

***Installation,
Operation,
&
Maintenance
Manual***

WelkerScope[®]

***Model
WS-2000A***

The information in this manual has been carefully checked for accuracy and is intended to be used as a guide to operations. 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 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 use. If you have any questions, please call 1-800-776-7267 or 281-491-2331 in the USA.

- The WelkerScope[®] is a liquid gel illuminated inspection device that provides a means of inspecting meter tubes or other piping configurations without having to disassemble them.
- The WelkerScope[®] should be powered by a 120 VAC / 60 Hz power source.
- The power unit is equipped with a thermostat inside its explosion-proof box that cuts off the power to the system if the temperature inside the box gets too high.
- The optical insertion probe has an inverted image with a 1.5 times magnification and can be focused from 4 inches to infinity.

1.2 Specifications

| | |
|----------------------------|-----------------------------------|
| Materials of Construction: | 316 stainless steel and aluminum |
| Insertion Length: | 8 – 10" |
| Temperature Range: | -20°F to 104°F (-28.9°C to 40°C) |
| Maximum Line Pressure: | Atmospheric |
| Pipeline Connection: | ½" NPT or larger coupling |
| Power Connection: | 120 VAC |
| Area Classification: | Class 1, Division 1, Groups C & D |

2. INSTALLATION INSTRUCTIONS

2.1 Installing the WelkerScope®

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 The portion of the pipeline to be inspected must be blown down and purged prior to use of the WelkerScope®.

2.1.3 Prior to inserting the optical insertion probe, the lock collar should be set so that the insertion depth is correct for the diameter of tube being inspected. For example, if the diameter of the tube is 8", then the lock collar should be set so that approximately 5" of the probe will be inserted into the line (4" for the pipeline and 1" for the coupling).

NOTE: If possible, the light probe should be inserted on the opposite side of the portion to be inspected as the optical probe. Take care not to shine the light directly into the eyepiece. If both probes are used on the same end, the light probe should be in front of the optical probe and slightly higher (see Figure 1).

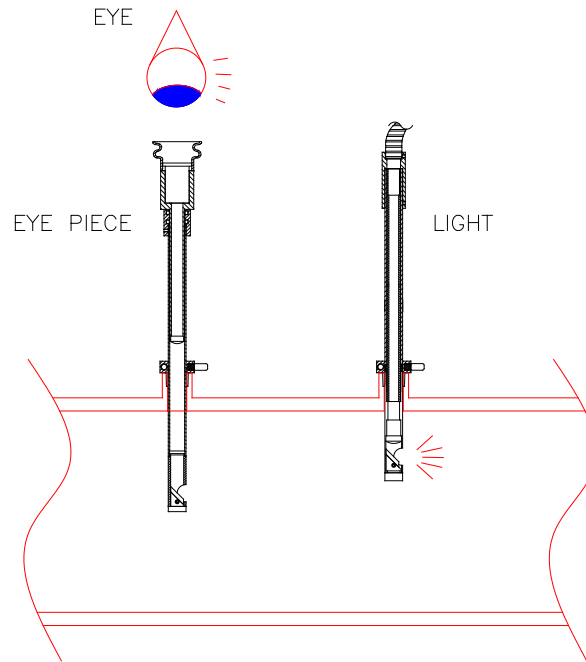
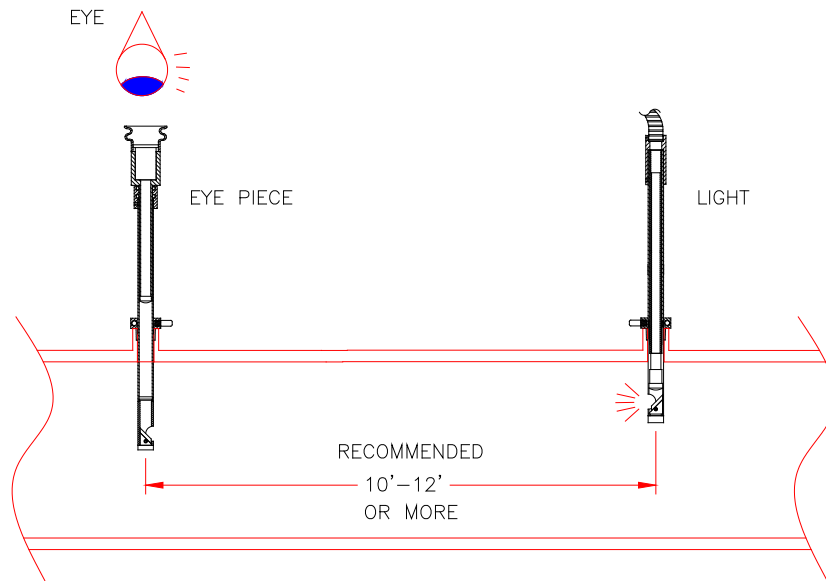


FIGURE 1

2.1.4 Insert the WelkerScope[®] probes through ½” NPT or larger couplings.

NOTE: Use care not to force the probe through a hole.

2.1.5 Plug in the standard 30’ electrical cord to an explosion-proof outlet.

2.1.6 The unit is now ready for operation.

NOTE: When transporting the unit, put a piece of tape over the mirror openings on both the optical and light probes. The WelkerScope[®] should be considered a valuable scientific instrument and be handled accordingly.

3. OPERATION

3.1 Instructions

3.1.1 After completing installation, push the start button. The unit transforms the primary voltage into 21 VAC, which operates the light source. The light source delivers an intensity of more than 10,000 foot candles.

3.1.2 Line up the light source and the visual image.

NOTE: It does take some practice to get the light and visual image pointing at the same spot.

3.1.3 Focus the image by moving the eye piece up and down. Again, this may take some practice.

4. MAINTENANCE

4.1 Instructions

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

We recommend 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.

4.1.1 The optical components need to be cleaned periodically. This should be accomplished by using the appropriate lens cleaning fluid, paper and cotton swabs.

4.1.2 The mirrors are “First Surface Mirrors” that are aluminized on the surface nearest the incident light. They should be handled and cleaned with care using proper cleaning fluid and cotton swabs since they are vulnerable to scratching.

4.1.3 The light bulb should be changed in a non-hazardous area if it goes out. Use caution when changing a recently burned out bulb, as it could be very hot.

NOTE: A bulb has an expected life of 20 hours, but a spare bulb should always be kept on hand.

4.1.4 Handle the WelkerScope® with care.



*Installation, Operation, and
Maintenance Manual*

Welker[®] Optional Camera Kit Assembly
Appendix A
WelkerScope[®] LITE

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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INSTALLATION

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 *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 Optional Camera Kit Assembly is a lens adapter and adjustable lens that is an optional accessory for the WelkerScope LITE.



NOTE

Camera Kit should come pre-assembled from the factory. The following instructions are provided in the event the user should decide to disassemble the kit for inspection or cleaning purposes. These instructions may also be used as a guide to inspect the assembly in case it became loose during shipment.



INSTALLATION

2. INSTALLATION INSTRUCTIONS

2.1 General

After unpacking the unit, check it for compliance and for 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.

2.2 Assembly Instructions



Figure 1 - Adapter Tube Assembly

1. Assembling the adapter:

Attach the adapter tube (Figure 2), to the adapter ring (Figure 3). The female threads are on the wide lip of the adapter tube (Figure 2), and the male threads are on the narrow lip of the adapter ring (Figure 3).

! CAUTION

The threading for these two parts is very narrow. Make sure to align the threads properly and to screw the pieces together slowly. If the threads are not properly aligned and they are screwed together too quickly, they could be stripped.

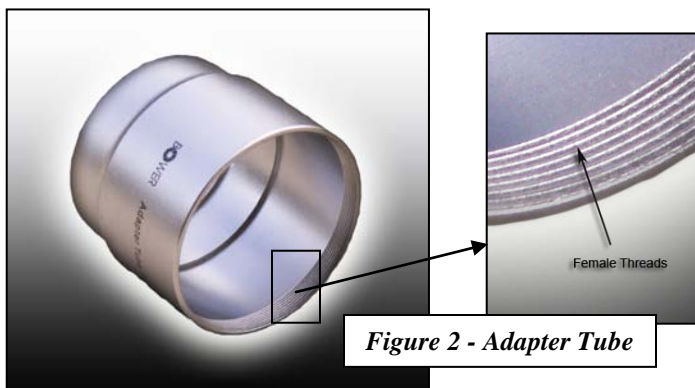


Figure 2 - Adapter Tube



Figure 3 - Adapter Ring

INSTALLATION

2.2 Assembly Instructions (Continued)

2. *Assembling the adjustable lens:*

- Loosen the adjustment screw on the adjustment cylinder so the screw is almost flush with the inner wall of the cylinder (Figure 4).
- Place the lens (Figure 5) inside the adjustment cylinder, making sure the adjustment screw on the cylinder is aligned to the alignment groove on the lens.
- Position lens at desired focus point, and then tighten alignment screw securely to hold lens in position (Figure 6).

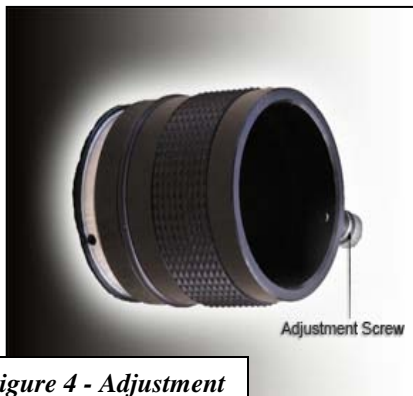


Figure 4 - Adjustment Cylinder



Figure 5 - Lens



Figure 6 - Lens Assembly

3. *Attaching the lens assembly to the adapter assembly.*

- Loosen the three screws on the ring section of the adapter assembly so that they are flush with the inner wall of the ring (Figure 7).
- Set the adapter assembly on a flat surface ring side up (Figure 7) in order to insure proper alignment of the assembly.
- Set lens assembly inside adapter assembly lining up the three screws to the three holes (Figure 6 & 7).
- Tighten screws.



Figure 7 - Adapter Assembly

4. *Optional Camera Kit is now assembled and ready for attachment to WelkerScope® Lite).*

INSTALLATION

3. MAINTENANCE

It is recommended the following instructions are followed periodically or when necessary in order to clean the glass lens inside the unit.

3.1 Disassembly Instructions

1. *Detach the lens assembly from the adapter assembly.*
 - Loosen the three screws on the adapter ring (See Figure 7 in Section 2).
 - Detach lens assembly from adapter assembly (See Figure 6 in Section 2).
2. *Detach the lens from the adjustment cylinder.*
 - Loosen the set screw on the adjustment cylinder (See Figure 4 in Section 2).
 - Detach lens (See Figure 5 in Section 2) from adjustment cylinder.

3.2 Maintenance

1. *Cleaning the glass lens.*

After disassembling the unit, the glass lens will now be accessible for cleaning. Use a non-abrasive cloth and a smudge-proof lens cleaner to remove any residue from the lens.
2. *Re-assembling the camera kit.*

Follow instructions in Section 2.2, begin at step 2 (see page 5), to re-assemble and re-install the camera kit.



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