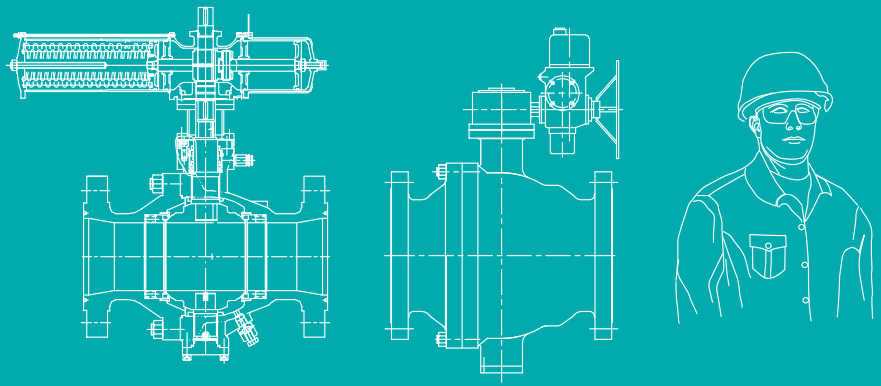
CE-PED OHSAS 18001:2007 ISO 9001:2008

RUV

API6D BALL VALVE

FDR/GDR SERIES

FDR Floating Ball Valve GDR Trunnion Mounted Ball Valve CAB-17-01



ROCKY UNION

BALL VALVE

Floating Ball Valve

Trunnion Mounted Ball Valve

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.

RUV BALL VALVE STANDARD

Rocky Union valves are designed, manufactured and tested in accordance with API, ANSI and ASME requirements. The following list contains the most important applicable standards. Rocky Union valves may be produced in accordance with other 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)

RUV BALL VALVE PRODUCTS RANGE

- VALVE BALL SUPPORTING

Floating ball valve		Trunnion Mounted ball valve	
Size	1/2 " to 8 "	Size	2 " to 42 "
Pressure	150# , 300#	Pressure	150#/300#/600# 900#/1500#/2500#
Temperature	-46℃ to 500℃	Temperature	-46℃ to 500℃

- VALVE SEALING METHOD

Soft seated ball valve		Metal to metal seated ball valve	
Size	1/2 " to 42 "	Size	2 " to 24 "
Pressure	150#/300#/600# 900#/1500#/2500#	Pressure	150#/300#/600# 900#/1500#/2500#
Temperature	-46℃ to 150℃	Temperature	-46℃ to 500℃

- VALVE BODY CONNECTION

Bolted body		Fully welded body	
Size	1/2 " to 42 "	Size	6 " to 48 "
Pressure	150#/300#/600# 900#1500#/2500#	Pressure	300#/600# 900#/1500#
Temperature	-46℃ to 500℃	Temperature	-46℃ to 150℃

- VALVE BALL ENTRY THE BODY TYPE

Side entry ball valve		Top entry ball valve	
Size	1/2 " to 42 "	Size	2 " to 24 "
Pressure	150#/300#/600# 900#/1500#	Pressure	150#/300#/600# 900#/1500#
Temperature	-46℃ to 500℃	Temperature	-46℃ to 500℃

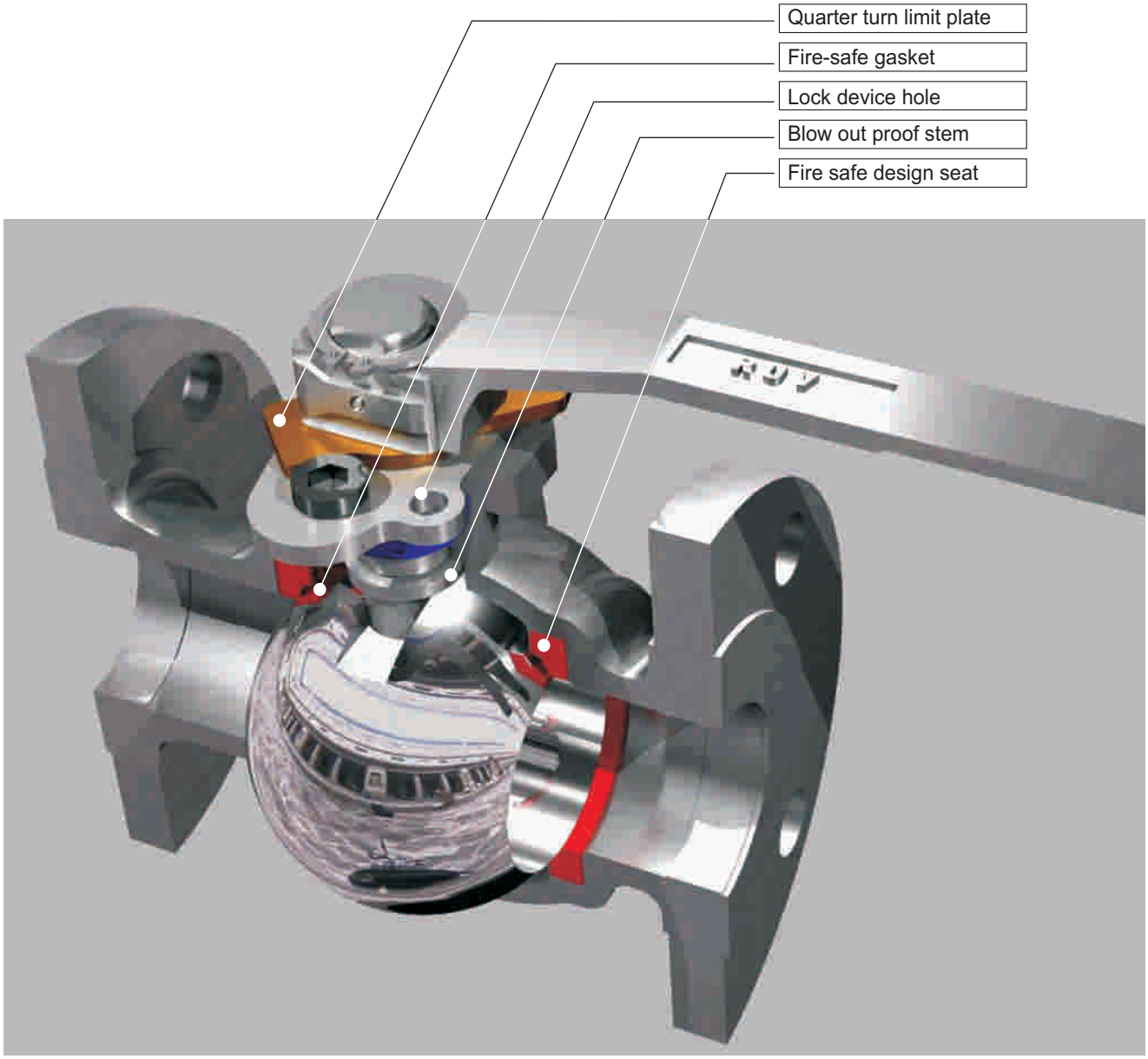
- VALVE OPERATION

Handle/Lever	Gear Box
Electric actuation	Hydraulic actuation
Pneumatic actuation	Gas Over Oil actuation

RUV valves can be configured to match the general working conditions of our customers as shown above. And the following descriptions are for valves that are most commonly used in the industry. Upon request RUV can manufacture valves to meet any customer specifications that may be required.

FDR-1 FLOATING BALL VALVE FEATURE

Rocky Union FDR type floating ball valve has multi ways safety design, keep the pipe and working equipments in a safety protection. Especially keep the valuable human lives in safer working condition.



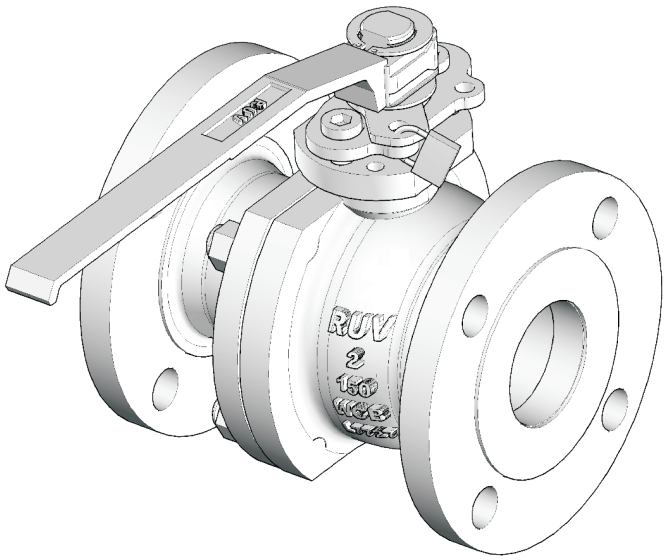
Functions & features

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

FDR-1 FLOATING BALL VALVE FEATURE

ROCKY UNION FDR TYPE FLOATING BALL VALVE

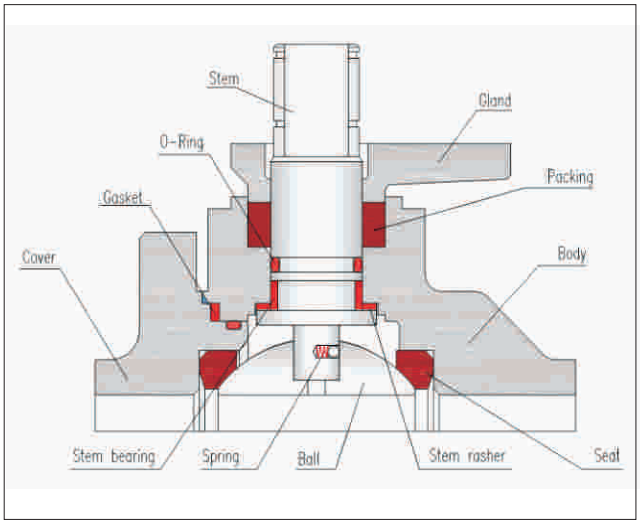
Content	Specification
General design standard	API6D/API608
Pressure-temperature rating	ASME B16.34
Face to face dimensions	ASME B16.10
Flange type and dimensions	ASME B16.5
Butt-welded end	ASME B16.25
Inspection and test	API6D/API598



FLOATING BALL VALVE FEATURES

● BLOW OUT-PROOF STEM CONSTRUCTION

The lower end of stem is terraced and is installed from the inside of the valve body. This construction insures a blow out proof stem and metal to metal seal in case of fire.

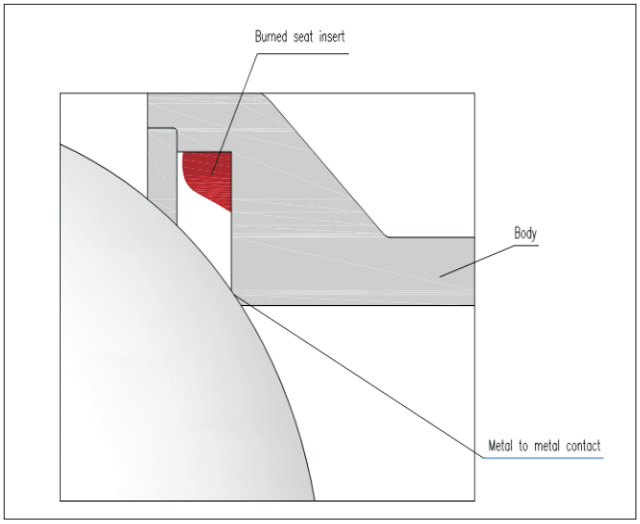


● ANTISTATIC DESIGN

During operation of valve, static electricity may accumulate on the ball. The special antistatic device can discharge the static electricity during opening and closing of the valve.

● FIRE-SAFE DESIGN: API607/API6FA

Each possible leaking part between Ball and Body,Middle flange, Stem and body are designed for metal to metal contact which conforms to the fire-proof requirements of API 6FA and API 607. In case of extreme fire-proof conditions, the packing and gasket material shall be flexible graphite to insure zero leakage.



● ADVANCED AND EXCLUSIVE SEAT DESIGN

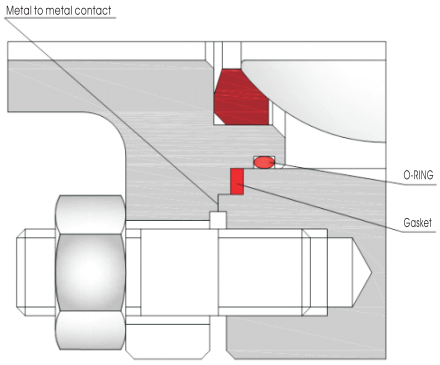
With many years of Ball Valve manufacturing experience and advanced technology from abroad, the cone sealing surface developed, makes the sealing more reliable. Our designs are available with various types of seat materials that offer low friction and low operational torque.

FDR-1 FLOATING BALL VALVE FEATURE AND MATERIALS

● MIDDLE FLANGE WITH NO LEAKAGE DESIGN

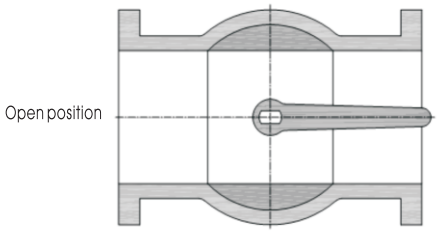
(Body and Cap connection)

Body and Cap connection are sealed by gaskets. To prevent leakage from fire, high temperature or vibrations, metal to metal sealing between the body and cap is maintained.



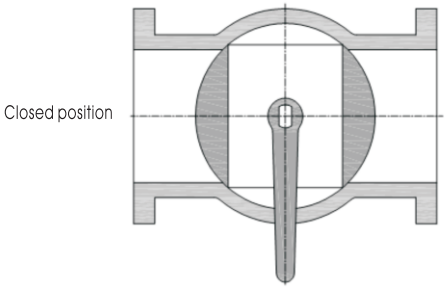
● WRENCH WITH VALVE OPEN/CLOSE INDICATION

When the handle(lever) is on the same horizontal line with the pipe, this indicates the valve is at open position. When the handle(lever) is on the vertical line with the pipe, this indicates the valve is at closed position.



● LOCKING DEVICE

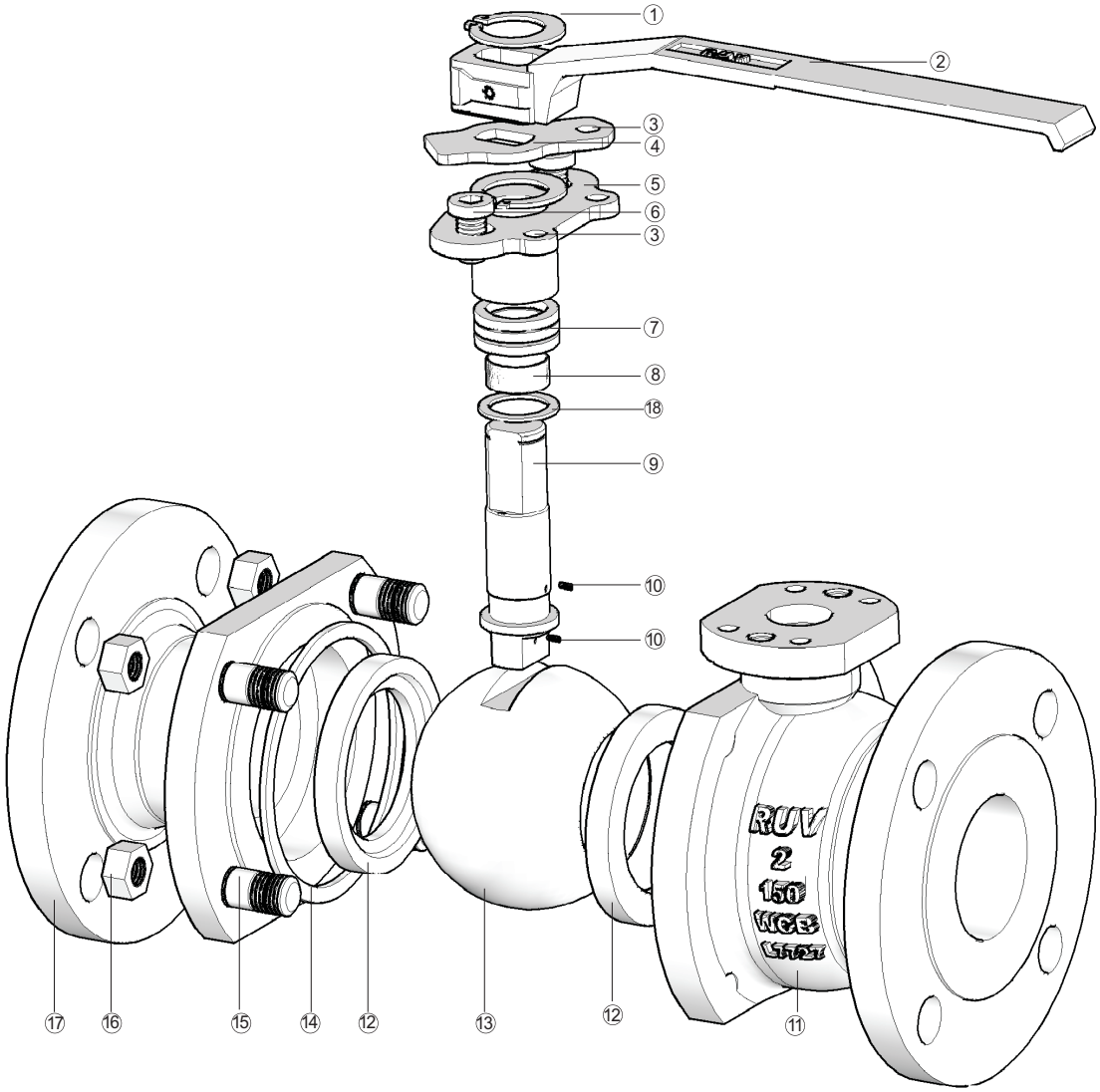
The valve is equipped with locking holes for the lever in the full open and full closed position, to prevent accidental opening and closing of the valve.



MATERIALS FOR THE PARTS

Part	CS Series	Sulfur-proof Series	SS. Series NACE		LCC, LBB Series
	WCB	WCB	CF8、CF3	CF8M、CF3M	LCB、LCC
Body	A216-WCB	A216-WCB	A351-CF8, CF3	A351-CF8M, CF3M	A352-LCB, LCC
Ball	A105+HCR/ENP	A105+ENP	A182-F304, F304L	A182-F304, F304L	A182-F304+HCR
Stem	A182-F6A	ANSI 4140	A182-F304, F304L	A182-F316L	A182-F304
Seat Insert	PTFE (standard) /PPL(high temperature)/PEEK/EPDM/VITON/DEVLON				
Packing	PTFE / PPL/Graphite				
Gasket	PTFE / PPL/SS+Graphite				
Bearing	PTFE / PPL				
Stud	A193-B7	A193-B7M	A193-B8	A193-B8M	A320-L7/L7M
Nut	A194-2H	A194-2HM	A194-8	A194-8M	A194-7/7M

FDR-1 FLOATING BALL VALVE DYNAMIC DRAWING



Item	Part Name	Item	Part Name	Item	Part Name
1	Snap ring	7	Packing	13	Ball
2	Lever	8	Bearing	14	Gasket
3	Locking hole	9	Stem	15	Bolt
4	Limited plate	10	Antistatic spring	16	Nut
5	Packing gland	11	Body	17	Bonnet
6	Gland bolt	12	Seat	18	Thrust washer

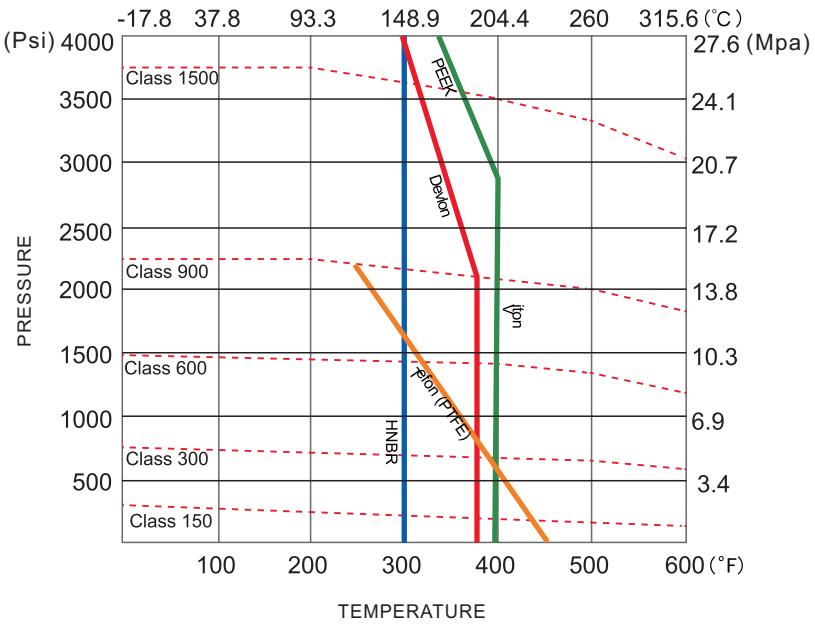
FDR-1 FLOATING BALL VALVE P-T RATING

PRESSURE-TEMPERATURE 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 B16.34

Temp		Max. Working Pressure											
		150Lb		300Lb		400Lb		600Lb		900Lb		1500Lb	
℉	℃	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M
Up to	Up to	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar
100	38	19.7	19	51	49.6	68.3	66.2	102	99.3	153.1	148.9	255.5	248.2
200	93	17.9	16.5	46.5	42.7	62.1	56.9	93.1	85.5	139.6	128.2	232.7	213.4
300	149	15.9	14.8	45.2	38.6	60.3	51.4	90.7	77.2	135.8	115.8	226.1	192.7
400	204	13.8	13.4	43.8	35.5	58.3	47.2	87.6	71	131	106.2	218.6	177.2
500	264	11.7	11.7	41.4	33.1	55.2	43.8	82.7	65.8	123.8	98.9	206.5	164.8

The RUV soft seated trunnion mounted ball valve P-T rating is not only related to the body material, but also related to the material of seat, packing and gasket. Sealing material is made of macromolecule, asbestos or rubber. And the selection of sealing material is depended upon the medium of the valve, valve working temperature, pressure and velocity of flow.
As the P-T rating is varied on different valve working conditions, the following P-T rating value is calculated out by stable valve working condition.



LOW TEMPERATURE LIMITS

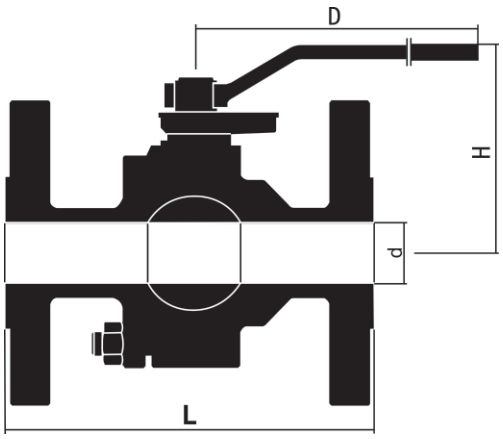
Body Material	°F	°C
WCB	-20	-29
LCB	-50	-46
CF8M	-50	-254

Seal Material	°F	°C
Teflon(PTFE)	-50	-100
Viton	-20	-29
Peek	-50	-100

Seal Material	°F	°C
Devlon V	-50	-40
HNBR	-50	-46

FDR-1 FLOATING BALL VALVE DIMENSIONS

FLOATING BALL VALVE DIMENSIONS



FULL BORE TYPE

CLASS 150 Dimensions

DN	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"
d	13	19	25	38	49	62	74	100	125	150	201
L	108	117	127	165	178	191	203	229	356	394	457
H	63	75	95	115	120	155	165	200	220	295	355
D	130	130	160	230	230	380	400	450	700	750	900
Wt(Kg)	2.5	4	7	10	12	15	22	33	50	70	200

CLASS 300 Dimensions

DN	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	5"	6"	8"
d	13	19	25	38	49	62	74	100	125	150	201
L	140	152	165	191	216	241	283	305	381	403	502
H	63	75	95	115	120	155	165	200	220	295	355
D	130	130	160	230	230	400	400	600	750	800	950
Wt(Kg)	4	7	9	11	14	19	25	40	75	105	225

CLASS 600 Dimensions

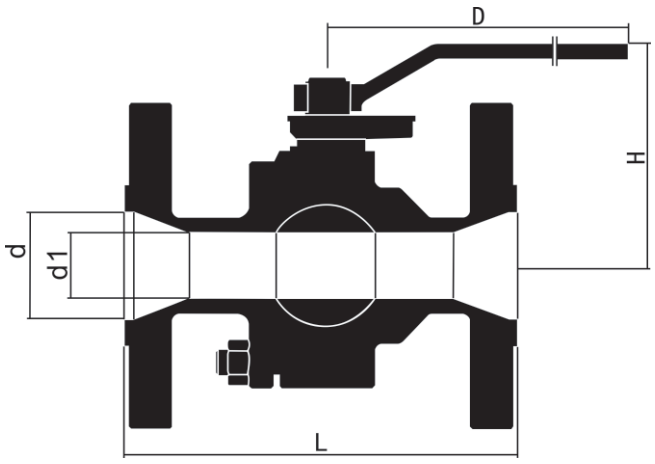
DN	1/2"	3/4"	1"	1 1/2"
d	13	19	25	38
L（RF）	16 5	1 90	216	241
H	105	108	130	135
D	160	160	230	230
Wt (Kg)	4.5	8	11	13

CLASS 900/1500 Dimensions

DN	1/2"	3/4"	1"	1 1/2"
d	13	19	22	38
L（RF）	216	229	254	305
H	115	115	122	157
D	160	230	230	400
Wt (Kg)	7	11	14	16

FDR-1 FLOATING BALL VALVE DIMENSIONS

FLOATING BALL VALVE DIMENSIONS



REDUCED BORE TYPE

CLASS 150 Dimensions

DN	2"	2 1/2"	3"	4"	5"	6"	8"	10"
d	49	62	74	100	125	150	201	252
d1	38	49	62	74	100	125	150	201
L	178	191	203	229	254	394	457	533
H	115	120	155	165	200	220	295	355
D	230	230	400	400	500	780	900	950
Wt (Kg)	10.5	12	20	30	45	65	175	310

CLASS 300 Dimensions

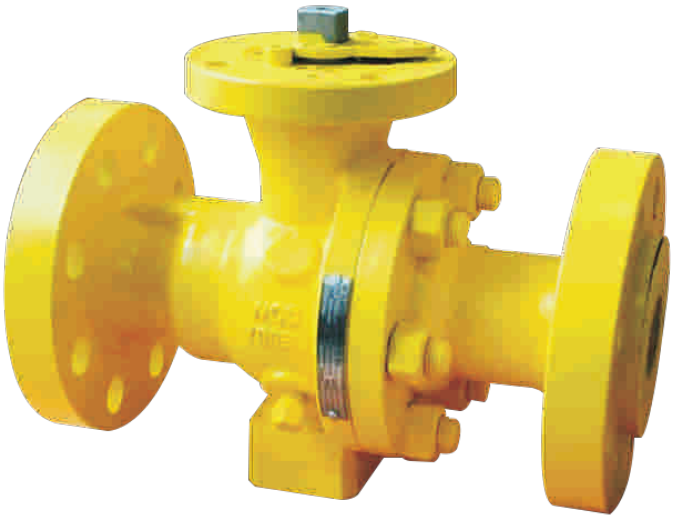
DN	2"	2 1/2"	3"	4"	5"	6"	8"	10"
d	49	62	74	100	125	150	201	252
d1	38	49	62	74	100	125	150	201
L	216	241	283	305	381	403	502	568
H	115	120	155	165	200	260	295	355
D	230	230	400	400	650	800	900	950
Wt (Kg)	13.5	16.5	22	37.5	65	90	155	330

Cv value

Right chart is the flow ratio of floating ball. Cv indicates the gallons of water at temperature +60°F flowing through the valve bore in pressure differential down1Lbs/Inch2 (0.0068694757Mpa).

Cv			
Specification		Reduce Bore	Full Bore
Inch	Metric		
1/2"	15		25
3/4"	20		50
1"	25		100
1 1/2"	40		270
2"	50	165	490
2 1/2"	65	270	950
3"	80	350	1160
4"	100	550	2200
5"	125	670	3800
6"	150	765	5100
8"	200	1890	9300
10"	250	3900	

GDR-1 TRUNNION MOUNTED BALL VALVE FEATURE



ROCKY UNION GDR TYPE
TRUNNION MOUNTED BALL VALVE

Content	Specification
General design standard	API6D
Pressure-temperature rating	ASME B16.34
Face to face dimensions	AS ME B16.10
End Flange	ASME B16.5 ANSI B16.47
Butt-welded end	ASME B16.25
Inspection and test	API6D/API598

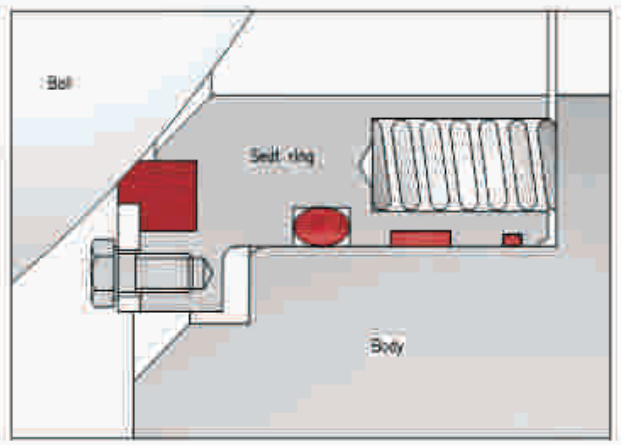
DESIGN FEATURE

- **UP STREAM SEALING TWO-WAY VALVE**

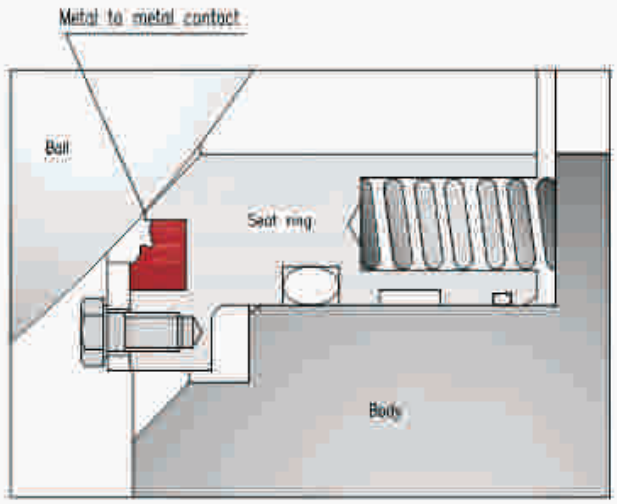
  RUV trunnion mounted ball valve has two seats on both side. Each seat has springs loaded and make seat insert contact the ball surface for sealing. So the valve is bi-directional sealing, and no limitation for installation.

- **FIRE-SAFE DESIGN API607/API6FA**

  When the seat inserts are softened and burnt in case of the fire or unusual temperature increase, the seat retainer, under the duty of the spring, will touch with the ball and form a metal-to-metal contact, which can prevent internal leak. Meanwhile, the middle flange and the upper part and lower part of the stem will form a metal-to-metal contact which can prevent external leak and conform to API6FA or API607.



Valve in normal working condition

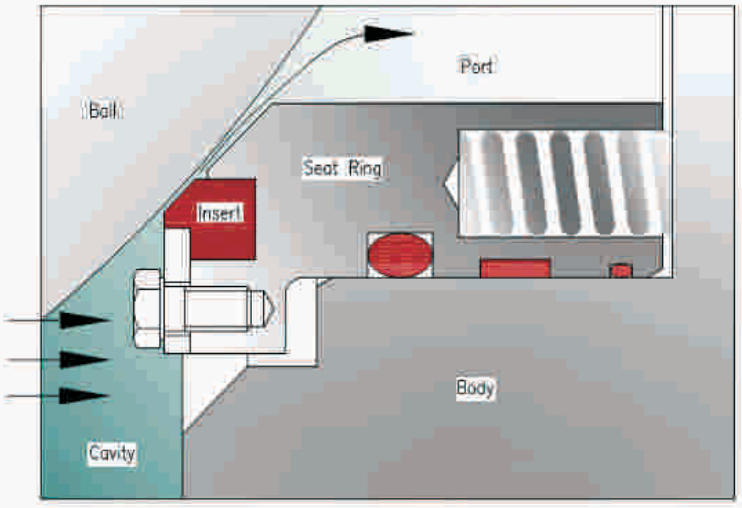


Valve after fire

GDR-1 TRUNNION MOUNTED BALL VALVE FEATURE

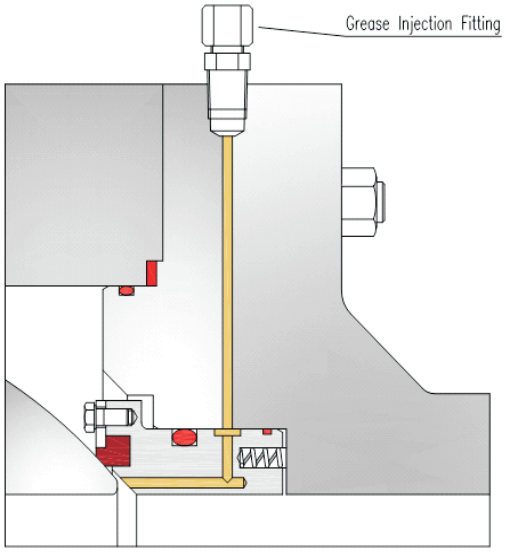
VALVE CAVITY PRESSURE AUTOMATIC RELIEF

When the body cavity pressure exceeds the seat springs pressure by the thermal expansion of the fluid trapped in valve cavity, automatic pressure relief will occur by relieving the body cavity pressure past the downstream seat.
Until an equilibrium, seat ring will move back to contact the ball surface as a “Piston Effect” seat.



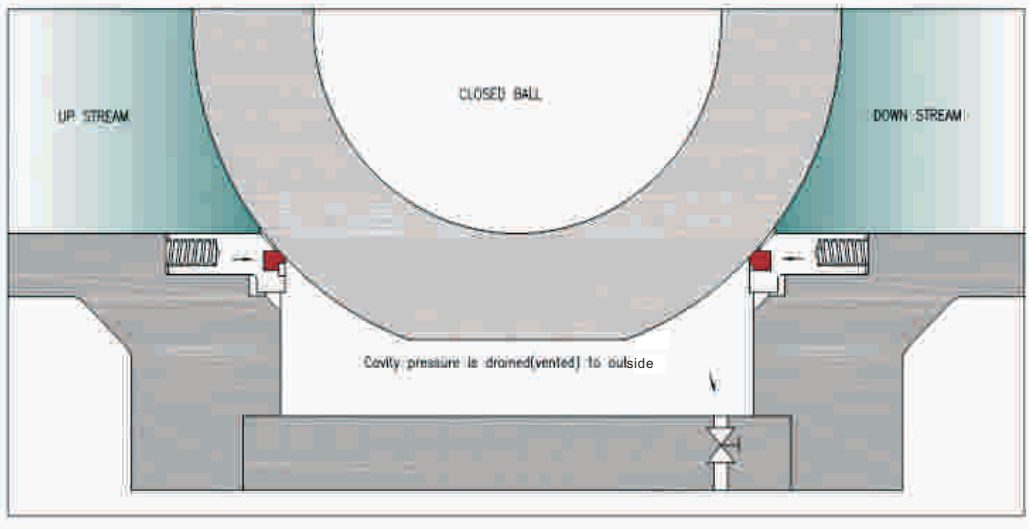
STEM AND SEAT EMERGENCY SEALANT INJECTION

The seat ring and the valve stem have a special grease injection valve. In case of the leakage, the grease will be injected to the valve ball surface and to the stem room, creates a temporary sealing.

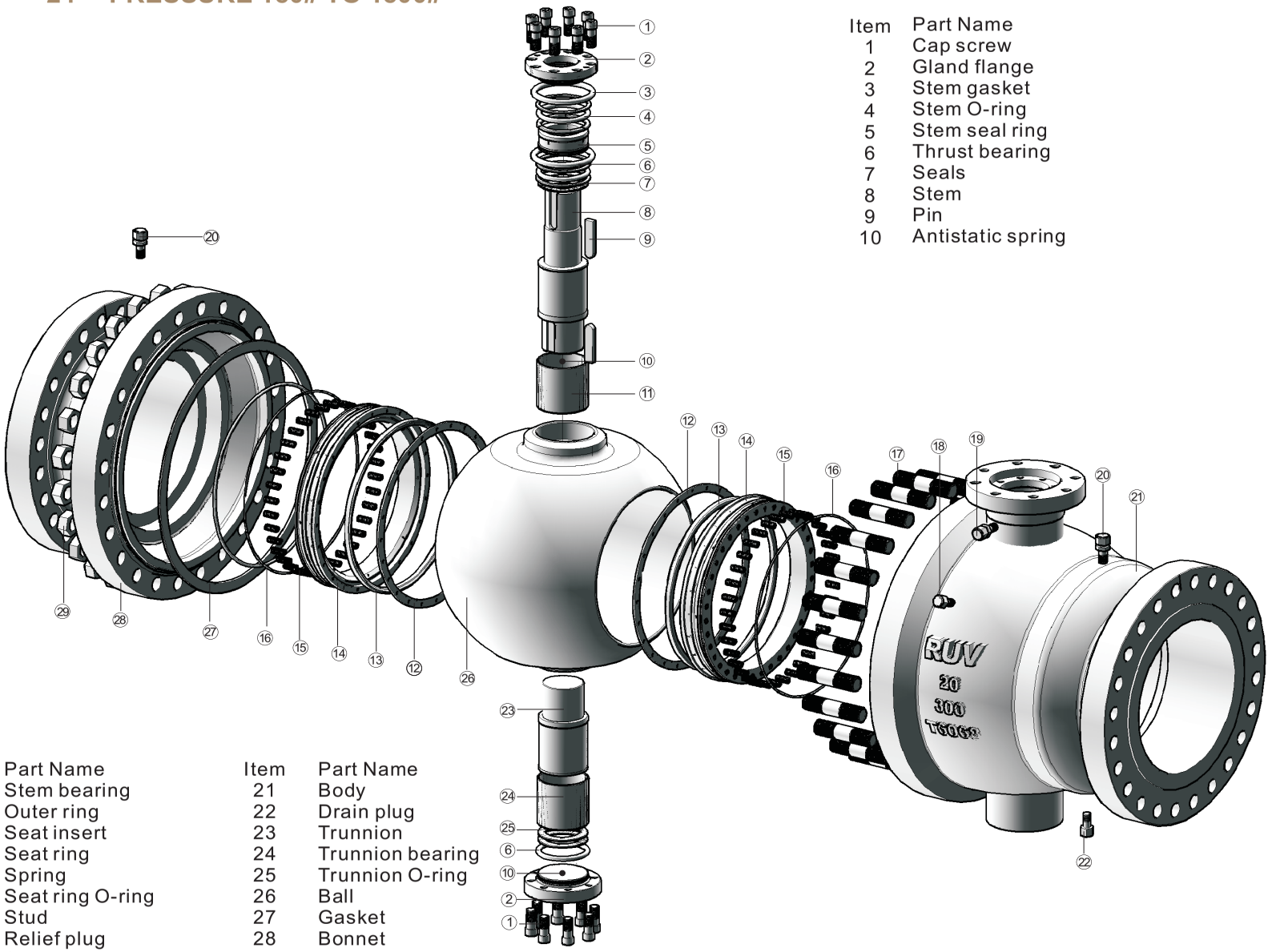


DOUBLE BLOCK AND BLEED DBB

The trapped cavity pressure can bleed out by vent fitting or drain plug when the valve is in fully open or fully closed position. The fluid is intercepted by seats of up stream and down stream side. So, the stem packing or O-ring may be replaced under working pressure. Each seat works independently assuring tight seal against ball on both upstream and downstream side.



ROCKY UNION GDR-1 TYPE
API6D TWO PIECES CAST STEEL BODY TRUNNION MOUNTED BALL VALVE
SIZE 2 " - 24 " PRESSURE 150# TO 1500#

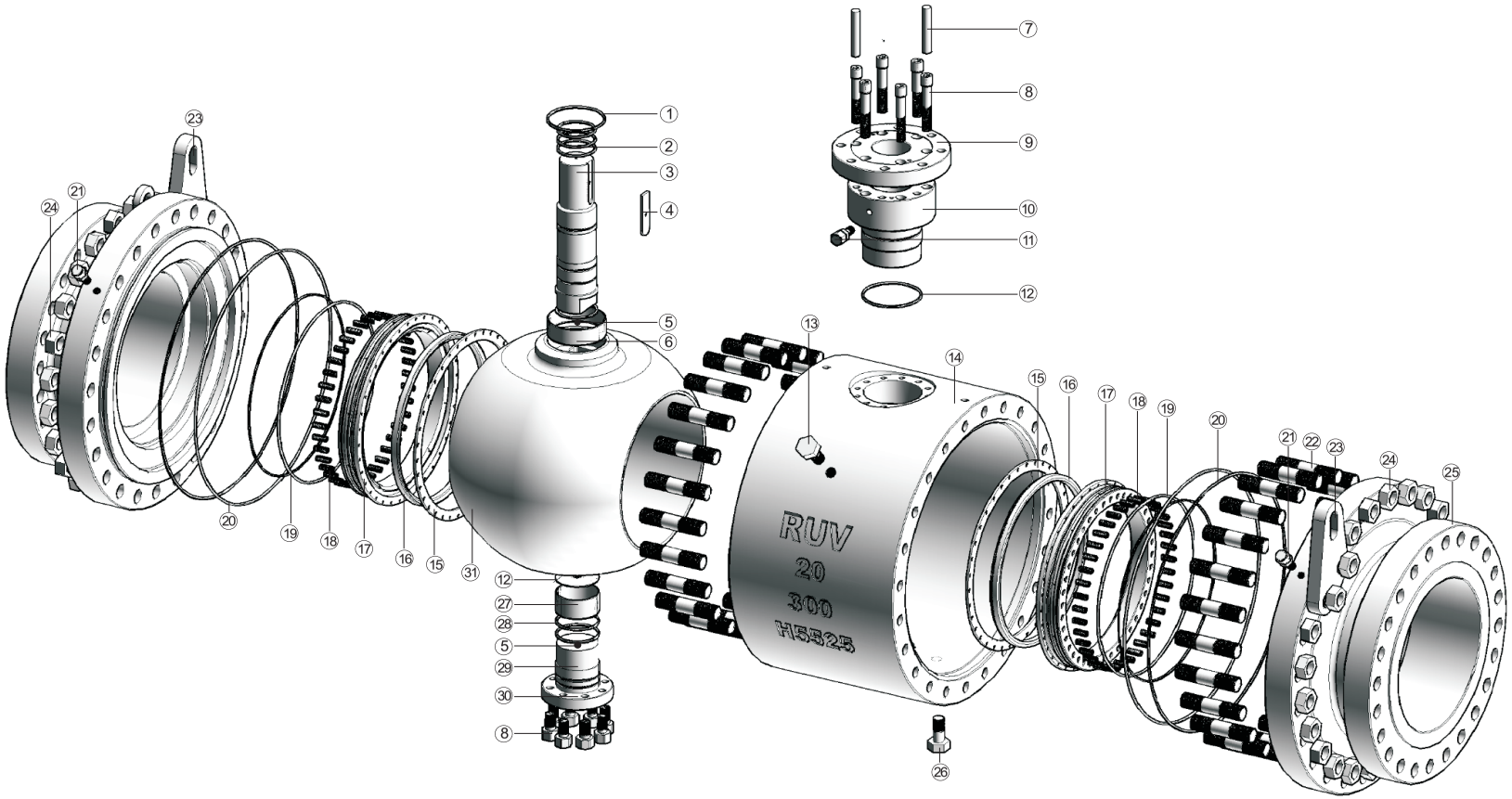


Item	Part Name
1	Cap screw
2	Gland flange
3	Stem gasket
4	Stem O-ring
5	Stem seal ring
6	Thrust bearing
7	Seals
8	Stem
9	Pin
10	Antistatic spring

Item	Part Name
11	Stem bearing
12	Outer ring
13	Seat insert
14	Seat ring
15	Spring
16	Seat ring O-ring
17	Stud
18	Relief plug
19	Stem grease injection
20	Seat grease injection

Item	Part Name
21	Body
22	Drain plug
23	Trunnion
24	Trunnion bearing
25	Trunnion O-ring
26	Ball
27	Gasket
28	Bonnet
29	Nut

ROCKY UNION GDR-2 TYPE
API6D THREE PIECES FORGED STEEL BODY TRUNNION MOUNTED BALL VALVE
SIZE 2 " - 40 " , PRESSURE 150# TO 1500#



Item	Part Name
1	Stem gasket
2	Stem O-ring
3	Stem
4	Pin
5	Antistatic spring
6	Stem bearing
7	Alignment pin
8	Cap screw
9	Adapter plate
10	Gland

Item	Part Name
11	Stem grease
12	Thrust bearing
13	Relief plug
14	Body
15	Outer ring
16	Seat insert
17	Seat ring
18	Spring
19	Seat ring O-ring
20	Gasket

Item	Part Name
21	Seat grease injection
22	Stud
23	Lift lug
24	Nut
25	Bonnet
26	Body drain plug
27	Trunnion bearing
28	Trunnion O-ring
29	Trunnion
30	Mounting plate
31	Ball

GDR-2 TRUNNION MOUNTED BALL VALVE MATERIALS

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℃(-22˚F), working condition, the valve stem need to be extended.
5. For NACE working requirements, spring strength ≤HRC28, body hardness≤HRC22.

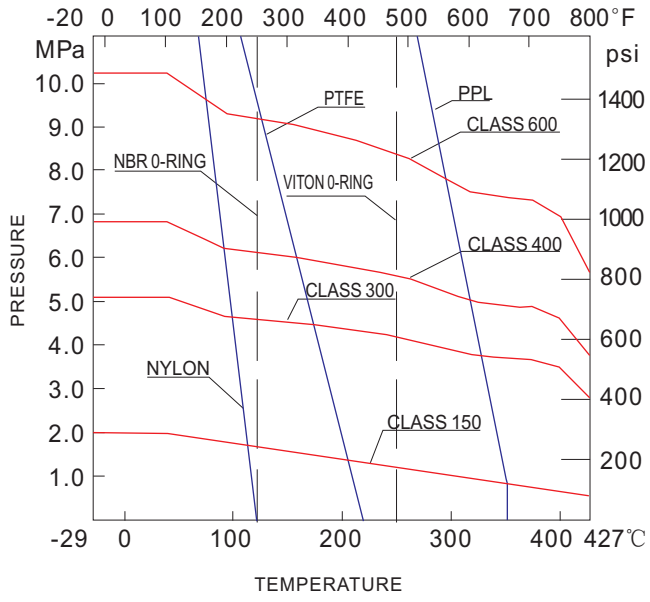
GDR-2 TRUNNION MOUNTED BALL VALVE P-T RAING

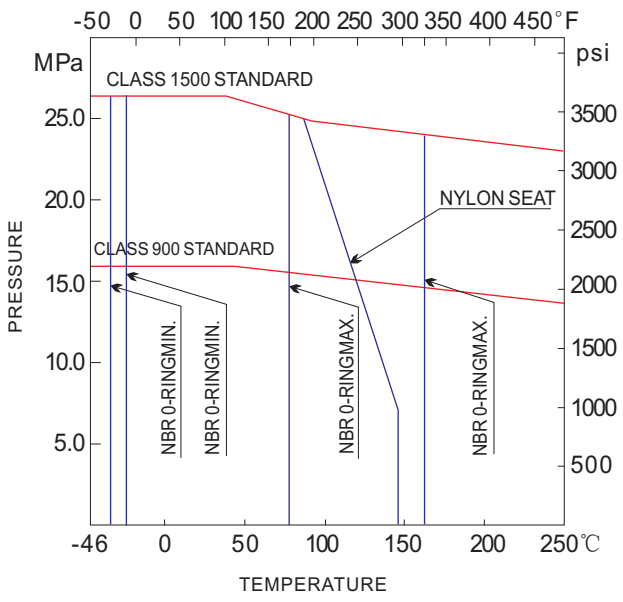
PRESSURE-TEMPERATURE RATING

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 B16.34

Temp		Max. Working Pressure											
		150Lb		300Lb		400Lb		600Lb		900Lb		1500Lb	
℉	℃	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M	WCB,LCB	CF8M
Up to	Up to	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar	bar
100	38	19.7	19	51	49.6	68.3	66.2	102	99.3	153.1	148.9	255.5	248.2
200	93	17.9	16.5	46.5	42.7	62.1	56.9	93.1	85.5	139.6	128.2	232.7	213.4
300	149	15.9	14.8	45.2	38.6	60.3	51.4	90.7	77.2	135.8	115.8	226.1	192.7
400	204	13.8	13.4	43.8	35.5	58.3	47.2	87.6	71	131	106.2	218.6	177.2
500	264	11.7	11.7	41.4	33.1	55.2	43.8	82.7	65.8	123.8	98.9	206.5	164.8

The RUV soft seated trunnion mounted ball valve P-T rating is not only related to the body material, but also related to the material of seat, packing and gasket. Sealing material is made of macromolecule, asbestos or rubber. And the selection of sealing material is depended upon the medium of the valve, valve working temperature, pressure and velocity of flow.
As the P-T rating is varied on different valve working conditions, the following P-T rating value is calculated out by stable valve working condition.

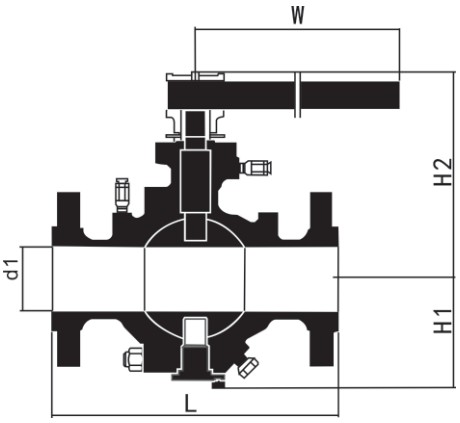


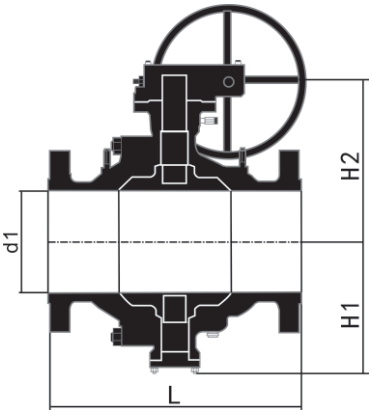


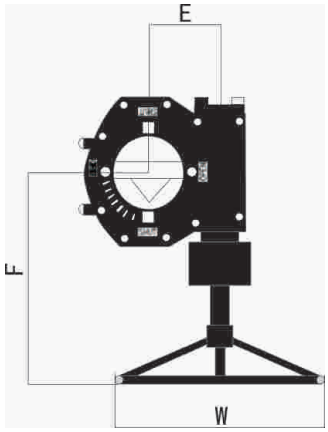
Note: The valve body material in the above chart is WCB. For other P-T rating of different body material, please refer to ASME B16.34 (lasted edition)

GDR-1 TRUNNION MOUNTED BALL VALVE DIMENSIONS

GDR-1 TRUNNION MOUNTED BALL VALVE







CLASS 150 Dimensions

DN		2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"
d1		49	62	74	100	125	150	201	252	303	334	385	436	487	589	684
L	RF	178	191	203	229	356	394	457	533	610	686	762	864	914	1067	1245
	BW	216	241	283	305	381	457	521	559	635	762	838	914	991	1143	1346
H1		102	114	127	152	184	219	273	360	395	430	470	550	580	700	800
H2		107	125	152	178	300	330	398	495	580	625	670	698	840	1050	1100
E		/	/	/	/	/	/	116	116	171	171	257	257	257	150	83
F		/	/	/	/	/	/	350	350	420	420	400	400	400	410	650
W		230	350	380	420	600	650	600	600	800	800	800	800	800	800	800
Wt (kg)		12	15	23	38	57	75	206	330	460	560	850	1290	1580	3500	4400

CLASS 300 Dimensions

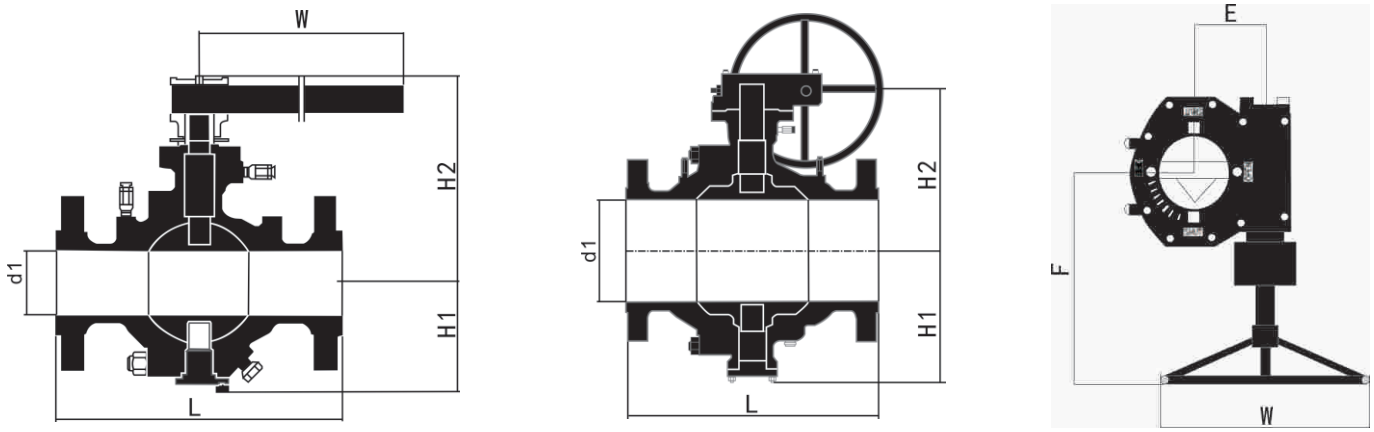
DN		2"	2 1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"	28"
d1		49	62	74	100	125	150	201	252	303	334	385	436	487	589	684
L	RF	216	241	283	305	381	403	502	568	648	762	838	914	991	1143	1346
	BW	216	241	283	305	381	457	521	559	635	762	838	914	991	1143	1346
H1		102	114	127	152	184	219	273	360	395	430	470	550	580	700	800
H2		107	125	152	178	300	330	398	495	580	625	670	698	840	1050	1100
E		/	/	/	/	/	/	116	116	171	171	257	257	257	150	83
F		/	/	/	/	/	/	350	350	420	420	400	400	400	410	650
W		230	400	400	600	650	700	600	600	800	800	800	800	800	800	800
Wt (kg)		14	22	27	50	82	110	250	365	530	620	980	1450	2000	4050	5150

CLASS 400 Dimensions

DN		2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	20"	24"	28"
d1		49	62	74	100	150	201	252	303	334	385	487	589	684
L	RF BW	292	330	356	406	495	597	673	762	826	902	1054	1232	1397
H1		295	333	359	410	498	600	676	765	829	905	1060	1241	1410
H2		114	124	133	159	250	294	395	445	500	530	660	800	900
E		168	155	197	235	300	374	445	512	550	615	810	1010	1180
F		/	/	/	/	116	171	171	257	257	257	150	83	123
W		/	/	/	/	350	420	420	400	400	400	410	650	735
Wt (kg)		20	30	45	85	175	330	610	840	950	1480	2700	5100	5500

GDR-1 TRUNNION MOUNTED BALL VALVE DIMENSIONS

GDR-1 TRUNNION MOUNTED BALL VALVE



● CLASS 600 Dimensions

DN		2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	20"	24"	28"
d1		49	62	74	100	150	201	252	303	334	385	487	589	684
L	RF&BW	292	330	356	432	559	660	787	838	889	991	1194	1397	1549
	RJ	295	333	359	435	562	664	791	841	892	994	1200	1407	1562
H1		114	124	133	159	250	294	395	445	500	530	660	800	900
H2		108	155	197	235	300	374	445	512	550	615	810	1010	1180
E		/	/	/	/	116	171	171	257	257	257	150	83	123
F		/	/	/	/	350	420	420	400	400	400	410	650	735
W		400	600	650	700	600	800	800	800	800	800	800	800	800
Wt(kg)		32	35	50	100	220	370	685	930	1650	1860	3150	5700	6550

● CLASS 900 Dimensions

DN		2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
d1		49	62	74	100	150	201	252	303	322	373	423	471	570
L	RF&BW	368	419	381	457	610	737	838	965	1029	1130	1219	1321	1549
	RJ	371	422	384	460	613	740	841	968	1038	1140	1232	1334	1568
H1		126	158	191	216	270	322	420	470	510	600	700	720	810
H2		217	241	259	297	360	394	502	572	675	762	866	894	956
E		/	116	116	116	171	171	257	169	42	42	72	72	91
F		/	350	350	350	420	420	400	573	696	696	745	745	830
W		650	600	600	600	800	800	800	700	700	700	700	700	700
Wt(kg)		45	52	70	110	255	420	745	1100	1700	1870	2850	3150	5700

● CLASS 1500 Dimensions

DN		2"	2 1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
d1		49	62	74	100	144	192	239	287	315	360	406	454	546
L	RF&BW	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	2043
	RJ	371	422	473	549	711	841	1000	1146	1276	1407	1559	1686	1972
H1		126	158	191	216	296	378	495	542	590	670	710	750	850
H2		217	241	259	297	365	475	578	696	761	831	900	950	1080
E		/	116	116	116	171	257	169	42	42	72	91	91	280
F		/	350	350	350	420	400	573	696	696	745	830	830	/
W		650	600	600	600	800	800	700	700	700	700	700	700	700
Wt(kg)		50	60	76	115	270	415	755	1150	1750	2020	3050	3250	5950

TRUNNION MOUNTED BALL VALVE Cv VALUE AND TORQUE

C_V VALUE

The following chart is the flow ratio of trunnion mounted ball valve.

c_v indicates the gallons of water at temperature +60° F flowing through the valve bore in pressure differential down 1LBS/inch^2 (0.0068694757MPA).

SIZE	CLASS150	CLASS300	CLASS600	CLASS900	CLASS1500
2"	500	470	400	360	360
3"	1300	1100	1000	1000	900
4"	2300	2200	1800	1800	1600
6"	5400	5400	4500	4300	4000
8"	10000	10000	8900	8400	7900
10"	17800	17100	14500	14000	13000
12"	26000	25000	22000	21000	19000
14"	32000	31000	28000	26000	24000
16"	44000	42000	39000	36000	33000
18"	58000	56000	51000	47500	42000
20"	75000	72000	66000	60000	52000
24"	111200	102000	92000	86000	81000
26"	123000	108000	98000	91000	
28"	143000	123000	12200	112000	

RUV GDR TRUNNION MOUNTED BALL VALVE TORQUE

Size		Unit	Class 150		Class 300		Class 400		Class 600		Class 900	
DN	IN		Formula	Torque at 20 bar	Formula	Torque at 50 bar	Formula	Torque at 64 bar	Formula	Torque at 100 bar	Formula	Torque at 150 bar
150	6	N.m	176+7.36P	355	176+7.36P	612	176+7.36P	712	176+7.36P	1008	569+9.46P	2243
200	8		415+11.6P	712	415+11.6P	1095	415+11.6P	1272	415+11.62P	2395	982+24.93P	5125
250	10		500+19.1p	970	552+25.4p	2005	552+25.4p	2396	552+25.4p	3401	1318+30.6p	6657
300	12		901+33.8p	1735	901+33.8p	2851	901+33.8p	3370	901+33.8p	4752	2384+5488p	12410
350	14		973+45p	2060	973+45p	7500	973+45p	4238	1287+61.7p	8155	2896+74.97p	16225
400	16		1582+77.3p	3441	1582+77.3p	5990	1582+77.3p	7182	1582+77.3p	11250	3789+103.4p	23410
450	18		1897+86p	3978	1897+86p	6816	1897+86p	8208	4907+97.3p	16220	4907+116.6p	25125
500	20		2385+108.8p	5017	2385+108.8p	7825	2385+108.8p	10355	5488+141.3p	23040	2385+108.8p	29965

1. This table of the torque is the valve breaking torque at maximum pressure differential, for choosing the operators.
2. Formula in the table can be used to calculate the stem torques at other pressure differential. Example: calculated stem torque of DN250, PN100 valve at 70bar pressure differential. The corresponding table can be used formula:552+25.4Xp, p=70, Torque=2330N.m
3. 50% Safety factor should be considered when choose the actuators.
4. All the datas above are just for reference. Contact RUV engineers to get actual datas.

TRUNNION MOUNTED BALL VALVE PIPE SIZE

CONNECTION PIPE INFORMATION

Pipe Description	Nominal Pipe Size(in.)						
	2	3	4	6	8	10	12
Outside Dia.(in.)	2.375	3.500	4.500	6.625	8.625	10.750	12.750
(STD)Standard	---	---	.237	.280	.322	.365	.375
Sch 40	.154	.216	.237	.280	.322	.365	.406
XS	.218	.300	.337	.432	.500	.500	.500
Sch 80	.218	.300	.337	.432	.500	.593	.687
Sch 160	.343	.438	.531	.718	.906	1.125	1.312
XXS	.436	.600	.674	.864	.875	1.000	1.000

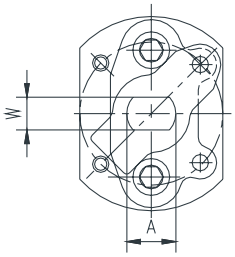
Pipe Description	Size(in.)					
	14	16	18	20	22	24
Outside Dia.(in.)	14.000	16.000	18.000	20.000	22.000	24.000
(STD)Standard	.375	.375	.375	.375	.375	.375
Sch40	.438	.500	.562	.593	---	.687
XS	.500	.500	---	---	.500	---
Sch80	.750	.843	.937	1.031	1.125	1.218---
Sch 160	1.406	1.593	1.781	1.968	---	2.343
XXS	---	---	---	---	---	---

CONNECTION PIPE OUTSIDE DIA.(O.D)

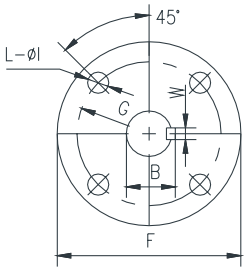
Size(in.)	In.	mm
2	2.375	60.33
3	3.500	88.90
4	4.500	114.30
6	6.625	168.28
8	8.625	219.08
10	10.750	273.05
12	12.750	323.85
14	14.000	355.60
16	16.000	406.40
18	18.000	457.20
20	20.000	508.00
24	24.000	609.60

TRUNNION MOUNTED BALL VALVE TOP WORKS AND STEM TORQUE

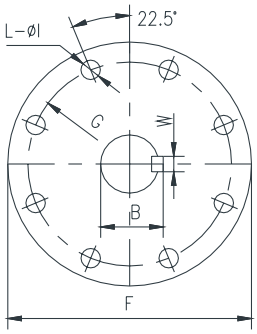
RUV BALL VALVE TOP WORKS AND STEM TORQUE



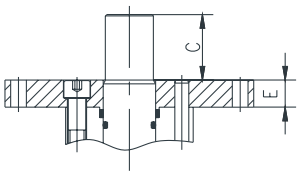
Valve Size:2"–4"



Valve Size:6"–8"

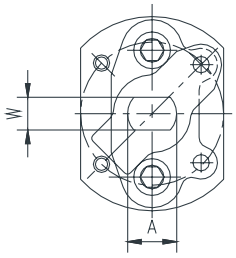


Valve Size:10"–24"

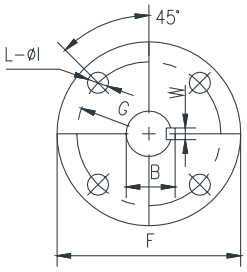


ANSI Class	Valve Size(in.)	A	B	C	E	F	G	I Hole Dia.	L No.of Holes	W	ISO5211 Mounting pad
150# 300#	2 "	0.787	- - - -	1.496	0.394	3.622	-----	- - - -	----	- - - -	F07
	3 "	1.024	- - - -	1.89	0.63	3.622	-----	- - - -	----	- - - -	F07
	4 "	1.339	- - - -	1.89	0.787	4.921	-----	- - - -	----	- - - -	F10
	6 "	1.732	- - - -	3.307	1.299	6.69	5.512	0.748	4	1.063	F14
	8 "	1.969	- - - -	2.598	1.732	8.268	6.496	0.906	4	0.551	F16
	10 "	1.969	2.106	2.598	0.984	8.268	6.496	0.906	8	0.551	F16
	12 "	2.52	2.74	3.268	1.201	11.811	10	0.748	8	0.709	F25
	14 "	2.52	2.74	3.268	1.299	11.811	10	0.748	8	0.709	F25
	16 "	2.953	3.173	4.522	1.299	11.811	10	0.748	8	0.787	F25
	18 "	2.953	3.173	4.522	1.299	11.811	10	0.748	8	0.787	F25
	20 "	3.346	3.646	4.522	1.575	11.811	10	0.748	8	0.945	F25
	24 "	3.937	4.276	5.433	1.417	13.78	11.732	0.906	8	1.102	F30

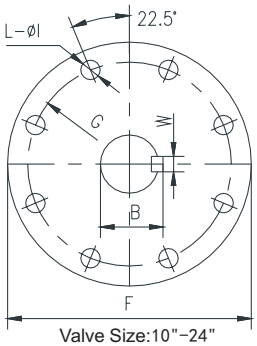
TRUNNION MOUNTED BALL VALVE TOP WORKS AND STEM TORQUE



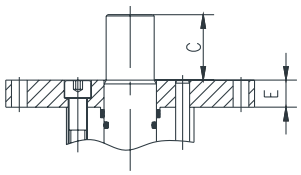
Valve Size:2"–4"



Valve Size:6"–8"



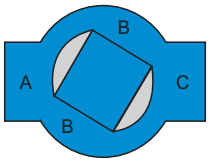
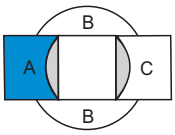
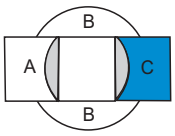
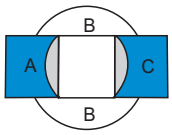
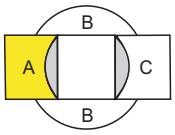
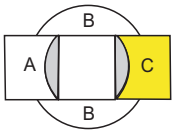
Valve Size:10"–24"



ANSI Class	Valve Size(in.)	A	B	C	E	F	G	I Hole Dia.	L No.of Holes	W	ISO5211 Mounting pad
600#	2 "	1.024	- - - -	1.89	0.394	3.543	2.756	0.315	4	0.669	F07
	3 "	1.339	- - - -	1.89	0.394	4.646	4.016	0.394	4	0.866	F10
	4 "	1.732	- - - -	3.346	1.22	6.89	5.512	0.748	4	1.063	F14
	6 "	1.969	- - - -	2.598	1.299	8.268	6.496	0.906	4	0.551	F16
	8 "	2.52	2.74	3.346	1.732	11.811	10	0.748	4	0.709	F25
	10 "	2.52	2.74	3.346	0.984	11.811	10	0.748	8	0.709	F25
	12 "	2.953	3.173	4.252	1.319	11.811	10	0.748	8	0.787	F25
	14 "	2.953	3.173	4.252	1.299	11.811	10	0.748	8	0.787	F25
	16 "	3.346	3.646	4.252	1.299	11.811	10	0.748	8	0.945	F25
	18 "	3.937	4.276	5.433	1.299	13.811	11.732	0.906	8	1.102	F30
	20 "	3.937	4.276	5.433	1	13.78	11.732	0.906	8	1.102	F30
	24 "	4.724	5.102	7.48	2.362	13.78	14.016	1.299	8	1.26	F35
900#	2 "	1.339	- - - -	1.89	0.394	4.724	4.016	0.394	4	0.866	F10
	3 "	1.732	- - - -	3.346	0.394	6.89	5.512	0.784	4	1.063	F14
	4 "	1.969	- - - -	2.598	1.22	8.268	6.496	0.906	4	0.551	F16
	6 "	1.969	- - - -	2.598	1.378	8.268	6.496	0.906	4	0.551	F16
	8 "	2.52	2.74	3.346	1.575	11.811	10	0.748	8	0.709	F25
	10 "	2.953	3.173	4.252	1.26	11.811	10	0.748	8	0.787	F25
	12 "	3.346	3.646	4.522	1.811	11.811	10	0.748	8	0.945	F25
	14 "	3.937	4.276	5.433	1.378	13.78	11.732	0.906	8	1.102	F30
	16 "	3.937	4.276	5.433	1	13.78	11.732	0.906	8	1.102	F30
1500#	2 "	1.339	- - - -	1.89	1.102	4.724	14.016	0.394	4	0.866	F10
	3 "	1.969	- - - -	2.598	1.181	8.268	6.496	0.906	4	0.511	F16
	4 "	1.969	- - - -	2.598	1.22	8.268	6.496	0.906	4	0.511	F16
	6 "	2.52	- - - -	3.346	1.181	11.811	10	0.748	8	0.709	F25
	8 "	2.953	3.173	4.522	1.575	11.811	10	0.748	8	0.787	F25
	10 "	3.346	3.646	4.522	1.457	11.811	10	0.748	8	0.945	F25
	12 "	3.937	4.276	5.433	1.811	13.78	11.732	0.906	8	1.102	F30

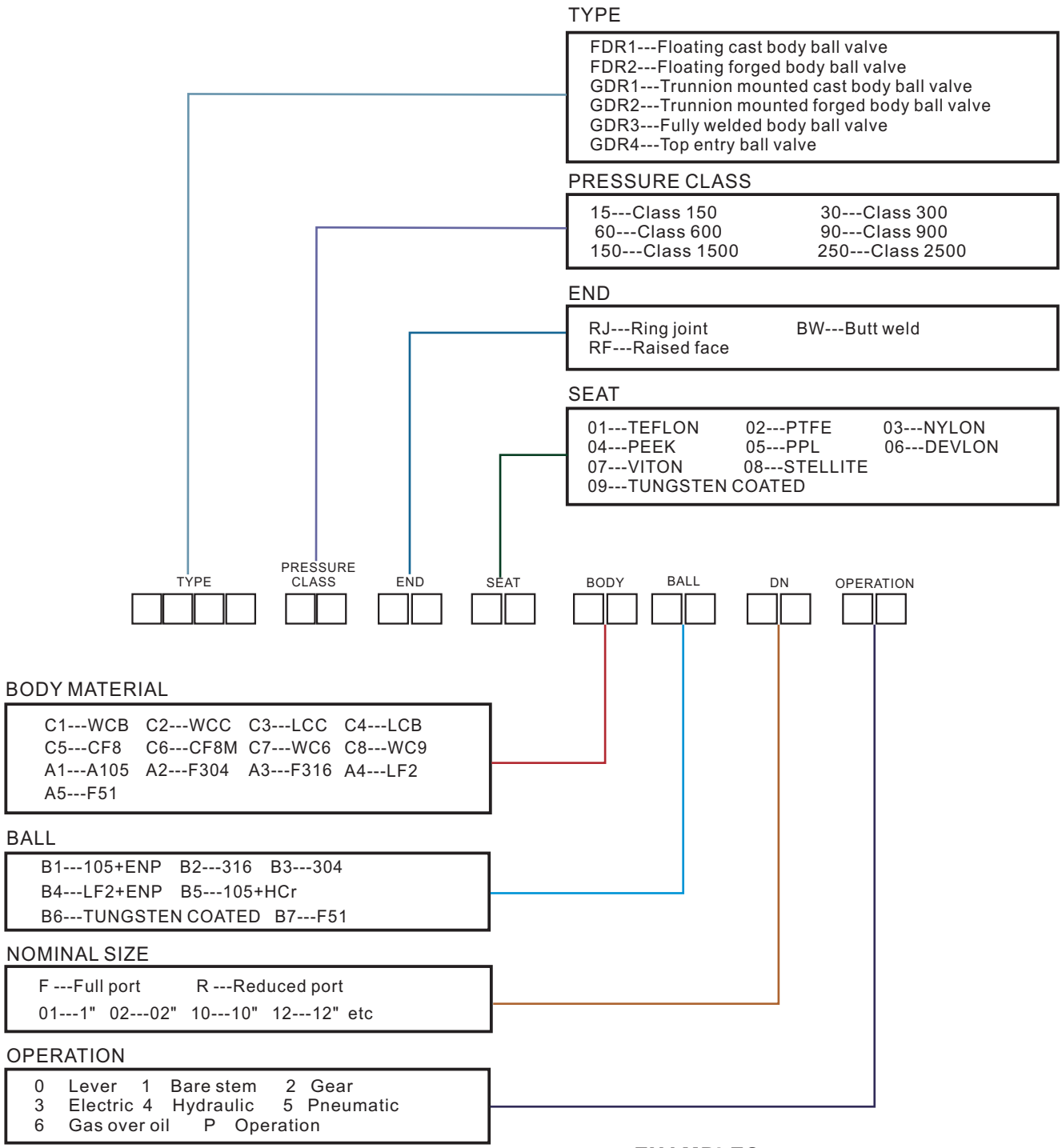
TRUNNION MOUNTED BALL VALVE TEST PROCEDURE

ROCKY UNION TRUNNION MOUNTED 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		Seat hydro seal test at A end toawrds body B
		B	Atmospheric			
		C	Atmospheric			
		A	Atmospheric	5		Seat hydro seal test at C end toawrds body B
		B	Atmospheric			
		C	1.1xPN			
		A	1.1xPN	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		Seat air seal test at A end toawrds body B
		B	Atmospheric			
		C	80PSIG(5.5bar)			
		A	80PSIG(5.5bar)	5		Seat air seal test at C end toawrds body B
		B	80PSIG(5.5bar)			
		C	Atmospheric			

PN= Nominal Pressure Blue=Liquid Yellow=Air

HOW TO SPECIFY RUV BALL VALVES



EXAMPLES

F	D	R	1	1	5	R	F	0	2	C	1	B	1	F	02	P	0

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

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

Cast body trunnion mounted ball valve, Class 600, Ring joint, with seat of PTFE and body materials constructed using WCB, Ball constructed with materials of 316, Full port, nominal size 8 inch, operated by gearbox.

WE MAKE FOR RELIABILITY

ROCKY UNION VALVE CO.,LTD

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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.