



**Installation,  
Operation,  
and  
Maintenance  
Manual**

**Welker<sup>®</sup> Liquid Eliminator with Welker<sup>®</sup>  
Probe and Welker<sup>®</sup> Instrument Regulator**

***Models***

**LE2SSKO  
LE2IR  
LE2SSKOIR**

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.

13839 West Bellfort  
Sugar Land, Texas 77498-1671  
U.S.A.  
Tel.: (800) 776-7267  
Tel.: (281) 491-2331  
Fax: (281) 491-8344  
[www.welkereng.com](http://www.welkereng.com)

*This page intentionally left blank*

# TABLE OF CONTENTS

---

|          |  |          |
|----------|--|----------|
| <b>1</b> | <b>GENERAL</b>                         | <b>4</b> |
| 1.1      | Introduction .....                     | 4        |
| 1.2      | Description of product .....           | 4        |
| 1.3      | Specifications .....                   | 5        |
| <b>2</b> | <b>INSTALLATION AND OPERATION</b>      | <b>7</b> |
| 2.1      | General .....                          | 7        |
| 2.2      | Installation & operation .....         | 7        |
| <b>3</b> | <b>MAINTENANCE</b>                     | <b>9</b> |
| 3.1      | General .....                          | 9        |
| 3.2      | Liquid eliminator maintenance .....    | 10       |
| 3.3      | Instrument regulator maintenance ..... | 10       |

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

# 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 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 Liquid Eliminator with Welker Probe and the Welker Liquid Eliminator with Welker Instrument Regulator are designed for use in a pipeline where it is desirable to provide a gas sample that is free of entrained liquid. As pipeline product enters the probe, the gas to be sampled passes through the liquid eliminator and into the outlet port, while all liquids are filtered out and then drained back into the pipeline. The Instrument Regulator is designed for output devices that are unable to sustain high pipeline pressures. Pressure is reduced as it travels from the device's inlet port to the outlet port on the regulator. In order to set the desired output pressure, an adjusting screw on the regulator is tightened, pushing down on a spring inside the device. The spring then pushes down on a diaphragm, that, in turn, pushes against a poppet. When high pressure is applied to the device's inlet port, the poppet is moved up, allowing only the set amount of pressure to pass through the outlet port. The regulator is also equipped with a gauge port and a port for a relief valve.

# SPECIFICATIONS

---

## 1.3 Specifications

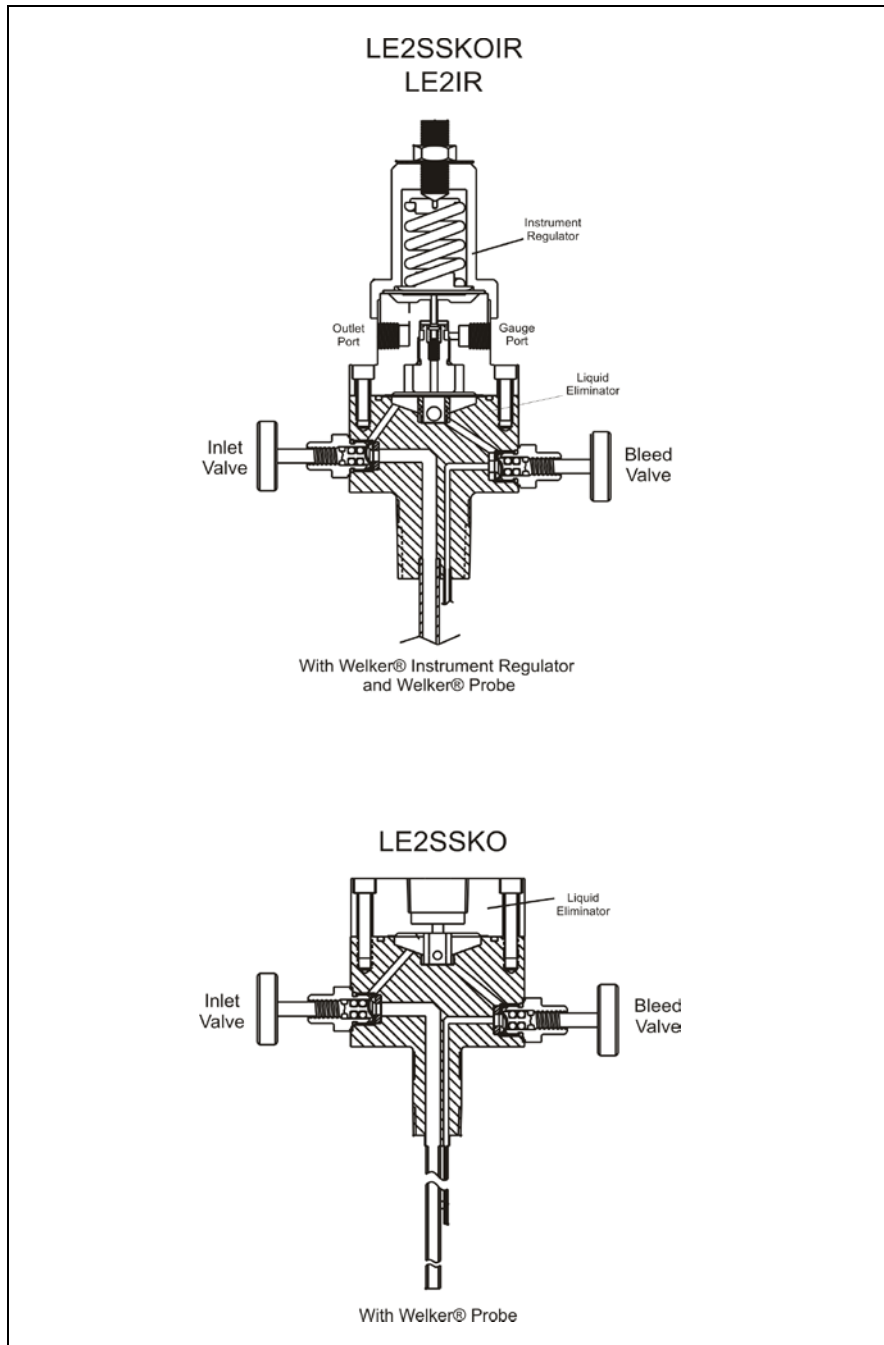
**N** NOTE

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.**

| General                      |   |
|------------------------------|---|
| Products                     | Gases   |
| Materials of Construction    | 316 Stainless Steel, Viton <sup>®</sup><br>(others available) |
| Insertion Length             | Customer specified  |
| Pipeline Connection          | ½", ¾", and 1" MNPT<br>(other NPT and flanged available)      |
| Outlet Connection            | ¼" or ½" FNPT   |
| Auxiliary Connections        | ¼" FNPT   |
| Maximum Allowable Pressure * | 1,440 PSI @ -20° F to 100° F<br>(99 bar @ -29° C to 37° C)    |

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

# INSTALLATION & OPERATION



**Figure 1**

*Refer to this Figure throughout the entire installation and operation process.*

# INSTALLATION & OPERATION

## 2. INSTALLATION AND OPERATION

### 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.

#### **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 and retraction of the unit; however, tools used will vary depending on model.

- Measuring tape
- Small hex key set
- 1/4" Allen wrench
- 6" adjustable wrench

### 2.2 Installation & operation

- 2.2.1 Make sure the inlet valve and bleed valve are closed.
- 2.2.2 Make sure all eight cap screws are tightened on the device.
- 2.2.3 Connect the probe on the liquid eliminator to the depressurized pipeline. The inlet valve should be faced against the direction of pipeline flow (see Figure 2).
- 2.2.4 Connect the output device to the appropriate outlet port on the liquid eliminator (see Figure 3).
- 2.2.5 Connect a gauge to the gauge port on the instrument regulator, if applicable.

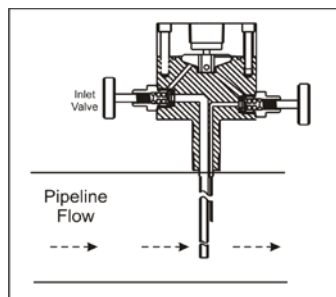


Figure 2



Figure 3

# INSTALLATION & OPERATION

---

- 2.2.6 Connect a relief valve to the relief valve port on the instrument regulator, if applicable.
- 2.2.7 Pressurize the pipeline.
- 2.2.8 If you have a model with an instrument regulator, skip to step 2.2.10. If you do not have a model with an instrument regulator, continue to step 2.2.9.
- 2.2.9 Open the inlet valve and bleed valve. Installation is now complete.

## **W** WARNING

If you have a model with an instrument regulator, **do not** open the inlet valve at this time. Opening the inlet valve before the relief valve is set could result in over-pressurizing the regulator.

### 2.2.10 Set the Instrument Regulator (if applicable)

- a) Use a safe auxiliary gas supply to set the relief valve to the proper pressure (*refer to IO&M for relief valve*).

## **W** WARNING

If you choose to use the regulator to set the relief, do not exceed the output pressure range of the device.

## **N** NOTE

If requested, the manufacturer can preset the relief prior to shipment.

- b) Once the relief is set, open the inlet valve and bleed valve.
- c) Loosen or tighten the adjusting screw until the gauge reads the desired pressure for outlet (see Figure 4).
- d) Tighten the nut on the adjusting screw to secure it into place.
- e) Check the entire system for leaks.



Figure 4

# MAINTENANCE

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



CAUTION

Maintenance on the instrument regulator should not be performed until the regulator has been isolated from all pressure.



NOTE

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.



NOTE

To ensure that the liquid eliminator will function properly, all maintenance should be done on a clean surface and with clean equipment.

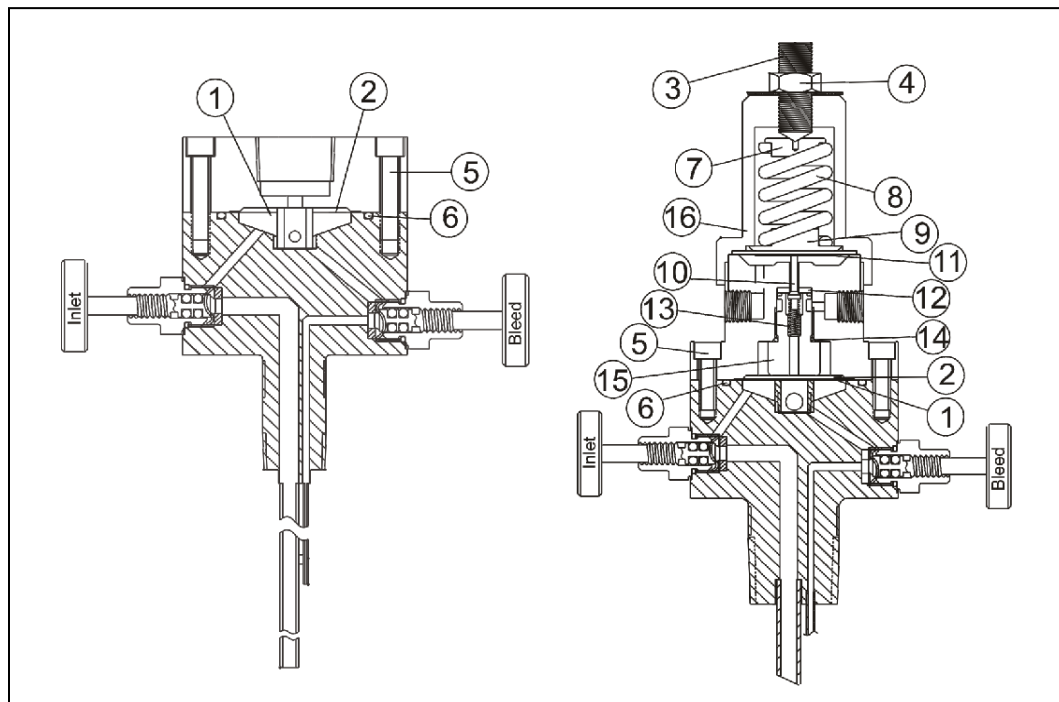


FIGURE 5

*Refer to this Figure throughout the entire maintenance process.*

# MAINTENANCE

---

## 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.

- 1/4" Allen wrench
- small hex key set
- 6" adjustable wrench

- 3.1.1 Close the inlet valve and the bleed valve on the device.
- 3.1.2 Loosen the adjusting screw and nut on the regulator, if applicable.
- 3.1.3 Depressurize the pipeline and remove the device from the pipeline.

## 3.2 Liquid eliminator maintenance

*Refer to Figure 5 for the following Section.*

- 3.2.1 Remove all tubing and fittings connected to the device.
- 3.2.2 Loosen the eight screws (Part 5) from the cap or instrument regulator.
- 3.2.3 Remove the cap or instrument regulator.
- 3.2.4 If you have a model with an instrument regulator, set the regulator to the side for later maintenance (see Section 3.3).
- 3.2.5 Remove the screen (Part 2)
- 3.2.6 Use a pick or small knife to remove the O-ring (Part 6).
- 3.2.7 Remove the copolymer filter element (Part 1).
- 3.2.8 Use a solvent to wipe and clean the inside of the liquid eliminator.
- 3.2.9 Use Dow Corning 111 (DC 111) grease or an equivalent lubricant to lightly grease the O-ring.

### **N** NOTE

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

- 3.2.10 Replace the copolymer filter element onto the center of the inside of the liquid eliminator.
- 3.2.11 Replace the O-ring.
- 3.2.12 Replace the screen onto the center of the element.
- 3.2.13 If you have a model with in instrument regulator, skip to Section 3.3. If not, continue to step 3.2.14.
- 3.2.14 Align the cap with the liquid eliminator body so that the eight screws can be replaced.
- 3.2.15 Cross-bolt the eight screws into the cap itself.
- 3.2.16 Maintenance is now complete.

## 3.3 Instrument regulator maintenance

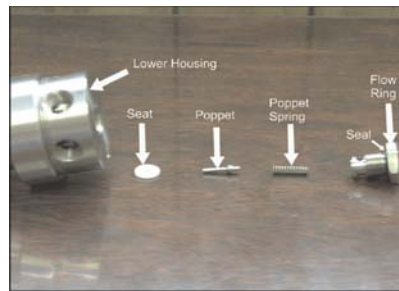
*Refer to Figure 5 for the following Section.*

- 3.3.1 Loosen the nut (Part 4) on the adjusting screw (Part 3).
- 3.3.2 Loosen the adjusting screw to relieve tension on the spring (Part 8).
- 3.3.3 Unscrew the upper housing (Part 16) and remove.
- 3.3.4 Remove the bottom spring guide (Part 9) and the spring (Part 8).
- 3.3.5 Remove the top spring guide (Part 7).
- 3.3.6 Remove the diaphragm (Part 11). Inspect for wear, and replace if necessary.
- 3.3.7 Set the diaphragm back into place.

# MAINTENANCE

---

- 3.3.8 Set the bottom spring guide back into place on top of the diaphragm.
- 3.3.9 Set the spring back into place.
- 3.3.10 Set the top spring guide back into place on top of the spring.
- 3.3.11 Reattach the upper housing securely.
- 3.3.12 Unscrew the flow ring (Part 15) from the regulator body.
- 3.3.13 Replace the seal (Part 14) in the flow ring.
- 3.3.14 Remove the poppet spring (Part 13) and the poppet (Part 10) (also see Figure 6).



**Figure 6**

- 3.3.15 Examine the poppet and poppet spring. Replace if necessary.
- 3.3.16 Use a pointed instrument to carefully pick the seat (Part 12) out of the body.
- 3.3.17 Examine the seat and replace if necessary.
- 3.3.18 Set the seat back into place.

**N** NOTE

Debris or scratches on either the poppet or seat will prevent positive shut off of the regulator.

- 3.3.19 Guide the poppet into the seat.
- 3.3.20 Reattach the poppet spring and flow ring.
- 3.3.21 Tighten the flow ring securely.
- 3.3.22 Reattach the instrument regulator to the liquid eliminator. Cross-bolt the eight screws (Part 5) into the eliminator.
- 3.3.23 Maintenance is now complete.



13839 West Bellfort, Sugar Land, Texas 77498-1671

Phone: (281) 491-2331

Fax: (281) 491-8344

Toll Free: (800) 776-7267

Web Page: [www.welkereng.com](http://www.welkereng.com)