KV CONTROLS
Total Cost of Ownership

PIPELINE BALL VALVE

KV CONTROLS
Total Cost of Ownership

The following standards are referred for the products in this catalogue.

American Petroleum Institute

API 6D. Petroleum and natural gas industries — Pipeline transportation systems — Pipeline valves

API 607. Fire Test for Soft Seated Quarter-Turn Valve

API 6FA. Specification for Fire Test for Valves

API Q1. Specification for Quality Programs for the Petroleum,Petrochemical and Natural Gas Industry.

Manufacturers Standardization Association

MSS SP-25. Standard Marking System for Valves, Fittings, Flanges and Unions

MSS SP-55. Steel Castings for Controlled Quality Level,-General Industrial Steel Casting Grades for Valves Visual Surface Inspection and Scheduled Radiographic Inspection

NACE (National Association of Corrosive Equipment)

NACE MR-01-75 2002. Sulfide Stress Cracking Resistance of Metallic Materials for Oilfield Equipment

ANSI (American National Standard Institute)

ASME/ANSI B 16.10. Face to Face and End to End Dimensions of Valve

ASME/ANSI B 16.5. Steel pipe flanges and flanged fittings

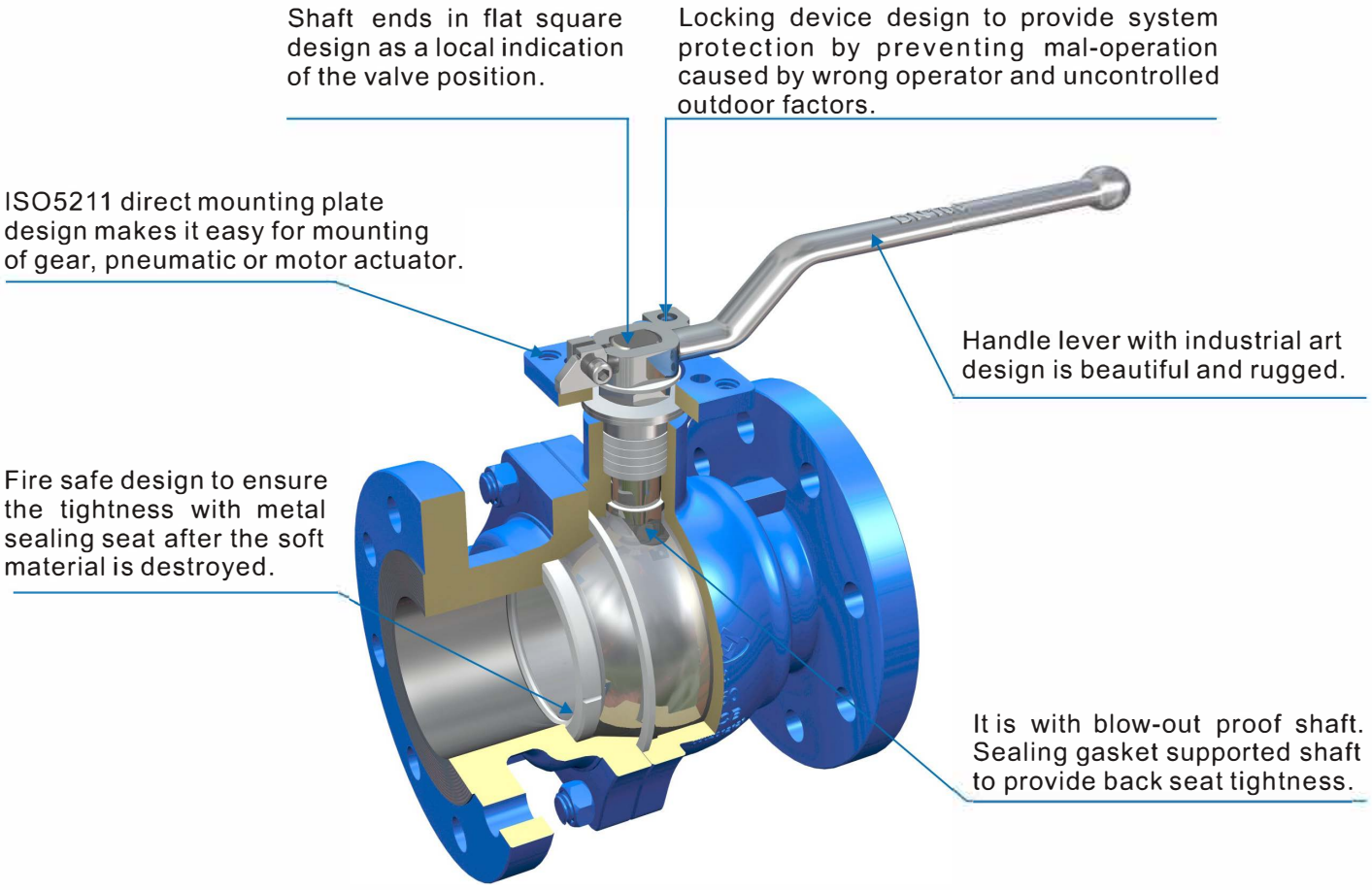
ASME/ANSI B 16.34. Valves—Flanged, Threaded, and Welding End

ASME/ANSI B 31.1. Chemical plant and petroleum refinery piping

ASME 31.4. Liquid petroleum transportation piping systems

ASME B 31.8. Gas transmission and distribution piping systems

RR Series Ball Valve



Two–Piece Body, Floating Ball, End Entry

RR series ball valve is in two-piece body, floating ball and end entry design. Two pieces valve body are bolted by flange. It is designed as per API 608 and fire tested as per API 607. Sealing materials available for various pressure and temperature ranges are TEFLON, PPL, PEEK, DELRIN, etc.

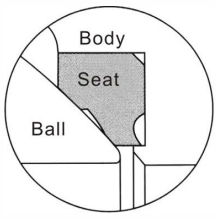
RR series floating ball valve is with fire proof, blow-out proof, anti-static design, with locking device and ISO5211 mounting plate for easy mounting of gear, pneumatic and electric actuators.

Size Range：1/2″-8″ (DN15-DN200)
Pressure Rating Range：150LB-300LB,PN10-PN40
Operating Temperature Range：-40~+200℃, -100~+425℃

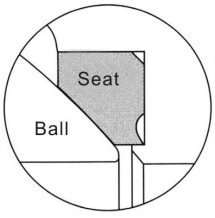
Special Seat Design

The floating ball valve adopts the flexible seal ring design. When the medium pressure is lower, the contact area of seat and ball is smaller, so higher sealing load is formed at the seating face. When the medium pressure is higher, the contact area of seat and ball becomes bigger along with the elastic deformation of seat, so the seat can offer longer life cycle and low operation torque requirement.

Elastic Seat



Lower pressure

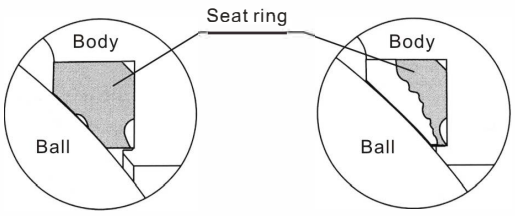


High pressure

Fireproof

In case of fire during operation,the seat ring made of PTFE or other non-metal materials will be decomposed or damaged by high temperature and cause leakage. The fireproof seal ring is set between ball and metal seat. After the valve seat is burnt, the ball will be pushed against the down stream metal seal ring to form the auxiliary metal to metal tightness. In addition, the middle flange sealing gasket is in stainless steel spiral wound graphite material, which can ensure tightness even under high temperature. The fireproof design of floating ball valve conforms to API 607, API 6FA,BS6755 and other standards.

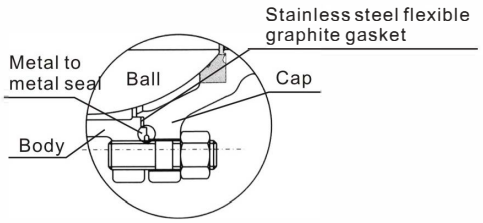
Fireproof Design of Seat



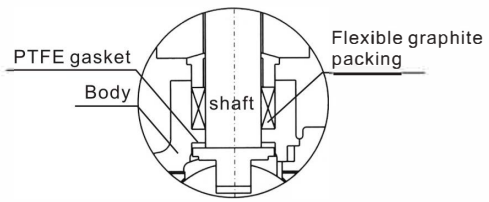
Normal use

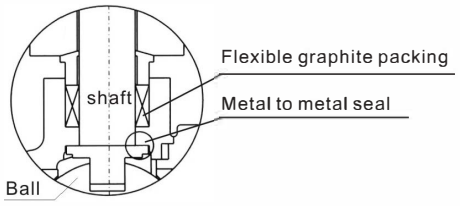
After burning

Fireproof Design of Middle Flange



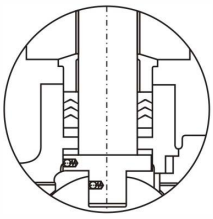
Fireproof Design of Shaft



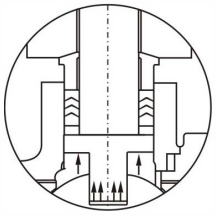


Reliable Tightness of shaft

The shaft is designed with the shoulder at its bottom so that it will not be blown out by the medium under extreme conditions such as abnormal pressure rise inside valve cavity, failure of gland etc. In addition, to avoid leakage after the shaft packing is burnt, the thrust bearing is set between shaft shoulder and body to form backseat tightness. The tightness will increase to the rising of medium pressure to ensure reliable shaft packing under various pressure.



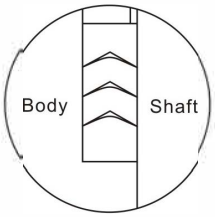
The bottom-mounted shaft will not be blown out by medium pressure.



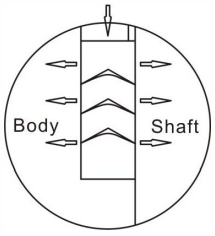
The top-mounted shaft may be blown out by medium pressure.

The shaft packing is V type which can effectively convert the pressing force and medium force into the sealing force.

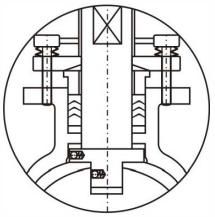
according to user's requirements,Belleville spring loaded packing gland nut design is available to ensure more reliable packing tightness.



Before the packing is pressed



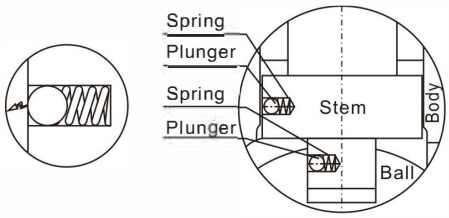
After the packing is pressed



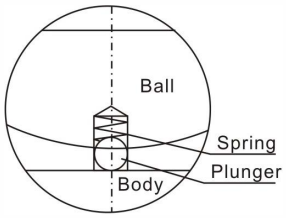
Belleville spring loaded packing pressing mechanism is adopted

Anti-static

The ball valve is with anti-static design to directly form a static channel between the ball and body through the shaft, to discharge the static electricity produced by friction during operation, avoiding fire or explosion resulted from static spark and ensuring system safety.



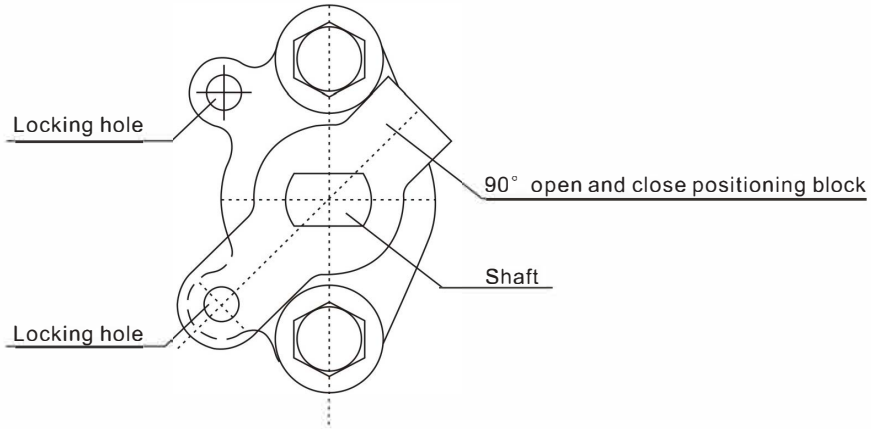
Anti-static design of ball valve with DN≥32

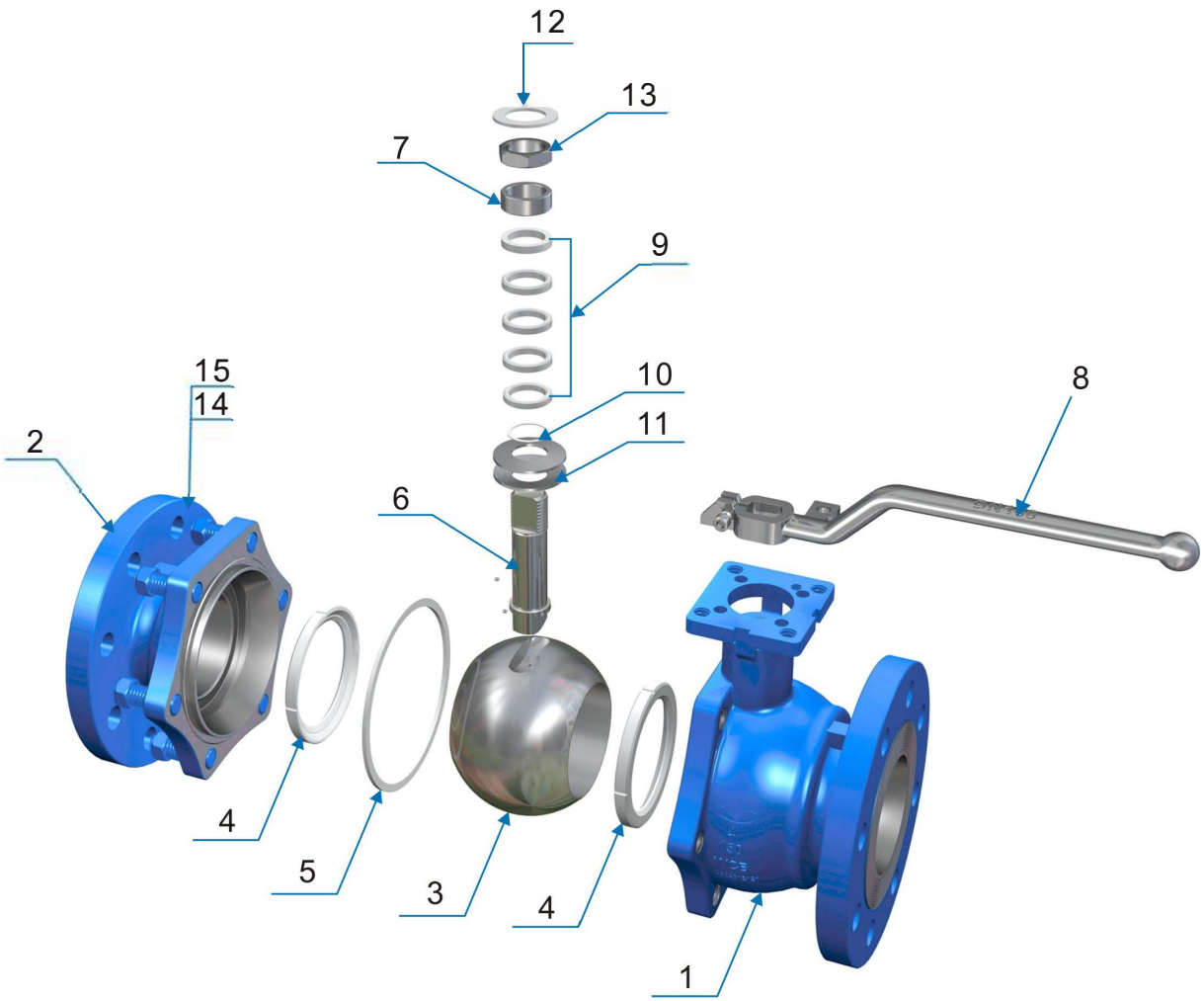


Anti-static design of ball valve with DN≤25

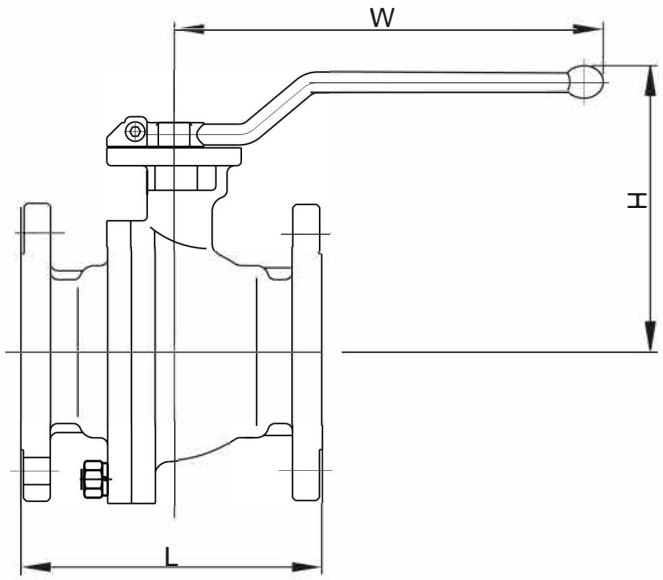
Locking And Misoperation Prevention

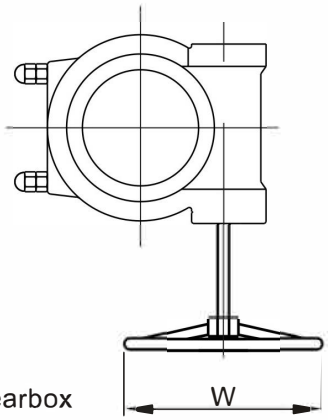
The manual ball valve can be locked by a locking device when it is at the full open or full closed position. Positioning block with locking hole is designed to avoid valve disoperation by non-operators. It can also prevent valve to be open or closed by pipeline vibration or unpredictable factors. It is very necessary especially for inflammable and explosive oil, chemical and medical working pipelines or field tubing. Flat shaft end design offers local position indication. When the valve is opened, the handle is parallel to the pipeline and when the valve is closed, the handle is vertical to the pipeline, so that the opening and closing indications of the valve are guaranteed without error.





NO.	PARTS	Carbon Steel	Stainless Steel304(CF8)	Stainless Steel316(CF8M)
1	BODY	ASTM A216-WCB	ASTM A351-CF8	ASTM A351-CF8M
2	BONNET	ASTM A216-WCB	ASTM A351-CF8	ASTM A351-CF8M
3	BALL	ASTM A182 F6A	ASTM A182 F304	ASTM A182 F316
4	SEAT	PTFE	PTFE	PTFE
5	GASKET	PTFE	PTFE	PTFE
6	SHAFT	ASTM A182-F6A	17-4PH	ASTM A182-F316
7	BUSHING	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL
8	HANDLE LEVER	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL
9	PACKING	PTFE	PTFE	PTFE
10	THRUST WASHER	PTFE	PTFE	PTFE
11	BELLEVILL SPRING	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL
12	WASHER	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL
13	NUT	ASTM A194-2H	ASTM A193-B8	ASTM A193-B8
14	BOLT	ASTM A193-B7	ASTM A194-8	ASTM A194-8
15	NUT	ASTM A194-2H	ASTM A193-B8	ASTM A193-B8





CLASS150 Dimensions

Full Bore（mm）

DN	L	H	W	Weight (kg)
15	108	75	137	1.8
20	117	80	137	2.0
25	127	92	172	3.5
32	140	103	172	5.5
40	165	115	234	7.0
50	178	130	234	9.5
65	190	165	253	14.0
80	203	193	288	19.0
100	229	224	323	30.0
125	356	272	323	58.0
150	394	312	*300	80.0
200	457	418	*300	140.0

Full Bore（inch）

NPS	L	H	W	Weight (kg)
½	4.25	2.95	5.39	1.8
¾	4.61	3.15	5.39	2.0
1	5.00	3.62	6.77	3.5
1¼	5.51	4.06	6.77	5.5
1½	6.50	4.53	9.21	7.0
2	7.01	5.12	9.21	9.5
2 ½	7.48	6.50	9.96	14.0
3	7.99	7.60	11.34	19.0
4	9.02	8.82	12.72	30.0
5	14.02	10.71	12.72	58.0
6	15.51	12.28	*11.81	80.0
8	17.99	16.46	*11.81	140.0

*With gearbox operation

CLASS300 Dimensions

Full Bore（mm）

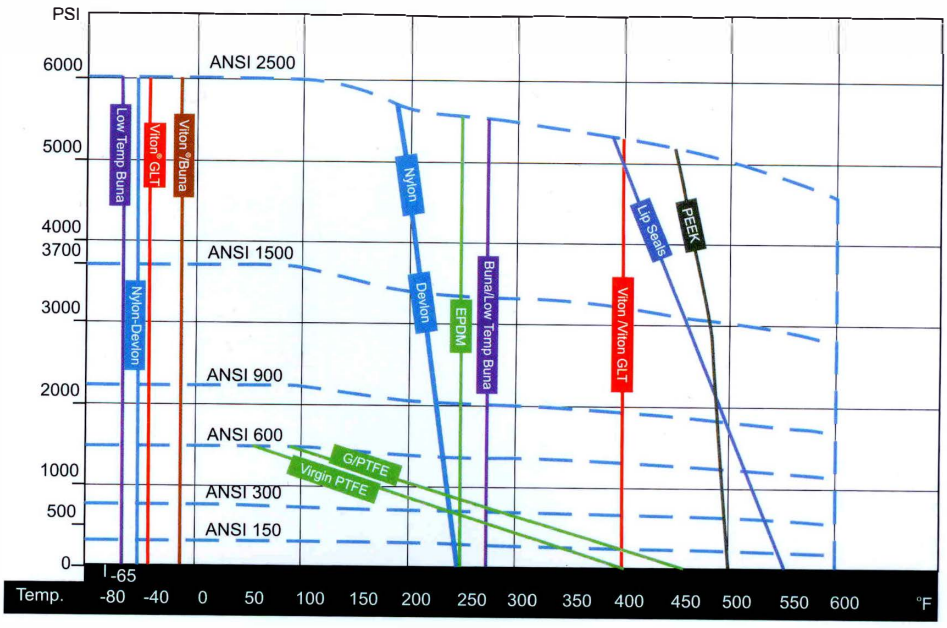
DN	L	H	W	Weight (kg)
15	140	75	137	2.3
20	152	80	137	3.6
25	165	92	172	5.0
32	178	103	172	7.5
40	190	115	234	10.0
50	216	130	234	14.0
65	241	165	253	23.0
80	283	193	288	30.0
100	305	224	323	50.0
125	381	272	323	90.0
150	403	312	*300	116.0
200	502	418	*300	180.0

Full Bore（inch）

NPS	L	H	W	Weight (kg)
½	5.51	2.95	5.39	2.3
¾	5.98	3.15	5.39	3.6
1	6.50	3.62	6.77	5.0
1¼	7.01	4.06	6.77	7. 5
1½	7.48	4.53	9.21	10.0
2	8.50	5.12	9.21	14.0
2 ½	9.49	6.50	10.08	23.0
3	11.14	7.60	11.34	30.0
4	12.01	8.82	12.72	50.0
5	15.00	10.71	12.72	90.0
6	15.87	12.28	*11.81	116.0
8	19.76	16.46	*11.81	180.0

*With gearbox operation

ENGINEERING DATA



Torque Value—Floating Ball Valve

Unit :N.M

Class\Size(inch)	½	¾	1	1½	2	2½	3	4	5	6	8
150	10	15	20	40	50	80	90	180	300	520	800
300	20	25	30	60	70	120	160	280	600	950	1550

Torque Value—Trunnion Mounted Ball Valve

Unit :N.M

Class \Size(inch)	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	30	36	40
150	25	50	65	125	250	410	700	1100	1750	2600	3900	6200	7500	10500	14500	21000	28000	35000
300	60	120	160	280	600	950	1550	2000	3300	5000	7500	11800	14400	19600	28200	29800	40000	45000
400	140	240	350	540	740	1260	1910	3250	5340	7500	10000	12400	18500	29500	40500	53000	51000	71000
600	190	360	460	770	1050	1980	3280	5250	7200	9860	14500	19600	29000	42500	58000	62000	75000	105000

NOTE:

1.The above torque value is calculated as per normal condition with PTFE seat.

2.For actuator selection, safety factor 1.3-1.5 is recommended.

3.The torque value will be subject to change with different trim material and medium .

Cv

Size		Class				
mm	inch	150	300	600	900	1500
15	1/2	25	25	20	16	16
20	3/4	65	56	40	34	34
25	1	95	95	64	55	55
40	1½	308	308	308	165	165
50	2	500	430	370	320	320
80	3	1360	1100	1020	920	820
100	4	2500	2000	1850	1760	1600
150	6	4060	4056	3410	4300	4150
200	8	8090	7720	6730	8475	8010
250	10	13510	13090	11120	14160	13220
300	12	20440	19830	17440	21200	18800
350	14	25050	23770	22010	26700	24180
400	16	34200	32595	29980	36600	33150
450	18	44430	43200	39520	49000	45703
500	20	57665	55380	60460	64600	60750
550	22	70080	70080	68900		
600	24	87680	84720	76630		
700	28	120000	115350	107510		
750	30	141850	136600	125630		
800	32	160390	152000	140900		
900	36	205450	192995	175730		
1000	40	248700	248700	239160		
1050	42	275260	275260	275260		
1200	48	364180	364180	247080		
1400	56	529430	529430	520500		

Remark :

1. The above Cv value is for full bore design.
2. The design for all pressure ratings are as per API6D

How To Calculate Cv:

What is the Cv Value? The volume flow in US gallons per minute of water at a temperature of 60° fahrenheit with a pressure drop across the valve of 1 psi.
Cv value is calculated with the following formula:

Liquids:

$QL=Cv(P/G)^{1/2}$
QL: Flow rate (gallons / min)
P: Differential pressure through the Valve
G: Specific gravity of the liquid (Water:G=1)

Gas:

$Qg=61Cv(P_2P/g)^{1/2}$
(For non-critical:$P_2/P<1$)
QL: Flow rate (CFH at STP)
P2: Outlet pressure (psia)
G: Specific gravity of the gas (Air: g=1.0)

METAL SEATED BALL VALVE

Ball and Seat Hardening Technology

According to different service conditions and requirements of users, various advanced ball and seat hardening technologies can be adopted, including HVOF coating, nickel-base alloy spray welding, high nickel alloy spray welding, nickel-base tungsten carbide alloy spray welding, cobalt-base hard alloy spray welding, etc. the ball and seat surface hardness can reach HRC55~70. Generally, the coating on the sealing face is good for heat resistance for 540℃, maximum 980℃. They are also with good wear resistant and impact resistant performances.

Flexible Valve Opening and Closing

For high temperature application, the ball and seat will have large thermal expansion, causing jamming problem. The ball valve adopts the Belleville spring or spring loaded sealing design so that thermal expansion of parts under high temperature can be compensated by the Bellville spring or spring, and it is ensured that the valve will be flexibly opened and closed under high temperature.

Fireproof Design

In the metal to metal ball valve seat design, gasket is the stainless steel flexible graphite and the packing is the flexible graphite. Therefore, reliable sealing of the valve can be ensured even in case of fire.

Reliable Tightness

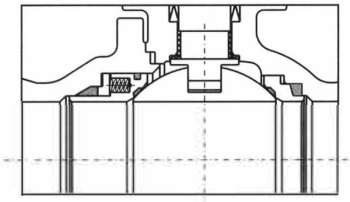
Ball grinding technology is adopted to grind the ball against the grinder at different positions. The ball surface will achieve high roundness and fineness. The seat tightness under low differential pressure is realized by spring pre-tightening. In addition, the piston effect of valve seat is designed reasonably, realizing high pressure sealing by the pressure of the medium itself. The tightness class meets ANSI/FCI70.2 class IV to class VI.

Double Block and Bleed (Metal Seated Trunnion mounted Ball Valve)

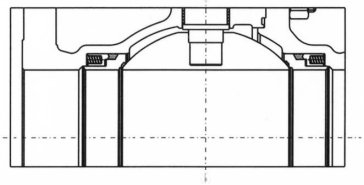
The metal seated trunnion mounted ball valve is with seat located in front of the ball. When the valve is closed, the medium left in the middle cavity can be discharged through the bleed valve. The upstream and downstream seats will independently block the fluid at the inlet and outlet to realize double block function.

The metal seated floating ball valve is with seat is located behind the ball. Unidirectional sealing is adopted with flow direction marked on the body. If users have special requirements, bidirectional sealing design can be adopted.

Metal seated floating ball valve



Metal seated trunnion mounted ball valve



HOW TO ORDER

RB	300	F1 – 01	C	21	R	P0	R – SD – GL
①	②	③ ④	⑤	⑥	⑦	⑧	⑨ ⑩ ⑪

① | VALVE TYPE
BALL VALVE
RR | Floating ball two-piece body
RB | Trunnion mounted ball two -piece body
RC | Trunnion mounted ball three-piece body

② | VALVE SIZE		
015 | 1/2″	100 | 4″	450 | 18″
020 | 3/4″	125 | 5″	500 | 20″
025 | 1″	150 | 6″	600 | 24″
032 | 1-1/4″	200 | 8″	700 | 28″
040 | 1-1/2″	250 | 10″	800 | 32″
050 | 2″	300 | 12″	900 | 36″
065 | 2-1/2″	350 | 14″	1000 | 40″
080 | 3"	400 | 16"	

③ | CONNECTION TYPE	
F1 | Flanged (RF)	R1 | Flanged (RTJ)
S1 | Socked welding	B1 | Butt Welding

④ PRESSURE RATING	
MNSI STANDARD	GB STANDARD
01 | 150Lb	10 | PN10
03 | 300Lb	16 | PN16
06 | 600Lb	25 | PN25
09 | 900Lb	40 | PN40
15 | 1500Lb	64 | PN64
20 | 2500Lb	80 | PN100
	90 | PN160

⑤ BODY MATERIAL		
C | WCB/A105	M | CF8M/F316	B | LCB
P | CF8/F304	L | CF3M/F316L	D | LCC
Q | CF3/F304L	G | CG8M/F317	W | WC6/F11

⑥ TRIM MATERIAL&SURFACE TREATMENT	
TRIM MATERIAL	SURFACE TREATMENT
1 | WCB/A105	01 | Poshing
2 | F6a	1 | Hard Chrome Plating
3 | CF8/F304	2 | Nickle Plating (ENP)
4 | CF3/F304L	3 | Spray welding Nickle based alloy
5 | CF8M/F316	4 | Spray welding Tungsten Carbide
6 | CF3M/F316L	5 | Plasma Nitriding
7 | CG8M/F317	6 | Overlaying welding Stellite

⑦ SEAT TYPE	
Normal Temperature.Metal Seat	Y
High Temperature.Metal Seat	G
Soft Seat	R

⑧ | SEAT MATERIAL&SURFACE TREATMENT		
Y-Metal Seat		R-Soft Seat
Material	Surface Treatment	Material
1 | A105	1 | Hard Chrome Plating	PO | PTFE
2 | F6a	2 | Nickle Plating(ENP)	RO | RTFE
3 | 304	3 | Spray welding Nickle based alloy	NO | NYLON
4 | 304L	4 | Spray welding Tungsten Carbide	LO | PPL
5 | 316	5 | Plasma Nitriding	KO | PEEK
6 | 316L	6 | Overlaying welding Stellite	
7 | 317		

⑨ | O-RING MATERIAL	
Material & Application Temperature	
E | EPDM -40~+120℃	A | PFA -40~+230℃
R | NBR -40~+100℃	F | FEP -40~+160℃
V | VITON -40~+230℃	G | GRAPHITE -100~+425℃
S | SI -60~+230℃	

⑩ | ACTUATOR
SD | Manual
ZS | Pneumatic
ZK | Electric

⑪ | OTHERS
GL | Seat/Shaft Injection
AS | Shaft Extension
AB | Bonnet Extension
NC | NACE

Wide industrial application range served by KV Controls product including
Chemical /Petro chemical /Oil & Gas /Pulp & Paper /Biochemistry /Pharmaceutical /Water /
Mining

KV CONTROLS

Total Cost of Ownership

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