

Coosai®

Segment Ball Valve

www.coosaisv.com



COOSAI VALVE

Company Introduction

China Coosai Valve Co., Ltd is a leader which has 20 years experience in the design and manufacture of quality engineered and tailor made valves.

The prime markets served by Coosai are the Oil & Gas exploration and production sectors, oil field , power plants, pulp and paper mills, chemical plants, mining industry, sugar industry , and other special service industrial applications.

Coosai offers a vast production range that satisfies the most critical project requirements, manufacturing valves in a wide range of sizes (up to 5000mm), pressures classes (up to ANSI 2500LB and 10000PSI), materials (Stainless steel and special alloy material)

Coosai valves are CE PED 97/23/EEC, API 6D-0749, API 6A-1199, API 607 (fire safe) and TS certified.

Coosai diaphragm pumps are CE and ATEX (EX Equipment II 2 GDC) certified.

Coosai Electric actuator is CE certified.

Coosai workshops cover an area of 12000 square meters. Total registered asset is RMB 80 million . Besides ISO 9001:2008 quality management and QC system, Coosai has the capability in offering varied products by virtue of over 100 sets large scale CNC lathes, testing equipment and computerized control valve testing and calibration bench. Nondestructive testing equipment include PT, UT, MT and RT are available.

There is a real technical proficiency at Coosai with an organization to produce and supply valves according to any specific requirements the customer may ask.

Coosai is dedicated to offering the best configuration and satisfy client's expectations and their eventual commitments.

We look forward to meeting all distinguished clients and industry experts and sincerely welcome all your valuable inquiries.



Company Profile

Wenzhou Kesai Valve Co., Ltd is a leader which has 20 years experience in the design and manufacture of quality engineered and tailor made valves.

The prime markets served by Coosai are the Oil&Gas exploration and production sectors, oil field,power plants,pulp and paper mills,chemical plants,mining industry, sugar industry , and other special service industrial applications.

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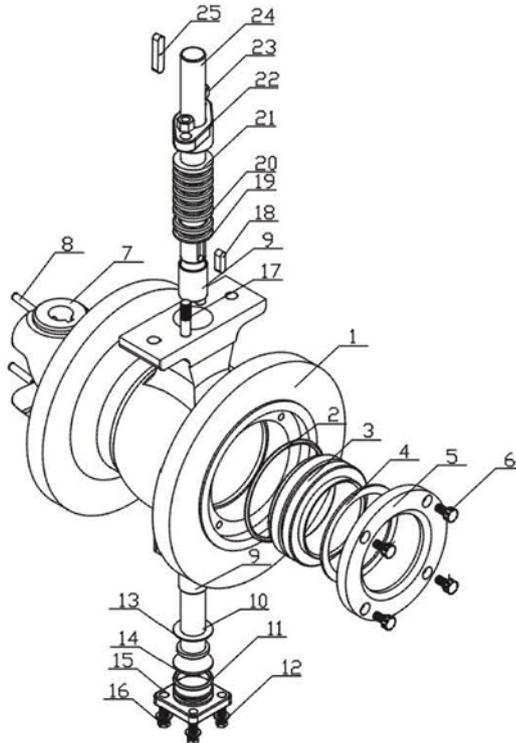
SERVICE

Segment ball valve combines the advantage of globe control valve with the efficiency of a rotary ball valve which satisfy the needs for throttle and shut off of flow within automatic process industry. The segment ball in V-notch design has strong cutting force and self-cleaning function. With the segment ball quarter turning, the passage area changes in ectorial shape, leading to the precise control of the flow. It is the ideal valve for most paper and pulp process applications. Low CV value precise control is available by special V-notch on DN25 segment ball.

FEATURES

- ★ **Excellent** sealing capacity-Class V Standard
- ★ **Precise** contouring of the V-notch provides excellent control characteristics for an extensive variety of flow applications.
- ★ **Rugged** self-adjusting metal seated option is ideally suited for high temperature applications or slurries.
- ★ **Splined connection** between the shaft and ball ensures precise control and low hysteresis.
- ★ **Shearing action** between ball and seal promotes smooth, non-clogging operation-perfect for fiber or slurry applications.
- ★ **Easy** to change seats, means low cost for valve repairs.
- ★ **Heavy duty** construction with unrestricted straight through flow path gives high Capacity.
- ★ **Spring loaded** seat maintains constant contact with the ball, giving enhanced sealing performance.
- ★ **Superior** trunnion bearing technology is engineered for excellent abrasion resistance.

PARTS LIST/MATERIALS OF CONSTRUCTION



No.	Name	Quantity	Material	Remark	No.	Name	Quantity	Material	Remark
1	Body	1	WCB,CF8,CF8M		14	Adjust gasket	1	PTFE	
2	O-ring	1	Viton,Graphite		15	Blind flange	1	CF8,CF8M	
3	Seat	1	SS304,SS316+Stellite Surfacing	HVOF coating is available	16	Hexagon screw	4	SS304	
4	Wavy spring	1	17-4PH		17	Stud	2	SS304	
5	Retainer	1	WCB,SS304,SS316		18	Flat Key	1	SS304	
6	Socket head screw	4	SS304		19	Upper packing	1	PTFE	
7	Segment Ball	1	Chromium	HVOF coating is available	20	Middle packing	1Group	PTFE	
8	Cylindrical pin	2	SS304		21	Lower packing	1	PTFE	
9	Self-lubricating bearing	2	SS304+PTFE		22	Gland	1	CF8,CF8M	
10	Lower shaft	1	17-4PH,SS316		23	Hexagon nut	2	SS304	
11	O-ring	1	Viton,Graphite		24	Upper shaft	1	17-4PH,SS316	
12	Flat gasket	4	SS304		25	Wavy spring	1	17-7PH	Option: Inconel
13	Gasket	1	PTFE						

TECHNICAL DATA

End Connection

Flange structure: 1"-10"(DN25-DN250)

Flange structure: 12"-20"(DN300-DN500)

Normal Pressure Ratings

ANSI 150 ANSI300

DIN PN10,PN16,PN25,PN40,PN64

Design Standard

1 Flange standard: ASME B 16.5,EN1092-1:2001,JB/T79.1-1994,HG20592-1997

2 Pressure-Temp rated vavle:ASME B 16.34-2003 ISO7005-1

3 Face to face length standard:

Wafer:special size

Flange:ISA S75.04-1995、IEC/DIN 534-3-2

4 Applicable Temp range

-20°F-248°F(-29°C-120°C) for PTFE seat

-20°F-392°F(-29°C-200°C) for Metal seat

-20°F-572°F(-29°C-300°C) for High temp metal seat

5 Seat and shell test standard

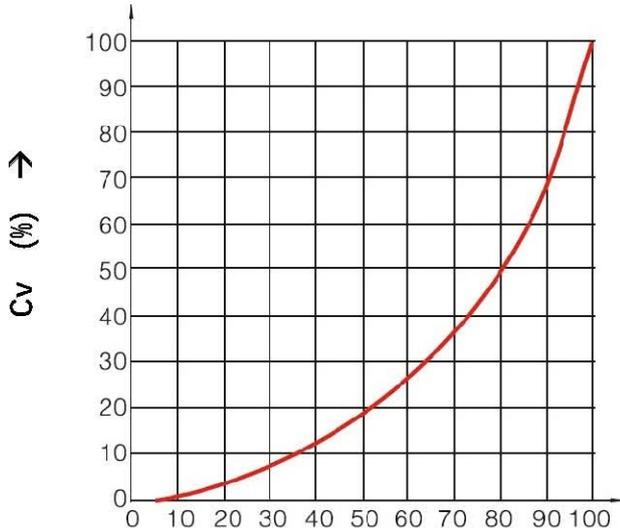
Each Coosai valve undergoes hydraulic test with 1.5×pressure rating as shell test pressure and 1.1×pressure ratig as seat tightness test pressure. Test medium is water.

Maximum Allowable leakage Rate

Size	Metal seat	Soft seat
DN25 (1")	1.50ml/min	0.15ml/min
DN32 (1 1/4")	1.80ml/min	0.20ml/min
DN40 (1 1/2")	2.40ml/min	0.24ml/min
DN50 (2")	3.00ml/min	0.3ml/min
DN65 (2 1/2")	3.90ml/min	0.39ml/min
DN80 (3")	4.80ml/min	0.48ml/min
DN100 (4")	6.00ml/min	0.60ml/min
DN125 (5")	7.50ml/min	0.75ml/min
DN150 (6")	9.00ml/min	0.9ml/min
DN200 (8")	12.00ml/min	1.20ml/min
DN250 (10")	15.00ml/min	1.50ml/min
DN300 (12")	18.00ml/min	1.80ml/min
DN350 (14")	21.00ml/min	2.10ml/min
DN400 (16")	24.00ml/min	2.40ml/min

CV AND ALLOWABLE DIFFERENTIAL PRESSURE

Flow Characteristic



Size	CV
DN25	36
DN32	56
DN40	94
DN50	152
DN65	262
DN80	358
DN100	540
DN125	906
DN150	1424
DN200	2176
DN250	3532

Size	CV
DN300	5732
DN350	8245
DN400	10651
DN450	12878
DN500	16343

*The rated Cv value is for reference only.

Maximum Allowable Differential Pressure

Size	Wafer Connection Class 150		Wafer Connection Class 300		Flanged Connection Class 150		Flanged Connection Class 300	
	Max Shutoff dp	Max Control dp	Max Shutoff dp	Max Control dp	Max Shutoff dp	Max Control dp	Max Shutoff dp	Max Control dp
	psi	psi	psi	psi	psi	psi	psi	psi
DN25 (1")	290	217	725	507	290	217	725	507
DN32 (1 1/4")	290	217	725	507	290	217	725	507
DN40 (1 1/2")	290	217	725	507	290	217	725	507
DN50 (2")	290	217	725	507	290	217	725	507
DN65 (2 1/2")	290	217	725	507	290	217	725	507
DN80 (3")	290	217	725	507	290	217	725	507
DN100 (4")	232	174	580	362	232	174	580	362
DN125 (5")	232	174	580	362	232	174	580	362
DN150 (6")	232	174	580	362	232	174	580	362
DN200 (8")	232	174	507	362	232	174	507	362
DN250 (10")	203	145	507	362	203	145	507	362
DN300 (12")	-	-	-	-	203	145	507	362
DN350 (14")	-	-	-	-	174	116	435	290
DN400 (16")	-	-	-	-	174	116	435	290

ACTUATOR SIZING

Segment Ball Valve Actuator Sizing

Size (mm)	Z series Scotch-yoke piston actuator		GT Rack and pinion type actuator		Electric actuator Unic	Air connecting and fittings	Air supply (Mpa)
	ZS (Double acting)	ZDS (Single acting)	DA (Double acting)	SR (Single acting)			
DN25 (1")	ZS36-63	ZDS45-100	63	75	05	Φ6 × 1(G1/8)	0.5-0.7
DN32 (1 1/4")	ZS36-63	ZDS45-100	63	75	05		
DN40 (1 1/2")	ZS36-80	ZDS45-100	63	83	10		
DN50 (2")	ZS36-80	ZDS45-100	85	92	10		
DN65 (2 1/2")	ZS45-80	ZDS45-125	85	92	20		
DN80 (3")	ZS45-100	ZDS45-125	105	105	20		
DN100 (4")	ZS45-100	ZDS55-125	105	125	40	Φ8 × 1.5(G1/4)	
DN125 (5")	ZS55-100	ZDS55-125	105	125	40		
DN150 (6")	ZS55-125	ZDS55-160	125	140	40		
DN200 (8")	ZS63-160	ZDS63-200	140	160	60	Φ10 × 2(G3/8)	
DN250 (10")	ZS80-200	ZDS80-250	160	210	100		
DN300 (12")	ZS80-250	ZDS100-300	210	270	150		
DN350 (14")	ZS100-300	ZDS130-300	270	300	200		
DN400 (16")	ZS100-300	ZDS130-350	300	350			

Note: ZS actuators are manufactured by Coosai, for actuator particulars, please refer to Z series actuator sizing. The actuator above are recommended for valves of pressure ANSI 150Lb and temps -20°F -175°F (-29°C -80°C), with minimum air supply pressure of 60psig (0.5Mpa)
For actuator sizing for ANSI 300LB or above or medium is for higher temp like vapor, please consult factory.

Segment Ball surface treatment

Hard chromium plating: Fine wear resistance and corrosion resistance, Hardness Rockwell HRC45-52, for general service

Ionitriding(plasma nitriding): Hardness HRC52-62, suitable for abrasive conditions like solid particles, not applicable for corrosive conditions

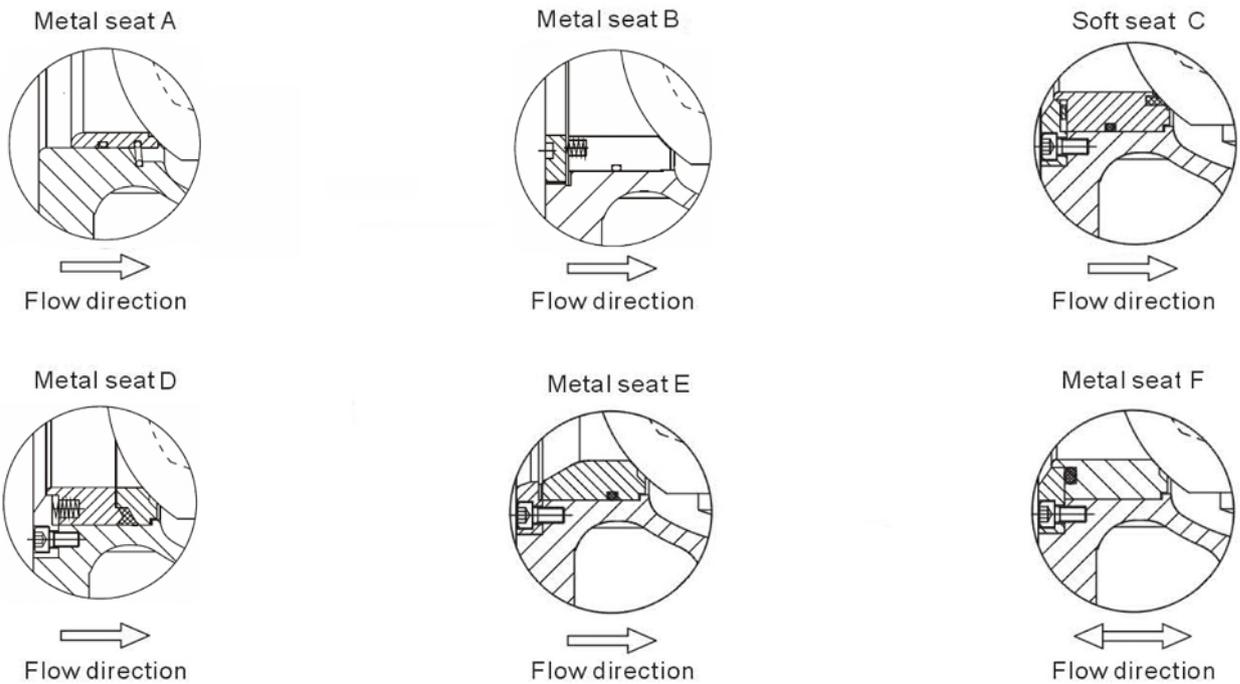
Stellite based alloy spray welding coating: Hardness HRC48-55, superior abrasion and erosion resistance

HVOF coating: Tungsten carbide coating: HRC62-68 Excellent wear resistance and corrosion resistance, applicable for solid particles or severe conditions requiring long service life



SIX DIFFERENT SEAT TYPES

Sealing structure schematic drawing



Metal seat type A	
Seat	SS304/SS316+stellite surfacing
Spring	17-7PH/316
O-ring	VITON
Temp range	-29°C-150°C
Applied medium	General

Metal seat type B	
Seat	SS304/SS316+stellite surfacing
Spring	17-7PH/316
O-ring	VITON
Temp range	-29°C-250°C
Applied medium	General or fluid containing long fiber

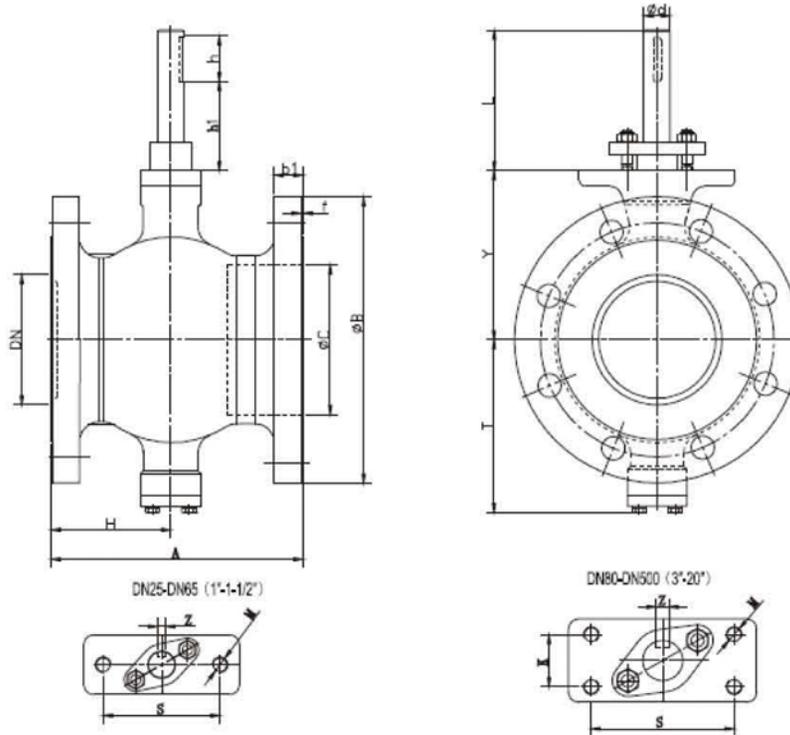
Soft seat type C	
Seat	SS304/SS316+PTFE/RTFE
Spring	17-7PH/316
O-ring	VITON
Temp range	-29°C-150°C
Applied medium	General

Metal seat type D	
Seat	SS304/SS316+ stellite surfacing
Spring	17-7PH/316/Inconel
O-ring	Graphite
Temp range	-29°C-350°C
Applied medium	Vapor or condensate

Metal seat type E	
Seat	SS304/SS316+stellite surfacing
Spring	17-7PH/Inconel
O-ring	VITON
Temp range	-29°C-200°C
Applied medium	Non-clogging design applied for high consistency pulp or solid particles

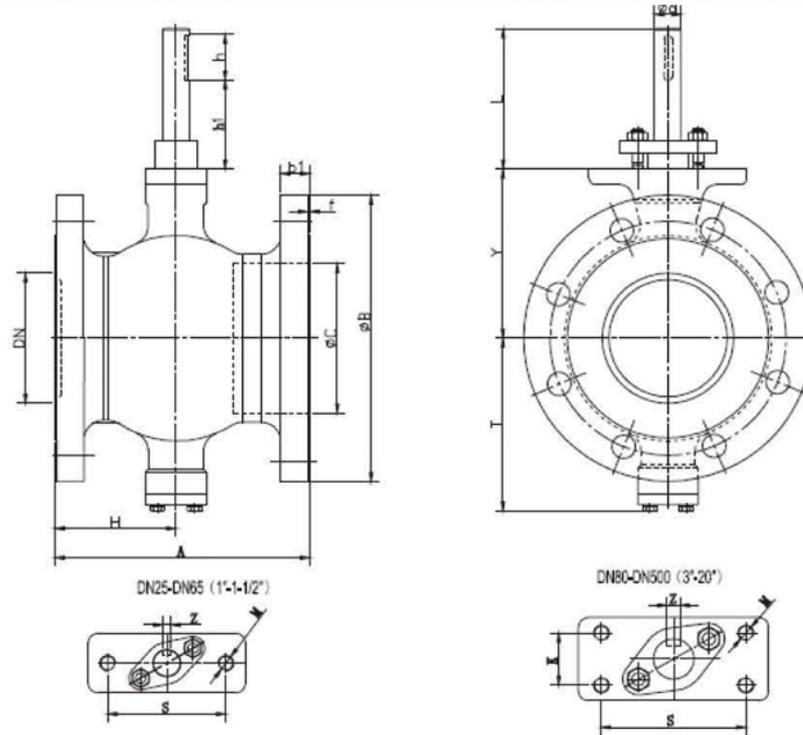
Soft seat type F	
Seat	SS304/SS316+stellite surfacing
Spring	17-7PH/316
O-ring	VITON
Temp range	-29°C-150°C
Applied medium	General, bidirectional flow

DIMENSION OF BARE STEM VALVE, FLANGED, PN16



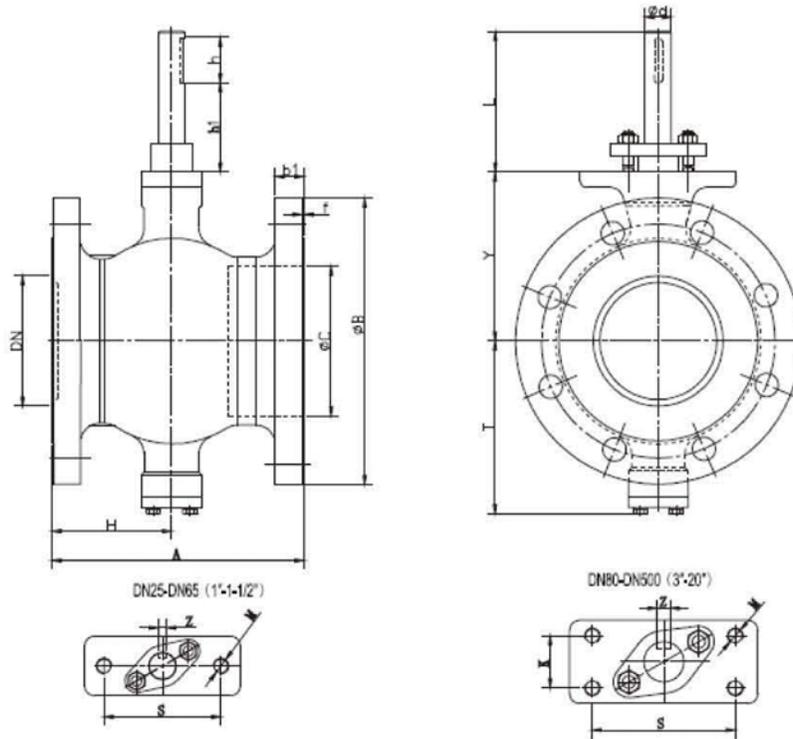
DN	A	B	b1	f	C	T	Y	L	d	H	S	K	M	Z	Weight (kg)
25	102	115	16	2	38	81	73	75	16	35	75	/	2-M10	5	4.9
32	102	140	18	2	45	86	78	75	16	35	75	/	2-M10	5	6.6
40	114	150	18	2	50	90	80	75	16	35	75	/	2-M10	5	7.6
50	124	165	20	2	62	93	90	75	16	35	75	/	2-M10	5	9.5
65	145	185	20	2	73	108	105	75	16	35	75	/	2-M10	5	12.4
80	165	200	20	2	90	123	118	75	20	35	90	28	4-M10	6	15.5
100	194	220	22	2	115	138	130	75	20	35	90	28	4-M10	6	20.6
125	194	250	22	2	134	148	145	80	25	40	90	28	4-M10	8	28.6
150	229	285	24	2	164	170	170	94	30	50	110	40	4-M12	8	42.5
200	243	340	24	2	206	200	201	94	30	50	110	40	4-M12	8	59.5
250	297	405	26	2	260	240	237	98	40	60	135	40	4-M16	12	99
300	338	460	28	2	316	286	282	98	40	60	135	40	4-M16	12	148
350	400	520	30	2	372	330	337	125	50	60	140	64	4-M16	14	216
400	400	580	32	2	420	367	372	172	60	80	170	80	4-M20	18	285
450	520	640	40	2	470	422	432	172	70	90	190	90	4-M24	20	370
500	600	715	44	2	516	490	498	180	80	100	190	90	4-M24	22	480

DIMENSION OF BARE STEM VALVE, FLANGED, PN25



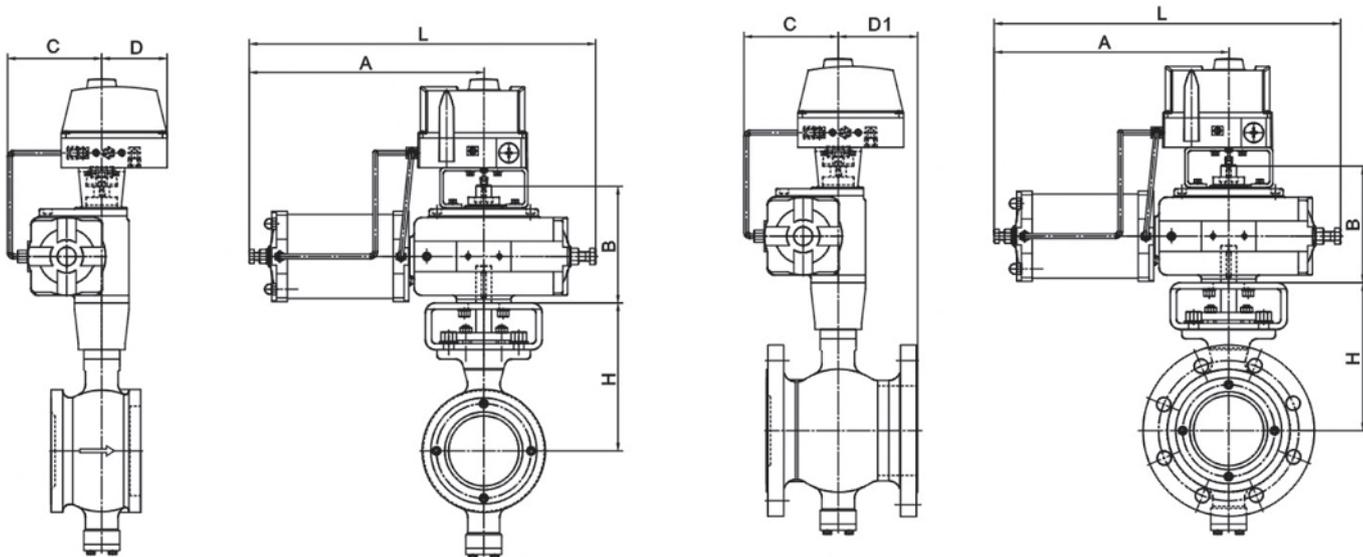
DN	A	B	b1	f	C	T	Y	L	d	h	S	K	M	Z	Weight (kg)
25	102	115	16	2	40	88	86	75	20	35	90	28	4-M10	6	5.4
32	102	140	18	2	48	90	90	75	20	35	90	28	4-M10	6	7.3
40	114	150	18	2	56	95	93	80	25	40	90	28	4-M10	8	8.4
50	124	165	20	2	65	98	98	80	25	40	90	28	4-M10	8	10.5
65	145	185	22	2	81	130	125	95	30	50	110	40	4-M12	8	13.2
80	165	200	24	2	95	128	128	95	30	50	110	40	4-M12	8	17.7
100	194	235	24	2	115	142	142	95	30	50	110	40	4-M12	8	24.7
125	194	270	26	2	138	175	170	100	40	60	135	40	4-M16	12	34.5
150	229	300	28	2	170	215	215	125	50	60	140	64	4-M16	14	50.7
200	243	360	30	2	208	228	228	125	50	60	140	64	4-M16	14	72.7
250	297	425	32	2	265	260	260	150	60	80	170	80	4-M20	18	116
300	338	485	34	2	320	310	310	150	60	80	170	80	4-M20	18	169

DIMENSION OF BARE STEM VALVE, FLANGED, ANSI 150



DN	A	B	b1	f	C	T	Y	L	d	h	S	K	M	Z	Weight (kg)
1"	102	108	14.5	2	38	81	73	75	16	35	75	/	2-M10	5	5.4
1 1/4"	102	115	14.5	2	45	86	78	75	16	35	75	/	2-M10	5	7.3
1 1/2"	114	127	14.5	2	50	90	80	75	16	35	75	/	2-M10	5	8.4
2"	124	152	16.3	2	62	93	90	75	16	35	75	/	2-M10	5	10.5
2 1/2"	145	180	18	2	73	108	105	75	16	35	75	/	2-M10	5	13.2
3"	165	191	19.5	2	90	123	118	75	20	35	90	28	4-M10	6	17.7
4"	194	230	24	2	115	138	130	75	20	35	90	28	4-M10	6	24.7
5"	194	255	24.3	2	134	148	145	80	25	40	90	28	4-M10	8	34.5
6"	229	280	26	2	164	170	170	94	30	50	110	40	4-M12	8	50.7
8"	243	340	29	2	206	200	201	94	30	50	110	40	4-M12	8	72.7
10"	297	405	30.6	2	260	240	237	98	40	60	135	40	4-M16	12	116
12"	338	485	32.2	2	316	286	282	98	40	60	135	40	4-M16	12	169
14"	400	535	35.4	2	372	330	337	125	50	60	140	64	4-M16	14	249
16"	400	595	37	2	420	367	372	172	60	80	170	80	4-M20	18	326
18"	520	635	40.1	2	470	422	432	172	70	90	190	90	4-M24	20	410
20"	600	700	44	2	516	490	498	180	80	100	190	90	4-M24	22	510

DIMENSIONS OF VALVE AUTOMATED WITH COOSAI PISTON TYPE ACTUATOR



Size		A	L	B	H	C	D	D1
in	mm							
1"	25	270	390	140	133	105	85	85
1 1/4"	32	270	390	140	138	105	85	85
1 1/2"	40	275	395	140	140	115	85	85
2"	50	275	395	140	150	115	85	85
2 1/2"	65	296	440	150	165	125	85	85
3"	80	300	445	150	178	135	85	90
4"	100	300	445	150	190	135	85	102
5"	125	343	507	155	205	155	85	97
6"	150	343	507	155	235	170	85	129
8"	200	418	617	190	265	200	85	123
10"	250	502	742	224	317	260	92	149
12"	300	520	760	224	362	280	/	148
14"	350	605	900	277	437	330	/	179
16"	400	620	900	277	492	330	/	180

HOW TO ORDER 1

Example: V W 150# P P₁ P₂ P 50

1 2 3 4 5 6 7 8

1 Valve Type

Code	V
Type	Segment Ball Valve

2 End Connection

Code	W	F
Type	Wafer	Flanged

3 Nominal Pressure

GB, DIN standard	Code	10	16	25	40	64
	MPa	1.0	1.6	2.5	4.0	6.4
ANSI standard	Code	150#	300#	400#	600#	
	Class	150	300	400	600	
JIS standard	Code	J10	J20	J40		
	K	10K	20K	40K		

4 Body Material

5 Segment Body Material+Surface treatment

Code	P	R	RL	PL	S	G	GL	Ti
Body Material	CF8	CF8M	CF3M	CF3	SMO/2205/2507	CG8M	CG3M	Titanium

Code	1	2	3	4
Surface Treatment	Hard chromium plating	Stellite spray welding	Ionitriding (plasma nitriding)	HVOF:Tungsten carbide coating

6 Seat Material+Surface treatment

Metal Seat

Code	P	R	RL	PL	S	G	GL	Ti
Seat Material	SS304	SS316	SS316L	SS304L	Duplex Steel	SS317	SS317L	Titanium
Code	2		3			4		
Surface Treatment	Stellite spray welding		Ionitriding(plasma nitriding)			HVOF:Tungsten carbide coating		

Soft seat

Code	F	RF
Seat Material	PTFE	Reinforced PTFE

7 Shaft Material

Code	H	P	R	RL	PL	S	G	GL	Ti
Shaft Material	17-4PH	SS304	SS316	SS316L	SS304L	Duplex Steel	SS317	SS317L	Titanium

8 Nominal Diameter

inch code	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
mm code	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
DN	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600

Note: The code instruction above is exclusive for bare shaft valves.

HOW TO ORDER 2

Example: **ZS** **V** **W** **10** **R** **FL** **50** **P** **D2**
1 **2** **3** **4** **5** **6** **7** **8** **9**

1 Actuation

Code	ZS	ZDS	ZE
Type	Piston type double acting piston	Piston type single acting piston	Electric
Code	DA	SR	
Type	Rack and pinion type double acting actuator	Rack and pinion type spring opposed actuator	

2 Valve Connection

Code	V
Type	Segment Ball Valve

3 End Connection

Code	W	F
Type	Wafer	Flange

4 Nominal Pressure

GB、DIN standard	Code	10	16	25	40	64
	MPa	1.0	1.6	2.5	4.0	6.4
ANSI standard	Code	150#	300#	400#	600#	
	Class	150	300	400	600	
JIS standard	Code	J10	J20	J40		
	K	10K	20K	40K		

5 Control Modes

Code	O	R
Type	On-off	Proportional regulating

6 Valve Action

Code	FL	FC	FO
Type	Stay in put(Stay in the last position)	Air/Power to open(Air failure to close)	Air/Power to close(Air failure to open)

7 Nominal Diameter

inch code	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
mm code	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
DN	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600

8 Valve body

Code	C	P	R	RL	PL	G	GL	Ti
Material	WCB	CF8	CF8M	CF3M	CF3	CG8M	CG3M	Titanium alloy

9 Signal Input

Code	D2	D3	D4	To be decided
Type	4-20mA	220VAC	24VDC	Others

Note: The code instruction above is exclusive for control valve assembly, including codes for actuators and accessories

■ Valve Test Equipments

QUALITY INSPECTION LABORATORY

Coosai understands the importance of the quality and reliability our customers depend upon for their valves. Coosai's laboratory has served the purpose of insuring all our valves meet the quality our customers have been accustomed to. Coosai is now offering our laboratory testing services to the public and are not limited to Coosai valves. No matter if you need non-destructive or destructive, coosai is prepared to tackle nearly any of your quality inspections needs.



Control Valve Testing Bench



Shell test machine



Hydraulic/Air Seat Test Machine



Inventory



High And Low Temp Testing Machine
And Digital Impact Testing Machine



Spectrograph (For testing of chemical
composition analysis)



Universal Material Testing Machine



Radiographic Testing Machine



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