body allows the valve body to be easily aligned centrally with the pipe flanges, an essential requirement in avoiding erosion across the flange faces.
- **Excellent Flow Control**—Precise contouring of the V-notch ball provides a modified equal percentage flow characteristic. When combined with a valve actuator/controller system having minimal lost motion, improved process control can be obtained.

*(continued on page 2)*

## Features (continued)

- **Quick and Easy Maintenance**—All trim parts are retained without the use of press fits or screw threads exposed to the process fluid. See figure 1.
- **Structural Integrity**—The valve body, complete with flanges, is made from a one-piece casting. No welding is employed. No O-ring seals are used. Use of a flanged valve body does not require the use of extra long studs.

The shaft seal is made from well-proven PTFE chevron ring packing with the means for external adjustment.

ceramic ball for particularly aggressive slurry services with extended lifetime requirements. The ceramic insert offers substantial increase in flow ring lifetimes.

- Trim materials are available to meet the requirements of corrosive/erosive slurries. See table 2.
- The “Flow Over the Top” V-Notch Ball offers an alternative to the standard V-Notch Ball in scaling applications.
- The drive shaft is available with either a double D or splined actuator connection to accommodate a choice of actuation between a spring-opposed diaphragm or a rack and pinion.

## Options

- A PSZ (partially stabilized zirconia) ceramic flow ring insert is available with HCl (high chrome iron) or PSZ

**Specifications**

**Valve Sizes**

■ NPS 3, ■ 4, ■ 6, ■ 8, ■ 10, and ■ 12

**End Connection**

V150S: CL150 Raised-face flange

V300S: CL300 Raised-face flange

**Face to Face Dimension**

See figure 2

**Maximum Inlet Pressure**

Consistent with pressure-temperature ratings per ASME B16.34 but do not exceed the material temperature capabilities shown below or the pressure drop limitations

**Maximum Shut Off Pressure**

See tables 3 and 4

**Shutoff Classification**

Class I per ANSI/FCI 70-2 and IEC 60534-4 (Class II and better not available). A defined initial maximum leak rate can be provided subject to review of service conditions.

**Construction Materials**

Standard Construction: See table 1

**Temperature Capability**

For Trim 1: 427°C (801°F) maximum

For Trims 2 and 3: 230°C (446°F) maximum

For materials: See table 1

**Flow Characteristic**

Modified equal percentage

**Dimensions**

See figures 2 and 3

**Flow Direction**

Reverse flow recommended (into concave face of ball, out through the flow ring)

**Flow Coefficients**

See Fisher Catalog 12

**Maximum Ball Rotation**

90 degrees

**Valve Installation**

Shaft axis to be horizontal

**Actuator Mounting**

Standard ball rotation is clockwise (CW) to close with right hand mount actuator. Left hand mount actuator with counter clockwise (CCW) to close ball action is optional. For horizontal pipe run and horizontal shaft orientation, it is recommended the ball rotate to the top of the valve body upon opening.

**Valve/Actuator Action**

With diaphragm or piston rotary actuator and splined shaft, the valve is field-reversible between PDTC or PDT0: ■ push-down-to-close (extending actuator rod closes valve) and ■ push-down-to-open (extending actuator rod opens valve)

**Actuator Size Selection**

Contact your [Emerson sales office](#) for information.

**Approximate Weight**

Valve Size, NPS	V150S		V300S	
	kg	lb	kg	lb
3	15	33	30	66
4	28	62	39	86
6	45	99	65	142
8	82	180	120	265
10	120	265	213	470
12	178	390	314	692

**Table 1. Standard Construction Materials**

Part	Material	MATERIAL TEMPERATURE CAPABILITY			
		°C		°F	
		Minimum	Maximum	Minimum	Maximum
Valve Body	Carbon Steel ASME SA216 WCC	-29	427	-20	800
Body Liner	High Chrome Iron (HCl) ASTM A532 Class III Type A	-29	427	-20	800
V-Notch Ball	High Chrome Iron ASTM A532 Class III Type A	-29	427	-20	800
	Ceramic (optional)	-29	427	-20	800
Flow Ring	High Chrome Iron ASTM A532 Class III Type A	-29	427	-20	800
	HCl with Ceramic Insert (optional)	-29	230	-20	450
Flow Ring Retainer	Carbon Steel ASME SA105	-29	427	-20	800
Bearing Shroud	High Chrome Iron ASTM A532 Class III Type A	-29	427	-20	800
Bearing	S44004	-29	427	-20	800
Drive Shaft	S17400	-29	427	-20	800
Follower Shaft	S17400	-29	427	-20	800
Shaft Pins	S42000	-29	427	-20	800
Gaskets	Graphite SST Laminate	-198	538	-325	1000
Packing Set	PTFE V-ring	-46	230	-50	450
	Graphite	-198	538	-325	1000
Packing Box Ring and Follower	S31600	-198	538	-325	1000
Studs	B8M Class 2	-45	538	-50	1000
Nuts	S31600	-45	538	-50	1000
Retainer Screws and Clips	S31600	-45	538	-50	1000
Spring	S30400	-29	427	-20	800
Plug	S31600	-45	538	-50	1000

**Table 2. Trim Levels**

Trim Level	Ball	Flow Ring	Valve Body Liner	Bearing Shrouds
1 (standard)	HCl (High Chrome Iron)	HCl	HCl	HCl
2	HCl	HCl with ceramic insert	HCl	HCl
3	Ceramic Ball	HCl with ceramic insert	HCl	HCl

**Table 3. V150S and V300S Maximum Allowable Shutoff Pressure Drops (Body Ratings)**  
(Tables for both trim and body limits must be consulted)

TEMPERATURE RANGE	PRESSURE RATING	
	WCC CL150	WCC CL300
°C	Bar	
-46 to -29	---	---
-29 to 38	20.0	51.7
93	17.9	51.7
149	15.9	50.3
204	13.8	48.6
232	12.8	47.2
260	11.7	45.9
316	10.7	43.8
343	9.65	41.7
371	8.62	38.3
399	6.55	34.8
427	5.52	28.3
°F	Psi	
-50 to -20	---	---
-20 to 100	290	750
200	260	750
300	230	730
400	200	705
450	185	685
500	170	665
550	155	635
600	140	605
650	125	590
700	110	555
750	95	505
800	80	410

**Table 4. V150S and V300S Maximum Allowable Shutoff Pressure Drops based on Standard Trim.**  
Note: Do not exceed the pressure/temperature rating of the valve or mating flanges

TEMPERATURE RANGE	VALVE SIZE, NPS					
	3	4	6	8	10	12
°C	Bar					
-29 to 427	47.0	27.5	28.3	27.5	15.2	13.8
°F	Psi					
-20 to 800	680	400	410	400	220	200
1. Refer to table 3.						

**Figure 1. Slurry Vee-Ball Cutaway View**



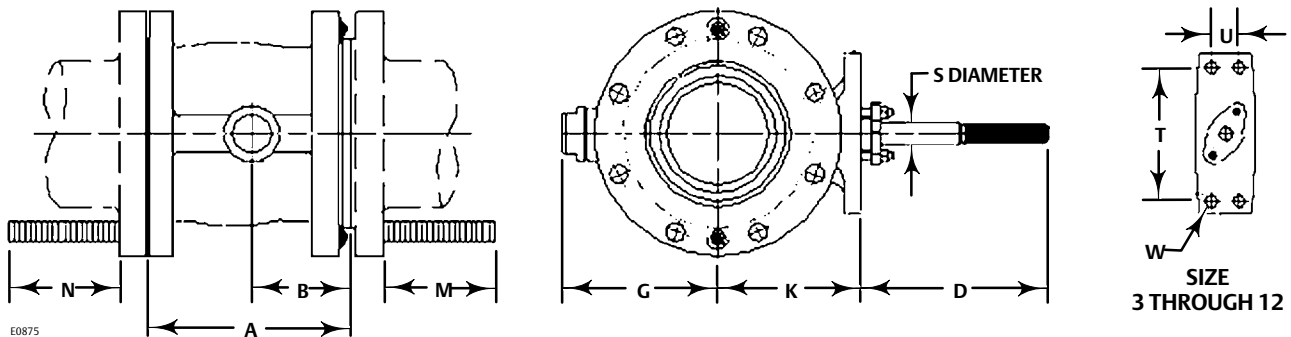
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**Table 5. Fisher V150S Dimensions**

VALVE SIZE	V150S DIMENSIONS <sup>(1)</sup>										
	A	B	D	G	K	M <sup>(2)</sup>	N <sup>(2)</sup>	S Diameter	T	U	W
<b>NPS</b>	<b>mm</b>										
3	165	80.0	235	140	130	104	98.0	19.1	152	31.8	14.2
4	194	102	214	152	140	117	98.0	19.1	152	31.8	14.2
6	230	111	214	175	164	124	112	25.4	152	31.8	14.2
8	304	184	208	220	231	195	124	31.8	235	46.0	17.5
10	385	235	208	250	261	235	132	31.8	235	46.0	17.5
12	455	291	208	300	304	270	132	38.1	235	46.0	17.5
	<b>Inch</b>										
3	6.49	3.15	9.26	5.51	5.12	4.11	3.86	0.75	6.00	1.25	0.56
4	7.62	4.02	8.44	5.98	5.53	4.61	3.86	0.75	6.00	1.25	0.56
6	9.06	4.38	8.44	6.89	6.45	4.90	4.40	1.00	6.00	1.25	0.56
8	11.96	7.25	8.19	8.66	9.11	7.68	4.90	1.25	9.25	1.81	0.69
10	15.16	9.26	8.18	9.84	10.26	9.25	5.19	1.25	9.25	1.81	0.69
12	17.91	11.47	8.18	11.81	11.97	10.63	5.19	1.50	9.25	1.81	0.69

1. Stud length associated with clearance dimension "M" is longer than standard length specified in ASME B16.5.  
2. Clearance necessary to remove flange bolts.

**Figure 2. Slurry Vee-Ball Dimensions (see tables 5 and 6)**



**Table 6. Fisher V300S Dimensions**

VALVE SIZE	V300S DIMENSIONS										
	A	B	D	G	K	M <sup>(1)</sup>	N <sup>(1)</sup>	S Diameter	T	U	W
<b>NPS</b>	<b>mm</b>										
3	165	80.0	235	140	130	127	121	19.1	152	31.8	14.2
4	194	102	214	152	140	146	127	19.1	152	31.8	14.2
6	230	111	214	175	164	152	140	25.4	152	31.8	14.2
8	304	184	208	220	231	223	152	31.8	235	46.0	17.5
10	385	235	208	250	261	276	137	31.8	235	46.0	17.5
12	455	291	208	300	304	324	186	38.1	235	46.0	17.5
	<b>Inch</b>										
3	6.49	3.15	9.26	5.51	5.12	5	4.75	0.75	6.00	1.25	0.56
4	7.62	4.02	8.44	5.98	5.53	5.75	5	0.75	6.00	1.25	0.56
6	9.06	4.38	8.44	6.89	6.45	6	5.5	1.00	6.00	1.25	0.56
8	11.96	7.25	8.19	8.66	9.11	8.78	6	1.25	9.25	1.81	0.69
10	15.16	9.26	8.18	9.84	10.26	10.87	6.81	1.25	9.25	1.81	0.69
12	17.91	11.47	8.18	11.81	11.97	12.75	7.31	1.50	9.25	1.81	0.69

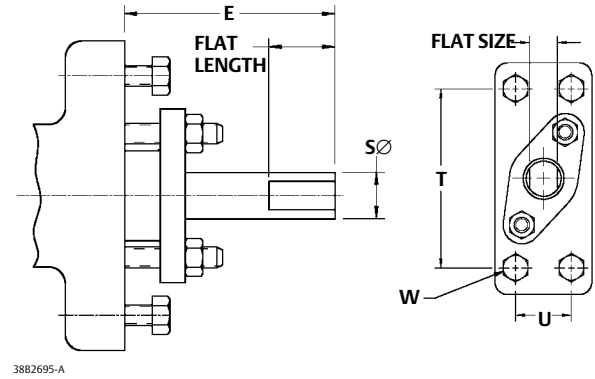
1. Clearance necessary to remove flange bolts.

**Table 7. Fisher Slurry Vee-Ball Dimensions for Double D Shaft Drive**

VALVE SIZE	E	S <sup>(1)</sup>	FLAT LENGTH	FLAT SIZE	T	U	W
NPS	mm						
3	83	19.0	25.4	14.2	95	25	see below
4	83	19.0	25.4	14.2	95	25	
6	83	25.4	25.4	17.5	95	25	
8	83	31.8	25.4	20.6	133	38	
10	89	31.8	25.4	20.6	133	38	
12	89	38.1	38.1	25.4	133	38	
	Inch						
3	3.25	0.75	1.0	0.56	3.75	1.0	1/2-13
4	3.25	0.75	1.0	0.56	3.75	1.0	1/2-13
6	3.25	1	1.0	0.69	3.75	1.0	1/2-13
8	3.25	1.25	1.0	0.81	5.25	1.5	5/8-11
10	3.5	1.25	1.0	0.81	5.25	1.5	5/8-11
12	3.5	1.5	1.5	1.0	5.25	1.5	5/8-11

1. This nominal valve shaft diameter is the shaft diameter through the packing box. Use this diameter when selecting Fisher actuators.

**Figure 3. Fisher Slurry Vee-Ball Dimensions for Double D Shaft Drive (see table 7)**

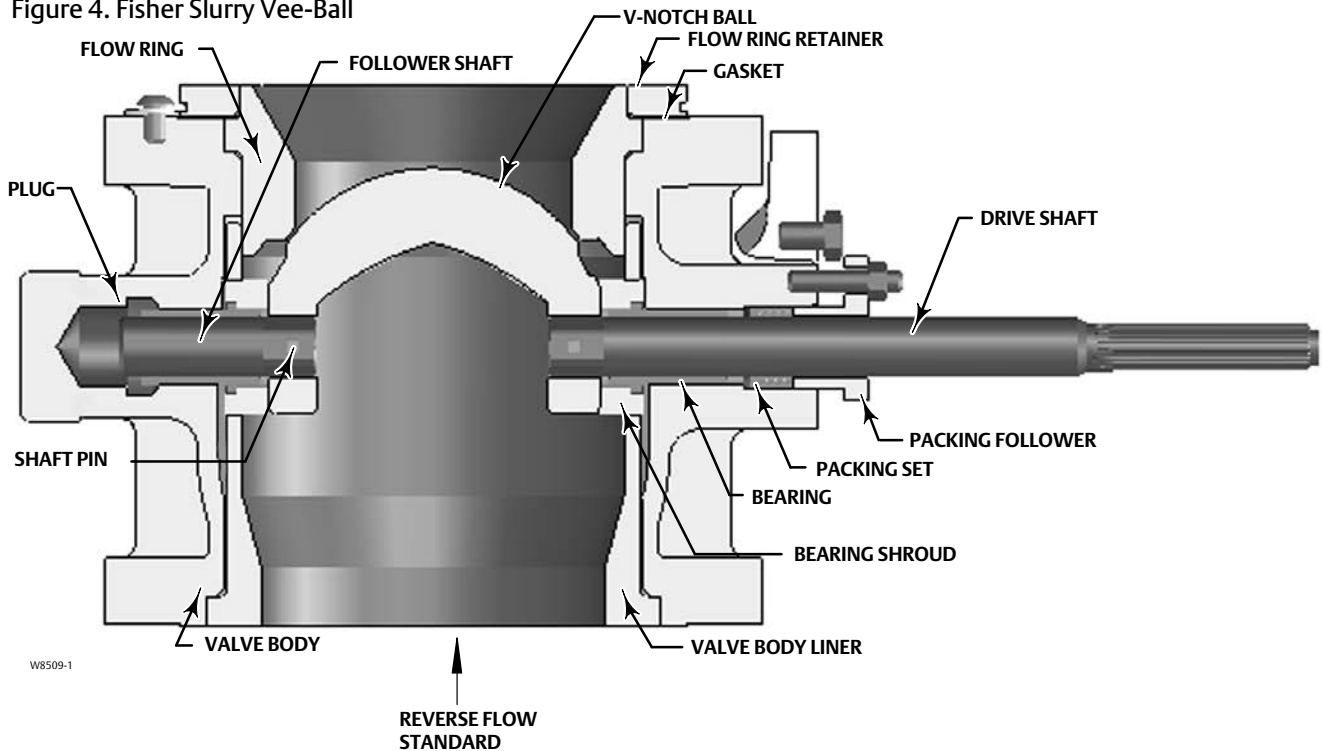


## Product Bulletin

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Figure 4. Fisher Slurry Vee-Ball



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