Installation, Operation, and Maintenance Manual

Welker® Automatic Insertion Probe

Model AID-1

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.

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1. GENERAL

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 IO&M Manual prior to installation and operation of this equipment is required so that you have a full understanding of its application and performance prior to commencement of use. If you have any questions, please call 1-800-776-7267 or 281-491-2331 in the USA.

The Standard Welker Automatic Insertion Device (AID-1 Series) is designed for use in systems where it is advantageous to insert and retract the probe/shaft from a pressurized pipeline up to 2,160 psi. The automatic insertion style allows the operator to control the movement of the probe into and out of the pipeline safely through the use of four valves and an oil reservoir, instrument air or process fluid. The unit should always be mounted to a full opening, full ported valve matching the mating connection.

This device is frequently used in conjunction with another manufacturer's device. The other device's manual should also be consulted prior to installation, operation or maintenance.

1.2 Specifications

Products:	Gases and Liquids
Materials of Construction:	316SS, 7075-T6 Aluminum, Carbon Steel, Viton and PTFE
Insertion Length:	18" (457mm) Standard (others available in 6" (152mm) increments)

Viscosity Range:	0.009cp to 2,000cp @ 68°F (20°C)
Maximum Allowable Temperature*:	350° F @ 1,000 psi (176° C @ 69 bar)
Maximum Allowable Pressure*:	2,160 psi (149 bar)
Pipeline Connection:	1" NPT Standard (other NPT and flanged available)
Sample Outlet Connection:	¼" NPT Standard (others available)
Area Classification:	Can be used in hazardous locations

Options:

Pressure ratings

Temperature ratings

Materials of construction

* Maximum allowable temperatures and pressures may be lower depending on specifications of pipeline connections device.

2. INSTALLATION AND REMOVAL INSTRUCTIONS

2.1 Inserting and operating the device

2.1.1 After unpacking the unit, check it for compliance and any damages that may have occurred during shipment.

NOTE: Claims for damages caused during shipment must be initiated by the receiver to the carrier. Welker is not responsible for any damages caused from mishandling by the shipping company.

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

2.1.2 Determine the amount of insertion travel desired by measuring from the top of the pipeline isolation valve to the desired depth in the pipeline.

2.1.3 With the probe fully retracted, locate the lock collar on the shaft at the appropriate length. (i.e. if the insertion travel desired is 12 inches, measure up 12 inches from the top of the upper housing and tighten the lock collar at this point. This will limit the insertion travel to 12 inches).

2.1.4 Close all valves on the assembly.

2.1.5 Mount the device onto the pipeline isolation valve.

NOTE: If the unit has an oil reservoir, do not use the oil reservoir and tubing as a leverage grip to rotate or locate the unit on the valve. The oil reservoir is shipped from the factory with the necessary oil volume. It should be noted that the unit is shipped from the factory with the assumption that the installation will be vertical. In cases where the unit is mounted in the horizontal position, the user will have to rotate the oil reservoir 90 degrees and re-tube, so that the oil reservoir drain valve is always aimed towards the

ground. **The internals of the reservoir have a down-comer that will not function if the oil pot is located in a horizontal position.**

2.1.6 Slowly open the pipeline isolation valve and check all connections for leaks. If the unit is equipped with an oil reservoir, go to steps 2.1.7 to 2.1.10. Otherwise, go to step 2.1.11.

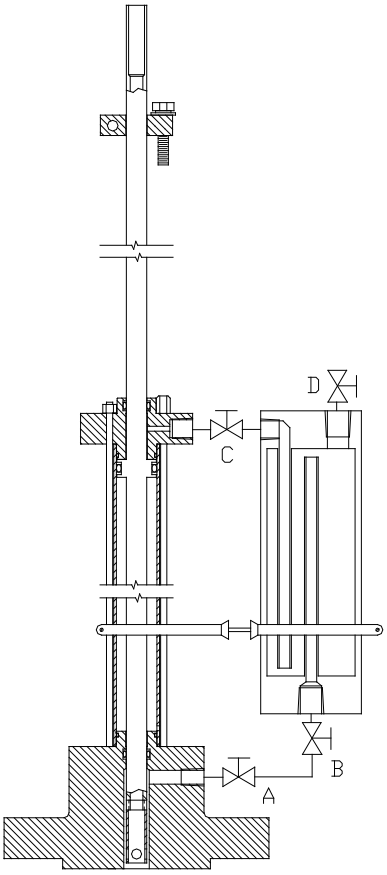

FIGURE 1

2.1.7 Close valve "D", open valves "A" and "B" (see Figure 1) and allow pipeline pressure to enter the oil reservoir.

2.1.8 Slowly open valve "C" between the oil reservoir and the top cap. This will allow the probe to insert smoothly into the pipeline to the desired length.

2.1.9 Rotate the probe to align the lock collar and the top cap so that the lock down screw can be installed through the collar into the top cap. Tighten the lock down screw.

2.1.10 Close valve “C” and check for leaks. Go to step 2.1.12.

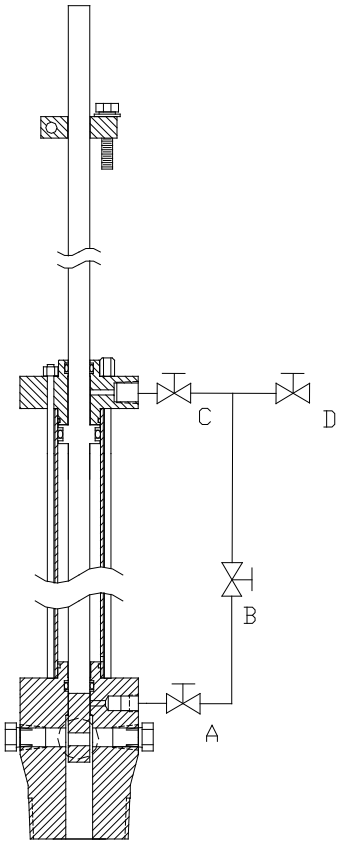

FIGURE 2

2.1.11 Close valve “D” (see Figure 2) and open valves “A” and “B” to allow pipeline pressure to valve “C” on the top cap. Open valve “C” slowly. This will allow the probe to insert into the pipeline to the desired length. Rotate the probe to align the lock collar and the top cap so that the lock down screw can be installed through the collar into the top cap. Tighten the lock down screw.

2.1.12 Close valves “A” and “C”. Open valve “D” to release any trapped process pressure from the insertion tubing/valve assembly. Close valves “B” and “D”.

2.1.13 Check the entire system for leaks.

2.1.14 Make any auxiliary hook-ups with the other manufacturer’s equipment.

2.1.15 The unit is now ready for operation.

2.2 Retracting the device

2.2.1 Disconnect any auxiliary hook-ups that would be damaged during retraction. If the unit is equipped with an oil reservoir, go to steps 2.2.2 to 2.2.5. Otherwise, go to step 2.2.6.

2.2.2 Open valves “A, B, & C” (see Figure 1).

2.2.3 Remove the lock down screw.

2.2.4 Close valves “A” and “B” and slowly open valve “D”. This will vent the gas in the reservoir to the atmosphere, allowing the probe to withdraw from the pipeline.

2.2.5 When the probe has retracted completely, close the pipeline isolation valve and valves “C” and “D”. Go to step 2.2.9.

2.2.6 Open valves “A, B, & C” (Figure 2).

2.2.7 Remove the lock down screw. Close valves “A” and “B”.

2.2.8 Open valve “D” slowly to release the pressure from the top portion of the insertion cylinder. Make sure to open valve “D” slowly so that the probe retracts from the process line. When the probe has retracted completely, close the pipeline isolation valve.

NOTE: If the probe is being withdrawn from the pipeline to run a pig, stop at step 2.2.8.

2.2.9 Open all system valves to vent the pressure in the probe assembly.

CAUTION: You will have to properly dispose of the process fluid that is being vented.

2.2.10 Remove the instrument from the pipeline isolation valve.

2.2.11 The instrument is now ready for maintenance or to be moved to another location.

2.3 Helpful Suggestions

2.3.1 The most common repair on an automatic insertion device is caused by closing the isolation valve on the insertion shaft while the shaft is still inserted into the pipeline.

Before closing the pipeline isolation valve, be sure to check that the insertion shaft has been fully retracted.

2.3.2 Operate the assembly slowly and smoothly to avoid slamming the lock collar and the shaft piston with sudden stops.

2.3.3 If oil is needed, the unit should be fully retracted first and depressurized. Then, remove the vent valve on the oil reservoir and add oil until it is three-fourths full. Then replace the vent valve.

2.3.4 Avoid rough handling of the probe and unnecessary bending of the shaft. This is a polished surface that seals and travels through seals.

2.3.5 The entire instrument should be handled with care.

3. MAINTENANCE

3.1 General

Prior to maintenance or disassembly of the unit, it is advisable to have a repair kit handy for the system in case of encountering unexpected wear or faulty seals.

We recommend that the unit have annual maintenance under normal operating conditions. In the case of severe service, dirty conditions, excessive cycling usage or other unique applications that may subject the equipment to unpredictable circumstances, a more frequent maintenance schedule may be appropriate.

3.2 Instructions

New seals supplied in spare parts kits are not lubricated. They should be lightly coated with lubrication grease (silicone grease or other) before they are installed into the equipment. This helps in the installation of the seals while reducing the risk of damage when positioning them on the parts. After the seals are installed, some additional lubrication can be applied to shafts or cylinder inner diameters to allow smooth transition of parts.

The following tools will be required for disassembly and maintenance:

- Small hex key set
- 6" Adjustable Wrench
- 10" Adjustable Wrench
- 10" Water Pump Pliers
- Fine Grit Sandpaper

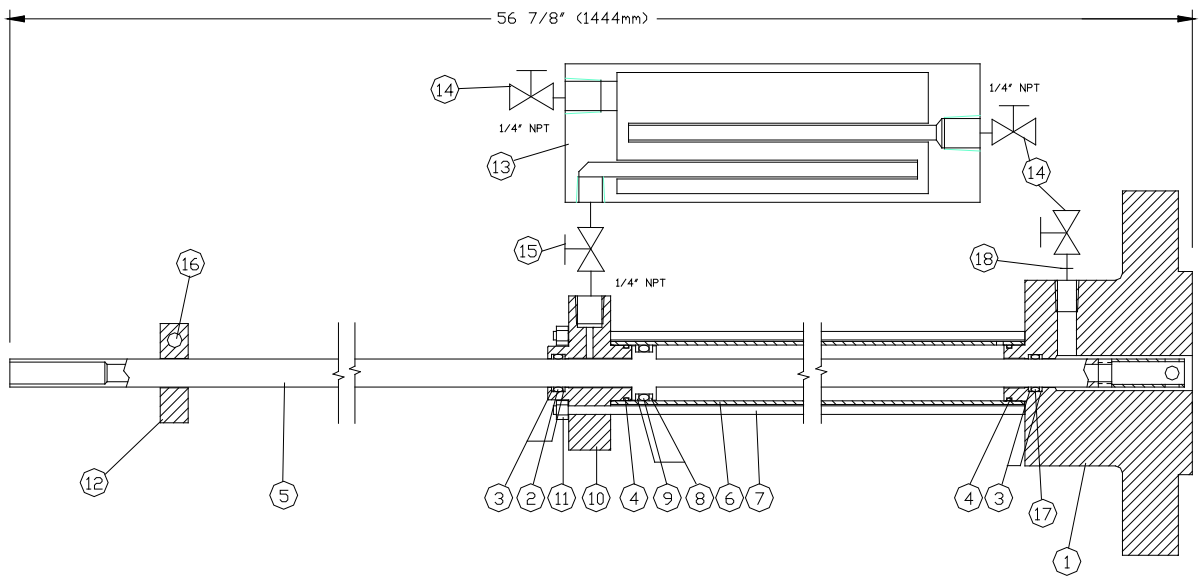

FIGURE 3

3.2.1 If the instrument has an oil reservoir, go to step 3.2.2, otherwise go to step 3.2.5.

3.2.2 Close valves “B, C, & D”.

3.2.3 Disconnect the tubing between valves “A” and “B” (see Figure 1).

3.2.4 Use an adjustable wrench on the body of valve “C” and remove the oil reservoir from the top cap (Part 10).

3.2.5 Disconnect and remove any junction boxes or external fittings on the shaft.

NOTE: Depending on the apparatus that is mounted to the automatic insertion device, some additional disassembly and reassembly may be required. See the auxiliary apparatus manufacturer’s instructions for further guidance.

3.2.6 Slide the lock down collar (Part 12) off of the probe shaft (Part 5).

3.2.7 Unscrew or unbolt the top cap from the cylinder (Part 6) and slide the cap off of the probe.

3.2.8 Mark the top end of the cylinder and the shaft for reassembly.

3.2.9 Unscrew or slide the cylinder from the base cap or lubricator body (Part 1) and slide the base cap or lubricator body off of the probe.

3.2.10 Carefully remove the probe from the cylinder.

NOTE: Take care when removing the shaft to locate and handle any wires in the shaft (if applicable) so as not to break or twist.

3.2.11 Replace the eight seals [Parts 2, 3 (2 each), 4 (2 each), 8, 9, & 17] in both caps and on the probe piston.

3.2.12 Examine the inner surface of the cylinder for a smooth finish. If there are any pits or major scratches, the seals will leak. Call Welker for service options.

3.2.13 Examine the outer surface of the probe for a smooth finish.

3.3 Reassembly Instructions

3.3.1 Coat the inside, top end of the cylinder with silicone grease or an equivalent lubricant, and reinsert the shaft into the cylinder.

NOTE: The valve end or top of the probe/shaft should end up at the top end of the cylinder.

3.3.2 Push the shaft into the cylinder approximately halfway and replace the top and base caps. Push the shaft carefully through the seals in the top cap and base. Do not replace the valve at this time.

3.3.3 Thread or bolt the cylinder into both caps securely.

3.3.4 Manually work the probe back and forth in the cylinder to check for a smooth travel. If the probe is dragging, stop and inspect further before any obstruction damages the probe's finish.

3.3.5 Fully retract the probe and replace the oil reservoir and tubing.

3.3.6 Replace the lock down collar.

3.3.7 Reassemble the probe valve (if applicable) to the shaft using PTFE tape or pipe dope on the threads, or reinstall the tubing fitting ferrules.

3.3.8 Replace any junction boxes or fittings, if applicable.

3.3.9 The assembly is now ready to install.

NOTE: O-rings and seals can be easily damaged. Use care in assembly when pushing parts through or over seals.

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