Installation, Operation, and Maintenance Manual

Welker® Adjustable Corrosion Coupon Probe
Model
APM-4CC

Drawing No.: AD778BW
Manual No.: IOM-159

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® Adjustable Corrosion Coupon Probe, APM-4CC. 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.
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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.

<table>
<thead>
<tr>
<th>Notes, Cautions, and Warnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes emphasize information or set it off from the surrounding text.</td>
</tr>
<tr>
<td>Caution messages appear before procedures that, if not observed, could result in damage to equipment.</td>
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<tr>
<td>Warnings are alerts to a specific procedure or practice that, if not followed correctly, could cause personal injury.</td>
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</table>

*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 DESCRIPTION OF PRODUCT

The Welker® Adjustable Corrosion Coupon Probe is designed to insert a corrosion coupon into a pressurized pipeline. The probe length can be adjusted, using the stop and lock collars, to insert the corrosion coupon attachment to the desired insertion depth.

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>
<thead>
<tr>
<th>Table 1: Product Specifications</th>
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<tbody>
<tr>
<td><strong>Products Sampled</strong></td>
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<tr>
<td><strong>Materials of Construction</strong></td>
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<tr>
<td><strong>Connections</strong></td>
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<tr>
<td><strong>Maximum Allowable Operating Pressure</strong></td>
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<tr>
<td><strong>Maximum Allowable Manual Insertion &amp; Retraction Pressure</strong></td>
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</table>
1.4 SYSTEM DIAGRAM

Figure 1: System Diagram

<table>
<thead>
<tr>
<th>NO.</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Base</td>
</tr>
<tr>
<td>2</td>
<td>Lock Collar</td>
</tr>
<tr>
<td>3</td>
<td>Pin</td>
</tr>
<tr>
<td>4</td>
<td>Probe Shaft</td>
</tr>
<tr>
<td>5</td>
<td>Stop Collar</td>
</tr>
<tr>
<td>6</td>
<td>Stop Collar Bolts</td>
</tr>
<tr>
<td>7</td>
<td>Stop Collar Cap Screws</td>
</tr>
<tr>
<td>8</td>
<td>Body</td>
</tr>
<tr>
<td>9</td>
<td>Valve</td>
</tr>
<tr>
<td>10</td>
<td>Adapter Body</td>
</tr>
<tr>
<td>11</td>
<td>Stop Ring</td>
</tr>
<tr>
<td>12</td>
<td>Coupon Holder</td>
</tr>
</tbody>
</table>

Refer to Figure 1 and Drawing AD778BW throughout this manual.
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 shipping 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 company.

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

1. Welker® recommends the probe be threaded onto a full-open valve (hereafter, “pipeline isolation valve”) which can be used to isolate the probe from pipeline pressure.
2. Handle the unit with care. Avoid bending the probe, which has a polished surface that travels through seals.
3. Operate the unit slowly and smoothly while inserting and retracting to avoid unnecessary slamming of the lock collar.
4. Be careful not to close the pipeline isolation valve on the probe while the probe is still inserted into the pipeline. This is the most common cause of damage to Welker® probes.

2.2 INSTALLATION

1. Screw a customer-supplied corrosion coupon into the threaded opening of the coupon holder.

   The corrosion coupon holder contains a Delrin® bearing to insulate the corrosion coupon from electrical charges. Screw the coupon into the coupon holder gently to prevent damaging the Delrin® bearing.

**Positioning the stop collar (Figure 2):**

2. Before 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 the desired insertion depth (e.g., center $\frac{1}{3}$ of the pipeline). This will be the probe insertion length.

   The desired insertion depth should be determined based on company policy and standards. Ensure the corrosion coupon will not come into contact with the internal sides or bottom of the pipeline when inserted.

3. Ensure that the probe is fully retracted. The corrosion coupon should be flush with the bottom of the adapter.

4. Beginning at the top of the body, measure up on the probe from the bottom of the corrosion coupon to the desired insertion length. It may help to mark this point with a felt-tip pen.

5. Loosen the two set screws in the stop collar, and move the bottom of the stop collar to the desired probe insertion length, or the mark made in Step 4.

6. Tighten the set screws in the stop collar to hold the stop collar in place on the shaft.
Installing the Probe:

7. With the pipeline isolation valve closed and the probe shaft fully retracted, install the probe onto the threaded connection on the pipeline isolation valve.
8. Ensure all valves are closed.
9. Slowly open the pipeline isolation valve.
10. Firmly push the shaft into the pipeline.

   When pushing the shaft into the pipeline, push straight downward; do not allow the shaft to bend. Do NOT insert the probe at pressures higher than the pressure specified in Table 1 of these instructions.

11. Tighten the stop collar bolts to lock the stop collar in place. Continue to push downward on the shaft until the stop collar is locked in place.
12. Check the system for leaks and repair as necessary.

Retracting the Probe:

13. Push downward on the unit, and simultaneously loosen the stop collar bolts.

   Failure to maintain downward force on the probe unit while loosening the lock collar may cause the probe to retract too quickly, possibly resulting in damage to the equipment or injury of personnel.

14. Slowly allow pipeline pressure to push the probe shaft out of the pipeline. Gently pull up on the probe shaft as needed until the probe is fully retracted.

   Maintain downward pressure and allow the probe to retract slowly; do not allow the shaft to bend. Do NOT retract the probe at pressures higher than the pressure specified in Table 1 of these instructions.

15. Close the pipeline isolation valve.

   Ensure the probe is fully retracted prior to closing the isolation valve. Failure to fully retract the probe shaft prior to closing the isolation valve is the leading cause of damage to Welker® probes.

16. Open the valve on the probe to relieve any remaining pressure from the probe.
17. Unscrew the unit from the pipeline threaded connection. The unit is now ready for maintenance or to be moved to another location.
Section 3:
MAINTENANCE

3.1 BEFORE YOU BEGIN

1. Welker® recommends that the unit have annual maintenance under normal operating conditions. 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 coated with lubrication grease 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 done on a smooth, clean surface.

4. During system operation, check for leaks and repair as necessary.

5. Prior to maintenance, remove the unit from operation and retract the unit from the pipeline (Section 2.2, Steps 13-17).

3.2 MAINTENANCE (FIGURE 3)

1. Loosen the lock collar and slide it down the shaft. Be careful with the pin, which is a small part and may be easily lost.

2. Unscrew the base from the top of the shaft.

3. Replace the O-ring inside the base.

4. Slide the lock collar and pin off the end of the shaft.

5. Remove the stop collar bolts.

6. Loosen and remove the stop collar from the shaft.

7. Gently slide the probe shaft out of the body. Be careful not to bend or scratch the probe shaft.

8. Replace the wiper, O-ring, and back-up rings in the body.

9. Inspect the probe shaft for scratches, bending, or other damage. If the probe shaft is scratched or otherwise damaged, polish or replace as necessary. The shaft may need to be replaced if it is bent or deeply scratched.

10. Remove the coupon holder from the end of the probe shaft.

11. Replace the O-ring on the end of the probe shaft.

12. Reattach the coupon holder to the end of the probe shaft.

13. Gently slide the probe shaft through the body.

14. Reattach the stop collar to the probe shaft.

15. Reattach and tighten the lock collar and base to the end of the probe shaft. The probe is now ready to be reinstalled.
Figure 3: Maintenance Diagram

<table>
<thead>
<tr>
<th>No.</th>
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<tr>
<td>6</td>
<td>Stop Collar</td>
</tr>
<tr>
<td>7</td>
<td>Wiper</td>
</tr>
<tr>
<td>8</td>
<td>Back-up Rings (2)</td>
</tr>
<tr>
<td>9</td>
<td>O-Ring</td>
</tr>
<tr>
<td>10</td>
<td>Adapter Body</td>
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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: AD778BW