



**Installation,
Operation, &
Maintenance
Manual**

Welker[®] Heated Spa
Model
HR-4SSN

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 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

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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 Product description

The Welker Heated Spa is designed to provide analytical equipment with a properly conditioned sample stream, keeping the sampled product in the gas phase. The system utilizes a Welker Heated Instrument Regulator (HR-4SS) that prevents temperature drops that can compromise the composition of the product. A heater inside the device keeps the sample heated to the necessary temperature. Pressure is reduced as it travels from the regulator's inlet port to its outlet port. In order to set the desired output pressure, an adjusting screw on the device is tightened, pushing down on a spring inside the device. The spring then pushes down on a piston or diaphragm that, in turn, pushes against a poppet. When high pressure is applied to the regulator's inlet port, the poppet is moved up, allowing only the set amount of pressure to pass through.

Analyzer Liquid Shutoff (optional)

The Welker Analyzer Liquid Shutoff (ALS) is used to prevent liquids from entering into injection valves, columns of gas chromatographs, and other analytical equipment.

Liquid Eliminator (optional)

The Welker Liquid Eliminator can be connected to the inlet of the unit in order to assure that all liquids be filtered thoroughly from the system. As gas enters the eliminator, the device filters out any entrained liquids and drains them back into the pipeline.

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 needs. However, please note that **the specifications may vary depending on the customization of your product.**

| General | |
|---------------------------|--|
| Products | Gases/ Liquids |
| Materials of Construction | Stainless Steel, PTFE, and Viton (others available) |
| Maximum Line Pressure | 1,440 psi @ -20° F to 100° F (99 bar @ -29° C to 37° C) |
| Inlet Connection | 1/4" FNPT |
| Outlet Connection | 1/4" FNPT |
| Auxiliary Connections | 1/4" FNPT |
| Spring Range | 0-25 psi (0-1.72 psi) |

* Maximum allowable temperatures and pressures may vary depending on the specifications of the pipeline connection device.

INSTALLATION & OPERATION

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 shipment must be initiated by the receiver and directed to the shipping carrier. Welker is not responsible for damages caused from mishandling during shipping.

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.

- 6" adjustable wrench
- 316 stainless steel tubing
- Tubing cutters

2.2 Instructions

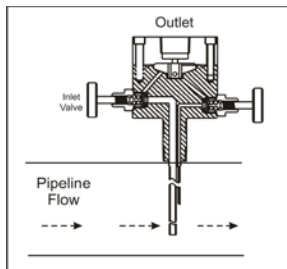


Figure 1

- 2.2.1 If you are connecting a Liquid Eliminator to the unit, complete steps 2.2.2 and 2.2.3. If not, skip to step 2.2.4.
- 2.2.2 Depressurize the pipeline and connect the Liquid Eliminator to the appropriate pipeline port. The inlet valve should be faced against the direction of pipeline flow (see Figure 1).
- 2.2.3 Use tubing to connect the incoming cable from the outlet port of the Liquid Eliminator to the inlet port of the Heated Regulator (see Figure 2).
- 2.2.4 Use tubing to connect the incoming cable from the pipeline to the inlet port of the Heated Regulator (see Figure 3).

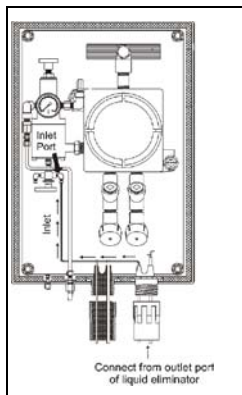


Figure 2

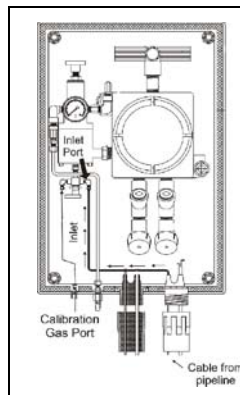


Figure 3

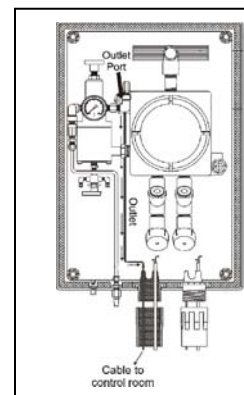


Figure 4

INSTALLATION & OPERATION

- 2.2.5 Use tubing to connect the outgoing cable from the control room to the outlet port of the Heated Regulator (see Figure 4).
- 2.2.6 If applicable, open the inlet and bleed valves on the sides of the Liquid Eliminator.
- 2.2.7 Open the three-way ball valve on the bottom of the Heated Regulator to prepare for incoming pressure to enter through the inlet port.
- 2.2.8 Pressurize the pipeline to allow product to flow through the inlet and into the system.
- 2.2.9 Tighten the knob on the regulator until the gauge reads the desired output pressure.
- 2.2.10 Tighten the nut on the regulator's knob to secure it into place.
- 2.2.11 Open the terminal box and set the thermostat to the desired temperature. Allow the device to heat for 30-60 minutes.

W WARNING

Do not open the terminal box when power is supplied to the terminal.

- 2.2.12 Make the AC connections from the pipeline and control room (see Figure 5).

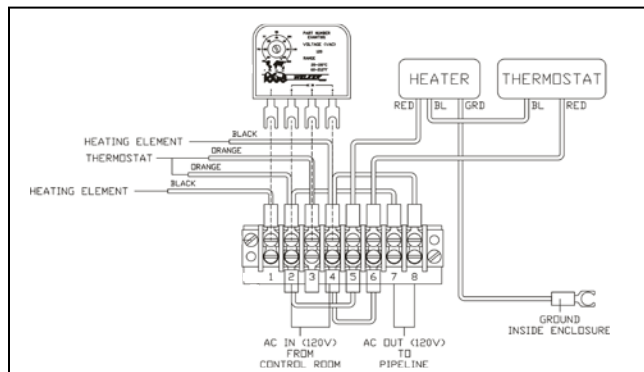


Figure 5

N NOTE

Sealing compound kits are provided for the conduit seals.

2.3 Calibrating

- 2.3.1 When it is necessary to calibrate the system, connect the calibration gas supply to the calibration port (see Figure 3).
- 2.3.2 Switch the three-way ball valve at the bottom of the Heated Regulator to allow calibration gas to pressurize the regulator.
- 2.3.3 If it is not already regulated, tighten the knob on the regulator until the gauge reads the desired output pressure.
- 2.3.4 Open the calibration gas supply to pressurize the system.

MAINTENANCE

3 MAINTENANCE

3.1 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 shipment must be initiated by the receiver and directed to the shipping carrier. Welker is not responsible for damages caused from mishandling by the shipping.

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.

- Hex key set
- 6" adjustable wrench
- Tubing cutters
- 1/4" Allen wrench

W WARNING

When performing maintenance on any of the unit's components, ensure there is no power source being supplied at the terminal strip in the explosion-proof box.

3.2 Liquid Eliminator maintenance

Refer to Figure 6 for the following Section.

- 3.2.1 Close the inlet valve and the bleed valve on the device.
- 3.2.2 Shut down and disconnect all electrical connections to the unit.
- 3.2.3 Remove all tubing and fittings connected to the Liquid Eliminator.
- 3.2.4 Loosen the eight screws (Part 5) from the cap of the Liquid Eliminator.
- 3.2.5 Remove the cap.
- 3.2.6 Remove the screen (Part 2).
- 3.2.7 Use a pick or small knife to remove the O-ring (Part 6).
- 3.2.8 Remove the PTFE element (Part 1).
- 3.2.9 Use a solvent to wipe and clean the inside of the Liquid Eliminator.

! CAUTION

Use a cleaning solution that will not affect the sample analysis.

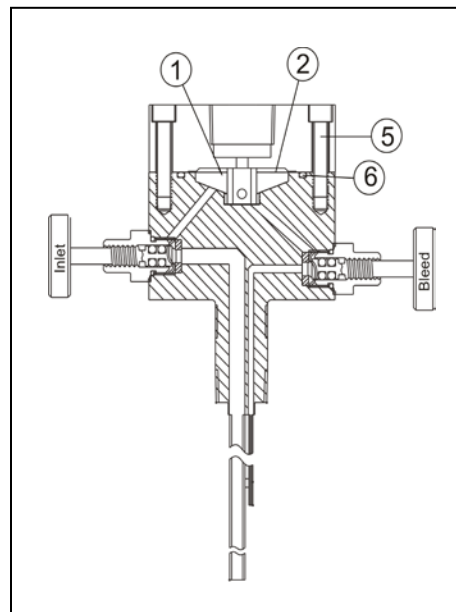


Figure 6

MAINTENANCE

- 3.2.10 Reposition the PTFE element onto the center of the inside of the Liquid Eliminator (Part 1).
- 3.2.11 Replace the O-ring (Part 6). Use Dow Corning 111 (DC 111) grease or an equivalent lubricant to lightly grease the O-ring.
- 3.2.12 Reposition the screen (Part 2) onto the center of the PTFE element.
- 3.2.13 Align the cap with the Liquid Eliminator body so that the eight screws (Part 5) can be reassembled.
- 3.2.14 Cross-bolt the eight screws into the cap itself.

3.3 Heated Regulator maintenance

Refer to Figure 7 for the following Section.

- 3.3.1 Depressurize the system.
- 3.3.2 Shut down the AC from the control room.
- 3.3.3 Loosen the nut (Part 2) on the adjusting knob (Part 1).
- 3.3.4 Loosen the adjusting knob to relieve tension on the spring (Part 4).
- 3.3.5 Loosen and remove the spring housing (Part 5).
- 3.3.6 Remove the top spring guide (Part 3) and the spring.
- 3.3.7 Remove the bottom spring guide (Part 6).
- 3.3.8 Remove the diaphragm (Part 7). Inspect for wear and replace if necessary.
- 3.3.9 Set the bottom spring guide back into place on top of the diaphragm.
- 3.3.10 Set the spring back into place.
- 3.3.11 Set the top spring guide back into place on top of the spring.
- 3.3.12 Reattach the spring housing (Part 5).
- 3.3.13 Loosen and remove the eight cap screws (Part 12).
- 3.3.14 Remove the regulator body (Part 13) from the heating chamber (Part 16).
- 3.3.15 Unscrew the flow ring (Part 14) from the regulator body.
- 3.3.16 Replace the seal around the flow ring.
- 3.3.17 Remove the poppet spring and the poppet (see Figure 8).
- 3.3.18 Examine the poppet and poppet spring. If deep scratches are present, they will need to be replaced.

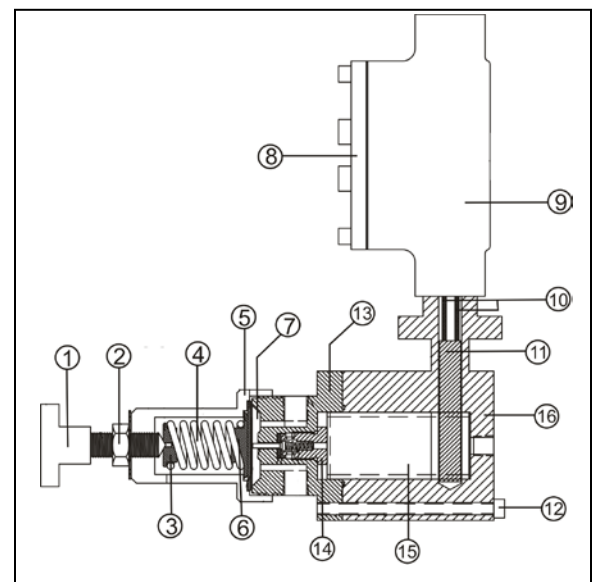


Figure 7

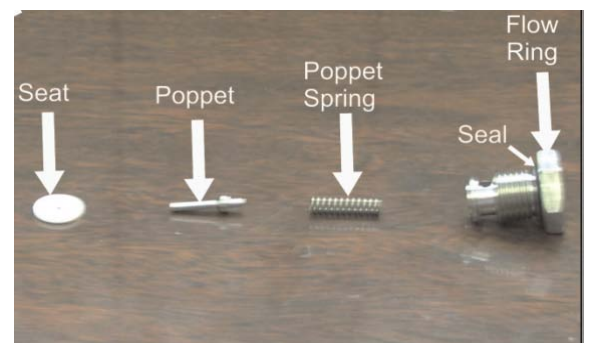


Figure 8

MAINTENANCE

- 3.3.19 Use a pointed instrument to carefully pick the seat out of the regulator body (see Figure 8).
- 3.3.20 Examine the seat and replace if necessary.
- 3.3.21 Set the seat back into place. The bevel in the seat should face the poppet.

N NOTE

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

- 3.3.22 Guide the poppet into the seat.
- 3.3.23 Reattach the poppet spring and flow ring (Part 14) to the regulator body (Part 13).
- 3.3.24 Tighten the flow ring securely.
- 3.3.25 Remove the chamber insert (Part 15) and clean it with solvent.

! CAUTION

Use a cleaning solution that will not affect the sample analysis.

- 3.3.26 Reconnect the regulator body to the heating chamber (Part 16).
- 3.3.27 Reinstall the eight cap screws (Part 12) at the bottom of the regulator.
- 3.3.28 To perform maintenance on the relief valve, refer to the corresponding relief valve manual.
- 3.3.29 To replace the heating element:
 - a) Disconnect the four heating element leads (Part 10) from the terminal.
 - b) Pull out the heating element (Part 11) and leads from the regulator.
 - c) Replace the heating element with a new heating element.
 - d) Lightly lubricate the new heating element and reconnect it into the heating chamber.
 - e) Reconnect the leads to the terminal and close the lid (Part 8) of the terminal housing (Part 9).

3.4 ALS maintenance

Refer to Figure 9 for the following Section.

- 3.4.1 Depressurize the system.
- 3.4.2 Shut down the AC from the control room.
- 3.4.3 Disconnect the ALS from the Heated Regulator.

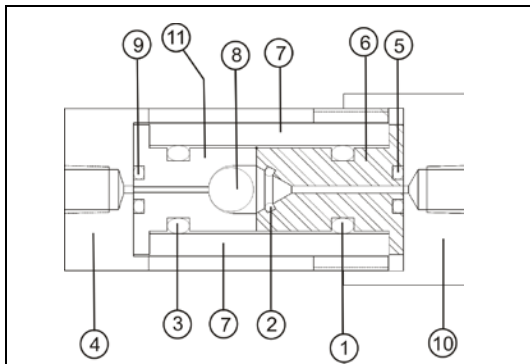


Figure 9

- 3.4.4 Remove the liquid shutoff glass assembly (Parts 6, 7, and 11) from its body (Part 10).
- 3.4.5 Replace all applicable seals (Parts 1, 2, 3, 5, and 9) in the device.
- 3.4.6 Remove the ball (Part 8) and examine it for scratches and wear. If deep scratches or excessive wear exist, the ball will need to be replaced.
- 3.4.7 Reinsert the ball into the guide (Part 11).
- 3.4.8 Reinstall the glass assembly inside the cap (Part 4).
- 3.4.9 Hand tighten the cap (Part 4) to the body (Part 10).

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13839 West Bellfort, Sugar Land, Texas 77498-1671

Phone: (281) 491-2331

Fax: (281) 491-8344

Toll Free: (800) 776-7267

www.welkereng.com