

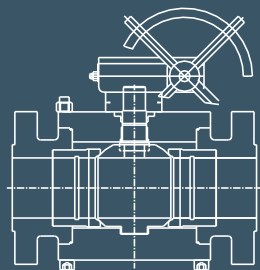
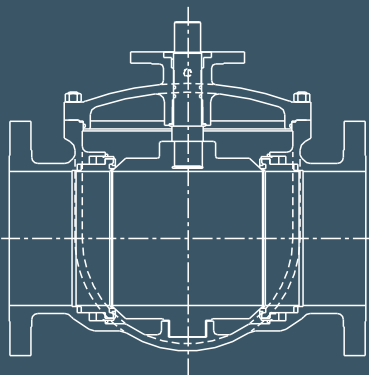


# RUV API6D TOP ENTRY BALL VALVE



GDR-4 Top Entry Ball Valve

CAB-17-01



## Top Entry Ball Valve

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Rocky Union is committed to enhancing our customers' working site safety, system stability, and convenient operations through our valve product offerings. Our diverse and innovative valves will have more safety design, longer working life and more reliable operation.

Located in the city with a more than forty years' history to make industrial valve, RUV has carried on the mature valve manufacturing tradition of Zigong city. By our advanced seat design and special workmanship, we are making high quality ball valve and through conduit gate valve, range from complete size and pressure for petroleum, chemical, and energy industrial use. To be a professional API6D valve company, we are making for reliability.

## APPLICABLE STANDARD

The following list contains the most important applicable standards for ball valve, RUV valves will be designed, manufactured and tested in accordance with other international standards on request.

### ANSI-American National Standard Institute

- ASME B 1.20.1 Pipe threads, general purpose
- ASME B 16.5 Steel pipe flanges and flanged fittings
- ASME B16.10 Face-to-face and end-to-end dimensions of ferrous valves.
- ASME B 16.25 Butt welding ends
- ASME B16.34 Steel valves-flanged and butt welding ends
- ASME B16.47 Larger diameter steel flange(26" ~ 60")
- ASME B31.3 Technics pipeline
- ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, rules for construction of pressure vessel
- MESC SPE 76/001 Surface roughness degree of flange gasket interface
- MESC SPE 77/130 Ball Valve to API SPEC. 6D
- MESC SPE 77/302 Material Acceptance Requirements for Valves in General Service
- MESC SPE 77/315 Electroless Nickel Plating

### British Standard

- BS 1503 Pressure-containing forged parts (including semi finished) specification
- BS 6755-2 Valve test, section 2: fire test requirement specification
- BS 5351 Industrial valve, shell thickness, and bore dimension
- BS 1560 End flange dimensions and Flange gasket facing
- BS 5146 Pressure test

### ISO9001-International Organization for Standardization

- ISO9001 Quality systems-model for quality assurance in design, development, production, installation and servicing.
- ISO15156 Materials for use in H2S containing environment in oil & gas production.
- ISO 5211-1 Executive institution accessories of quarter-turn valves, section1: flange dimension
- ISO 5211-2 Executive institution accessories of quarter-turn valves, section2: capability character of flange and connector.
- ISO 5211-3 Executive institution accessories of quarter-turn valves, section3: the dimension of drive parts
- ISO 10479 Valve test: fire-proof test requirement

### API-American Petroleum Institute

- API 6A Specification for wellhead valves
- API 6D Specification for pipeline valves
- API 6FA Specification for fire testing of valves
- API 607 Fire test for soft seated quarter-turn valves
- API Q1 Quality program
- API 5B EUE External upset tubing threads

### MSS-Manufacturers Standardization Society

- MSS SP-6 Standard finishes for contact faces of pipe flanges and connecting-end flanges of valves and fittings.
- MSS SP-25 Standard marking system for valves, fittings, flanges and unions.
- MSS SP-55 Quality standard for steel castings.
- MSS SP-45 Bypass, and drain connections standard
- MSS SP-53 Cast steel quality standard of valve, flange, fitting and pipeline accessories -- Magnetic-particle testing
- MSS SP-54 Cast steel quality standard of valve, flange, fitting and pipeline accessories ---Radiographic testing
- MSS SP-93 Cast steel and forged steel quality standard of valve, flange, fitting and pipeline accessories ---Liquid Penetrant Testing

- PrEN 12116 Industry valve, executive institution accessories of quarter-turn valves
- DEP 31.38.01.11-GEN Standard of pipeline
- DEP 31.40.70.30-GEN Quarter-turn open/close executive institution
- DEP 32.36.01.17-GEN Control valves' choice, specification and standard

### NACE-National Association of Corrosion Engineers

- MR0175 Sulfide stress cracking resistant metallic materials for oil field equipment (Superseded by ISO15156)

**RANGE OF PRODUCT**

Valve Size (INCH)	PRESSURE CLASS				
	ANSI150	ANSI300	ANSI600	ANSI900	ANSI1500
2	Cast	Cast	Cast	Cast	Cast
3	Cast	Cast	Cast	Cast	Cast
4	Cast	Cast	Cast	Cast	Cast
6	Cast	Cast	Cast	Cast	Cast
8	Cast	Cast	Cast	Cast	Cast
10	Cast	Cast	Cast	Cast	Cast
12	Cast	Cast	Cast	Cast	Cast
14	Cast	Cast	Cast	Cast	Cast
16	Cast	Cast	Cast	Cast	Cast
18	Cast	Cast	Cast	Cast	Cast
20	Cast	Cast	Cast	Cast	Cast
22	Cast	Cast	Cast	Cast	Cast
24	Cast	Cast	Cast	Cast	Cast
26	Cast	Cast	Cast	Cast	Cast
28	Cast	Cast	Cast	Cast	Cast
30	Cast	Cast	Cast	Cast	Cast
32	Cast	Cast	Cast	Cast	Cast
36	Cast	Cast	Cast	Cast	Cast

Cast Body Forged Body

**APPLICATIONS**

A wide variety of body designs, materials, and trim make RUV Top Entry Ball Valves exceptionally versatile and suitable for a multitude of liquid and gas fluid applications.



**Petroleum Refining**

- Hydrogen
- Cracking
- Steam
- Crude Oil
- Gasoline
- Visbreakers
- Naptha
- Sulfur

**Chemicals**

- Chlorine
- Phosgene
- Aromatics
- Polymers
- Acids
- Air Separation
- Cautics

**Oil and Gas Production**

- Oil/Steam Separation
- Gas/Oil Gathering Systems
- Flowlines
- Wellheads



**Steel/Primary Metals**

- Quench Lines
- De-Scaling
- Continuous Casters
- Steam
- Condensate
- Strippers
- Electro-Galvanizing

**Pulp and Paper**

- Bleaching Lines
- Black Liquor
- Green Liquor
- White Water
- Steam
- Chemical Recovery

**Power Generation**

- Steam
- Condensate
- Boiler Feed Pumps
- Cooling Towers
- Service Water Recirculators
- River Water Intake

**Petrochemicals**

- Ethylene
- Propylene
- Steam
- Reboilers
- Gases



**RUV TOP ENTRY BALL VALVE FEATURE**

**General Design Features**



















Design Features

- Top entry design
- Spring energized seats
- Metal or soft seated
- Double Block and Bleed
- Full or reduced bore
- Flanged or welded ends
- Anti blow out trunnion stem design
- Corrosion resistant low friction bearing
- Sealant injection fittings for emergency stem or seal sealing
- ISO5211 Mounting pad for actuator or gear operator
- Removable stem seals under full line pressure in fully opened or closed position
- Antistatic device for grounding of the ball, stem and body
- Self lubricated bearings
- In accordance with API 6D, API 6FA, BS 6755 and NACE 01-75 (latest edition)
- One piece body design



- 8" & larger valves are equipped with lifting lugs
- Trunnion supported design reduces operating torque
- Two sets of O-rings plus firesafe stem packing prevents leakage

**FUNCTIONS & FEATURES**

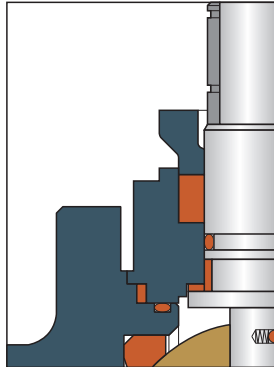
- |   |   |  |
|---|---|--|
|  1. Double block & bleed |  7. Special seat             |  13. Diversity of body materials      |
|  2. Safe release         |  8. Bonnet combined seal     |  14. Diversity of seat materials      |
|  3. Reliable seal        |  9. Draining                 |  15. Various kinds of control systems |
|  4. Fire safe            |  10. Extended stem           |  16. Reliable operation               |
|  5. Cleaning pipe        |  11. Various operations      |  17. Bearing pipe stress safety       |
|  6. Emergency seal       |  12. Various end connections |  18. Online maintenance               |

**RUV TOP ENTRY BALL VALVE FEATURE**

**Design Features**

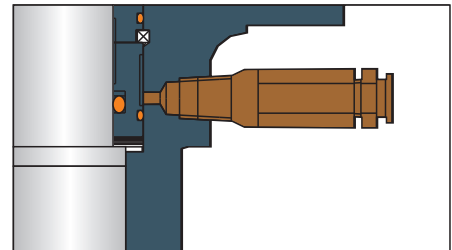
**Anti-Blowout Stem Design**

Stem seal integrity is achieved by the use of three o-rings (or two o-rings and a graphite gasket). Upper o-ring (or graphite gasket) can be replaced with the valve in line and under pressure.



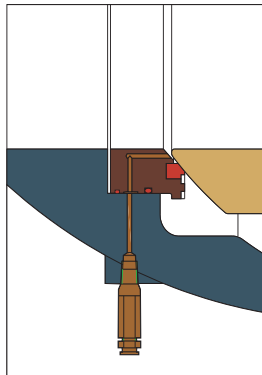
**Emergency Sealant Injection System**

The Sealant Injection System located on the Bonnet can be utilized in case of emergencies, o-ring damage, or if stem leakage occurs.



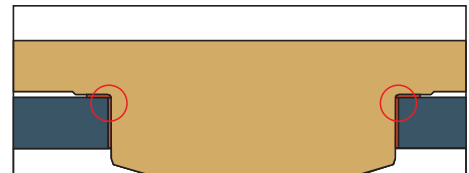
**Emergency Seat Seal**

Special sealants may be injected thru fittings that are located on the adapter flanges to restore sealing integrity if damaged. A second internal check valve provides backup to the fitting.



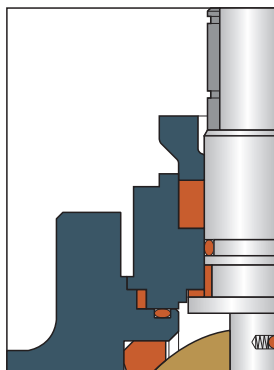
**Heavy Duty Bearings**

Trunnion are supported by heavy duty Teflon coated Steel Bearings. Thrust load on the ball is supported by large trunnions mounted within captured trunnion blocks, resulting in low operating torque and seat wear.



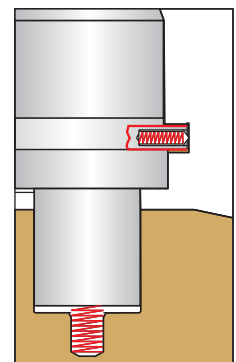
**Double Sealed Envelope Connections**

Double o-rings or a combination of an o-ring and fire safe gasket on body/ adapter connections to ensure positive sealing. This makes the P3 suitable for above or below ground service.



**Antistatic Device**

A spring between the trunnion and the ball or between the stem and the gland plate permits electrical continuity between all valve components.



**TECHNICAL SEATING FEATURES**

**Technical Seating Features**

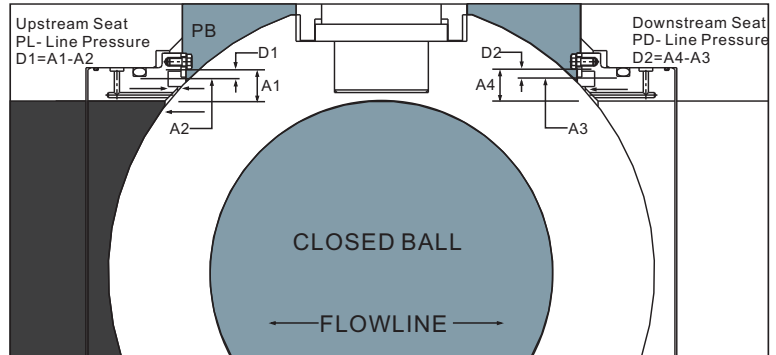
**Double Piston Seat Design**

**Upstream Seat:**

Line Pressure acting on the seat area (A1) does not equalize against the line pressure acting on the seat area (A2). The difference in the area (D1) times the line pressure creates “piston effect” force which pushes the seat against the ball surface resulting in a tight effective seal.

**Downstream Seat:**

When the body cavity pressure is greater than the downstream pressure, the body cavity pressure acts on the seal area (A4). The net pressure difference, acting over area (D2), pushes the downstream seat tightly against the ball creating a positive seal.



PB=Body Cavity Pressure

**THE ULTIMATE BENEFIT OF USING THE “DOUBLE PISTON SEAT” DESIGN:**

In case of upstream seat leakage, the downstream seat maintains a pressure assisted tight shut off by sealing against the ball surface.

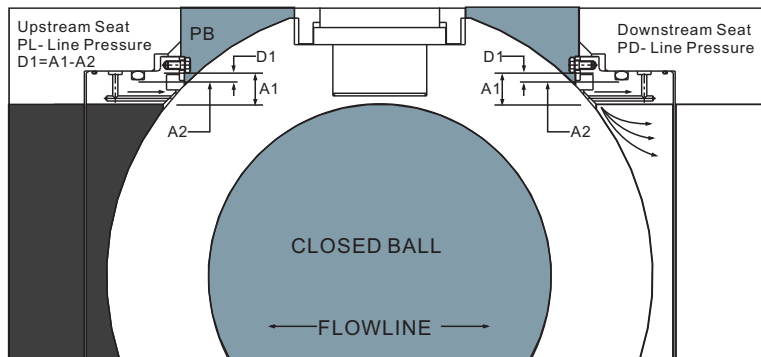
**Self Relieving Seat Design**

**Upstream Seat:**

The difference in the area (D1) times the line pressure creates a “piston effect” which forces the seat against the ball surface. Also the springs behind the seat adds the force to the seat which keeps the seat in contact with the ball surface by providing the tight seal.

**Downstream Seat:**

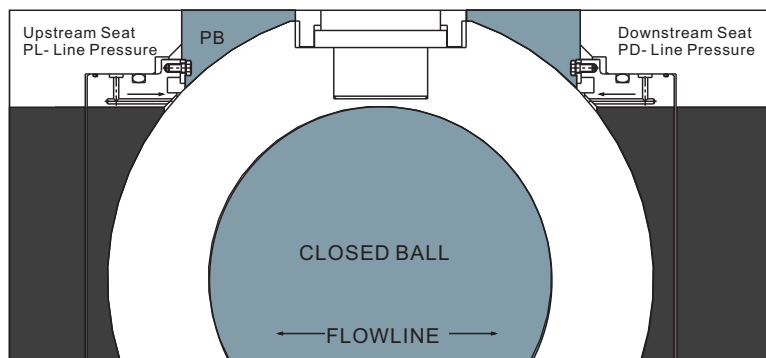
When the body cavity pressure exceeds the spring pressure, automatic pressure relief will occur by relieving the body cavity pressure past the downstream seat. This eliminates the need for the body relief valve.



PB=Body Cavity Pressure

**Double Block and Bleed**

The double block and bleed condition is available in all seat design configurations. When the ball is in the closed position the body cavity pressure may be drained down to ‘zero’ by opening the bleed valve and draining the fluid by removing the drain plug. Each seat works independently assuring tight shut off seal against ball on the upstream and downstream side.



PB=Body Cavity Pressure is Zero

Cavity Pressure is Drained or Vented to Atmosphere

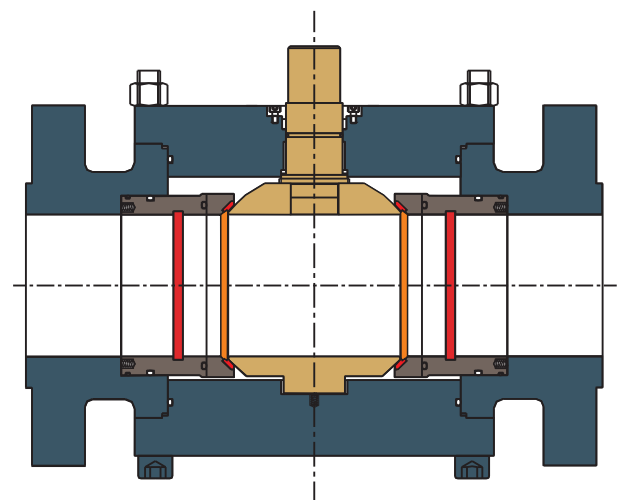
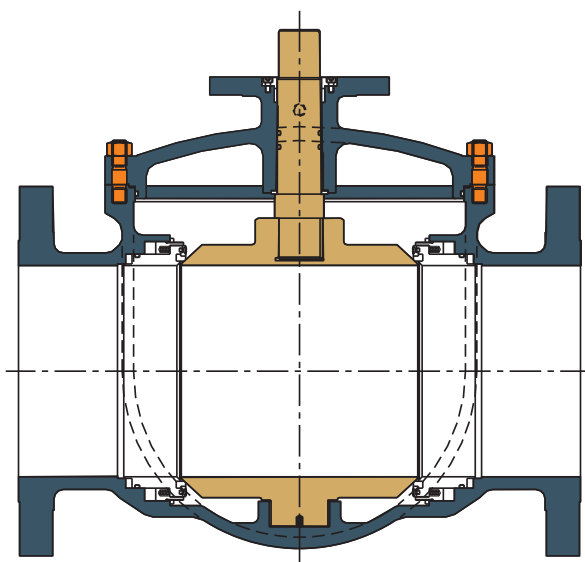


**RUV TOP ENTRY BALL VALVE ASSEMBLY DRAWING**

- Nominal Size (DN): 2 inches (50mm) up to 36 inches (900mm)
- Pressure Class (PN): ANSI 150 up to ANSI 1500
- Bore: full & reduced (Venturi type)
- Ends: butt weld, flanged, ring joint, butt weld by flanged
- Various configurations



**Top Entry Ball Valve**



◆ Assembly drawing

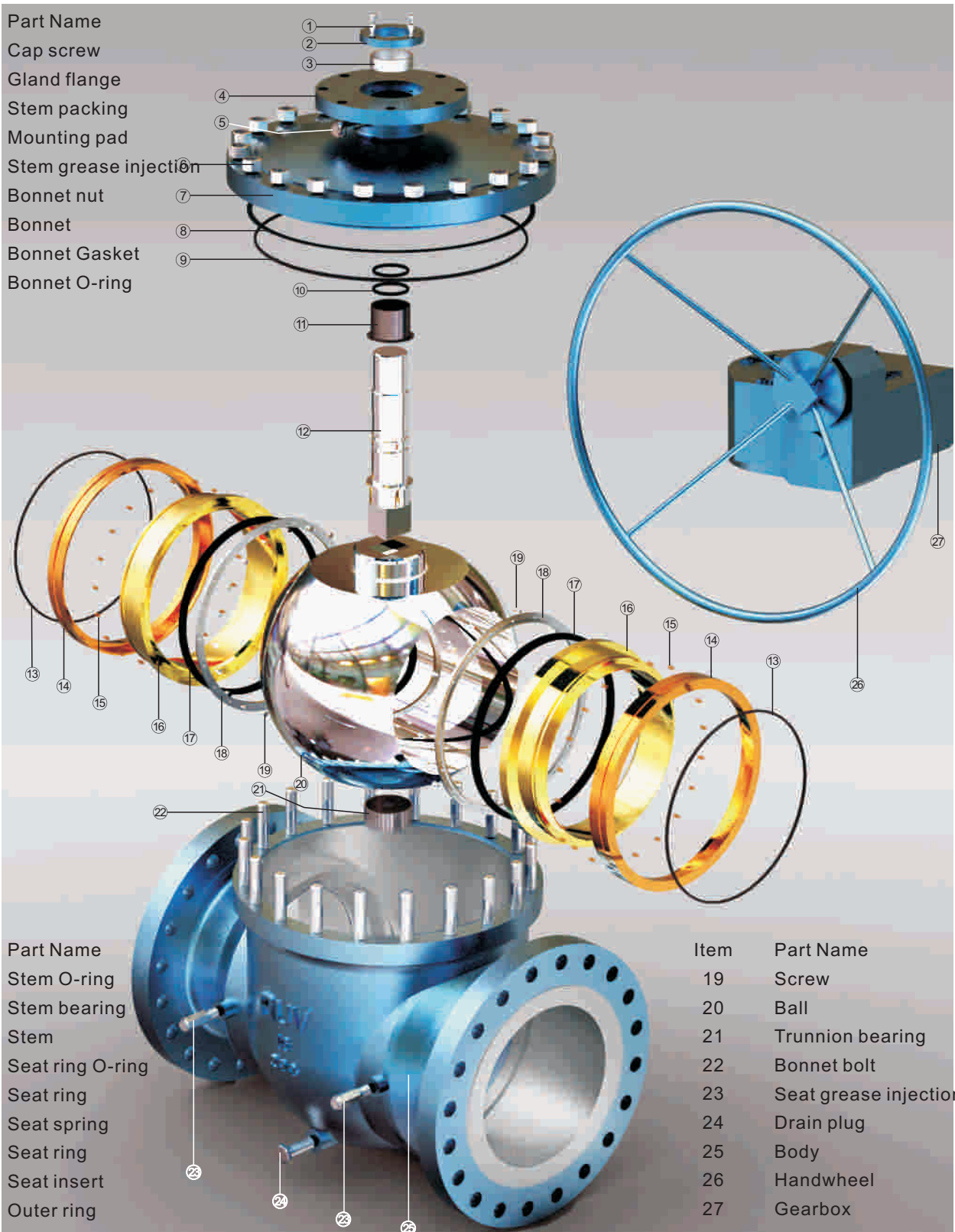


**DYNAMIC DRAWING**

**RUV API6D TOP ENTRY BALL VALVE**

Item Part Name

- 1 Cap screw
- 2 Gland flange
- 3 Stem packing
- 4 Mounting pad
- 5 Stem grease injection
- 6 Bonnet nut
- 7 Bonnet
- 8 Bonnet Gasket
- 9 Bonnet O-ring



Item Part Name

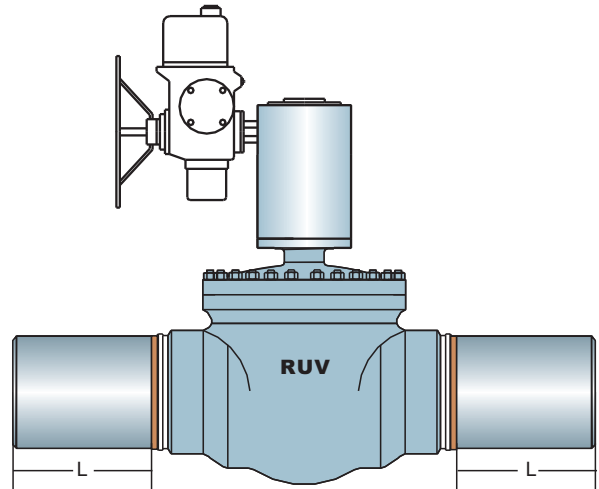
- 10 Stem O-ring
- 11 Stem bearing
- 12 Stem
- 13 Seat ring O-ring
- 14 Seat ring
- 15 Seat spring
- 16 Seat ring
- 17 Seat insert
- 18 Outer ring

Item Part Name

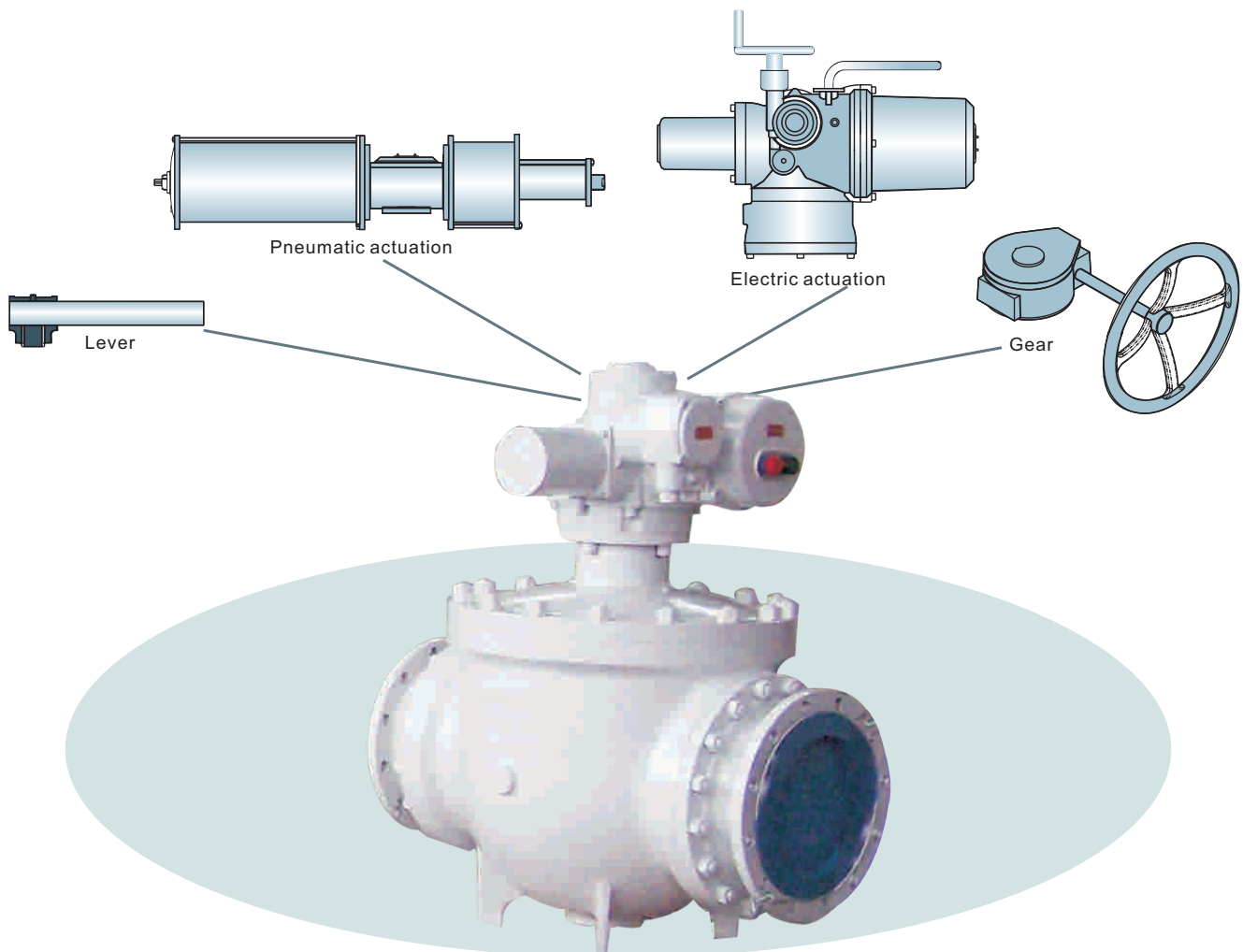
- 19 Screw
- 20 Ball
- 21 Trunnion bearing
- 22 Bonnet bolt
- 23 Seat grease injection
- 24 Drain plug
- 25 Body
- 26 Handwheel
- 27 Gearbox

**TRANSITION PUPS**

The Ball Valves can be furnished with transition pups of different length to facilitate the installation of valve and piping on site in accordance with existing standards.. Also the transition pups are required for welding between the valve and the pipeline. The transition piece length L is to be specified by the customer, including wall thickness and pipe specification.



**VARIOUS OPERATORS**



## MATERIALS FOR MAIN PARTS

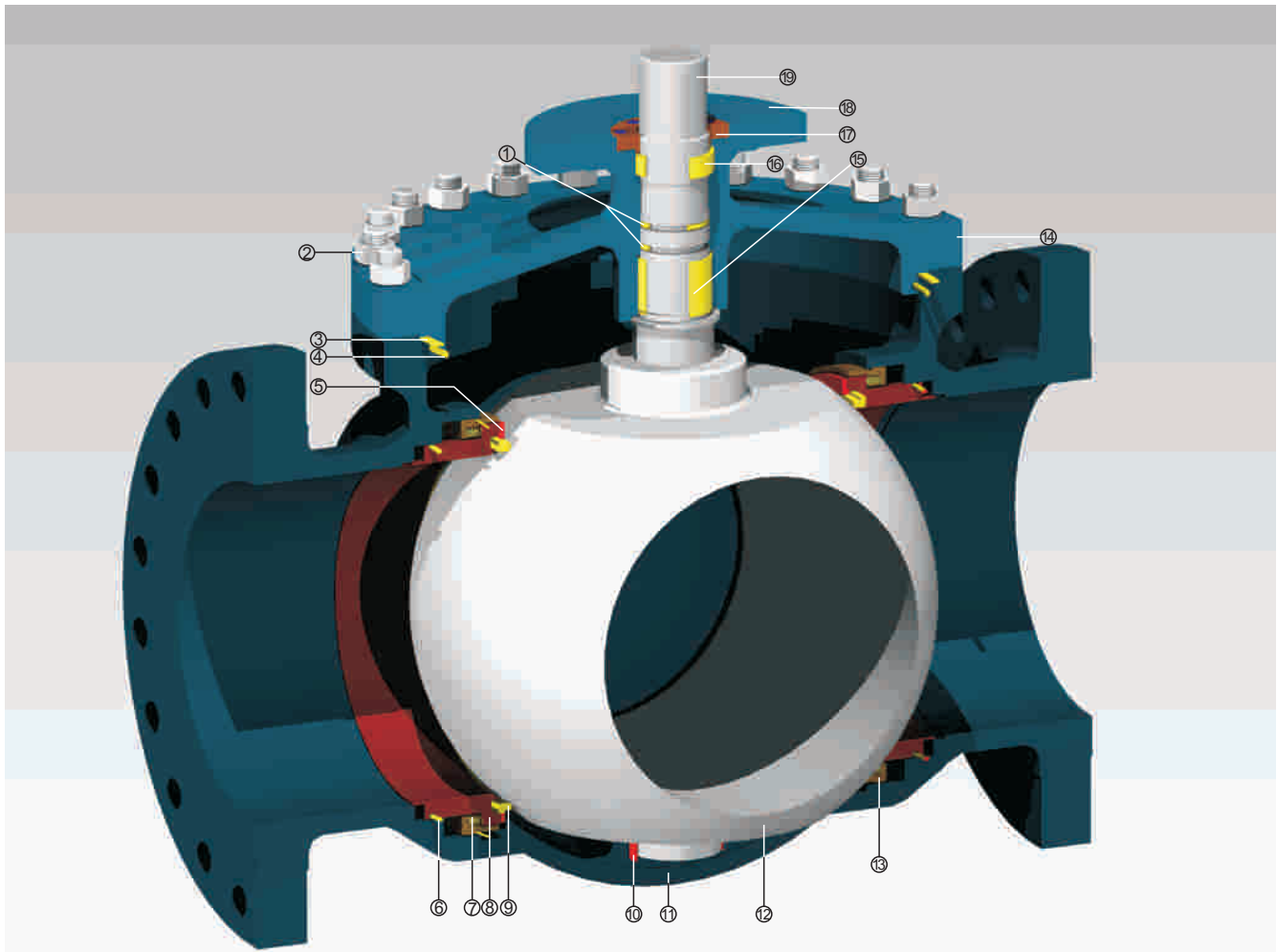
### MATERIALS FOR MAIN PARTS

Parts	C.S Series	NACE	S.S Series NACE		LCB、LCC Series
Body	WCB	WCB	CF8、CF3	CF8M、CF3M	LCB、LCC
	A216-WCB	A216-WCB	A135-CF8,CF3	A351-CF8M,CF3M	A352-LCB,LCC
Packing Gland	A105	A105	A182-F304,F304L	A182-F316,F316L	A182-F304
Ball	A105+ENP	A105+ENP			
	A105+HCr				LF2+ENP
	A182-F6a+HCr	A182-F6a+ENP	A182-F304,F304L+ENP	A182-F316,F316L+ENP	A182-F304+ENP
	A216-WCB+HCr	A216-WCB+ENP	A351-CF8,CF3+ENP	A351-CF8M,CF3M+ENP	A352-LCB,LCC+ENP
Stem	A182-F6a	A182-410+ENP	A182-F304,F304L	A182-F316,F316L	A182-F304
Seat Insert	PTFE/PPL/NYLON/VITON/PEEK/EPDM/DEVLON				
	PTFE for 150#, 300#; Nylon for 600#, 900#, 1500#,2500#; PPL/PEEK for high temperature				
Seat Retainer	A105-1025+Zn	A105-1025+ENP	A182-F304,F304L	A182-F316,F316L	A182-F304
Packing	PTFE/PPL/Graphite				
Gasket	PTFE/PPL/SS+Graphite				
Bearing	PTFE/PPL				
Spring	316SS/Inconel X-750/17-4PH/35-CrMo				
Stud	A193-B7	A193-B7M	A193-B8	A193-B8M	A320-L7/L7M
Nut	A194-2H	A194-2HM	A194-8	A194-8M	A194-7/7M

#### REMARKS:

1. All materials conform to ASTM standard.
2. Materials above conform to general standard. We can apply other materials according to valve working condition or customer's requirement. We also reserve the rights to improve the valve material according to relating standard.
3. Zn-Galvanized      ENP-Electroless Nickel Plated      Hcr-Electroless Hard Chrome Plated
4. Under-30°C (-22°F), working condition, the valve stem need to be extended.
5. For NACE working requirements, spring strength  $\leq$  HRC28, body hardness  $\leq$  HRC22.

**STRUCTURE**



Item	Part Name	Item	Part Name	Item	Part Name
1	Stem O-ring	8	Seat ring	14	Bonnet
2	Bonnet bolt & nut	9	Seat insert	15	Stem bearing
3	Bonnet gasket	10	Trunnion bearing	16	Stem packing
4	Bonnet O-ring	11	Body	17	Gland flange
5	Outer ring	12	Ball	18	mounting pad
6	Seat ring O-ring	13	Seat ring	19	Stem
7	Seat spring				

**P-T RATING**

The following table indicates rated values of temperature and pressure for main materials of valves. These valves are determined according to American standard ASME/ANSI B 16.34.

Temp.		Maximum Working Pressure																			
		150Lb				300Lb				400Lb				600Lb				900Lb			
°C	°F	A105,LF2		ASTM A182 F316		A105,LF2		ASTM A182 F316		A105,LF2		ASTM A182 F316		A105,LF2		ASTM A182 F316		A105,LF2		ASTM A182 F316	
		bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi
Up to	Up to																				
38	100	19.7	285	19	275	51	740	49.6	720	68.3	990	66.2	960	102	1480	99.3	1440	153.1	2220	148.9	2160
93	200	17.9	260	16.5	240	46.5	675	42.7	620	62.1	900	56.9	825	93.1	1350	85.5	1240	139.6	2025	128.2	1860
149	300	15.9	230	14.8	215	45.2	655	38.6	560	60.3	875	51.4	745	90.7	1315	77.2	1120	135.8	1970	115.8	1680
204	400	13.8	200	13.4	195	43.8	635	35.5	515	58.3	845	47.2	685	87.6	1270	71.0	1030	131	1900	106.2	1540
264	500	11.7	170	11.7	170	41.4	600	33.1	480	55.2	800	43.8	635	82.7	1200	65.8	955	123.8	1795	98.9	1435

Notes:

(1) Nominal P-T formula for CLASS 300 or higher pressure rating:

$$p_t = \frac{C_1 S_1}{9750} p_r \leq p_c$$

In this formula:

- $p_t$ ----Nominal working pressure, the specified materials in temperature t (bar) (psi);
- $p_c$ ----In temperature t, the maximum pressure specified in the standard (bar) (psi);
- $p_r$ ---- Nominal Pressure Rated. To Pressure  $\geq$  Class 300,  $p_r$ =Pressure Class Rate (for example: Class 300,  $p_r$ =300 );
- $C_1$ ----When  $S_1$  is Mpa,  $C_1$  is 10; when  $S_1$  is psi,  $C_1$  is 1;
- $S_1$ ----In temperature t, the chosen stress value of specified materials (Mpa) (psi).

(2) ASME B16.34---2004, it is including the flanged valve's nominal P-T rating in ASME B16.5---2003. In this standard, the way to fix the flanged valve's nominal P-T rating is basically similar to the ASME B16.5---2003, but it has a special pressure class formula.

$$p_{sp} = \frac{C_2 S_2}{7000} p_r \leq p_{cb}$$

In this formula:

- $p_{sp}$ ---- Nominal working pressure of special pressure rating, the specified materials in temperature t (bar) (psi);
- $p_{cb}$ ---- The Maximum Pressure of special pressure rating, in the specified temperature t according this standard (bar) (psi);
- $p_r$ ---- Nominal Pressure rating. To Pressure  $\geq$  Class 300,  $p_r$ =Pressure Class Rate , for example, Class 300,  $p_r$ =300, Class 150,  $p_r$ =155, to the pressure between Class 150 to Class 300, need use Class 150  $p_r$ =115 to replenish.
- $C_2$ ---- When  $S_2$  is Mpa,  $C_2$  is 10, when  $S_2$  is psi,  $C_2$  is 1;
- $S_2$ ---- In temperature t, the chosen stress value of specified materials (Mpa)

**MAXIMUM WORKING TEMPERATURE OF SHELL MATERIALS**

Materials	Standard No.	Max. Working Temperature/°C	Materials	Standard No.	Max. Working Temperature/°C
LCB	ASTMA352	340	WC6	ASTMA217	593
LC3	ASTMA352	340	WC9	ASTMA217	649
M35-1	ASTMA494	400	CF8M	ASTMA351	649
WCB	ASTMA216	425	CF8	ASTMA351	649
CN7M	ASTMA351	425	CW6M	ASTMA494	649
CF3M	ASTMA351	454	C5	ASTMA217	649
C12	ASTMA487	482	N7M	ASTMA494	649
CA6NM	ASTMA487	482	CA15	ASTMA217	704

**DIMENSIONS**

Ratings: Carbon Steel

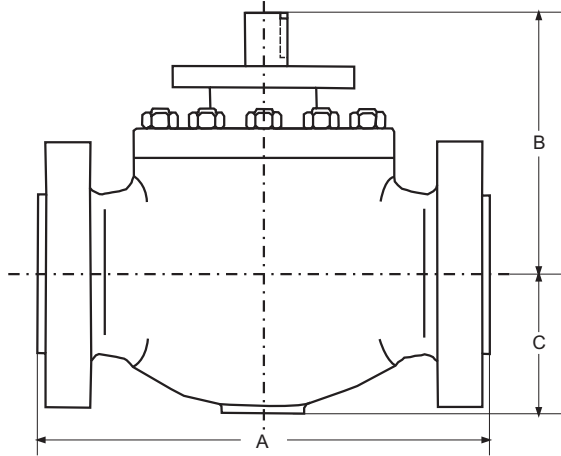
Class 150-275 p.s.i. @ 100°F-Seat PTFE + Graphite

Class 300-720 p.s.i. @ 100°F-Seat PTFE + Graphite

Class 600-1440 p.s.i. @ 100°F-Seat Nylon + Graphite

Class 900-2160 p.s.i. @ 100°F-Seat Nylon

Class 1500-3600 p.s.i. @ 100°F-Seat Nylon



**Class 150-300-600-900-1500**

**FULL BORE-TOP ENTRY BALL VALVE**

Integral flanges - End to End According to API 6D Flange Dimensions to ANSI B16.5

FULL BORE	DN	50		80		100		150		200		250		300		350		400		450		500		500		
		IN	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Class 150	A	178	11.5	203	14.0	229	17.0	394	22.0	457	26.0	533	31.0	610	24.0	686	27.0	762	30.0	864	34.0	914	36.6	1067	42.0	
Class 300	A	216	11.5	283	14.0	305	17.0	403	22.0	502	26.0	568	31.0	648	25.5	762	30.0	838	33.0	914	36.0	991	39.0	1143	45.0	
Class 600	A	292	11.5	356	14.0	432	17.0	559	22.0	660	26.0	787	31.0	838	33.0	889	35.0	991	39.0	1092	43.0	1194	47.0	1397	55.0	
Class 900	A	371	14.6	384	15.1	460	18	613	24.0	740	29.0	841	33.0	968	38.0	1038	40.5	1140	44.5	1232	48.0	1334	52.0	1568	62.0	
Class 1500	A	371	14.6	473	18.6	549	21.6	711	28.0	841	32.7	1000	39.0	1146	44.5	1276	49.5	1407	54.5	-	-	-	-	-	-	
Center to Top	Class 150	B	142	5.6	142	5.6	219	8.6	202	7.9	295	11.6	338	13.3	460	18.1	480	18.9	540	21.2	580	22.8	715	28.1	780	30.7
	Class 300	B	142	5.6	142	5.6	219	8.6	202	7.9	295	11.6	338	13.3	465	18.3	545	21.4	600	23.6	620	24.4	734	28.9	780	30.7
	Class 600	B	174	6.9	205	8.1	276	10.8	338	13.3	409	16	469	18.5	440	17.3	505	19.9	590	23.2	700	27.5	775	30.5	840	33.1
	Class 900	B	221	8.7	240	9.4	294	11.6	366	14.4	417	16.4	480	18.9	438	17.2	545	21.4	650	25.6	675	26.6	790	31.1	915	36.0
	Class 1500	B	221	8.7	297	11.7	330	13.0	414	16.3	437	17.2	502	19.8	533	21.0	626	24.6	725	28.5	-	-	-	-	-	-
Center to Bottom	Class 150	C	105	4.1	105	4.1	151	5.9	184	7.3	274	10.8	318	12.5	310	12.2	340	13.4	385	15.2	428	16.8	545	21.5	655	25.8
	Class 300	C	105	4.1	105	4.1	151	5.9	184	7.3	274	10.8	318	12.5	325	12.8	430	16.9	470	18.5	510	20.1	500	19.7	600	23.6
	Class 600	C	123	4.8	148	5.8	178	7.0	242	9.5	310	12.2	363	14.3	320	12.6	340	13.4	410	16.1	445	17.5	510	20.1	640	25.2
	Class 900	C	163	6.4	170	6.7	201	7.9	300	11.8	310	12.2	363	14.3	410	16.1	370	14.6	420	16.5	417	24.3	725	28.5	831	32.7
	Class 1500	C	163	6.4	200	7.8	247	9.7	329	13.0	340	13.4	381	15.0	438	17.2	498	19.6	460	18.1	-	-	-	-	-	-

**Class 150-300-600-900-1500**

**FULL BORE-TOP ENTRY BALL VALVE**

Integral flanges - End to End According to API 6D Flange Dimensions to ANSI B16.5

REDUCED BORE	DN	80*50		100*80		150*100		200*150		250*200		300*250		350*300		400*350		450*400		500*450		600*550		
		IN	3"*2"	4"*3"	6"*4"	8"*6"	10"*8"	12"*10"	14"*12"	16"*12"	18"*14"	20"*16"	24"*20"	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
Class 150	A	203	11.1	229	12.0	394	15.5	457	18.0	533	21.0	610	24.0	686	27.0	762	30.0	864	34.0	914	36.6	1067	42.0	
Class 300	A	283	11.1	305	12.0	403	15.9	502	19.7	568	22.4	648	25.5	762	30.0	838	32.9	914	35.9	991	39.0	1143	45.0	
Class 600	A	356	14.0	432	17.0	559	22.0	660	26.0	787	31.0	838	33.0	889	35.0	991	39.0	1092	43.0	1194	47.0	1397	55.0	
Class 900	A	384	15.1	460	18.1	613	24.1	740	29.1	841	33.1	968	38.0	1038	40.5	1140	44.5	1230	48.0	1334	52.0	1568	61.9	
Class 1500	A	473	16.3	549	21.6	711	28.0	841	33.1	1000	39.0	1146	44.5	1276	49.5	1407	54.5	-	-	-	-	-	-	
Center to Top	Class 150	B	142	5.6	195	7.7	219	8.6	202	7.9	295	10.2	338	13.3	460	18.1	480	18.9	540	21.3	580	22.8	715	28.1
	Class 300	B	142	5.6	195	7.7	219	8.6	202	7.9	295	10.2	338	13.3	465	18.3	545	21.5	600	23.6	620	24.4	734	28.9
	Class 600	B	174	6.9	205	8.1	276	10.8	338	13.3	409	16.1	469	18.5	440	17.3	505	19.9	590	23.2	700	27.6	775	31.5
	Class 900	B	221	8.7	240	9.4	294	11.6	366	14.4	417	16.4	480	18.9	438	17.2	540	21.5	650	25.6	675	26.7	790	31.1
	Class 1500	B	221	8.7	297	11.7	330	13.0	414	16.3	437	17.2	502	19.8	533	21.0	626	24.6	-	-	-	-	-	-
Center to Bottom	Class 150	C	105	4.1	125	4.9	151	5.9	184	7.3	274	10.8	318	12.5	310	12.2	340	13.4	385	15.2	428	16.9	545	21.5
	Class 300	C	105	4.1	125	4.9	151	5.9	184	7.3	274	10.8	318	12.5	325	12.8	430	16.9	470	18.5	510	20.1	500	19.7
	Class 600	C	123	4.8	148	5.8	178	7.0	242	9.5	310	12.2	363	14.3	320	12.6	340	13.4	410	16.1	445	17.5	510	20.1
	Class 900	C	163	6.4	170	6.7	201	7.9	300	11.8	310	12.2	363	14.3	410	16.1	370	14.6	420	16.5	617	24.3	725	28.5
	Class 1500	C	163	6.4	200	7.8	247	9.7	329	13.0	340	13.4	381	15.0	438	17.2	498	19.6	-	-	-	-	-	-

For detail of larger size and pressure, please contact to RUV technical department.

**TEST PROCEDURE**

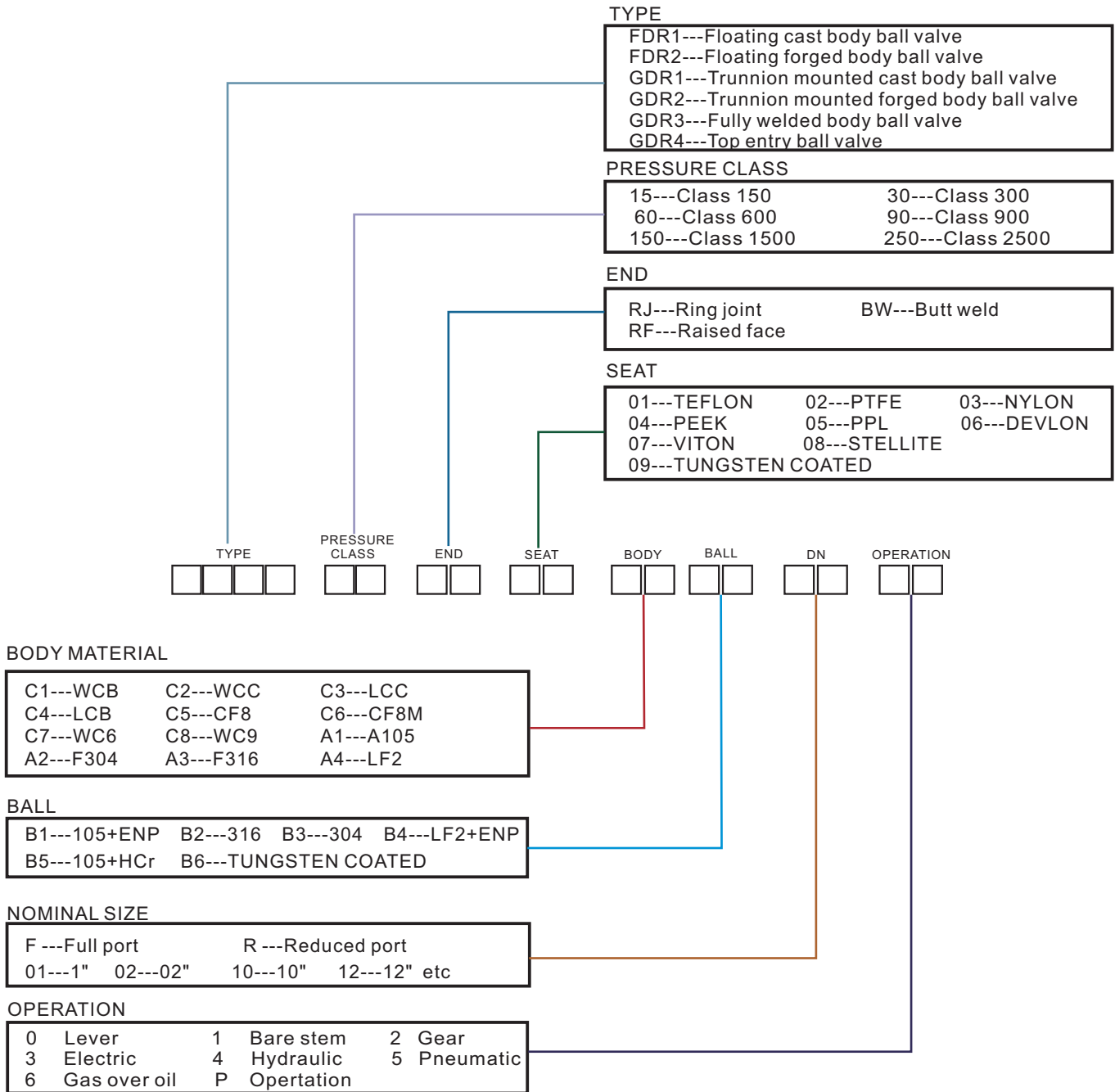
**ROCKY UNION TOP ENTRY BALL VALVE TEST PROCEDURE**

HYDROSTATIC SEAL TEST API6D 10.3 and 10.4						
Sequence		Area Pressure		Duration(min)		Description
SHELL TEST		A	1.5x PN	6 " -10 "	5	1. Valve in partial open. 2. Set the pressure to 150% PN. 3. Reduce the pressure to 50% PN. 4. Reset the pressure to 150% PN. 5. Hold the pressure for the duration of testing.
		B	1.5xPN	12 " -18 "	15	
		C	1.5xPN	20 " -60 "	30	
SEAT TEST		A	1.1xPN	5	5	Seat hydro seal test at A end toawrds body B
		B	Atmospheric			
		C	Atmospheric			
		A	Atmospheric	5	5	Seat hydro seal test at C end toawrds body B
		B	Atmospheric			
		C	1.1xPN			
		A	1.1xPN	5	5	Seat hydro seal test for both A and C DBB
		B	Atmospheric			
		C	1.1xPN			
AIR SEAL TEST API6D 10.4						
SEAT TEST		A	Atmospheric	5	5	Seat air seal test at A end toawrds body B
		B	Atmospheric			
		C	80PSIG(5.5bar)			
		A	80PSIG(5.5bar)	5	5	Seat air seal test at C end toawrds body B
		B	80PSIG(5.5bar)			
		C	Atmospheric			

PN=Nominal Pressure    Green=Liquid    Red=Air



## HOW TO SPECIFY RUV BALL VALVES



### EXAMPLES

F D R 1 1 5 R F 0 4 A 1 B 1 F 02 P 0

Floating ball valve, Class 150, Raised face, with seat of PEEK and body materials constructed using A105, Ball constructed with 105+ENP, full port, nominal size 2 inch, operated by lever.

G D R 4 6 0 R F 0 2 C 1 B 3 F 08 P 2

Top entry ball valve, Class 600, Raised face, with seat of PTFE and body materials constructed using WCB, Ball constructed with materials of 304, Full port, nominal size 8 inch, operated by gearbox.

# **WE MAKE FOR RELIABILITY**

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### Special Statement

ROCKY UNION is always committed to provide high quality products and efficient service to our customers, At the same time, we have always strictly abided by the provisions of the state; abided by the relevant international rules. And we also abide by the business and professional ethics, making effort to providing employees safety, healthy, environmental work environment.