SPECIFICATION DATA
V800-2016-R0

HIGH PERFORMANCE BALL VALVE

SERIES V800

UNICON

CONTENTS

Certificate of Authority to use the Official API Monogram

License Number: 608-0022 **ORIGINAL**

The American Petroleum Institute hereby grants to

UNICON SYSTEM CO., LTD.
21 Block 13 Lot, Gangchon-Ro
139 Beon-Gil 72, Danwon-Gu, Ansan-Si
Ansan-Si, Gyeonggi-do
South Korea

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and **API-608** and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram shall be used in conjunction with this certificate number: **608-0022**

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following: Metal Ball Valves

QMS Exclusions: Servicing

Effective Date: SEPTEMBER 18, 2015
Expiration Date: SEPTEMBER 18, 2018

American Petroleum Institute

Vice President, Global Industry Services

To verify the authenticity of this license, go to www.api.org/compositelist

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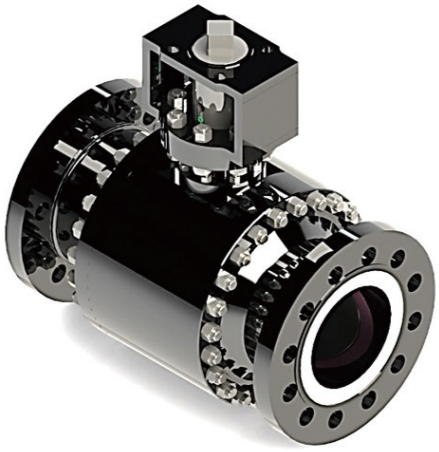
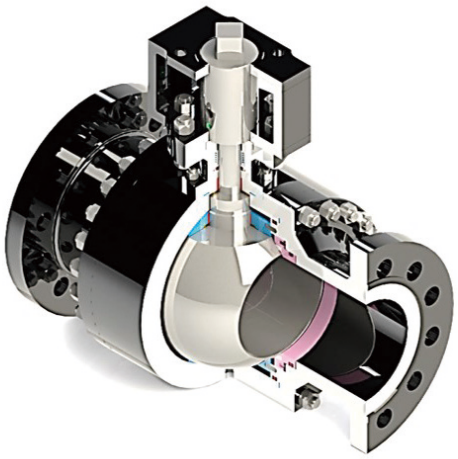
V800 SERIES
HIGH PERFORMANCE BALL VALVE

- UNICON manufactures the most complete line of quality ball valves, and can provide the exact ball valves and actuators to meet the most demanding application requirements. Our Trunnion Ball Valves are available in an extensive range of designs, materials, sizes and pressure classes and are in full conformance with ANSI, API and NACE specifications. The UNICON family of Trunnion Ball Valves provides positive shut-off of fluids and gases under extreme service conditions.

- The forging material can ensure the best rigidity and strength under maximum rated operation pressure without inherent flaw of cast. Other properties found in forging include greater impact resistance, resistance to fatigue cracking, particularly when cycling at either high or cryogenic temperature.

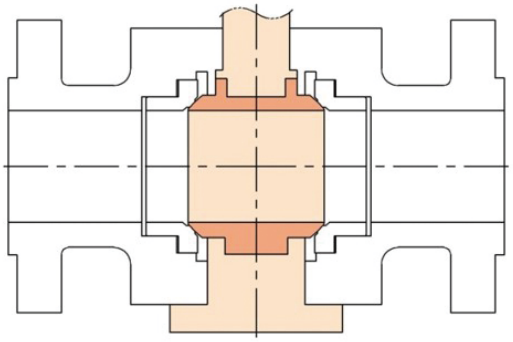
- Overdesigned wall thickness and adaptation of high strength tie bolts are convenient for valve maintenance and sufficient to bear the stress of pipe. The internal parts of valve are carefully designed and selected to ensure reliability under all kinds of work condition. Since a variety of materials are available, UNICON valves can be used with various fluids and gases. Trunnion ball valve have a mechanical means of anchoring the ball at the top and the bottom, this design is the standard design applied on larger and higher pressure valves.

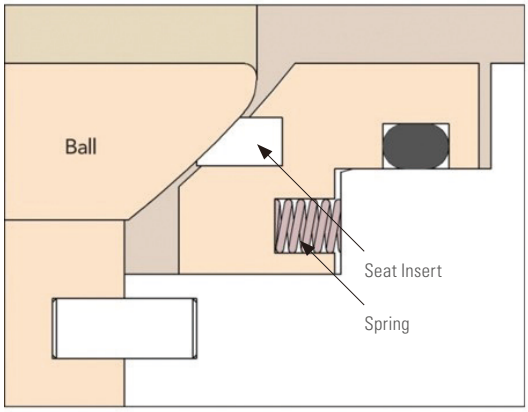




TECHNICAL FEATURES

- **Trunnion-Mounted Ball**
  The ball is fixed and the seat rings are floating, free to move along the valve axis. Side load generated by the pressure acting on the ball is absorbed by bearings. At low pressure the seat sealing action is achieved by the thrust of the spring acting on the seat ring. As the pressure increases the fluid pressure pushes the seat rings against the ball.





- **Independent Ball And Stem**

  The ball and stem are independent to minimize the effect of the side thrust generated by the pressure acting on the ball.

- **Anti – Static Design**

  The electrical conductance continuity between all the metallic components is guaranteed and certified.

- **Low Emission Valves**

  Accurate machining of stem and bonnet sealing surfaces ensure compliance with the most severe pollution control regulations. Special "live" seals are available on request.

- **Floating Self – Relieving Seat Rings**

  Two independent floating seat rings assure the bi-directional tightness of the valve. The seats are carefully designed to minimize the torque required to operate the valves without losing sealing power, which is assured from zero differential pressure to the valve's maximum rated pressure. Self-relieving seats are supplied as a standard feature. Double piston or combination seats (self - relieving/upstream, double piston/downstream) can be supplied on request. Trunnion Mounted Valves are available in both soft seated and metal seated design.

- **Fire Safe Design**

  Trunnion mounted ball valves have been designed to comply with the fire safety standards of API 6FA and API 607, fire safe qualification tests witnessed by independent inspection authorities covering all the production range. Qualification tests to other fire safety standards may be performed on request.

- **Ball Seat Alignment**

  Stem/Flange mechanical stops ensure control and precise alignment over ball rotation

- **Flow Capacity**

  Valve design allows for high flow capacity in liquid or gas services regardless of whether the media is clean or dirty. Full port valves allow for pigging and ensure maximum flow capacity.

- **Soft-seated valves**

  In valves designed for standard service, a resilient material is inserted into the metal seat holder to provide a soft seating action in addition to the metal to metal seating between the ball and the seat rings.

- **Metal-seated valves**

  Valves designed for abrasive service or for operation in temperatures that prohibit the use of a resilient material have seating action provided by the metal-to-metal contact between the ball and the seat rings.

- **End**

  Valve ends can be manufactured to several configurations to comply with customer requests, such as: Flanged RF or RTJ to ASME B16.5 up to 24" and B16.47A for 26" and larger. Other type of flanges are available upon request. Butt-weld ends to ASME B16.25. Others types of weld ends are available upon request.

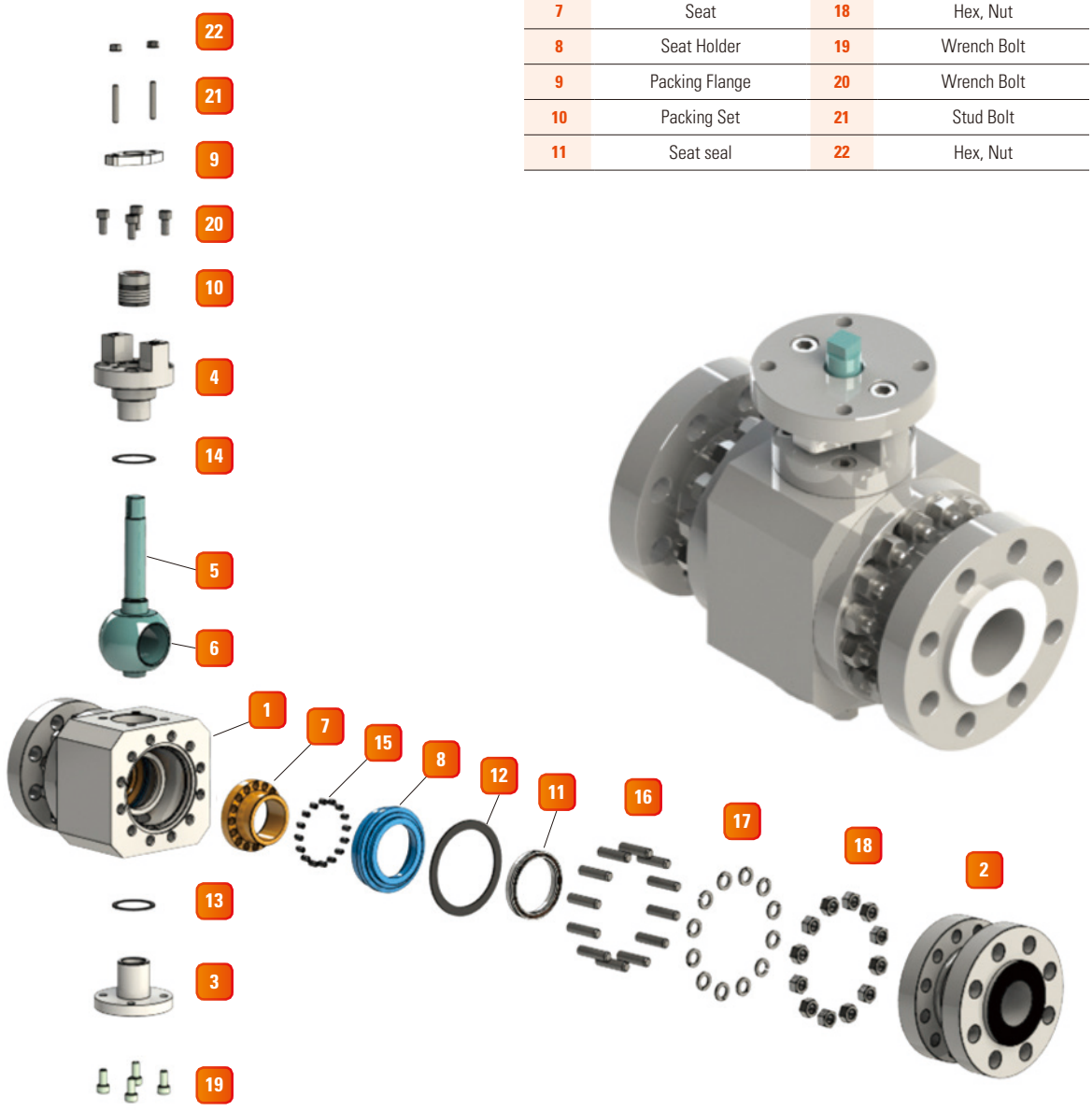
- **Longevity Of Life**

  Special consideration was devoted to the attainment of enhanced life and operation of our valve throughout design, development, testing and manufacturing stages. Valve designs combined with the selection of advanced materials are such that long periods of inactivity should not affect the operations of efficiency.

TRUNNION-MOUNTED BALL VALVE DESIGN

Metal Seated Design

No.	Part Name	No.	Part Name
1	Body	12	Gasket
2	Body Flange	13	Gasket
3	Bottom Flange	14	Gasket
4	Upper Guide	15	Spring
5	Stem	16	Stud Bolt
6	Ball	17	Washer
7	Seat	18	Hex, Nut
8	Seat Holder	19	Wrench Bolt
9	Packing Flange	20	Wrench Bolt
10	Packing Set	21	Stud Bolt
11	Seat seal	22	Hex, Nut



TORQUE TABLE

Valve Max. W.P		275 Psi / 19 Bar	720 Psi / 50 Bar	1440 Psi / 100 Bar	2160 Psi / 150 Bar		
Size		Valve Rating					
in	mm	150	300	600	900	1500	2500
1-1/2"	40	40	50	80	140	-	-
2"	50	50	72	119	202	322	590
3"	80	60	93	185	349	466	1,130
4"	100	226	298	466	781	1,116	1,800
6"	150	640	789	1,046	1,479	2,456	-
8"	200	1,021	1,388	2,309	3,293	5,462	-
10"	250	1,458	2,027	3,057	4,699	8,847	-
12"	300	2,004	2,788	4,483	7,193	12,698	-
14"	350	2,218	3,795	6,826	9,124	16,103	-
16"	400	3,095	5,300	8,686	13,023	20,546	-
18"	450	4,166	6,956	13,012	19,207	-	-
20"	500	5,320	9,442	17,562	26,008	-	-
24"	600	8,795	14,792	26,238	40,151	-	-

Trunnion-Mounted Ball Valve Flow Coefficient Cv Specification Table

Size		Pressure Grade					
in	mm	150	300	600	900	1500	2500
1"	25	90	78	69	63	63	27
1-1/2"	40	227	211	187	167	167	92
2"	50	463	420	361	322	322	291
3"	80	1,247	1057	943	911	820	739
4"	100	2,489	2,156	1,811	1,760	1,610	1,450
6"	150	5,458	5,359	4,581	4,386	4,079	2,528
8"	200	10,721	10,235	8,920	8,446	7,978	5,301
10"	250	17,756	17,202	14,614	14,164	13,029	8,431
12"	300	26,714	25,917	22,782	21,230	19,619	12,348
14"	350	32,609	30,936	28,641	26,625	24,083	-
16"	400	44,627	42,550	39,141	36,642	33,110	-
18"	450	57,799	56,171	51,396	48,645	43,329	-
20"	500	74,763	71,830	65,432	62,207	55,426	-
24"	600	113,221	109,381	989,404	93,948	83,892	-

Note!
1. All the sizes are in full port. 2. Pressure ratings are according to API 608

Method of Calculation Flow

The flow coefficient Cv of a valve is the flow rate of water (gallons/minute) through a fully opened valve with a pressure drop of 1 psi across the valve. To find the flow of liquid through the valve from the valve from the Cv, use the following formulas.

Liquid Flow

$QL=Cv(P/G)^{(1/2)}$

$\Delta p=Differential\ pressure\ across\ the\ valve(psig)$

$QL=Flow\ rate\ of\ liquid(gal./min)$

$G=Specific\ gravity\ of\ liquid$

$(for\ water, G=1)$

Gas Flow

$Qg=61Cv(P_2\ P/g)^{(1/2)}$

$(For\ non-critical\ flow,\ P\_2/P<1.0)$

$P\_2=Outlet\ pressure(psig)$

$Qg=Flow\ rate\ of\ gas(CFH\ at\ STP)$

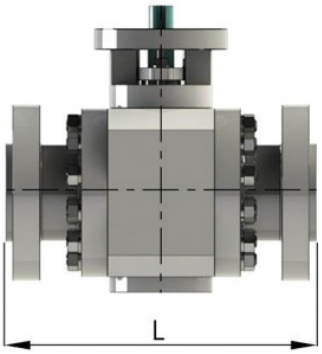
$G=Specific\ gravity\ of\ gas$

$(for\ air, g=1.0)$

STANDARD SPECIFICATION

DESIGN STANDARD	API 608
SIZE	1" to 24" (DN 25 to 600)
PRESSURE RATING	ANSI 150LBS to 2500LBS, JIS 10K to 63K, PN10 to PN450
LEAKAGE	FCI-70.2 Standard : ANSI Class IV Option : ANSI Class V
PRESSURE RANGE	Up to 6,167 psi (g) Up to 434 Kg/cm²
OPERATING TEMPERATURE RANGE	-58˚F to +1,050˚F -50˚C to +565˚C Option : -320˚F to +1,562˚F -192˚C to +850˚C
END CONNECTIONS	Socket Weld – ANSI B16.11 Butt Weld – ANSI B 16.25 FF/RF/RTJ Flange – ANSI B 16.5 Option : JIS Flange, DIN Flange, NPT/PT Screw
FACE TO FACE	API 608 / ASME B 16.10
TEST & INSPECTION	API 598
MATERIALS	Carbon Steel(WCB, WCC, A105) Chrome-moly Steel(WC6, WC9, C12A) Stainless Steel(CF8, CF8M, CF3, CF3M, F304, F304L, F310, F316L) Duplex Stainless Steel, Monel, AL Bronze, Inconel 625 Hastelloy B/C, Other Alloy
ACTUATORS	Pneumatic Actuator Motor Actuator Gear Operating Level Handle Bare Stem
APPLICATIONS	On/Off Shore Oil and Gas Production Subsea Oil and Gas Production Oil and Gas Storage, Transportation, Gathering Systems Gas Re-injection Plants, Treatment Plants LPG and LNG Production, Storage, Transportation Petrochemical Industry Metering Systems Refining Industry Power Generation Pulp and Paper Industry

DIMENSIONS OF BALL VALVES TO ASME



UNIT : mm

SIZE	L												B (1)
	CLASS 150		CLASS 300		CLASS 600		CLASS 900		CLASS 1500		CLASS 2500		
in	FLANGED	WELDING	FLANGED	WELDING	FLANGED	WELDING	FLANGED	WELDING	FLANGED	WELDING	FLANGED	WELDING	
1″	127	-	165	-	216	216	254	254	-	-	-	-	24
1-1/2″	165	190	190	190	241	241	305	305	-	-	-	-	40
2″	178	216	216	216	292	292	368	368	368	368	451	451	50
3″	203	282	282	282	356	356	381	381	470	470	578	578	80
4″	229	305	305	305	432	432	457	457	546	546	673	673	100
6″	394	457	403	457	559	559	610	610	705	705	914	914	150
8″	457	521	502	521	660	660	737	737	832	832	1022	1022	200
10″	533	559	568	559	787	787	838	838	991	991	1270	1270	250
12″	610	635	648	635	838	838	965	965	1130	1130	1422	1422	300
14″	686	762	762	762	889	889	1029	1029	1257	1257	-	-	350
16″	762	838	838	838	991	991	1130	1130	1384	1384	-	-	400
18″	864	914	914	914	1092	1092	1219	1219	-	-	-	-	450
20″	914	991	991	991	1194	1194	1321	1321	-	-	-	-	500
24″	1067	1143	1143	1143	1397	1397	1549	1549	-	-	-	-	600

Note!

1. Full Bore Size.
2. All dimensions are approximate and subject to change. Consult sales offices for other size requirements.

NUMBERING SYSTEM

V	800		1.	2.	3.	-	6.	7.	8.	9.	10.

Valve Constructions

000. VALVE SERIES	
800	BALL VALVE

1. CONSTRUCTION	
T	TOP ENTRY
S	SIDE ENTRY

2. TYPE OF BORE	
F	FULL
R	REDUCED

3. TYPE OF BALL	
F	FLOATING
T	TRUNNION
Y	SPECIAL

Body/Bonnet Constructions

4,5. BODY SIZE (INCH)			
CODE	INCH	CODE	INCH
25	1	B5	10
40	1-1/2	C0	12
50	2	C5	14
80	3	D0	16
A0	4	D5	18
A2	5	E0	20
A5	6	E5	22
B0	8	F0	24

6. PRESSURE RATING					
1	KS(JIS)10K	N	DIN PIN 16	B	ANSI 150LB
7	KS(JIS)16K	P	DIN PIN 25	D	ANSI 250LB
2	KS(JIS)20K	Q	DIN PIN 40	E	ANSI 300LB
3	KS(JIS)30K	R	DIN PIN 63	F	ANSI 400LB
4	KS(JIS)40K	S	DIN PIN 100	H	ANSI 600LB
6	KS(JIS)63K	T	DIN PIN 250	K	ANSI 900LB
		Y	SPECIAL	L	ANSI 1500LB
				M	ANSI 2500LB
				Z	ANSI 4500LB

7. END CONNECTION	
R	RF FLANGED
F	FF FLANGED
B	BUTT WELDING
S	SOCKET WELDING
J	RING JIONT
N	NPT THREAD
Y	SPECIAL

8. BONNET TYPE	
P	STANDARD
C	CRYOGENIC
E	EXTENSION
J	JACKET
Y	SPECIAL

9. BODY & BONNET MATERLAL	
1	WCB /A105
2	CF8
3	CF8M
4	CF3 (304L)
5	CF3M
6	LCC / LCB / LF2
7	LC3 / LF3
8	ALLOY 20
9	DUPLEX
A	AL-BRONZE
B	HASTELLOY
C	INCONEL
Y	SPECIAL

Operator

10. OPERATOR	
P	PNEUMATIC ACTUATOR
M	MOTOR ACTUATOR
G	GEAR OPERATOR
L	LEVEL HANDLE
B	BARE STEM
Y	SPECIAL

UNICON

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Manufacturing Facilities