Installation,
Operation,
and
Maintenance
Manual

Welker® Adjustable Probe with Liquid Eliminator

Model
APP-5LE

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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INTRODUCTION

1. GENERAL

1.1 Introduction

We appreciate your business and your choice of Welker products. The installation, operation, and maintenance liability for this product become 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 in the USA or 1-281-491-2331.

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.

Notes, Warnings, and Cautions

NOTE Notes emphasize information or set it off from the surrounding text.

CAUTION

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

WARNING

Warnings alert users to a specific procedure or practice that, if not followed correctly, could cause personal injury.

1.2 Description of Product

The Welker Adjustable Probe with Liquid Eliminator (APP-5LE) is designed for use in systems where it is desirable to insert and retract the probe while the pipeline remains pressurized. The preferred location for installation of the probe is in a straight section of inlet piping before the flowing stream is subjected to turns and impingements that can result in turbulent flow.

Liquid Eliminator

In order to provide a clean sample, a Liquid Eliminator is attached to the unit, removing any free or entrained liquid from the process gas. As the gas enters the unit, liquids are filtered into the bottom of the eliminator. A piece of flexible tubing connected to the eliminator's drain is also connected to a return valve at the bottom of the unit. The liquid drains through the tubing and is returned to the pipeline via the return valve.

1.3 Specifications

NOTE The specifications listed in this section are customized for this tool assembly. If the specifications do not meet your company's needs, Welker can modify the tool so that it is specific to your requirements.

General	
Products	Gases/Liquids
Materials of Construction	316 Stainless Steel, Viton® and PTFE (others available)
Insertion Length	Up to 24" (609 mm)
Viscosity Range	0.009 cp to 2,000 cp @ 68° F (20°C)
Pipeline Connection	$^1/_2$", $^3/_4$", or 1" NPT Standard
Sample Outlet Connection	$^1/_4$" NPT Standard
Maximum Insertion Pressure	1,000 psi (34 bar)
Maximum Allowable Pressure	1,440 psi @ -20° F to 100° F (99 bar @ -29° C to 38° C)
Maximum Allowable Temperature	400° F @ 1,030 psi (204° C @ 71 bar)

SPECIFICATIONS

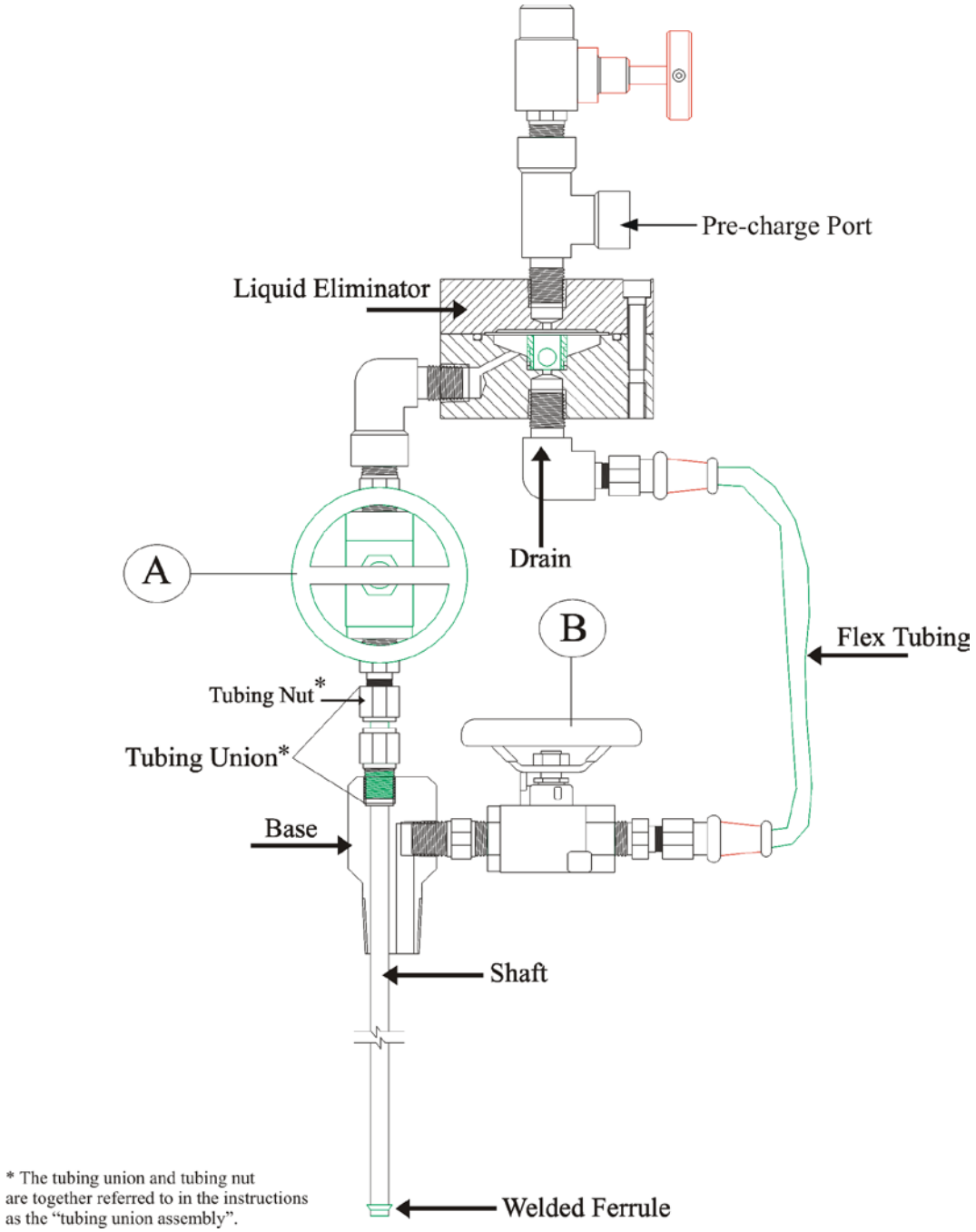

Figure 1

2. INSERTING AND OPERATING THE PROBE

2.1 General

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

N NOTE

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

N NOTE

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

Recommended Tools
It would be advisable to have the following tools available for installation of the unit; however, tools used will vary depending on model.

- Measuring tape
- 6" adjustable wrench
- 10" adjustable wrench
- Permanent marker
- Tubing cutters
- Fine-grit sandpaper
- Small file

2.2 Preparing the unit for installation

2.2.1 Determining the insertion length

Before installing the unit, determine the length the insertion shaft will need to travel inside the pipeline. Measure from the top of the pipeline's isolation valve (or flange) to the center one-third of the pipeline.

2.2.2 Setting the insertion length on the shaft

Once the insertion length of the shaft is determined, this length should be measured on the shaft itself. (Refer to Figure 2 on the next page for the following steps.)

a. Fully retract the probe from the tubing union assembly and base.
b. Begin at the top of the tubing union assembly and measure up on the shaft to the desired length.
c. Mark this point on the shaft, as this is where you will lock the assembly.
d. Move the tubing union assembly up on the shaft to the marked point.
e. Use an adjustable wrench to tighten the tubing nut onto the tubing union. The ferrule will clasp onto the shaft, locking the assembly in place.

2.2.3 Cutting off excess tubing from the shaft

a. Measure up on the shaft approximately two inches from where the tubing union assembly is now positioned. Mark this point on the shaft.
b. Using tubing cutters, remove the excess tubing from the two-inch mark on the shaft.

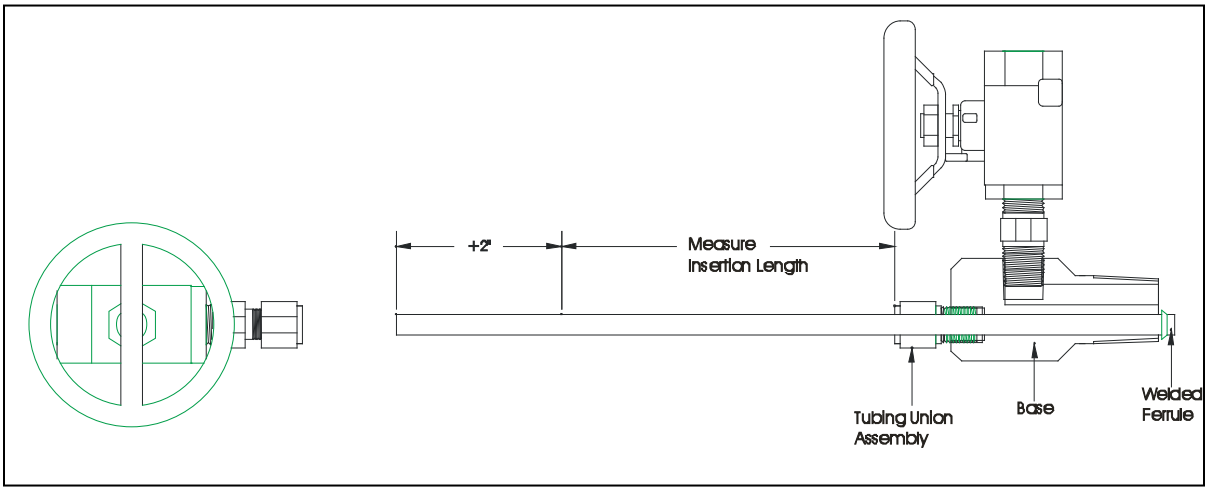

Figure 2

2.2.4 File and smooth the cut edge of the shaft.
2.2.5 Thread valve "A" onto the shaft, making sure the valve is closed.

NOTE

The Liquid Eliminator and flex tubing should be connected to valve "A". If not, attach the eliminator and flex tubing to valve "A".

2.3 Installing the unit

2.3.1 Make sure valves "A" and "B" on the unit are closed.
2.3.2 Retract the shaft from the base and tubing union assembly.
2.3.3 With the pipeline isolation valve closed, install the unit onto the pipeline isolation valve or flanged adapter.
2.3.4 Slowly open the pipeline isolation valve, and push the shaft down into the pipeline.

NOTE

As pipeline pressure will be pushing up on the shaft, you will have to firmly push down on the unit in order to insert the shaft. **Maximum Allowable Pressure is 1,000 psi at -20° F to 100° F (99 bar at -29° C to 38° C)**

2.3.5 Thread the tubing union assembly tightly onto the base to hold the shaft in the pipeline.

WARNING

Do not let go of the unit until the tubing assembly is securely tightened.

2.3.6 Connect the sampler to the top of the Liquid Eliminator.
2.3.7 Connect the other end of the flex tubing to valve “B” on the base.
2.3.8 Open valves “A” and “B”.

2.4 Helpful hints

2.4.1 Avoid rough handling of the unit and bending of the shaft. The shaft has a polished surface that travels through seals.
2.4.2 Operate the unit slowly and smoothly while inserting and retracting.
2.4.3 The entire unit should be treated with care.

2.5 Retracting the unit

2.5.1 Close valves “A” and “B”.
2.5.2 Disconnect the sampler from the Liquid Eliminator.
2.5.3 Disconnect the flex tubing from valve “B”.
2.5.4 Firmly push down on the unit while **slowly** loosening the tubing assembly from the base.

WARNING

Pipeline pressure will be forcing the shaft out of the pipeline. Failure to push down on the unit while loosening the assembly could cause a rapid retraction of the probe from pipeline, possibly resulting in injury.

2.5.5 Make sure the probe has completely retracted from the pipeline by pulling up on the shaft until it stops.

NOTE

The most common cause for repairs to an adjustable probe is due to the pipeline isolation valve closing on the probe while the probe is still inserted into the pipeline. Please avoid this practice.

2.5.6 Close the pipeline isolation valve.
2.5.7 Loosen and remove the unit from the pipeline isolation valve or flange adapter.
2.5.8 The unit is now ready for maintenance or to be moved to another location.

3. MAINTENANCE

With the exception of the Liquid Eliminator, maintenance should not be necessary unless a leak occurs due to improper or excessive use of the unit.
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. All maintenance of the unit should be done on a smooth, clean surface.

3.1 Unit Maintenance

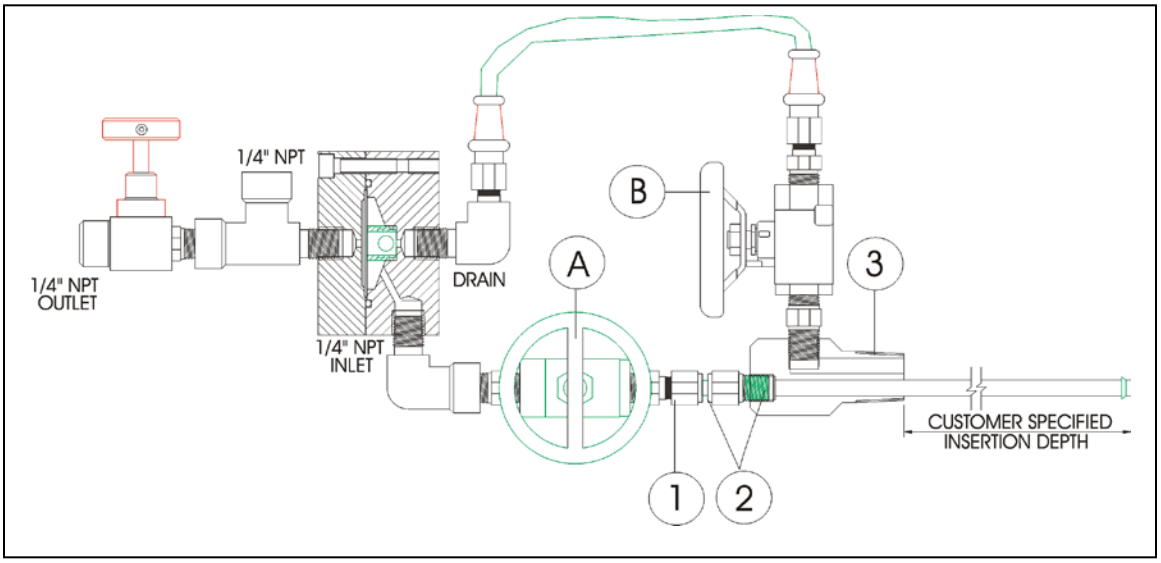

Figure 3
Refer to this Figure throughout Section 3.1.

Recommended Tools
It would be advisable to have the following tools available for maintenance of the unit; however, tools used will vary depending on model.

- 6" adjustable wrench
- 10" adjustable wrench
- 10" channel lock pliers
- Tubing cutters
- $^1/_4$" Stainless steel ferrule set
- Fine-grit sandpaper
- Small file

3.1.1 Loosen and remove valve “B” from the base (Part 3).
3.1.2 Loosen and remove valve “A” from the top of the shaft.
3.1.3 Loosen the tubing nut (Part 1) from the shaft.
3.1.4 Cut and remove the shaft tubing from the unit’s components. The tubing can be discarded.
3.1.5 Remove the tubing union assembly (Parts 1 and 2) and base (Part 3) from the shaft tubing.
3.1.6 Replace the O-ring inside the base (see Figure 4).

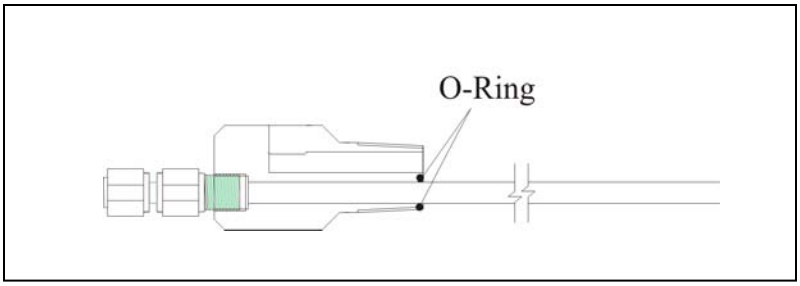

Figure 4

3.1.7 Replace the ferrule inside the base.
3.1.8 Crimp a ferrule on the end of a new piece of tubing. This tubing will serve as the unit's new shaft.
3.1.9 Slide the base (Part 3) on the new shaft.
3.1.10 Slide the tubing union (Part 2) onto the shaft.
3.1.11 Slide a new ferrule onto the shaft on top of the tubing union.
3.1.12 Slide the tubing nut (Part 1) on top of the ferrule and tubing union.
3.1.13 File and smooth the edge of the shaft.
3.1.14 Replace valves "A" and "B".
3.1.15 Repeat steps 2.1.1-2.3.8 to reinstall the unit.

3.2 Liquid Eliminator Maintenance

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.

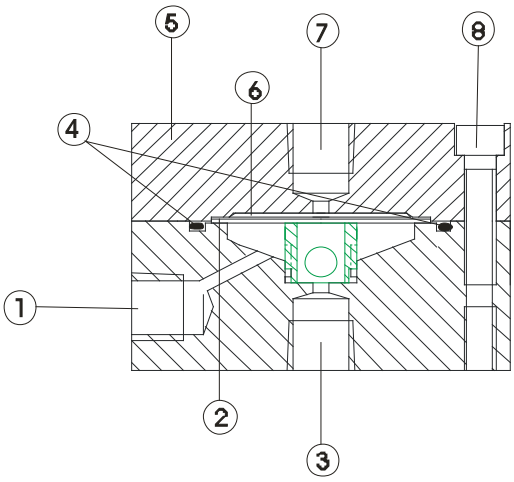

Figure 5
Refer to this Figure throughout Section 3.2

3.2.1 Remove the valve fitting from the eliminator's side port (Part 1).
3.2.2 Remove the pre-charge fitting from the eliminator's top port (Part 7).
3.2.3 Remove the tube fitting from the eliminator's drain (Part 3).
3.2.4 Loosen the eight cap screws (Part 8) from the cap itself (Part 5).
3.2.5 Remove the cap.
3.2.6 Remove the screen (Part 6) and hydrophobic Teflon element (Part 2).
3.2.7 Use a pick or small knife to remove the O-ring (Part 4).
3.2.8 Use a solvent to wipe the inside of the eliminator.

3.2.9 Use Dow Corning 111 (DC 111) grease or equivalent lubricant to lightly grease the O-ring.

NOTE

When cleaning, make sure there is no residue left in the eliminator or on the O-ring, as this can prevent the unit from functioning properly when pipeline pressure enters the eliminator.

3.2.10 Replace the O-ring.
3.2.11 Replace the hydrophobic Teflon element onto the center of the inside of the eliminator.
3.2.12 Replace the screen onto the center of the element.
3.2.13 Align the cap with the eliminator body so that the eight cap screws can be replaced.
3.2.14 Cross-bolt the eight cap screws into the cap itself.

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