



*Installation, Operation, and  
Maintenance Manual*

***Welker<sup>®</sup> Probe Instrument Regulator  
Model  
IRD-4SSF***

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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# SPECIFICATIONS

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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 *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 Probe Instrument Regulator is designed to serve as a probe and a regulator combination while minimizing the Joule-Thomson effect by design. Supply enters through the tip of the probe and is regulated to a reduced pressure and immediately passes through thermal exchange fins before exiting the flowing stream in the pipeline. The body houses the output adjustment and spring along with output port, gauge port, and safety relief port.



# SPECIFICATIONS

## 1.3 Specifications

### **N** NOTE

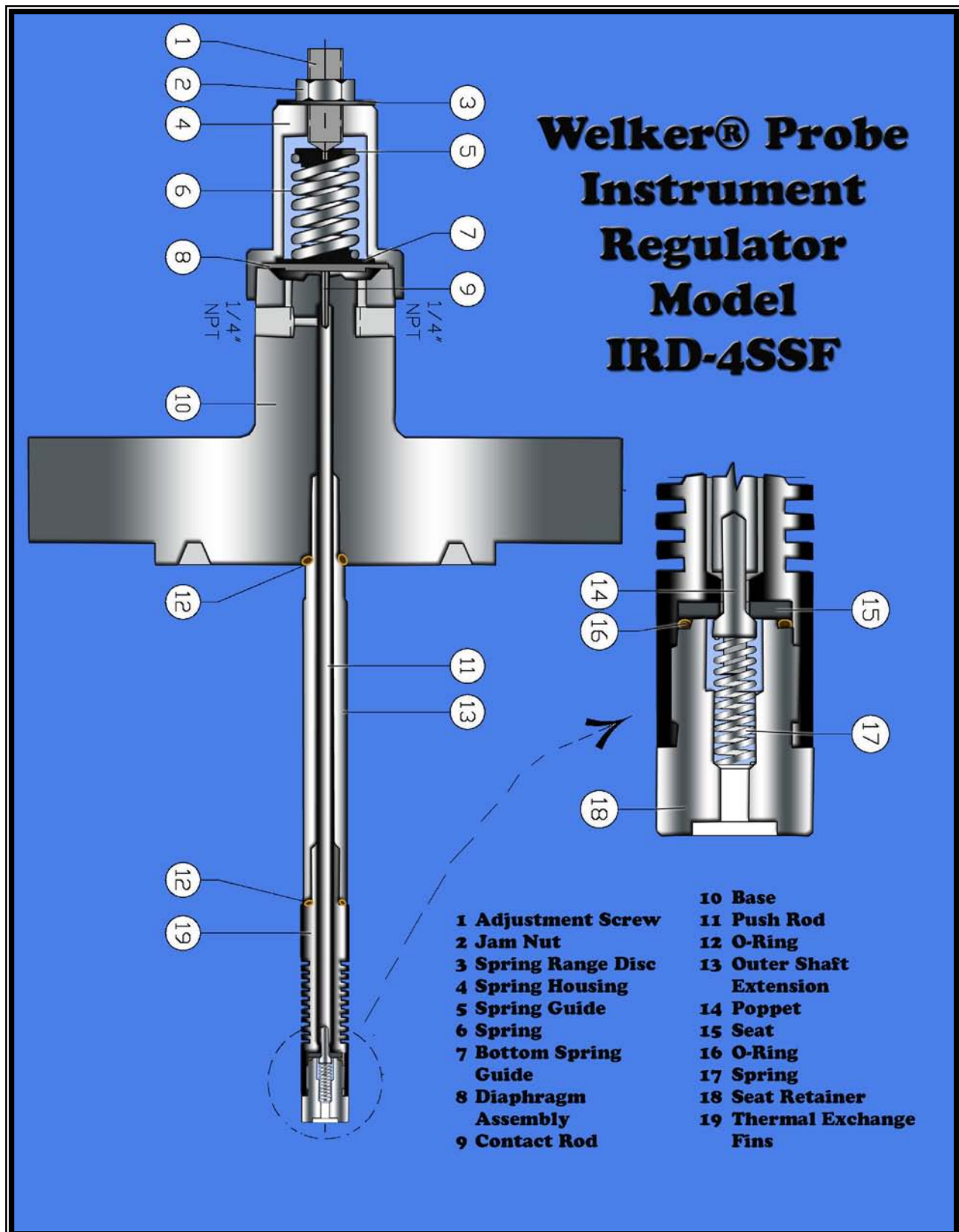
The specifications listed in this section are generalized for this equipment. Welker can modify the equipment according to your company's needs. However, please note that **the specifications may vary depending on the customization of your product.**

**Table 1**

<b>Specifications</b>	
<b>Products</b>	Natural gas or other gases or liquids compatible with the materials of construction
<b>Materials of Construction</b>	316 Stainless Steel, Viton <sup>®</sup> , PTFE, Buna-N <sup>®</sup> , and Kel-f <sup>®</sup> (others available)
<b>Sample Outlet Connection</b>	1/4" NPT (others available)
<b>Sample Inlet Connection</b>	1/4" NPT (others available)
<b>Pipeline Connection</b>	1/2", 3/4", and 1" NPT
<b>Maximum Allowable Inlet Pressure*</b>	<b>IRD-4:</b> 2,160 psi @ -20° F to 100 ° F (248 bar @ -29° C to 37° C)
<b>Output Range*</b>	<b>IRD-4:</b> 0-100 psi @ -20° F to 100 ° F (0-6 bar @ -29° C to 37° C)
<b>Temperature Range*</b>	-40° F to 275° F

\*Maximum allowable pressures, output ranges, and temperature ranges may differ depending on specifications of the pipeline connection device.

# SPECIFICATIONS



# INSTALLATION & OPERATIONS

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## 2. INSTALLATION INSTRUCTIONS

### 2.1 General

After unpacking the unit, check it for compliance and for any damages which 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.

- 10" adjustable wrench
- Tubing
- Tubing cutters

### 2.2 Important Information

1. Always depressurize the pipeline when installing or removing the probe.
2. Avoid rough handling of the probe and unnecessary bending of the probe shaft. The shaft has a polished surface that travels through a seal.
3. The entire instrument should be treated with care.

# INSTALLATION & OPERATIONS

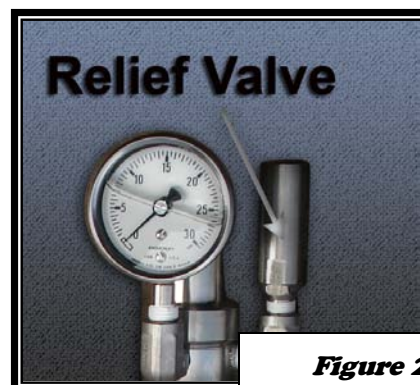
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## 2.3 Installation Instructions

### **N** NOTE

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 contaminate the sample being taken.

1. Close the appropriate pipeline valves in order to depressurize the pipeline.
2. Use a safe auxiliary gas supply to set the relief valve to the proper pressure.
3. If necessary, follow steps in number 4 of this section, using a safe auxiliary gas supply to set the relief valve to the proper pressure. If relief is preset, skip to number 5 of this section.
4. Set the Relief Valve (RV-1D) (Figure 2):



**Figure 2**  
**Relief Valve**

### **N** NOTE

If requested, Welker can preset Welker relief valves prior to shipment.

- Use a hex wrench to adjust the spring tension in the relief valve for positive shut-off.
  - Adjust the relief to the desired set point.
5. The relief valve is now in operation. Connect the set relief valve to the relief valve port in the regulator.
  6. Tube the relief valve to vent to a safely designated ventilation port.
  7. Close the appropriate pipeline valves in order to depressurize the pipeline.
  8. Connect the probe regulator to the appropriate pipeline connection. Bolt the flange to the pipeline.
  9. Back off the adjusting screw to the regulator to prevent any pressure from escaping.
  10. If necessary, connect a gauge to the gauge port in the regulator.
  11. Use tubing to connect from the outlet port on the regulator to the inlet of the instrument.
  12. Open the appropriate pipeline valves to pressurize the pipeline.



# INSTALLATION & OPERATIONS

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13. The regulator is now ready to be set to the desired output pressure.
14. Set the Instrument Regulator to desired pressure setting:
  - Make sure the pipeline is providing pressure to the regulator.
  - Turn the inlet supply to pressurize the regulator inlet.
  - Loosen or tighten the adjusting screw until the gauge reads the desired pressure for outlet (See Figure 3).
  - Tighten the jam nut (Part 2) on the adjusting screw (Part 1) to secure it into place.
  - The regulator is now in operation.



***Figure 3***  
***Setting the Instrument Regulator***

15. Check for leaks.
16. The probe is now in service.

# MAINTENANCE

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## 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 unexpected wear or faulty seals. All maintenance and cleaning of the unit should be done on a smooth, clean surface.

**N** 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.

**N** NOTE

New seals supplied in spare parts kits are not lubricated. They should be lightly coated with lubrication grease (Dow Corning 111 [DC 111] or equivalent lubricant) before they are installed into the equipment. This helps with the installation of the seals while reducing the risk of damage when positioning them on the parts.

**!** CAUTION

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

### Recommended Tools

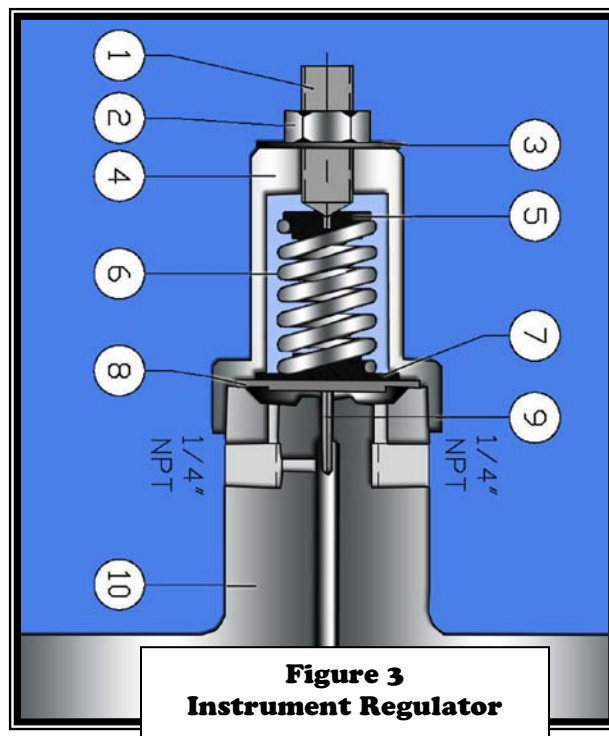
It would be advisable to have the following tools available for maintenance of the unit. However, tools used will vary depending on model.

- Small hex key set
- 10" adjustable wrench
- Cleaning solvent

# MAINTENANCE

## 3.2 Instrument Regulator Maintenance (See Figure 3)

1. Close the appropriate pipeline valves to depressurize the pipeline. Disconnect the instrumentation from the regulator's outlet port. Remove the probe from the pipeline.
2. Loosen the adjusting nut (Part 2) on the adjusting screw (Part 1).
3. Loosen the adjusting screw to relieve tension on the spring (Part 6).
4. **Disassemble Diaphragm Assembly:**
  - a) Unscrew the spring housing (Part 4) and remove.
  - b) Remove the top spring guide (Part 5) and the spring (Part 6).
  - c) Remove the bottom spring guide (Part 7).
  - d) Remove the diaphragm assembly (Part 8). Inspect for wear, and replace if necessary.
  - e) Set the diaphragm back into place.
  - f) Set the bottom spring guide back into place on top of the diaphragm.
5. Set the spring (Part 6) back into place.
6. Set the top spring guide (Part 5) back into place on top of the spring.
7. Reattach the spring housing (Part 4) securely. Hand-tighten the housing.
8. Proceed to Section 3.3 for relief valve maintenance.



# MAINTENANCE

## 3.3 Relief Valve (RV-1) Maintenance (See Figure 4)



**Figure 4**  
**Relief Valve (RV-1D)**

1. Isolate and depressurize the relief valve from the supply source.
2. Remove the relief valve from the supply.
3. Remove the spring adjuster, spring and ball.
4. If the spring is in good condition, it can be reused.
5. Check the ball for nicks and scratches and replace if necessary.
6. Unscrew the base from the spring housing and replace the seal (See Figure 5).



**Figure 5**  
**Seal**

7. Screw the base and spring housing back together.
8. Drop the ball and spring into the spring housing.

**N** NOTE

The ball must rest on the seal. If the ball rests on the metal trim, then the relief will not seat.

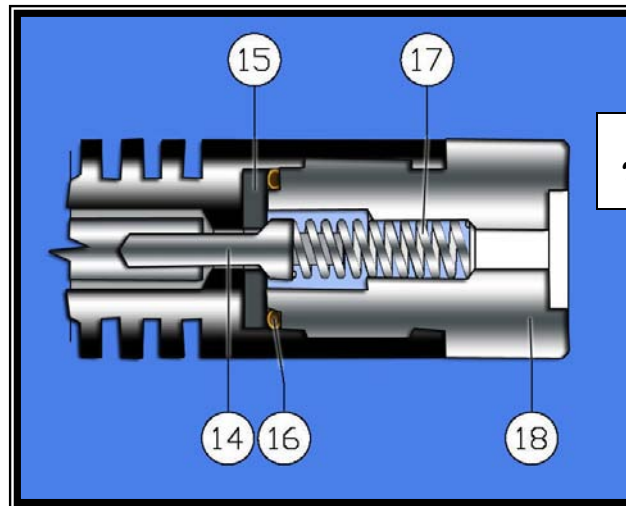
9. Replace the spring adjuster.
10. The relief valve is ready to reinstall and reset.
11. Proceed to Section 3.4 for probe maintenance instructions.

# MAINTENANCE

## 3.4 Probe Maintenance Instructions

(See Figure 5)

1. Use a pair of channel lock pliers as a backup to hold the thermal fins (Part 16) while using another pair to remove the seat retainer (Part 20).



**Figure 5**  
**Thermal Fins & Retainer**

2. Remove the poppet spring (Part 17) and the poppet (Part 14).
3. Use a pointed instrument to carefully pick the seat (Part 15) out of the body of the thermal fin.
4. Examine the poppet and the seat for scratches. If scratches are present, the part will need to be replaced.

**! CAUTION**

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

5. Guide the poppet into the seat.
6. Replace the spring and seat retainer.
7. Tighten the seat retainer firmly.
8. Replace the O-ring (Part 16) on the shaft.
9. If there is a shaft extension, remove the extension from the thermal fins.
10. Reattach the thermal fins to the shaft. Tighten firmly.

**! CAUTION**

When reattaching the base to the body, make sure that the contact rod and push rod are carefully installed and lined up correctly. The push rod should fit easily over the poppet and should not stack on top of it. If the rod is stacked on top of the poppet, the device will not be able to be reassembled properly.

11. Follow instructions in Section 2.3 to reinstall the probe assembly.



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