

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

***Welker[®] Probe Instrument Regulator
with Liquid Eliminator Cartridge
Model LEFRD-4SS***

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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Table of Contents

1. GENERAL.....	3
1.1 Introduction.....	3
1.2 Specifications	3
2. INSTALLATION INSTRUCTIONS	4
2.1 Installing the Probe Regulator.....	4
2.2 Setting the Regulator	6
3. MAINTENANCE	6
3.1 General.....	6
3.2 Instructions.....	6

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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 1-281-491-2331 in the USA. The Welker LEFRD Style Instrument Regulators are designed for use in systems where it is desirable to have a regulator installed into the pipeline. The unit is offered in a flanged or threaded connection style. These regulators are non-relieving, and it is recommended that they are used in conjunction with a compatible relief valve on the downstream flow; i.e. a Welker RV-1, RV-2, or RV-3 Series Relief Valve.

1.2 Specifications

Products Sampled: Natural gas or other gases compatible with the materials of construction.

Materials of Construction: 316 stainless steel, Viton, Kel-f and PTFE

Insertion Length: Standard 3.5" (89 mm) other lengths available

Temperature Range: -40°F to 300°F (-40°C to 149°C)

Maximum Line Pressure: 2,160 psi (344 bar)

Pipeline Connection: ½", ¾" and 1" NPT

Sample Outlet Connection: ¼" NPT

Area Classification: Can be used in hazardous areas

Options

- Various outlet spring ranges
- Relief valves
- Flanged connections
- Additional materials of construction
- Customized lengths
- Various Liquid Knock-out Tips

2. INSTALLATION INSTRUCTIONS

2.1 Installing the Probe Regulator

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.

2.1.2 The instrument regulator has four ports on the body. They are marked outlet, gauge, relief and drain (The drain is prior to the knock-out membrane). Each of these ports are common, and they receive regulated downstream pressure.

2.1.3 Install a relief valve and a gauge in the appropriate ports (see Figure 1).

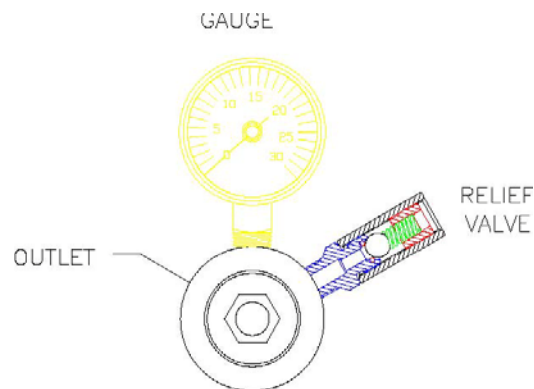


FIGURE 1

2.1.4 We recommend installing a valve on the outlet port to shut off the supply to your instrument if necessary.

NOTE: It is highly recommended that only one instrument at a time is connected to the instrument regulator. More than one instrument can negate the effects of the thermal fins in off-setting the Joule-Thomson effect.

2.1.5 The preferred location for installation into the pipeline is in a straight section of inlet piping before the flowing stream is subjected to turns and impingements that can produce aerosols. Aerosols can cause a non-representative sample to be taken from the pipeline.

2.1.6 Install the probe regulator on to a **depressurized** portion of the pipeline.

2.1.7 Use PTFE tape or pipe dope for the NPT connections.

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

2.1.8 Connect tubing from the outlet valve or valves on the regulator to the instrument.

2.1.9 Close all valves connected to the regulator.

2.1.10 The pipeline can now be re-pressurized.

2.2 Setting the Regulator

NOTE: When pressuring the system, always open pipeline valves slowly. All connections must be checked carefully for leaks at full line pressure. No leaks are acceptable within the complete sampling system.

2.2.1 Loosen the jam nut on the regulator adjusting screw (see Figure 2).

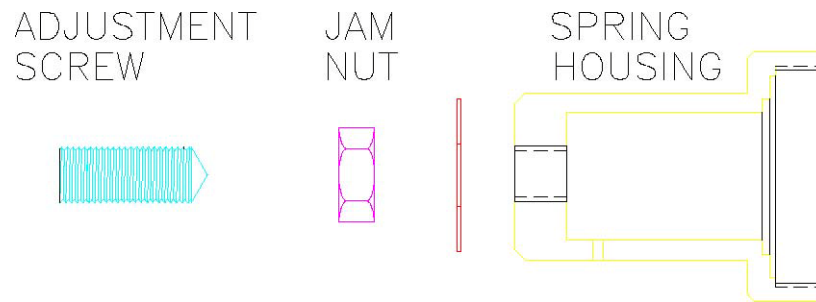


FIGURE 2

2.2.2 Loosen or tighten the adjusting screw until the desired outlet pressure is reached.

2.2.3 Tighten the jam nut.

2.2.4 Set the relief valve to proper the pressure (see instructions).

2.2.5 Check the entire system for leaks.

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.

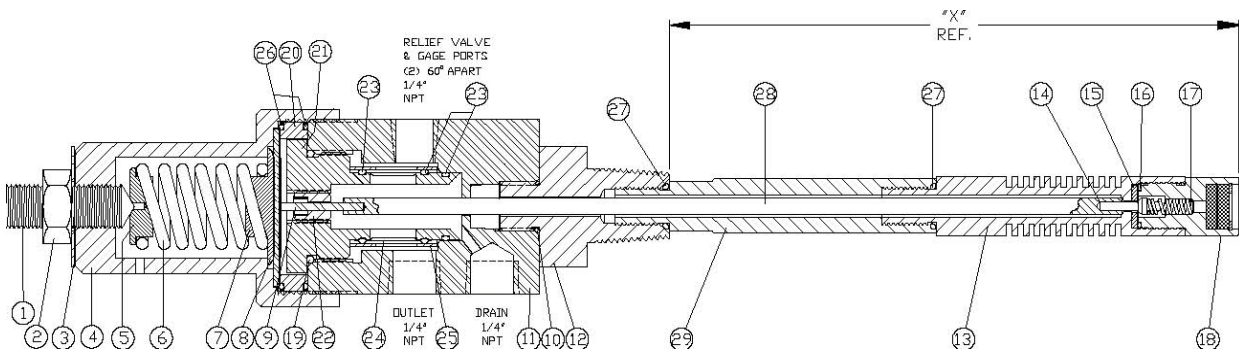


FIGURE 3

3.2 Instructions

NOTE: Refer to Figure 3. 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
- . • 10" adjustable wrench
- . • 6" and 10" channel lock pliers

3.2.1 Maintenance should be performed only after the pipeline has been depressurized and the regulator has been removed from the pipeline.

3.2.2 Loosen the jam nut #2 and back off the adjusting screw #1.

3.2.3 Unscrew the spring housing from the body #11 (see Figure 4).

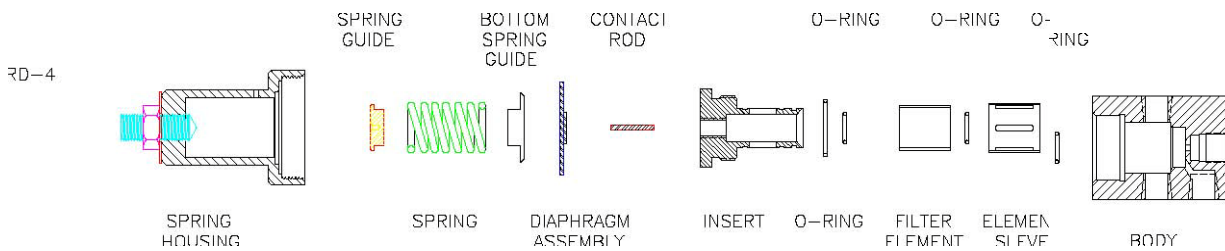


FIGURE 4

- 3.2.4 Replace the diaphragm #8 if it is equipped with one.
- 3.2.5 Remove the spacer #20 and replace O-Rings #26.
- 3.2.6 Unscrew the insert #21 and remove the element sleeve #25.
- 3.2.7 Remove and replace the filter element #24 and O-Rings #19 and #23 (3).
- 3.2.8 Replace the element sleeve #25 and screw in the insert #21 making sure the contact rod #9 protrudes through hole in bushing #22.
- 3.2.9 Set the spring back in place, making sure that the top and bottom spring guides #5 and #7 are place on the spring.
- 3.2.10 Reattach the spring housing and spacer #20 and hand tighten the spring housing to the body.
- 3.2.11 Use a pair of channel lock pliers to hold the thermal fins #13 and use the other pair to remove the seat retainer #18.
- 3.2.12 Remove the poppet spring #17 and poppet #14 (see Figure 5).

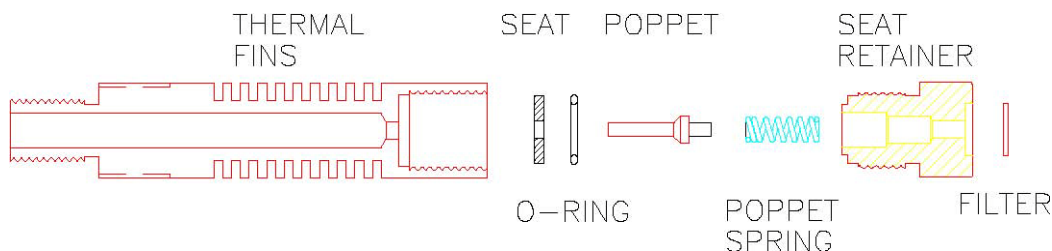


FIGURE 5

- 3.2.13 Examine the poppet and poppet spring. Replace if necessary.
- 3.2.14 Use a pointed instrument to carefully pick the seat #15 out of the thermal fin body.
- 3.2.15 Replace the seat, being careful to install the new seat so that the beveled side of the center hole faces the poppet.
NOTE: Trash or scratches on either the poppet or seat will prevent positive shut off of the regulator.
- 3.2.16 Guide the poppet into the seat.
- 3.2.17 Replace the spring and seat retainer.
- 3.2.18 Tighten firmly.
- 3.2.19 Grab the shaft above the thermal fins with a pair of the water pump pliers. With the other water pump pliers remove the shaft from the base #29.
NOTE: If there is a shaft extension, remove the extension from the thermal fins.
- 3.2.20 Replace the O-ring #27 or O-rings.

- 3.2.21 Put the base, shaft and thermal fins back together.
- 3.2.22 Tighten firmly.
- 3.2.23 Remove the base from the body and replace the O-ring #10.
- 3.2.24 Put the pieces back together and tighten firmly.

NOTE: When putting the base and body back together, make sure that the contact rod and push rod are carefully installed and lined up correctly. The push rod slipping over the poppet can be felt when putting the pieces back together. The unit should screw together easily. If not, loosen and gently shake the assembly somewhat to help the contact rod slip into the hole in the regulator body. Then tighten firmly.

- 3.2.25 The unit is now ready to reinstall and reset.