Pishro Sanat VP501, VP501A, and VP501R Sliding-Stem Control Valves

Pishro Sanat VP501, VP501A, and VP501R general-purpose control valves (figures 1, 2, and 3) are used for throttling or on-off control of a wide variety of liquids and gases. All three valve designs have single ports, balanced valve plugs, and cage guiding. Metal-to-PTFE seating for stringent shutoff requirements is standard in all valves except those with Anti-Cavitation cages. Metal-to-metal seating for higher temperatures is standard for valves with Anti-Cavitation cages and optional for all other valves.

The temperature limits of VP501 valves can be extended above 232ºC (450ºF) by using PEEK anti-extrusion rings in combination with a spring-loaded PTFE seal. The PEEK anti-extrusion rings expand to close off the clearance gap between the plug and the cage where the PTFE seal may extrude at high temperatures and pressures. The temperature limits are extended to 316ºC (600ºF) for non-oxidizing service and to 260ºC (500ºF) for oxidizing service.
The VP501 product line is available for a wide range of applications, including sulfide and chloride stress-cracking environments common to the oil and gas production industries. To discuss available constructions, contact PISHRO SANAT AMAL sales office and include the applicable codes and standards required for these environments.

PISHRO SANAT VP501 CONTROL VALVE WITH VA32 ACTUATOR

The VP-500 Valve Family

VP501, VP501A, and VP501R control valves are part of the versatile VP-500 family of Pishro Sanat industrial control valves. VP-500 valves share the following characteristics:

- Multiple trim material choices
- Interchangeable, restricted-capacity trims and full-sized trims to match variable process flow demands
- Different cage/plug styles that provide particular flow characteristics for highly-specialized applications. The standard cage comes in three
- different flow characteristics: quick-opening, linear, or equal percentage.

Features

- Anti-Noise Trim (figure 6) and cages (figures 4 and 5) attenuate aerodynamic noise in gaseous service.
- To help eliminate cavitation damage in a properly-sized valve, a standard-travel, Anti-Cavitation, one-stage cage (figure 8) and a long-travel, Anti-Cavitation, two-stage cage are available in the NPS 1 through NPS 8 VP501 control valve.
- Compliance with the Clean Air Act– chevron packing systems (figures 9 and 10) that provide an improved stem seal to help prevent the loss of process fluid are available. These packing systems feature PTFE or Graphite packing with live-loading for reduced packing maintenance.
- PTFE Seating for Long-Lasting Shutoff Capability– Controlled compression of standard seat construction protects PTFE disk between metal disk seat and disk retainer (figure 1). Only the edge of the PTFE disk is contacted by the flowstream during normal operation. Excellent shutoff is maintained by a backup ring or spring-loading that forces the valve plug seal ring against the cage (figure 1).
- Valve Plug Stability– Rugged cage guiding provides high valve plug stability, which reduces vibration and mechanical noise.
- Cost-Effective Operation and Maintenance Economy– Increased wear resistance of hardened stainless steel trim means longer-lasting service. When inspection or maintenance is necessary, the body can stay in the pipeline during removal of trim parts. Balanced valve plug construction permits use of smaller, lower-cost Pishro Sanat actuators. The VP501R valve also permits easy body interior access without having to remove the bonnet or actuator (figure 3). And, trim inventory costs are cut because dimensional standardization permits use of most standard VP-500 trim parts.
- Compliance with European Standards– Valves are available with dimensions specified by EN/DIN standards. See figure 15.
- Sour Service Capability– Unless otherwise noted, references are to NACE MR0175-2002. Optional materials are available to meet NACE MR0103 and NACE MR0175 / ISO 15156. Material requirements under these standards vary by edition and year of issue; the specific standard must be specified.

Table of Contents

Specifications

Available Configurations

VP501: Single-port, globe-style control valve with cage guiding, balanced valve plug, and push-down-to-close valve plug action (figure 1)
VP501A: Angle version of VP501 control valve, used to facilitate piping or in applications where a self-draining valve is desired (figure 2)
VP501R: Same as VP501 control valve except with push-down-to-open valve plug action (figure 3)

Valve Sizes and End Connection Styles

Flanged raised-face per EN 1092-1/B and see table 1

Maximum Inlet Pressures and Temperatures[1,2]

As listed below, unless limited by maximum pressure drop or material temperature capabilities
Valves with Cast Iron Bodies
Flanged: Consistent with CL125B or 250B per ASME B16.1
Valves with Steel and Stainless Steel Bodies
Flanged: Consistent with CL150, 300, 600[3] , 900 per ASME B16.34
Screwed or Welding: Consistent with flanged CL600 per ASME B16.34

Maximum Pressure Drops[2]

Same as maximum inlet pressure for specific construction defined above, except where further limited as follows:
All Valves Except Those with Anti-Cavitation, Anti-Noise Trim, and Anti-Noise Cages: See figure 11.
Valves with Anti-Cavitation Cages: See figure 12.
Valves with Anti-Noise Trim Cages: See figure 13 except where further limited by the following max dP/P1 ratios[4] – 0.60 for level A3 cage, 0.75 for level B3 cage, 0.85 for level C3 cage, or 0.99 for level D3 cage
Valves for NACE MR0175 / ISO 15156 and MR0103: See figure 14

Shutoff Classifications Per ANSI/FCI 70-2 and IEC 60534-4

Class IV, V, or VI. See tables 2, 3, or 4

Construction Materials

Body, Bonnet, and Bonnet Spacer or Bottom Flange, if used: Cast iron, WCC carbon steel, or LCC carbon steel, WC9 chrome moly steel, CF8M (cast 316 stainless steel), or other materials upon request
Valve Plug, Cage, and Metal Seating Parts:
All Valves Except Those with Anti-Cavitation or Anti-Noise Trim Cages: See table 5
Valves with Anti-Cavitation Cages: See table 6
Valves with Anti-Noise Trim Cages: See table 8
Valves with Anti-Noise Cages: See table 7
Bellows Seal Assembly: 316L stainless steel or N04400
All Other Parts: See table 9

Material Temperature Capabilities[2]

Body/Trim Combinations:
All Valves Except Those with Anti-Cavitation or Anti-Noise Trim Cages: See figure 11
Valves with Anti-Cavitation Cages: See table 6
Valves with Anti-Noise Trim Cages: See table 8
Valves with Anti- Noise Cages: See table 7
Bolting For NACE MR0175 / ISO 15156 and MR0103: See table 18
Bonnets: See table 11
All Other Parts: See table 9

Flow Characteristics

Standard Cages: Quick-opening, linear, or equal percentage
Anti-Noise Trim, Anti-Noise, and Anti-Cavitation Cages: Linear

Flow Directions

VP501
Standard Cage: Normally down
Anti-Noise Trim and Anti- Noise Cages: Always up
Anti-Cavitation Cage: Always down
VP501A
Standard Cage with Liner for Metal Seat: Normally down
Standard Cage without Liner: Flow up or down
Anti-Noise Trim and Anti- Noise Cages: Always up
VP501R
Standard Cage: Normally up
Anti-Noise Trim Cage: Always down

Flow Coefficients and Noise Level Prediction

See table 12
For Anti-Noise Trim cage flow coefficients (other than NPS 6 valves), contact PISHRO SANAT sales office

- continued -

1. EN (or other) ratings and end connections can usually be supplied; consult PISHRO SANAT sales office.
2. The pressure or temperature limits in this bulletin, and any applicable code limitations, should not be exceeded.

Specifications (continued)

Port Diameters and Maximum Valve Plug Travels

See tables 13 and 15

Yoke Boss and Stem Diameters

See table 14

Typical Bonnet Styles

See table 11

Packing Arrangements

Standard Material: Single PTFE V-ring
Optional Materials: See table 9
ENVIRO-SEAL Packing Systems: See figures 9 and 10
ENVIRO-SEAL Packing Systems in vacuum service: Standard ENVIRO-SEAL packing systems can be used in vacuum service with packing rings in standard orientation. Do not reverse the ENVIRO-SEAL PTFE packing rings. Also, see Bulletins, ENVIRO-SEAL Packing Systems for Sliding-Stem Valves

Approximate Weights

NPS 1: 15 kg
NPS 1-1/2: 22 kg
NPS 2: 42 kg
NPS 2-1/2: 48 kg
NPS 3: 60 kg
NPS 4: 83 kg
NPS 6: 166 kg
NPS 8: 418 kg

Additional Options

Lubricator, lubricator/isolating valve, drilled and tapped connection in extension bonnet for leak-off service, body drain plug, style 3 fabricated extension bonnet made on order to a specific length for cryogenic service, style NS bonnet for seismic service requirements, packings suitable for nuclear service, Class V shutoff for VP501 above 232ºC (450ºF) using PEEK anti-extrusion rings

3. Certain bonnet bolting material selections may require a CL600 VP-500 valve assembly to be derated. Contact PISHRO SANAT sales office for more information.
4. Limitation based on excessive noise increase if max dP/P1 ratio for a given cage level is exceeded.

ENVIRO-SEAL Packing System Specifications

Applicable Stem Diameters

9.5 mm (3/8 inches), 12.7 mm (1/2 inches), 19.1 mm (3/4 inches), 25.4 mm (1 inch), and 31.8 mm (1-1/4 inches) diameter valve stems

Maximum Pressure/Temperature Limits[1,2]

To Meet the EPA Fugitive Emission Standard of 100 PPM[2]
For ENVIRO-SEAL PTFE and ENVIRO-SEAL Duplex packing systems: full CL300 up to 232ºC (450ºF)
For ENVIRO-SEAL Graphite ULF packing: 104 bar (1500 psig) at 316ºC (600ºF)

Construction Materials

PTFE Packing Systems
Packing Ring and Lower Wiper: PTFE V-ring[3]
Male and Female Adaptor Rings: Carbon-filled PTFE V-ring
Graphite ULF Packing Systems: Graphite rings Duplex Packing Systems:
Male and Female Adaptor Rings: Carbon-filled PTFE V-ring
Guide Bushings: Carbon graphite
Packing Rings: Graphite composite
Packing Washer: PTFE
Anti-Extrusion Washer: Filled PTFE (not required for Graphite ULF or duplex packing)
Lantern Ring: S31600 (316 stainless steel) (not required for Graphite ULF packing)
Packing Box Flange: S31600
Spring: 17-7PH stainless steel or N06600
Packing Follower: S31600 lined with carbon-filled PTFE
Packing Box Studs: Strain-hardened 316 stainless steel
Packing Box Nuts: 316 stainless steel SA194 Grade 8M

1. Refer to the valve specifications in this bulletin for pressure/temperature limits of valve parts. Do not exceed the pressure/temperature rating of the valve. Do not exceed any applicable code or standard limitation.

2. The Environmental Protection Agency (EPA) has set a limit of 100 parts per million (ppm) for fugitive emissions from a valve in selected VOC (Volatile Organic Compound) services.

3. In vacuum service, it is not necessary to reverse the ENVIRO-SEAL PTFE packing rings.

Table 1. Available Constructions

VALVE	VALVE SIZE, NPS	VALVE BODY MATERIAL AND END CONNECTION STYLE(1)							
		Cast Iron Valve Body		Carbon Steel, Alloy Steel, or Stainless Steel Valve Body					
		CL125 FF Flanged	CL250 RF Flanged	Screwed	RF or RTJ Flanged			Butt Weld	Socket Weld
					CL150	CL300	CL600		
VP501	1, 1-1/2, or 2	X	X	X	X	X	X	X	X
	2-1/2, 3, 4, 6, or 8	X	X	- - -	X	X	X	X	X
VP501A	1 or 2	- - -	- - -	- - -	X	X	X	X	X
	3, 4, or 6	- - -	- - -	- - -	X	X	X	X	X
VP501R	1, 1-1/2, or 2	- - -	- - -	X	X	X	X	X	X
	2-1/2, 3, or 4	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -

VALVE	VALVE SIZE, DN	STEEL VALVE BODY MATERIAL AND RAISED-FACE END CONNECTION STYLE(2)				
		PN16	PN25	PN40	PN63	PN100
VP501	25, 40, 50, 65, 80, 100, 150, or 200	X	X	X	X	X
VP501A	25, 50, 80, 100, or 150	X	X	X	X	X
VP501R	25, 40, 50, 65, 80, or 100	X	X	X	X	X

X = Available Construction.

1. End connection style abbreviations: FF - Flat Faced, RF - Raised Face, RTJ - Ring Type Joint.
2. End connection EN1092-1/B.

Table 2. Shutoff Classifications Per ANSI/FCI 70-2 and IEC 60534-4

Valve Design	Seating	Shutoff Class
All except those with Anti-Cavitation cages	PTFE	V Air Test
		V (optional)
		VI (optional)(3)
	Metal	IV (standard)
		V (optional)(1)
		VI (optional)(3)
VP501 with Anti-Cavitation one-stage cage	Metal	IV (standard)
		V (optional)
VP501 with Anti-Cavitation two-stage cages	Metal	V
VP501 and VP501A w/ TSO (Tight Shutoff) trim (CL125 through 600)	Replaceable, protected soft seat	TSO(2) TSO is not an ANSI/FCI leakage class. Valves with TSO trim are factory tested to a more stringent PISHRO SANAT test requirement of no leakage at time of shipment. Test medium is water. Specify service nP when ordering. Shutoff class V.
VP501 w/ TSO (Tight Shutoff) trim (CL125 through 600)	Std or Anti-Cavitation trim. Replaceable, protected soft seat.	

1. Class V shutoff requires spring-loaded seal ring, radius-seat plug, and wide-bevel seat ring (not available with 8-inch port, quick-opening cage). Not available with trims 4, 29, and 85.
2. For additional information, contact PISHRO SANAT sales office.
3. Refer to table 3.

ENVIRO-SEAL, HIGH-SEAL Packing Systems

ENVIRO-SEAL and HIGH-SEAL packing systems offer exceptional sealing capabilities. These systems easily install in existing valves or can be purchased with new valves. These systems help seal the process to conserve valuable process fluid. The long-life and reliability of these systems also reduce maintenance costs and downtime.

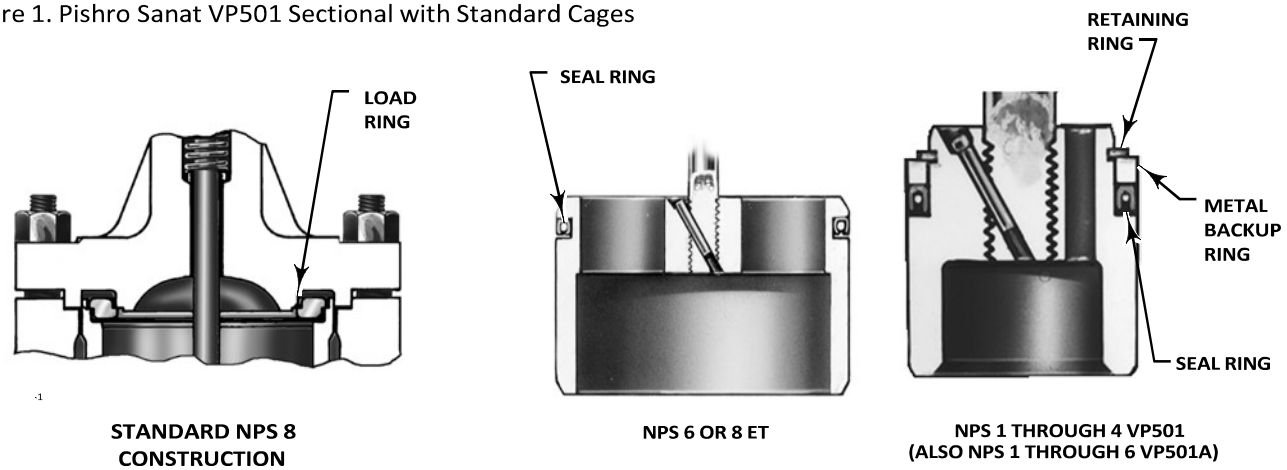
For applications requiring compliance with environmental protection regulations, the unique ENVIRO-SEAL packing system (figure 10) and a unique ENVIRO-SEAL bellows seal system (figure 9) are offered. The emission control packing system keeps emission concentrations below the EPA 100 ppm requirement.

For an excellent stem seal in applications that are not environmentally-sensitive, the HIGH-SEAL Graphite

ENVIRO-SEAL packing systems, available with PTFE,
Graphite ULF, or duplex packing, and the HIGH-SEAL Graphite ULF packing system feature live-loading and unique packing-ring arrangements for long-term, consistent sealing performance.

ULF packing system (figure 10) is offered. The HIGH-SEAL packing system provides improved sealing at pressure/temperature ratings beyond ENVIRO-SEAL limits.

Figure 1. Pishro Sanat VP501 Sectional with Standard Cages



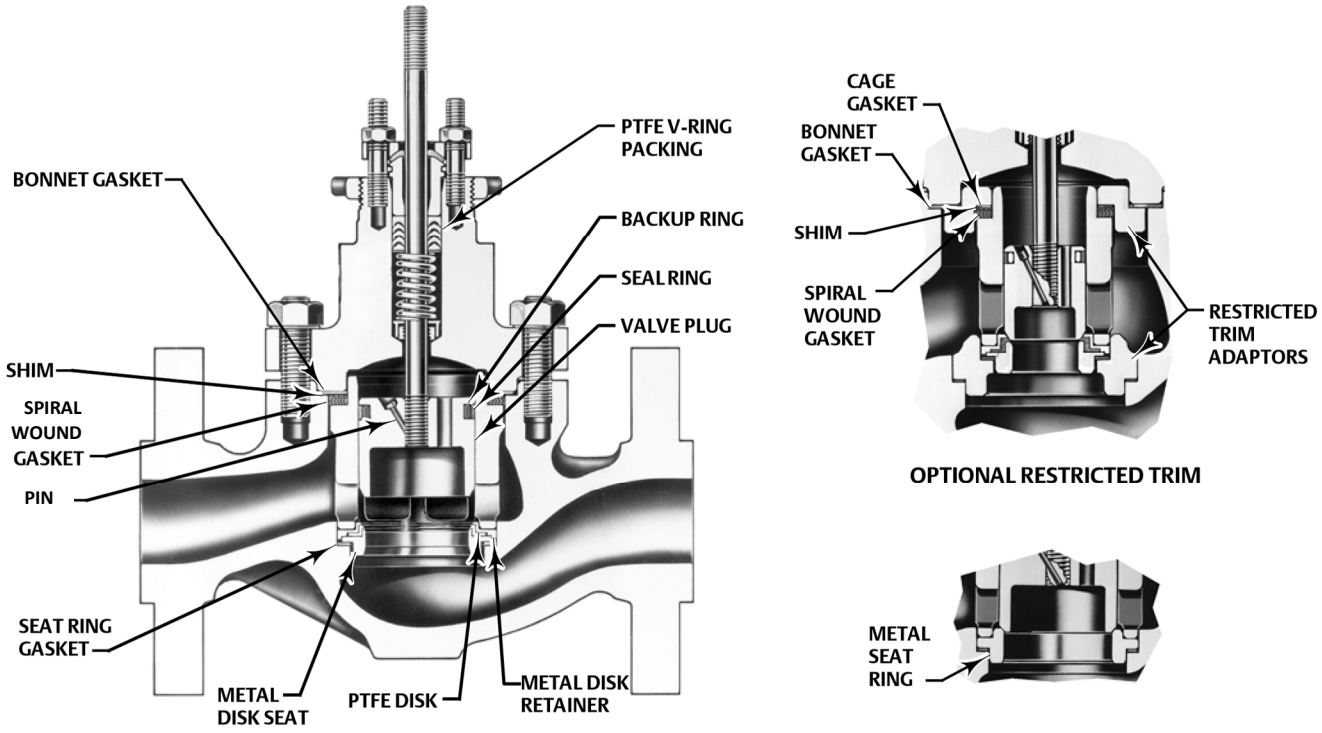


Figure 2. Pishro Sanat VP501A Sectional

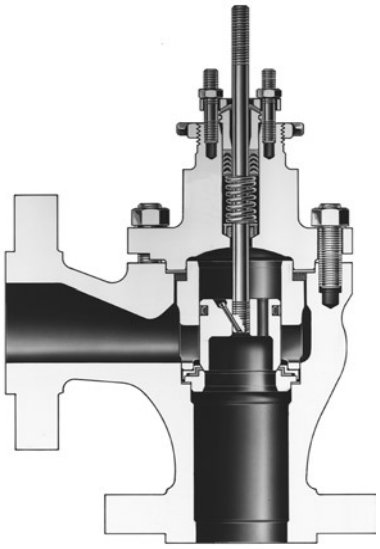


Figure 3. Pishro Sanat VP501R Sectional

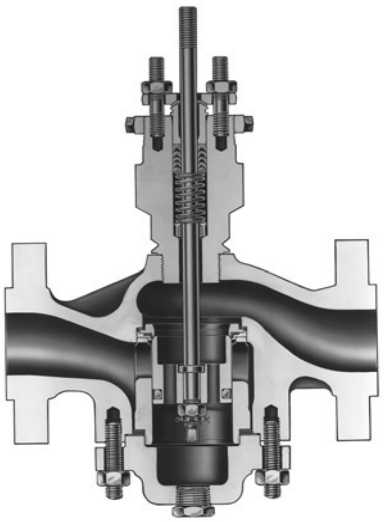


Figure 4. Typical Valve with Anti- Noise Aerodynamic Trim

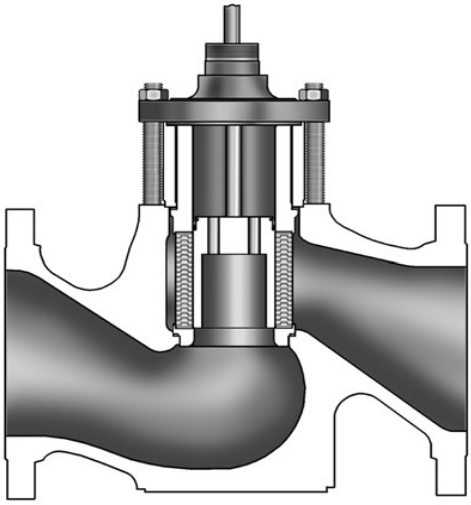
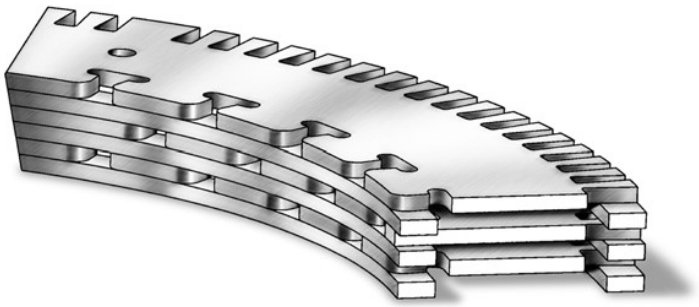


Figure 5. Typical WhisperFlo Cage



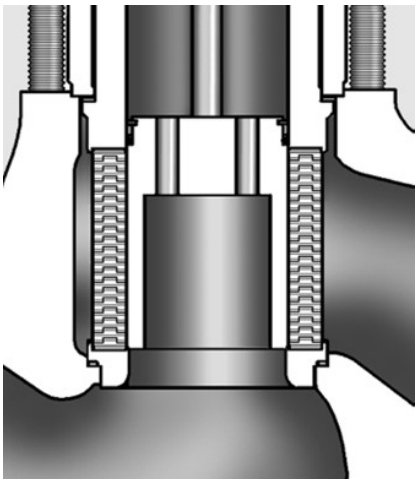


Table 6. Anti-Cavitation (1) Metal Trim Part Materials and Body/Trim Temperature Capabilities

TRIM DESIGNATION	VALVE PLUG	CAGE	CAGE RETAINER	SEAT RING	BODY & BONNET		MATERIAL TEMPERATURE CAPABILITY			
							ºC		ºF	
							Minimum	Maximum	Minimum	Maximum
Anti-Cav	Heat-treated S42000	S17400 SST H900 for Anti-Cavitation 1-stage or S17400 SST H1075 for Anti-Cavitation 2-stage	S31600	S17400 with H900 heat-treat condition	WCC carbon steel, WC9 chrome moly steel, or LCC carbon steel		-29	These materials not limiting factors	-20	These materials not limiting factors
					CF8M	NPS 1, 1-1/2, or 2 valve body size	-29	These materials and sizes not limiting factors	-20	These materials and sizes not limiting factors
						NPS 2-1/2 or 3 valve body size	-29	216	-20	420
						NPS 4, 6, or 8 valve body size	-29	177	-20	350

1. Available only in NPS 1 through 8 VP501 valves.

Table 7. Anti- Noise Metal Trim Part Materials and Valve Body/Trim Temperature Capabilities (NPS 4, 6, and 8 Pishro Sanat VP501 only)

TRIM DESIGNATION	VALVE BODY	VALVE PLUG	CAGE	CAGE RETAINER	SEAT	MATERIAL TEMPERATURE CAPABILITY(1)			
						ºC		ºF	
						Min	Max	Min	Max
WCC/416/410	WCC	S41600	S41000	WCC ENC	S41600	-29	316	-20	600
WCC/316	WCC	S31600/CoCrA Seat and Guide	S41000	WCC ENC	S31600/CoCrA	-29	316	-20	600
WCC/316N	WCC	S31600/CoCrA Seat and Guide	S41000 NACE	WCC/NACE/ENC	S31600/CoCrA	-29	316	-20	600
CF8M/316	316 CF8M	S31600/CoCrA Seat and Guide	S31603/ R31233	S31600/ENC	S31600/CoCrA	-198	316	-325	600
WCC/410	WCC	S41000	S41000	WCC ENC	S31600/PTFE	-29	232	-20	450
WCC/316/410	WCC	S31600	S41000	WCC ENC	S31600/PTFE	-29	149	-20	300
WCC/316/410N	WCC	S31600	S41000 NACE	WCC/NACE/ENC	S31600/PTFE	-29	149	-20	300
CF8M/316	CF8M	S31600	S31603/ R31233	S31600/ENC	S31600/PTFE	-73	149	-100	300
318	CD3MN	S31803/CoCrA Seat and Guide	S31803/ R31233	S31800/Cr Plate	S31803/CoCrA Seat	-51	316	-60	600
	LCC					-46	316	-51	600
	WCC					-29	316	-20	600
318C	CD3MN	S31803/CoCrA Seat and Guide	S31803/ R31233	S31800/Cr Plate	S31803/PTFE	-51	232	-60	450
	LCC					-46	232	-51	450
	WCC					-29	232	-20	450

1. Temperatures above 232ºC (450ºF) require PEEK anti-extrusion rings and spring-loaded seal ring. This option allows VP501 construction to be used up to 316ºC (600ºF) for non-oxidizing service and 260ºC (500ºF) for oxidizing service.

Table 8. Anti-Noise Trim Metal Trim Part Materials and Body/Trim Temperature Capabilities (NPS 6 Pishro Sanat VP501 with 5.375 inch port only)

Trim Designation	Valve Plug	Cage	Cage Retainer	Baffle (For Level D3 Cage Only)	DiskSeat and Retainer for PTFE-Seat Construction	Seat Ring for Metal-Seat Construction	Body Bonnet, & Bonnet Spacer	Material Temperature Capability	
								ºC	ºF
AN1 (standard for all body materials except CF8M)	S17400 HT	S41600 HT	Carbon steel NACE with electroless nickel coating (ENC)	Steel	- - -	S41000 HT	WCC carbon steel or WC9 chrome moly steel	-29 to 316(1)	-20 to 600(1)
							CF8M (316 SST)	-29 to 163	-20 to 325
AN1C (for soft seats)	S17400 HT	S41600 HT	Carbon steel NACE with electroless nickel coating (ENC)	Steel	S31600	- - -	WCC carbon steel or WC9 chrome moly steel	-29 to 204	-20 to 400
							CF8M (316 SST)	-29 to 163	-20 to 325
AN4	S31600 with seat and guide hard-faced with CoCr-A	S41600 HT	Carbon steel NACE with electroless nickel coating (ENC)	Steel	- - -	S31600 with seat hard-faced with CoCr-A	WCC carbon steel or WC9 chrome moly steel	-29 to 316(1)	-20 to 600(1)
							CF8M (316 SST)	-29 to 177	-20 to 350
AN2 (for level D NACE)	S31600 with seat and guide hard-faced with CoCr-A	S31600 with electroless nickel coating (ENC)	S31600 with electroless nickel coating (ENC)	S31600	- - -	S31600 with seat hard-faced with CoCr-A	WCC carbon steel or WC9 chrome moly steel	-29 to 260(1)	-20 to 500(1)
							CF8M (316 SST)	-198 to 316(1)	-325 to 600(1)
AN2C (for level D NACE)	S31600 with seat and guide hard-faced with CoCr-A	S31600 with electroless nickel coating (ENC)	S31600 with electroless nickel coating (ENC)	S31600	S31600	- - -	WCC carbon steel or WC9 chrome moly steel	-29 to 260(1)	-20 to 500(1)
							CF8M (316 SST)	-198 to 316(1)	-325 to 600(1)
AN3 (NACE compatible)	S31600 with seat and guide hard-faced with CoCr-A	S31600 with electroless nickel coating (ENC)	Carbon steel NACE with electroless nickel coating (ENC)	Steel	- - -	S31600 with seat hard-faced with CoCr-A	WCC carbon steel or WC9 chrome moly steel	-29 to 204	-20 to 400
							CF8M (316 SST)	-29 to 316(1)	-20 to 600(1)
AN3C (NACE compatible) (for soft seats)	S31600 with seat and guide hard-faced with CoCr-A	S31600 with electroless nickel coating (ENC)	Carbon steel NACE with electroless nickel coating (ENC)	Steel	S31600	- - -	WCC carbon steel or WC9 chrome moly steel	-29 to 204	-20 to 400
							CF8M (316 SST)	-29 to 204	-20 to 400

1. Temperatures above 232ºC (450ºF) require PEEK anti-extrusion rings and spring-loaded seal ring. This option allows VP501 construction to be used up to 316ºC (600ºF) for non-oxidizing service and 260ºC (500ºF) for oxidizing service.

Figure 6. Metal Seat and Anti Noise Trim Cage in NPS 6 Pishro Sanat VP501

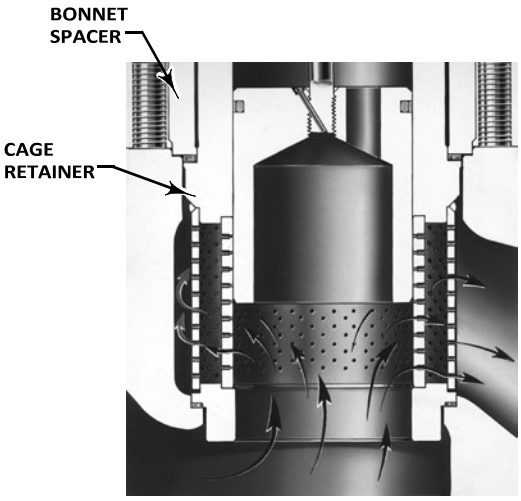


Figure 7. Typical Balanced TSO Trim

Figure 8. Anti-Cavitation One-Stage Cage

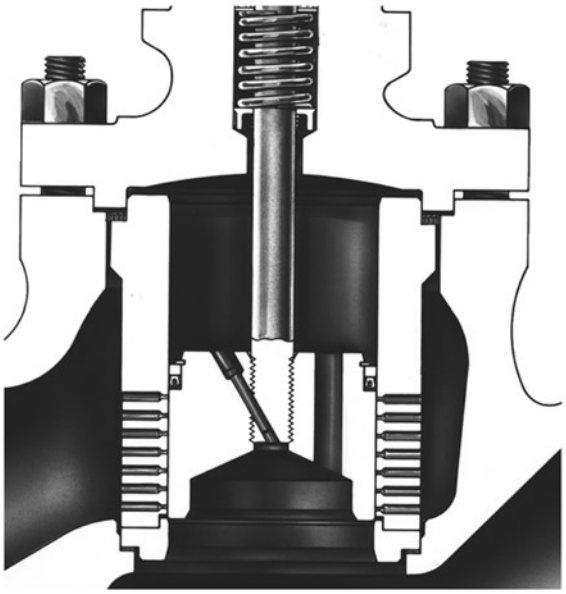
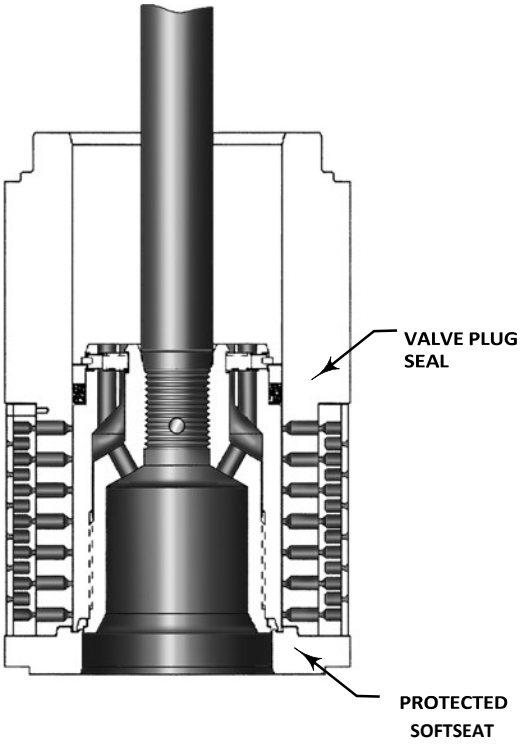


Figure 9. Typical ENVIRO-SEAL Bellows Seal Bonnet and Bellows Seal Assembly



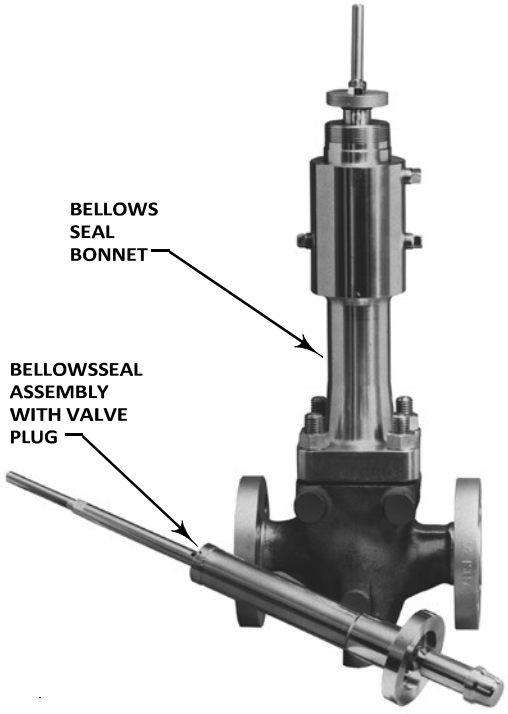
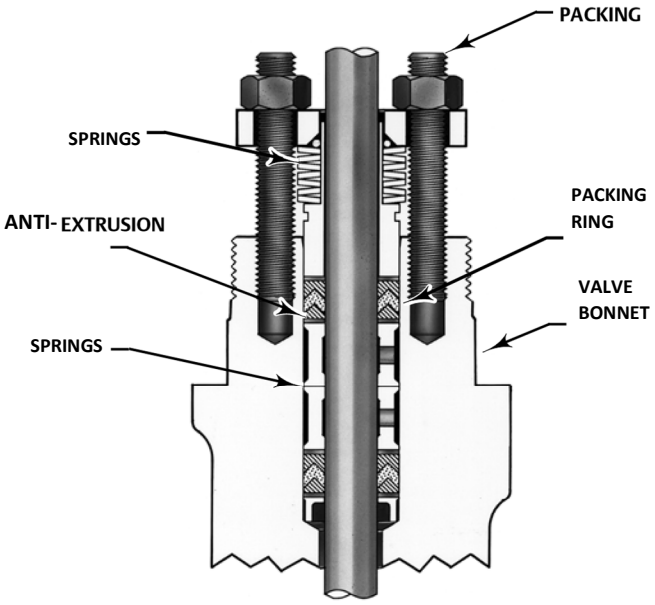
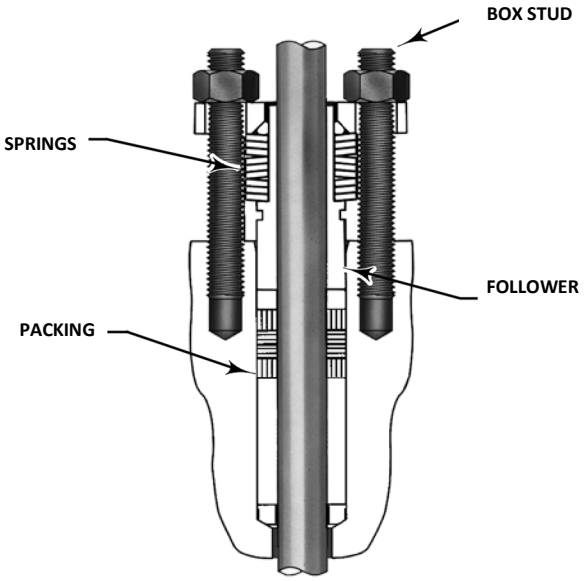


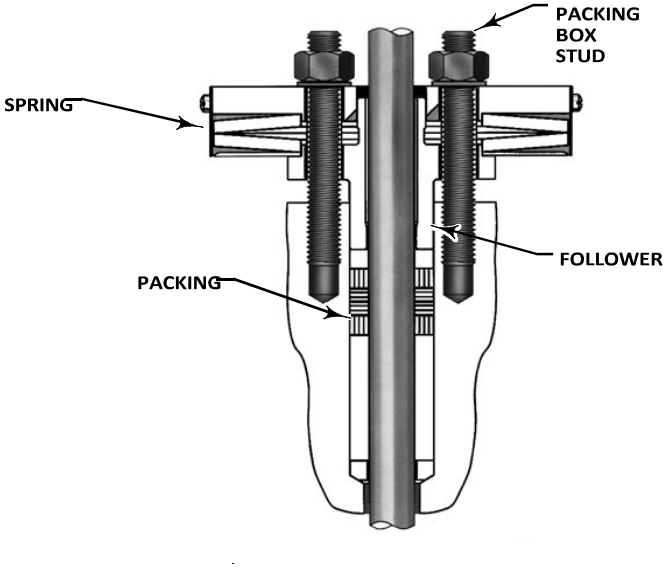
Figure 10. ENVIRO-SEAL and HIGH-SEAL Packing Systems



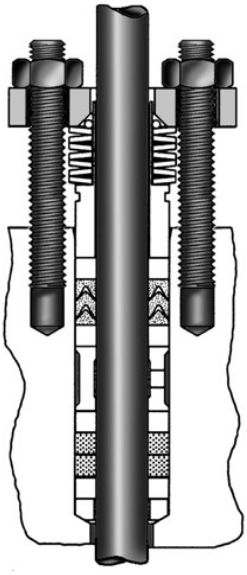
TYPICAL ENVIRO-SEAL PACKING SYSTEM
WITH PTFE PACKING



TYPICAL ENVIRO-SEAL PACKING SYSTEM
WITH ULF PACKING



TYPICAL HIGH-SEAL PACKING SYSTEM
WITH GRAPHITE ULF PACKING



TYPICAL ENVIRO-SEAL PACKING SYSTEM
WITH DUPLEX PACKING

Table 9. Materials and Temperature Limits for Other Parts

PART			MATERIAL		TEMPERATURE CAPABILITIES			
					ºC		ºF	
					Minimum	Maximum	Minimum	Maximum
Body-to-bonnet bolting.	Cast iron body	Cap screws	Steel SAE Grade 5		-29	232	-20	450
	WCC body	Studs	Steel SA-193-B7		-29	- - -(5)	-20	- - -(5)
		Nuts	Steel SA-194-2H					
	LCC body	Studs	Steel SA-193-B7		-46		-50	
		Nuts	Steel SA-194-2H					
	CF8M (316 stainless steel) body	Studs	Steel SA-193-B7 (std) (NACE [non-exposed bolting])		-48	- - -(5)	-55	- - -(5)
		Nuts	Steel SA-194-2H (std) (NACE [non-exposed bolting])		-46	- - -(5)	-50	- - -(5)
		Studs	S30400 stainless steel SA-320-B8		- - -(5)	38	- - -(5)	100
		Nuts	S30400 stainless steel SA-194-8					
		Studs	S31600 stainless steel SA-193-B8M (strain-hardened) or S31600 stainless steel SA-193-B8M		- - -(5)	- - -(5)	- - -(5)	- - -(5)
		Nuts	S31600 stainless steel SA-194-8M					
Disk			PTFE		-73	204	-100	400
2-piece valve plug seal (standard for NPS 1 thru 6 valves except those with Anti-Cavitation cage)		Backup ring	Fluorocarbon(1)		-18	204	0	400
			Ethylene-propylene(2)		-40	232	-40	450
			Nitrile(3)	For use with air and hydrocarbons	-40	71	-40	160
				For use with other compatible fluids	-40	82	-40	180
		Seal ring	Carbon-filled PTFE		-73	232	-100	450
Spring-loaded valve plug seal(7)		Backup ring(4)	S41600 stainless steel		-29	- - -(5)	-20	- - -(5)
			S31600 stainless steel		- - -(5)	- - -(5)	- - -(5)	- - -(5)
		Retaining ring(4)	S30200 stainless steel (N07750, NACE Std)					
		Seal ring	PTFE with N10276 spring		-73	232	-100	450
For applications using PEEK Anti-Extrusion Rings: Spring-loaded valve plug seal		Backup ring(4)	S41600 stainless steel		-29	- - -(5)	-20	- - -(5)
			S31600 stainless steel		- - -(5)	- - -(5)	- - -(5)	- - -(5)
		Retaining ring(4)	S30200 stainless steel					
		Seal ring	PTFE/graphite with R30003spring		232	316(6)	450	600(6)
		Anti-extrusion rings	PEEK (PolyEtherEtherKetone)		- - -(5)		- - -(5)	
Valve plug stem			S31600 (S20910, NACE Std.)		- - -(5)	- - -(5)	- - -(5)	- - -(5)
Load ring (NPS 8 VP501 valve only)			S17400 or optional N06600 or N05500					
Restricted trim adaptors			Cast iron		-73	232	-100	450
			WCC steel		-29	- - -(5)	-20	- - -(5)
			S31600 stainless steel		- - -(5)		- - -(5)	
Seat ring, bonnet and cage gaskets			FGM (standard)		- - -(5)		- - -(5)	
			PTFE-coated N04400		- - -(5)	149	- - -(5)	300
Spiral wound gasket			S31600/graphite (FGM-standard)		- - -(5)		- - -(5)	
			N04400/PTFE		-73	149	-100	300
Shim			S31600 stainless steel		- - -(5)	- - -(5)	- - -(5)	- - -(5)
			N04400					
Packing	(temperatures shown are material	See table 11 for proper	PTFE V-ring		-40	232	-40	450
			PTFE/composition		-73	232	-100	450

Table 9. Materials and Temperature Limits for Other Parts (continued)

PART		MATERIAL	TEMPERATURE CAPABILITIES			
			ºC		ºF	
			Minimum	Maximum	Minimum	Maximum
Packing flange, studs, and nuts when used with standard bonnet		S31600 stainless steel	- - -(5)		- - -(5)	
Metal packing box parts		S31600 or S17400 stainless steel depending on part	- - -(5)		- - -(5)	
Extension bonnet bushing	Trims 1 & 4	S41600 stainless steel	-29	- - -(5)	-20	- - -(5)
	Other trims	S31600 stainless steel	- - -(5)		- - -(5)	
1. For high-temperature air, hydrocarbons, and certain other chemicals and solvents. Not for use with steam or ammonia. Not recommended for water above 82ºC (180ºF). 2. Has excellent moisture resistance to hot water and steam and may be used with most fire-resistant hydraulic oils, but cannot be used with petroleum-based fluids and other hydrocarbons. 3. Cannot be used with fire-resistant hydraulic oils. 4. These parts not used with 137 mm (7 inch) ports or larger. 5. These materials not limiting factors. 6. This material may be used in temperatures up to 260ºC (500ºF) for oxidizing service. 7. Standard for NPS 8 valve regardless of cage and all NPS 1 thru 6 valves with Anti-Cavitation cages, optional in NPS 1 thru 6 valves with other than Anti-Cavitation cages.						
	temperature capabilities)	bonnet selection	Graphite ribbon/filament	- - -(5)		- - -(5)

-continued Table 10. Pishro Sanat VP501 Valve Body/Trim Temperature Capabilities For All Valves Except Anti-Cavitation , NPS 6 VP501 with Anti-Noise Trim Cage, and NPS 4, 6, and 8 VP501 with Anti- Noise Cage

BODY/BONNET[3] MATERIALS	TRIM DESIGNATION	VALVE SIZE AND DESIGN	MATERIAL TEMPERATURE CAPABILITY			
			ºC		ºF	
			Min	Max	Min	Max
Cast iron		All	-29	232	-20	450
		All	-29	210	-20	410
		All	210	232	410	450
WCC steel		All	-29	316(1)	-20	600(1)
		All	-29	316(1)	-20	600(1)
		All	-29	149(2)	-20	300(2)
		All	-29	210	-20	410
		All	210	316(1)	410	600(1)
		All	-29	232	-20	450
WC9 chrome moly steel		All	-29	316(1)	-20	600(1)
		All	-29	316(1)	-20	600(1)
		All	-29	149(2)	-20	300(2)
		All	-29	210	-20	410
		All	210	316(1)	410	600(1)
		All	-29	232	-20	450
LCC steel		All	-29	316(1)	-20	600(1)
		All	-46	210	-50	410
		All	-46	316(1)	-50	600(1)
		All	-46	149(2)	-50	300(2)
		All	-46	210	-50	410
		All	210	316(1)	410	600(1)
		All	-29	232	-20	450
CF8M (316 stainless steel)		All	-198(4)	316(1)	-325(4)	600(1)
		All	-198(4)	149(2)	-325(4)	300(2)
		All	-198(4)	149(2)	-325(4)	300(2)
1. Temperatures above 232ºC (450ºF) require PEEK anti-extrusion rings and spring-loaded seal ring. This option allows VP501 construction to be used up to 316ºC (600ºF) for non-oxidizing service and 260ºC (500ºF) for oxidizing service. 2. Lubricating service allows usage to 232ºC (450ºF) 3. Same material also used for bottom flange, if required. Restricted trim and full-sized limits are the same. 4. May be used down to -254ºC (-425ºF) if manufacturing process includes Charpy impact test.						

Table 11. Bonnet Selection Guidelines

BONNET STYLE	PACKING MATERIAL	IN-BODY PROCESS TEMPERATURE LIMITS(1)	
		°C	°F
Plain: ■Standard for all valve sizes through NPS 6 with 2-13/16 yoke boss diameter ■Standard for NPS 6 and 8 valves in cast iron and WCC steel bonnet material with 3-9/16 yoke boss diameter	PTFE V-ring	-18 to 232	0 to 450
	PTFE/Composition	-18 to 232	0 to 450
	Graphite ribbon/filament	0 to 316(2)	0 to 600(2)
Style 1 Cast Extension: ■Standard for NPS 8 valves in S31600 bonnet material with 3-9/16 yoke boss diameter	PTFE V-ring	-46 to 316(2)	-50 to 600(2)
	PTFE/Composition		
	Graphite ribbon/filament		
Style 2 Cast Extension: ■Optional for NPS 2 through 4 valve sizes with 2-13/16 inch yoke boss diameter ■Optional for NPS 6 and 8 valves with 3-9/16 yoke boss diameter. Not available for NPS 8 valve in S31600 bonnet material	PTFE V-ring	-101 to 316(2)	-150 to 600(2)
	PTFE/Composition		
	Graphite ribbon/filament		
ENVIRO-SEAL bellows seal bonnet	PTFE	For exceptional stem sealing capabilities. See Bulletin 59.1:070, ENVIRO-SEAL Bellows Seal Bonnets, for pressure/temperature ratings.	
	Graphite ULF	For exceptional stem sealing capabilities. See Bulletin 59.1:070, ENVIRO-SEAL Bellows Seal Bonnets, for pressure/temperature ratings.	

1. These in-body process temperatures assume an outside, ambient temperature of 21°C (70°F) and no insulation on the bonnet. When using any packing at low process temperatures, a cast extension bonnet may have to be used to prevent packing damage which could result from the formation of valve stem frost. Material selection for trim and other components will also be limiting factors.
2. Temperatures above 232°C (450°F) require PEEK anti-extrusion rings and spring-loaded seal ring.

Table 12. Maximum Flow Coefficients for Full-Sized Trim with Equal Percentage Cage and Normal Flow Direction

Valve		Valve Size, NPS	Cv at Max. Valve Plug Travel
VP501		1 1-1/2 2 2-1/2 3	17.2 35.8 59.7 99.4 136
		4 6 8(1) 8(2)	224 394 567 819
VP501A	with liner	1 2 3 4 6	18.5 48.1 149 152 336
	without liner	1 2 3 4 6	19.0 47.2 148 156 328
VP501R		1 1-1/2 2 2-1/2 3 4	17.2 35.8 59.7 99.4 136 224

1. With 51 mm (2 inch) travel.
2. With 76 mm (3 inch) travel.

Table 13. Port Diameters and Valve Plug Travel

VALVE SIZE, NPS				PORT DIAMETER(1)		MAXIMUM VALVE PLUG TRAVEL(1)	
VP501 or VP501R		VP501A					
Full-SizedTrim	Restricted-Capacity Trim	Full-Sized Trim	Restricted-Capacity Trim	mm	Inch	mm	Inch
1	1-1/2	1	2	33.3	1.3125	19.1	0.75
- - -	2	- - -	- - -	33.3	1.3125	19.1	0.75
1-1/2	- - -	2	- - -	46.7	1.875	19.1	0.75
- - -	2-1/2	- - -	- - -	46.7	1.875	19.1	0.75
2	3	- - -	4	58.7	2.3125	29	1.125
2-1/2	4	3	6	73.0	2.875	38	1.5
3	- - -	4	- - -	87.3	3.4375	38	1.5
4	- - -	6	- - -	111.1	4.375	51	2
6(2)	- - -	- - -	- - -	177.8(3)	7(3)	51(3)	2(3)
				136.5(4)	5.375(4)	76(4)	3(4)
8(2)	- - -	- - -	- - -	203.2	8	51	2
						76	3

1. For Anti-Cavitation trim, see table 15.
2. Not available in VP501R valves.
3. Standard-travel cages.
4. Anti-Noise Trim cages

Table 14. Stem and Yoke Boss Diameters

VALVE SIZE, NPS				STEM AND YOKE BOSS DIAMETERS							
VP501 or VP501R		EAT		Standard				Optional			
Full-SizedTrim	Restricted-Capacity Trim	Full-Sized Trim	Restricted-Capacity Trim	Stem		Yoke Boss		Stem		Yoke Boss	
				mm	Inch	mm	Inch	mm	Inch	mm	Inch
1	1-1/2	1	2	9.5	3/8	54	2-1/8	12.7	1/2	71	2-13/16
- - -1-	2	- - -	- - -	12.7	1/2	71	2-13/16	- -	- -	- - -	- - -
1/2	- - 2-	2	- - -	9.5	3/8	54	2-1/8	-12.7	-1/2	71	2-13/16
- -	1/2	- - -	- - -	12.7	1/2	71	2-13/16	- - -	- - -	- - -	- - -
2	3	- - -	4	12.7	1/2	71	2-13/16	19.1 19.1	3/4	90	3-9/16
2-1/2	4	3	6	12.7	1/2	71	2-13/16	19.1	3/4	90	3-9/16
3	- - -	4	- - -	12.7	1/2	71	2-13/16		3/4	90	3-9/16
4	- - -	6	- - -	12.7	1/2	71	2-13/16	19.1	3/4	90	3-9/16
								25.4	1	127	5
6(1)	- - -	- - -	- - -	19.1	3/4	90	3-9/16	25.4 or 31.8	1 or 1-1/ 4	127	5
8(1)	- - -	- - -	- - -								

1. Not available in VP501R valves.

Table 15. Port Diameters and Valve Plug Travel for Anti-Cavitation Cage

VP501 VALVE SIZE, NPS	ONE-STAGE CAGE		TWO-STAGE CAGE	
	Port Diameters	Valve Plug Travel(1)	Port Diameters	Valve Plug Travel
	mm			
1	33.3	25	25.4	25
1-1/2	47.6	22	33.3	38
2	58.7	29	47.6	51
2-1/2	73.0	38	58.7	64
3	87.3	41	7.30	76
4	111.1	54	73.0	102
6	177.8	57	136.5	102
8	203.2	86	177.8	152
Inch				
1	1.3125	1	1	1
1-1/2	1.875	0.875	1.3125	1.5
2	2.3125	1.125	1.875	2
2-1/2	2.875	1.5	2.3125	2.5
3	3.4375	1.625	2.875	3
4	4.375	2.125	2.875	4
6	7	2.25	5.375	4
8	8	3.375	7	6

1. The travel listed is the maximum travel that can be obtained for the given size. In situations where increased valve capacity is not needed, standard VP501 valve travels should be utilized in selecting the actuator.

Table 16. Port Diameteres, Valve Plug Travel, Yoke Boss Diameteres, for TSO Trim

VALVE	TRIM	MAX TRAVEL		YOKE BOSS SIZE		PORT DIAMETER				Cv REDUCTION AT 100% TRAVEL (1)	UNBALANCE AREA
						Nominal		Actual TSO			
		mm	Inch	mm	Inch	mm	Inch	mm	Inch		Inch 2
VP501 NPS 3	Anti-Cav 2-Stage	76.2	3	90 127	3-9/16 5	73	2.875	68.3	2.6875	0%	0.098
VP501 NPS 4	Anti-Cavl 2-Stage	102	4	90 127	3-9/16 5	73	2.875	68.3	2.6875	5%	0.098
VP501A NPS 4	Std	38.1	1.5	71.4 90	2-13/16 3-9/16	87.3	3.4375	82.6	3.25	6% 4%	0.118
VP501A NPS 6	Std	50.8	2	90	3-9/16	111	4.375	106	4.1875	4% (linear) 3% (equal percent)	0.154

1.This column lists the percent reduction of published maximum Cv of the trim listed in the TRIM column.

Table 18. Bolting Materials and Temperature Limits for Bolting Compliance with NACE MR0175-2002, NACE MR0175/ISO 15156, and NACE MR0103. Environmental restrictions may apply

VALVE BODY MATERIAL		BOLTING MATERIAL	TEMPERATURE CAPABILITIES			
			ºC		ºF	
			Min	Max	Min	Max
Non-exposed bolting (Standard)						
WCC and CF8M (316 SST)	Studs	Steel SA-193-B7	-48(2)	427	-55(2)	800
	Nuts	Steel SA-194-2H				
Exposed bolting (Optional) May require derating of valve(1) when these body-to-bonnet bolting materials are used						
WCC and CF8M	Studs	Steel SA-193-B7M	-48(2)	427	-55(2)	800
	Nuts	Steel SA-194-2HM				

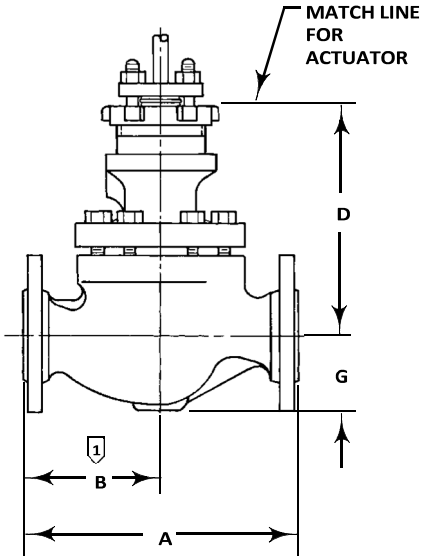
1. Derating is not required for CL150 and 300 valves. Derating may be required for valves rated at CL600. Contact PISHRO SANAT sales office for assistance in determining the derating of valves when these body-to-bonnet bolting materials are used.
2. -29ºC (-20ºF) with WCC body material.

Table 19. Pishro Sanat VP501 and VP501R Dimensions

VALVE SIZE, NPS	A									G (MAX)	
	Pressure Rating, End Connection Style (1)										
	Scrd or SW	CL125 FF or CL150 RF	CL150 RTJ	CL250 RF or CL300 RF	CL300 RTJ	BW or CL600 RF	CL600 RTJ	PN16-40 (2)	PN63-100 (2)	VP501	VP501R
	mm										
1	210	184	197	197	210	210	210	160	230	60	119
1-1/2	251	222	235	235	248	251	251	200	260	71	116
2	286	254	267	267	282	286	289	230	300	78	133
2-1/2	---	276	292	292	308	311	314	290	340	90	159
3	---	298	311	317	333	337	340	310	380	97	168
4	---	353	365	368	384	394	397	350	430	129	192
6	---	451	464	473	489	508	511	480	550	140	---
8	---	543	556	568	584	610	613	600	650	191	---
	Inch										
1	8.25	7.25	7.75	7.75	8.25	8.25	8.25	See mm above	See mm above	2.38	4.69
1-1/2	9.88	8.75	9.25	9.25	9.75	9.88	9.88			2.81	4.56
2	11.25	10.00	10.50	10.50	11.12	11.25	11.38			3.06	5.25
2-1/2	---	10.88	11.38	11.50	12.12	12.25	12.38			3.56	6.25
3	---	11.75	12.25	12.50	13.12	13.25	13.38			3.81	6.62
4	---	13.88	14.38	14.50	15.12	15.50	15.62			5.06	7.56
6	---	17.75	18.25	18.62	19.25	20.00	20.12			5.51	---
8	---	21.38	21.88	22.38	23.00	24.00	24.12			7.50	---

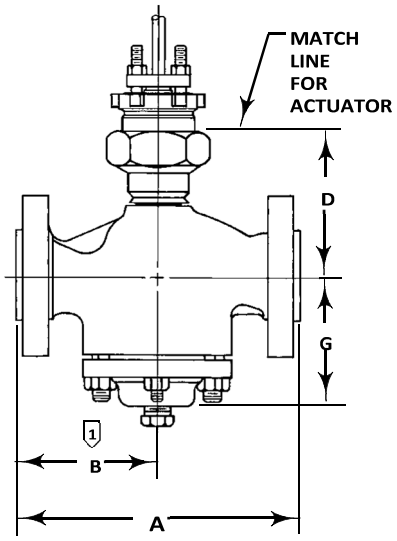
1. End connection style abbreviations: BW - Buttwelding, FF - Flat Faced, Scrd - Screwed, SW - Socketweld, RF - Raised Face, RTJ - Ring Type Joint
2. Valves which meet EN 1092 flange standards and have EN face-to-face dimensions are available only from Europe (EN 558-1). Valves which meet EN 1092 flange standards but not EN face-to-face standards are available in the US. Consult PISHRO SANAT sales office.

Figure 15. Pishro Sanat VP501 and VP501R Dimensions (also see tables 19, 20, and 21)



AR4967-a
A0925-3

VP501 CONTROL VALVE



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A0926-2

VP501R CONTROL VALVE

NOTES:
1. $B = \frac{A}{2}$
2. FOR DIMENSIONS OF VALVES WITH OTHER END CONNECTIONS, CONSULT PISHRO SANAT SALES OFFICE.

Table 20. Pishro Sanat VP501 and VP501R Dimensions

VALVE SIZE, NPS	D FOR PLAIN BONNET										
	VP501 Except with Anti-Cavitation Two-Stage Cage Stem Diameter, mm				VP501 with Anti-Cavitation Two-Stage Cage Stem Diameter, mm				VP501R Stem Diameter, mm		
	9.5	12.7	19.1	25.4 or 31.8	9.5	12.7	19.1	25.4 or 31.8	9.5	12.7	19.1
1	127	149	---	---	---	184	---	---	113	124	---
1-1/2	124	146	---	---	155	177	---	---	122	133	---
2	---	165	162	---	---	201	198	---	---	148	140
2-1/2	---	187	184	---	---	229	226	---	---	157	152
3	---	191	187	---	---	260	256	---	---	167	159
4	---	221	217	238	---	311	308	354	---	198	191
6(1)	---	---	251	270	---	---	336	380	---	---	---
6(2)	---	---	312	330	---	---	---	---	---	---	---
8	---	---	375(3)	426	---	---	511	560	---	---	---
	Stem Diameter, Inch				Stem Diameter, Inch				Stem Diameter, Inch		
	3/8	1/2	3/4	1 or 1-1/4	3/8	1/2	3/4	1 or 1-1/4	3/8	1/2	3/4
1	5.00	5.88	--	---	--	7.25	--	---	4.44	4.88	--
1-1/2	4.88	5.75	--	---	6.09	6.97	--	---	4.81	5.25	--
2	---	6.50	6.38	---	--	7.91	7.78	---	---	5.81	5.50
2-1/2	---	7.38	7.25	---	--	9.03	8.91	---	---	6.31	6.00
3	---	7.50	7.38	---	--	10.22	10.09	---	---	6.56	6.25
4	---	8.69	8.56	9.38	---	12.25	12.12	13.94	---	7.81	7.50
6(1)	---	---	9.88	10.62	---	---	13.22	14.97	---	---	---
6(2)	---	---	12.26	13.00	---	---	--	--	---	---	---
8	---	---	14.75(3)	16.75	---	---	20.12	22.06	---	---	---

1. All except Anti-Noise Trim and Anti- Noise cages.
2. Anti-Noise Trim and Anti- Noise cages.
3. Available only in cast iron or WCC steel for the stem diameter with plain bonnet.

Table 21. Pishro Sanat VP501 and VP501R Dimensions

VALVE SIZE, NPS	D FOR EXTENSION AND ENVIRO-SEAL BELLOWS SEAL BONNETS (ETONLY, EXCEPTWITH ANTI-CAVITATION CAGE)									
	Style 1 Ext. Bonnet Stem Diameter				Style 2 Ext. Bonnet Stem Diameter			ENVIRO-SEAL Bellows Seal Bonnet Stem diameter		
	mm									
	9.5	12.7	19.1	25.4 or 31.8	9.5	12.7	19.1	9.5	12.7	19.1
1	213	251	---	---	303	319	---	320	---	---
1-1/2	210	248	---	---	300	316	---	317	---	---
2	---	267	272	---	---	465	---	---	384	---
2-1/2	---	289	294	---	---	492	---	---	---	---
3	---	292	297	---	---	495	487	---	517	517
4	---	322	327	370	---	526	518	---	541	---
6(1)	---	---	357	402	---	---	543	---	---	573
6(2)	---	---	418	462	---	---	604	---	---	---
8	---	---	421	450	---	---	621	---	---	703
	Inch									
	3/8	1/2	3/4	1 or 1-1/4	3/8	1/2	3/4	3/8	1/2	3/4
1	8.38	9.88	--	---	11.94	12.56	--	12.62	--	--
1-1/2	8.25	9.75	--	---	11.81	12.44	--	12.50	--	--
2	---	10.50	10.69	---	---	18.31	--	---	15.12	--
2-1/2	---	11.38	11.56	---	---	19.38	--	---	--	--
3	---	11.50	11.69	---	---	19.50	19.19	---	20.38	20.38
4	---	12.69	12.88	14.56	---	20.69	20.38	---	21.31	- -
6(1)	---	---	14.06	15.81	---	---	21.38	---	---	-22.56
6(2)	---	---	16.44	18.19	---	---	23.76	---	---	- -
8	---	---	16.56	17.75	---	---	24.44	---	---	-27.69

1. Standard-travel cages.
2. Anti-Noise Trim and Anti- Noise cages.

Table 22. VP501A Dimensions (1)

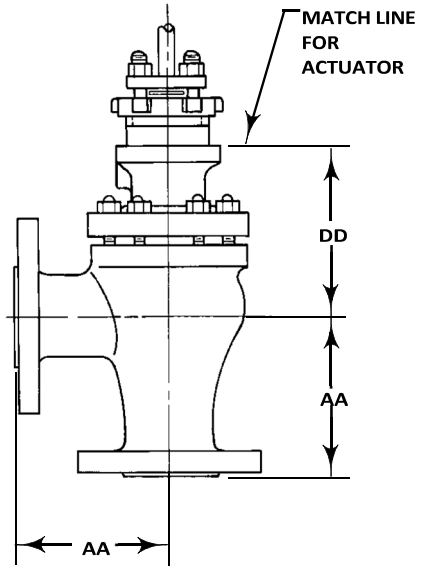
VALVE SIZE, NPS	AA					
	CL150		CL300		CL600	
	RF	RTJ	RF	RTJ	BW, SW or RF	RTJ
	mm					
1	92	98	98	105	105	105
2	127	133	133	141	143	144
3	149	156	159	167	168	170
4	176	183	184	197	197	198
6	225	232	237	244	254	256
	Inch					
1	3.62	3.88	3.88	4.12	4.12	4.12
2	5.00	5.25	5.25	5.56	5.62	5.69
3	5.88	6.12	6.25	6.56	6.62	6.69
4	6.94	7.19	7.25	7.56	7.75	7.81
6	8.88	9.12	9.31	9.62	10.00	10.06

1. End connection style abbreviations: BW - Buttwelding, FF - Flat Faced, Scrd - Screwed, SW - Socketweld, RF - Raised Face, RTJ - Ring Type Joint.

Table 23. VP501A Dimensions

VALVE SIZE, NPS	DD						
	Plain Bonnet				Style 1 Extension Bonnet		
	Stem Diameter, mm				Stem Diameter, mm		
	9.5	12.7	19.1	25.4 or 38.1	9.5	12.7	19.1
1	111	133	---	---	197	253	---
2	98	121	---	---	184	223	---
3	---	149	146	---	---	251	256
4	---	140	137	---	---	241	246
6	---	144	141	187	---	246	251
	Stem Diameter, In.				Stem Diameter, In.		
	3/8	1/2	3/4	1 or 1-1/4	3/8	1/2	3/4
1	4.38	5.25	---	---	7.75	9.95	---
2	3.88	4.75	---	---	7.25	8.75	---
3	---	5.88	5.75	---	---	9.88	10.06
4	---	5.50	5.38	---	---	9.50	9.69
6	---	5.69	5.56	7.38	---	9.69	9.88

Figure 16. Pishro Sanat VP501A Dimensions (also see tables 22. 23. and 24)



NOTE:
FOR DIMENSIONS OF VALVES WITH PN (OR OTHER) END CONNECTIONS, CONSULT YOUR EMERSON SALES OFFICE.

Table 24. Pishro Sanat VP501A Dimensions

VALVE SIZE, NPS	DD					
	Style 2 Extension Bonnet			ENVIRO-SEAL Bellows Seal Bonnet		
	Stem Diameter, mm			Stem Diameter, mm		
	9.5	12.7	19.1	9.5	12.7	19.1
1	291	305	---	305	---	---
2	278	291	---	292	---	---
3	---	454	---	---	---	---
4	---	445	437	---	467	---
6	---	449	441	---	465	---
	Stem Diameter, In.			Stem Diameter, In.		
	3/8	1/2	3/4	3/8	1/2	3/4
1	11.44	12.00	- -	12.00	- -	---
2	10.94	11.44	-	11.50	-	---
3	---	17.88	- -	---	- -	---
4	---	17.50	-	---	-	---
6	---	17.69	- - -17.19 17.38	---	- - -18.38 18.31	---

Ordering Information

Inlet pressure and temperature must always be limited by the applicable ASME pressure/temperature rating.

Pressure drop information for various trim material combinations is provided in figures 11, 12, and 14. The maximum allowable pressure drop for the application must not exceed the lowest value indicated for the combination of materials selected.

When ordering, specify:

Application Information

1. Type of application:
   a. Throttling or on-off
   b. Reducing or relief
2. Controlled fluid (include chemical analysis of fluid ifpossible)
3. Specific gravity of controlled fluid
4. Fluid temperature
5. Inlet pressures:
   a. Minimum
   b. Normal
   c. Maximum
6. Pressure drops:
   a. Minimum flowing drop
   b. Normal flowing drop
   c. Maximum flowing drop
   d. Maximum at shut-off
7. Flow rates:
   a. Minimum controlled flow
   b. Normal flow
   c. Maximum flow
8. Maximum permissible noise level, if critical
9. Shutoff classification required
10. Valve stem diameter and bonnet type (plain, extension, or ENVIRO-SEAL bellows seal bonnet)
11. Line size and schedule

Valve Information

To determine what valve ordering information is needed, refer to the specifications. Review the description for each specification and in the referenced tables; write down your choice whenever there is a selection to be made. Always specify the valve design letter designation.

Actuator and Accessory Information

Refer to the specific actuator and accessory bulletins for required ordering information.
You can fill the following Data sheet table to give us your desire specifications.

Control Valve Data Sheet

PISHRO SANAT

Customer		**Manufacturer: Pishro Sanat Amal Co. LTD**	
Phone		Fax	
Contact		P.O. Number	
Item/Qty	,	Project	
Tags		P&Id Number	
Description		Line Number	
Service Description			
1 Fluid:		Critical Pressure:	

	Service Conditions	Unites	Min	Norm	Max	Other	
2	Flow rate	GPM(US)					
3	Inlet press.	barg					
4	Outlet Press.	barg					
5	Inlet Temp.	deg C					
6	Spec. Gravity						
7	Viscosity	CP					
8	Vapor Press.	barg					
9	Sizing Coefficient						
10	% opening						
11	Sound Level	dB	<85	<85	<85	<85	
12	Flow Condition		Normal	Normal	Normal	Normal	

	PIPE LINE		
13	Size, Schedule In:		
14	Size, Schedule Out:		
15	Insulation		
16	Valve Type:	Globe	
17	Size:	Class:	
18	Max Press/Temp:		
19	Mfg Model:		
20	Body/Bonnet Matl:		
21	Liner Matl:		
22	End Connection In:		
23	End Connection Out:		
24	Flg Face Finish:		
25	End Ext/Matl:		
26	Flow Directin:		
27	Bonnet Type:	Bellows Matl:	
28	Lub/Iso Valve:		
29	Packing Material:		
30	Packing Type:		
31	Trim:		
32	Trim Type:		
33	Size(in):	0 Travel(in):	
34	Flow Characteristic:		
35	Balance/Unbalance:		
36	Rated Cv:	FL:	
37	Trim Matl:		
38	Seat Matl:		
39	Cage Matl:		
40	Stem Matl:		
41	Plug Matl		
42			

	Special Accessories
43	Name / Type
44	Mfg / Model
45	Action
46	Description
47	
48	
49	
50	
51	
52	

	ACTUATOR		
53	Actuator Type:		
54	Mfg/Model:		
55	Size:	Eff. Area:	
56	On/Off:	Modulating:	
57	Spring Action: Close		
58	Max. Allow Press.:		
59	Min. Reqd Press.:		
60	Available Air Supply Press		
61	Min:	Max:	
62	Bench Range:		
63	Act. Orientation:		
64	Handwheel Type:	Side Mounted	
65	Air Failure Valve:	Set At:	
	POSITIONER		
66	Input Signal:		
67	Positioner Type:		
68	Mfg/Model:	/	
69	Incr Signal Output:		
70	Gauge:	By-Pass:	
71	Characteristic:		
72	Hazardous Area:		
	SWITCHES		
73	Type: /		
74	Mfg/Model: /		
75	Contact/Rating:		
76	Actuation Points:		
77			
	Air Set		
78	Mfg/Model:	/	
79	Set Pressure:		
80	Filter:	Gauge:	
	TESTS		
82	Hydro. Pressure:		
83	ANSI/FCI Leak Class:		
84	Leak Test Pres.		
85	Shut-Off Pressure:		

REVISIONS

rev	Revision	Date	Check	App