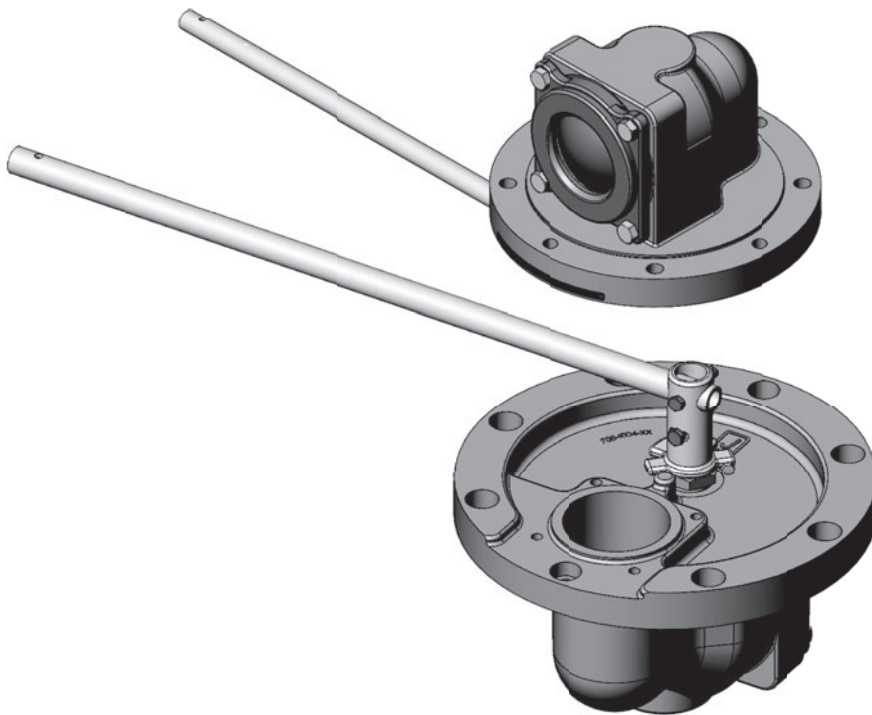


# Railroad Ball Valves Series 6RIB3 4" (DN100)

Installation, Maintenance and  
Operating Instructions



## TABLE OF CONTENTS

<b>1. GENERAL.....</b>	<b>3</b>
1.1 Scope of the Manual .....	3
1.2 Valve Markings .....	3
1.3 Safety Precautions.....	3
<b>2. TRANSPORTATION AND STORAGE.....</b>	<b>3</b>
<b>3. INSTALLATION .....</b>	<b>3</b>
3.1 General .....	3
3.2 Handles .....	3
3.3 Installing on the Tank car.....	4
3.4 Commissioning .....	4
<b>4. MAINTENANCE .....</b>	<b>4</b>
4.1 General .....	4
4.2 Disassembly.....	4
4.3 Checking Parts.....	5
4.4 Assembly .....	5
4.5 Pressure Testing the Valve .....	6
<b>5. REPAIR KITS .....</b>	<b>6</b>
<b>6. REPAIR / SPARE PART .....</b>	<b>6</b>
<b>7. HOW TO ORDER 6RIB3 BALL VALVES .....</b>	<b>6</b>
<b>8. EXPLODED VIEW.....</b>	<b>7</b>

### **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/products/valves/tank-car-valves/](http://www.metso.com/products/valves/tank-car-valves/) for the latest documentation.

### **SAVE THESE INSTRUCTIONS!**

Subject to change without notice.  
 All trademarks are property of their respective owners.

## 1. GENERAL

### 1.1 Scope of the Manual

This instruction manual contains important information regarding the installation, operation and maintenance of the Jamesbury® 4" (DN100) Series 6RIB3 Railroad Ball Valves. Please read these instructions carefully and save them for future reference.

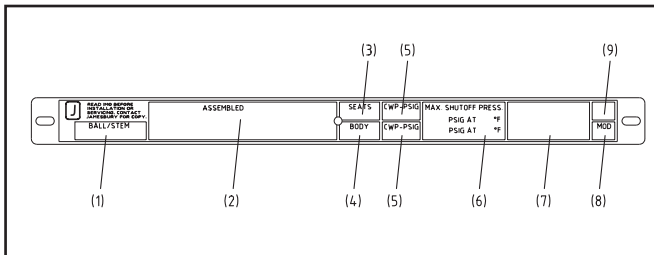
#### WARNING

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.

### 1.2 Valve Markings

The valve has an identification plate attached to the mounting flange (see **Figure 1**).



**Figure 1.**

Identification plate markings:

1. Ball/Stem material
2. Valve catalog code
3. Seat Material
4. Body Material
5. Maximum operating pressure
6. Maximum/minimum shut-off pressure/temperature
7. Approvals/Special Service marking
8. Model
9. Assembly date

### 1.3 Safety Precautions

#### WARNING

##### DO NOT EXCEED THE VALVE PERFORMANCE LIMITATIONS!

EXCEEDING THE PRESSURE OR TEMPERATURE LIMITATIONS MARKED ON THE VALVE IDENTIFICATION PLATE MAY CAUSE DAMAGE AND LEAD TO UNCONTROLLED PRESSURE RELEASE. DAMAGE OR PERSONAL INJURY MAY RESULT.

#### WARNING

##### SEAT AND BODY RATINGS!

THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE SEAT AND BODY RATINGS. READ THE IDENTIFICATION PLATE AND CHECK BOTH RATINGS. THIS PRODUCT IS AVAILABLE WITH A VARIETY OF SEAT MATERIALS. SOME OF THE SEAT MATERIALS HAVE PRESSURE RATINGS THAT ARE LESS THAN THE BODY RATINGS. ALL OF THE BODY AND SEAT RATINGS ARE DEPENDENT ON VALVE TYPE AND SIZE, SEAT MATERIAL, AND TEMPERATURE. DO NOT EXCEED THESE RATINGS!

#### 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 TANK CAR. WHEN THE VALVE IS ACTUATED, THE BALL FUNCTIONS AS A CUTTING DEVICE. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY!

## 2. TRANSPORTATION AND STORAGE

Check the valve and the accompanying devices 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) will be stored for a long period, follow the recommendations in IMO-S1 to maintain the valve's integrity.

## 3. INSTALLATION

### 3.1 General

Remove the flow port protectors and check that the valve is clean inside. Clean valve if necessary. Flush the tank car carefully before installing the valve. Foreign objects, such as sand or pieces of welding electrodes, will damage the ball and seats.

### 3.2 Handles

If the valve handle (31) has to be removed for any reason, the handle must be remounted in the same orientation.

#### WARNING

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

### 3.3 Installing on the Tank car

#### WARNING

THE VALVE SHOULD BE TIGHTENED ON FLANGES USING APPROPRIATE GASKETS AND FASTENERS COMPATIBLE WITH THE APPLICATION, AND IN COMPLIANCE WITH APPLICABLE PIPING CODES AND STANDARDS. CENTER THE FLANGE GASKETS CAREFULLY WHEN FITTING THE VALVE BETWEEN FLANGES. DO NOT ATTEMPT TO CORRECT MISALIGNMENT BY MEANS OF FLANGE BOLTING.

Open the valve

The valve is installed into the bottom of the tank car. 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.

### 3.4 Commissioning

Ensure that there is no dirt or foreign objects left inside the valve or tank car. Flush the tank car carefully. Make sure that the valve is fully open when flushing. Ensure that all nuts, fittings, and cables are properly fastened.

#### WARNING

GOOD 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. SEE SECTION 4.5.

## 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. Routine maintenance consists of tightening the hex nuts (18) in (**Figure 3**) periodically to compensate for stem seal wear. Stem nut torque should be about 240 in-lb. The inspection and maintenance frequency depends on the actual application and process condition.

Overhaul maintenance consists of replacing seats and seals. A standard repair kit consisting of these parts may be obtained through your authorized Metso Distributor.

**NOTE:** Repair kits include stem seals (8), secondary stem seal (7), seats (5), body seal (6). Refer to the **Section 5 - Repair Kits**.

#### WARNING

FOR YOUR SAFETY IT IS IMPORTANT THE FOLLOWING PRECAUTIONS BE TAKEN PRIOR TO REMOVAL OF THE VALVE FROM THE TANK CAR OR BEFORE ANY DISASSEMBLY:

1. WEAR ANY PROTECTIVE CLOTHING OR EQUIPMENT NORMALLY REQUIRED WHEN WORKING WITH THE FLUID INVOLVED.
2. DEPRESSURIZE THE TANK CAR AND CYCLE THE VALVE AS FOLLOWS:
  - A. UPON VERIFYING THE TANK CAR IS EMPTY, PLACE THE VALVE IN THE OPEN POSITION.
  - B. CYCLE THE VALVE TO RELIEVE RESIDUAL PRESSURE IN THE BODY CAVITY BEFORE REMOVAL FROM THE TANK CAR.
  - 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 Disassembly

**NOTE:** If complete disassembly becomes necessary; it is recommended to replace all seats and seals. Refer to the **Section 5 - Repair Kits**.

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

1. Follow the steps in all the **WARNING** sections above before performing any work on the valve.
2. Open and close the valve and leave in the closed position.
3. Remove the two spring pins (28), lock nuts (27) and hex head cap screws (26).
4. Remove the pipe handle (17) and screw retainer (25).
5. Loosen and remove the hex head cap screw (18), and remove washer (19) and indicator stop (12).
6. Remove the stem nut (15) and compression ring (21).
7. Place the valve in the vertical position with the body cap end up.
8. Mark the body joint flanges to assure correct body (1) and body cap (2) orientation during assembly. Remove body bolts (10) and remove body cap (2). **BE CAREFUL NOT TO SCRATCH THE BALL.**
9. Remove the body seal (6) and the first seat (5) from the body cap.
10. If the ball (3) does not swing free from the body, with the ball in the fully closed position, use a piece of wood or some other soft material to gently tap the ball (from the end opposite the body cap). This should loosen the ball so that it can be pivoted free of the stem (4).
11. Carefully remove the second seat (5) out of the body, **BEING CAREFUL NOT TO SCRATCH THE BODY SEALING SURFACE BEHIND THE SEAT.**
12. Press the stem (4) from the top into the valve body and remove it through the body cap end of the body.

13. Remove and discard the bottom stem seal (8), and secondary stem seal (7), **BEING CAREFUL NOT TO SCRATCH ANY SEALING SURFACES IN THE BODY.**
14. Remove the top stem seals (8), **BEING CAREFUL NOT TO SCRATCH ANY SEALING SURFACE INSIDE THE STEM BORE.**

### 4.3 Checking Parts

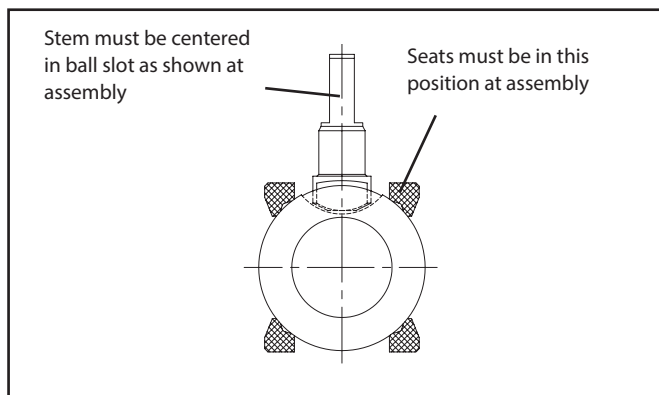
**NOTE:** For detailed instructions on visual inspection of critical components, refer to IMO-R26.

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.

### 4.4 Assembly

It is advisable to replace seats and seals if complete disassembly and reassembly become necessary. Refer to the **Section 5 - Repair Kits.**

1. Clean all valve components if not done previously.
2. Re-inspect all components for damage before reassembling the valve. Look for damage to the sealing areas of the stem, body and body cap; and look for wear in the bearing areas. Replace any damaged parts.
3. Carefully clean and polish the ball (3) sealing surface: It should be free of all scratches and grooves.
4. If the ball is slightly damaged, it may be possible to smooth the sealing surface with crocus cloth or equivalent. If deep scratches are present, replace the ball.
5. With the body cap side facing up, slide one valve seat (5) sideways into the body (1) to below the stem bore, and tilt it into place so that the proper surface (see **Figure 2**) will be adjacent to the ball (3), being careful not to cut or scratch the seat.



**Figure 2. Proper Seat and Ball Orientation**

6. From inside the body (1), insert the secondary stem seal (7), and the bottom stem seal (8) into the stem bore (see **Figure 3**).
7. Insert the stem (4) through the body cap end of the body (1), being careful not to scratch the stem sealing surface; and press it gently up into the stem bore until resistance is felt from the stem seal.
8. Hold the stem in place from the bottom and insert the top stem seal (8) over the stem (4).
9. Place compression ring (21) over stem (4). Screw the stem nut (15) with the side marked "TOP" being up. Place the stem (4) in the closed position and tighten the stem nut (15) to 70-80 FT·LBS (95-108 N·m).
10. Insert the ball (3) rotating it onto the stem (4) in the closed position. If necessary, turn the stem blade to align with the ball slot. Make certain that the stem blade is in the middle of the ball slot; i.e. equal distance from the ends of the slot. Rotate the ball if necessary (see **Figure 2**).
11. Gently place the body seal (6) into the machined recess of the body (1).
12. Place the second seat (5) into the body cap (2) with the proper surface adjacent to the ball. (see **Figure 2**).
13. Align the body cap (2) over body bolt holes being careful to properly orient body cap and body as originally assembled by matching orientation marks made prior to disassembly. Take care not to damage body seal (6) or seat (5) during this operation.
14. Lubricate the threaded portion of body bolts (10) with NeverSeez® or equivalent. Install body bolts (10) and tighten sequentially as shown in the diagram in **Figure 3**, to the recommended torques as shown in the torque chart (**Table 1**).

TABLE 1		
Body Bolt Torque		
Bolt Material	Bolt Identification	Assembly Torque FT·LBS (N·m)
20	B7	65 - 70 (88 - 95)
31	B8	35 - 40 (47 - 54)

15. Place the indicator stop (12) as shown in **Figure 3**, and fasten with washer (19) and hex head cap screw (18). Be sure the washer is orientated as shown. Torque the hex head cap screw to 35 FT·LBS (47 N·m).
16. Place the screw retainer (25) on the hex head cap crew (18) inside of the indicator stop (12). Position the screw retainer so that the hole in the screw retainer lines up with the bottom slot on the indicator stop.
17. Insert the lower hex head cap screw (26) through the indicator stop (12) and screw retainer (25). Assemble lock nut (27) and tighten until the lock nut makes contact with the indicator stop.

18. Drive the spiral spring pin (28) into the hole on the cap screw (26) below the lock nut. Position the spiral pin so that equal amount protrudes on either side of the cap screw.
19. Insert the pipe handle (17). Line up the hole in the pipe handle in the indicator stop (12), and repeat steps 17 and 18 with the upper hex head cap screw (26), lock nut (27) and spiral spring pin (28) for pipe handle assembly.
20. Cycle the valve slowly with a gentle back and forth motion building gradually to the full quarter turn. By cycling slowly, the seat lips will seat against the ball. Take care to avoid scratching the ball O.D.

#### 4.5 Pressure Testing the Valve

##### **WARNING**

WHEN PRESSURE TESTING, EXERCISE CAUTION AND MAKE SURE ALL EQUIPMENT USED IS IN GOOD WORKING CONDITION AND APPROPRIATE FOR THE INTENDED PRESSURE.

If the valve is to be tested prior to returning to service make sure the test pressures are in accordance with an applicable standard.

When testing the valve for external tightness, keep the ball in the half open position.

If testing the valve seat tightness, please contact Metso for advice.

##### **WARNING**

WHEN PERFORMING ANY TESTS, NEVER EXCEED THE MAXIMUM OPERATING PRESSURE OR MAXIMUM SHUT-OFF PRESSURE LISTED ON THE IDENTIFICATION PLATE!

#### 5. REPAIR KITS

Repair kits contain one pair of seats, a body seal, stem seals and a secondary stem seal. When ordering repair kits for your 6RIB3 valve order RKR-33TT or RKR-33MT depending on your valve's seat material. Refer to **Section 1.2, Valve Markings** and check area "3" on your valve's identification plate to determine the correct seat material for your valve.

#### 6. REPAIR / SPARE PART

For further information on spare parts and service or assistance visit our web-site at [www.metso.com/products/valves/tank-car-valves/](http://www.metso.com/products/valves/tank-car-valves/).

**NOTE:** When ordering spare parts not included in the repair kits, always include the following information:

- a. Valve catalog code from identification plate,
- b. If the valve is serialized – the serial number (from identification plate)
- c. From **Figure 3**, the ballooned part number, part name and quantity required.

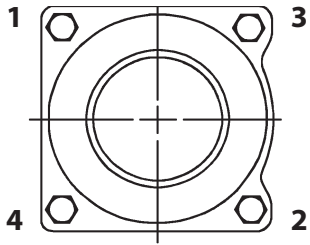
#### 7. HOW TO ORDER 6RIB3 BALL VALVES

Carbon steel body with 316 stainless steel trim:  
4" 6RIB322HBTT

316 stainless steel body and trim:  
4" 6RIB336HBTT

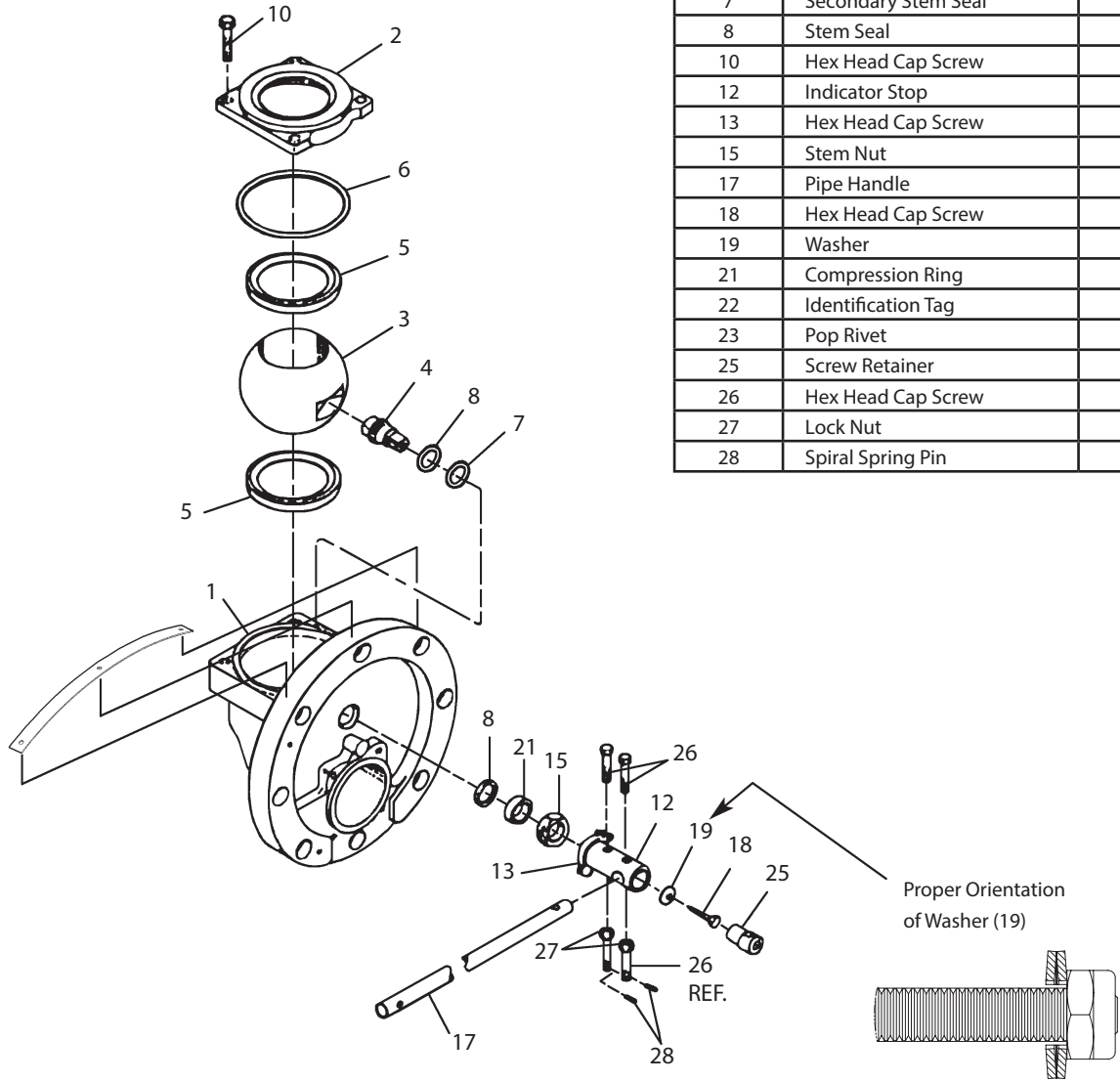
For PTFE seats, simply substitute 'MT' for 'TT'.

**Bolt Tightening Sequence**



**EXPLODED VIEW & PARTS LIST**

PARTS		
ITEMS	PART NAME	QTY.
1	Body	1
2	Body Cap	1
3	Ball	1
4	Stem	1
5	Seat	2
6	Body Seal	1
7	Secondary Stem Seal	1
8	Stem Seal	2
10	Hex Head Cap Screw	4
12	Indicator Stop	1
13	Hex Head Cap Screw	2
15	Stem Nut	1
17	Pipe Handle	1
18	Hex Head Cap Screw	1
19	Washer	1
21	Compression Ring	1
22	Identification Tag	1
23	Pop Rivet	3
25	Screw Retainer	1
26	Hex Head Cap Screw	2
27	Lock Nut	2
28	Spiral Spring Pin	2



**Figure 3**

---

Subject to change without prior notice.

**Metso Flow Control Inc.**

**Europe**, Vanha Porvoontie 229, P.O. Box 304, FI-01301 Vantaa, Finland. Tel. +358 20 483 150. Fax +358 20 483 151

**North America**, 44 Bowditch Drive, P.O. Box 8044, Shrewsbury, M A 01545, USA. Tel. +1 508 852 0200. Fax +1 508 852 8172

**South America, Av.** Independência, 2500-Iporanga, 18087-101, Sorocaba-São Paulo, Brazil. Tel. +55 15 2102 9700. Fax +55 15 2102 9748

**Asia Pacific**, 238B Thomson Road, #17-01 Novena Square Tower B, Singapore 307685. Tel. +65 6511 1011. Fax +65 6250 0830

**China**, 11/F, China Youth Plaza, No.19 North Rd of East 3rd Ring Rd, Chaoyang District, Beijing 100020, China. Tel. +86 10 6566 6600. Fax +86 10 6566 2583

**Middle East**, Roundabout 8, Unit AB-07, P.O. Box 17175, Jebel Ali Freezone, Dubai, United Arab Emirates. Tel. +971 4 883 6974. Fax +971 4 883 6836

[www.metso.com/valves](http://www.metso.com/valves)

