RHINO VALVES WORLDWIDE

Series 152/302

LICENSE No. 6D-0321

The Valve Flanged Full Port is economic par excellence.
Available in ANSI 150 # and 300 #.
This slight valve is ideal for automation applications and this available one in diverse configurations, materials and options.

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

RHINO VALVES WORLDWIDE

SERIES 152/302

Full Port, ANSI 150# flanged, two pieces body, ISO 5211 top mounting plate for easy automation, integrated locking device, double static device in stem, etc. are only some of the standard characteristics of this ball valve of light design and great performance. For all applications, Series 152 is the most convenient valve for its price, easy of installation, integrity against leakage, low operation torque, ease of automation and tested confiability as any Worcester valve. Valvulas Worcester de Mexico/ Rhino Valves Worldwide manufacture and stock the series 152 valve, which warranty parts availability and short delivery times with configurations for every application.
Available from 1/2" to 8" (*) in WCB Carbon Steel and CF8M Stainless Steel, the Series 152 IS normally supplied with PTFE (Virgin Teflon), but as in all Worcester/Rhino valves, a complete range of seats and seal material is available for every application.
(*) At the time this document was printed, not all sizes were available. Pleas ask factory about availability.

SPECIFICATIONS

Stem design:
The thermal self-adjusted stem, has bee designed blow-proof for a long life whitout leakage: Inserted from inside of the body, it is securely held by body, the external CHEVRON® type seal warranty an excellent sealing.
The stem has a double antistatic device which allow a permanent Ball - Stem - Body contact.

Valve Size:
1/2", 3/4", 1", 1 1/2", 2", 3", 4", 6", 8".
(15, 20, 25, 40, 50, 80, 100, 150, 200)

Flanges:
Series 150 - ANSI 150#

Body Material:
Carbon Steel ASTM A216 gr WCB
Stainless Steel ASTM A351 gr CF8M

Stem design:
Inside inserted, double antistatic device, double Belleville washers, internal thrust bearing washer, coupling for direct mounting actuator and CHEVRON® type outside sealing.

Bolting:
Bolts: ASTM A193/193M (AISI 304) Nuts: ASTM A193/193M (AISI 304)

Stem Seal Material:
R-PTFE (15% fiber glass reinforced teflon), Multifil, Graphoil.

Seats material:
PTFE (Virgin Teflon), R-PTFE (reinforced Teflon), Multifil.

Body SEALS:
PTFE, R-PTFE, Viton, EPR, Graphoil
NOTE: Some other seats and seal materials are available.

Ball and Stem material:
Stainless Steel ASTM A276 gr 316

Maiz 263 Col. Valle del Sur Iztapalapa Mexico, D.F.
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RHINO VALVES WORLDWIDE

SERIES 152/302

Design:
Two pieces body.

Operation:
Casted full handle (1/2" to 2").
Casted handle for lever extension (3" to 8").
or Pneumatic or electric actuation.

Design Specifications:
ANSI B16.10 - Face to face dimensions.
ANSI B16.5 - 150# Flange dimensions.
MSS SP72 - Ball valves with flanged or welded ending 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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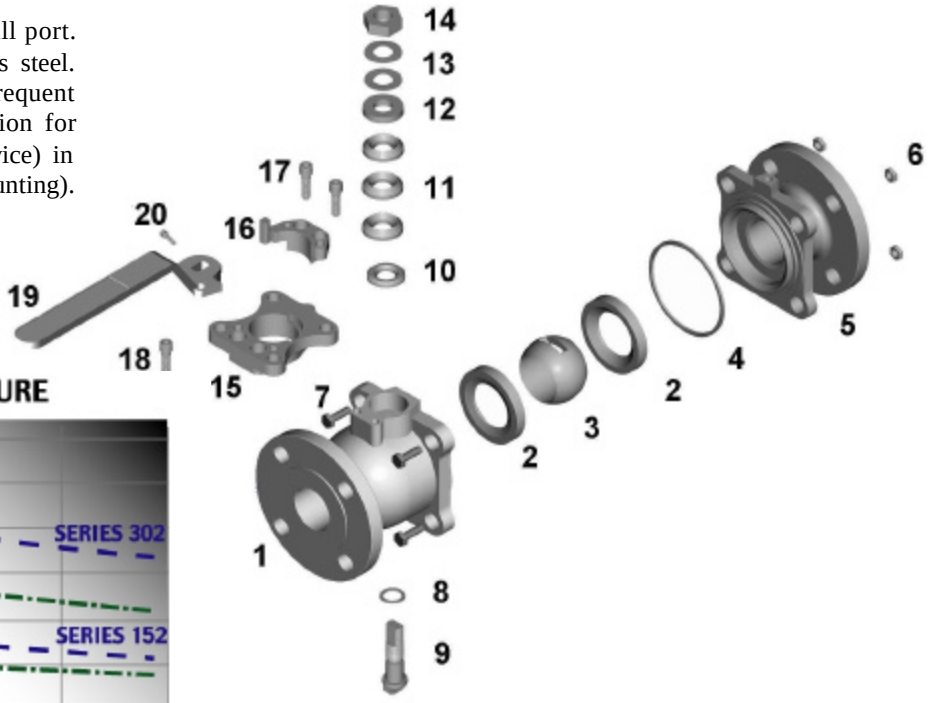
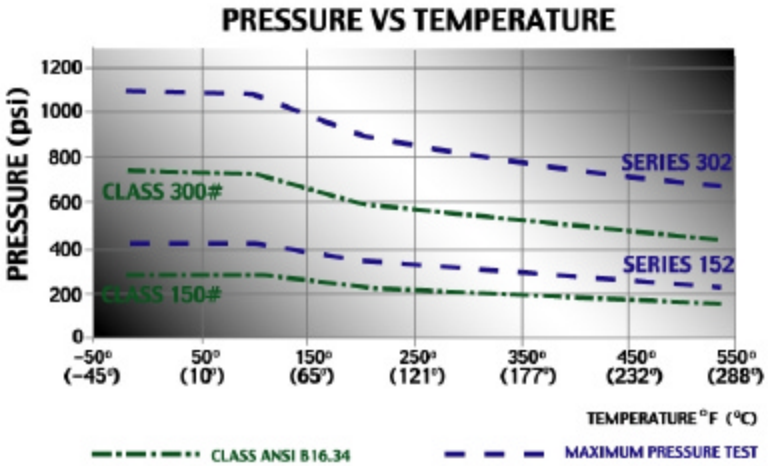
RHINO VALVES WORLDWIDE

SERIES 152/302

SERIES 152/302. Flanged ANSI 150# or 300#. Full port. Strong construction in carbon steel and stainless steel. Two piece Body design from ½" to 8". Seals for frequent cycling in diverse materials. Handle with provision for locking device. Ball and stem (with antistatic device) in stainless steel. ISO5211 pad optional (direct mounting). Optional Fire safe API607 and API 6D.





PARTS LISTING OF SERIES 152/302

			MATERIAL	
ITEM	QUANTITY	DESCRIPTION	CARBON STEEL	STAINLESS STEEL
1	1	BODY	ASTM A 216 WCB	ASTM A 351 CF 8M
2	2	SEAT	PTFE	PTFE
3	1	BALL	ASTM A 351 CF 8M	ASTM A 351 CF 8M
4	1	SEAL	PTFE	PTFE
5	1	BODY FLANGE	ASTM A 216 WCB	ASTM A 351 CF 8M
6	4/6	NUT	ASTM A 194 2HM	ASTM F594 TYPE A304
7	4/6	BOLT	SAE J 429 GR. 5	ASTM F594 TYPE A304
8	1	THRUST BEARING	R-PTFE 25%	R-PTFE 25%
9	1	STEAM	AISI 1018-12L14	AISI 316
10	1	STEAM SEAL	PTFE	PTFE
11	3	CHEVRON PACKING	PTFE	PTFE
12	1	SUPERIOR PACKING	PTFE	PTFE
13	2	BELLEVILLE WASHERS	AISI 1075	AISI 302
14	1	STEM NUT	ASTM A 194 2HM	ASTM F594 TYPE A304
15	1	ISO PLATE (OPTIONAL)	AISI 304	AISI 304
16	1	LOCK BASE	AISI 304	AISI 304
17	3	ALLEN SCREW ISO PLATE	AISI 1045	AISI 304
18	2	ALLEN SCREW LOCK BASE	AISI 1045	AISI 304
19	1	LOCKING HANDLE	ASTM A 743 CF8/CA15	ASTM A 743 CF8/CA15
20	1	SET SCREW	AISI 1045	AISI 304

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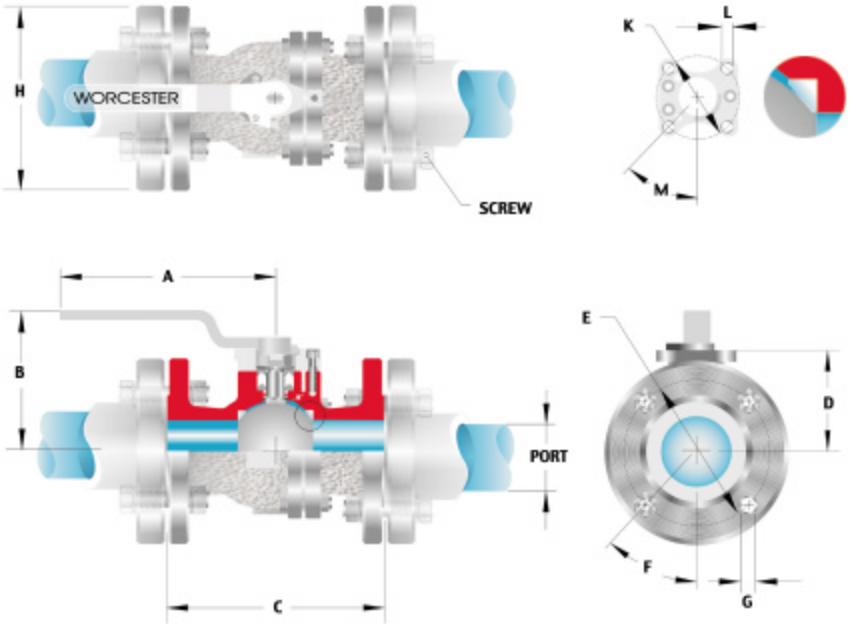
RHINO VALVES WORLDWIDE

SERIES 152



SERIES 152

FLOW RATE	
SIZE VALVE	Cv (USGPM)
1/2"	32
3/4"	54
1"	105
1 1/2"	275
2"	460
3"	1330
4"	2420
6"	5400
8"	10000

Service Conditions:

CONDITION	*CARBON STEEL*	*STAINLESS STEEL*
ANSI CLASS #	150	150
OPERATION TEMPERATURE	-20 to 100°F (-29 to 38°C)	-20 to 100°F (-29 to 38°C)
MAX. ALLOWABLE WORKING PRESSURE	285psi (20 kg/cm2)	275psi (19.3 kg/cm2)

SERIE 152 1/2" - 8"

SIZE	A	B	C	D	PORT
1/2"	4 1/4	2.80	4.25	1.80	0.500
3/4"	4 1/4	3.08	4.62	2.00	0.750
1"	5 3/4	3.25	5.00	2.25	1.000
1 1/2"	7	4.50	6.50	3.04	1.500
2"	7	4.75	7.00	3.30	2.000
3"	3	5.38	8.00	4.47	3.000
4"	3	6.02	9.00	5.10	4.000
6"	4 1/2	8.66	15.50	7.40	6.000
8"	4 1/2	10.00	18.00	8.85	8.000

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

Dimension in inches.

SIZE	Flanged ANSI B 16.5 class 150						PLATE ISO 5211				
	E	F	G	H	Number of Holes	Bolt Flange		K	L	M	Weight in Lbs.
1/2"	2.38	45º	5/8	3.50	4	1/2	F03/F05	1.417/1.97	1/4-5/16	45º	3.968
3/4"	2.75	45º	5/8	3.88	4	1/2	F03/F05	1.417/1.97	1/4-5/16	45º	4.850
1"	3.12	45º	5/8	4.25	4	1/2	F05	1.970	9/32	45º	6.614
1 1/2"	3.88	45º	5/8	5.00	4	1/2	F07	2.750	23/64	45º	11.023
2"	4.75	45º	3/4	6.00	4	5/8	F07	2.750	23/64	45º	19.401
3"	6.00	45º	3/4	7.50	4	5/8	F10	4.016	7/16	45º	41.888
4"	7.50	45º	3/4	9.00	4	5/8	F10	4.016	7/16	45º	65.698
6"	9.50	22.5º	7/8	11.00	8	3/4	F12/F14	4.921/5.51	1/2-11/16	45º	142.418
8"	11.75	22.5º	7/8	13.50	8	3/4	F12/F14	4921/5.51	1/2-11/16	45º	207.234

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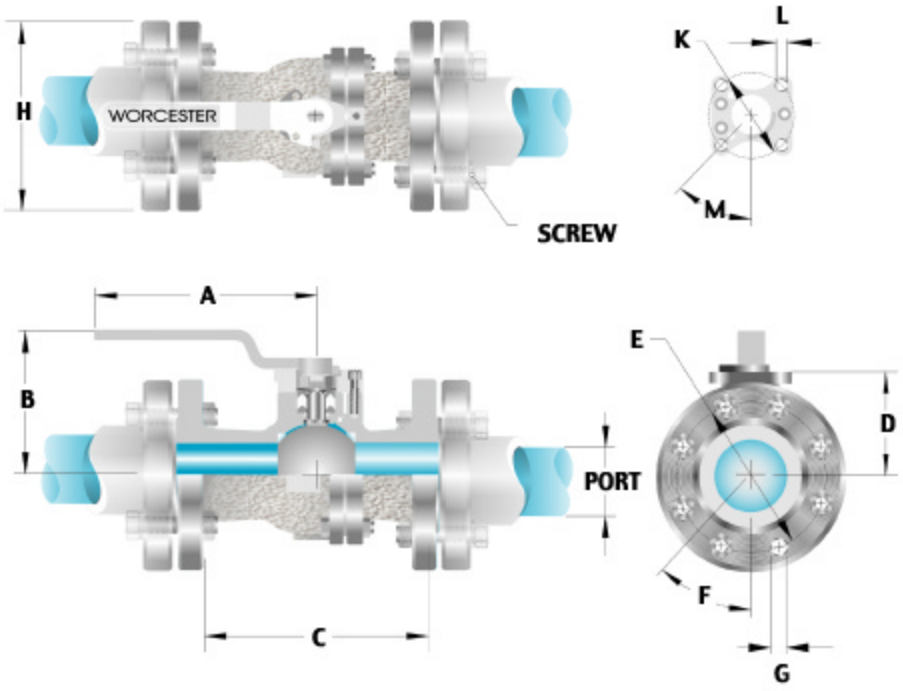
RHINO VALVES WORLDWIDE

SERIES 302



SERIES 302

FLOW RATE	
SIZE VALVE	Cv (USGPM)
2"	460
3"	1330
4"	2420
6"	5400

Service Conditions:

CONDITION	*CARBON STEEL*	*STAINLESS STEEL*
ANSI CLASS #	300	150
OPERATION TEMPERATURE	-20 to 100°F (-29 to 38°C)	-20 to 100°F (-29 to 38°C)
MAX. ALLOWABLE WORKING PRESSURE	740psi (52 kg/cm2)	720psi (50.6 kg/cm2)

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

Dimension in inches.

SERIE 302 2", 3", 4", 6"

SIZE	A	B	C	D	PORT
2"	7	4.75	8.50	3.30	2.000
3"	3	5.38	11.12	4.47	3.000
4"	3	6.02	12.00	5.10	4.000
6"	4 1/2	8.66	15.88	7.40	6.000

SIZE	Flanged ANSI B 16.5 class 300						PLATE ISO 5211				
	E	F	G	H	Number of Holes	Bolt Flange		K	L	M	Weight in Lbs.
2"	5.00	22.5º	3/4	6.50	8	5/8	F07	2.75	23/64	45º	24.251
3"	6.62	22.5º	7/8	8.25	8	3/4	F10	4.02	7/16	45º	63.493
4"	7.88	22.5º	7/8	10.00	8	3/4	F10	4.02	7/16	45º	89.508
6"	10.62	22.5º	7/8	12.50	8	3/4	F12-F14	4.92/5.51	1/2-11/16	45º	190.148

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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	A-351-CF8M
SEAL	PTFE / GRAPHOIL (fire safe)	PTFE / GRAPHOIL (fire safe)
FLANGE	A-216-WCB	A-351-CF8M
NUT	ASTM A-194-2HM	F-594 TYPE 304
BOLT	SAE J429 Gr.5	A193 B8
THIN WASHER	R-PTFE	R-PTFE
STEM	AISI 1018 / AISI 12L14	AISI 316
PACKING	PTFE / GRAPHOIL (fire safe)	PTFE / GRAPHOIL (fire safe)
BELLEVILLE WASHER	AISI 1075	AISI 304
ISO PLATE	AISI 304	AISI 304
LOCK BASE	AISI 304	AISI 304
HANDLE	ASTM A-743 CF8 / CA15	ASTM A-743 CF8 / CA15

Service Conditions:

CONDITION	***CARBON STEEL***	***STAINLESS STEEL***
ANSI CLASS #	150	150
OPERATION TEMPERATURE	-20 to 100°F (-29 to 38°C)	-20 to 100°F (-29 to 38°C)
MAX. ALLOWABLE WORKING PRESSURE	285psi (20 Kg/cm2)	275psi (19.3 Kg/cm2)

General Dimensions:

DESCRIPTION	***½"***	***¾"***	***1"***	***1 ½"***	***2"***	***3"***	***4"***	***6"***	***8"***
LENGTH in (mm)	4.25 (108)	4.62 (117)	5.00 (127)	6.50 (165)	7.00 (178)	8.00 (203)	9.00 (229)	15.50 (394)	18.00 (457)
WIDTH in (mm)	3.50 (89)	3.88 (99)	4.25 (108)	5.00 (127)	6.00 (152)	7.50 (191)	9.00 (229)	11.00 (279)	13.50 (343)
HIGH in (mm)	4.55 (116)	5.02 (128)	5.38 (137)	7.00 (178)	7.75 (197)	9.13 (232)	10.52 (267)	14.16 (360)	16.75 (425)
WEIGHT lb (Kg)	1.80 (46)	2.20 (56)	3.00 (76)	5.00 (127)	8.80 (224)	19.00 (483)	29.80 (757)	64.60 (1641)	207.2 (94)

INSTALLATION AND OPERATION:

Your Series 152 Flanged Ball Valve is ready for its installation. All you need is to choose correctly the Flange Seal or Gasket, according to the media, and place it between the Valve's Flange and the Pipe's flange. Then set up the screws (not included), in each side, tightening them crossed in a gradual way in order to settle them perfectly parallels.
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.
Small sizes valves (1/2" to 2") includes a handle to operate them, but for longer sizes, only a short device is supplied to operate the valve through a pipe extension (no included). The reason is because these kind of valves need a long lever to operate them which if it is permanently fitted, may not be suitable for your facility space and/or may be dangerous as it can be accidentally moved. We recommend the lever must not remain installed in the Valve. Keep it near of your Valve, *not installed!*

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.*

Caution *: Do not install your valve at the end of the line or in a high vibrating piping system, as the bolts which joint the two parts of the body can get loose. If necessary, add a lock washer in everyone of these bolts 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 the next instructions:

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) Remove the Valve from the installation; take out the ISO plate on the top of the valve (if installed) with the proper Allen tool. Take out the bolts to split the body.
e) Remove the ball, preventing from scratching its surface. Place it over a soft material free of burrs.
f) Change the stem's seal and chevron seals, taking out the handle, the adjustment's nut, the lock nut, the Belleville washers and the follower.
g) Reassemble your Valve placing 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).
h) Finish the Valve assembly placing the ball (remember ball only can be assembled with the valve in the closed position.

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

i) Place a new body seal and then join the two parts of the body, tightening the bolts with next recommended torques:

Size	***Recommended Torque of Split Body Nuts***			
	Carbon Steel		***Stainless Steel***	
	(lb*plg)	***Nm***	***(lb*plg)***	***Nm***
½"	*156-204*	*17.6-23.1*	*126-144*	*14.2-16.3*
¾"	*156-204*	*17.6-23.1*	*126-144*	*14.2-16.3*
1"	*156-204*	*17.6-23.1*	*126-144*	*14.2-16.3*
1 ½"	*156-204*	*17.6-23.1*	*126-144*	*14.2-16.3*
2"	*1062-1416*	*120-160*	*708-973*	*80-110*
3"	*1062-1416*	*120-160*	*708-973*	*80-110*
4"	*1062-1416*	*120-160*	*708-973*	*80-110*
6"	*1062-1416*	*120-160*	*708-973*	*80-110*
8"	*1062-1416*	*120-160*	*708-973*	*80-110*

j) Place again the Valve on line with its seal or packing, tighten gradually the screws in a crossing way so the flanges will rest parallels.
k) Place the ISO plate on the top of the body and the handle or actuator.

Seals:

In case of leak between the two parts of the body, you may consider next recommendations:

a) Verify the good condition of the seal or gasket between flanges. Check if the torque of the screws that joint the valve with the pipe flanged is appropriate, if it is necessary tight the screws.

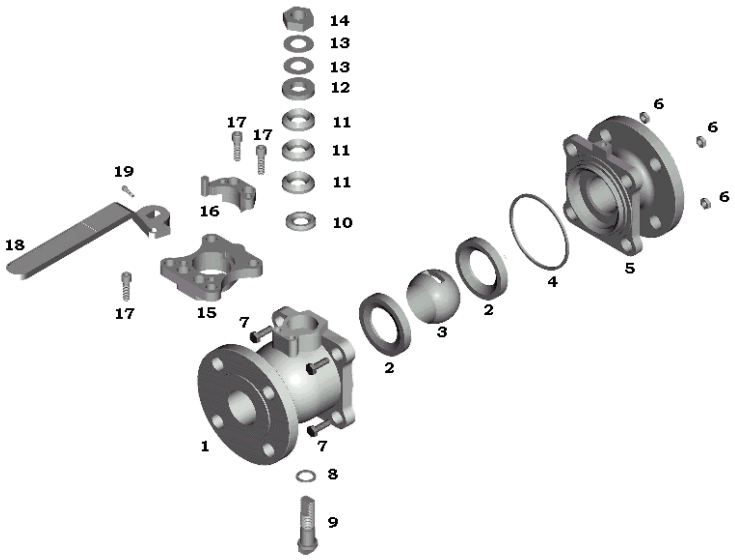
b) Verify that the nuts of the bolts that joint the two parts of the body are tightened as per the recommended torque. Tight them as necessary. If this happen often, it may be due to an excessive line vibration. We might suggest you to include "Expansion Joints" in the line to avoid it. If this is not possible or enough, you can install pressure nuts in each nut to reduce this effect.
c) If leak persist, disassemble the Valve according to the steps "c", *"d" and "e"* of the previous section.
d) Reassemble the Valve placing a new seal according to the steps *"i"*, *"j"* and *"k"* of the previous 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 considering 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 "c", *"d"* and *"e"* of the Stem's 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 the steps *"h"*, *"i"*, *"j"* and *"k"* of the Stem's 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.



1. BODY
2. SEAT
3. BALL
4. SEAL
5. FLANGE
6. NUT
7. BOLT
8. THUST BEARING
9. STEM
10. PACKING FOLLOWER BOTTOM
11. CHEVRON PACKING
12. PACKING FOLLOWER TOP
13. BELLEVILLE WASHER
14. STEM NUT
15. ISO BASE
16. LOCK BASE
17. BASE CAP BOLT
18. HANDLE
19. HANDLE SET SCREW

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
152	150	285 (20Kg/cm2)	275 (19.3 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.**

Visit our web site : *www.worcester.com.mx*

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	A-351-CF8M
SEAL	PTFE / GRAPHOIL (fire safe)	PTFE / GRAPHOIL (fire safe)
FLANGE	A-216-WCB	A-351-CF8M
NUT	ASTM A-194-2HM	F-594 TYPE 304
BOLT	SAE J429 Gr.5	A193 B8
THIN WASHER	R-PTFE	R-PTFE
STEM	AISI 1018 / AISI 12L14	AISI 316
PACKING	PTFE / GRAPHOIL (fire safe)	PTFE / GRAPHOIL (fire safe)
BELLEVILLE WASHER	AISI 1075	AISI 304
ISO PLATE	AISI 304	AISI 304
LOCK BASE	AISI 304	AISI 304
HANDLE	ASTM A-743 CF8 / CA15	ASTM A-743 CF8 / CA15

Service Conditions:

CONDITION	***CARBON STEEL***	***STAINLESS STEEL***
ANSI CLASS #	300	300
OPERATION TEMPERATURE	-20 to 100°F (-29 to 38°C)	-20 to 100°F (-29 to 38°C)
MAX. ALLOWABLE WORKING PRESSURE	740psi (52 Kg/cm2)	720psi (50.6 Kg/cm2)

General Dimensions:

DESCRIPTION	***½"***	***¾"***	***1"***	***1 ½"***	***2"***	***3"***	***4"***	***6"***	***8"***
LENGTH in (mm)	NA	NA	NA	NA	8.50 (216)	11.12 (282)	12.00 (305)	15.88 (403)	NA
WIDTH in (mm)	NA	NA	NA	NA	6.50 (165)	8.25 (210)	10.00 (254)	12.50 (318)	NA
HIGH in (mm)	NA	NA	NA	NA	8.00 (203)	9.51 (241)	11.02 (280)	14.91 (379)	NA
WEIGHT lb (Kg)	NA	NA	NA	NA	24.25 (11)	63.5 (28.8)	89.5 (40.6)	190.3 (86.3)	NA

INSTALLATION AND OPERATION:

Your Series 302 Flanged Ball Valve is ready for its installation. All you need is to choose correctly the Flange Seal or Gasket, according to the media, and place it between the Valve's Flange and the Pipe's flange. Then set up the screws (not included), in each side, tightening them crossed in a gradual way in order to settle them perfectly parallels.
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.
Small sizes valves (up to 2") includes a handle to operate them, but for longer sizes, only a short device is supplied to operate the valve through a pipe extension (no included). The reason is because these kind of valves need a long lever to operate them which if it is permanently fitted, may not be suitable for your facility space and/or may be dangerous as it can be accidentally moved. We recommend the lever must not remain installed in the Valve. Keep it near of your Valve, *not installed!*

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.*

Caution *: Do not install your valve at the end of the line or in a high vibrating piping system, as the bolts which joint the two parts of the body can get loose. If necessary, add a lock washer in everyone of these bolts 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 the next instructions:

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) Remove the Valve from the installation; take out the ISO plate on the top of the valve (if installed) with the proper Allen tool. Take out the bolts to split the body.
e) Remove the ball, preventing from scratching its surface. Place it over a soft material free of burrs.
f) Change the stem's seal and chevron seals, taking out the handle, the adjustment's nut, the lock nut, the Belleville washers and the follower.
g) Reassemble your Valve placing 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).
h) Finish the Valve assembly placing the ball (remember ball only can be assembled with the valve in the closed position.

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

i) Place a new body seal and then join the two parts of the body, tightening the bolts with next recommended torques:

Size	***Recommended Torque of Split Body Nuts***			
	Carbon Steel		***Stainless Steel***	
	(lb*plg)	***Nm***	***(lb*plg)***	***Nm***
½"	*156-204*	*17.6-23.1*	*126-144*	*14.2-16.3*
¾"	*156-204*	*17.6-23.1*	*126-144*	*14.2-16.3*
1"	*156-204*	*17.6-23.1*	*126-144*	*14.2-16.3*
1 ½"	*156-204*	*17.6-23.1*	*126-144*	*14.2-16.3*
2"	*1062-1416*	*120-160*	*708-973*	*80-110*
3"	*1062-1416*	*120-160*	*708-973*	*80-110*
4"	*1062-1416*	*120-160*	*708-973*	*80-110*
6"	*1062-1416*	*120-160*	*708-973*	*80-110*
8"	*1062-1416*	*120-160*	*708-973*	*80-110*

j) Place again the Valve on line with its seal or packing, tighten gradually the screws in a crossing way so the flanges will rest parallels.
k) Place the ISO plate on the top of the body and the handle or actuator.

Seals:

In case of leak between the two parts of the body, you may consider next recommendations:

a) Verify the good condition of the seal or gasket between flanges. Check if the torque of the screws that joint the valve with the pipe flanged is appropriate, if it is necessary tight the screws.

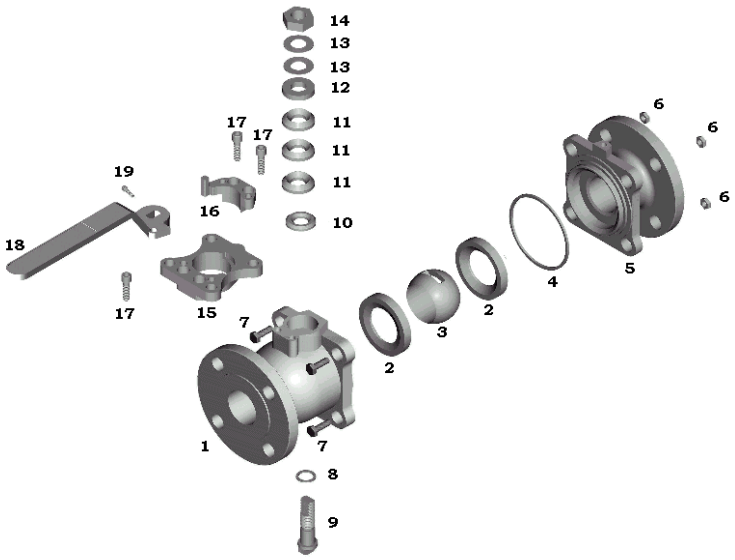
b) Verify that the nuts of the bolts that joint the two parts of the body are tightened as per the recommended torque. Tight them as necessary. If this happen often, it may be due to an excessive line vibration. We might suggest you to include "Expansion Joints" in the line to avoid it. If this is not possible or enough, you can install pressure nuts in each nut to reduce this effect.
c) If leak persist, disassemble the Valve according to the steps "c", *"d" and "e"* of the previous section.
d) Reassemble the Valve placing a new seal according to the steps *"i"*, *"j"* and *"k"* of the previous 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 considering 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 "c", *"d"* and *"e"* of the Stem's 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 the steps *"h"*, *"i"*, *"j"* and *"k"* of the Stem's 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.



1. BODY
2. SEAT
3. BALL
4. SEAL
5. FLANGE
6. NUT
7. BOLT
8. THUST BEARING
9. STEM
10. PACKING FOLLOWER BOTTOM
11. CHEVRON PACKING
12. PACKING FOLLOWER TOP
13. BELLEVILLE WASHER
14. STEM NUT
15. ISO BASE
16. LOCK BASE
17. BASE CAP BOLT
18. HANDLE
19. HANDLE SET SCREW

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
302	300	740 (52Kg/cm2)	720 (50.6 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).**

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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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