Jamesbury™ Wafer-Sphere™ butterfly valves high performance series 815W & 815L
model A & B 3”-14” (DN 80-350)
series 830W, 830L, 860W, 860L
model A 3”-12” (DN 80-300)

Installation, maintenance and operating instructions
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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.

SAVE THESE INSTRUCTIONS!
Addresses and phone numbers are printed on the back cover.
1. GENERAL

1.1 Scope of the Manual

This instruction manual contains important information regarding the installation, operation and maintenance of Jamesbury™ Wafer-Sphere high performance butterfly valves, 3” - 14” (DN 80 - 350) Series 815W and 815L, Model A & B, 3” - 12” (DN 80 - 300) Series 830W, 830L, 860W, 860L, Model A. Please read the 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 NELES FOR MORE INFORMATION.

1.2 Valve Markings

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

Identification plate markings:
1. Valve Catalog Code
2. Pressure Class
3. Body Material
4. Shaft Material
5. Disc Material
6. Seat Material
7. Maximum/minimum shut-off pressure/temperature
8. CWP (cold working pressure)
9. Assembly date
10. Valve model

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 disc movement!

Keep hands, other parts of the body, tools and other objects out of the open flow port. Leave no foreign objects inside the pipeline. When the valve is actuated, the disc functions as a cutting device. The disc may also change positions as a result of moving the valve.

WARNING

When handling the valve or valve/actuator assembly, take its weight into account!

Never lift the valve or valve/actuator assembly by the actuator, positioner, limit switch or their piping. Follow the lifting methods shown in Figure 2. Failure to follow these instructions may result in damage or personal injury from falling parts.

WARNING

Beware of noise emissions!

The valve may produce noise in the pipeline. The noise level depends on the application. Observe the relevant work environment regulations on noise emission.

Figure 1 Identification Plate

Figure 2 Lifting of the Valve
1.4 Eccentric Shaft Design

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 (see Figure 10). 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. Because the disc rotates off the seat in an eccentric arc, it operates in one quadrant only (see Figure 10).

1.5 Positive Stop Feature

To prevent seat damage from over-travel of the disc beyond the closed position (primarily during field mounting of a handle or actuator), a “positive stop” feature been designed into the Wafer-Sphere butterfly valve. The “positive stop” feature also makes it possible to adjust the actuator travel stops in-line. The location of this feature is on the body insert for 3” - 12” (DN 80 - 300) and in the body for 14” (DN 350) (see Figure 17).

1.6 Wafer Body Design

Some wafer designs (see Figures 1, 2, 8) contain flange bolt holes or slots in the body to hold the valve and assist with correct alignment during installation in the line. The centering holes or slots in wafer bodies alone are not suitable, or intended for containing line pressure, and are only for use in conjunction with a fully bolted pipeline flange.

1.7 Actuation

Types 815W, 815L, 830W and 830L valves, either a manual gear operator, or pneumatic or electric actuator should be used in place of a detent handle on 3” & 4” (DN 80 & 100) valves when differential pressure exceeds 300 psi (20.7 bar), on 6” & 8” (DN 150 & 200) valves when differential pressure exceeds 150 psi (10.4 bar), and on 10” & 12” (DN 250 & 300) valves when differential pressure exceeds 50 psi (3.5 bar). With series 860W and 860L valves in 3” - 6” (DN 80 - 150) sizes, a gear operator or actuator should be used when differential pressure exceeds 150 psi (10.5 bar).

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.

If the valve(s) will be stored for a long period, follow the recommendation in IMO-S1 to maintain the valves 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 pipeline carefully before installing the valve. Foreign objects, such as sand or pieces of welding electrodes, will damage the disc and seat.

For lowest torque requirements, Wafer-Sphere butterfly valves should be installed with the insert toward the higher pressure (shaft downstream).

3.2 Installing in the pipeline

Warnings

THE VALVE SHOULD BE TIGHTENED BETWEEN 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 PIPELINE MISALIGNMENT BY MEANS OF FLANGE BOLTING! RECOMMENDED FASTENER LENGTHS ARE LISTED IN TECHNICAL BULLETIN T104-1.

1. IMPORTANT: Only operating handle stops or actuator stop set screws must be used to stop the disc in position. DO NOT use the “positive stop” by itself to limit actuator travel.

2. The valve may be installed in any position and offers tightness in both directions. It is recommended, however, that the valve be installed with the insert (2) facing upstream. Install the valve in the pipeline so the shaft is horizontal if possible. 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.

3. Visually check the position of the disc when the valve is in the closed position and the insert is fully compressed. There should be .010” to .040” (.254 to 1.02 mm) clearance between the disc and the “positive stop” on the insert.
4. Before installing the closed valve in the line, be sure that the handle or actuator is attached so that a counter-clockwise rotation, viewed from above, opens the valve (see Figure 10). Again, fully close the valve before installing it in the line.

5. **CAUTION:** The Wafer-Sphere butterfly valve should be centered between flanges to prevent any damage to the disc or shaft which could be caused by the disc striking the pipe wall.

6. Secure the valve between flanges. Compress the flange gasket **EVENLY** by tightening the fasteners in an alternating sequence.

7. If there is weepage past the shaft seal upon installation, the valve may have been subject to wide temperature variations in shipment. Leak tight performance will be restored by a simple packing adjustment described in the MAINTENANCE Section.

### 3.3 Valve Insulation

If necessary, the valve may be insulated. Insulation must not continue above the upper level of the valve (see Figure 3).

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### 3.4 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 Neles for advice.

### 3.5 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.

Ensure that all nuts and fittings are properly fastened.

If so equipped, check that the actuator positioner and/or switch are correctly adjusted. Actuator adjustment is explained in **Section 5**. To adjust any accompanying device(s) refer to the separate control equipment instruction manuals.
Series 815W 3”-14” (DN 80-350) Wafer-Sphere Valves
Ansi Class 150 Wafer Design

Series 830L 3”-12” (DN 80-300) Wafer-Sphere Valves
Ansi Class 300 Single Flange Lugged Design

Series 830W 3”-12” (DN 80-300) Wafer-Sphere Valves
Ansi Class 300 Wafer Design

Series 860W 3”-12” (DN 80-300) Wafer-Sphere Valves
Ansi Class 600 Wafer Design

Series 815L 3”-14” (DN 80-350) Wafer-Sphere Valves
Ansi Class 150 Single Flange Lugged Design

Series 860L 3”-12” (DN 80-300) Wafer-Sphere Valves
Ansi Class 600 Single Flange Lugged Design
4. MAINTENANCE

4.1 General

Although 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. Neles 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 hex nuts (15) in (Figure 18) periodically to compensate for stem seal wear. The valve should be fully closed during the tightening. CAUTION: Tightening hex nuts (15) 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 Neles Distributor.

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

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. Read all WARNINGS prior to attempting any maintenance.
2. Detach the air supply, electrical supply, hydraulic supply and control signal cables or pipes from their connectors.
3. If the valve uses a two-piece "no-play"bolted coupling, loosen the valve/actuator coupling screws.
4. Remove the four bolts holding the actuator bracket to the baseplate.
5. Lift the actuator straight up in line with the valve shaft until the coupling between actuator drive and valve stem is completely disengaged.
6. Place actuator in a safe location to avoid damage or personal injury.

4.3 Manual Valve - with Handle

1. Read all WARNINGS prior to attempting any maintenance.
2. Loosen the handle nut (H11). Lift the handle (H1) straight up in line with the valve shaft (4) until it is completely disengaged (see Figure 18).

4.4 Seat Replacement Non Fire-Tite Valves

Numbers in ( ) refer to items shown in (Figure 18).

1. After removing the valve from the line, 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 18). If the insert does not lift out easily, tap it out from the shaft side using a wooden or plastic rod and a hammer. Do not strike the valve directly with a hammer.

3. Remove the seat (5) and discard it.

4. Remove the body seal (40) when applicable, (3” and 4” [DN 80 and 100] Series 815L, 830L, 860L and 860W valves).

5. Clean the valve.

6. Carefully clean and polish the disc (3) sealing surface. It should be free of all grooves and scratches.

7. If the disc (3) is slightly damaged it may be possible to smooth the sealing surface with crocus cloth, a fine stone, or the equivalent. If the deep scratches are present, replace the disc or return the valve to the local Neles center.

8. Cycle the valve closed.

9. Install the seat (5) into the insert.

10. Place the new body seal (40) in the groove in the body (when applicable).

11. Replace the insert and seat together, using insert screws when applicable. Tighten the screws in a uniform sequence. Torque values are given in (Table 1). Open valve and retorque the insert screws (per Table 1). Take care not to damage the sealing edge of the disc. Close the valve.

12. Set the handle or actuator stops as described in the SETTING ADJUSTMENTS Section. NOTE: After installation of a new seat, torque will be higher for a few cycles.

NOTE: If complete disassembly becomes necessary; it is recommended to replace the seat and all seals. Standard repair kits and/or spare parts may be obtained through your authorized Neles Distributor.

### 4.5 Seat Replacement Fire-Tite Valves

Numbers in ( ) refer to items shown in (Figure 18).

1. After removing the valve from the line, 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 18). If the insert does not lift out easily, tap it out from the shaft side using a wooden or plastic rod and a hammer. Do not strike the valve directly with a hammer.

3. Remove the seat (5) and discard it.

4. Remove the gasket from the insert and body.

5. Carefully clean the gasketing surfaces with solvent. They should be free of all grooves and scratches. If deep scratches are present, polish or repair as required.

6. Clean the valve.

7. Carefully clean and polish the disc (3). It should be free of all grooves and scratches.

8. If the disc (3) is slightly damaged, it may be possible to smooth the sealing surface with crocus cloth, a fine stone, or the equivalent. If deep scratches are present, replace the disc or return the valve to the local Neles center.

9. Cycle the valve closed.

10. A gasket is required between the seat tail and body as shown in (Figure 12). The valve uses a graphite type gasket (except 14” [DN 350] which uses PTFE paste sealant). This is installed in accordance with the following steps:

A. **IMPORTANT:** Exercise care at all times not to damage the gasket. A break will cause leakage, and hence cannot be allowed.

B. The bottom surface of the insert is to be free of all foreign particles. Clean thoroughly with a solvent that is compatible with the media.

<table>
<thead>
<tr>
<th>ANSI CL 150/300/600</th>
<th>Screw Size</th>
<th>Torque C’stl.-IN-LBS (N.m)</th>
<th>Torque St. St’l.-IN-LBS (N-m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3” (DN 80)</td>
<td>#10</td>
<td>63/92 (7.1/10.4)</td>
<td>17/25 (1.9/2.9)</td>
</tr>
<tr>
<td>4” (DN 100)</td>
<td>1/4</td>
<td>10/16 (13.5/21.7)</td>
<td>4/7 (5.4/9.5)</td>
</tr>
<tr>
<td>6” (DN 150)</td>
<td>#10</td>
<td>63/92 (7.1/10.4)</td>
<td>17/25 (1.9/2.9)</td>
</tr>
<tr>
<td>8” (DN 200)</td>
<td>1/4</td>
<td>10/16 (13.5/21.7)</td>
<td>4/7 (5.4/9.5)</td>
</tr>
<tr>
<td>10” (DN 250)</td>
<td>1/4</td>
<td>10/16 (13.5/21.7)</td>
<td>4/7 (5.4/9.5)</td>
</tr>
<tr>
<td>12” (DN 300)</td>
<td>5/16</td>
<td>22/33 (19.8/44.7)</td>
<td>8/12 (10.9/16.3)</td>
</tr>
<tr>
<td>14” (DN 350)</td>
<td>3/8</td>
<td>37/55 (50.2/74.6)</td>
<td>15/22 (20.3/29.8)</td>
</tr>
</tbody>
</table>
Refer to (Figure 17) for complete valve.

C. Apply the gasket to the body taking care to align the holes in the gasket with the insert screw and pin holes. With 14" (DN 350) valves apply a uniform bead of PTFE paste to the under side of seat (grooved surface) only.

11. Verify that the disc is in the level position. Install new seat and insert (see Figure 11). Install the insert screws, and tighten them in a uniform sequence. Torque values are given in (Table 1). Open valve and retorque the insert screws (per Table 1). Take care not to damage the sealing edge of the disc. Close the valve.

12. Set the actuator stops as described in the ACTUATOR/VALVE ADJUSTMENTS Section. Do not install and tighten flanges on a newly reseated valve until the actuator stops are properly set and the valve is fully closed. Incorrect disc positioning may cause damage to a new seat when the valve is compressed between flanges for the first time. NOTE: After installation of a new seat, torque will be higher for a few cycles.

4.6 Shaft Packing Replacement

Numbers in ( ) refer to items shown in (Figure 18).

1. Remove the handle or actuator as described in 4.2 and 4.3.

2. Remove the indicator pointer (29) from the shaft. Pull it straight out with a pair of pliers to avoid breaking it off.

3. Remove the nuts (15) and washers (16) from above the compression plate (10). Remove the compression plate and blowout spacer (75) (3", 4" and 6" [DN 80, 100 and 150] 860 ONLY). The studs (14) do not have to be removed.

4. Slide the retainer ring (47) off the shaft.

5. Remove the compression ring (9).

6. Remove the old shaft packing (8) with a packing tool.

7. The spacer (7) need not be removed for shaft packing replacement.

8. Replace the old packing with new packing. NOTE: If the packing is of the PTFE chevron type, keep the packing rings stacked in the same order as removed from the kit. Remove one of the four center chevron rings from packing being installed in Series 815W and 815L valves. (Note orientation in Figure 18).

9. Reinstall the compression ring (9) (not on 14" [DN 350] Type 815), the retainer ring (47), the blowout spacer (75) (3", 4" and 6" [DN 80, 100 and 150] 860 ONLY), the compression plate (10), the lock washers (16) and nuts (15) and the indicator pointer (29). Be sure that the indicator plate is under the pointer.

*If the compression ring initially sits too high to install the retainer ring it may be necessary to precompress the packing somewhat. In that case, install the compression plate and tighten the nuts enough to accomplish the precompression. Remove the compression plate to install the retainer ring and then complete the reassembly.

10. Close the valve (the seat and insert should be installed in the valve at this point).

11. 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.
4.7 Valve Disassembly

Numbers in ( ) refer to items shown in Figure 18.

**NOTE:** If complete disassembly becomes necessary, replacement of all seats and seals is recommended.

1. Place the valve on a bench or other suitable working place.
2. If the seat is to be replaced, follow Steps 2, 3 and 4 in the Seat Replacement Section. **NOTE:** It is a good idea to replace the seat (and body seal in 3” and 4”[DN 80 and 100] valves) any time a valve is rebuilt.
3. Remove the shaft packing compression hardware as detailed in Steps 1-5 in the Shaft Packing Replacement Section. The packing material itself can be more easily removed after the shaft has been removed from the valve.
4. Remove the disc pin welds by grinding or machining off the weld. Drive out the pins in the direction shown in Figure 18.
5. Grind or file off the tack weld locking the pressure plug (11). Remove the plug and its seal (42).
6. Use a soft rod and hammer to tap the bottom of the shaft (4). Remove it through the top of the valve.
7. NOTE: In doing so, and freeing the disc, be careful not to scratch the sealing surface of the disc.
8. Remove the packing (8) and the spacer (7), and when applicable, the spacers (41) and (43)
9. Remove the top bearing (6) either through the top of the valve or the waterway.
10. Remove the bottom bearing (6) either from the bottom of the valve or the waterway.

4.8 Valve Assembly

Numbers in ( ) refer to items shown in Figure 18.

1. Clean all valve components.
2. Inspect all components for damage before starting to assemble the valve. Look especially for damage to sealing areas on the disc, shaft and body, and for wear in the bearing areas of the shaft and body
3. Carefully clean and polish the disc sealing surface. It should be free of all grooves and scratches.
4. If the disc is slightly damaged it may be possible to smooth the sealing surface with crocus cloth, a fine stone, or the equivalent. If deep scratches are present, replace the disc or return the valve to the local Neles Center.
5. Install the bearings (6) into the body bores.
6. Coat the shaft and the disc bore lightly with a lubricant compatible with the fluid to be handled by the valve.
7. Position the disc (3) in the body between the thrust bearings (64) and slide the shaft (4) through the body and disc. For high cycle constructions, position excluder rings in shaft bore of body as shown in Figure 13. Use caution to prevent damage to the bearings. An arrow and the word “bonnet” on the disc indicates correct orientation with the compression plate (10).
8. Insert the disc pins (13) and drive them into place. The pins must be driven so that both pins are the same depth within 1/16” (1.6 mm). An arrow cast on the back of the disc shows the direction of pin installation. Be certain that the pins are installed from the direction shown in Figure 18. When they are correct, the indicator pointer (29) will point exactly parallel with the face of the disc. Weld both ends of the pins, small end first. After the disc cools, clean the welds with a wire brush. **CAUTION:** Use care to keep contamination out of the valve.
9. Install the upper bearing spacer (41) when applicable, the spacer (7), the packing (8), the compression ring (9)(not on 14” [DN 350] Type 815), and the retainer ring (47) where applicable. If the packing is of the PTFE chevron type, be certain that it is installed in the orientation shown in Figure 18.
10. If the studs (14) have been removed from the valve, reinstall them in the holes shown in Figure 18.
11. If the handle ratchet plate or the actuator base plate has been removed from the valve, reinstall it in the orientation shown in Figure 15 or Figure 18. Install lockwashers and screws in the two bonnet holes not used by the studs and install the lower lockwashers (16) and nuts (15) on the studs. Do not tighten the screws and nuts until the stops are set (see Setting Adjustments Section).
12. Install blowout spacer (75) (3”, 4” and 6” [DN 80, 100 and 150] 860 ONLY). Place the compression plate (10) over the shaft (4) and studs (14). Orient the plate so that the indicator pointer will be over the indicator plate. Install the lockwashers (16) and nuts (15), but do not tighten. Install the indicator pointer in the shaft.
13. Install the lower bearing spacer (43), when applicable. Place the plug seal (42) in the recess at the bottom of the valve and install the plug (11). Torque the plug until it is flush with the body. A small (1/16” [1.6 mm]) tack weld on the corner of the plug is recommended. **CAUTION:** A larger tack weld is apt to have enough heat to damage the seal.
14. Cycle the valve fully closed. If the seat and body seal are to be replaced as recommended, do so at this point. See the Seat Replacement Section for details.
15. Install the insert or insert screws as shown in Figure 18. The 3” and 4” (DN 80 and 100) 815W and 830W series valves do not have insert screws. They use two pins (12) to locate and hold the insert. Tighten the screws in a uniform sequence. Torque values are given in Table 1.
16. With the valve still closed, tighten the nuts (15) on the compression plate 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.

17. Set the handle or actuator stops as described in the SETTINGS ADJUSTMENTS Section. Tighten the screws and nuts holding the ratchet plate or actuator base plate.

4.9 High Cycle Construction (860 only)

Using these materials, Xtreme® (X) seat, filled super PTFE shaft seals, 316 SS/Woven PTFE shaft bearings, PEEK®-filled PTFE thrust bearings and excluder rings, yields significantly longer life than a standard configuration valve. Actual cycle performance is subject to media, pressure, and temperature conditions. Applications such as oxygen, nitrogen, hydrogen, water, and other clean media are ideally suited for this option.

WARNING
AVOID ANY MEDIA CONTAINING ACIDS OR CHEMICALS SUCH AS CHLORINE, BROMINE, SULFUR DIOXIDE, OR STEAM, OR TEMPERATURES THAT EXCEED 325°F (163°C).

For proper assembly, the excluder ring must be assembled with the open side toward the waterway on both sides. See Figure 13 for proper assembly.

4.10 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 di in the half open position.

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

5. ACTUATOR MOUNTING

Original mounting of actuators is not covered in this document because of the wide variety of possible actuators. If an actuator is to be added to the valve, see the Actuator Mounting Instructions (AMI) accompanying the linkage kit for the actuator being mounted. Adjust the actuator stops as described in the STOP SETTING Section for the appropriate actuator.

5.1 Change of Actuator Quadrant

If it is necessary to orient the actuator in a different quadrant (Figure 15 and 16):

1. If the valve uses a two-piece “no-play” bolted coupling, loosen the valve/actuator coupling by loosening the coupling screws.

2. Remove the four bolts holding the actuator bracket to the actuator base plate.

Figure 13
3. After removing the actuator and bracket from the valve, remove the four screws holding the actuator bracket to the actuator.

4. Reposition the actuator in the desired quadrant.

5. Reinstall and retighten the four screws which hold the actuator bracket to the actuator.

6. Verify that the actuator and valve positions match, i.e., valve closed and actuator at the “closed” end of stroke. This ensures opening of the valve in a counterclockwise direction, as shown in the illustrations.

7. Reinstall the bracket on the base plate, holding the two together with the four bolt and nuts. The bracket and base plate should touch each other at all four bolt holes, but the nuts should be only “finger-tight”. (Excessive tightening will prevent proper alignment of the actuator drive shaft and valve stem. Failure to tighten snugly will cause the shaft and disc to be pushed downward away from the optimum seat contact when final tightening is accomplished.)

8. Install the coupling and tighten the coupling bolts. Be sure the actuator drive shaft and valve stem are rigidly held together and properly aligned.

9. Loosen slightly the four nuts and bolts joining the bracket and base plate so that the coupling can better align the actuator drive shaft and valve stem. Then fully tighten the nuts and bolts.

10. Set the actuator stops as described below in the SETTINGS ADJUSTMENTS Section for the appropriate actuator. If the valve is not installed in the line, do not install it until the actuator stops are properly adjusted.

6. CHANGE OF HANDLE QUADRANT

If it is necessary to remount the handle 180° from its standard direction (Figure 14):

1. Remove the handle, hex head cap screws (H6) and lockwashers (H12). Do not remove the studs (14).

2. Lift the ratchet plate up and rotate it 180° around the shaft. Do not turn it upside down.

3. Reinstall all the components which were just removed. Be certain that the indicator plate (26) is correctly oriented with respect to the indicator pointer (29) during the reassembly. Do not tighten the ratchet plate fasteners until the plate has been properly adjusted as described in the SETTING HANDLE STOP Section. If the valve is not installed in the line, do not install it until the ratchet plate is properly adjusted.

7. SETTING ADJUSTMENTS

7.1 Setting Stops (Valve in the Line)

It is preferable to adjust the stops on the handle or actuator before the valve is installed in the line because of the ability to check disc position visually. If this is not possible, and the valve is installed in the line, use the procedures which follow, ignoring any reference to measured clearance to the disc. CAUTION: There must be no pressure across the valve while the stops are being set. Following adjustments, check all linkage and coupling bolts for tightness. Recommended torque values for fasteners are shown in (Table 1).

7.2 Setting Stops (Valve Out of Line)

The following steps rely upon the insert (2) being clamped in the position it will take when installed in the line. The insert must be flush with the face of the body (1) within 1/32" (.79 mm) maximum. The installed seat tends to lift the insert unless it is completely clamped or screwed in place. It may be most convenient to adjust the stops with the seat removed from the valve. Following the setting of the stops, the seat and insert must be reinstalled as described in the SEAT REPLACEMENT Section.

Following adjustments, check all linkage and coupling bolts for tightness. Recommended torque values for fasteners are shown in (Table 2).
7.3 Setting Handle Stop (Figure 15)

1. Loosen the two hex head cap screws (H6) clamping the ratchet plate to the valve.
2. Close the valve until the disc is parallel with the flange faces within 1/32” (.79 mm) Do not over close the valve so that the disc is in contact with the insert.
3. If the handle (H1 in Figure 18) has been removed from the valve, reinstall it on the shaft drive square and tighten the nut (H11). The handle should be installed so that it is parallel with the disc (3) in order to provide visual indication of disc position when viewed from a distance. With the handle locking tab in the last (closed) notch of the ratchet plate, rotate the ratchet plate clockwise (when viewed from above the handle) until it is stopped by the locking tab. The disc/handle assembly is now lightly trapped between the insert and the ratchet plate.
4. Tighten the two nuts (15) and two screws (H6) holding the ratchet plate.

7.4 Setting StopsonSTandST-MSpneumatic Actuators (Figure 16)

1. Disc travel on Wafer-Sphere valves with a type ST or ST-MS pneumatic actuator is controlled with a closed ("shut") travel stop set screw (19A), and by an open travel stop set screw (19B) in the actuator.
2. Remove acorn nuts (18) protecting the stop set screws. **NOTE:** Be sure O-rings remain in the acorn nuts.
3. Adjust the closed ("shut") stop set screw (19A) until the disc just touches the insert when the actuator is at the end of its stroke. Air pressure may have to be applied to ST-MS actuators to relieve the load on the closed ("shut") stop set screw during the adjustment. **CAUTION:** If pressure is supplied to the actuator while the valve is exposed, keep hands and tools away from the disc.
4. From the position which allows the disc to just touch the insert, turn the stop set screw in about 1/8 turn to get the disc .010”/.040” (.254/1.02 mm) off the insert.
5. Cycle the actuator open and back to closed several times and verify that the disc returns to the same position each time. Keep hands and tools away from the disc, and do not allow the disc to drag across surfaces which can scratch the sealing edge.
6. Cycle the valve to the open position. If necessary, adjust the open set stop screw (19B) until the pointer (24) is approximately 90˚ from the closed ("shut") position. This is full open.
7. With the valve in the full open position, and with air applied so that the load is applied to the open stop set screw to prevent it from moving, cover the open set screw with an acorn nut. Tighten the open stop set screw acorn nut.
8. Now close the valve. With the valve in the closed position, and air (or spring) load applied to the stop set screw, tighten the closed (“shut”) stop set screw acorn nut.

9. Cycle the valve open and closed, with full air pressure, three times. The disc must return to the same position each time. Visually check to see that the disc is within .010”/.040” (.254/1.02 mm) of the insert stop, but is not lifting the insert from its proper position.

7.5 Setting Stops on Quadra-Powr Actuators

Follow the instructions for adjustment of ST-MS actuators with the following exceptions:

1. The Quadra-Powr has no acorn nuts on the stop screws.

2. Because the stop set screws can be held in position with a screwdriver while tightening the jam nuts, there is no need to apply a load to the ends of the screws during this operation.

7.6 Setting Stops on MA Manual Gear Actuator (Figure 17)

1. Loosen the jam nuts (23) locking the stop set screws (19). Back out the closed (“shut”) stop set screw (19A) far enough to allow the actuator to move the disc until it is just touching the insert.

2. Screw in the closed (“shut”) stop set screw until it stops against the gear face inside the actuator.
EXPLODED VIEW

3", 4" & 6"
(DN 80, 100 & 150)
860 Only

SERIES 815W, 830W & 860W

SERIES 815L, 830L & 860L

Figure 18
**TABLE 2.**

<table>
<thead>
<tr>
<th>BRACKET BOLTING TORQUES FOR GR. 5 HEX CAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque to Aluminum Body Actuators</td>
</tr>
<tr>
<td>No Lubrication to Screws</td>
</tr>
<tr>
<td>Bolt Size</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1/4</td>
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<td>5/16</td>
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<td>3/8</td>
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<tr>
<td>M20</td>
</tr>
<tr>
<td>M30</td>
</tr>
<tr>
<td>M36</td>
</tr>
</tbody>
</table>

<p>| REQUIRED TORQUE FOR NO-PLAY COUPLING FASTENERS (Gr. 8 Socket Cap Screws and Lock Nuts) |
| No Lubrication to Screws/Nuts |</p>
<table>
<thead>
<tr>
<th>Thread Size</th>
<th>Tightening Torque - FT•LBS (N•m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4 - 20</td>
<td>9 - 12 (12.2 - 16.3)</td>
</tr>
<tr>
<td>1/4 - 28</td>
<td>11 - 14 (14.9 - 19.0)</td>
</tr>
<tr>
<td>5/16 - 18, 5/16 - 24</td>
<td>22 - 27 (29.8 - 36.6)</td>
</tr>
<tr>
<td>3/8 - 16, 3/8 - 24</td>
<td>35 - 40 (47.5 - 54.2)</td>
</tr>
<tr>
<td>1/2 - 13, 1/2 - 20</td>
<td>80 - 90 (108.4 - 122.0)</td>
</tr>
<tr>
<td>5/8 - 11, 5/8 - 18</td>
<td>160 - 170 (217.0 - 230.5)</td>
</tr>
</tbody>
</table>

3. Taking care not to move the set screw, use the handwheel to open the disc slightly. Turn the closed (“shut”) stop set screw in about 1/8 turn. Check to see that the disc is .010”/.040” (.254/1.02 mm) off the insert.

4. Lock the stop set screw with the jam nut at this point. The screw must be kept from moving while the nut is being tightened. This may be done either by holding the screw with a wrench, or by using the handwheel to drive the gear firmly against the end of the screw.

5. Open the valve so that the pointer is approximately 90˚ from the closed (shut position using the handwheel). Adjust the open stop set screw (19B) to stop the gear at this position. Hold the stop set screw and tighten the jam nut.

### 6.2 Setting Stops on Electric Actuators

Electric actuator stops are controlled by adjustable cams and switches. Follow basically the same procedure for these actuators as for ST actuators. The closed (“shut”) switch should stop the disc within .010”/.040” (.254/1.02 mm) of the insert. Do not set the stop so that the disc touches the insert before the switch turns the actuator off.

### 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 datasheets (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.neles.com/valves](http://www.neles.com/valves).

**NOTE:** When ordering spare parts, 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 18, the ballooned part number, part name and quantity required.
# JAMESBURY BRAND WAFER-SPHERE VALVE, SERIES 800

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>9</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>815</td>
<td>W</td>
<td>-</td>
<td>11</td>
<td>22</td>
<td>36</td>
<td>XZ</td>
<td>A</td>
<td>QY</td>
</tr>
</tbody>
</table>

### 1. sign VALVE SIZE (inch / mm)
- **INCHES**: 3, 4, 6, 8, 10, 12, 14
- **DN**: 80, 100, 150, 200, 250, 300, 350

### 2. sign VALVE SERIES & STYLE
- **815**: Standard Class 150
- **F815**: Fire-Tite Class 150
- **818**: Standard with CE Marking & Documentation Class 150
- **F818**: Fire-Tite with CE Marking & Documentation Class 150
- **830**: Standard Class 300
- **F830**: Fire-Tite Class 300
- **838**: Standard with CE Marking & Documentation Class 300
- **F838**: Fire-Tite with CE Marking & Documentation Class 300
- **860**: Standard Class 600
- **F860**: Fire-Tite Class 600
- **868**: Standard with CE Marking & Documentation Class 600
- **F868**: Fire-Tite with CE Marking & Documentation Class 600

### 3. sign BODY STYLE
- **W**: Wafer
- **L**: Single-flange Lugged

### 4. sign CONSTRUCTION / SPECIAL SERVICE
- **-**: Standard (no entry)
- **C**: Chlorine
- **N**: NACE MR0103-2003
- **O**: Oxygen
- **H**: Hard-coated Disc
- **HV**: High Vacuum
- **HVC**: High Vacuum Certified
- **D**: Double Packing
- **DL**: Double Packing with Monitoring Port

### 5. sign SEAT TYPE
- **11**: Standard (non Fire-Tite)
- **31**: Fire-Tite

### 6. sign BODY MATERIAL
- **22**: Carbon Steel (WCB)
- **35**: Alloy 20 (CN7M)
- **36**: Stainless Steel (CF8M)
- **37**: Stainless Steel (CG8M)
- **71**: Monel® (M-35-1)
- **73**: Hastelloy® C (CW-12MW)

### 7. sign DISC AND SHAFT MATERIAL
- **35**: Alloy 20 disc and shaft
- **36**: 316 Stainless Steel disc and shaft
- **37**: 317 Stainless Steel disc and shaft
- **71**: Monel disc and shaft
- **73**: Hastelloy C disc and shaft
- **HB**: 316 Stainless Steel disc, 17-4 PH shaft
- **00**: Same as body material

### 8. sign SEAT AND SEAL MATERIAL

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>FIRE-TITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>XZ: Xtreme seat &amp; carbon-filled enhanced PTFE seal</td>
<td>AE: PTFE/Stainless steel seat, graphite seal</td>
</tr>
<tr>
<td>TT: PTFE seat and seal</td>
<td>AF: PTFE/Alloy-20 seat, graphite seal</td>
</tr>
<tr>
<td>MT: Filled PTFE seat, PTFE seal</td>
<td>AH: PTFE/Monel seat, graphite seal</td>
</tr>
<tr>
<td>UU: PEEK/Graphite/Graphite</td>
<td>XF: Xtreme/Alloy-20 seat, graphite seal</td>
</tr>
<tr>
<td></td>
<td>XH: Xtreme/Monel seat, graphite seal</td>
</tr>
</tbody>
</table>

### 9. sign Model
- **A**

### 10. sign Modifier Code
- **-**: Standard
- **QY**: Live-loaded packing
- **MM**: High Cycle Construction

Other materials available on application

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Monel® is a registered trademark of Special Metals Corporation