

Railroad Wafer-Sphere® Valves

WSRR and WSRF Fire-Tite® Valves, Mod. 5 and Mod. 6 (KT Version – Food Grade Service Only)

Installation, Maintenance and
Operating Instructions

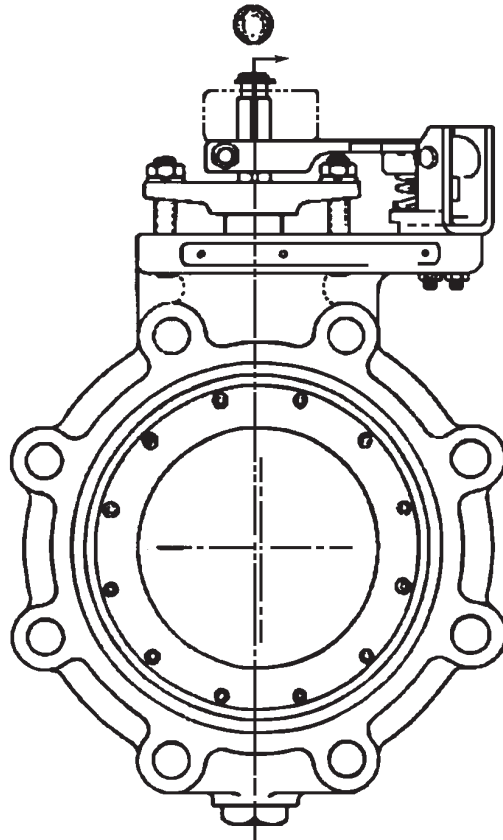


Table of Contents

1	GENERAL	3
	1.1 Warning	3
2	DESCRIPTION	3
3	INSTALLATION	3
4	MAINTENANCE	3
	4.1 Seat Replacement	3
	4.2 Shaft Packing Replacement	5
5	REPAIR KITS/SPARE PARTS	6

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!

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

1 GENERAL

This instruction manual contains important information regarding the installation, operation and maintenance of the *Jamesbury* WSRR Railroad *Wafer-Sphere* Valve and WSRF *Fire-Tite* Railroad *Wafer-Sphere* valve. Please read these instructions carefully and save them for future reference.

1.1 WARNING

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

1. EXERCISE NORMAL SAFETY PRECAUTIONS TO PROTECT YOURSELF AGAINST THE FLUID BEING HANDLED.
2. DO NOT REMOVE THE VALVE FROM A LOADED TANK CAR.

2 DESCRIPTION

The *Jamesbury* *Wafer-Sphere* Railroad Tank Car valve is a one-piece body butterfly valve with a resilient positive sealing seat. It consists of a body, an insert, a PTFE seat, a disc and shaft, shaft seals and bearings, and a compression plate. The seat is contained in the body by the insert. The shaft seals are held in place by the compression plate. The shaft and disc are positively joined by wedge pins.

One of the design features of the *Wafer-Sphere* valve that is responsible for its superior performance is the valve's eccentric shaft design. The shaft is offset in two planes: (1) away from the valve disc center line, and (2) behind the disc sealing plane. This offset shaft design makes the rotating disc cam back and away from the seat, completely eliminating the usual wear points at the top and bottom of the seat.

The valve is compact and lightweight for easy installation.

The valve is designed with a locking feature to prevent accidental opening of the valve in case of derailment. The handle can be removed and the valve will remain locked. In normal operation the valve can be opened only after it is unlocked by squeezing the gripper part of the

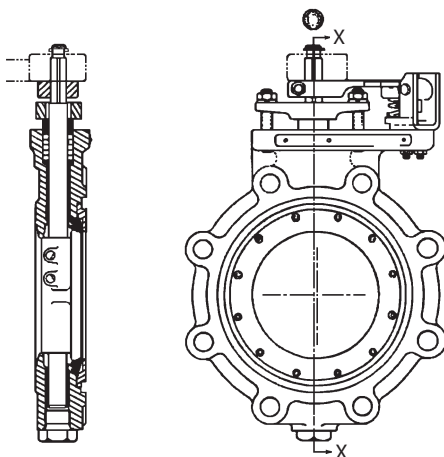


Figure 1A

handle. When the valve is closed, the spring will automatically engage the lock arm without squeezing the gripper part of the handle, ensuring that the valve is locked in the closed position.

Jamesbury valves manufactured for railroad use meet all applicable AAR specifications.

3 INSTALLATION

The *Jamesbury* Railroad *Wafer-Sphere* valves are installed with the body insert against the tank car. Follow the recommended practices of the gasket manufacturer when tightening flange bolts.

4 MAINTENANCE

Routine maintenance consists of tightening down the compression plate periodically to compensate for seal wear. The valve should be closed during tightening. The compression plate, however, should not be tightened down too severely, since this will shorten the life of the seals. More extensive maintenance such as seat, seal and bearing replacement is described below. Numbers in parentheses () refer to items shown in (Figure 2).

4.1 Seat Replacement

(Numbers in parentheses () refer to items in Figure 2).

1. After removing the valve from the car, place it on a bench and cycle it open. Take care not to damage the sealing edge of the valve disc.
2. Remove the insert screws (21) and the insert (2), (See Figure 2). If the insert does not lift out easily, tap it out from the shaft side using a wooden or plastic rod and a hammer. Don't strike the valve directly with the hammer.
3. Remove the metal sealing ring (60) in type WSRF *Fire-Tite* valves only. Remove the soft seat (5) and discard it. If the valve is *Fire-Tite*, carefully clean the sealing ring. Polish the I.D. It should be free of all grooves and scratches. If deep scratches are present, replace the sealing ring.
4. Clean the valve.
5. Carefully clean and polish the sealing surface of the disc (3). It should be free of all grooves and scratches. **BE CAREFUL NOT TO DAMAGE COATING ON FOOD DISC.**

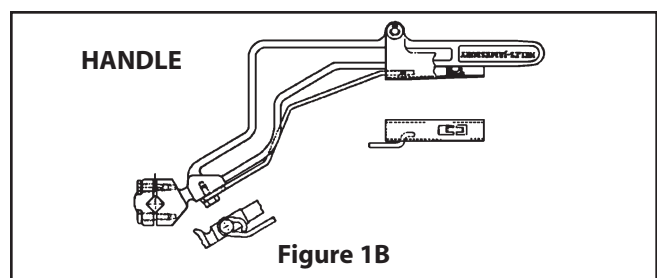
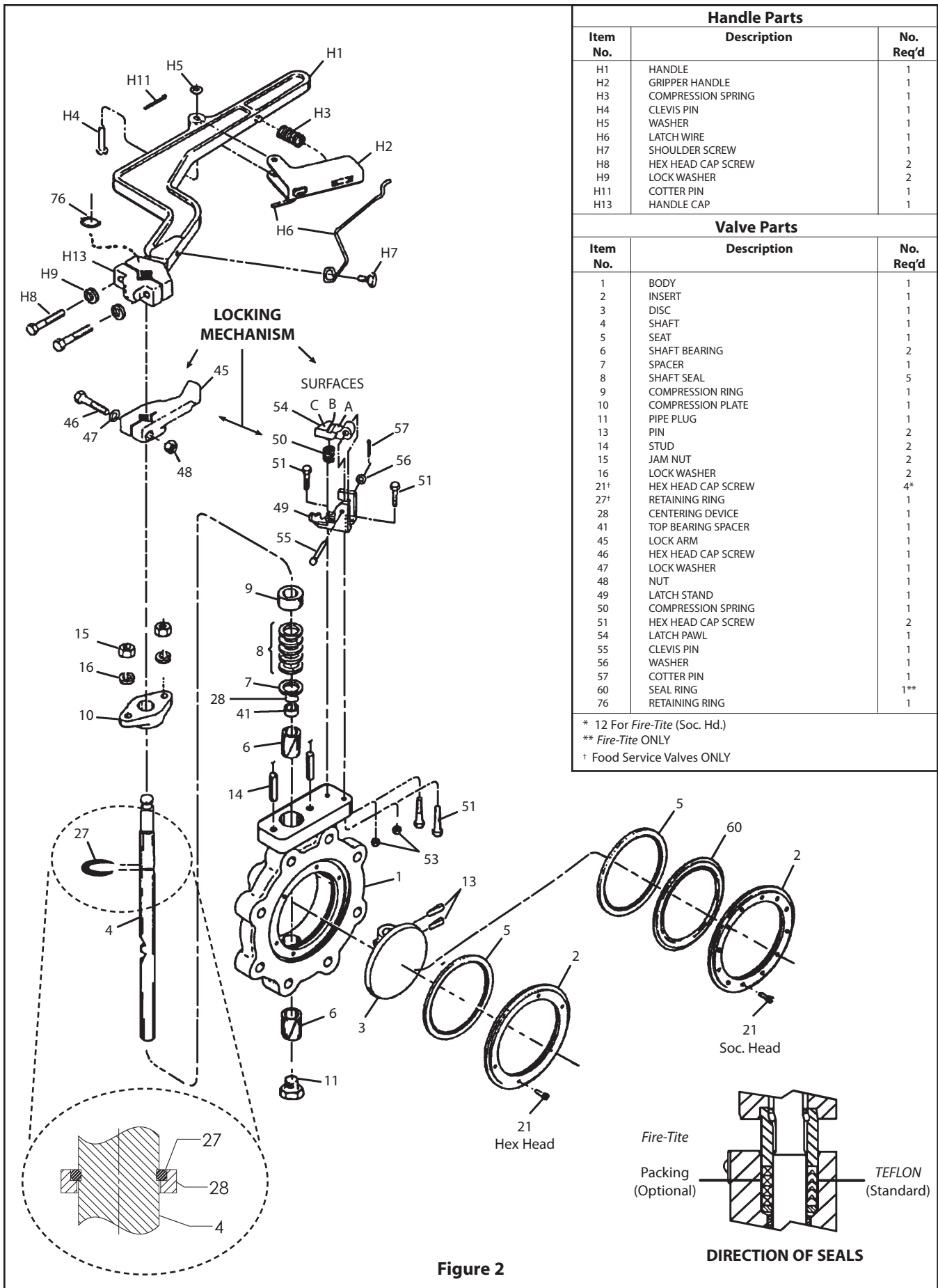


Figure 1B



Handle Parts		
Item No.	Description	No. Req'd
H1	HANDLE	1
H2	GRIPPER HANDLE	1
H3	COMPRESSION SPRING	1
H4	CLEVIS PIN	1
H5	WASHER	1
H6	LATCH WIRE	1
H7	SHOULDER SCREW	1
H8	HEX HEAD CAP SCREW	2
H9	LOCK WASHER	2
H11	COTTER PIN	1
H13	HANDLE CAP	1

Valve Parts		
Item No.	Description	No. Req'd
1	BODY	1
2	INSERT	1
3	DISC	1
4	SHAFT	1
5	SEAT	1
6	SHAFT BEARING	2
7	SPACER	1
8	SHAFT SEAL	5
9	COMPRESSION RING	1
10	COMPRESSION PLATE	1
11	PIPE PLUG	1
13	PIN	2
14	STUD	2
15	JAM NUT	2
16	LOCK WASHER	2
21†	HEX HEAD CAP SCREW	4*
27†	RETAINING RING	1
28	CENTERING DEVICE	1
41	TOP BEARING SPACER	1
45	LOCK ARM	1
46	HEX HEAD CAP SCREW	1
47	LOCK WASHER	1
48	NUT	1
49	LATCH STAND	1
50	COMPRESSION SPRING	1
51	HEX HEAD CAP SCREW	2
54	LATCH PAWL	1
55	CLEVIS PIN	1
56	WASHER	1
57	COTTER PIN	1
60	SEAL RING	1**
76	RETAINING RING	1

* 12 For Fire-Tite (Soc. Hd.)
 ** Fire-Tite ONLY
 † Food Service Valves ONLY

Figure 2

6. If the disc is slightly damaged it may be possible to smooth the sealing surface with crocus cloth, a fine stone, or the equivalent **EXCEPT ON FOOD GRADE VALVES**. If deep scratches are present, replace the disc or return the valve to the factory for service. **IF THE FOOD SERVICE DISC IS DAMAGED, DO NOT ATTEMPT TO REPAIR. ONLY AN AUTHORIZED SERVICE CENTER MAY REPLACE THE FOOD SERVICE DISC.**
7. Cycle the valve closed. Set the disc level with the body within 1/32" (.79 mm).
8. Verify that the disc is in the level position. Install the new soft seat (5). Install the sealing ring (60) at this time if *Fire-Tite*. (See Figure 2.)
9. Replace the insert (2) and insert screws (21). Tighten the screws uniformly in a sequence such as shown in (Figure 3), to a torque value of 17 – 25 IN•LBS (1.9 – 2.8 N•m) On *Fire-Tite* valves, check the gap between the sealing ring and the disc using feeler gauges. The gap must not vary more than .008" (.2 mm) when checked at six spots equally spaced on the disc (See Figure 4). **Note:** After installation of a new seat, torque may be higher for a few cycles.

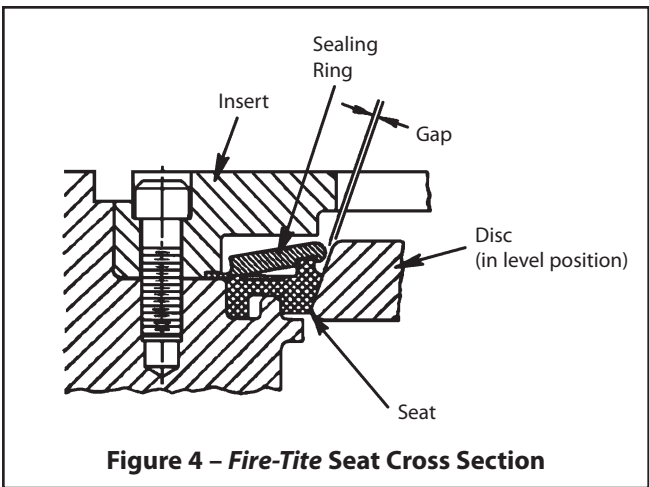


Figure 4 – Fire-Tite Seat Cross Section

4.2 Shaft Packing Replacement

(Numbers in parentheses () refer to items shown in Figure 2).

1. Remove the retaining ring (76).
2. Remove the handle by loosening the cap screws (H8) which hold the handle assembly to the shaft square. Slide the handle off. Also, loosen cap screw (46) and remove the lock arm (45) from the shaft square.
3. Remove the nuts (15) and lockwashers (16) from above the compression plate. Remove the compression plate. The studs (14) do not have to be removed.
4. Remove the compression ring (9).
5. Remove the old shaft packing (8) with a packing tool.
6. The spacer (7) need not be removed for shaft packing replacement.
7. Install new packing (8) (See Figure 2 for orientation).
8. Reinstall the compression ring (9), the compression plate (10), the lockwashers (16) and the nuts (15).
9. Close the valve (the seat should be in the valve at this point).
10. Tighten the nuts (15) evenly until the packing is adequately compressed to prevent leakage. This should require tightening the nuts approximately 1-1/2 to 2 full turns past the "finger-tight" position.
11. Reinstall the lock arm (45) and handle as described in steps 12 and 13 to follow.
12. Reinstall the lock arm (45) over the shaft (4) until it rests on Surface A of the latch pawl (54). Tighten the nut (48) with 27 – 33 FT•LBS (37 – 45 N•m) of torque. With the lock arm flush against the latching surface (Surface B), and the disc in a level position, no adjustment should be required if the latch stand (49) has not been moved. If the latch stand has been moved, be certain the latch pawl (54) is squared with the lock arm (45). Tighten the nuts (53) to 100 – 115 IN•LBS (11.3 – 13 N•m) of torque. Apply a 1/8" by 1/4" (3.2 mm by 6.3 mm) long weld

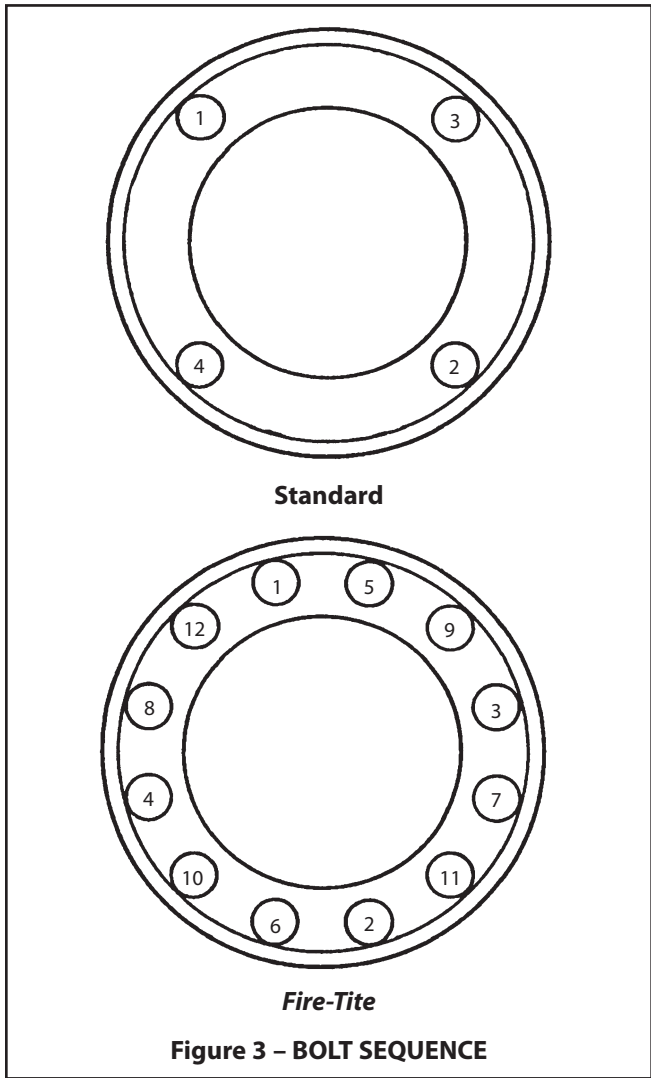
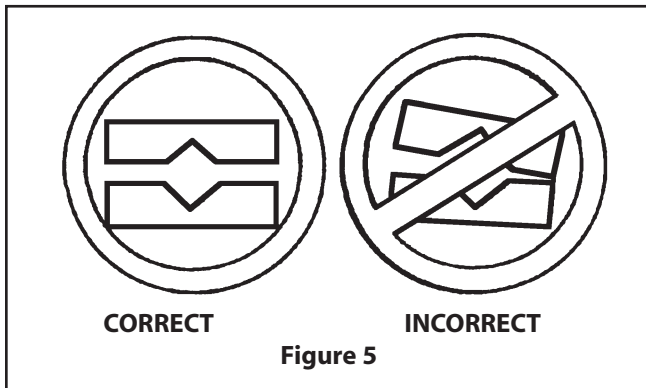


Figure 3 – BOLT SEQUENCE

bead at the joint between the body and the bottom of the latch stand as was done during the original assembly at the factory.

13. Reinstall the handle (H1) on the shaft until the latch wire (H6) rests firmly on Surface C of the latch pawl (54). Do not push the handle assembly down so far that it pushes the latch down. Tighten the (H8) Nyloc® cap screws (Grade 8) with 14 – 20 FT•LBS (10 – 27 N•m) of torque. Make sure the handle (H1), handle cap (H13) and shaft (4) are properly aligned as in **(Figure 5)**. Reinstall the retaining ring (76). Try locking and unlocking the handle two or three times to ensure that it operates properly.



5 REPAIR KITS/SPARE PARTS

Overhaul maintenance consists of replacing seats and seals. IF FURTHER REFURBISHING OF THE VALVE IS REQUIRED, PLEASE CONTACT YOUR NEAREST METSO SERVICE CENTER. The standard service kit consisting of these parts may be obtained by contacting Metso.

Kit designations are as follows:

6" (DN 150)	WSRR	RKR32TT
6" (DN 150)	WSRF	RKR35TL

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

Subject to change without prior notice.

Metso Automation 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, Massachusetts, 01545-8044, 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 9748/49

Asia Pacific, Haw Par Centre No. 06-01, 180 Clemenceau Avenue, 239922 Singapore, Singapore, Tel. +65 6511 1011, fax +65 6250 0830

China, 19/F, the Exchange Beijing, No. 118, Jianguo Lu Yi, Chaoyang Dist, 100022 Beijing, China, Tel. +86-10-6566-6600, fax +86-10-6566-2575

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

