



*Installation, Operation, and
Maintenance Manual*

***Welker[®] Automatic Insertion Pitot Probe
Model
AIPP-8L***

***Drawing No.: AD302CO
Manual No.: IOM-190***

The information in this manual has been carefully checked for accuracy and is intended to be used as a guide for the installation, operation, and maintenance of the Welker[®] equipment described above. Correct operating and/or installation techniques, however, are the responsibility of the end user. Welker[®] reserves the right to make changes to this and all products in order to improve performance and reliability.

This manual is intended to be used as a basic installation and operation guide for the Welker[®] Automatic Insertion Pitot Probe, *AIPP-8L*. For comprehensive instructions, please refer to the IOM Manuals for each individual component. A list of relevant component IOM Manuals is given in the Appendix section of this manual.

13839 West Bellfort
Sugar Land, TX 77498-1671
(281) 491-2331 - Office
(800) 776-7267 - USA Only
(281) 491-8344 - Fax
<http://www.welker.com>

TABLE OF CONTENTS

<u>1.</u>	<u>SPECIFICATIONS</u>	<u>3</u>
1.1	INTRODUCTION	3
1.2	PRODUCT DESCRIPTION	3
1.3	SPECIFICATIONS	4
1.4	SYSTEM DIAGRAM	5
<u>2.</u>	<u>INSTALLATION & OPERATIONS</u>	<u>6</u>
2.1	BEFORE YOU BEGIN	6
2.2	INSTALLATION	6
2.3	RETRACTION	8
<u>3.</u>	<u>MAINTENANCE</u>	<u>10</u>
3.1	BEFORE YOU BEGIN	10
3.2	MAINTENANCE	10
3.3	REASSEMBLY	13
<u>APPENDIX</u>		<u>14</u>
REFERENCED OR ATTACHED WELKER® IOMS		14
REFERENCED OR ATTACHED BUY-OUT IOMS		14
REFERENCED OR ATTACHED DRAWINGS		14

Welker®, Welker Jet®, and WelkerScope® are Registered Trademarks owned by Welker, Inc.

Section 1: SPECIFICATIONS

1.1 INTRODUCTION

We appreciate your business and your choice of Welker[®] products. The installation, operation, and maintenance liability for this product becomes that of the purchaser at the time of receipt. Reading the applicable *Installation, Operation, and Maintenance (IOM) Manual* prior to installation and operation of this equipment is required for a full understanding of its application and performance prior to use.*

If you have any questions, please call 1-800-776-7267 (USA) or 1-281-491-2331.

Notes, Cautions, and Warnings



Notes emphasize information and / or provide additional information to assist the user.



Caution messages appear before procedures that, if not observed, could result in damage to equipment.



Warning messages appear before procedures that, if not observed, could result in personal injury.

*The following procedures have been written for use with standard Welker[®] parts and equipment. Assemblies that have been modified may have additional requirements and specifications that are not listed in this manual.

1.2 PRODUCT DESCRIPTION

The Welker[®] *AIPP-8L* Automatic Insertion Pitot Probe is designed for use in gas or liquid systems where it is desirable to maintain the pipeline's normal operating pressure during probe insertion and retraction. An operator can safely insert or retract the AIPP-8L from the pressurized pipeline through a customer-supplied full ported ball valve using instrument valves and pipeline pressure.

The AIPP-8L can be installed vertically or horizontally to suite the customer's application and specifications.

Welker[®] may custom design the AIPP-8L to suit the particular application and specifications of each customer.

1.3 SPECIFICATIONS

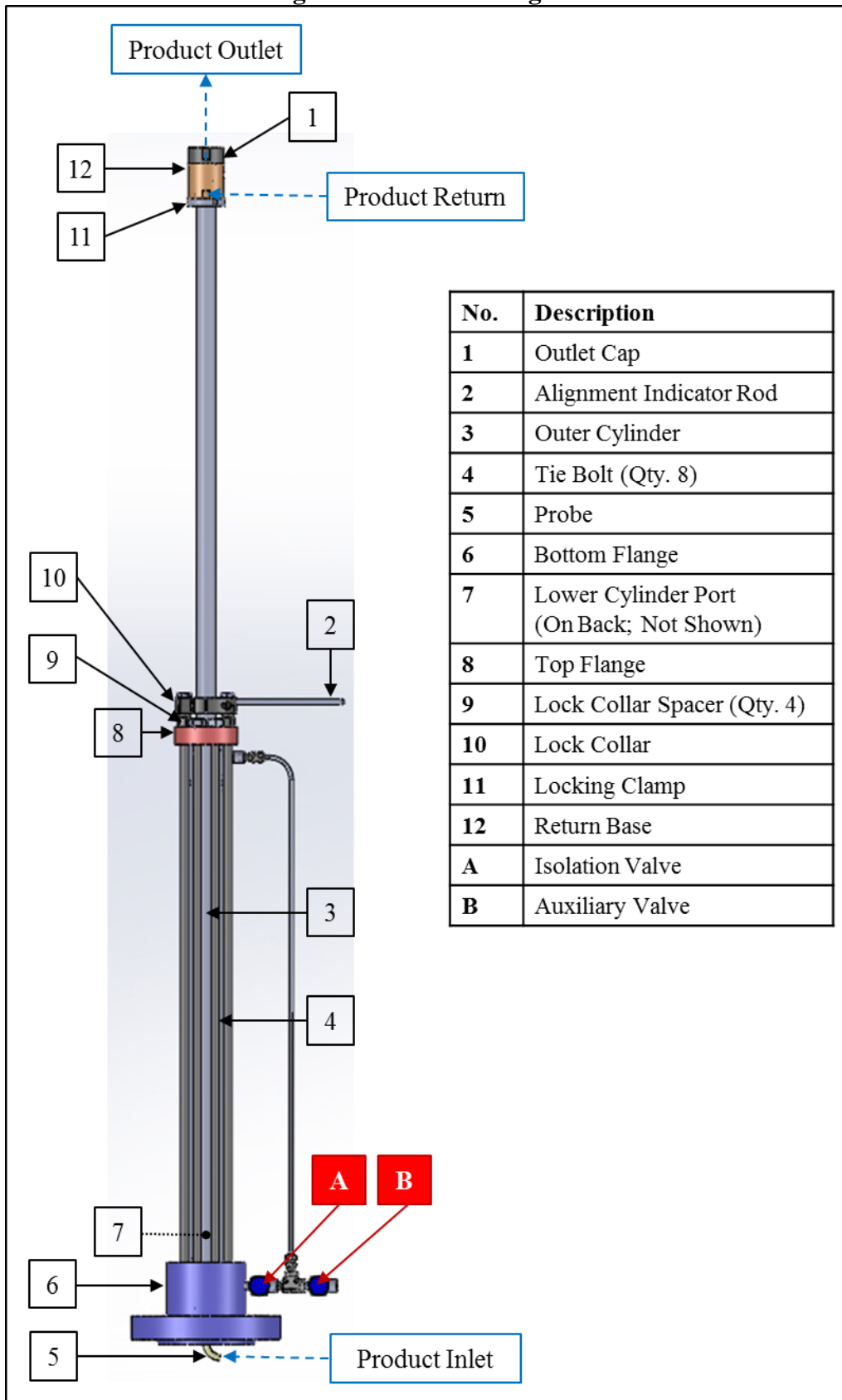


The specifications listed in this section are generalized for this equipment. Welker® can modify the equipment according to your company's needs. However, **please note that the specifications may vary depending on the customization of your product.**

Table 1: AIPP-8L Specifications	
Products Sampled	Gases or Liquids
Materials of Construction	316/316L Stainless Steel, Viton®, Fluorotrel®, PTFE
Maximum Allowable Operating Pressure	2160 psi @ -20°F to 100°F (<i>149 bar @ -29°C to 37°C</i>)
Insertion Diameter	1.25"
Pipeline Connection	ANSI 3"-900 RTJ Standard Others Available upon Request
Insertion Length	18", 24", 30", 36" Standard Others Available upon Request
Sample Outlet Connection	1/2" NPT Standard Others Available upon Request
Features	Adjustable Locking Collar Alignment Indicator Rod Outlet and Return Ports for Hot Loop Operation
Options	CE Compliance Certification Product Outlet and Return Block Valves

1.4 SYSTEM DIAGRAM

Figure 1: AIPP-8L Diagram



Section 2:

INSTALLATION & OPERATIONS

2.1 BEFORE YOU BEGIN



After unpacking the unit, check the equipment for compliance and for any damage that may have occurred during shipment. **Claims for damage caused during shipment must be initiated by the receiver and directed to the shipping carrier.** Welker[®] is not responsible for any damage caused by mishandling by the shipping carrier.



When sealing fittings with PTFE tape, refer to the proper sealing instructions for the tape used.

1. Welker[®] recommends that the probe be set to collect sample from the center one-third (1/3) of the pipeline in order to get the best representative sample of product.
2. For gas sampling applications, Welker[®] recommends that the probe be installed in the top of the pipe and inserted into the center one-third (1/3) of the pipeline in a location where the product is well-mixed and will yield an accurate and representative sample. The sample probe should be located in the least turbulent area of the flowing stream available (i.e., not in a header or a blow-down stack and away from obstructions, elbows, or partially closed valves).
3. For liquid sampling applications, Welker[®] recommends that the probe be connected to the side of the pipe and inserted into the center one-third (1/3) of the pipeline in a location where the product is well-mixed and will yield an accurate and representative sample.
4. Handle the unit with care. Avoid bending the probe, which has a polished surface that travels through seals.
5. Operate the unit slowly and smoothly while inserting and retracting to avoid damaging the unit.
6. Be careful not to close the pipeline isolation valve on the probe while the probe is inserted into the pipeline. This is the most common cause of damage to Welker[®] probes.

2.2 INSTALLATION



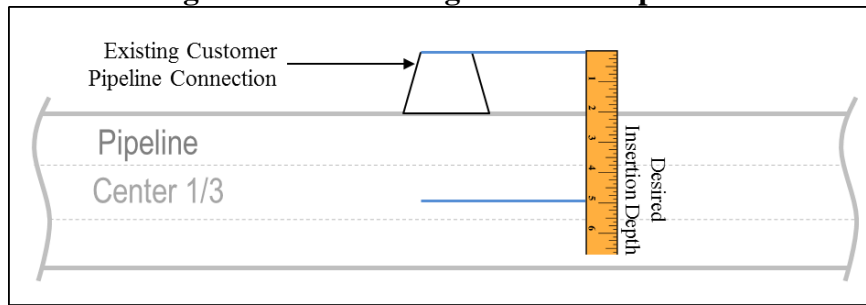
Installation procedures apply to vertical and horizontal installation.



For long probes installed horizontally, Welker[®] recommends field installation of bracing or support for the outlet end of the probe to offset the cantilever effect and prevent bending of the shaft. Any bracing or support installed should NOT contact the probe shaft, as scratching or other damage of the shaft may lead to loss of integrity of the sealing surface.

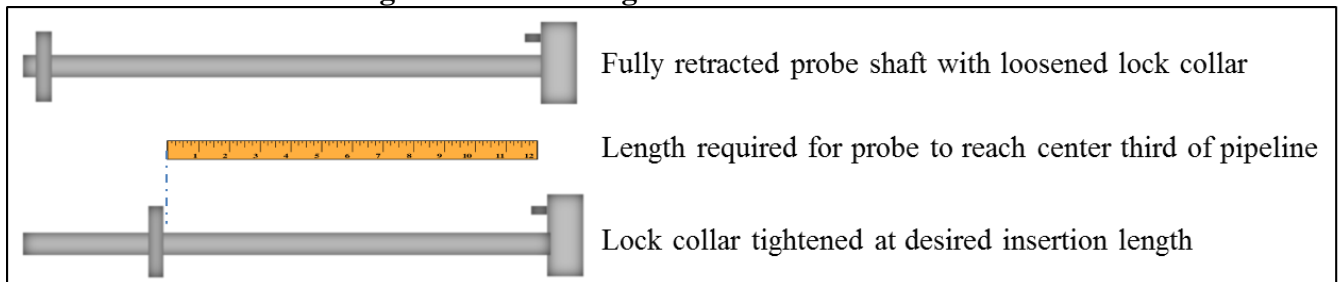
1. Prior to installing the probe, the length the insertion probe will need to travel inside the pipeline must be determined. Measure the distance the probe must travel from the top of the pipeline isolation valve to desired insertion depth (e.g., the center one-third (1/3) of the pipeline). This will be the probe insertion length (*Figure 2*).

Figure 2: Determining Insertion Depth



2. Pull up on the probe to ensure that it is fully retracted. The end of the probe should be flush with the bottom flange face.
3. Beginning at the top edge of the top flange, measure up on the outer shaft assembly to the desired insertion length. As needed, use a felt-tip pen to mark this point.
4. Loosen the two (2) screws on the sides of the lock collar. Remove the four (4) lockdown bolts on the top of the lock collar.
5. Slide the lock collar up the outer cylinder to the probe insertion length (*Figure 3*).

Figure 3: Positioning the Lock Collar



6. Prior to setting the lock collar, determine the direction of product flow. The free end of the alignment indicator rod should point in the direction of product flow.
7. As necessary, adjust the direction of the probe opening by rotating the outer shaft assembly. Typically, the probe opening and alignment indicator rod point in opposite directions.
8. Tighten the two (2) screws on the sides of the lock collar to secure the lock collar to the outer shaft assembly at the marked point.
9. As necessary, install customer-supplied 1/2" NPT valves or other fittings to the product outlet and return ports.



Welker[®] recommends installing valves to the product outlet and return ports to isolate pipeline pressure once the unit is installed.

10. Ensure that all valves on the unit are closed.
11. Locate the sampler two to four times (2-4x) the pipe diameter downstream of an inline static mixer or other flow conditioning system.

Installation Using an Auxiliary Gas (RECOMMENDED)



An auxiliary gas supply is **OPTIONAL** for this unit. However, for products containing liquid or sand and other abrasive contaminants, Welker[®] strongly recommends the use of an auxiliary gas supply (e.g., clean, dry nitrogen gas) to prevent damage to the cylinder.

12. With the alignment indicator rod pointing in the direction of product flow, secure the sampler to the pipeline isolation valve.
13. Connect a regulated auxiliary gas supply, such as clean, dry nitrogen, to valve B.

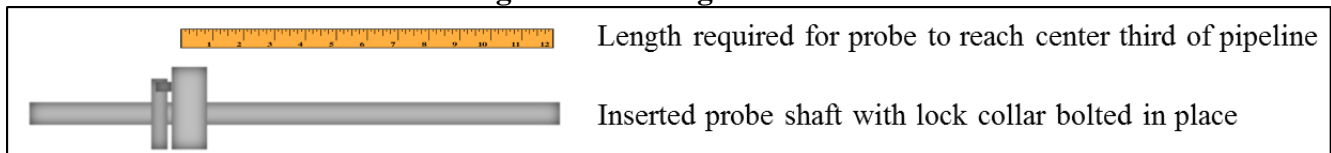
14. Slowly open the pipeline isolation valve and check for leaks. Repair as necessary.
15. Open the valve on the auxiliary gas supply and regulate the supply to the pipeline pressure.
16. Slowly open valve B. This will apply auxiliary gas pressure to the internal shaft piston, causing the probe to insert into the pipeline.



Once the probe begins to insert, do not open the valve any further. The probe should be inserted slowly and smoothly. Opening the valve too quickly or too much may cause the probe to insert into the pipeline too quickly and may result in damage to the unit.

17. Once the lock collar reaches the top flange, close valve B.
18. Secure the lock collar to the top flange with the four (4) lockdown bolts (*Figure 4*).

Figure 4: Locking the Lock Collar



19. Check the system for leaks. Repair as necessary.

Installation Using Pipeline Product (If NOT Using an Auxiliary Gas)

20. With the alignment indicator rod pointing in the direction of product flow, secure the sampler to the pipeline isolation valve.
21. Connect valve B to a customer-supplied recovery system. Valve B should remain closed.
22. Slowly open the pipeline isolation valve and check for leaks. Repair as necessary.
23. Slowly open valve A. This will apply pipeline pressure to the internal shaft piston, causing the probe to insert into the pipeline.



Once the probe begins to insert, do not open the valve any further. The probe should be inserted slowly and smoothly. Opening the valve too quickly or too much may cause the probe to insert into the pipeline too quickly and may result in damage to the unit.

24. Once the lock collar reaches the top flange, close valve A.
25. Secure the lock collar to the top flange with the four (4) lockdown bolts (*Figure 4*).
26. Open valve B to relieve pipeline product pressure. The probe will remain in the pipeline, held in place mechanically by the lock collar.
27. Check the system for leaks. Repair as necessary.

2.3 RETRACTION



Prior to retracting the probe, shut down or disconnect any instrument attached to the unit and ensure that all valves on the unit are closed.

Retraction Using an Auxiliary Gas

1. Open the valve on the auxiliary gas supply and regulate the supply to the pipeline pressure.
2. With all valves closed, slightly open valve B to ensure that auxiliary gas pressure is applied to the internal shaft piston. Valve A should remain closed.



Failure to ensure that adequate pressure is applied to the internal shaft piston prior to retraction could result in unexpected probe retraction, which could damage the unit or injure the operator.

3. To isolate pipeline pressure from any customer-supplied system, close the product outlet and return valves.
4. Depressurize and disconnect any customer-supplied tubing.
5. Close the valve on the auxiliary gas supply and disconnect it from valve B.
6. Connect valve B to a customer-supplied recovery system. Valve B should remain closed.
7. Remove the four (4) lockdown bolts from the lock collar.
8. Slowly open valve B. This will relieve pressure in the shaft, causing the probe to begin retracting from the pipeline.



Once the probe begins to retract, do not open the valve any further. The probe should be retracted slowly and smoothly. Opening the valve too quickly or too much may cause the probe to retract from the pipeline too quickly and may result in damage to the unit.

9. Once the probe has been fully retracted from the pipeline, close the pipeline isolation valve to isolate the unit from pressure.
10. If complete removal of the unit from the pipeline is desired, disconnect the customer-supplied recovery system from valve B prior to removing the unit from the pipeline isolation valve. The unit is now ready for maintenance or to be moved to another location.
11. If the unit will remain secured to the pipeline after retraction, secure the lock collar to the top flange with the four (4) lockdown bolts.

Retraction Using Pipeline Product (If NOT Using an Auxiliary Gas)

12. With all valves closed, slightly open valve A to ensure that pipeline pressure is applied to the internal shaft piston. Valve B should remain closed.



Failure to ensure that adequate pressure is applied to the internal shaft piston prior to retraction could result in unexpected probe retraction, which could damage the unit or injure the operator.

13. To isolate pipeline pressure from any customer-supplied system, close the product outlet and return valves.
14. Depressurize and disconnect any customer-supplied tubing.
15. Close valve A.
16. Remove the four (4) lockdown bolts from the lock collar.
17. Slowly open valve B. This will relieve pipeline pressure in the shaft, causing the probe to begin retracting from the pipeline.



Once the probe begins to retract, do not open the valve any further. The probe should be retracted slowly and smoothly. Opening the valve too quickly or too much may cause the probe to retract from the pipeline too quickly and may result in damage to the unit.

18. Once the probe has been fully retracted from the pipeline, close the pipeline isolation valve to isolate the unit from pressure.
19. If complete removal of the unit from the pipeline is desired, disconnect the customer-supplied recovery system from valve B prior to removing the unit from the pipeline isolation valve. The unit is then ready for maintenance or to be moved to another location.
20. If the unit will remain secured to the pipeline after retraction, secure the lock collar to the top flange with the four (4) lockdown bolts.

Section 3:

MAINTENANCE

3.1 BEFORE YOU BEGIN

1. **Welker® recommends that the unit have regular maintenance under normal operating conditions:** for *gas sampling* every six (6) months; and for *liquid sampling* every twelve (12) months. In cases of severe service, dirty conditions, excessive usage, or other unique applications that may lead to excess wear on the unit, a more frequent maintenance schedule may be appropriate.
2. Prior to maintenance or disassembly of the unit, it is advisable to have a repair kit available for repairs of the system in case of unexpected wear or faulty seals.



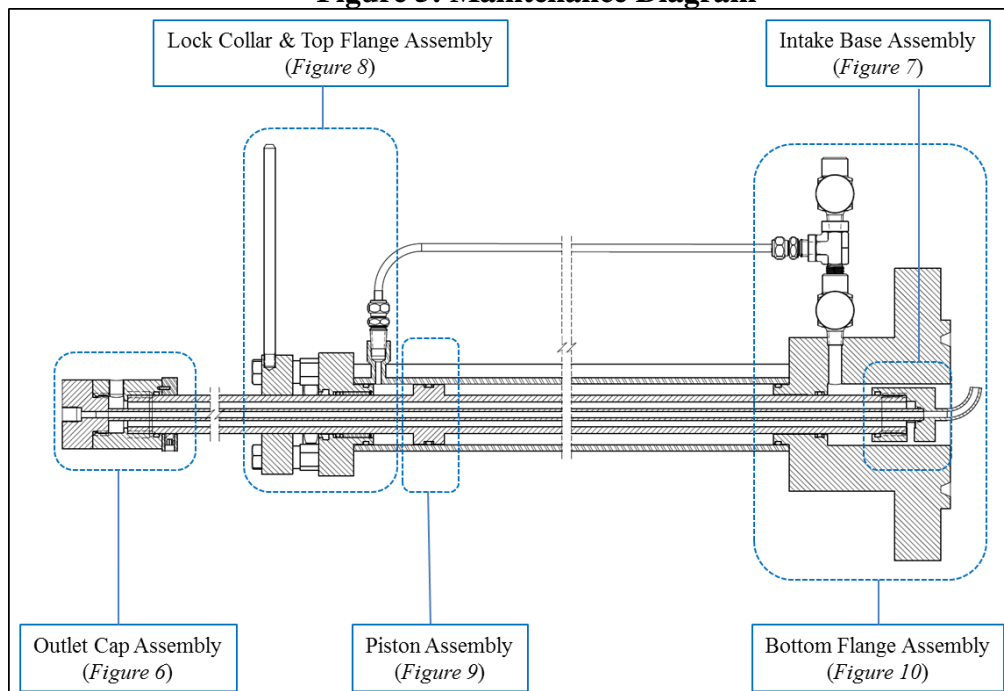
New seals supplied in spare parts kits are not lubricated. They should be lightly lubricated before installation. Welker® recommends Dow Corning® 111 (DC 111) or an equivalent lubricant for use with this unit.

3. All maintenance and cleaning of the unit should be performed on a smooth, clean surface.

3.2 MAINTENANCE

1. Prior to maintenance, the unit must be removed from the pipeline. Refer to *Section 2.3* for instructions on retracting the probe and removing the unit from the pipeline.
2. Secure the lock collar to the top flange with the four (4) lockdown bolts. Ensure that the two (2) screws on the sides of the lock collar are tight.
3. With valves A and B open, gently push the outer shaft assembly down until the outlet cap assembly is directly above the lock collar.
4. Close all valves on the unit.

Figure 5: Maintenance Diagram

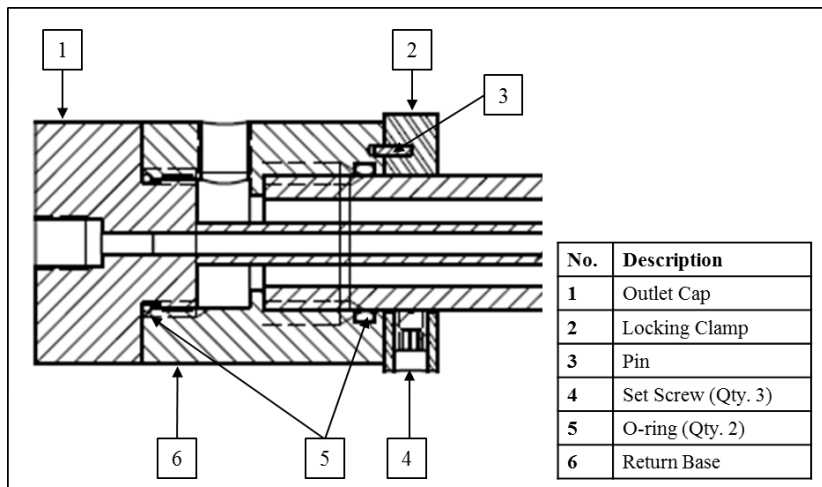


5. Loosen the three (3) set screws in the locking clamp and unscrew the outlet cap assembly to remove it from the outer shaft assembly.
6. Unscrew the outlet cap from the return base.
7. Separate the return base from the locking clamp, taking care to not lose the pin that aligns the locking clamp with the return base.
8. Replace the O-ring in the outlet cap and the O-ring in the return base (*Figure 6*).



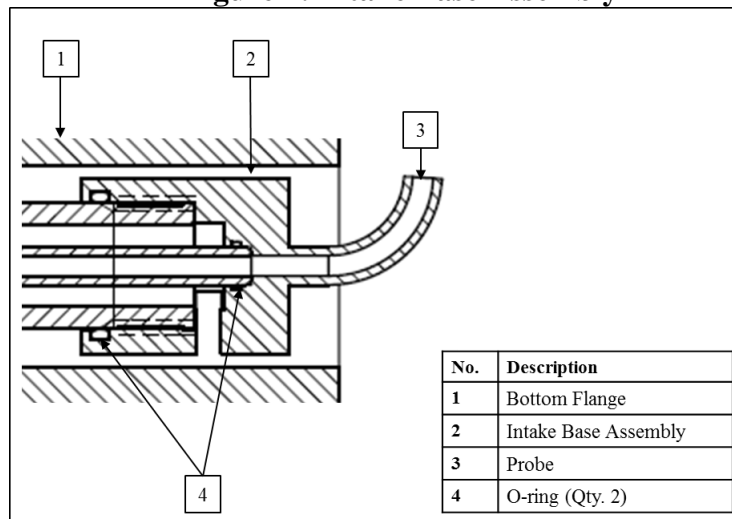
Do not scratch or scrape the metal surfaces of the parts when removing O-rings from the O-ring grooves. Scratching or scraping the sealing surface can result in a leak.

Figure 6: Outlet Cap Assembly



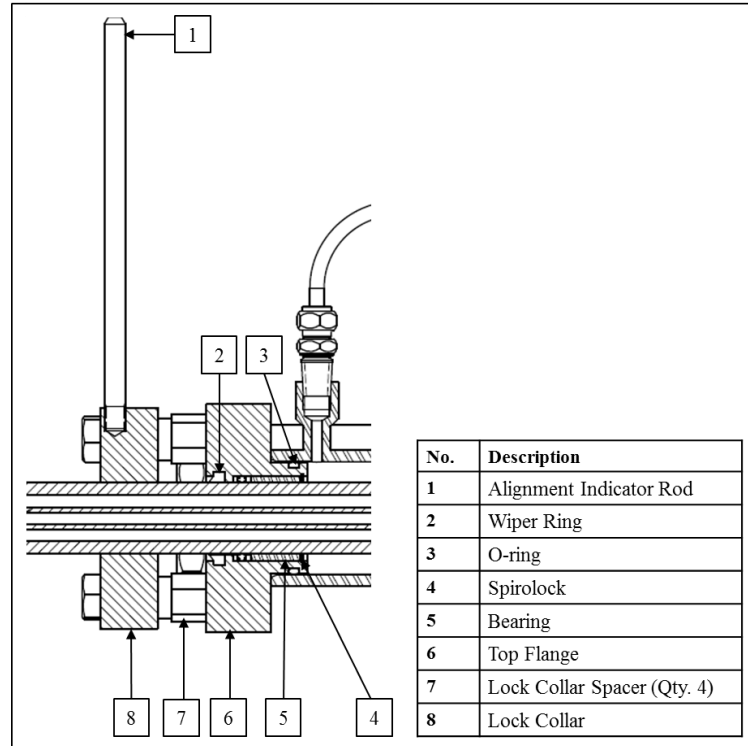
9. Unscrew the intake base assembly from the outer shaft assembly.
10. Replace the O-rings in the intake base assembly (*Figure 7*).

Figure 7: Intake Base Assembly



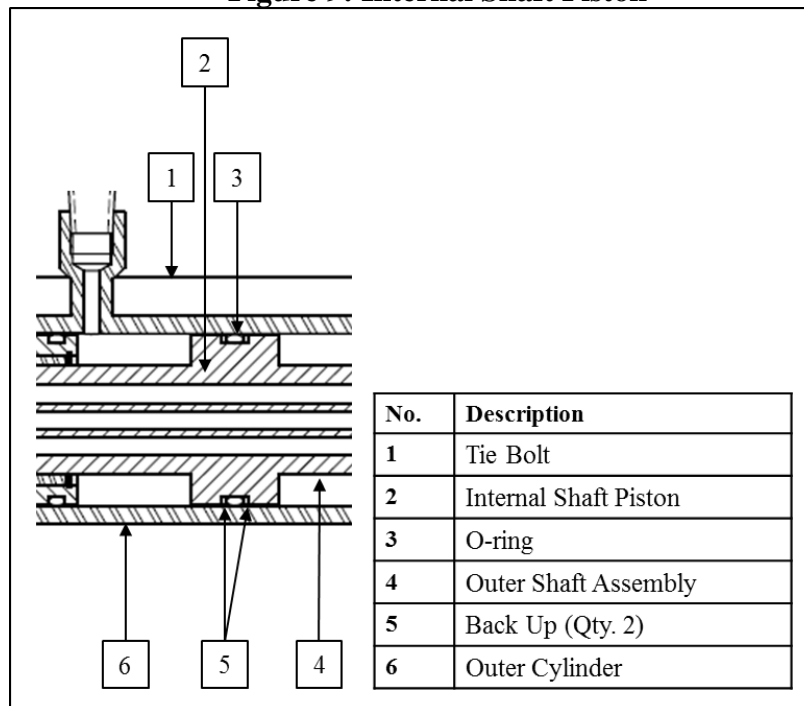
11. Remove the tubing connecting the tee between valves A and B to the upper port.
12. Remove the lock collar, lock collar spacers, and the top flange.
13. Replace the wiper, backups, crown seal, bearing, and O-ring in the top flange (*Figure 8*).

Figure 8: Lock Collar & Top Flange Assembly



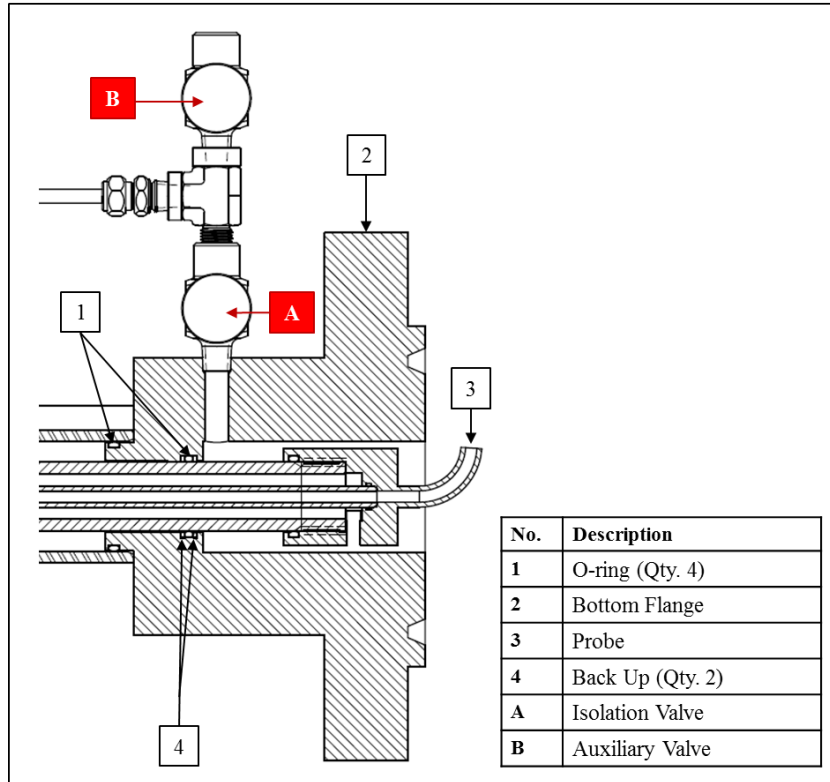
14. Carefully pull the outer shaft assembly up through and out of the outer cylinder.
15. Replace the O-ring and backup on the internal shaft piston (*Figure 9*).

Figure 9: Internal Shaft Piston



16. Remove the eight (8) tie bolts and separate the outer cylinder from the bottom flange.
17. Replace the O-rings and backups in the bottom flange (*Figure 10*).

Figure 10: Bottom Flange Assembly



18. Closely examine the honed surface of the outer shaft assembly and the outer cylinder. Scratches or pits may cause the seals to leak. If scratches or pits are present, the unit may need to be repaired or replaced. Contact Welker® for service options.

3.3 REASSEMBLY

1. Insert the outer cylinder into the bottom flange.
2. Insert the eight (8) tie bolts around the outer cylinder into the bottom flange.
3. Insert the shaft assembly into the outer cylinder and through the bottom flange.
4. Slide the top flange onto the outer shaft assembly and attach the lock collar spacers and hex nuts. Tighten the eight (8) tie bolts.
5. Slide the lock collar onto the outer shaft assembly and secure it to the top flange with the four (4) lockdown bolts.
6. Push the outer shaft assembly towards the bottom flange until the internal shaft piston contacts the bottom flange.
7. Tighten the two (2) screws on the sides of the lock collar.
8. Reattach the tubing between the tee between valves A and B to the upper port.
9. Screw the intake base assembly onto the outer shaft assembly and tighten.
10. Screw the outlet cap onto the return base and tighten. Insert the pin into its port on the locking clamp and align the pin with its port in the return base.
11. Screw the outlet cap assembly onto the outer shaft assembly and fully tighten it against the shaft.
12. Screw the three (3) set screws into the locking clamp and tighten.
13. The unit is now ready for installation.

APPENDIX

ATTACHED DOCUMENTS:

Welker® *Installation, Operation, and Maintenance* Manuals suggested for use with this unit:

- None

Other *Installation, Operation, and Maintenance* Manuals suggested for use with this unit:

- None

Welker® drawings and schematics suggested for use with this unit:

- Assembly Drawing: AD302CO (standard)



**13839 West Bellfort
Sugar Land, TX 77498-1671
(281) 491-2331 - Office
(800) 776-7267 - USA Only
(281) 491-8344 - Fax
<http://www.welker.com>**