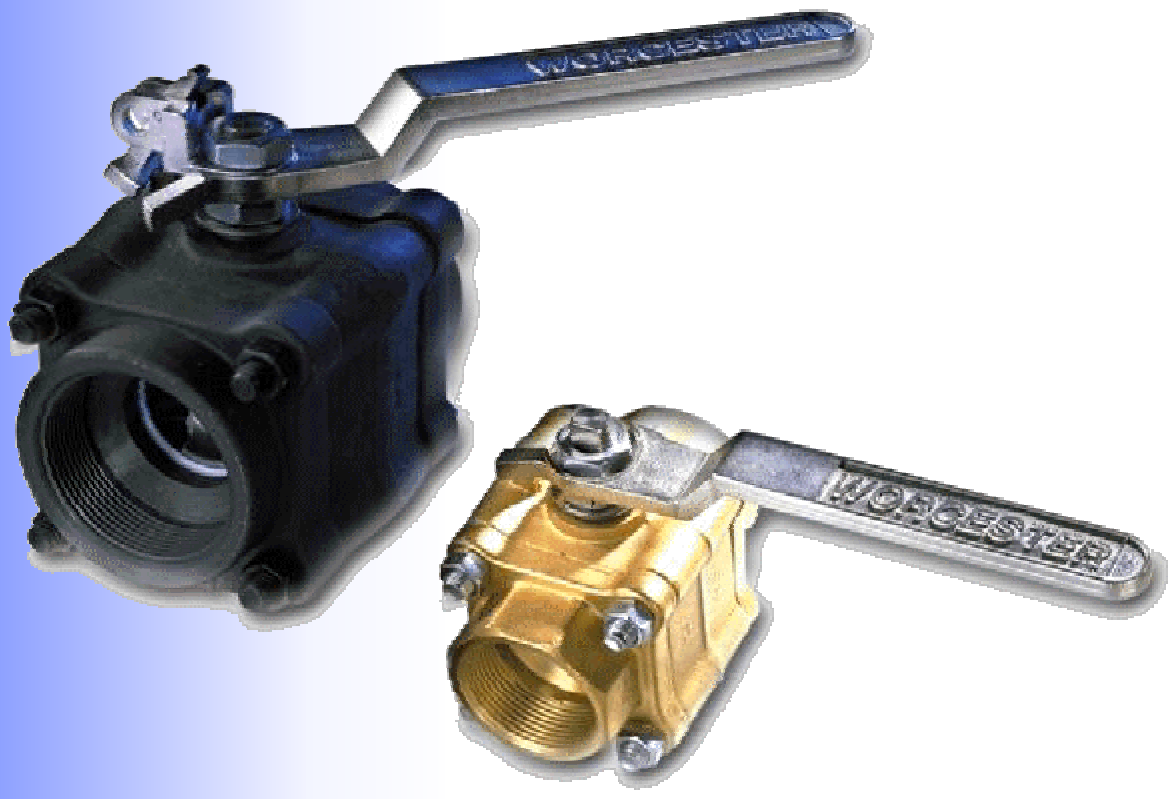
RHINO VALVES WORLDWIDE



Series 44 (400)/600/H600

LICENSE No. 6D-0321

A great quantity of possible configurations makes of this valve of 3 pieces, the more versatile of the market: diverse construction materials and seals, different operation ranges, several connection types, as well as multiple options, the they either transform into the best for each application manual or automated.

ISO 9001 REGISTERED
MGMT. SYS.
RvA C 024
DNV Certification B.V., The Netherlands

RHINO VALVES WORLDWIDE

SERIES 44(400)/600/H600

The Series 400 valve is a three piece robust design offering maximum ease of installation and serviceability in systems where unions and easy access to lines are necessary.
The design allows the center section to swing completely free of the ends whitout having to cut the piping or disturb the line integrity. This means maintenance of seats, seals, and ball is done right in the line. Fully encapsulated body bolts assure and ease proper alignment during re-assembly. This design also allows the Series 400 to double as a union which, when needed, eliminates the need to separate connection. The simplicity of installation and maintenance makes this valve ideal for a variety of uses including Chemical Industries, Oil and Gas Production, Refining and Transmission, Textiles, Pulp, and Paper, Pharmaceutical, and Food and Beverage.

SPECIFICATIONS

Valve Size
1/4", 3/8", 1/2", 3/4", 1", 1/ 1/4", 1 1/2", 2"
(8,10,15,20,25,32,40,50)

Design:
2-way, bi-directional flow, 3 pieces swing-out construction, standard port (full port optional)

Valve Body pressure rating:
Carbon and Stainless Steel wall thickness material is defined as per ANSI B16.34:
Ends: Class 400
Body: Class 600
Brass body and ends valves are rated up to 600psi.
NOTE: To know the maximum pressure rating, it must be considered the Seats and seals maximum pressure, which depending of material may de-rate the valve

Body and Ends Material:
Carbon Steel: ASTM A105 forged (subject availability) or ASTM A216 gr WCB casted
Stainless Steel: ASTM A351 GrCF8M casted (CF3M ends optional)
Brass: ASTM B283 C37700 forged

Bolts and nuts material:
Bolts: SAE J429 gr 5
Nuts ASTM A563
All nuts and bolts zinc plated. Stainless Steel bolting optional.

Ball and stem materials:
Carbon Steel: AISI 12L14 or SAE 1112 hard chrome plated ball.
Stainless Steel: ASTM A276 gr 316
Brass: ASTM B21 C46400 or ASTM B283 C37700

Seats:
Buna, Neoprene, PTFE, R-TFE (reinforced teflon 15% fiber glass), Lubetal (Delrin), UHMWPE, Multifil.

Body seals:
Buna, Neoprene, Viton, EPDM, PTFE, UHMWPE, TFE coated Stainless Steel.

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Stem seals:
R-PTFE, UHMWPE
NOTE: Some other materials for seats and seals are available.

Stem design:
Bottom entry stem, live loaded retaining system (two Belleville washers), internal thrust bearing, external stem seal.

Temperature range:
Depending upon Seats and seal choice, Will operate from -20°F a 500°F.

Seat/Seal leakage:
All valves 100% tested to bubble-tight standards.

Design Specification:
ANSI B16.25 - Buttweld ends.
ANSI B16.11 - Screw and socket weld end, socket diameter, depth and length only.
ANSI B1.20.1 - NPT threads.
ANSI 16.34 - Wall thickness.
MSS SP25 - Valve marking.
MSS SP72 - Ball calves with flanged or buttweld ends for general service.
NACE-MRO 1-75 - Material resistance.

SEATS

The design of Worcester/Rhino Valves allows flow pressure in both directions which is transferred to the floating ball. Then, this is pressed against the downstream seat, resulting in a bubble tight sealing. The resilient seats patented by Worcester allow relief the pressure to the upstream seat against the ball, resulting a low torque of operation and a long, soft operation even with high differential pressures. This low torque characteristic, permits a smaller actuator operation, resulting in lower cost. The seats also acts as a ball whipper, as it removes any adhered material to ball for a better sealing.

STEM

The stem is designed for both safety and a long, leak-tight service life. Inserted from the bottom through the cavity, it rests securely against an interior body shoulder.
The stem is held in place by a live loaded retaining system, featuring opposing belleville washers. These flex in response to thermal expansions and contractions and maintain effective sealing pressure as they compensate for normal stem seal wear. The seal can also be easily adjusted in-line by the accessible stem nut. In series 400 and 600, a stem nut retaining clip holds the nut in place and prevents backing off, particularly in high cycle actuated services. In series 152 a CHEVRON° type external stem seal is provided.

TORQUE

The operating torque of the ball valve is influenced by a number of factors which has to be considered to size a valve for actuation. These factors are divided in Design (type and material of valve seats), and application (pressure, media and frequency of operation).
The torque shown is in function of the pressure, as the friction between the floating ball and the seat is higher as the pressure is incremented.
Note: Our charts were made for reduced port valves (except for Series 152, which can be read directly). If you want to find the torque of a full port valve, please look for the curve of the next higher size, for example if you want to know the torque of a 1" fill port valve, you have to see the 1 1/4" valve readout.

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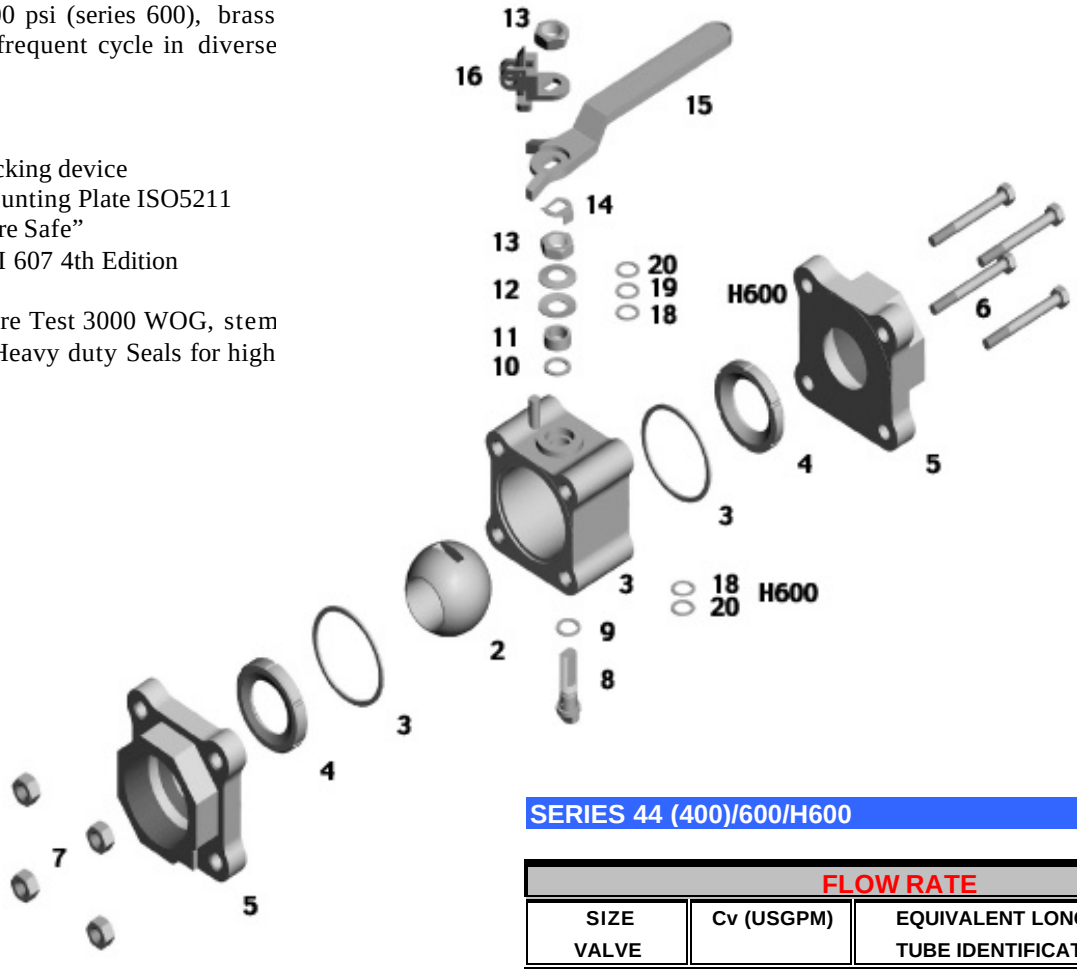
RHINO VALVES WORLDWIDE

SERIES 44 (400)/600/H600

SERIES 44 (400)/600/H600 Endings NPT, BS, SW, BW or Clamp Ends. Reduced or full bore. Robust construction of brass, in carbon steel and stainless steel. Pressure test of 1500 psi (series 400), 2200 psi (series 600), brass 1000 psi. Seals for frequent cycle in diverse materials.
Options:

Locking device
Mounting Plate ISO5211
"Fire Safe"
API 607 4th Edition

Option H600 :Pressure Test 3000 WOG, stem 17-4 PH, B7 bolts. Heavy duty Seals for high pressure.



SERIES 44 (400)/600/H600

FLOW RATE		
SIZE VALVE	Cv (USGPM)	EQUIVALENT LONGITUDE OF THE TUBE IDENTIFICATION 40 IN FEET
1/2"	8	3.1
3/4"	12	6.3
1"	32	3.1
1 1/2"	82	6.3
2"	120	4.3

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RHINO VALVES WORLDWIDE

SERIES 44 (400)/600/H600

PARTS LISTING OF SERIES 44 (400)/600/H600 1/2"- 2"

			MATERIAL		
ITEM	QUANTITY	DESCRIPTION	LATON *	CARBON STEEL	STAINLESS STEEL
1	1	BODY	ASTM B C37700	ASTM A 216 WCB/A105	ASTM A 351 CF 8M
2	1	BALL	ASTM B 21 C46400, ASTM B 283 C3	ASTM A 351 CF 8M A216WCB	ASTM A 351 CF 8M A216WCB
3	2	SEAL	PTFE	PTFE	PTFE
4	2	SEAT	PTFE	PTFE	PTFE
5	2	TIPE END	ASTM B 283 C37700	ASTM A 216 WCB	ASTM A 351 CF 8M
6	4	BOLT	SAE J429 GR. 5	SAE J429 GR. 5	ASTM F593 TYPE A 304
7	4	NUT	ASTM A 194 2HM	ASTM A 194 2HM	ASTM F594 TYPE A 304
8	1	STEM	AISI 316	AISI 1018-12L14	AISI 316
9	1	THRUST BEARING	R-PTFE 25%	R-PTFE 25%	R-PTFE 25%
10	1	STEM SEAL	R-PTFE 15%	R-PTFE 15%	R-PTFE 15%
11	1	FOLLOWER	AISI 416	AISI 416	AISI 416
12	2	BELLEVILLE WASHER	AISI 1076	AISI 1075	AISI 302
13	2	NUT	ASTM A 194 2HM	ASTM A 194 2HM	ASTM F594 TYPE A 304
14	1	LOCK NUT	AISI 304	AISI 304	AISI 304
15	1	HANDLE	ASTM A 743 CF8/CA15	ASTM A 743 CF8/CA15	ASTM A 743 CF8/CA15
16	1	LOCKING DEVICE (OPTIONAL)	ASTM A 743 CF8/CA15	ASTM A 743 CF8/CA15	ASTM A 743 CF8/CA15
ONLY FOR H600					
3	1	SEAL		VITON	VITON
4	2	SEAT		DELRIN	DELRIN
6	4	BOLT		ASTM A 193 GR.B7	ASTM A 193 GR.B7
7	4	NUT		ASTM A 194 2HM	ASTM A 194 2HM
8	1	STEM		ASTM A 564 (S17400)	ASTM A 564 (S17400)
18**	1	THRUST BEARING		MULTIFIL	MULTIFIL
19**	1	STEM SEAL		MULTIFIL	MULTIFIL
20**	1	PROTECTOR		DELRIN	DELRIN

* **ONLY AVAIALBLE FOR SERIES 44**

** **REPLACING ITEMS 9 & 10**

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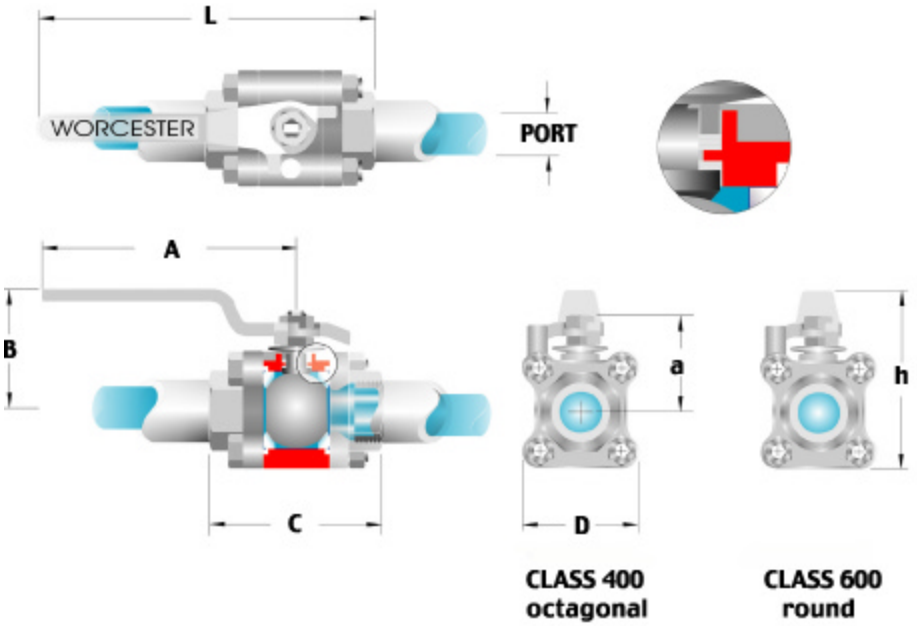
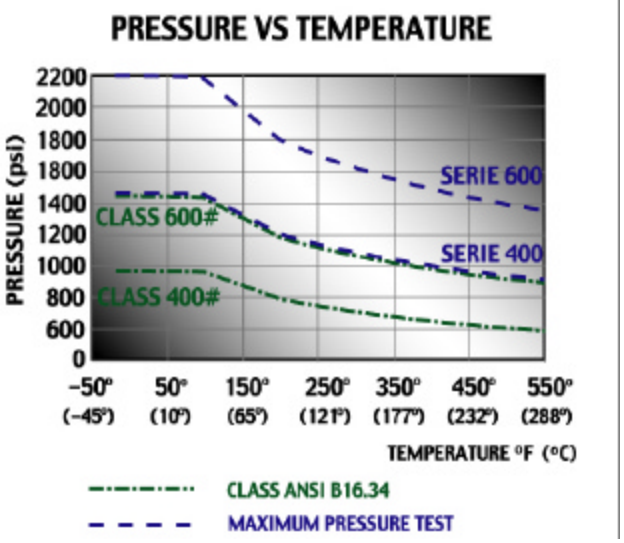
SERIES 44 (400)/600/H600





The pipe is exclusively representative.
They are only as reference and they are subject to changes without previous notice.

Dimension in inches.

Service Conditions:

CONDITION	***CARBON STEEL***	***STAINLESS STEEL***
ANSI CLASS # (Series 44-Octagonal Ends)	400	400
OPERATION TEMPERATURE	-20 to 100°F (-29 to 38°C)	-20 to 100°F (-29 to 38°C)
MAX. ALLOWABLE WORKING PRESSURE	990 psi (69.6 kg/cm2)	960 psi (67.5 kg/cm2)
MAXIMUM PRESSSURE TEST	1500 psi (105 kg/cm2)	1450 psi (102 kg/cm2)

CONDITION	***CARBON STEEL***	***STAINLESS STEEL***
ANSI CLASS # (Series 600-Round Ends)	600	600
OPERATION TEMPERATURE	-20 to 100°F (-29 to 38°C)	-20 to 100°F (-29 to 38°C)
MAX. ALLOWABLE WORKING PRESSURE	1480 psi (104 kg/cm2)	1440 psi (101.3 kg/cm2)
MAXIMUM PRESSSURE TEST	2225 psi (157 kg/cm2)	2175 psi (153 kg/cm2)

CONDITION	***CARBON STEEL***	***STAINLESS STEEL***
ANSI CLASS # (Full Port Octagonal Ends)	600	600
OPERATION TEMPERATURE	-20 to 100°F (-29 to 38°C)	-20 to 100°F (-29 to 38°C)
MAX. ALLOWABLE WORKING PRESSURE	1480 psi (104 kg/cm2)	1440 psi (101.3 kg/cm2)
MAXIMUM PRESSSURE TEST	2225 psi (157 kg/cm2)	2175 psi (153 kg/cm2)

Note: *Always consider the maximum, pressure allowed by the soft elements as seats and seals.*

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RHINO VALVES WORLDWIDE

SERIES 44 (400)/600/H600

REDUCED PORT

SERIE 44 (400)/600/H600 1/2" - 2"

SIZE	A	B	C	D	PORT	WEIGHT IN Lbs.	LONG	HEIGHT	WIDE
1/2"	4 1/4	1.58	2.61	1.51	0.438	1.301	5.56	2.45	1.75
3/4""	4 1/4	1.67	2.83	1.61	0.563	1.653	5.67	2.67	2.00
1"	5 3/4	2.21	3.72	2.17	0.813	3.219	7.66	3.40	2.38
1 1/4"	5 3/4	2.40	4.22	2.35	1.000	4.431	7.86	3.71	2.63
1 1/2"	7	3.02	4.56	2.89	1.250	7.341	9.28	4.62	3.19
2"	7	3.21	5.01	3.07	1.500	9.458	9.51	5.00	3.57

FULL PORT

SERIE FP44 (400)/FP600/FPH600 1/4" - 2"

SIZE	A	B	C	D	PORT	WEIGHT IN Lbs.	LONG	HEIGHT	WIDE
1/4"	4 1/4	1.58	2.61	1.51	0.438	1.411	5.56	2.45	1.75
3/8"	4 1/4	1.58	2.61	1.51	0.438	1.367	5.56	2.45	1.75
1/2"	4 1/4	1.67	2.83	1.61	0.563	1.653	5.67	2.67	2.00
3/4""	5 3/4	2.21	3.72	2.17	0.813	3.219	7.66	3.40	2.38
1"	5 3/4	2.40	4.22	2.35	1.000	4.431	7.86	3.71	2.63
1 1/4"	7	3.02	4.56	2.89	1.250	7.341	9.28	4.62	3.19
1 1/2"	7	3.21	5.01	3.07	1.500	9.458	9.51	5.00	3.57
2"	7 3/8	3.26	5.87	4.29	2.000	20.723	10.29	6.56	4.55

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Receiving Inspection.

All valves must be inspected when they arrive at the purchaser site, to verify that no damages have occurred during transportation or handing. Any damage found must be reported immediately.

Handling.

Store the valve in a safety place, free of rain, dust or any agent that can deteriorate it. All our valves are shipped with end protectors, you must keep them until the installation to avoid introduction of dust and other materials to the inside of the valve.
Note : If you plan to stock the valve for a long period of time, we recommend to leave it in the open position to avoid deformation on seats.

GENERAL INFORMATION.

Materials:

DESCRIPTION	***CARBON STEEL***	***STAINLESS STEEL***
BODY	A-216-WCB	A-351-CF8M
SEAT	PTFE	PTFE
BALL	A-351-CF8M / AISI 316	A-351-CF8M / AISI 316
SEAL	PTFE / GRAPHOIL (fire safe)	PTFE / GRAPHOIL (fire safe)
PIPE END	A-216-WCB	A-351-CF8M
NUT	ASTM A-194-2HM	F-594 TYPE 304
BOLT	SAE J429 Gr.5	A193 B8
THRUST BEARING	R-PTFE	R-PTFE
STEM	AISI 1018 / AISI 12L14 / A105	AISI 316
STEM SEAL	R-TFE / GRAPHOIL (fire safe)	R-TFE / GRAPHOIL (fire safe)
BELLEVILLE WASHER	AISI 1075	AISI 304
NUT LOCK	AISI 304	AISI 304
FOLLOWER	AISI 416	AISI 416
HANDLE (& opt. Locking dev.)	ASTM A-743 CF8 / CA15	ASTM A-743 CF8 / CA15

Service Conditions:

CONDITION	***CARBON STEEL***	***STAINLESS STEEL***
ANSI CLASS # (Series 44-Octagonal Ends)	400	400
OPERATION TEMPERATURE	-20 to 100°F (-29 to 38°C)	-20 to 100°F (-29 to 38°C)
MAX. ALLOWABLE WORKING PRESSURE	990 psi (69.6 Kg/cm2)	960 psi (67.5 Kg/cm2)
MAXIMUM PRESSURE TEST	1500 psi (105 Kg/cm2)	1450 psi (102 Kg/cm2)

CONDITION	***CARBON STEEL***	***STAINLESS STEEL***
ANSI CLASS # (Series 600-Round Ends)	600	600
OPERATION TEMPERATURE	-20 to 100°F (-29 to 38°C)	-20 to 100°F (-29 to 38°C)
MAX. ALLOWABLE WORKING PRESSURE	1480 psi (104 Kg/cm2)	1440 psi (101.3 Kg/cm2)
MAXIMUM PRESSURE TEST	2225 psi (157 Kg/cm2)	2175 (153 Kg/cm2)

Note : *Always consider the maximum pressure allowed by the soft elements as seats and seals.*

General Dimensions:

	Series 400 (44) and 600 Regular Bore					
DESCRIPTION	½"	¾"	1"	1 ¼"	1 ½"	2"
LENGTH in (mm) Face to face	2.61 (66)	2.83 (72)	3.72 (94)	4.22 (107)	4.56 (116)	5.01 (127)
WIDTH in (mm)	1.75 (44)	2.00 (51)	2.38 (60)	2.63 (67)	3.19 (81)	3.57 (91)
HIGH in (mm)	2.45 (62)	2.67 (68)	3.40 (86)	3.71 (94)	4.62 (117)	5.00 (127)
WEIGHT lb (Kg)	1.30 (0.59)	1.65 (0.75)	3.22 (1.46)	4.43 (2.01)	7.33 (3.33)	9.45 (4.29)

	Series 400 (44) and 600 Regular Bore - ISO					
DESCRIPTION	½"	¾"	1"	1 ¼"	1 ½"	2"
HIGH in (mm) Without Handle (stem included)	2.39 (60.6)	2.61 (66.3)	3.36 (85.3)	3.66 (93)	4.49 (114)	4.85 (123.3)
HIGH in (mm) Only Body (excluding Handle and stem height)	2.03 (51.6)	2.26 (57.3)	2.76 (70)	3.07 (78)	3.70 (94)	4.07 (103)
WEIGHT lb (Kg) (including handle)	1.4 (0.65)	1.8 (0.82)	3.5 (1.59)	4.7 (2.15)	7.8 (3.53)	10.2 (4.62)

INSTALLATION AND OPERATION:

Your valve is bi-directional and you can install it in any position.
It can be operated manually by rotating smoothly the handle 90 degrees. When the handle is parallel with valve line, the valve is opened. At 90 degrees it is in the closed position. Automation devices (optional) can also operate the valve.

Caution : *Remember that a Ball Valve is an OPEN/CLOSE device and it is not designed to control the flow. Never leave the valve in a different position from the OPEN or CLOSE position as it will eventually damage the seats, reducing its life.*

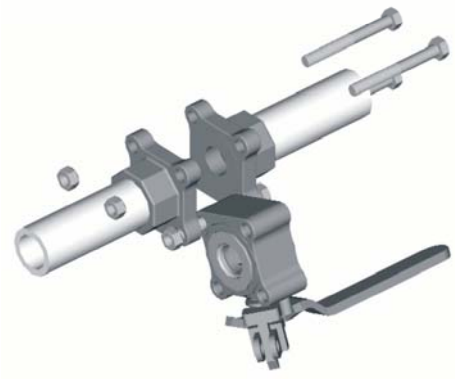
Actuated valves:

A. If your valve does not have an ISO5211 top mounting plate, you have first to remove the actuator, removing the two upper screws of the valve, taking out the bracket and the coupling element between valve stem and actuator.
B. If your valve have an ISO5211 top mounting plate, you can perform following instructions without disassembling the actuator from the valve.

Welded Valves to the pipe by any technique:

If you have a jig of the Valve's body:

1. Take away the Valve's ends, removing the 4 screws that join the body. Place the ends on the jig screwing in them in an adequate way.
2. Weld each extreme to the installation.
3. Assemble the Valve according to the 9 and 10 points of this section

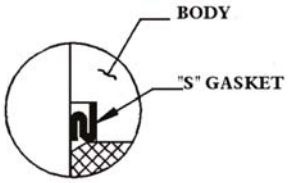


If you don't have a jig of the Valve's body:

4. Weld just some points in each cover of the Valve in the place of the installation for assure it. ***Don't heat it excessively.***
5. Remove the screws that support the body and covers except one of them. Open the Valve loosen the last screw, take out the Valve's body from the line rotating outwards.

NOTE: The Valves with a centering ring (like in some of the fireproof Valves) included in its design won't be rotated.

6. Remove the body's seals and seats. Close the Valve and remove the ball, preventing from scratching its surface. Place it over a soft material free of burrs.
7. Return the body to its position on line and assure it diagonally to the covers with 2 screws.
8. Complete the welding (If you're welding with gas or bronze, don't apply the flame directly to the body).
9. Reassemble the Valve using the extra seals that were supplied instead of the temporal seals installed on factory (if your Valve includes a "S-Gasket" install a new with the wider face of the side of the body). Remember ball only can be assembled with the valve in the closed position.



10. Tight the bolts which join the body with its ends, with next recommended torques:

Bolt Diameter	***Recommended Torque of Three piece Body Nuts***			
	Carbon Steel		***Stainless Steel***	
	(lb*plg)	***Nm***	***(lb*plg)***	***Nm***
¼"	*96-120*	10.8-13.6	*72-94*	8.1-10.6
5/16"	*156-204*	17.6-23.1	*120-144*	13.6-16.3
3/8"	*216-264*	24.4-29.8	*192-216*	21.7-24.4
7/16"	*480-540*	54.2-61.0	*336-384*	38.0-43.4

11. If you remove the actuator bracket, place it again together with the coupling element. Be sure all assembling is aligned in the center. If the actuator is not aligned and/or the coupling element is not perpendicular with the valve, the whole element could not work properly and/or media could leaks through the stem.

Threaded Valves:

Depending of the conditions or the used technique , screw in or disassemble the complete Valve following the instructions of point 5 of the previous section (taking away the 4 screws) and screwing in each cover in its corresponding extreme. Reassemble the Valve following the instructions of the points 9 and 11 of the previous section.

Caution *: Do not install your valve in a high vibrating piping system, as the bolts which joint the the body and ends can get loose. If necessary, add a lock washer in everyone of these bolts (nut's side) to avoid them to move as result of vibration.*

Caution *: After installation, some burrs can stay inside the pipe line. If they are not removed, they can produce scratches in the seats and ball, resulting in leaks. Always clean the pipeline after installation, to remove strange agents.*

The valve will operate with no leaks and low torque for a long life if it is operated under its design parameters. The torque for a new valve depends of its size and the material of the seats installed.

Please consult our printed or multimedia catalogs or visit our website: ***www.worcester.com.mx*** at your convenience, to get this data.
After proper installing (or maintenance) and before operation, always follow the safety instructions at the end of this document.

MAINTENANCE :

After operation and depending of the usage's conditions, Valve may need maintenance. Remember that your Valve has one-year warranty, if it is still in that period, please contact with your distributor, do not try to fix it or you may lost the warranty. Use ONLY originals RHINO Spare Parts, it assures you Valve will work according with its specifications. You can request them through the wide net of distributors all around the World.

Stem:

Although the Stem's design includes a self-adjustable system, compensatory of the wear and the contractions and expansions produced by thermal changes, if the valve presents leak for this section you must consider the next recommendations:

a) If your Valve has an actuator installed, check if it is aligned with the stem through the couple. A disaligned actuator can produce laterals pressure on the stem, which will have repercussions on leaks.
b) Tight lightly the adjusting nut of the stem until the leak stops. Remember tightening too much this nut will increase the torque of the Valve and can damage stem seal, reducing its life. If after you tightened the nut a leak continues, follow the next steps:
c) Shutoff the line where the valve is installed, verifying that no pressure and no dangerous media remains in the pipe and inside the valve. Proceed to disassemble the valve following instructions of steps A or B and 5 and 6 of the "Installation" section.

Caution: *Ball Valves can retain pressurized media in the body cavity when closed. Take care when disassembling. Always open Valve to relieve pressure prior to disassembly.*

Caution : *Always depressurize, disconnect and disengaged automation components installed on the valve before you work on it.*

d) Change the thrust bearing and stem's seal, taking out the handle, the adjustment's nut, the lock nut, the Belleville washers and the follower.
e) Reassemble the stem's elements in an inverse way you took them out. Tighten lightly to the stem's adjusting nut (once you have installed the valve on line, you can give the final adjustment).
f) Finish the Valve following steps 9 to 11 of "installation" section.

***Note**: Be careful with the seats, do not mistreat or scratch them, otherwise you will need to replace them.*

Seals:

In case of leak between the body and ends, you may consider next recommendations:

a) Verify that the nuts of the bolts that join the three parts of the body are tightened as per the recommended torque. Tight them as necessary, if this happens often, it may be due to an excessive line vibration. We might suggest you to include "Expansion Joints" in the line to avoid it. If this is not possible or enough, you can install pressure nuts in each nut to reduce this effect.
b) If leak persists, disassemble the Valve according to the steps "A" or "B", 5 and 6 of the "installation" section.

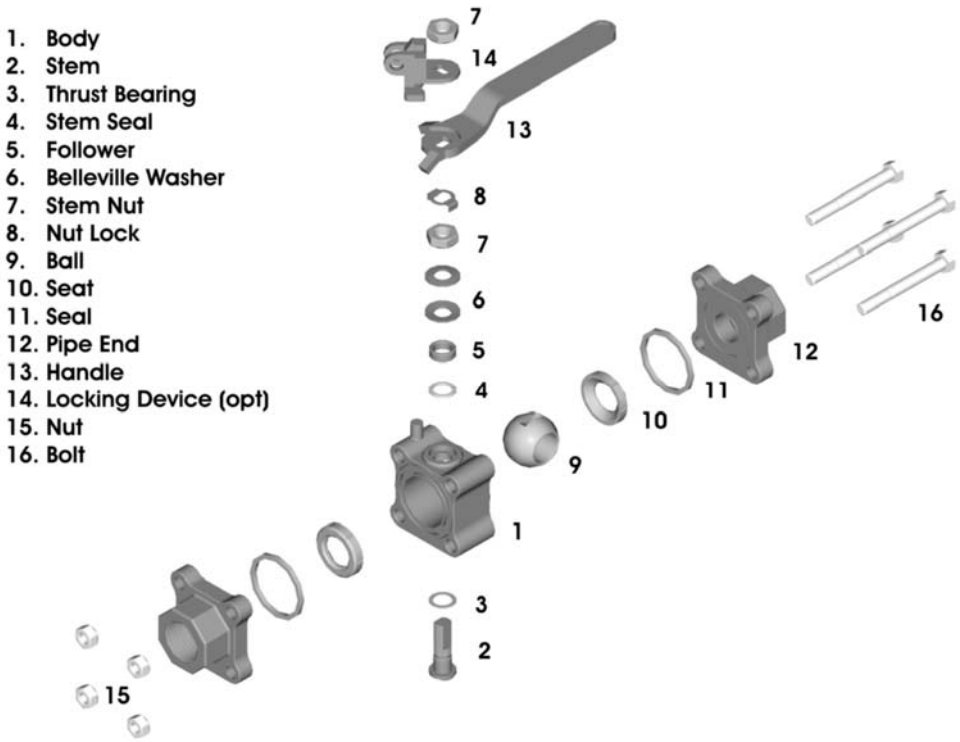
c) Reassemble the Valve placing new seals according to the steps 9 to 11 the “installation” section.

Internal Leak:

If the Valve presents internal leak (the fluid goes through it in closed position) it may be due to a wear on the seats or a scratch in the seats or ball. We suggest you to consider the next recommendations:

a) Some solid materials can clog between seat and ball. Operate the Valve several occasions to try to unblock these residues.
b) If your Valve has an actuator installed, check if it completes its own route and close perfectly, if not, maybe the Valve has and elevated torque or the actuator may be disaligned or defective. Verify that the voltage and/or air pressure of automation components is correct. If it is necessary, we recommend removing the actuator and manually operating the valve to check if this is the cause of the leak.
c) If the valve has an excessive torque, try loosing lightly the stem nut. If this is not enough or a stem leak appears, you must change the stem seals.
d) If the leak persists, disassemble the Valve following the steps 5 and 6 of the “installation” section.
e) Check carefully the seats and the ball, paying attention on the surfaces of mutual contact. Look for any clog material and any scratch or imperfection and in any case replace the damaged part.
f) Reassemble the Valve placing new seals according to steps 9 to 11 of the the “installation” section.

Note : *The seats made from harder material as Delrin, Peek, etc. are factory-adjusted during the valve assemble to get the softer torque without leaks. If you replace these kind of seats in the field and notice a dramatically higher torque of the valve, we recommend to reduce the height of the seats until get the desired torque. You can use sandpaper on a flat surface, moving the seats circularly over it avoiding a wavy or not flat back seat face.*



SAFETY :

WARNING !

Valves are actually pressure vessels, which can be dangerous if they are not properly calculated, selected, installed, maintenance and operated. To prevent risks, follow the next precautions :

1. **Always select the proper pressure rating of the Valve according with your application.**

Series	ANSI Class #	Maximum Operating Pressure psi (kg cm²)	
		Carbon Steel Body	Stainless Steel Body
400 (44)	400	990 psi (69.6 Kg/cm2)	960 psi (67.5 Kg/cm2)
600	600	1480 psi (104 Kg/cm2)	1440 psi (101.3 Kg/cm2)

2. **Always choose the appropriate materials for your application, by checking them in corrosion charts or consulting with our factory. An aggressive media can wear the Valve's metal, make it thinner and less pressure resistant. Aggressive media, can destroy their seal capability as it can also attack soft elements (seats and seals).**

3. **Choose and protect the valve accordingly to the facility conditions. Remember that Carbon Steel Valves are subject to environment corrosion. Don't leave them in the open environment without proper protection. The Black Oxidized given in our factory is to protect them from corrosion during stock and handling exclusively.**

4. **Always use the appropriate equipment as gloves to handle and install valves, as some sharp ends can remain in the Valve. Valves can be heavy, use always appropriated equipment to handle it, including industrial shoes and back support. Extremely hot or cold media can be flown through the valve, placing you in risk if you touch it without protection. Also the valves can conduct extremely dangerous media, existing the risk of permanent injury to your person if any leakage in the piping system, including the valve. Always use the appropriate aids as gloves, safety glasses or mask to operate a valve.**

5. **Do not install or use the valve at the end of the line or in a safety loop.**

6. **Always review bolting torque and adjust as necessary after installation and before to operate the valve.**

7. **After operation, and even if the line has been shutdown, a dangerous pressure can remain into the Valve as Ball Valves can retain pressurized media in the body cavity when closed. Take care when disassembling. Always open the Valve to relieve pressure prior to disassembly. Depressurize, drain and vent the line before working with the valve.**

8. **Do not introduce your hands or other part of your body into the Valve, specially if the Valve has been automated, as the ball can spin suddenly and risk of bite or loose of part of your body can occur. Always depressurize, disconnect and disengaged automation components installed on the valve before you work on it.**

9. **Do not use non-OEM parts. No warranty will apply if you do.**

10. **Consult and follow all local rules applicable.**

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RHINO VALVES WORLDWIDE

APPLICABLE INTERNATIONAL STANDARDS

APPLICABLE INTERNATIONAL STANDARDS				
Norm	**Description**	**Applicable in**	**Size**	**Content**
NACE MR-01-75	Valves that require special resistance to fractures and hydrosulfuric attack	All the models except Brass	1/4" - 8"	For sour environment, stainless ferrous and not ferrous metals
ANSI/FCI 70-2	for seat leaks of control valves. Class VI	All the models	1/4" - 8"	(pneumatic) trapped air test
MSS-SP-26	System of Marking Standard	All the models except series 42, 43, 1000	1/4" - 8"	Size-thread-temperature. Pressure-material-Nom. Casting Heat. No.
MSS-SP-55	Visual inspection Method acceptance of cast steel valves	All the models except Brass	1/2" - 8"	12 types of frequent surface irregularities identifiable by comparative visual inspection
API 6D	Specification for piping and valves	All the models	2" - 8"	Quality system according to American Petroleum Institute
API 607	"Fire Safe" testing	All the models except series 42, 43 and 1000	1/4" - 8"	Available certificate in some valves
API 598	Inspection and test of valves	All the models	1/4" - 2"	Hydrostatic and pneumatic inspection
ANSI B 16.5	Flanges for steel pipe lines	All the flanged models	1/2" - 8"	Dimension-material-range. Pressure temperature-facing. Different types of flanges
ANSI B 16.10	End to end dimensions of valves with flanges and/or to weld ends	All the flanged models and weld end models	1/2" - 8"	Face to face Dimensions
ANSI B 16.11	End Dimensions: S.W. (Socket Weld) S.E. (Threaded)	All the models except flanged	1/4" - 6"	Face to face Dimensions
ANSI B 16.34	Steel valves	All the models	1/4" - 14"	Wall Thickness designs. Material-specifications. Range-Pressure-Temperature. Hydrostatic Test
ANSI B 16.25	Buttweld ends	All the models except flanged	1/2" - 6"	Angle of machine beveling and O.D. And I.D.

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RHINO VALVES WORLDWIDE

HOW TO ORDER

HOW TO ORDER TO RHINO VALVES

1 1/2"	D	4	4	6	T	T	SW
Valve Size	Type	Series	Material: Body, pipe ends	Material: Ball Steam	Material: Seat	Material: Body Seals	Ends
1/4" 3/8" 1/2" 3/4" 1" 1 1/4" 1 1/2" 2" 3" 4" 6" 8"	- Normal FS - Fire Safe D - Diverter T - 3 Ways C - Cryogenic PT - Full Port	4 - 400 (44) 6 - 600 H6 - H600 42 - Mite 43 - Mass 60 - 6000 45 150 151 152 300 302 10 - 1000 20 - 2000	1 - Brass 4 - Carbon Steel 6 - Stainless Steel 6L - Stainless Steel CF-3M	1 - Brass 4 - Carbon Steel 6 - Stainless Steel	B - Buna T - Ptfe R - Tfe Y - Lubetal (Delrin) MT - Multifil U - Uhmwpe D - Devlon Note : Use only one letter if body seal is to be same material as seat	B - Buna T - Ptfe R - Tfe Y - Lubetal (Delrin) MT - Multifil U - Uhmwpe D - Devlon G - Graphoil V - Viton	SE - Screw End SW - Socket Weld BW - Butt Weld 150# - Ansi 150 300# - Ansi 300

NOT ALL THE COMBINATIONS ARE AVAILABLE. SEE THE FOLLOWING TABLE AND CONSULT TO THE COMPANY OR AUTHORIZED DISTRIBUTOR FOR AVAILABILITY.
THERE ARE SOME OTHER MATERIALS, OPTIONS AND ENDS AVAILABLE

COMMON COMBINATION FOR SEALS AND SEATS MATERIALS

SERIES	SEATS	BODY SEALS	STEAM SEAL
ALL	BUNA	BUNA	RTFE
ALL	PTFE	PTFE	RTFE
ALL	RTFE	PFTE	RTFE
ALL	LUBETAL	VITON	RTFE
ALL	MULTIFIL	MULTIFIL	MULTIFIL
ALL	UHMWPE	VITON	RTFE
FS ONLY	PTFE	GRAPHOIL	GRAPHOIL
H600 ONLY	DELRIN	VITON	DELRIN/MULTIFIL
6000 ONLY	DELRIN/VITON	VITON	DELRIN/MULTIFIL

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