

VALUE-LINE®
3-Piece Ball Valves
Series 3A & 3C
1/2" – 2" (DN15 - 50)

Installation, Maintenance and
Operating Instructions



TABLE OF CONTENTS

1. GENERAL.....	3
1.1 Scope of the Manual	3
1.2 Valve Markings	3
1.3 Safety Precautions.....	3
2. TRANSPORTATION AND STORAGE.....	4
3. INSTALLATION	4
3.1 General	4
3.2 Installing in the pipeline	4
3.3 Handles	5
3.4 Valve Insulation	5
3.5 Actuator	5
3.6 Commissioning	5
4. MAINTENANCE	5
4.1 General	5
4.2 Actuated Valve.....	5
4.3 Disassembly.....	6
4.4 Checking Parts.....	6
4.5 Assembly	6
5. ACTUATOR MOUNTING.....	7
6. REPAIR KITS	7
7. SERVICE / SPARE PART	7
8. EXPLODED VIEW / PART LIST	8
9. HOW TO ORDER.....	8

READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.
 If you require additional assistance, please contact the manufacturer or manufacturer's representative.
 Addresses and phone numbers are printed on the back cover.
 See also www.metso.com/valves for the latest documentation.

SAVE THESE INSTRUCTIONS!

1. GENERAL

1.1 Scope of the Manual

This instruction manual contains important information regarding the installation, operation and maintenance of the Jamesbury® 1/2" – 2" (DN15- 50) Standard Bore; Series 3A Thread-end Ball Valves, and Series 3C Weld-end Ball Valves. Please read these instructions carefully and save them for future reference.

WARNING:

AS THE USE OF THE VALVE IS APPLICATION SPECIFIC, A NUMBER OF FACTORS SHOULD BE TAKEN INTO ACCOUNT WHEN SELECTING A VALVE FOR A GIVEN APPLICATION. THEREFORE, SOME OF THE SITUATIONS IN WHICH THE VALVES ARE USED ARE OUTSIDE THE SCOPE OF THIS MANUAL.

IF YOU HAVE ANY QUESTIONS CONCERNING THE USE, APPLICATION OR COMPATIBILITY OF THE VALVE WITH THE INTENDED SERVICE, CONTACT METSO FOR MORE INFORMATION.

WARNING:

DOUBLE-SEATED BALL VALVE DESIGNS, LIKE THE SERIES 3A & 3C, CAN UNDER CERTAIN CONDITIONS TRAP FLUID IN THE BALL CAVITY. RAISING THE TEMPERATURE OF THE TRAPPED FLUID CAUSES THE INTERNAL VALVE PRESSURE TO RISE. EXTREME TEMPERATURE RISE CAN BUILD UP EXCESSIVE PRESSURE WHICH COULD LEAD TO UNCONTROLLED PRESSURE RELEASE. DAMAGE OR PERSONAL INJURY MAY RESULT.

WARNING:

BEWARE OF BALL MOVEMENT!

KEEP HANDS, OTHER PARTS OF THE BODY, TOOLS AND OTHER OBJECTS OUT OF THE OPEN FLOW PORT. LEAVE NO FOREIGN OBJECTS INSIDE THE VALVE. WHEN THE VALVE IS ACTUATED, THE BALL FUNCTIONS AS A CUTTING DEVICE. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY!

1.2 Valve Markings

The valve has an identification marking stamped on bottom of valve. (See **Figure 1**)

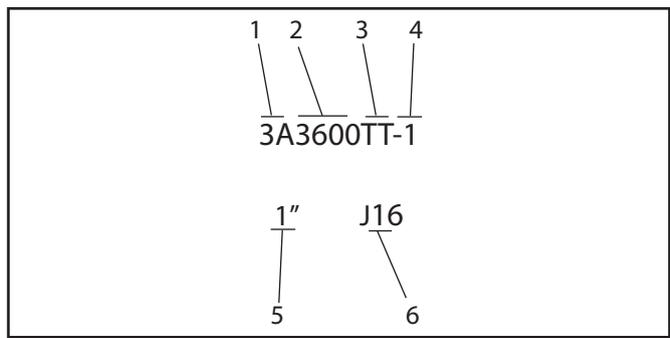


Figure 1 Valve ID

Identification markings:

1. Valve Series
2. Body/Trim Material
3. Seat/Seal Material
4. Bolting
5. Size
6. Assembly date

The valve also has marking cast into the sides of the valve. On one side is cast the valve cold working pressure (CWP) in psi. (See **Figure 2**)



Figure 2 Valve Rating

On the opposite side of the valve is the cast in size and body material. (See **Figure 3**)



Figure 3 Size/Material

1.3 Safety Precautions

WARNING:

VALVE RATINGS!

THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY THE CWP RATING: CAREFULLY CHECK RATING. (SEE **FIGURE 2**) THIS IS THE SAFE USE PRESSURE FOR THIS VALVE BETWEEN -20° TO +100°F (-29° TO +38°C). DO NOT EXCEED THESE RATINGS! FOR INSTALLATION TEMPERATURES BELOW AND ABOVE THESE LIMITS CONTACT METSO.

2. TRANSPORTATION AND STORAGE

Check the valve for any damage that may have occurred during transport.

Store the valve carefully. Storage indoors in a dry place is recommended.

Do not remove the flow port protectors until installing the valve.

Move the valve to its intended location just before installation.

The valve is usually delivered in the open position.

If the valve(s) are to be stored for a long duration follow the recommendations in IMO-S1.

3. INSTALLATION

3.1 General

Always loosen and tighten fasteners with the appropriate wrench to avoid damaging the valve, handle, linkage, actuator, fittings or flats.

Remove the protective packaging and flow port protectors and check that the valve is clean inside. Clean valve if necessary.

Flush the pipeline carefully before installing the valve. Foreign objects, such as sand or pieces of welding electrodes, will damage the ball and seats.

3.2 Installing in the pipeline

Read and follow all **WARNINGS!**

Refer to the Section 4, **MAINTENANCE** for stem seal adjustment. If there is weepage past the stem seals upon installation, it means the valve may have been subject to wide temperature variations in shipment. Leak-tight performance will be restored by a simple stem seal adjustment described in the **MAINTENANCE** section.

Flow through the *Jamesbury* 3A or 3C valve can be in either direction.

Thread-end Style (3A) Thread-end valves like the 3A have NPT threads. To insure a leak tight joint, liberal use of a compatible pipe joint compound is necessary.

WARNING:

ANY COMPOUND OR LUBRICANT USED ON THREADS SHALL BE SUITABLE FOR THE SERVICE CONDITIONS AND SHALL NOT REACT UNFAVORABLY WITH EITHER THE SERVICE FLUID OR THE PIPING MATERIAL.

Use standard piping practices when installing the valves with threaded connections. When tightening the valve to the pipe, apply the wrench to the end nearest the pipe being worked.

Weld-end Style (3C)

WARNING:

WELDING AND/OR GRINDING OF STAINLESS STEEL AND OTHER ALLOY STEELS CONTAINING CHROMIUM METAL MAY CAUSE THE RELEASE HEXAVALENT CHROMIUM. HEXAVALENT CHROMIUM, CHROMIUM(VI) OR CR(VI), IS KNOWN TO CAUSE CANCER. BE SURE TO USE ALL APPROPRIATE PPE WHEN WELDING METALS CONTAINING CHROMIUM. IF YOU HAVE ANY QUESTIONS CONSULT YOUR SUPERVISOR.

- A. Only a qualified person should weld pressure retaining parts, as outlined in Section IX of the ASME Boiler and Pressure Vessel Code.
- B. Use the appropriate filler material and qualified procedure, in accordance with applicable piping codes and standards.
- C. Turn the valve to the full open position.
- D. Remove or protect the handle, actuator, and any other part that might be damaged by heat, weld splatter, or incidental arc strikes.
- E. Wrap a wet cloth or the like around the center section of the valve body to minimize heat transfer to the seats and seals.
- F. **CAUTION:** Multiple weld passes are required. Maximum weld bead size should be less than 1/8" (3 mm). **DO NOT** heat the center section above 400°F (204°C). Use a temperature stick or other means to monitor the valve body temperature. For welds that require multiple passes to achieve size, stop after each 360° pass and carefully monitor the inter-pass temperature to prevent over-heating the center body. Between passes, ensure the wet cloth is still damp.
- G. After cooling to a temperature where the valve can be safely touched, replace the handle or actuator per the applicable instructions and procedures.

It is not recommended to install the valve with the stem on the underneath side because dirt in the pipeline may then enter the body cavity and potentially damage the stem packing (see **Figure 4**).

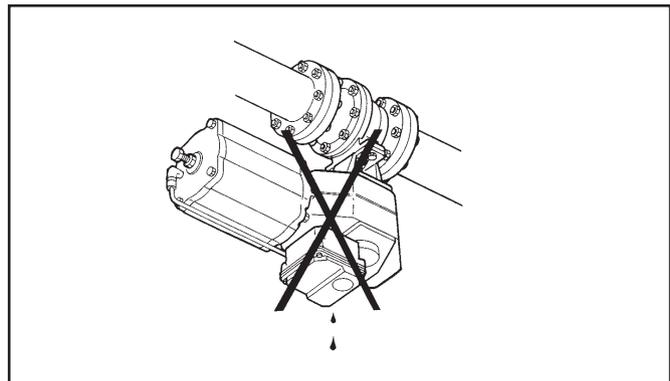


Figure 4 Avoid this mounting position

3.3 Handles

If the *Value-Line* Series 3 valve handle (15) has to be removed for any reason, the handles must be remounted with the handle stop tang as shown in **Figure 6**.

WARNING:

FAILURE TO PROPERLY MOUNT THE HANDLE MAY RESULT IN IMPROPER VALVE OPERATION, DAMAGE OR PERSONAL INJURY.

3.4 Valve Insulation

If necessary, the valve may be insulated. Insulation must not continue above the upper level of the valve (see **Figure 5**).

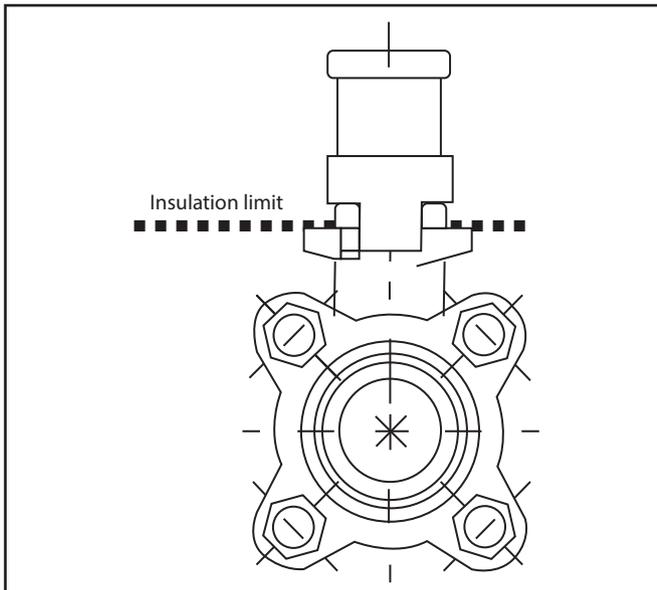


Figure 5 Insulation of the valve

3.5 Actuator

WARNING:

WHEN INSTALLING THE ACTUATOR ON THE VALVE, MAKE SURE THAT THE VALVE ASSEMBLY FUNCTIONS PROPERLY. INFORMATION ON ACTUATOR INSTALLATION IS GIVEN IN **SECTION 5** OR IN THE SEPARATE ACTUATOR INSTRUCTIONS.

The actuator should be installed in a manner that allows plenty of room for its removal.

The upright position is recommended for the actuator.

The actuator must not touch the pipeline, because pipeline vibration may interfere with its operation.

In certain cases, it may be considered advantageous to provide additional support to the actuator. These cases will normally be associated with large actuators, extended stems, or where severe vibration is present. Please contact Metso for advice.

3.6 Commissioning

Ensure that there is no dirt or foreign objects left inside the valve or pipeline. Flush the pipeline carefully. Make sure that the valve is fully open when flushing.

WARNING:

GOOD PIPING PRACTICE DICTATES THAT ONCE INSTALLED, BUT PRIOR TO FIRST USE, THE VALVE IS LEAK TESTED IN PLACE TO ASSURE LEAK-TIGHTNESS HAS NOT BEEN COMPROMISED BY THE INSTALLATION PROCESS. INSTALLATION ACTIONS THAT CAN CAUSE LEAKAGE INCLUDE, BUT ARE NOT LIMITED TO, WRENCHING, SOLDERING, WELDING AND/OR HOISTING. PIPELINE MIS-ALIGNMENTS AND/OR LACK OF SUFFICIENT SUPPORT CAN ALSO PLACE UNDUE STRESS ON THE VALVE, POSSIBLY RESULTING IN LEAKAGE.

4. MAINTENANCE

4.1 General

Although Metso's *Jamesbury* valves are designed to work under severe conditions, proper preventative maintenance can significantly help to prevent unplanned downtime and in real terms reduce the total cost of ownership. Metso recommends inspecting valves at least every five (5) years. The inspection and maintenance frequency depends on the actual application and process condition. Routine maintenance consists of tightening the stem nuts (16) in (**Figure 6**) 1/4 turn periodically to compensate for stem seal wear. The valve should be fully closed during the tightening. **CAUTION:** Tightening hex nuts (16) too severely will shorten the life of the shaft seals.

Overhaul maintenance consists of replacing seats and seals. These parts may be obtained through your authorized Metso Distributor

WARNING:

FOR YOUR SAFETY IT IS IMPORTANT THE FOLLOWING PRECAUTIONS BE TAKEN PRIOR TO INSTALLATION, SERVICING OR REMOVAL OF THE VALVE FROM THE PIPELINE OR BEFORE ANY DISASSEMBLY:

1. WEAR ANY PROTECTIVE CLOTHING OR EQUIPMENT NORMALLY REQUIRED WHEN WORKING WITH THE FLUID INVOLVED.
2. DEPRESSURIZE THE PIPELINE AND CYCLE THE VALVE AS FOLLOWS:
 - A. PLACE THE VALVE IN THE OPEN POSITION AND DRAIN THE PIPELINE.
 - B. CYCLE THE VALVE TO RELIEVE RESIDUAL PRESSURE IN THE BODY CAVITY BEFORE REMOVAL FROM THE PIPELINE.
 - C. AFTER REMOVAL AND BEFORE ANY DISASSEMBLY, CYCLE THE VALVE AGAIN SEVERAL TIMES.
3. THESE VALVES ARE SUITABLE FOR A WIDE VARIETY OF FLUIDS AND GASES. BE CERTAIN THAT THE VALVE MATERIALS SELECTED ARE SUITABLE FOR THE APPLICATION.

4.2 Actuated Valve

It is generally most convenient to detach the actuator and its auxiliary devices before removing the valve from the pipeline. If the valve package is small or if it is difficult to access, it may be more practical to remove the entire assembly.

NOTE: To ensure proper reassembly, observe the position of the actuator and positioner/limit switch with respect to the valve before detaching the actuator.

WARNING:

ALWAYS DISCONNECT THE ACTUATOR FROM ITS POWER SOURCE, PNEUMATIC, HYDRAULIC OR ELECTRICAL, BEFORE ATTEMPTING TO REMOVE IT FROM THE VALVE!

WARNING:

DO NOT REMOVE A SPRING-RETURN ACTUATOR UNLESS A STOP-SCREW IS CARRYING THE SPRING FORCE!

1. Detach the air supply, electrical supply, hydraulic supply and control signal cables or pipes from their connectors.
2. Unscrew the actuator mounting bracket screws.
3. Lift the actuator straight up in line with the valve stem until the coupling between actuator drive and valve stem is completely disengaged.
4. Place actuator in a safe location to avoid damage or personal injury.

4.3 Disassembly

NOTE: If complete disassembly becomes necessary, replacement of all seats and seals is recommended. Refer to the Repair Kit Chart (**Table 2**).

NOTE: Always use original OEM parts to make sure that the valve functions properly.

This ball valve is designed to be serviced in or out of the pipe line. The following instructions are for in-line disassembly:

1. Comply fully with the instructions in the **WARNING** Section at the beginning of this document.
2. Be sure to cycle the valve. Leave the valve in the open position. The center body section will not swing out if the valve is in the closed position.
3. Remove the top stem nut (16), lockwasher (9) and the handle (15).
4. Loosen all four body bolts (20). Remove three of the four bolts from the valve. Leave the remaining bolt in place with the nut backed off at least 1/4" (6 mm)
5. For positive alignment and ease of in-line assembly, each end cap is interlocked approximately 1/16" (1.5 mm) into the valve body. To overcome this feature during in-line disassembly, it is necessary to separate each end cap at least 1/16" (1.5 mm) from the valve body. Sharply rap the valve body and the end cap with a block of wood or a rubber mallet to break loose the body seal. Spread the end caps and swing the valve body (1) out of the pipe line. Be careful not to damage the sealing surface at each end of the valve.
6. Turn the stem (4) so that the valve is in the fully closed position. Remove the body seals (6) from the end caps (2) and the seats (5) from the valve body (1). Body

seals may be tightly compressed in their grooves. Use extreme care when prying them out. Damage such as scratches to the bottom of the groove will cause leaks. If the seats are not easily removed, gently tap the ball (3) with a piece of wood or other soft material.

7. Remove the lower stem nut (16) and the compression ring (18).
8. Remove the ball (3) from the valve body (1).
9. Press the stem (4) from the top into the valve body (1) and remove it through one end of the body.
10. Carefully pry out and discard the old stem seals (7), and the stem bearing (8). Be careful not to damage any of the sealing or bearing surfaces.

4.4 Checking Parts

1. Clean all disassembled parts.
2. Check the stem (4) and ball (3) for damage. Pay particular attention to the sealing areas.
3. Check all sealing and gasket surfaces of the body (1) and body cap (2).
4. Replace any damaged parts.
5. Replace any fastener where the threads are damaged or have been heated, stretched or corroded.
6. Replace any parts that have cracks, gouges or pits that will affect sealing.

NOTE: When ordering spare parts, always include the following information:

- a. Valve catalog code (see **Section 1.2**),
- b. If the valve is serialized – the serial number (stamped on the valve body),
- c. From **Figure 6**, the ballooned part number, part name and quantity required.

4.5 Assembly

The following instructions are for in-line assembly. For bench assembly, which may be more convenient, follow a similar procedure by holding the valve in a vise by one end cap. Use care not to cut or scratch the seats (5) or seals (7).

1. With the valve body (1) swung to the out-of-line position, insert the stem bearing (8), into the stem bore.
2. Insert the threaded end of the stem (4) into the stem bore and up out the top of the valve. Be careful not to damage the stem bearing (8).
3. Holding the stem bearing in place from inside the valve, install two stem seals (7), the compression ring (18), and thread on one of the stem nuts (16) until the stem starts to turn.
4. Place a wrench through the body on the bottom of the stem blade to hold the stem stationary. Place another wrench on the stem nut (16) and turn the nut down

until the seals bottom and the stem comes snugly into place. Tighten the stem nut (16) until snug, plus an additional 1/4 – 1/2 turn.

5. Align the stem blade inside the valve body (1) with the ball (3). Insert the ball (3) and rotate the stem (4) to the fully closed position.
6. Working at either end of the body (1), place a seat (5) into the body valve (1). Push the seat (5) snugly against the closed ball (3).
7. Place a body seal (6) into the machined sealing groove of the end cap (2). Be certain the groove and seal are clean.
8. Repeat steps 6 and 7 for assembly of the opposite end of the valve.
9. Turn the stem to the full open position.
10. Swing the entire body assembly back into the properly aligned and interlocked position between the end caps (2), being careful not to scratch the body seals. The end caps (2) may have to be spread slightly to accept the valve body (1).
11. Close the valve.
12. Bolt the valve together with body bolts (20) lockwashers (21) and nuts (19). Tighten the nuts evenly, alternating between them to the torque listed in **(Table 1)**.
13. Place the handle (15), lockwasher (9) and stem nut (16) over the stem (4). Tighten the stem nut (16) until it is snug.

TABLE 1	
Bolt Torque	
Valve Sizes - Inches (mm)	Torque - lb.-ft. (Nm)
1/2" (DN15)	4 (5.4)
3/4" (DN20)	9 (12)
1" (DN25)	16 (22)
1-1/4" (DN30)	16 (22)
1-1/2" (DN40)	16 (22)
2" (DN50)	25 (34)

5. ACTUATOR MOUNTING

When these valves are equipped with an actuator, and the actuator is removed to service the valve, proper alignment of the actuator driver and valve stem is essential when the actuator is remounted.

Follow the instructions in AMI-045 for Metso actuators.

6. REPAIR KITS

Repair kits include two seats (5), a two body seals (6), one stem bearing (8), and two stem seals (7).

When ordering repair kits for your valve refer to **Section 1.2, Valve Markings** and check area "3" to determine the correct seat material for your valve, then refer to **Table 2**.

7. SERVICE / SPARE PART

We recommend that valves be directed to our service centers for maintenance. The service centers are equipped to provide rapid turn-around at a reasonable cost and offer new valve warranty with all reconditioned valves.

NOTE: When sending goods to the service center for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. Include the material safety datasheet(s) (MSDS) for all media flowing through the valve. Valves sent to the service center without MSDS datasheet(s) will not be accepted.

For further information on spare parts and service or assistance visit our web-site at www.metso.com/valves.

NOTE: When ordering spare parts, always include the following information:

- a. Valve catalog code stamped on the valve,
- b. If the valve is serialized – the serial number (from identification plate)
- c. From **Figure 6**, the ballooned part number, part name and quantity required.

TABLE 2		
Repair Kits		
Valve Size	T Seats	M Seats
1/2" (DN15)	RKN-107-TT	RKN-107-MT
3/4" (DN20)	RKN-108-TT	RKN-108-MT
1" (DN25)	RKN-109-TT	RKN-109-MT
1-1/4" (DN30)	RKN-110-TT	RKN-110-MT
1-1/2" (DN40)	RKN-111-TT	RKN-111-MT
2" (DN50)	RKN-112-TT	RKN-112-MT

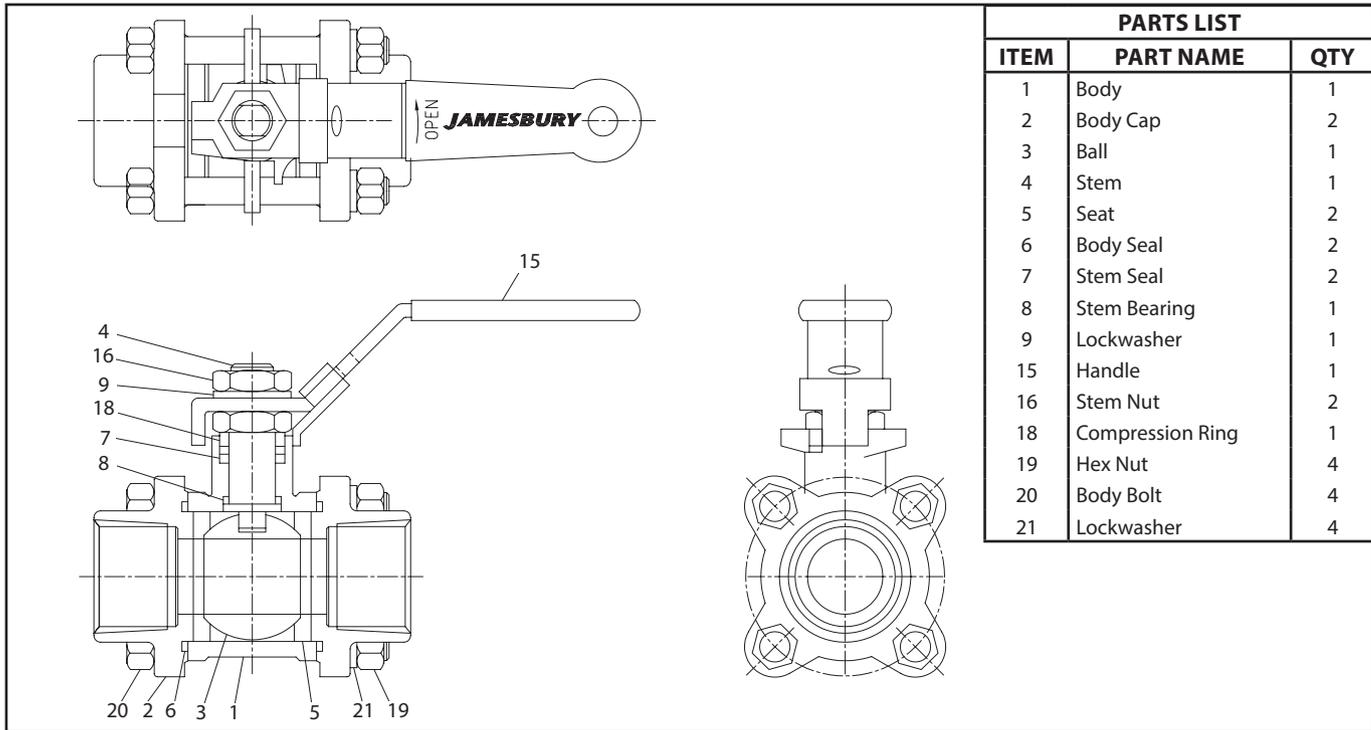


Figure 6

9. HOW TO ORDER

1	2	3	4
1"	3A	2236	TT-3

Example: 1", Standard Bore Thread-end, Carbon Steel Body, 316 SS TRIM, PTFE seats and seals, 300 series SS bolts and nuts.

Jamesbury Brand 3-piece Ball Valve

1. sign	VALVE SIZE (INCH / MM)
Inches	1/2, 3/4, 1, 1 1/4, 1 1/2, 2
DN	15, 20, 25, 30, 40, 50

3. sign	BODY / TRIM MATERIAL
2236	Carbon steel body / 316 ball & stem
3600	316 Stainless steel body, ball & stem

2. sign	BODY STYLE
3A	3-piece standard bore thread-end
3C	3-piece standard bore weld-end

4. sign	SEAT / SEAL / BOLTING
TT-3	PTFE/PTFE/300 Series stainless steel
MT-3	Filled PTFE/PTFE/300 Series stainless steel

Subject to change without prior notice.

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