Replacement of Glass and Seals on Kadant Johnson Port Hole Style Sight Flow Indicators

Follow your company's safety procedures whenever working on Kadant Johnson products. Read all of the instructions before proceeding with the installation or repair.

Please refer to the Kadant Johnson assembly drawing for part identification. Assembly drawings are available on request from Kadant Johnson.

Lubricate all fasteners with anti-seize compound. Tighten all fasteners in a star pattern. Torque specifications are listed on the product assembly drawing and are available from Kadant Johnson.

**STEP 1.**
Make sure all system pressure is relieved from the sight flow indicator.

**STEP 2.**
Remove eight socket head cap screws (6) and two retaining rings (2).

**STEP 3.**
Remove and discard two outer cushions (3), two glasses (4), optional Mica shields (3B), and two inner seals (3A).

**STEP 4.**
Carefully clean and inspect all sealing surfaces. Avoid damaging the gasket surfaces. Stubborn gaskets can be removed using gasket remover and a Scotch Brite pad. Replace body (1) or retaining ring (2), if steam cut or otherwise damaged.

**STEP 5.**
Install new seals and glasses in the order as shown in the exploded view: inner seal (blue, 3A), optional mica shield (3B), glass (3), outer cushion (green, 3), and retaining ring (2). Make sure the glass is centered and does not contact the body. Lubricate the threads on the socket head cap screws (6) with anti-seize compound and secure the retaining ring. Tighten the socket head cap screws evenly to 30 in-lb (3 Nm) with an inch pound torque wrench using a star pattern. Then increase torque value by 15 in-lb (2 Nm) increments until the final torque is reached. See Table 1 for torque values.

<table>
<thead>
<tr>
<th>Quantity of Bolts</th>
<th>Bolt Size</th>
<th>Maximum Torque in-lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1/4&quot;</td>
<td>130 (15 Nm)</td>
</tr>
<tr>
<td>6</td>
<td>1/4&quot;</td>
<td>160 (18 Nm)</td>
</tr>
<tr>
<td>6</td>
<td>3/8&quot;</td>
<td>200 (23 Nm)</td>
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</tbody>
</table>

**PRECAUTIONS**

1. Do not tighten the socket head cap screws while the sight flow indicator is pressurized. The glass could fracture, causing injury.
2. Do not use damaged glasses.
3. Check body and retaining rings for flatness and warping.
4. Make sure all gasket material is removed from sealing surfaces.
5. Do not over tighten the socket head cap screws. The glass could fracture.
6. Do not operate the sight glass at pressures over the ratings supplied by Kadant Johnson. Ratings are determined by operating temperature, fluid type, and pH.

**PREDICTIVE MAINTENANCE INSTRUCTIONS**

1. Wear safety glasses when looking toward a sight glass on operating process equipment.
2. Keep sight glasses in original boxes until ready to install them. Any glass-to-glass contact can scratch the glass. Glass-to-glass contact should be avoided.
3. The glasses should be inspected on regular bases. For example, if the equipment is shut down weekly or bi-monthly then the sight glasses should be inspected at that time.

4. Maintain records to verify that routine inspections are properly conducted.

5. In new processes, inspect the sight glass daily until the need for replacement becomes apparent. This will help to establish the routine inspection and replacement cycle.

6. To examine for scratches, shine a bright flashlight at about a 45° angle to the glass. Anything that glistens brightly should be examined closely. Any scratch that glistens and catches the fingernail or any star-shaped or crescent-shaped mark that glistens is cause for replacement.

7. Examine the sight glass for any signs of clouding, corrosion, erosion, dissolving, or scratching. Disassembly is generally required to identify dissolving.

8. Scratches, corrosion, chips, or surface damage on any side or edge weakens the sight glass. Any sight glass that appears cloudy or roughened and will not respond to cleaning procedures should be replaced.

9. Use a mica shield to protect the hot surface of the sight glass. When this protective shield wears out, the entire assembly should be replaced (shield, gaskets, and glass).

10. Keep the glasses clean using commercial glass cleaners.

11. Protect the outside face of the glass from sudden temperature changes, such as water sprays or cold air blasts.

12. Do not use wire brushes, metal scrapers, or other abrasives that could scratch the glass.

13. Do not attempt to inspect or clean the glass while the unit is in operation.

14. Do not adjust or tighten the retaining ring bolts while the unit is in operation.

15. Do not re-use any glass, gasket, or shield.

16. Do not tighten the bolts while the glass is hot.

17. Do not weld, impact, or sandblast near the sight glass areas without protecting the sight glass.

18. Do not use glass that is scratched, chipped, or scored, or otherwise damaged.

19. Do not bump, impact, or scratch the glass.

20. Only use the specified gaskets on the specified sides of the glass.

21. Do not interchange the gaskets.

**APPLICATION INFORMATION**

1. Borosilicate glass tends to thin (dissolve) in the presence of condensate (hot water). This thinning is most pronounced at temperatures over 320° F (160° C). This corresponds to a saturated steam pressure of 75 psig (517 kPa, 5.17 bar).

2. Thinning is accelerated when the condensate pH is over 10 (basic).

3. At elevated pressure, typically above the 75 psig (5 bar) limit, the rate of thinning of the glass will be much higher, service life will be shorter, and the glass must be changed more frequently. Correspondingly, the operation requires more attentive inspection and maintenance procedures.

4. Glass manufacturers normally recommend that the glass be protected on the inside by mica shields. These shields are particularly important when operating with hot condensate at high pressures. The mica shields may turn brown over time, making it difficult to observe the condensate flow. The shields should then be replaced, following the procedures outlined in the previous sections.

Dimensions are for reference only and subject to change. Certified drawings are available on request.