



## 85-00 High Performance Butterfly Valve

Type 8500 is a kind of high performance rotary butterfly valve. The design features splined driveshaft, wafer or single flanged end connection, wide variety selection of soft or metal seals and internal components for wide temperature range & ES type packing offer environment protection class sealing. It has high on-off and throttling control performance even under extreme pressure and temperature conditions. The process mediums include water, gas, liquid, steam and viscous fluids. The applications cover different areas such as petrol-gas, chemical, power generation and steel industries.

Type 8500 high performance butterfly valve provides outstanding performance under extreme pressure and temperature conditions. It maintains tight shutoff, is available in a fire-tested version and can be specified for cryogenic applications. Type 8500 valve is available as either a flangeless, wafer-style design or as a single-flange (lugged) design. A splined drive shaft combines with a variety of spring-and-diaphragm or pneumatic piston cylinder actuators to make 8500 valve a reliable, high-performance butterfly valve for a variety of throttling and on-off applications in the various process industries. Type 8500 valve can have several dynamic seals that can be used in many different applications. With appropriate selection of seal and construction materials, and the pressure-assisted seal, type 8500 valve provides great shutoff against the full ANSI Class 150 or 300 pressure ratings.

There are 2 kinds of type 8500 high performance butterfly valve: 8501 with valve body size 2"-12";  
8502 with valve body size 14"-24".

Valve Size: 2" ~ 24"  
 Pressure Range: ANSI 150 ~ ANSI 600  
 Temperature Range: -196 °C ~ 593 °C  
 Flow Coefficient: Approximate Linear  
 Modified Equal-Percentage  
 Shutoff Class: IV ~ V  
 End-Connection: Wafer, Flange

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Figure 1. 8500 High Performance Butterfly Valve assembled with CVS1052 Actuator

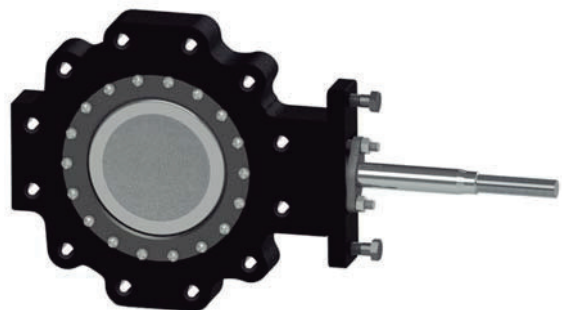


Figure 2. 8500 Series High Performance Butterfly Valve Body

## Features

### Tight shutoff with Economic cost

The pressure assistant shutoff design offer a tight sealing for all available pressure rating. Type 8501 has a pressure-balanced bi-direction soft seal ring, the shutoff classification is ANSI class VI.

### Reliable safety

8502 butterfly valve has a special anti-blowout shaft design for a better safety application.

### Perfect flow range ability

Design for type 8501 eccentric disc has approximate linear flow haracter, valve disc rotate from 0~90 degree, valves are used for on-off or throttling applications. Type 8500 butterfly valve has a modified equal percentage flow characteristic, with the valve disc rotate from 0 to 90 degree, the flow range ability is 100:1, can be used for improved control needs.

### Economic Design with Minimum Deadband

Type 8500 butterfly valve has compact design, with the splined driveshaft, it can be assembled with most type of rotate actuators.

### Satisfy different process application

Different combination of valve construction materials and seal component satisfy the different liquid and gas applications, and with high performance and long life time. Valve trim and stud materials are corrosive- proof of sour service, and are comply with NACE MR0175 standard.

### Easy replacement and maintenance

Different types of valve parts such as disc and drive shaft have standard design and are easy and fast interchangeable. It reduces the part inventory need and maintenance cost for customer .

### Improved sealing for Enviro-protection

ES packing system use material of PTFE, graphite or duplex packing, with live loading design, offer reliable and excellent stem sealing, guiding and transmission of loading force. The leakage is under 500 ppm according to the limitation of EPA standard.

### Easy mounting

The valve body is self-centering, offering easy and fast mounting with flange screws.

### Reliable flange gasket surface

The flange flat gasket or spiral wound gasket has a perfect surface for sealing; it's not affected by the seal fit ring of type 8502 butterfly valve.



Figure 3. 8500 Series High Performance  
Butterfly Valve Construction Drawing

## Specifications

Table 1. Technical Specification

Available Valve Configuration	Flangeless: Wafer-style Single-Flange: (lugged) control valve with a one-piece valve body, a two-component seal/backup O-ring, and a spline drive shaft)		
Valve Body Size	Type 8501: 2"-12", Type 3002: 14"-24"		
Available end connection	Wafer (no flange) Single flange , RF flange with ANSI 150 & 300 , comply with ASME 16.5		
Max inlet pressure/Temp <sup>①</sup>	Class 150,300 comply with standard ASME B16.34. More detail in Figure 5 & Figure 6		
Sealing style	Standard construction, detail for 8501 see Figure 7 & Table 6, for 8502 see Figure 8 & Table 6		
<b>Standard Construction Material</b>	<b>Valve Body and Disk</b>	ASTM grade of carbon steel and stainless steel	
	Disk Coating	Hardcoating (also see table 6): Standard when used with metal seal Composition seal or high temperature metal seal Cryogenic Seal: CoCr-A (Alloy 6): Standard when service temperature exceeds 538°C (1000°F)	
	Shaft	ASTM grade of S17400(17-4PH H1025 SST) S17400 (17-4PH H1150 SST) Nitronic 50	
	Shaft Extension	High Temperature: Not-required for temperature less than 650°F(343°C), 6 inches extension for temperature from 650 to 1000°F (343 to 538 °C), or 12 inches extension for temperature above 1000°F (538°C) Cryogenic: 36 inches extension (914mm)	
	Construction Material	Seal ring	PTFE, S31600 (316SST), S21800(Nitronic 60), S31600/PTFE, UHMWPE <sup>④</sup> , or Kel-F <sup>⑤</sup> .
		Back up ring	Nitrile, Neoprene, PTFE, Fluoroelastomer-for a broad range of hydrocarbon & chemical process applications <sup>③</sup> or EPR-For process applications including steam and water <sup>③</sup> . A backup ring is not used with the metal seal.
		Packing	PTFE V-ring (standard packing), Graphite(optional), or ES packing(optional)
Bearings		PEEK <sup>②</sup> (standard material), and S31600, PTFE Composition, or CoCr-A Alloy 6) (optional)	
Valve Body Classification	Face-to-face dimension are in compliance with MSS SP68 and API 609 standards; valve bodies are designed for installation with ASME B16.5-1996 Class 150 or 300 Raised-Face flanges		
Shutoff Classification(According to ANSI/FCI 70-2 and IEC60534-4)	Standard Soft Seal: Bidirectional bubble-tight shutoff Metal Seal: Unidirectional shutoff Class V (preferred flow direction only) Composition Seal: Bidirectional bubble-tight Composition Seal for Fire Tested Applications: Shutoff per FCI 70-2 Class VI. Contact CIESA VLS sales office for more information.		
Flow Characteristic	Modified equal percentage, Approximate Linear		
Flow Coefficients	See Flow Coefficient Table 13~ 18		
Available Actuators	Spring-and-diaphragm, or piston-and-cylinder		
Disk Rotation	Counterclockwise 90 degree to close		
Valve Size and Approx Weight	See table 4,5,7 ~ 12		
ES Packing	This option PTFE or graphite packing system provides excellent sealing, guiding, and transmission of loading force, it has perfect control of liquid and gas emissions. See figure 12.		
<ol style="list-style-type: none"> <li>1. The pressure/temperature limits in this bulletin, and any application code or standard limitation, should not be exceed.</li> <li>2. PEEK stands for "poly-ether-ether-ketone".</li> <li>3. For optimum seal performance, the preferred valve orientation at shutoff is with the retaining ring downstream from the high pressure side of valve.</li> <li>4. UHMWPE stands for ultra high molecular weight polyethylene.</li> <li>5. Kel-F not recommended for fast cycling, less than 2 seconds. Contact an Application Engineer for other seals available for fast cycling or tighter shutoff.</li> </ol>			

## Mounting

Recommended installation for the 8500 series control valve is with the shaft horizontal in a normal-flow direction. Horizontal installation will enhance valve performance because process fluid flow will sweep entrained solids from valve surfaces. This sweeping action prevents particle buildup on seal surfaces. The valve can be installed in either the forward or reverse flow direction. The standard soft seal offers bubble-tight bi-directional shutoff. To meet the fire-test requirements, valve with a composition seal must be installed in the preferred orientation. Both the metal seal and cryogenic seals are uni-directional and should be installed with the shaft upstream of the seal. Special operating conditions may require a specific combination of actuator motion. Type 8500 valve can be assembled with actuator in 8 different ways to meet these requirements. Please consult CIESA VLS Sale office or sales Representative for assistance in selecting the appropriate combination of actuator action and open valve position.

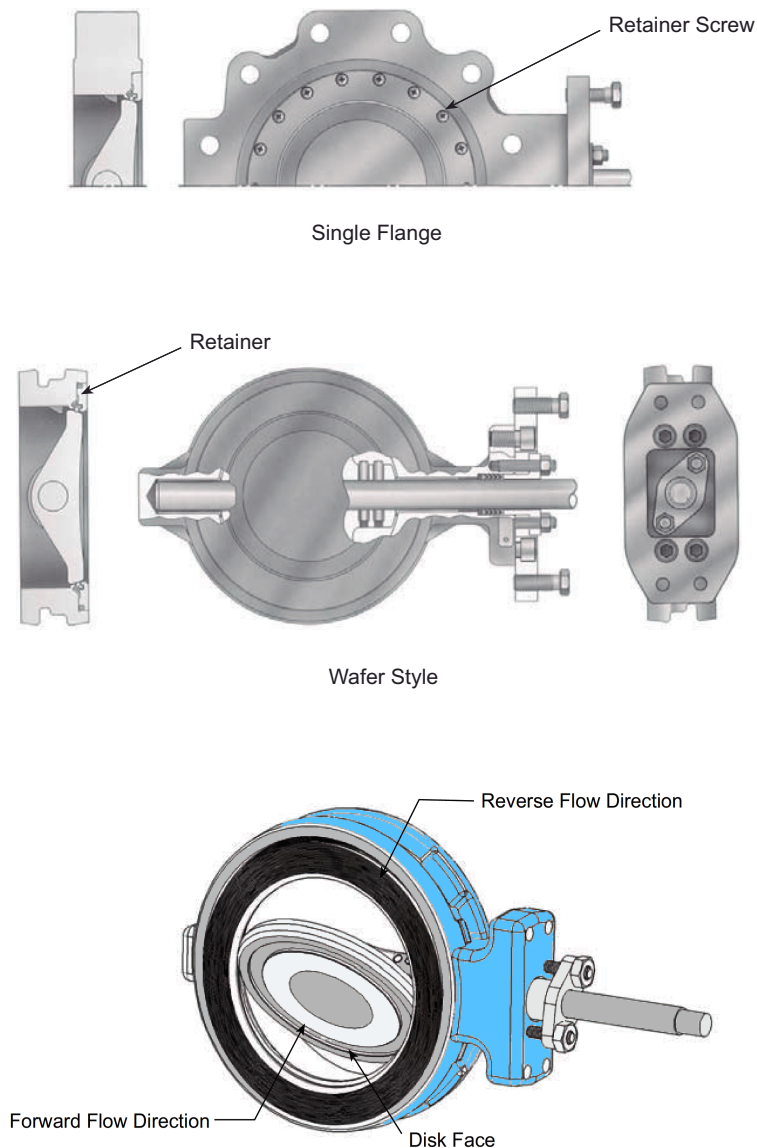
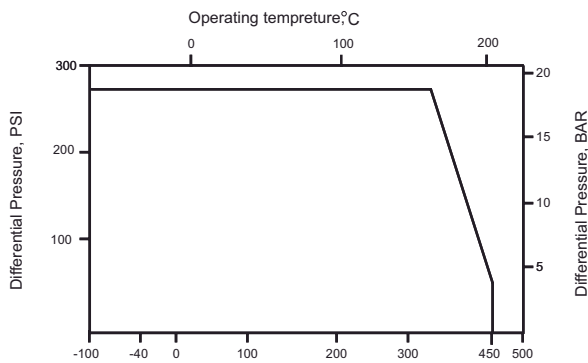
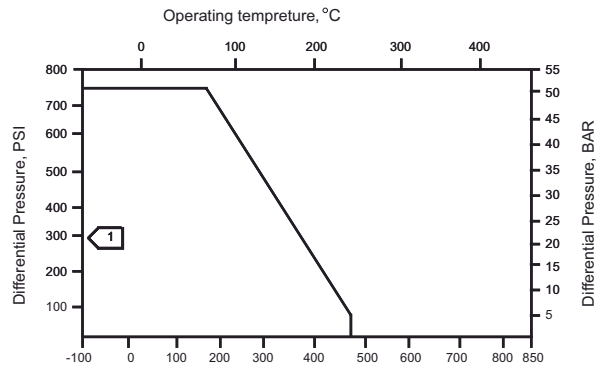


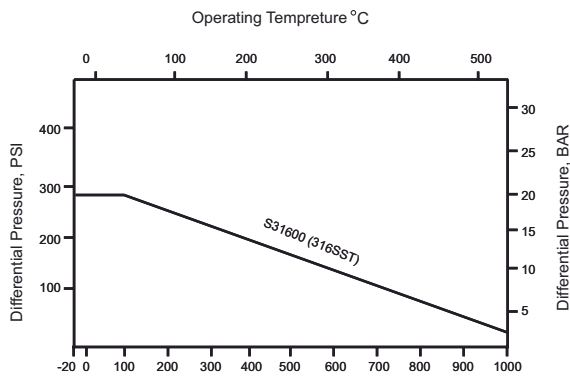
Figure4. Typical Valve Construction



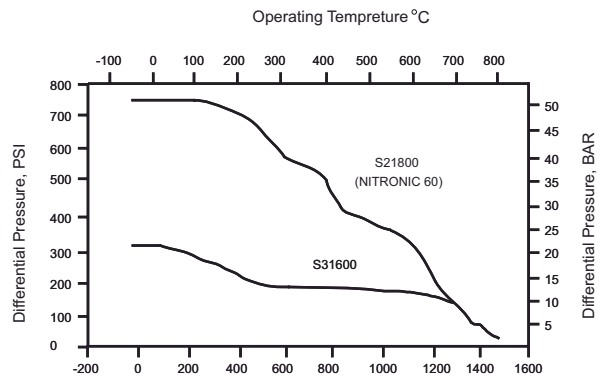
Operating temperature, °F  
Class 150, Soft Seal



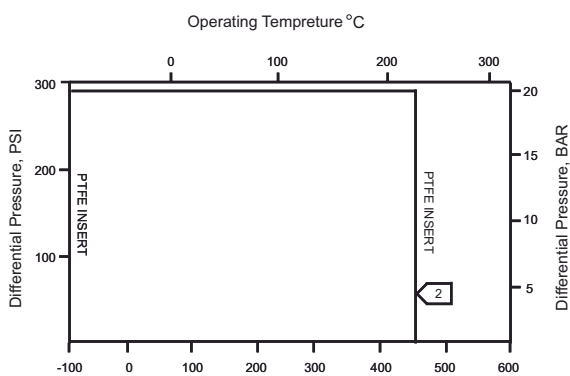
Operating Temperature, °F  
Class 300, Soft Seal



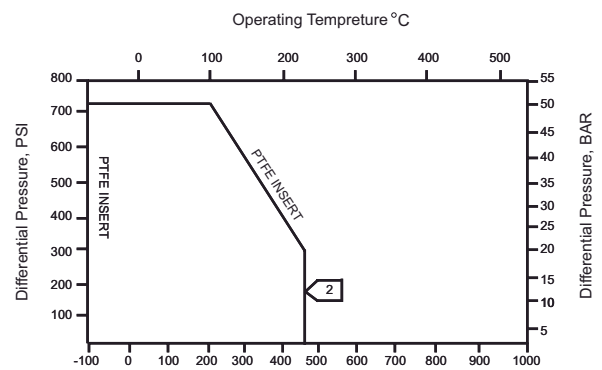
Operating Temperature, °F  
Class 150, Metal Seal



Operating Temperature, °F  
Class 300, Metal Seal



Operating Temperature, °F  
Class 150, Composition Seal



Operating Temperature, °F  
Class 300, Composition Seal

Note:

1 Because of potential erosive effects and premature seal failure that can occur, PTFE seals is not recommended at differential pressure greater than 300 PSID and disk angles less than 20 degree open .

Note:

2 Temperature Limitations do not account for the additional limitations imposed by the back-up O-ring used with this seal. Please refer to tabel 1 when required.

Figure5. Maximum Pressure/Temperature Ratings For 8502 Class 150 and Class 300

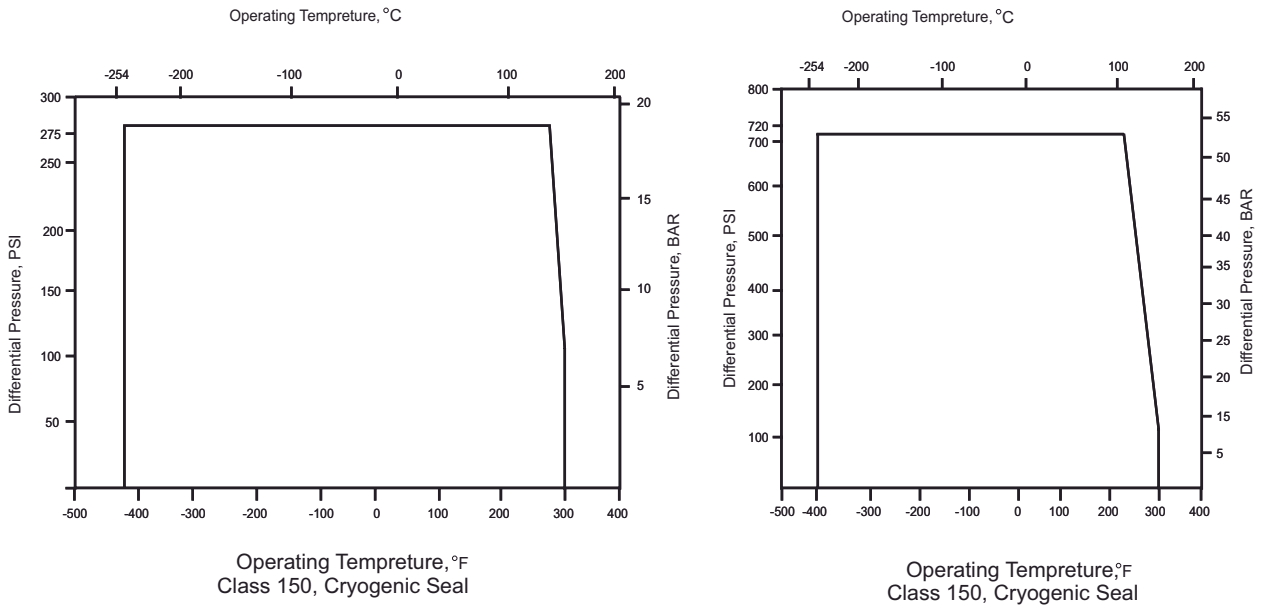


Figure6. Max Pressure/temperature Limits for Class150 and Class 300 Cryogenic Seal

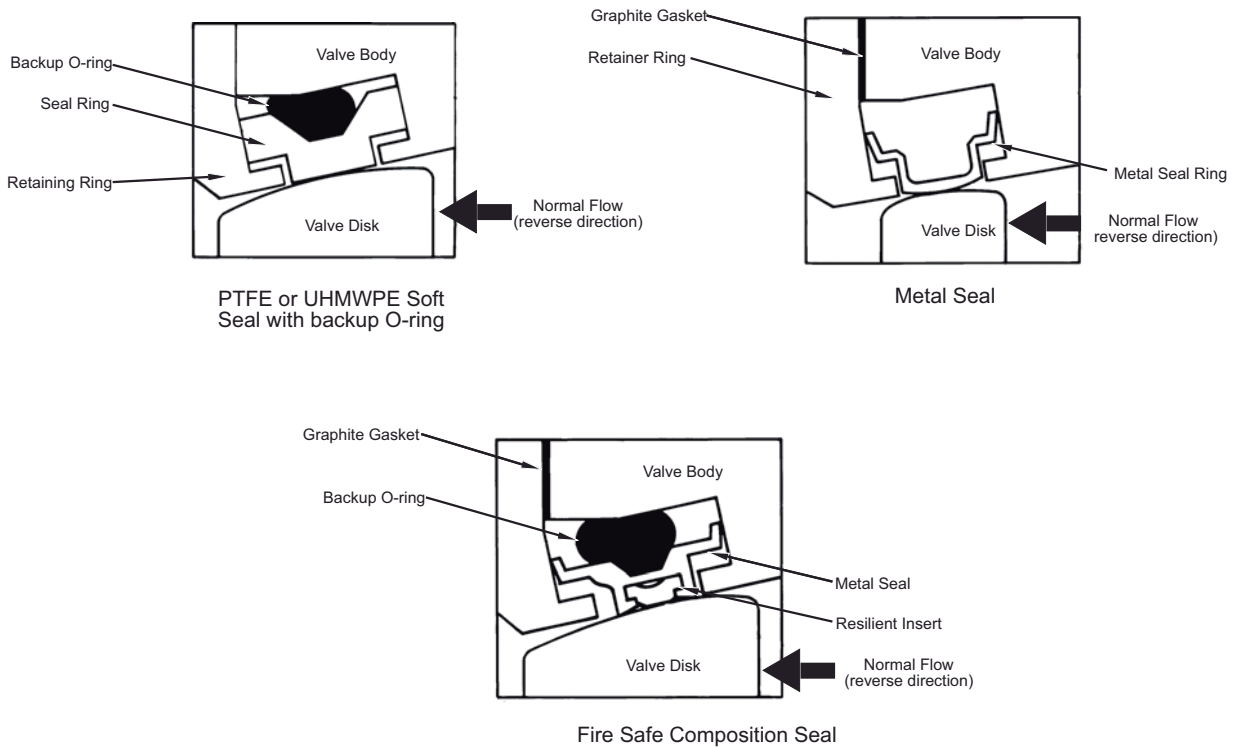


Figure7. Available Seal Configurations



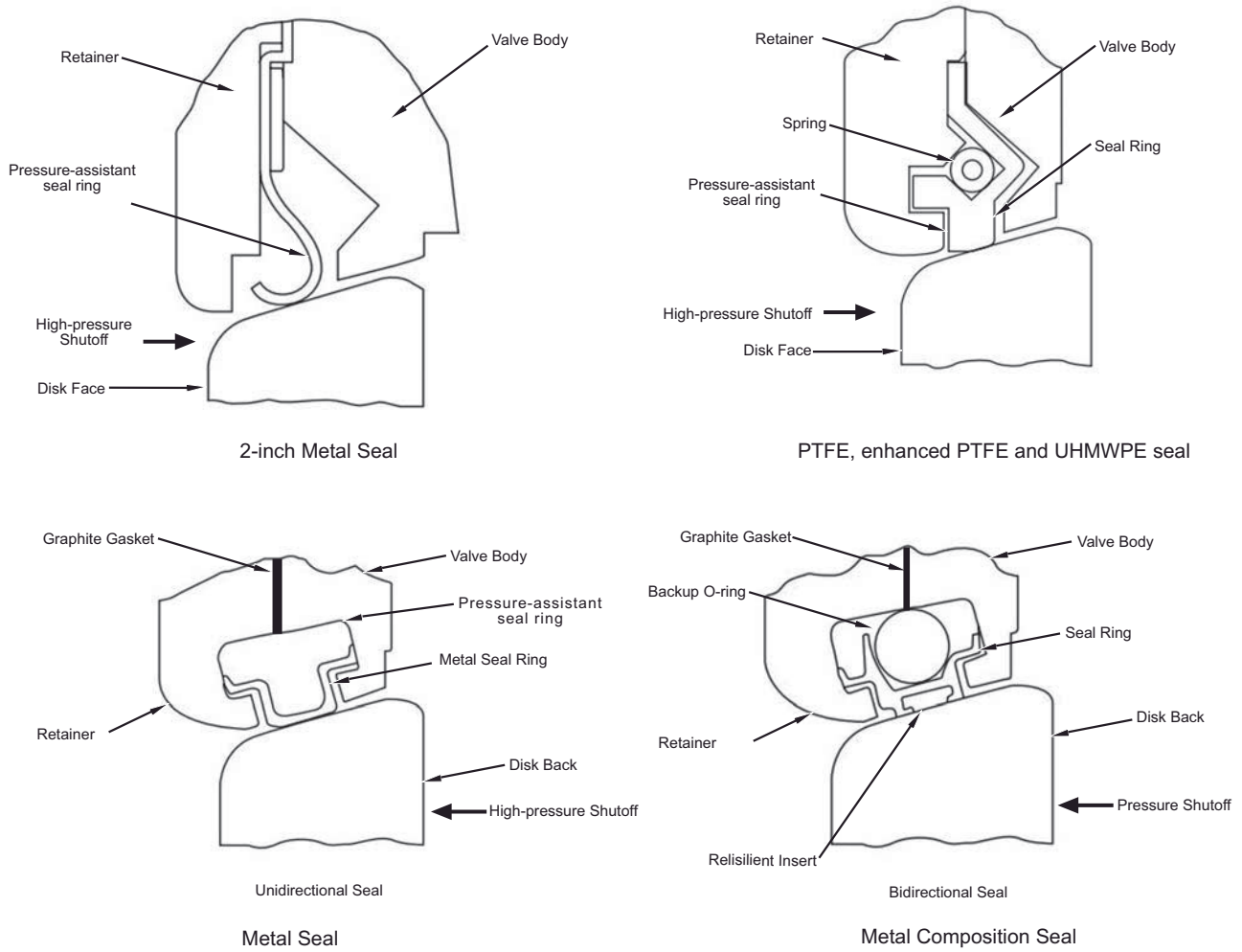
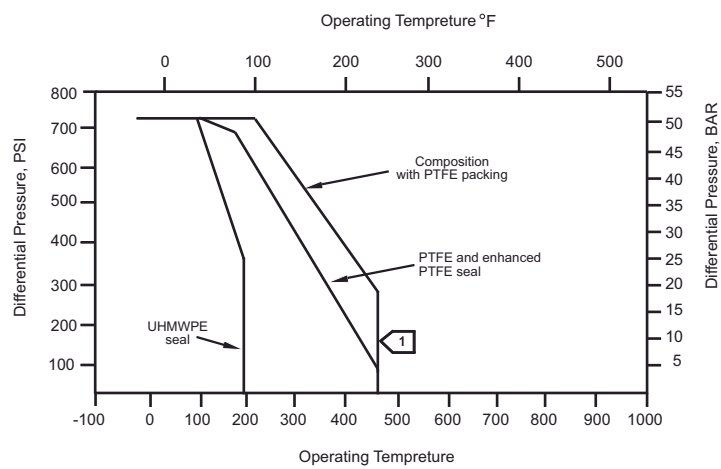


Figure8. Available seal configurations for 8501 type valve



**Note:**  
 Temperature Limitations do not account for the additional limitations imposed by the back-up O-ring used with this seal. Please refer to table 2 when required.

Figure9. Max Pressure and Temperature Limits for 8501 Type

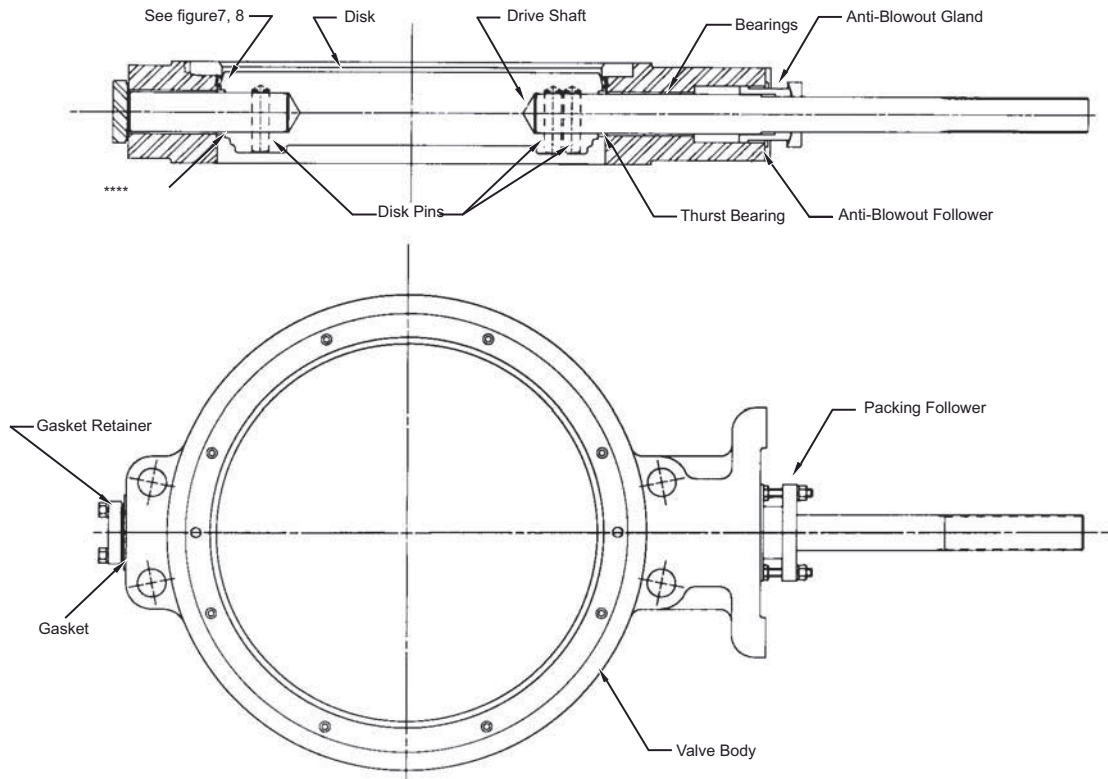


Figure10. Typical Valve Assembly

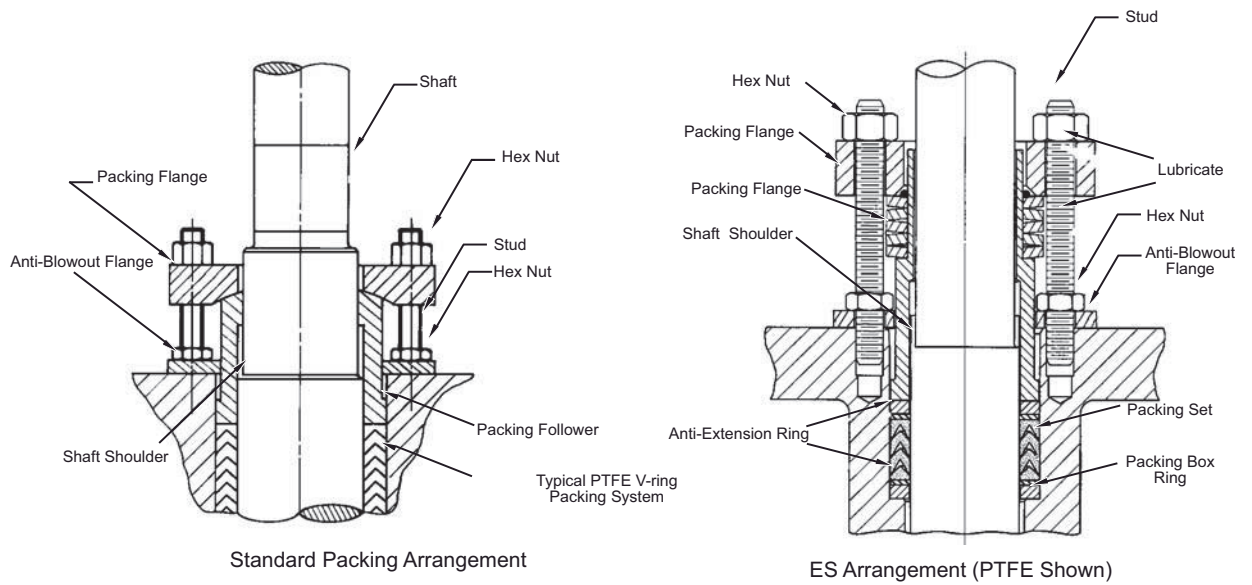
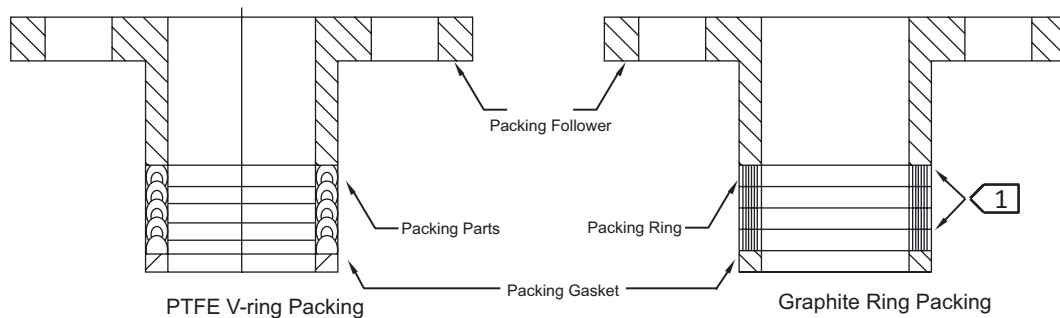
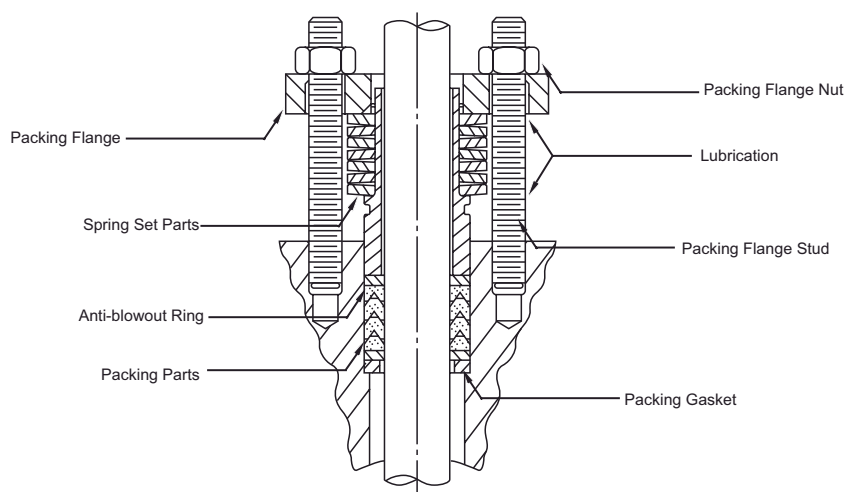


Figure11. 8502 Blowout Protection

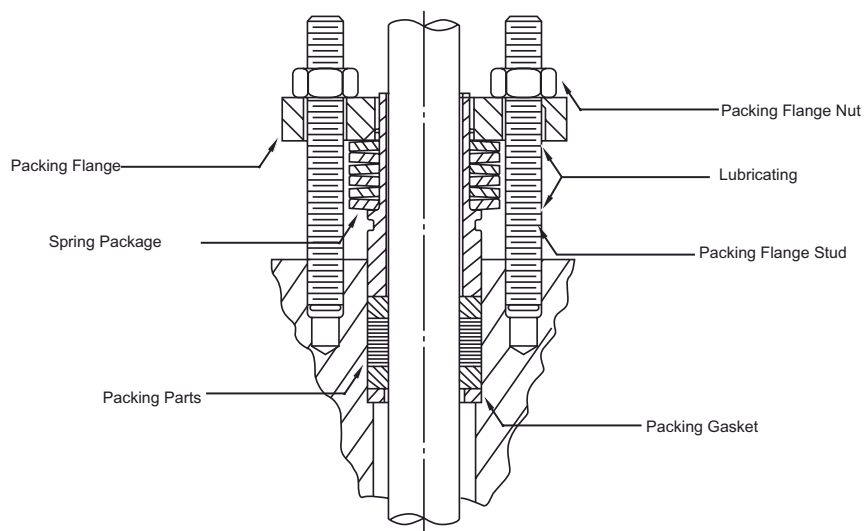




Standard Packing



ES PTFE Packing System



ES Graphite Packing System

Note: Only available for Graphite Ribbon Packing, including Zinc-coating gasket.

Figure12. Typical Packing Arrangement

Table2. Cv For Type 8501 with Valve Fully-Open (90 degree rotation), Direct Flow

Valve Size (inch)	Cv with Valve Fully-Open (90° rotation), Direct Flow	
	Class 150	Class 300
2	80.2	80.2
3	237	237
4	499	488
6	1250	1110
8	2180	2070
10	3600	3480
12	5400	5130

1. See Flow-Coefficient Table for complete list of flow coefficient.

Table3. Cv For Type 8502 with Valve Fully-Open (90 degree rotation), Direct Flow

Valve Size (inch)	Max Cv, Valve 90 degree Open, Direct Flow	
	Class 150	Class 300
14	6320	4550
16	8600	5630
18	11.050	8230
20	13.850	9530
24	21.500	12.510

1. To obtain the flow coefficient Kv in terms of cubic meters per hour at one kilogram force per square centimeter differential pressure across the valve, using the following multiplier:  $Kv=0.86Cv$ .  
 2. Measured in gallons per minutes at 1 psi differential pressure across the valve.  
 3. See Flow-Coefficient Table for complete list of flow coefficient.

Table4. Approx Weight for 8501 Valve

Valve Size (inch)	Wafer		Single-Flange	
	Class 150	Class 300	Class 150	Class 300
Kg				
2 <sup>(1)</sup>	4	4	---	---
3	5	6	6	11
4	9	10	11	18
6	13	15	16	27
8	21	24	27	42
10	34	44	40	78
12	49	64	62	131
Lb				
2 <sup>(1)</sup>	9.5	9.5	---	---
3	10	13	14	25
4	19	23	24	39
6	29	33	35	59
8	47	53	59	93
10	75	96	88	172
12	107	141	137	288

1. Weight of 2" Class 600 valve is same with Class 150 and Class 300.

Table5. Approx Weight for 8502 Valve

Valve Size (inch)	Wafer		Single-Flange	
	Class 150	Class 300	Class 150	Class 300
Kg				
14	72	95	121	227
16	94	138	183	294
18	139	178	227	402
20	167	224	364	544
24	255	315	469	821
Lb				
14	158	209	209	500
16	207	304	304	649
18	307	393	393	886
20	368	368	368	1200
24	563	563	563	1810

## Material Temperature Limitations

Table 6. Material Temperature Limitations

Construction Parts and Material Of Construction		Temperature Range	
		°C	°F
Valve Body <sup>②</sup> Carbon Steel (WCC or SA516-70) <sup>②</sup> CF8M(316SST) ANSI Class 150 and Class 300 CIESA VLS material standard CF8M FMS 20B16(min carbon 0.04%) ANSI Class 300		-29 to 427 -198 to 538 over 538 to 816	-20 to 800 -325 to 1000 over 1000 to 1500
Disk WCC Carbon Steel CF8M(316 Stainless Steel) CIESA VLS material standard CF8M FMS 20B16(min carbon 0.04%) ANSI Class 300		-29 to 427 -198 to 538 over 538 to 816	-20 to 800 -325 to 1000 over 1000 to 1500
Disk Coating CoCr-A (Alloy6) Hard coating (Non-electroless nickle coating or head chrome coating-see note below)		-198 to 916 -254 to 538	-325 to 1500 -425 to 1000
Shaft S20910(Nitronic 50) S17400(17-4PH1025) S17400(17-4PH1500M) N0771B(Inconel71B) N07750(Inconel750)		-198 to 538 -73 to 427 -196 to 427 -254 to 704 over 593 to 816	-325 to 1000 -100 to 800 -320 to 800 -425 to 1300 over 1100 to 1500
Bearings <sup>⑥</sup> PEEK (Standard) S31600 <sup>④</sup> S30006 (Alloy 6) Bronze		-73 to 260 -198 to 816 -198 to 816 -254 to 302	-100 to 500 -325 to 1500 -325 to 1500 -425 to 575
Packing PTFE Packing and PTFE ES Packing Graphite Packing Graphite Packing with oxidizing media Graphite ES packing		-148 to 232 -198 to 916 -198 to 538 -148 to 315	-325 to 450 -325 to 1500 -325 to 1000 -425 to 600
Seal Ring and Backup Ring	PTFE Seal Ring Nitrile Backup O-Ring Neoprene Back O-Ring EPD Back-up O-Ring Fluoroelastomer Backup O-Ring PTFE Backup O-Ring	-29 to 93 -43 to 149 -54 to 182 -29 to 204 -73 to 204	-20 to 200 -45 to 300 -65 to 360 -20 to 400 -100 to 400
	UHMWPE <sup>⑤</sup> Seal Ring(Class 150 Only) Nitrile Backup O-Ring Neoprene Back O-Ring EPD Backup O-Ring Fluoroelastomer Backup O-Ring PTFE Backup O-Ring	-29 to 93 -43 to 93 -54 to 93 -29 to 93 -73 to 93	-20 to 200 -45 to 200 -65 to 200 -20 to 200 -40 to 00
	Composition seal and/or Fire Tested Construction S31600 and PTFE Seal Ring with Nitrile Backup O-Ring Neoprene Back O-Ring EPD Backup O-Ring Fluoroelastomer Backup O-Ring	-40 to 149 -54 to 149 -62 to 204 -40 to 232	-40 to 300 -65 to 300 -80 to 400 -100 to 200
	Stainless Steel S31600 Seal <sup>④</sup> Ring (Class 150) Stainless Steel S31600 Seal <sup>④</sup> Ring (Class 300) Stainless Steel S21800 Seal <sup>④</sup> Ring (Class 150)	-29 to 538 -29 to 816 -29 to 816	-20 to 1000 -20 to 1500 -40 to 1500
Seal Ring	Cryogenic Seal Ring Contact CIESA VLS Sales Representative or Sales Office		

- NACE trim construction are available; consult CIESA VLS sales office or sales representative.
- Special gasket retainer screws are required for over 900 °F(482°C).
- Special retaining ring screws for single flange valves over 1000°F (538° C).
- Contact CIESA VLS sales office or sales representative for a complete material description.
- UHMWPE stands for ultra high molecular weight polyethylene.
- Special thrust bearings at temps, higher than 650° F(343° C).
- Materials process of forged or casted will depend on specific production process, unless specified by customer.

## Dimension and Weight

Table7. Dimension for type 8500 size 2"-12" Class 150

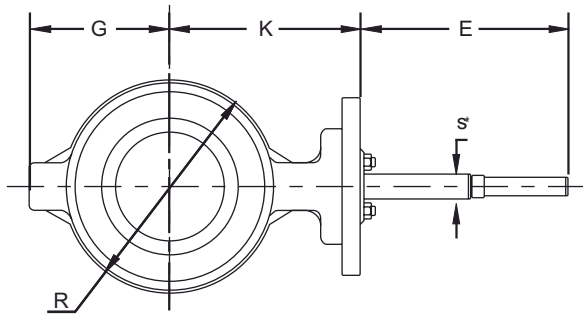
Valve Size (inch)	A	E	G		K	M <sup>②</sup>	R		S <sup>①</sup>	T	U	W	Y		
			Wafer	Single Flange			Wafer	Single Flange					Single Flange	Qty	
mm															
2	45	188	102	---	102	---	103	---	12.7	117	---	See Screw Details Below	---		
3	48	188	70	79	121	73	133	189	12.7	117	---		See Screw Details Below	See Screw Details Below	
4	54	188	86	102	143	97	171	219	15.9	117	---				
6	57	214	121	129	172	146	219	273	19.1	152	32				
8	64	214	155	157	200	191	272	333	25.4	152	32				
10	71	208	186	198	254	238	330	406	31.8	235	46				
12	81	208	222	230	279	284	387	476	38.1	235	46				
inch													Screw size	Qty	
2	1.78	7.38	4.0	---	4.00	1.88	4.06	---	1/2	4.62	---	1/2-13	---	---	
3	1.88	7.38	2.75	3.12	4.00	2.88	5.25	7.44	1/2	4.62	---	1/2-13	5/8-11	4	
4	2.12	7.38	3.38	4.00	5.62	3.81	6.75	8.62	5/8	4.62	---	1/2-13	5/8-11	8	
6	2.25	8.44	4.75	5.06	6.75	5.75	8.62	10.72	3/4	6.00	1.25	1/2-13	3/4-10	8	
8	2.50	8.44	6.12	6.19	7.88	7.5	10.69	13.12	1	6.00	1.25	1/2-13	3/4-10	8	
10	2.81	8.19	7.31	7.81	10.00	9.38	13.00	16.00	1-1/4	9.25	1.81	5/8-11	7/8-9	12	
12	3.19	8.19	8.75	9.06	11.00	11.19	15.25	18.75	1-1/2	9.25	1.81	5/8-11	7/8-9	12	

1. This valve shaft diameter refers to diameter between shaft and packing package.  
Actuators. Please make sure the disk rotate diameter matches the pipe size,

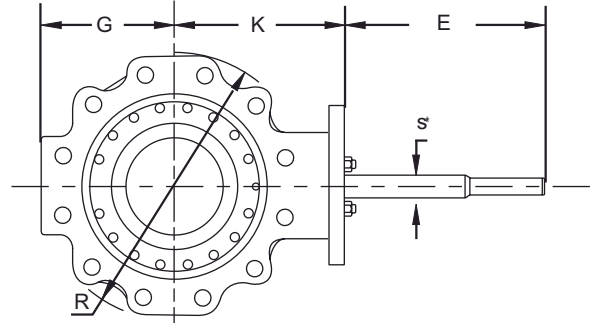
Table8. Dimension for type 8501 Size 2"-12" Class 300 Valve

Valve Size (inch)	A	E	G		K	M <sup>②</sup>	R		S <sup>①</sup>	T	U	W	Y		
			Wafer	Single Flange			Wafer	Single Flange					Single Flange	Qty	
mm															
2	45	188	102	---	102	---	1.3	---	12.7	117	---	See Screw Details Below	---		
3	48	188	89	95	137	73	132	206	15.9	117	---		See Screw Details Below	See Screw Details Below	
4	54	214	144	121	165	97	162	238	19.1	152	32				
6	59	214	146	152	197	146	221	305	25.4	152	32				
8	73	208	175	183	235	188	276	375	31.8	235	46				
10	83	208	232	229	268	233	330	438	38.1	235	46				
12	92	365	308	308	308	278	389	278	4.5	273	51				
inch													Screw size	Qty	
2	1.78	7.38	4.00	---	4.00	1.88	4.06	---	1/2	4.62	---	1/2-13	---	---	
3	1.88	7.38	3.50	3.75	5.28	2.88	5.19	8.12	5/8	4.62	---	1/2-13	3/4-10	8	
4	2.12	8.44	3.50	4.75	6.50	3.81	6.38	9.38	3/4	6.00	1.25	1/2-13	3/4-10	8	
6	2.31	8.44	5.75	6.00	7.75	5.69	8.69	12.12	1	6.00	1.25	1/2-13	3/4-10	12	
8	2.88	8.19	6.89	7.19	9.25	7.38	10.88	14.75	1-1/4	9.25	1.81	5/8-11	7/8-9	12	
10	3.25	8.19	9.12	9.00	10.56	9.19	13.00	17.25	1-1/2	9.25	1.81	5/8-11	1-8	16	
12	3.61	14.00	12.12	12.12	12.12	10.94	15.31	20.00	1-3/4	10.75	2.00	0.82	1 1/8-8	16	

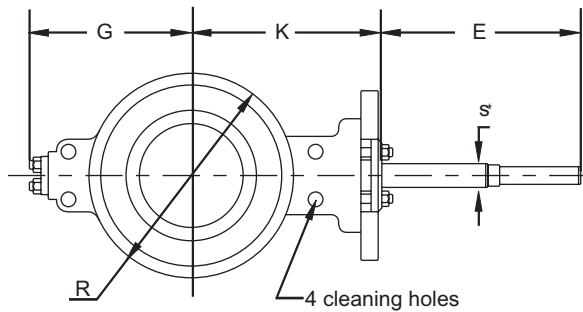
1. This valve shaft diameter refers to diameter between shaft and packing package. This diameter is required for selection of CVS Actuators.  
2. Please make sure the disk rotate diameter and matches the pipe size,



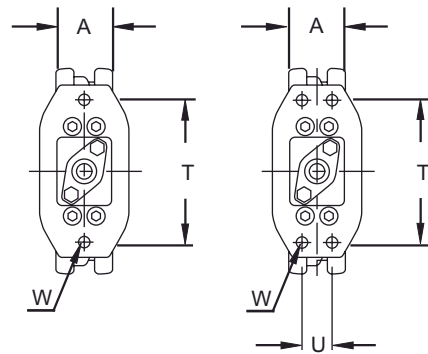
Wafer Valve



Single Flange Valve



12 inch Class300  
Wafer Valve



2-4 inch Class150      6 -12 inch Class 150  
2 inch and 3 inch Class300      4 -12 inch Class 300

Note: "M" is the rotate diameter of the disk, please make sure it matches the pipe size.

Figure13. 8501 Type Valve Dimension

Table9. Dimension and Weight for Type 8502 Class 150 Wafer Mounted Valve

Valve Size Inch	A <sup>①</sup>	D	G	K	M <sup>②</sup>	R	S (Shaft Dia at Yoke bearings)	T	U	W	Y		Approx Weight
mm											Screw size	Qty	Kg
14	91.9	208	295	327	331	422	31.8	235	46.0	17.5	---	---	72
16	102	208	318	371	375	465	31.8	235	46.0	17.5	28.6	4	94
18	114	356	349	400	419	529	39.6	273	50.8	20.1	31.8	4	139
20	127	356	381	432	464	584	44.5	273	50.8	20.1	31.8	4	167
24	154	356	438	492	581	692	57.2	337	76.2	23.9	34.9	4	255
inch											Screw size	Qty	Lb
14	3.62	8.19	11.62	12.88	13.04	16.62	1-1/4	9.25	1.81	0.69	---	---	158
16	4.00	8.19	12.5	14.63	14.77	18.31	1-1/4	9.25	1.81	0.69	1-1/8	4	207
18	4.50	14	13.75	15.75	16.49	20.81	1-9/16	10.75	2.00	0.81	1-1/4	4	307
20	5.00	14	15.00	17.00	18.27	23.00	1-3/4	10.75	2.00	0.81	1-1/4	4	368
24	6.06	14	17.25	19.38	22.87	27.25	2-1/4	13.25	3.00	0.94	1-3/8	4	563

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.
2. M is the minimum pipe or flange required for disk swing clearance.

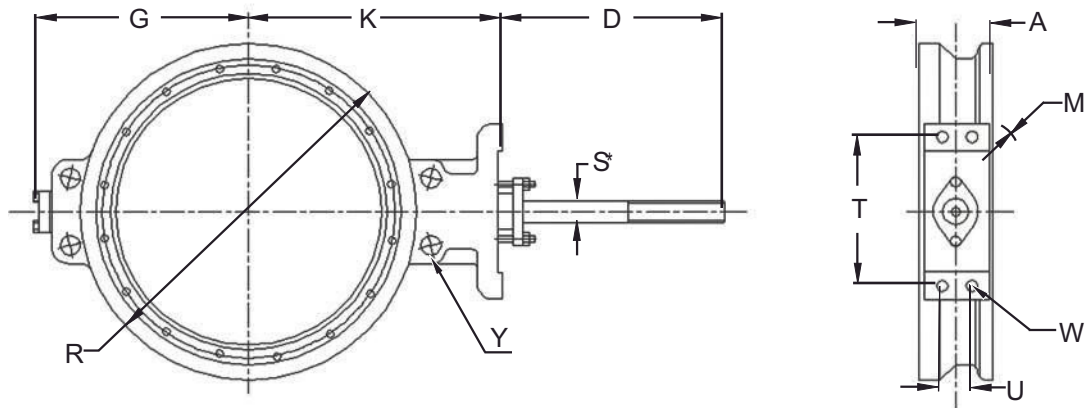


Figure14. Dimension and Weight for Type 8502 Class 150 Wafer Mounted Valve (also available in table 3)



Table 10. Dimension and Weight for Type 8502 Class 150 Single Flange Mounted Control Valve

Valve Size (inch)	A <sup>①</sup>	D	G	K	M <sup>②</sup>	R	S (Shaft Dia at Yoke bearings)	T	U	W	Y	Approx Weight	
mm												Kg	
14	91.9	208	295	327	331	531	31.8	235	46.0	14.2	---	95	
16	102	208	318	371	375	607	31.8	235	46.0	14.2	---	138	
18	114	356	349	400	419	645	39.6	273	50.8	20.1	---	178	
20	127	356	381	432	464	696	44.5	273	50.8	20.1	---	224	
24	154	356	438	492	581	822	57.2	337	76.2	23.9	---	315	
inch											Screw size	Qty	Lb
14	3.62	8.19	11.62	12.88	13.04	20.88	1-1/4	9.25	1.81	0.56	1-1/8	12	209
16	4.00	8.19	12.50	14.63	14.77	23.88	1-1/4	9.25	1.81	0.56	1-1/8	16	304
18	4.50	14	13.75	15.75	16.49	25.38	1-9/16	10.75	2.00	0.81	1-1/8-8	16	393
20	5.00	14	15.00	17.00	18.27	27.38	1-3/4	10.75	2.00	0.81	1-1/4	4	368
24	6.06	14	17.25	19.38	22.87	32.38	2-1/4	13.25	3.00	0.94	1-3/8	4	563

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.  
 2. M is the minimum pipe or flange required for disk swing clearance.

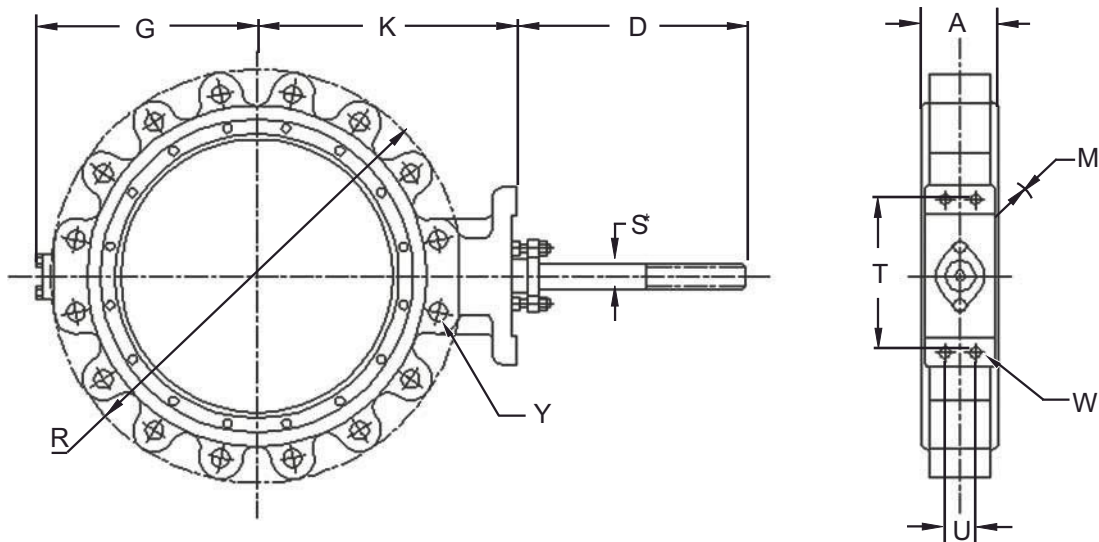


Figure 15. Dimension and Weight for Type 8502 Class 150 Single Flange Mounted Control Valve (Also available in Table 4)

Table 11. Dimension and Weight for Type 8502 Class 300 Wafer Mounted Control Valve

Valve Size (inch)	A <sup>①</sup>	D	G	K	M <sup>②</sup>	R	S (Shaft Dia at Yoke bearings)	T	U	W	Y		Approx Weight
mm											Screw size	Qty	Kg
14	117	356	319	364	304	437	44.5	273	50.8	20.6	---	---	121
16	133	356	353	397	346	498	44.5	273	50.8	20.6	---	---	183
18	149	356	384	419	389	556	57.2	337	76.2	23.9	---	---	227
20	159	265	416	483	422	605	76	337	76.2	23.9	---	---	364
24	181	265	483	546	523	716	89	337	76.2	23.9	---	---	469
inch											Screw size	Qty	Lb
14	4.62	14	11.62	12.88	13.04	20.88	1-1/4	9.25	1.81	0.56	1-1/8	12	209
16	5.25	14	12.50	14.62	14.77	23.88	1-1/4	9.25	1.81	0.56	1-1/8	16	304
18	5.88	14	13.75	15.75	16.49	25.38	1-9/16	10.75	2.00	0.81	1-1/8-8	16	393
20	6.25	10-7/16	15.00	17.00	18.27	27.38	1-3/4	10.75	2.00	0.81	1-1/4	4	368
24	7.12	10-7/16	17.25	19.38	22.87	32.38	2-1/4	13.25	3.00	0.94	1-3/8	4	563

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.
2. M is the minimum pipe or flange required for disk swing clearance.

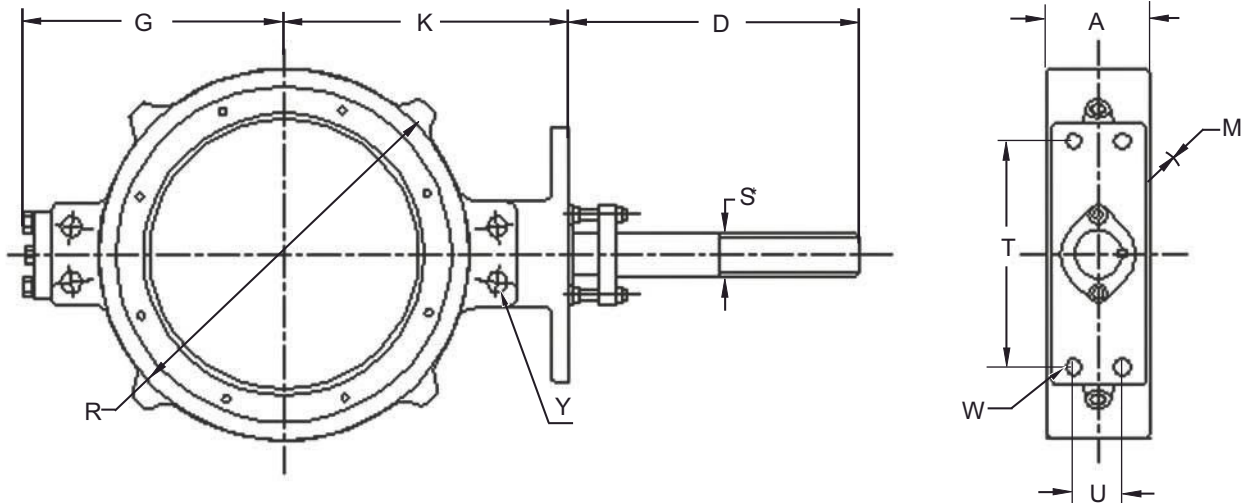


Figure 16. Dimension and Weight for Type 8502 Class 300 Wafer Mounted Control Valve (Also available in Table 5)

Table12. Dimension and Weight for Type 8502 Class 300 Single Foange Mounted Control Valve

Valve Size (inch)	A <sup>①</sup>	D	G	K	M <sup>②</sup>	R	S (Shaft Dia at Yoke bearings)	T	U	W	Y	Approx Weight	
mm												Kg	
14	117	356	319	364	304	594	44.5	273	50.8	20.6	—	227	
16	133	356	353	397	346	657	44.5	273	50.8	20.6	—	294	
18	149	356	384	419	389	721	57.2	337	76.2	23.9	—	402	
20	159	265	416	483	422	784	76	337	76.2	23.9	—	544	
24	181	265	483	546	523	924	89	337	76.2	23.9	—	821	
Inch											Screw size	Qty	Lb
14	4.62	14	12.56	14.31	12.0	23.38	1-3/4	10.75	2	0.81	1-1/8-8	16	500
16	5.25	14	13.88	15.62	13.60	25.88	1-3/4	10.75	2	0.81	1-1/4-8	20	649
18	5.88	14	15.12	16.5	15.3	28.38	2-1/4	13.25	3	0.94	1-1/4-8	24	886
20	6.25	10-7/16	16.38	19.00	17.4	30.88	3	13.25	3	0.94	1-1/4-8	24	1200
24	7.12	10-7/16	19.00	21.50	20	36.38	3-1/2	13.25	3	0.94	1-1/2-8	24	1810

1. Face-to-face dimensions are in compliance with MSS SP68 and API 609 specifications.

2. M is the minimum pipe or flange required for disk swing clearance.

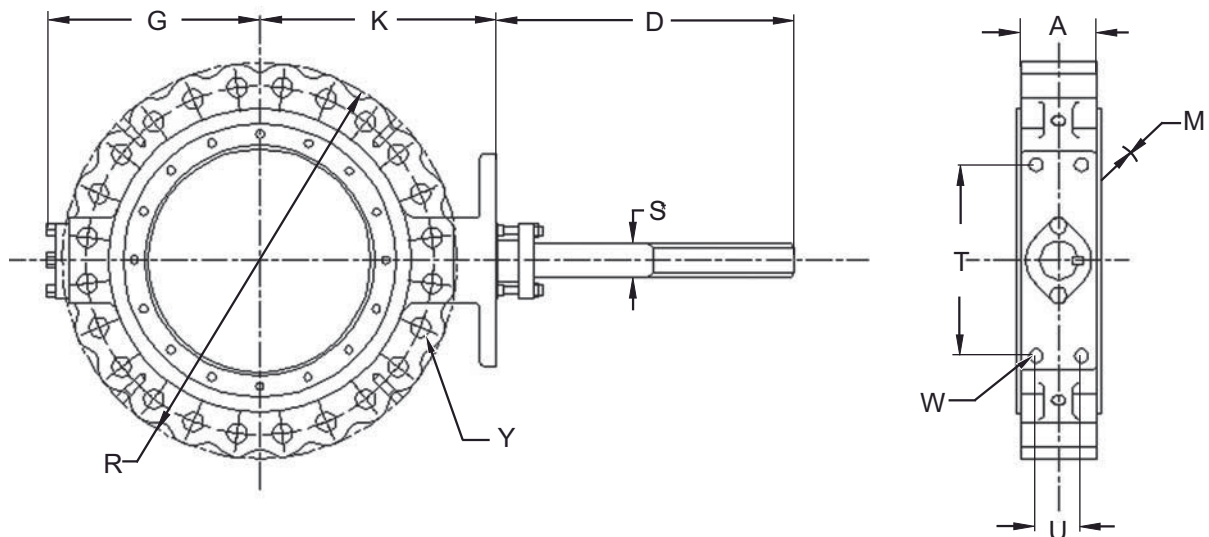


Figure17. Dimension and Weight for Type 8502 Class 300 Single Flange Mounted Control Valve (Also available in Table 5)(Also available in Table 6)

## Flow Coefficient

Table13. Flow Coefficient for Type 8501 Size 2-12 Inch Class 150 Valve, Direct Flow

Coefficient	Valve Size inch	Rotation (degree)								
		10	20	30	40	50	60	70	80	90
$C_v$	2 <sup>①</sup>	2.25	11.4	19.9	32.6	48.1	58.9	64.0	69.8	80.2
$K_v$		1.95	9.86	17.2	28.2	41.6	50.9	55.4	60.4	69.4
$X_T$		- - -	0.78	0.77	0.76	0.74	0.76	0.77	0.76	0.71
$F_L$		0.295	0.289	0.315	0.314	0.357	0.497	0.54	0.518	0.442
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$		3	3.21	20.8	40.5	66.7	90.1	115	150	189
$K_v$	2.78		18.0	35.0	57.7	77.9	99.5	130	163	205
$X_T$	0.78		0.89	0.8	0.75	0.68	0.71	0.65	0.61	0.58
$F_L$	0.855		0.602	0.461	0.404	0.372	0.358	0.306	0.259	0.232
$F_d$	0.09		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$	4		18.2	52.6	96.7	154	199	270	351	447
$K_v$		15.7	45.5	83.6	133	172	234	304	387	432
$X_T$		0.08	0.85	0.79	0.73	0.74	0.69	0.64	0.61	0.53
$F_L$		0.474	0.474	0.500	0.416	0.407	0.326	0.271	0.220	0.196
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$		6	34.7	109	198	321	452	664	882	1180
$K_v$	30.0		94.3	171	278	391	574	763	1020	1080
$X_T$	0.85		0.83	0.75	0.71	0.71	0.67	0.65	0.61	0.55
$F_L$	0.389		0.552	0.528	0.438	0.424	0.331	0.278	0.206	0.203
$F_d$	0.09		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$	8		60.5	190	345	560	788	1160	1540	2060
$K_v$		52.3	164	298	484	682	1000	1330	1780	1890
$X_T$		0.81	0.81	0.79	0.82	0.71	0.66	0.60	0.55	0.48
$F_L$		0.368	0.520	0.498	0.412	0.399	0.310	0.261	0.193	0.191
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$		10	83.3	259	463	727	1090	1670	2400	3340
$K_v$	72.1		224	400	629	943	1440	2080	2890	3110
$X_T$	0.81		0.81	0.79	0.82	0.71	0.66	0.60	0.55	0.48
$F_L$	0.626		0.658	0.646	0.622	0.538	0.381	0.285	0.201	0.167
$F_d$	0.09		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$	12		125	388	694	1090	1640	2500	3600	5010
$K_v$		108	336	600	943	1420	2160	3110	4330	4670
$X_T$		0.83	0.78	0.78	0.78	0.75	0.66	0.61	0.52	0.47
$F_L$		0.528	0.556	0.547	0.528	0.451	0.324	0.241	0.170	0.141
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70

1. Flow coefficient of 2-inch valve is not only available for Class 150, but also available for Class 300 and Class 600.

Table14. Flow Coefficient for Type 8501 Size 2-12 Inch Class 150 Valve, Reverse Flow

Coefficient	Valve Size Inch	Ratation (degree)								
		10	20	30	40	50	60	70	80	90
$C_v$	2 <sup>①</sup>	2.11	9.96	20.7	34.0	50.5	68.4	81.0	81.0	81.0
$K_v$		1.83	8.62	17.9	29.4	43.7	59.2	70	70	70
$F_L$		---	0.88	0.84	0.77	0.71	0.69	0.67	0.71	0.69
$X_T$		0.399	0.507	0.354	0.334	0.340	0.342	0.359	0.401	0.401
$F_d$		0.09	0.17	0.26	0.034	0.42	0.49	0.57	0.64	0.70
$C_v$	3	1.79	23.0	37.0	58.8	91.9	139	192	270	259
$K_v$		1.55	19.9	32.0	50.9	79.5	120	166	234	224
$F_L$		0.70	0.81	0.73	0.76	0.75	0.66	0.60	0.50	0.54
$X_T$		0.449	0.455	0.395	0.417	0.432	0.313	0.256	0.188	0.203
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$	4	17.2	50.2	87.8	146	206	285	365	465	521
$K_v$		14.9	43.4	75.9	126	178	247	316	402	451
$F_L$		0.72	0.84	0.79	0.75	0.71	0.63	0.58	0.53	0.55
$X_T$		0.445	0.471	0.481	0.417	0.370	0.276	0.225	0.191	0.196
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.7
$C_v$	6	30.6	100	173	285	424	640	893	1180	1290
$K_v$		26.5	86.5	150	247	367	554	772	1020	1120
$F_L$		0.83	0.83	0.80	0.78	0.76	0.69	0.59	0.52	0.54
$X_T$		0.444	0.608	0.574	0.485	0.441	0.316	0.227	0.176	0.182
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$	8	53.6	175	303	499	742	1120	1560	2070	2260
$K_v$		46.4	151	262	423	643	969	1350	1790	1950
$F_L$		0.79	0.83	0.82	0.79	0.73	0.66	0.58	0.51	0.48
$X_T$		0.413	0.567	0.534	0.449	0.409	0.295	0.213	0.164	0.170
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.7
$C_v$	10	84.4	232	423	737	1180	1730	2560	3250	3710
$K_v$		73.0	200	366	638	1020	1500	2210	2810	3210
$F_L$		0.79	0.83	0.82	0.79	0.73	0.66	0.58	0.51	0.48
$X_T$		0.542	0.745	0.673	0.590	0.489	0.380	0.245	0.189	0.156
$F_d$		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$	12	126	347	631	1100	1760	2590	3820	4850	5540
$K_v$		109	300	546	92.5	1520	2240	3300	4200	4790
$F_L$		0.78	0.87	0.85	0.80	0.75	0.69	0.55	0.51	0.47
$X_T$		0.491	0.671	0.610	0.535	0.443	0.343	0.222	0.171	0.141
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70

1. Flow coefficient of 2-inch valve is not only available for Class 150, but also available for Class 300 and Class 600.

Table15. Flow Coefficient for Type 8501 Size 2-12 Inch Calss 300 Valve, Direct Flow

Coefficient	Valve Size Inch	Rotation (degree)								
		10	20	30	40	50	60	70	80	90
$C_v$	2 <sup>①</sup>	2.25	11.4	19.9	32.6	48.1	58.9	64.0	69.8	80.2
$K_v$		1.95	9.86	17.2	28.2	41.6	50.9	55.4	60.4	69.4
$F_L$		- - -	0.78	0.77	0.75	0.74	0.75	0.77	0.75	0.71
$X_T$		0.299	0.292	0.319	0.318	0.362	0.502	0.546	0.525	0.446
$F_d$		0.090	0.17	0.26	0.034	0.42	0.49	0.57	0.64	0.70
$C_v$		3	3.21	20.8	40.5	66.7	90.1	115	150	189
$K_v$	2.78		18.0	35.0	57.7	77.9	99.5	130	163	205
$F_L$	0.78		0.88	0.78	0.77	0.79	0.80	0.72	0.69	0.64
$X_T$	0.370		0.542	0.433	0.411	0.464	0.469	0.397	0.346	0.286
$F_d$	0.09		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$	4		12.9	37.4	72.9	124	174	236	318	420
$K_v$		11.2	32.4	63.1	107	151	204	275	363	422
$F_L$		0.81	0.86	0.79	0.73	0.72	0.71	0.65	0.60	0.54
$X_T$		0.455	0.499	0.416	0.395	0.410	0.363	0.292	0.235	0.210
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$		6	39.6	120	215	340	440	598	777	1050
$K_v$	34.3		104	186	294	381	604	672	908	952
$F_L$	0.8		0.77	0.71	0.68	0.71	0.68	0.62	0.60	0.56
$X_T$	0.420		0.433	0.434	0.369	0.360	0.299	0.282	0.214	0.205
$F_d$	0.090		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$	8		73.9	224	401	634	821	1120	1450	1960
$K_v$		63.9	194	347	548	710	969	1250	1700	1790
$F_L$		0.80	0.79	0.77	0.75	0.71	0.66	0.61	0.55	0.49
$X_T$		0.367	0.380	0.381	0.322	0.314	0.260	0.248	0.187	0.177
$F_d$		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$		10	64.6	248	453	706	1070	1630	2340	3280
$K_v$	55.9		215	392	611	926	1410	2020	2840	3010
$F_L$	0.8		0.79	0.77	0.75	0.71	0.66	0.61	0.55	0.49
$X_T$	0.464		0.565	0.562	0.544	0.455	0.335	0.255	0.179	0.159
$F_d$	0.090		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$C_v$	12		92.5	365	668	1040	1580	2410	3450	4840
$K_v$		82.3	316	578	900	1370	2080	2980	4190	4440
$F_L$		0.86	0.80	0.78	0.79	0.74	0.67	0.59	0.53	0.48
$X_T$		0.422	0.514	0.506	0.492	0.412	0.301	0.231	0.162	0.144
$F_d$		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70

1. Flow coefficient of 2-inch valve is not only available for Class 150, but also available for Class 300 and Class 600.



Table16. Flow Coefficient for Type 8501 Size 2-12 Inch Class 300 Valve, Reverse Flow

Coefficient	Valve Size Inch	Rotation (degree)								
		10	20	30	40	50	60	70	80	90
C <sub>v</sub>	2 <sup>①</sup>	2.11	9.96	20.7	34.0	50.5	68.4	81.0	81.0	81
K <sub>v</sub>		1.83	8.62	17.9	29.4	43.7	59.2	70.0	70.0	70.0
F <sub>L</sub>		- - -	0.88	0.84	0.77	0.71	0.69	0.67	0.71	0.69
X <sub>T</sub>		0.399	0.507	0.354	0.334	0.340	0.342	0.359	0.401	0.401
F <sub>d</sub>		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>		3	1.79	23.0	37.0	58.8	91.9	139	192	270
K <sub>v</sub>	1.55		19.9	32.0	50.9	79.5	120	166	2347	224
F <sub>L</sub>	0.71		0.75	0.77	0.81	0.79	0.71	0.62	0.49	0.59
X <sub>T</sub>	0.370		0.542	0.433	0.411	0.464	0.496	0.397	0.346	0.286
F <sub>d</sub>	0.090		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	4		12.7	35.2	61.3	105	163	242	361	463
K <sub>v</sub>		11.0	30.4	53.0	90.8	141	209	312	400	417
F <sub>L</sub>		0.74	0.80	0.82	0.80	0.77	0.69	0.57	0.51	0.55
X <sub>T</sub>		0.455	0.499	0.416	0.395	0.410	0.363	0.393	0.235	0.210
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>		6	38.8	106	18.3	294	436	605	779	976
K <sub>v</sub>	33.6		91.7	158	254	377	523	674	844	952
F <sub>L</sub>	0.78		0.81	0.79	0.80	0.74	0.68	0.59	0.58	0.57
X <sub>T</sub>	0.420		0.433	0.434	0.369	0.360	0.299	0.282	0.214	0.205
F <sub>d</sub>	0.090		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	8		73.1	200	345	554	821	1140	1470	1840
K <sub>v</sub>		63.2	173	298	479	710	986	1270	1590	1810
F <sub>L</sub>		0.80	0.83	0.83	0.80	0.74	0.66	0.58	0.5	0.48
X <sub>T</sub>		0.405	0.454	0.542	0.451	0.346	0.269	0.239	0.206	0.173
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>		10	66.2	217	399	708	1110	1690	2400	3100
K <sub>v</sub>	57.3		188	345	612	960	1460	2080	2680	3080
F <sub>L</sub>	0.80		0.83	0.83	0.80	0.74	0.66	0.588	0.50	0.48
X <sub>T</sub>	0.50		0.714	0.672	0.557	0.465	0.339	0.243	0.187	0.155
F <sub>d</sub>	0.090		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
C <sub>v</sub>	12		100	328	603	1070	1680	2550	3620	4690
K <sub>v</sub>		86.5	284	522	926	1450	2210	3130	4060	4650
F <sub>L</sub>		0.80	0.86	0.87	0.80	0.75	0.66	0.55	0.50	0.48
X <sub>T</sub>		0.451	0.636	0.595	0.494	0.414	0.303	0.217	0.167	0.138
F <sub>d</sub>		0.090	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70

1. Flow coefficient of 2-inch valve is not only available for Class 150, but also available for Class 300 and Class 600.

Table17. Flow Coefficient for Type 8502 Size 14-24 Inch Class 150 Valve, Reverse Flow

Coefficient	Valve Size Inch	Rotation (degree)								
		10	20	30	40	50	60	70	80	90
$C_v$	14	95	316	695	1200	1900	2840	3980	5120	6320
$K_v$		82.2	273	601	1038	1643	2457	3433	4429	5467
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$F_L$		0.77	0.79	0.81	0.81	0.78	0.73	0.68	0.60	0.52
$X_T$		0.50	0.53	0.55	0.55	0.51	0.45	0.39	0.3	0.23
$C_v$		16	129	430	946	1640	2580	3870	5420	6970
$K_v$	112		372	818	1419	2232	3348	4688	6029	7439
$F_d$	0.09		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$F_L$	0.77		0.79	0.81	0.81	0.78	0.73	0.68	0.60	0.52
$X_T$	0.50		0.53	0.55	0.51	0.51	0.45	0.39	0.30	0.23
$C_v$	18		166	553	1220	2100	3320	4970	6960	8950
$K_v$		144	478	1055	1817	2872	4299	6020	7742	9558
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$F_L$		0.77	0.79	0.81	0.81	0.78	0.73	0.68	0.60	0.52
$X_T$		0.50	0.53	0.55	0.55	0.51	0.45	0.39	0.30	0.23
$C_v$		20	208	692	1520	2630	4160	6230	8730	11.22
$K_v$	180		599	1315	2275	3598	5389	7551	9705	11.980
$F_d$	0.09		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$F_L$	0.77		0.79	0.81	0.81	0.78	0.73	0.68	0.60	0.52
$X_T$	0.50		0.53	0.55	0.55	0.51	0.45	0.39	0.30	0.23
$C_v$	24		322	1080	2370	4080	6450	9670	13.540	17.410
$K_v$		277	934	2050	3529	5579	8365	11.712	15.060	18.598
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$F_L$		0.77	0.79	0.81	0.81	0.78	0.73	0.68	0.60	0.52
$X_T$		0.50	0.53	0.55	0.55	0.51	0.45	0.39	0.30	0.23

Table18. Flow Coefficient for Type 8502 Size 14-24 Inch Class 300 Valve, Reverse Flow

Coefficient	Valve Size Inch	Rotation (degree)								
		10	20	30	40	50	60	70	80	90
$C_v$	14	136	341	704	1200	1860	2680	3450	4050	4550
$K_v$		118	295	609	1038	1609	2318	2984	3503	3936
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.7
$F_L$		0.78	0.81	0.81	0.79	0.75	0.69	0.62	0.56	0.52
$X_T$		0.51	0.55	0.55	0.53	0.47	0.4	0.33	0.26	0.23
$C_v$		16	169	422	873	1490	2310	3320	4280	5010
$K_v$	146		365	755	1289	1998	2872	3702	4334	4870
$F_d$	0.09		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$F_L$	0.78		0.81	0.81	0.79	0.75	0.69	0.62	0.56	0.52
$X_T$	0.51		0.55	0.55	0.53	0.47	0.40	0.33	0.26	0.23
$C_v$	18		247	617	1280	2180	3370	4860	6260	7330
$K_v$		214	534	1107	1886	2915	3204	5415	6340	7119
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$F_L$		0.78	0.81	0.81	0.79	0.75	0.69	0.62	0.56	0.52
$X_T$		0.51	0.55	0.55	0.53	0.47	0.40	0.33	0.26	0.23
$C_v$		20	286	714	1480	2520	3910	5620	7240	8480
$K_v$	247		618	1280	2180	3382	4861	6263	7335	8243
$F_d$	0.09		0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.70
$F_L$	0.78		0.81	0.81	0.79	0.75	0.69	0.62	0.56	0.52
$X_T$	0.51		0.55	0.55	0.53	0.47	0.40	0.33	0.26	0.23
$C_v$	24		375	938	1940	3320	5130	7380	9510	11.140
$K_v$		324	811	1678	2872	4437	6384	8226	9636	10.821
$F_d$		0.09	0.17	0.26	0.34	0.42	0.49	0.57	0.64	0.7
$F_L$		0.78	0.81	0.81	0.79	0.75	0.69	0.62	0.56	0.52
$X_T$		0.51	0.55	0.55	0.53	0.47	0.40	0.33	0.26	0.23

# Ordering Information

Table19. 8500 Type High Performance Butterfly Valve Ordering Table

8500 Series Butterfly Valve							Actuator
8501 8502	Valve Body Size	Valve Body Material	Process Connection & Pressure Rating	Bonnet Style	Packing Material	Special	

Ordering Code

8501	2	C	RT1	B0	1
------	---	---	-----	----	---

Please attach actuator ordering table if value is assembled with actuator

1052 Spring Diaphragm Actuator
Piston Cylinder Actuator

Valve Body Size

Valve Body Size (inch)	Code
2	2
3	3
4	4
6	6
8	8
10	10
12	12
14	14
16	16
18	18
20	20
24	24

Packing System

Packing System	Code
Single PTFE	1
Double PTFE	2
Single Graphite	3
Double Graphite	4
Other Design	Y

Bonnet Style

Bonnet Style	Code
Standard	B0
Extension I	B1
EXTension II	B2

Valve Body Material

Valve Body Material	Code
WCC	T
Stainless Steel CF8	S
Stainless Steel CF8M	M
Other Material	Y

Process Connection and Pressure Rating

Valve Body Material	Available Valve Body Size	Process Connection	Pressure Rating	Code
WCC Stainless Steel	2-inch 8501 Type	No-Flange Wafer	Class150	RT1
			Class300	RT2
			Class600	RT3
	3-24 Inch Type 8501 / 8502	No-Flange Wafer	Class150	RT1
			Class300	RT2
			FM Flange	Class150
		Class300	FM2	
		RF Flange	Class150	RF1
			Class300	RF2



Notes:

1. Please fill the control valve ordering table for valve design and selection.
2. Please attach the Actuator ordering table when assembled with an actuator.
3. Control valve parts can be ordered separately, please specify.
4. Please contact CIESA VLS technical support for special requirements.

Figure18. Sectional Drawing For 8500 Butterfly Valve

# Control Valve Design Worksheet

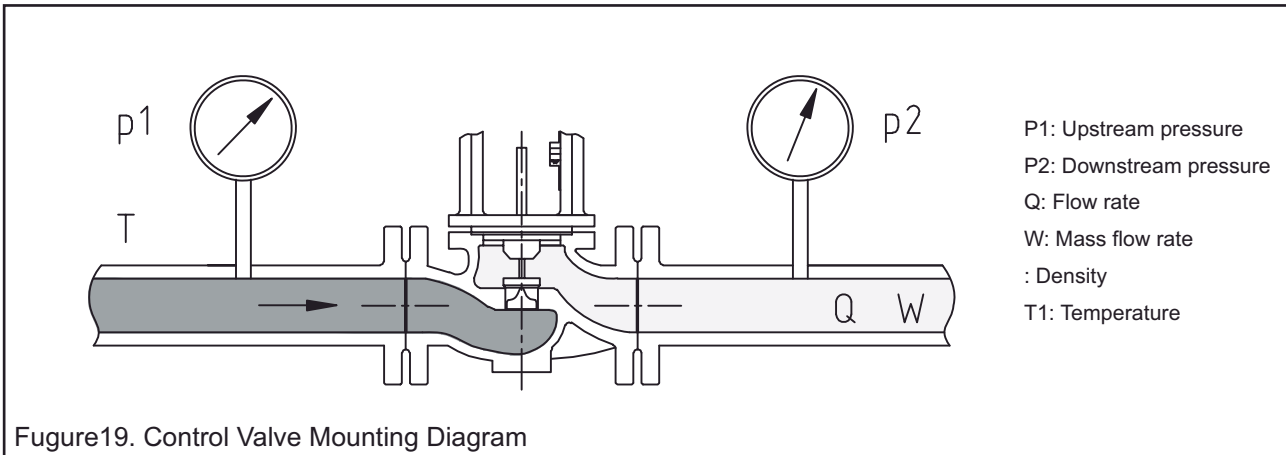


Figure 19. Control Valve Mounting Diagram

Control Valve Design Worksheet (■ - must fill this cell when select a control valve)				
1		OPERATING CONDITION	Control Location	
2			Test and Control Task	
3			Pipe Size	DN___ PN___ Classification___
4			Process fluid name	<input type="checkbox"/> Liquid <input type="checkbox"/> Stream <input type="checkbox"/> Gas
5	■		Process fluid status	
6				Min Regular Max Unit
7	■		Flow	
8	■		Upstream pressure P1	
9	■		Downstream pressure P2	
10	■		Shut-off diff. pressure	
11	■		Temperature T	
12	■		Density	
13			Stream Pressure Pv	
14			Critical pressure Pc	
15			Dynamic viscosity V	
16		Valve	Rated Pressure	
17	■	Body	Connecting type	<input type="checkbox"/> Flange <input type="checkbox"/> Wafer
18	■	Actuator &	Action	<input type="checkbox"/> Rotation: 0~90 degree <input type="checkbox"/> Other Rotation
19	■	Accessories		<input type="checkbox"/> Positioner <input type="checkbox"/> Regulator <input type="checkbox"/> Solenoid valve <input type="checkbox"/> Limit Switch <input type="checkbox"/> Hand Wheel
20		series	Other	

Remark: dark zone must be finished

Table 20. Control Valve Design Worksheet

# Assembly Parts

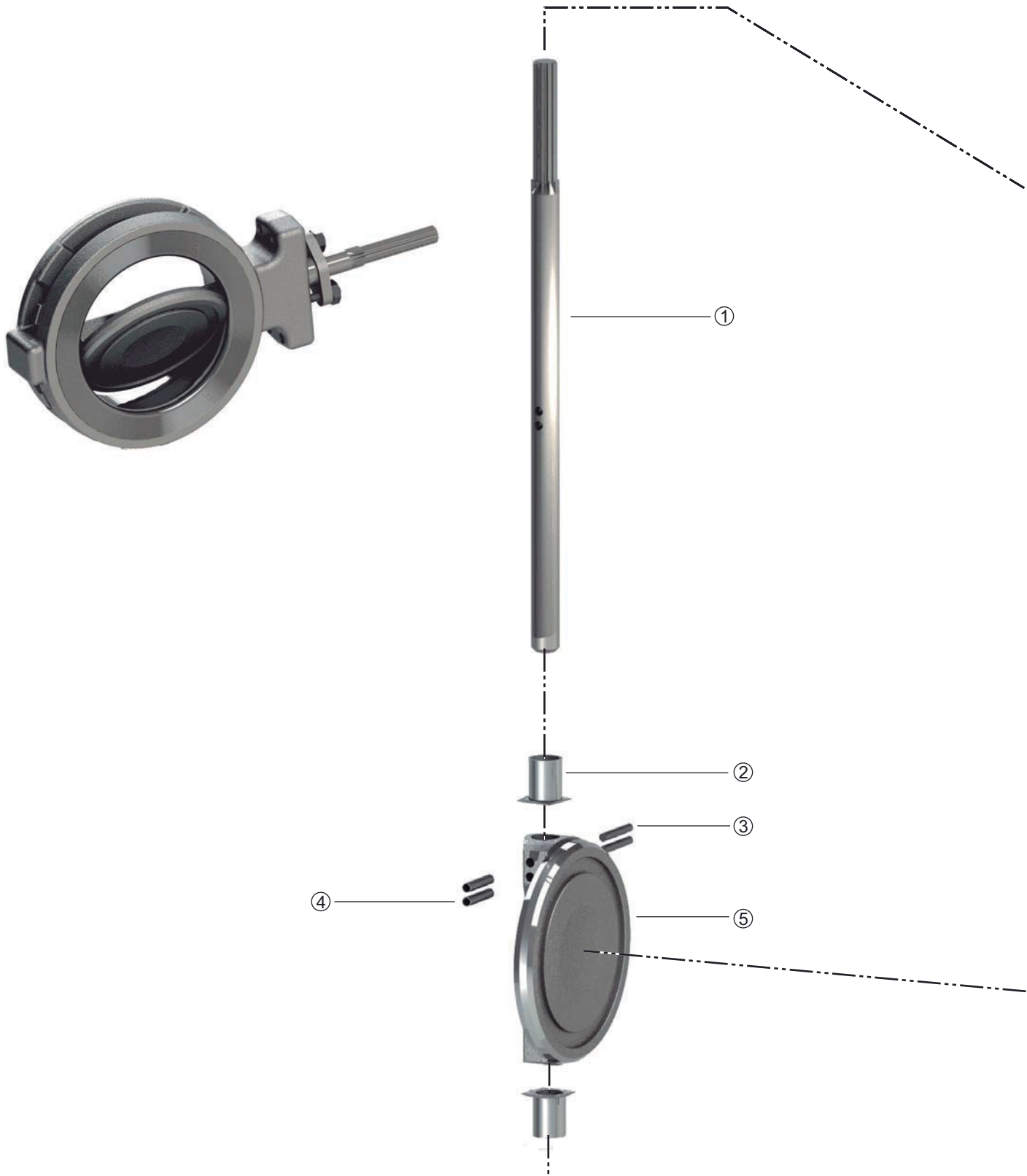


Figure20. Drawing of Assembly Parts



Table 21. 8500 Series Butterfly Control Valve Assembly Parts

Part Code	Description
1	Valve Stem
2	Bearing
3	Tapered Pin
4	Hollow Pin
5	Disk
6	Packing Flange Nut
7	Packing Flange
8	Packing Flange Stud
9	Packing Package
10	Packing Gasket
11	Valve Body
12	Seal Ring
13	Seal Ring Spring
14	Retainer Ring

Please contact CIESA VLS for assembly part code

