Model DV & TV Series, High Performance Butterfly Control Valves with V Series Actuators

The Valution Model DV & TV series is a butterfly control valve that minimizes the contact surface between the body/seat and the valve disc/stem, providing precise control over minute signal fluctuations when rotating.

- DV : Double Offset Butterfly
- TV : Triple Offset Butterfly

This valve has a double or triple eccentric trim structure with a simple internal flow path, which can be beneficial not only in clean fluid conditions but also in highly corrosive slurry services.

Depending on the properties of the eccentric disk, the properties of the flow essentially take the form of a nonlinear, s-shaped flow curve.

It is also possible to apply metal or soft sheets depending on the seat adhesion required and to support the transition of leak class IV, V, VI.
The body has a straight flow path structure, so it has low fluid resistance and enough space around the trim.

This model is capable of applying a spring diaphragm, cylinder, and electric motor type actuators.

It mainly performs modulating functions with traditional E/P, smart and HART positioners.

1. Numbering System

V70	-	DV	1	1	1	1

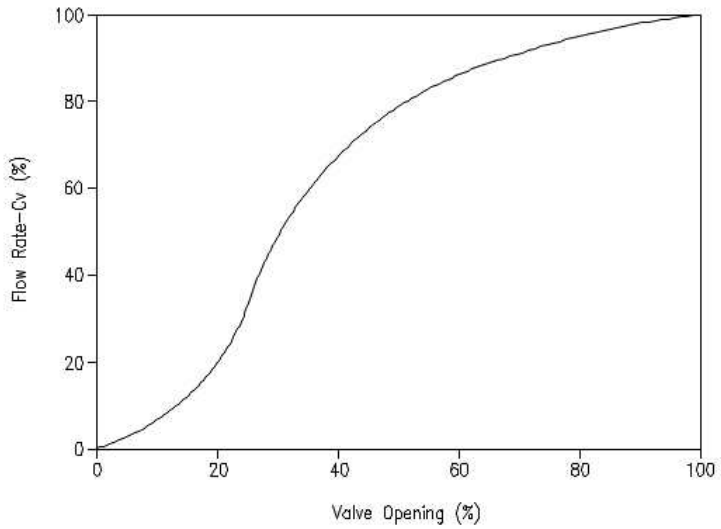
Actuator Type	Model	Body Type	Trim Type	Flow Characteristics	Disc Type
V40. Spring Diaphragm V50. Spring Cylinder Rack & Pinion V60. Cylinder, Double Rack & Pinion V70. Spring Cylinder Scotch Yoke V80. Cylinder, Double Scotch Yoke V90. Electric Motor V01. Other Type	DV TV	1. Wafer (Flangeless) 2. RF Flanged 3. Lug 4. Other	0. Undefined 1. Soft Seat / Metal Disc 2. Metal Seat / Metal Disc 3. Metal+Graphite Seat / Metal Disc 4. Other	0. Undefined 1. Butterfly (S-shaped) 2. Modified Linear 3. EQ-% (* 2 & 3 : Option) 4. Other	0. Undefined 1. Double Offset 2. Triple Offset 3. Other

2. Features

1. The center of the body/seat and the center of the valve plug/stem are configured at an eccentric angle to rotate the disc and seat surfaces to minimal contact, providing precise control over minute signal fluctuations.
2. The detachable seat retainer design provides easy access to the trim parts of the valve through the valve inlet by simply removing the retainer screw, thus allowing users to save a lot of costs by maintenance the seat spare instead of replacing the entire valve body.
3. The split connection between the stem and the disc ensures correct control and a low hysteresis.
4. Excellent trunnion bearing technology is designed to provide excellent wear resistance.
5. Rugged metal seating options are ideal for high temperatue applications or slurries.
6. The eccentric mounting seat in several forms of design offers a wide range of choices depending on usage conditions.
7. The non-contact action between the disc and the seat facilitates smooth and unblocked operation, perfect for fiber or slurry application.

3. Butterfly Valves and Control Performance

For the PID control loop to work well, the process gain must be kept constant above all else. That is, the process variables must change linearly with the change in the controller output. In particular, applying a robust tuning method can withstand slight nonlinearity, but a control problem can be expected if the process gain changes more than twice. The flow characteristics of the butterfly valve are very nonlinear, as shown in Figure 1, and generally have an S-shaped flow curve. However, the shape of the curve can also be concave (equal percentage) or convex (quick opening), depending on the flow pressure characteristics of the process. When applying the butterfly valve to the modulating control of the system, careful selection is required considering these flow characteristics.



Valve(Disc) Opening Degree	Flow % / Rated Cv (Approx.)
10°	8
20°	18
30°	42
40°	67
50°	78
60°	86
70°	87
80°	91
90°	100

< Fig-1 > Typical Butterfly Valve Flow Characteristics

■ High Performance Butterfly Valve

The high-performance butterfly valve manufacturer's advanced design and research efforts lead to practical benefits in a variety of industries. Featuring features such as easy replacement, replaceable seat options, and improved durability in case of corrosion, these valves are valuable assets that contribute to the efficiency and efficiency of all operations.

Simple maintenance and increased service life lead to long-term cost savings and improved corporate profitability. The valve's design also increases sustainability by reducing replacement and waste generation.

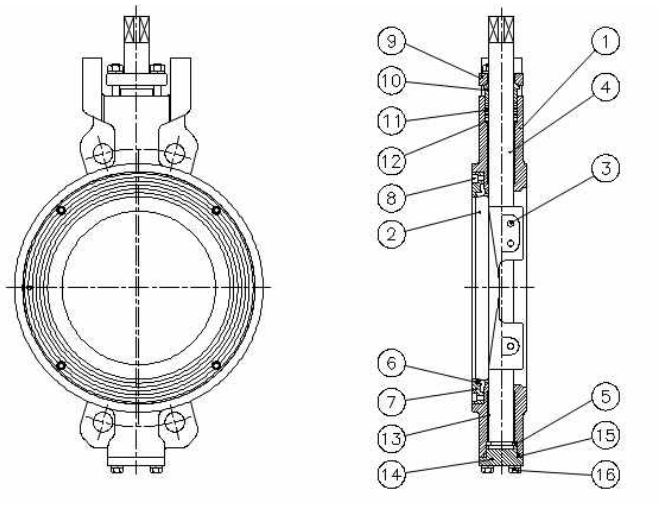
The high-performance butterfly valve provides a cost-effective solution for a wide range of applications that require bubble tight shutoff. The design utilizes an eccentric disk and offset shaft to integrate a flexible lip sealing system into a lightweight and compact body. As a result, the valve can operate more easily, last longer, and operate at a lower cost, even though it can in many cases replace glove and gate valves.
However, please consider the consideration of flow characteristics in consideration of the above points.

Due to its significant performance, valves are widely used in a variety of applications, including airport refueling, hydrocarbon treatment, HVAC, air treatment, chemical treatment, refined gas, vapor and vacuum services, drinking water, powder and pulp treatment, etc. The wafer design allows the valves to facilitate inter-flanges connection and save the length of the pipeline.

4. Butterfly Valves Body Type (1/2)

■ Model DV, Double Offset BFV Sectional View

Product Name	Double Offset Butterfly Valve
Design	API 609/ASME B16.34
End Connection	Wafer/Lug/Double Flanged
Operation	Pneumatic & Electric
Size Range	NPS 2"-48" (DN50-DN1200)
Pressure Rating	ASME Class150-300-600(PN16-PN25-PN40)
Body Material	Carbon steel, Stainless steel, Alloy steel, Duplex stainless steel
Seat Material	PTFE, RPTFE, PPL
Temperature	-29℃to 250℃



< Fig-2 > Model DV, Body Construction

■ Model DV, Double Offset BFV, Parts & Materials

No.	Part Name	Q`ty(EA)	Materials
1	Body	1	WCB, CF8, CF8M, CF3M, Others
2	Eccentric Disc	1	CF8M, CF3M, HCr or Stellite Surfacing, Others
3	Disc Pin	2~4	CF8M, CF3M, Others
4	Valve Stem	1	316(L)SS, 630SS(17-4PH), Others
5	Stem Retainer	1	316(L)SS, Others
6	Seat Ring	1	PTFE, RTFE, PEEK, 316(L)SS, Others
7	Seat Retainer	1	316(L)SS, Others
8	Set Screws	4~24	304(L)SS, 316(L)SS, Others
9	Gland Flange	1	304(L)SS, 316(L)SS, Others
10	Packing Gland	1	304(L)SS, 316(L)SS, Others
11	Packing	1	PTFE, RTFE, Graphite, Others
12	Packing Washer	1	304(L)SS, 316(L)SS, Others
13	Guide Bush	2	316(L)SS+PTFE, RTFE, Others
14	Bottom Cover	1	304(L)SS, 316(L)SS, Others
15	Seal	1	PTFE, RTFE, Graphite, Others
16	Cover Bolt	4	304(L)SS, 316(L)SS, Others

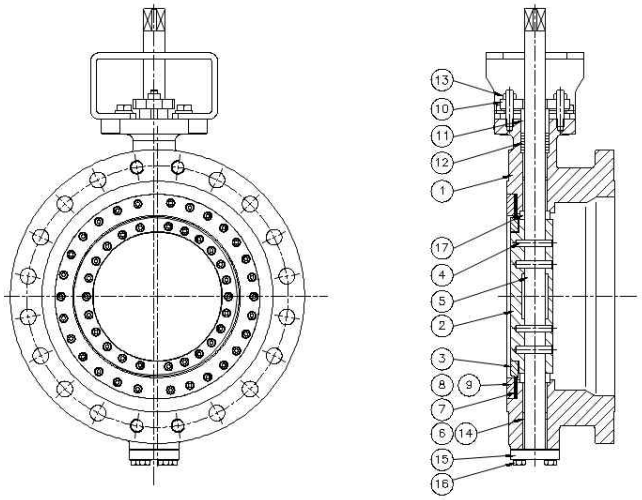
■ The material and quantity of each part are subject to change depending on the service conditions presented by the customer.

4. Butterfly Valves Body Type (2/2)

■ Model TV, Triple Offset BFV Sectional View

■ Features - Tripple Offset BFV

1. Zero Leakage Available
2. Metal Seated+Graphite
3. Bi-directional
4. Uni-directional
5. Inherently Firesafe
6. Low Operating Torque
7. Torque Seated
8. Continued Sealing through Thermal Cycling
9. Zero Seat/Seal Friction
10. Extended Life Time
11. Excellent Control of Fugitive Emissions
12. Excellent Flow and Throttling Characteristics
13. Quarter Turn Operation



< Fig-3 > Model TV, Body Construction

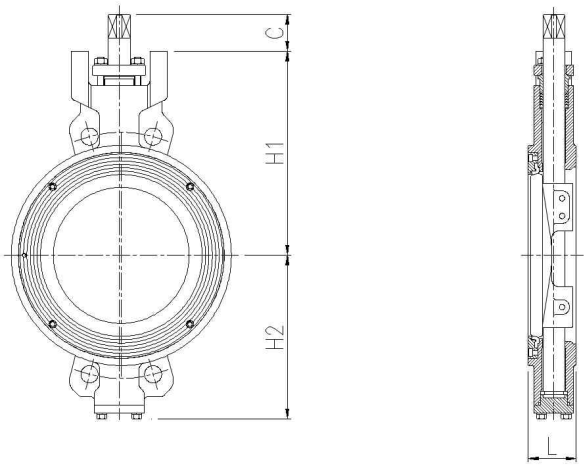
■ Model TV, Triple Offset BFV, Parts & Materials

No.	Part Name	Q`ty(EA)	Materials
1	Body	1	WCB, CF8, CF8M, CF3M, Others
2	Eccentric Disc	1	CF8M, CF3M, Others
3	Disc Seat	1	CF8M, CF3M, HCr or Stellite Surfacing, Others
4	Disc Pin	2~4	CF8M, CF3M, Others
5	Valve Stem	1	316(L)SS, 630SS(17-4PH), Others
6	Stem Retainer	1	316(L)SS, Others
7	Seat Ring	1	316(L)SS+Graphite, PTFE, RTFE, Others
8	Seat Retainer	1	316(L)SS, Others
9	Set Screws	4~24	304(L)SS, 316(L)SS, Others
10	Gland Flange	1	304(L)SS, 316(L)SS, Others
11	Packing Gland	1	304(L)SS, 316(L)SS, Others
12	Packing	1	PTFE, RTFE, Graphite, Others
13	Packing Bolt	2	304(L)SS, 316(L)SS, Others
14	Guide Bush	2	316(L)SS+PTFE, RTFE, Others
15	Bottom Cover	1	304(L)SS, 316(L)SS, Others
16	Cover Bolt	4	304(L)SS, 316(L)SS, Others

■ The material and quantity of each part are subject to change depending on the service conditions presented by the customer.

5. Valve Rated Cv & Dimensions (1/5)

■ Model DV, Double Offset BFV



< Fig-4 > Model DV, ASME 150#

■ Dimensions for DV Series ASME 150#

(unit : mm)

Valve Size (inch/mm)	Rated Cv	L		H1	H2	C	Approx. Weight (Kgs)		
		Wafer & Lug (Flangeless)	RF Flanged				Wafer	Lug	Flanged
2(50)	95	43	108	145	115	45	6.5	7.5	14
3(80)	195	48	114	190	140	45	8	13	24
4(100)	390	54	127	220	155	50	9	19	35
5(125)	695	56	140	240	175	50	15	22	45
6(150)	990	57	140	255	180	50	17	25	50
8(200)	2100	64	152	300	230	60	36	49	95
10(250)	4200	71	165	340	250	60	50	61	121
12(300)	6300	81	178	390	290	65	69	110	200
14(350)	8010	92	190	400	305	75	81	152	225
16(400)	9600	102	216	460	345	80	112	190	290
18(450)	11780	114	222	510	360	80	190	220	350
20(500)	15350	127	229	530	410	95	230	255	450
24(600)	21650	154	267	630	480	110	310	410	620
26(650)	25640	154	292	630	500	110	380	465	820
28(700)	29315	165	292	680	530	120	415	545	895
30(750)	33210	165	318	720	585	120	460	620	920
32(800)	38885	190	318	760	600	130	650	1200	1000
36(900)	52120	200	330	820	700	150	770	1260	1650
40(1000)	68720	216	410	840	740	160	1000	1430	1970
42(1050)	78560	251	410	880	755	165	1190	1540	2400
48(1200)	99830	276	470	1070	910	195	1690	2395	2700

***. Note**

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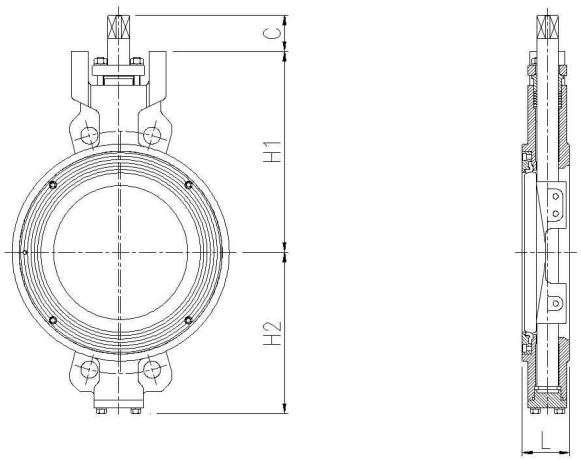
2. All data shown above are subject to change without notice.

5. Valve Rated Cv & Dimensions (2/5)

■ Model DV, Double Offset BFV



< Fig-5 > Model DV, ASME 300#

■ Dimensions for DV Series ASME 300#

(unit : mm)

Valve Size (inch/mm)	Rated Cv	L		H1	H2	C	Approx. Weight (Kgs)		
		Wafer & Lug (Flangeless)	RF Flanged				Wafer	Lug	Flanged
2(50)	86	43	108	190	120	45	7.5	9.5	18
3(80)	180	48	114	190	140	45	9	16	32
4(100)	362	54	127	230	170	50	10	24	47
6(150)	920	59	140	290	200	60	20	31	68
8(200)	1830	73	152	315	235	65	41	61	128
10(250)	2665	83	165	360	270	65	58	76	163
12(300)	5700	92	178	395	315	75	79	138	270
14(350)	7175	117	190	480	345	75	93	190	304
16(400)	8540	133	216	505	380	80	129	238	392
18(450)	10545	149	222	560	410	100	219	275	472
20(500)	13990	159	229	650	460	110	265	319	610
24(600)	19220	181	267	680	550	110	357	525	838
26(650)	22640	210	292	690	560	115	437	581	1108
28(700)	26380	229	292	710	595	115	477	680	1242
30(750)	31250	230	318	810	600	120	529	775	1344
32(800)	35875	241	318	850	660	130	748	1500	1360
36(900)	50130	251	330	880	720	150	886	1563	2227
40(1000)	64710	276	410	930	750	160	1150	1788	2660
42(1050)	74550	300	410	1070	860	165	1690	2395	3150
48(1200)	95810	350	470	1190	910	200	1944	2992	3646

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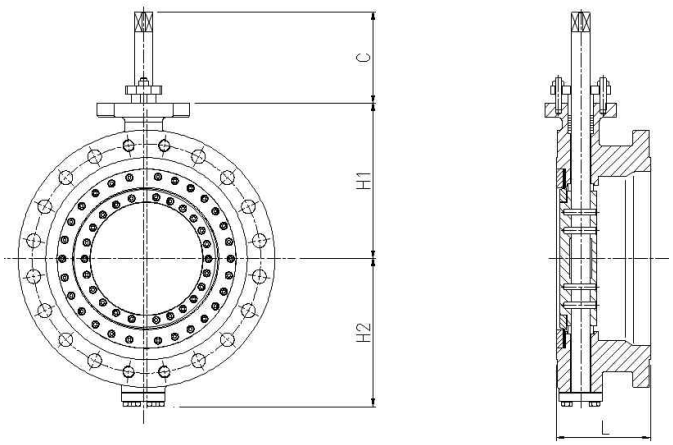
5. Valve Rated Cv & Dimensions (3/5)

■ Model TV, Triple Offset BFV

Product Name	Triple Offset Butterfly Valve
Design	API 609/ASME B16.34
Fire Safe	API 607, BS 6755
End Connection	Wafer/Lug/Double Flanged
Operation	Pneumatic & Electric
Size Range	NPS 3"-48" (DN80-DN1200)
Pressure Rating	ASME Class150-300-600(PN16-PN25-PN40)
Body Material	Carbon steel, Stainless steel, Alloy steel, Duplex stainless steel
Seat Material	316(L)SS+Graphite, PTFE, RPTFE, PPL
Temperature	-100℃to 538℃



< Fig-6 > Model TV, ASME 150#

■ Dimensions for TV Series ASME 150#

(unit : mm)

Valve Size (inch/mm)	Rated Cv	L		H1	H2	C	Approx. Weight (Kgs)		
		Wafer & Lug (Flangeless)	RF Flanged				Wafer	Lug	Flanged
3(80)	195	48	114	165	127	35	20	22	33
4(100)	390	54	127	200	150	35	22	24	38
6(150)	990	57	140	245	180	35	25	28	50
8(200)	2100	64	152	260	195	35	45	49	95
10(250)	4200	71	165	285	225	65	57	61	121
12(300)	6300	81	178	335	265	80	85	95	200
14(350)	8010	92	190	365	290	80	133	142	225
16(400)	9600	102	216	435	340	80	186	199	304
18(450)	11780	114	222	452	360	80	213	229	365
20(500)	15350	127	229	500	395	80	334	364	502
24(600)	21650	154	267	570	465	110	455	492	671
28(700)	29315	165	292	685	570	130	718	777	864
30(750)	33210	165	318	695	600	130	864	934	1084
32(800)	38885	190	318	750	630	165	1090	1200	1242
36(900)	52120	200	330	820	690	165	1418	1554	1715
40(1000)	68720	216	410	835	720	175	1743	1944	2207
42(1050)	78560	251	410	860	750	175	2108	2342	2490
48(1200)	99830	276	470	1020	845	200	3010	3283	3445

***. Note**

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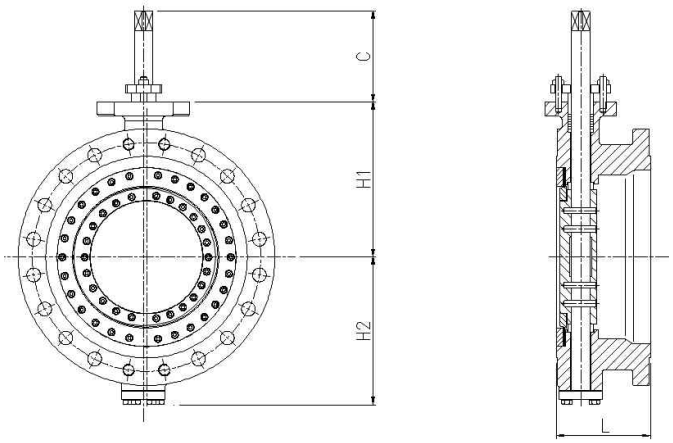
5. Valve Rated Cv & Dimensions (4/5)

■ Model TV, Triple Offset BFV

Product Name	Triple Offset Butterfly Valve
Design	API 609/ASME B16.34
Fire Safe	API 607, BS 6755
End Connection	Wafer/Lug/Double Flanged
Operation	Pneumatic & Electric
Size Range	NPS 3"-48" (DN80-DN1200)
Pressure Rating	ASME Class150-300-600(PN16-PN25-PN40)
Body Material	Carbon steel, Stainless steel, Alloy steel, Duplex stainless steel
Seat Material	316(L)SS+Graphite, PTFE, RPTFE, PPL
Temperature	-100℃to 538℃



< Fig-7 > Model TV, ASME 300#

■ Dimensions for TV Series ASME 300#

(unit : mm)

Valve Size (inch/mm)	Rated Cv	L		H1	H2	C	Approx. Weight (Kgs)		
		Wafer & Lug (Flangeless)	RF Flanged				Wafer	Lug	Flanged
3(80)	185	48	114	165	127	35	20	22	36
4(100)	372	54	127	200	151	35	22	24	46
6(150)	940	59	140	280	199	60	36	38	76
8(200)	1995	73	152	295	218	80	52	56	93
10(250)	3990	83	165	340	251	80	98	112	164
12(300)	5985	92	178	395	295	80	134	150	222
14(350)	7610	117	190	425	330	80	196	228	298
16(400)	9120	133	216	480	377	110	232	277	358
18(450)	11200	149	222	540	410	110	350	433	502
20(500)	14600	159	229	580	440	130	456	548	622
24(600)	20560	181	267	650	515	130	670	805	915
28(700)	27850	229	292	820	640	180	1194	1364	1418
30(750)	31550	241	318	850	690	180	1462	1658	1715
32(800)	36940	241	318	880	720	200	1661	1856	1956
36(900)	49515	260	330	960	780	200	1982	2212	2290
40(1000)	65285	300	410	990	800	200	2214	2425	2585
42(1050)	74630	300	410	1050	840	200	2440	2648	2850
48(1200)	94835	320	470	1150	940	200	3285	3685	4107

***. Note**

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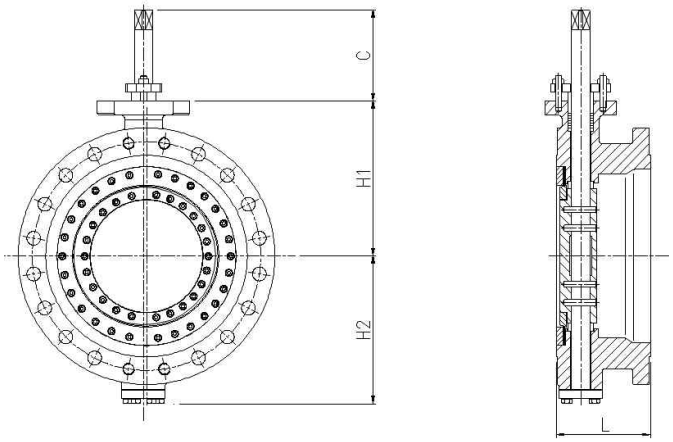
5. Valve Rated Cv & Dimensions (5/5)

■ Model TV, Triple Offset BFV

Product Name	Triple Offset Butterfly Valve
Design	API 609/ASME B16.34
Fire Safe	API 607, BS 6755
End Connection	Wafer/Lug/Double Flanged
Operation	Pneumatic & Electric
Size Range	NPS 4"-24" (DN100-DN600)
Pressure Rating	ASME Class150-300-600(PN16-PN25-PN40)
Body Material	Carbon steel, Stainless steel, Alloy steel, Duplex stainless steel
Seat Material	316(L)SS+Graphite, PTFE, RPTFE, PPL
Temperature	-100℃to 538℃



< Fig-8 > Model TV, ASME 600#

■ Dimensions for TV Series ASME 600#

(unit : mm)

Valve Size (inch/mm)	Rated Cv	L		H1	H2	C	Approx. Weight (Kgs)		
		Wafer & Lug (Flangeless)	RF Flanged				Wafer	Lug	Flanged
4(100)	280	64	190	215	166	50	34	42	69
6(150)	660	78	210	310	238	80	65	72	135
8(200)	1490	102	230	325	248	80	92	102	162
10(250)	2990	117	250	400	315	80	134	187	268
12(300)	4485	140	270	455	350	110	224	259	369
14(350)	5705	155	290	470	374	110	285	329	462
16(400)	6840	178	310	585	465	130	455	520	634
18(450)	8400	200	330	625	475	130	555	635	740
20(500)	10940	216	350	670	504	130	694	804	880
24(600)	15420	232	390	750	550	180	1092	1243	1423

***. Note**

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2. All data shown above are subject to change without notice.

valution

■ Applicable Instruments

- **Positioners**
  : Smart, E/P, P/P Positioners for Single/Double Acting

- **Instruments**
  : Transfer(Trip) Valves, Volume Booster Relay, Lock-up Valves, Check Valves
  Air Regulators(Air Set), Speed Control Valves, Volume Tanks

- **limit Switches & Stoppers**

- **Solenoid Valves**

*. Note

1. All data shown in this product specification are currently standard specifications of Valution and can be customized by order specification.
2. All data shown above are subject to change without notice.
3. The standard warranty period for all Valution products is one year after shipment, and we are not responsible for defects caused by arbitrary modification or customer error.

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