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The HPS joint is a self-supported design. Two bearings support the housing allowing the rotor to rotate easily within the joint body. In the seal assembly, the Convex Antimony Impregnated Carbon Graphite Seal Ring mates against a concave metallic surface.

Many joints use a concave seal ring. Pressure loads radiate outward against this seal to put the ring in tension, allowing it to break apart. By contrast, the HPS features a Convex Seal Ring. Forces against the seal put the ring into compression, making it four times more resistant to failure than Concave Rings. Furthermore, the seal configuration significantly improves seal life.

The HPS Series Joints are available both in monoflow and duoflow configurations.

**Operating Data:**

- **Max Speed:** 400 rpm  
  (for higher speeds consult Deublin Engineering)
- **Pressure:** 250 psi (17.2 BAR)
- **Media:** Steam

**Size:** 1½”
**Other Sizes:** 1¼” (1½” bushed down)  
2” (1½” bushed up)

**Applications:**

- Corrugating Machines
  1. Applicator Rolls
  2. Doctor Rolls
  3. Center Shaft
  4. Preheat Rolls
  5. Pressure Rolls
  6. Upper and Lower Corrugating Rolls

**Materials of Construction:**

- Housing: Nickel Plated Ductile Iron
- Grade 8 Socket Head Cap Screws
- Spring: Stainless Steel
- Seal Ring: Antimony Impregnated Carbon Graphite
- Outboard Bearing: Antimony Impregnated Carbon Graphite
- Siphon Pipe: ½” Schedule 80 Required
- Nickel Plated Front and Rear End Caps
HPS Series
1 ½” Union

Note: Numbers correspond to Features & Benefits on page 3
<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Siphon Bushing</td>
<td>• Provides rigid and secure attachment of siphon pipe eliminating stresses causing siphon breakage.</td>
</tr>
<tr>
<td>2. External Mechanism to adjust siphon pipe</td>
<td>• Allows easy external adjustment of siphon clearance with set screw, thus preventing the welded seam from catching the siphon pipe.</td>
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<tr>
<td></td>
<td>• Provides optimum condensate removal</td>
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<td></td>
<td>• Helps eliminate blistering</td>
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<tr>
<td>3. Adjustable Siphon End Cap</td>
<td>• Ability to orient outlet in any desired direction</td>
</tr>
<tr>
<td>4. Alignment Slot</td>
<td>• Allows for quick visual check of siphon drop leg position and continuous monitoring</td>
</tr>
<tr>
<td>5. Flat Tab Washer</td>
<td>• Bent flat tab washer keeps siphon drop leg in set position</td>
</tr>
<tr>
<td>6. Jacking Screw Holes in front end cap</td>
<td>• Easy to remove front end cap</td>
</tr>
<tr>
<td>7. Convex Seal Ring</td>
<td>• Keeps carbon in compression (4 times stronger than concave rings in tension)</td>
</tr>
<tr>
<td></td>
<td>• Better suited to handle mechanical and thermal shock</td>
</tr>
<tr>
<td>8. Seal Wear Indicator</td>
<td>• Allows for planned maintenance</td>
</tr>
<tr>
<td>9. Heavy Duty Rotor Design (66% thicker rotor wall thickness than competition or 3/32&quot; thicker)</td>
<td>• Eliminates Rotor breakage</td>
</tr>
<tr>
<td></td>
<td>• Increases worker safety</td>
</tr>
<tr>
<td>10. Fitting dimensions conform to current industry standards</td>
<td>• Allows easy field retrofit</td>
</tr>
<tr>
<td></td>
<td>• Allows usage of existing adaptive hardware (split wedges, flange, rotor pilot)</td>
</tr>
<tr>
<td>11. One Model for All Applications</td>
<td>• 1-1/2&quot; replaces 1-1/4&quot;, 1-1/2&quot; and 2&quot; size unions</td>
</tr>
<tr>
<td></td>
<td>• Lowers inventory holding costs</td>
</tr>
<tr>
<td>12. Field Repair Kit</td>
<td>• Allows economical and easy field repair</td>
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Installation Instructions

DEUBLIN®

HPS SERIES
Steam Joints

Model C15D-004-02-3A (UNC)

DEUBLIN® COMPANY

2050 Norman Drive, West
Waukegan, IL USA 60085-6747
Phone: 847/689-8600
Fax: 847/689-8690
The following instructions are designed to insure proper installation and operation of the HPS Series Rotating Union, 1-1/2 inch, Double-Bearing with External Siphon Adjustment.

Required Tools
- Allen wrench (5/16 inch)
- Allen wrench (3/16 inch) for adjustment set screw
- Open end wrench (7/8 inch)
- Torque wrench
- Adjustable wrench to fit 1-1/2" nut

Additional items that may be required for installation
- 1/2 inch Schedule 80 siphon pipe
- Mounting adaptation kit (to go from 1-1/2 inch mounting to 2 inch or 1-1/2 inch mounting to 1-1/4 inch mounting)

1. Siphon Pipe
2. Rotor Gasket
3. Split Wedges
4. Rotor Flange
5. Siphon Bushing
6. Copper Gasket
7. Adjustment Set Screw
8. Adjustment Locking Set Screw
9. End Cap
10. O-ring (for Siphon Bushing)
11. Tab Washer
12. Jam Nut
13. Hairpin Clip
Note: It is advisable to use some type of anti-seize compound on all bolts and screws in this installation.

Preparation

1. Clean all threads and bores to remove any grease and metal chips which may be left from machining.

2. When installing a bent pipe it should be threaded to 1/2” NPT and bent to the desired shape.

HPS Installation

1. With the union on the bench, slide the siphon pipe (Item 1) into the union from the journal end. See Figure 1.

2. With the siphon pipe extending from the union, thread the siphon bushing (Item 5) onto the siphon pipe. Tighten the bushing hand-tight and align the alignment slot with the downward leg of the siphon. See Figure 2.

3. Place the o-ring (Item 10), on the siphon bushing, in the groove as shown. See Figure 2.

4. Coat the tapered portion of the bushing with anti-seize compound. Lubricate the o-ring with silicone base grease.

5. Ensure that the copper gasket (Item 6) is installed on the end cap (Item 9), and slide the siphon bushing and siphon pipe into the end cap, aligning the siphon opening with the condensate outlet in the end cap and being careful not to damage the o-ring. See Figure 2.

6. Place the tab washer (Item 11) and jam nut (Item 12) on the end of the bushing and hand-tighten only at this time. See Figure 3.

7. Start the bolts in the end cap leaving them loose at this time.

8. Remove existing steam joint and journal flange, if necessary. Clean the end of the journal or journal flange, removing any residual gasket material.

9. Install new journal flange and gasket, (if necessary).
10. Ensure that the siphon is installed in the union and end cap as previously noted.

11. Attach flexible hoses to the inlet and outlet ports of the union. The design of the flexible hoses must not restrain the natural movement of the union or place additional loads on the union. See the Hose Installation Guide (page 6).

12. Temporarily remove hairpin clip (Item 13). Place the rotor flange (Item 4) over the rotor. Position the split wedges (Item 3) in the rotor grooves. Slide the rotor flange forward, over the split wedges, securing the rings in place. Replace hairpin clip behind flange as shown to hold flange and split wedges during assembly.

13. Place the rotor gasket (Item 2) in the recess of the journal flange.

14. Approach the union to the journal and carefully slide the rotor into the journal flange pilot.

15. Secure the rotor flange to the journal flange with the four hex head bolts and lock washers using a uniform locking pattern. A uniform gap between the flanges is critical and must be consistent to 0.020" to ensure the joint is properly aligned.

16. Remove the locking set screw (Item 8) at the top of the end cap and back out the adjusting set screw (Item 7) until it is flush with the end cap flange face.

17. Align siphon pipe by turning the alignment slot on the siphon bushing (Item 5) so it is vertical. Hold the siphon bushing in this position with a screwdriver and tighten the jam nut (Item 12) to 60 ft.-lbs. Ensure that the tab on the washer (Item 11) is not aligned with the machined flat on the end cap (Item 9). See Figure 3.

18. Bend the tab portion of the washer against one of the nut flats and bend the circular portion into the machined flat on the end cap.

19. Back out all end cap bolts and then with two fingers gently tighten the two bolts 90° from the set screw.

20. Tighten adjustment set screw (Item 7) until it just touches the union housing. Tighten the adjustment set screw the additional amount required to obtain the desired siphon clearance per Figure 4.

21. Tighten all remaining bolts 1 through 6 following the sequence shown in Figure 3. Torque initially to 12 ft.-lbs., then re-torque all bolts to 25 ft.-lbs.

22. Replace the locking set screw (Item 8).

23. Attach torque restraining rods that will allow 3/16" axial and 1/4" radial movement.

24. After 2-3 hours of operation, verify that all connections remain secure.
TURNS OF UNC ADJUSTMENT SCREW vs. SIPHON CLEARANCE

[Graph showing the relationship between turns of UNC adjustment screw and siphon clearance for different lengths of siphon.]

[Recommended Minimum Siphon Clearance is .250 in]
Flexible hose must be used to connect the HPS Series Rotating Union to its steam supply and condensate return piping. Use of rigid piping will drastically reduce the life of the rotating union due to its inflexibility. The union should not be burdened with the weight of the pipe and fittings. The hose should be connected directly to the union and suitable support should be provided for the fittings and supply pipe beyond the hose. Use braided metal hose for inlet and outlet connections. Make certain that the pressure rating of the hose is above the operating pressure of the system.

**FIGURE A**

<table>
<thead>
<tr>
<th>Hose Diameter</th>
<th>Length</th>
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<tbody>
<tr>
<td>1/2”</td>
<td>x 10”</td>
</tr>
<tr>
<td>3/4”</td>
<td>x 14”</td>
</tr>
<tr>
<td>1”</td>
<td>x 16”</td>
</tr>
<tr>
<td>1-1/4”</td>
<td>x 18”</td>
</tr>
<tr>
<td>1-1/2”</td>
<td>x 20”</td>
</tr>
<tr>
<td>2”</td>
<td>x 24”</td>
</tr>
</tbody>
</table>

**NOTE:** WARRANTY WILL BE VOID IF TWO-PIECE HOSE ASSEMBLY IS NOT UTILIZED IN CONDENSATE RETURN LINE.

**FIGURE B**

Steam inlet and condensate outlet connections.

Use 45° or 90° elbow and pipe union for connection to supply and return headers. Ensure that the hose is not installed taut.

Use of elbow and two pieces of flexible hose are required to eliminate side-loading of siphon pipe.
HPS SERIES
Mounting Kit Drawings

DEUBLIN COMPANY
2050 Norman Drive, West
Waukegan, IL USA 60085-6747
Phone: 847/689-8600
Fax: 847/689-8690

Rev. 8/27/03
835-05 LOCK WASHER
687
[17.4]
(1.083)
[27.5]
B X .562 THRU EQUALLY SPACED

#4.750

#3.937

#5.950

.457
[11.6]

#2.321

2.323

42275 GASKET
17894 ADAPTER

#150-223 WEDGE SET
PO50-002 FLANGE

1.5" HPS UNION WITH QUICK-CONNECT MOTOR
C15D-001-01-3F
C15D-001-02-3F
C15D-002-02-3A
C15D-003-02-3A
C15R-001-03-3F
C15R-002-03-3A
C15R-003-03-3F
C15R-004-03-3A
C15D-004-02-3A

OBSOLETE MODELS

DEUBLIN COMPANY
WAUKESHA, ILLINOIS, U.S.A.

MOUNTING KIT
1.5" HPS Q-CONN TO 2" Q-CONN HOLE

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