



KTM DUAL-V HIGH PERFORMANCE CONTROL BALL VALVES
 SERIES WA SIZES DN 25-200 CLASS 150 AND 300

Enhanced, proven design offers both control and block valve functions



FEATURES

- Unique dual-V ball features a secondary (Small) V-notch allowing extremely small, accurate flow rates
- The primary (Large) V-notch provides straight through and non-clogging flow
- Dual-V ball allows rate changes and controls fluids with a rangeability in 250:1
- Equal percent flow characteristic
- Rotary-valve design provides shearing action between the V-notch ball and the seat, promoting a smooth, non-clogging operation
- Spring loaded stellited metal seat
- ANSI / FCI 70-2 Class V
- Unibody design protect from the effect of piping stress
- Minimum body cavity reduces build-up
- Fugitive emissions control for flammable and non-flammable applications
- Available in flangeless or flanged construction
- Multiple, adjustable ring packing allows easy adjustment without valve disassembly or actuator removal
- ISO mounting pad is available as optional
- Positive position indication

GENERAL APPLICATIONS

Slurry and viscous fluids, powder (option) and pellet, sludge in water treatment and pollution control processes, chips and fibers in pulp and paper process, flow control in pipeline and transmissions, pressure control in oil and gas

Options

- Special tests
 - X-ray test (RT)
 - Liquid penetrant test (PT)
 - Positive material identification (PMI)

TECHNICAL DATA

Models: WA20, WA21, WA22
 Sizes: DN 25 to DN 200
 Pressure rating: JIS 10K, 20K / ASME Class 150, 300 (JPI available)

Face to face:
 Flanged type ASME B16.10 (short pattern)
 Flangeless type: ISA 75.04

End connection: JIS B2220
 ASME B16.5 RF

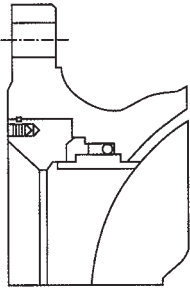
Temperature: -20°C to 270°C
 Seat leakage: ANSI / FCI 70-2 Class V

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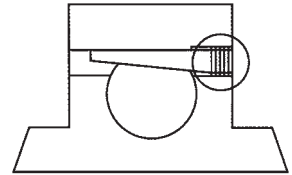
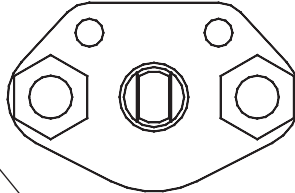
Fugitive emissions control packages

Available for both flammable and non-flammable service.



Integral mounting pad

Machined 'actuator pad' allows precise mounting of actuator. Mounting bolts are independent from the shaft-packing gland bolts. This exact alignment reduces torque and prevents out-of-line wear on the shaft and packing (option).



Shaft to disc connection

A tapered pin connection is used to ensure accurate control of flow, which also results in a high resolution of 250:1.

Positive locking, end cap retention

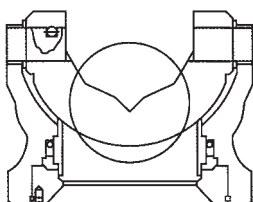
Wire-ring with three point locking device assures tight fit and makes maintenance easier.

Versatile end-connection

The Unibody design is available in flangeless or flanged construction and meets ISA S-75.04 and ASME B16.10 (Short pattern) face-to-face dimensions.

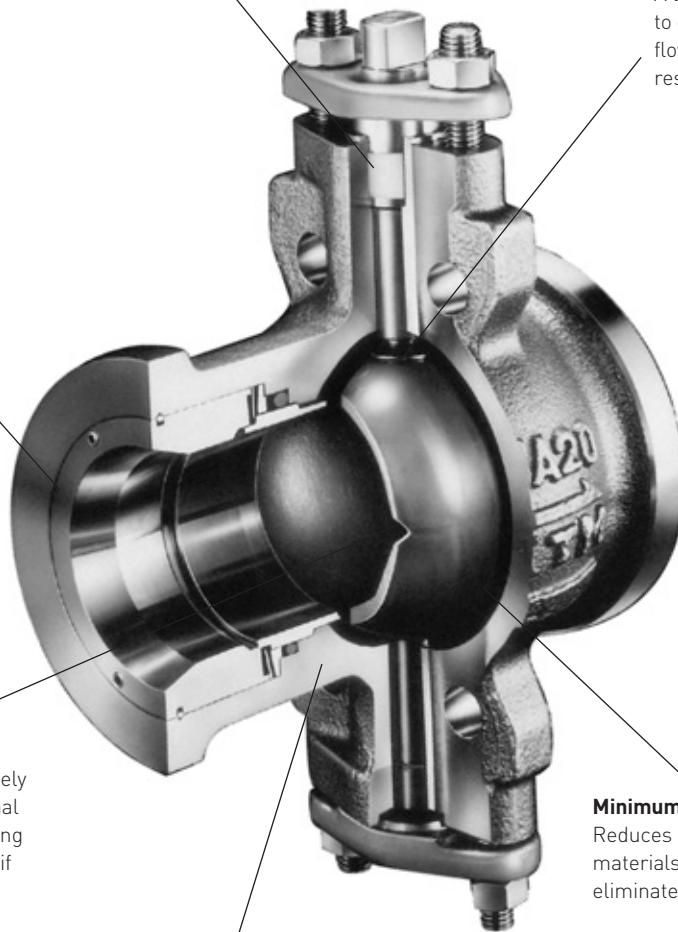
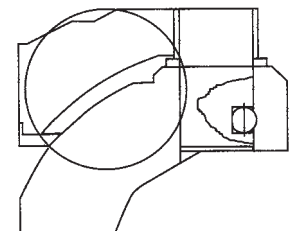
Unique dual-V ball

A secondary (Small) V-notch allows extremely small, accurate flow rates with the additional benefit of the primary (Large) V-ball providing straight through, non-clogging flow which, if necessary, will shear slurries and fibers.



Unibody design

This proven structural design enhances piping integrity by reducing stress and additionally eliminates potential leak paths.



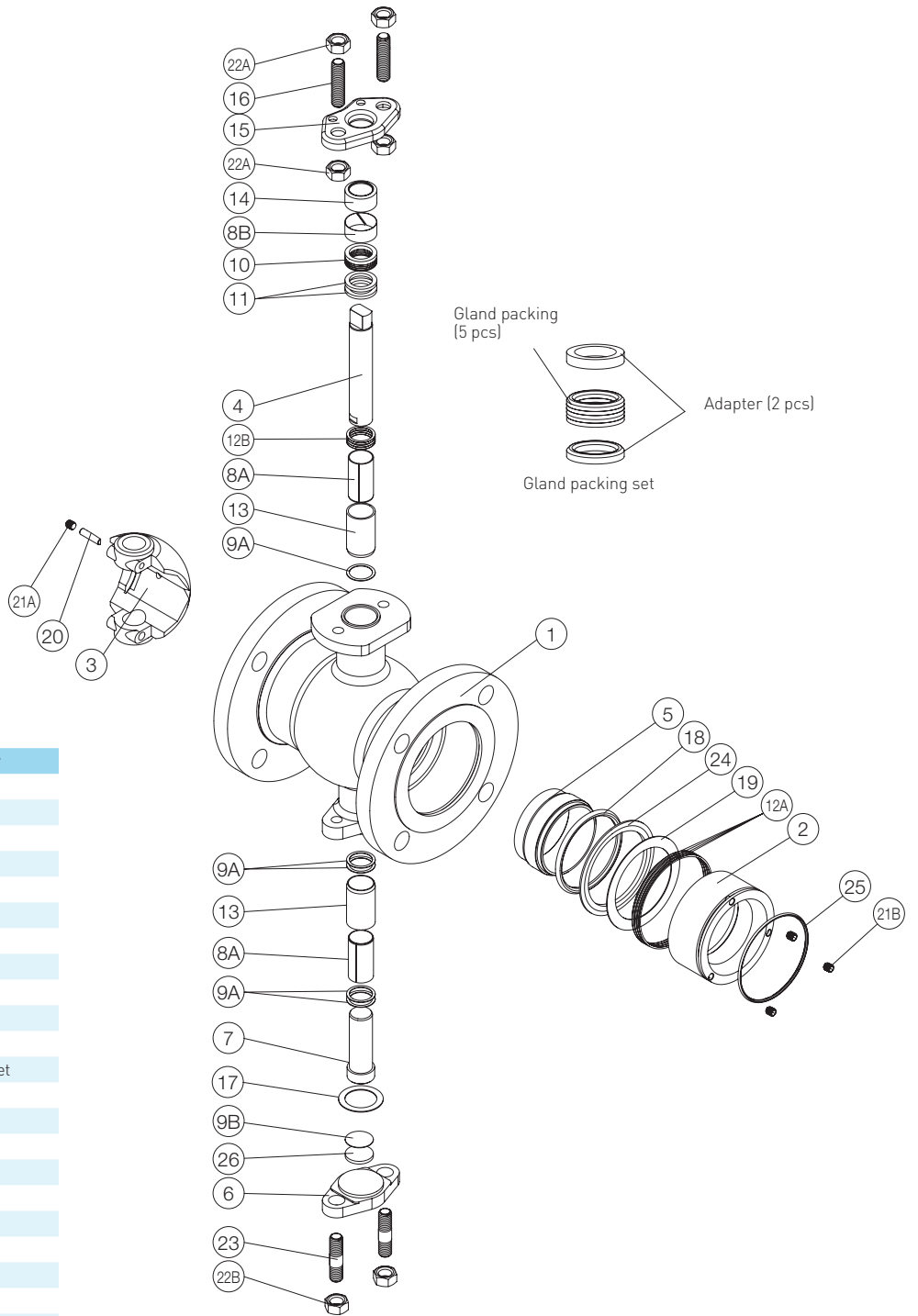
Note: DN 15 to DN 100 valve illustrated

Minimum body cavity

Reduces build-up of transition process materials and the segmented V-ball eliminates freeze-up.

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PARTS LIST

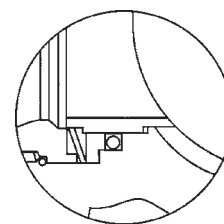
No.	Parts name	Qty
1	Body	1
2	Body cap	1
3	Disk	1
4	Shaft	1
5	Seat	1
6	Lower cover	1
7	Lower shaft	1
8A	Shaft bearing	2
8B	Shaft bearing	1
9A	Thrust bearing	5
9B	Thrust bearing	1-2
10	Gland packing	1 set
11	Thrust washer	2
12A	Shim	2-5
12B	Shim	2-4
13	Bearing holder	2
14	Gland	1
15	Gland flange	1
16	Gland bolt	2
17	Gasket	1
18	Seal ring	1
19	Spring	1
20	Taper pin	1
21A	Set screw	1
21B	Set screw	3
22A	Nut	4
22B	Nut	2-4
23	Stud	2-4
24	Stopper	1
25	Locking ring	1
26	Thrust washer	1

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SEAT DESIGN

The precision finished heavy duty 'V' ball surface and spring supported, stellite metal seat combination provides excellent sealing performance with low torque. It also offers the additional benefit of exceptional wear and pressure drop performance over a wide range of media - steam, gas, liquid, fiber and slurry applications.



Seat leakage: FCI 70-2 Class V
Spring loaded stellite seat

AVAILABLE TRIMS

Application	General purpose	Abrasion resistant	Corrosion resistant	Corrosion and abrasion resistant	Abrasion and high temp resistant
Trim combination	AV	BV	AT	BT	BP
Operating temp	-20°C to 150°C		-20°C to 200°C		-20°C to 270°C
Body material			CF8 (SCS13A), CF8M (SCS14A)		
V-ball material	CF8M (SCS14A)+ HCr*	CF8M (SCS14A)+ SFNi*	CF8M (SCS14A)+ HCr*	CF8M (SCS14A)+ SFNi*	
Seat material				316 SS + Stellite	
Seat seal material	FKM O-ring		PTFE seal-ring		PEEK seal-ring
Shaft bearing				Metal-backed PTFE	
Packing				PTFE	
				Graphite	

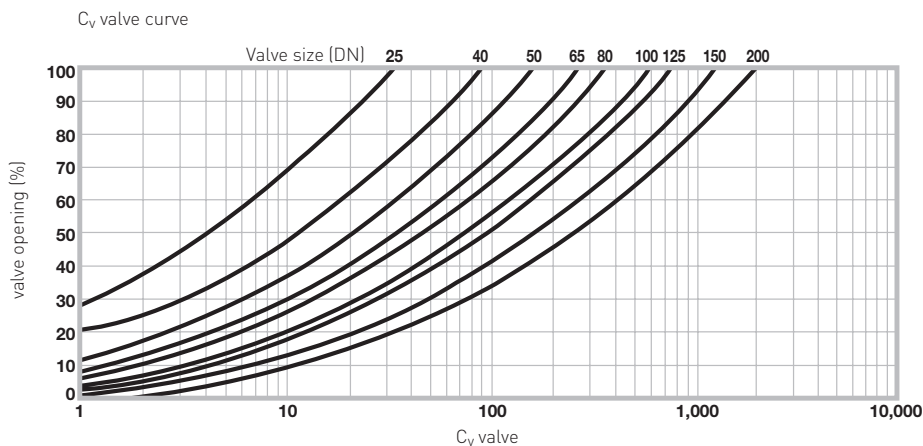
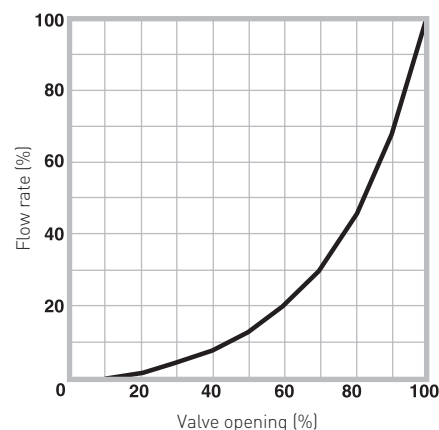
* HCr: Hard chromium plating SFNi: Nickel alloy overlay

• Material in parentheses indicate equivalent JIS material.

C_v VALUES

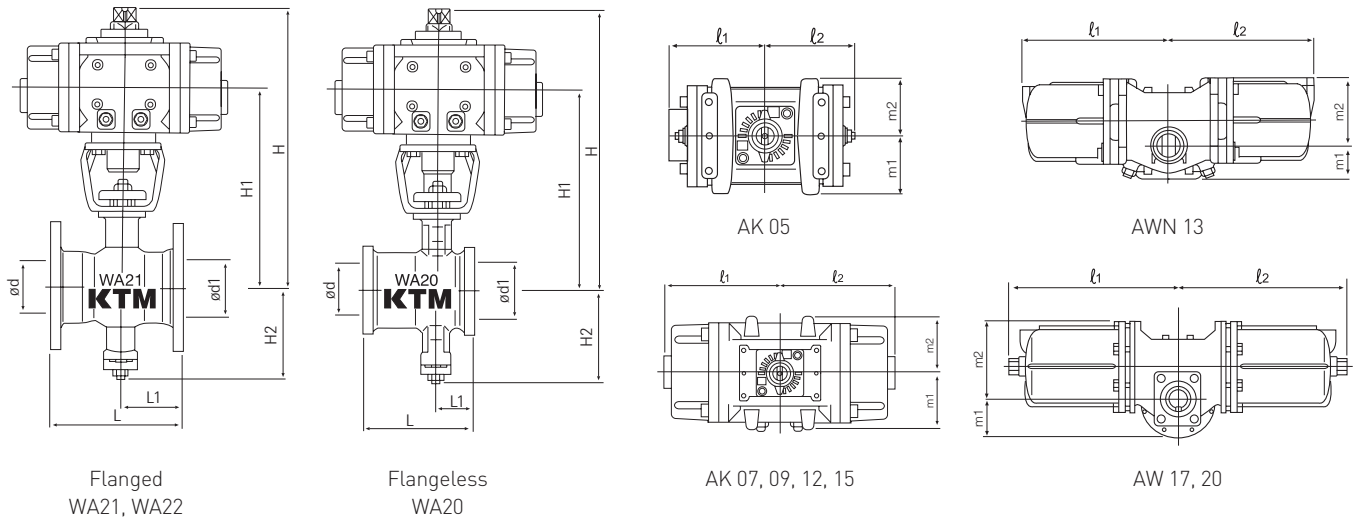
Valve size (DN)	Valve opening (%)									
	10	20	30	40	50	60	70	80	90	100
25	0.16	0.33	1.2	2.3	4.1	6.6	10.2	15.8	23.4	33
40	0.45	0.90	3.2	6.3	11.3	18.0	27.9	43.2	63.9	90
50	0.83	2.50	5.8	11.6	20.6	33.0	51.2	79.2	117.0	165
65	1.40	4.10	9.6	19.3	34.4	55.0	85.3	132.0	195.0	275
80	1.80	5.50	12.8	25.6	45.6	73.0	113.0	175.0	259.0	365
100	3.00	9.00	21.0	42.0	75.0	120.0	186.0	288.0	426.0	600
125	3.80	11.40	26.6	53.2	95.0	152.0	236.0	365.0	540.0	760
150	6.50	19.50	45.5	91.0	163.0	260.0	403.0	624.0	923.0	1300
200	10.40	31.40	72.8	146.0	260.0	416.0	645.0	998.0	1480.0	2080

INHERENT FLOW CHARACTERISTICS



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DIMENSIONS (WA21, WA22, WA20)

Valve size (DN)	Cylinder actuator	Flange		Flangeless		Cylinder for Double Acting								
		ød	ød ^{1*}	L	L ¹	L	L ¹	H	H ¹	H ²	l ¹	l ²	m ¹	m ²
25	AK05							251	162	72	84.5	80.5	50	50
	AK07	25	44	127	61	102	36	251	162	72	115.5	115.5	50	50
	AK09							277	178	72	131.5	131.5	60	60
40	AK05							272	183	90	84.5	80.5	50	50
	AK07	38	52	165	91	114	40	272	183	90	115.5	115.5	50	50
	AK09							298	199	90	131.5	131.5	60	60
	AK12							356	236	90	157	157	77	75
50	AK05							282	193	110	84.5	80.5	50	50
	AK07	51	66	178	98	124	44	282	193	110	115.5	115.5	50	50
	AK09							308	209	110	131.5	131.5	60	60
	AK12							366	246	110	157	157	77	75
	AK15							395	260	110	195	195	94	90
65	AK07							310	221	131	115.5	115.5	50	50
	AK09	64	80	190	100	143	53	336	237	131	131.5	131.5	60	60
	AK12							386	266	131	157	157	77	75
	AK15							436	301	131	195	195	94	90
80	AK07							331	232	139	115.5	115.5	50	50
	AK09	76	84	203	95	165	57	347	248	139	131.5	131.5	60	60
	AK12							397	277	139	157	157	77	75
	AK15							426	291	139	195	195	94	90
100	AK09							372	273	149	131.5	131.5	60	60
	AK12	102	104	229	112	194	77	427	307	149	157	157	77	75
	AK15							456	321	149	195	195	94	90
	AWN13							479	322	149	285.5	285.5	66	132
125	AK12							442	322	162	157	157	77	75
	AK15	127	130	254	127	213	78	471	336	162	195	195	94	90
	AWN13							494	337	162	285.5	285.5	66	132
150	AK15							491	356	181	195	195	94	90
	AWN13	152	160	267	133.5	229	99	542	385	181	285.5	285.5	66	132
	AW17							636	427	181	377.5	377.5	95	176
200	AWN13							547	417	220	285.5	285.5	66	132
	AW17	203	203	292	146	243	106	668	459	220	377.5	377.5	95	176
	AW20							746	502	220	530	530	115	232

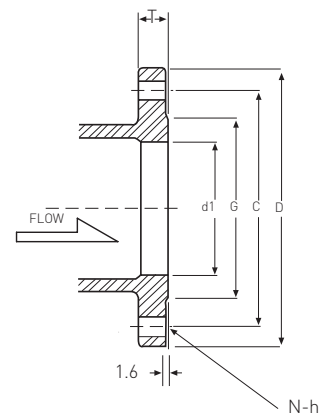
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FLANGE DIMENSIONS (mm)

Valve size (DN)	ASME class 150						ASME class 300					
	D	C	G	T	N	h	D	C	G	T	N	h
25	108	79.5	*60	11.2	4	16	124	89.0	*60	17.5	4	19
40	127	98.5	*81	14.3	4	16	156	114.5	*81	20.7	4	22
50	152	120.5	*96	15.9	4	19	165	127.0	*96	22.3	8	19
65	178	139.5	*116	17.5	4	19	190	149.0	*116	25.4	8	22
80	190	152.5	127	19.1	4	19	210	168.0	127	28.6	8	22
100	229	190.5	157	23.9	8	19	254	200.0	157	31.8	8	22
125	254	216.0	186	23.9	8	22	279	235.0	186	35.0	8	22
150	279	241.5	216	25.4	8	22	318	270.0	216	36.6	12	22
200	343	298.5	270	28.6	8	22	381	330.0	270	41.3	12	25

* These dimensions differ from ASME standard. For JIS, the flange dimensions are same as JIS standard.



- D: Outside diameter
- C: Bolt circle diameter
- G: Raised face diameter
- T: Flange thickness
- N: Number of bolts
- h: Bolt hole size

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ORDERING INSTRUCTIONS

WA21	R	-	32	•	AV	A15	RF	25	GG
Body style	Special feature		Body material		Trim material	Pressure class	Connection	Valve size (DN)	Option

Example: WA21 R - 32 • AV A15 RF 25 GG

Body style: Reduced bore, DN 25 to DN 200. **Special feature:** Reverse action. **Body material:** JIS: SCS14A (316SS), ASTM: CF8M (316SS).

Ball material: JIS: SCS14A with HCr, ASTM: CF8M with HCr. **Seat material:** 316SS with stellited. **Packing material:** PTFE / FKM o-ring.

Shaft material: 329J1 SS. **Pressure class:** ASME Class 150. **Connection:** Raised face 125 to 250 AARH. **Valve size:** DN 25.

Option: Packing / Gasket-graphite.

Code	Body style		
	ASME	JIS	
WA20	150/300	10K/20K	Reduced bore, Flangeless, DN 25 to 200
WA21	150	10K	Reduced bore, DN 25 to DN 200
WA22	300	20K	Reduced bore, DN 25 to DN 200
Code	Sub code		
Blank	Metal seat		
Code	Special feature		
Blank	No special feature		
D	Direct action		
R	Reverse action		
Code	Body material		
	JIS	ASTM	
31	SCS13A (304SS)	CF8 (304SS)	
32	SCS14A (316SS)	CF8M (316SS)	

Code	Pressure class	Code	Size (DN)
A15	ASME Class 150	25	25
A30	ASME Class 300	40	40
J10	JIS 10K	50	50
J20	JIS 20K	65	65
(JPI also available)		80	80
100		100	100
Code	Connection	Code	Option
RF	Raised face 125 to 250 AARH	125	125
SM	Smooth finish 63 to 125 AARH	150	150
		200	200
Blank			No additional option
B1			Buffing (All wetted parts)
GG			Packing / Gasket-graphite

Code	Trim material	Seat	Packing	Shaft	
Ball	JIS				
	ASTM				
AV	SCS14A with HCr	CF8M with HCr	316SS with stellited	PTFE / FKM o-ring	329J1 SS
AT	SCS14A with HCr	CF8M with HCr	316SS with stellited	PTFE / PTFE seal-ring	329J1 SS
BV	SCS14A with SFNi	CF8M with SFNi	316SS with stellited	PTFE / FKM o-ring	329J1 SS
BT	SCS14A with SFNi	CF8M with SFNi	316SS with stellited	PTFE / PTFE seal-ring	329J1 SS
BP	SCS14A with SFNi	CF8M with SFNi	316SS with stellited	Graphite / PTFE seal-ring	329J1 SS

HCr : Hard chromium plating

SFNi : Electroless nickel plating

Body styles

DUAL-V HIGH PERFORMANCE CONTROL BALL VALVES

Code	Body style	Bore	Connection	Pressure class	Sizes
WA20	Trunnian ball 1 pce body	Reduced bore	Raised face or smooth finish	ASME 150/300, JIS 10K/20K	DN 25-200
WA21	Trunnian ball 1 pce body	Reduced bore	Raised face or smooth finish	ASME 150, JIS 10K	DN 25-200
WA22	Trunnian ball 1 pce body	Reduced bore	Raised face or smooth finish	ASME 300, JIS 20K	DN 25-200

