



*Installation, Operation, and  
Maintenance Manual*

***Welker<sup>®</sup>  
Heated Regulator High Voltage  
Model  
HR-4SS-230***

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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# INTRODUCTION

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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 Product Description

The Welker Heated Instrument Regulator is designed to provide an adequate output pressure for instrumentation that is unable to sustain high pressures. It is also designed to prevent temperature and pressure 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 the device. In addition to the inlet port, the instrument regulator has three common ports on the body: the gauge, relief, and outlet. All ports are marked on the device accordingly (see Figure 2).



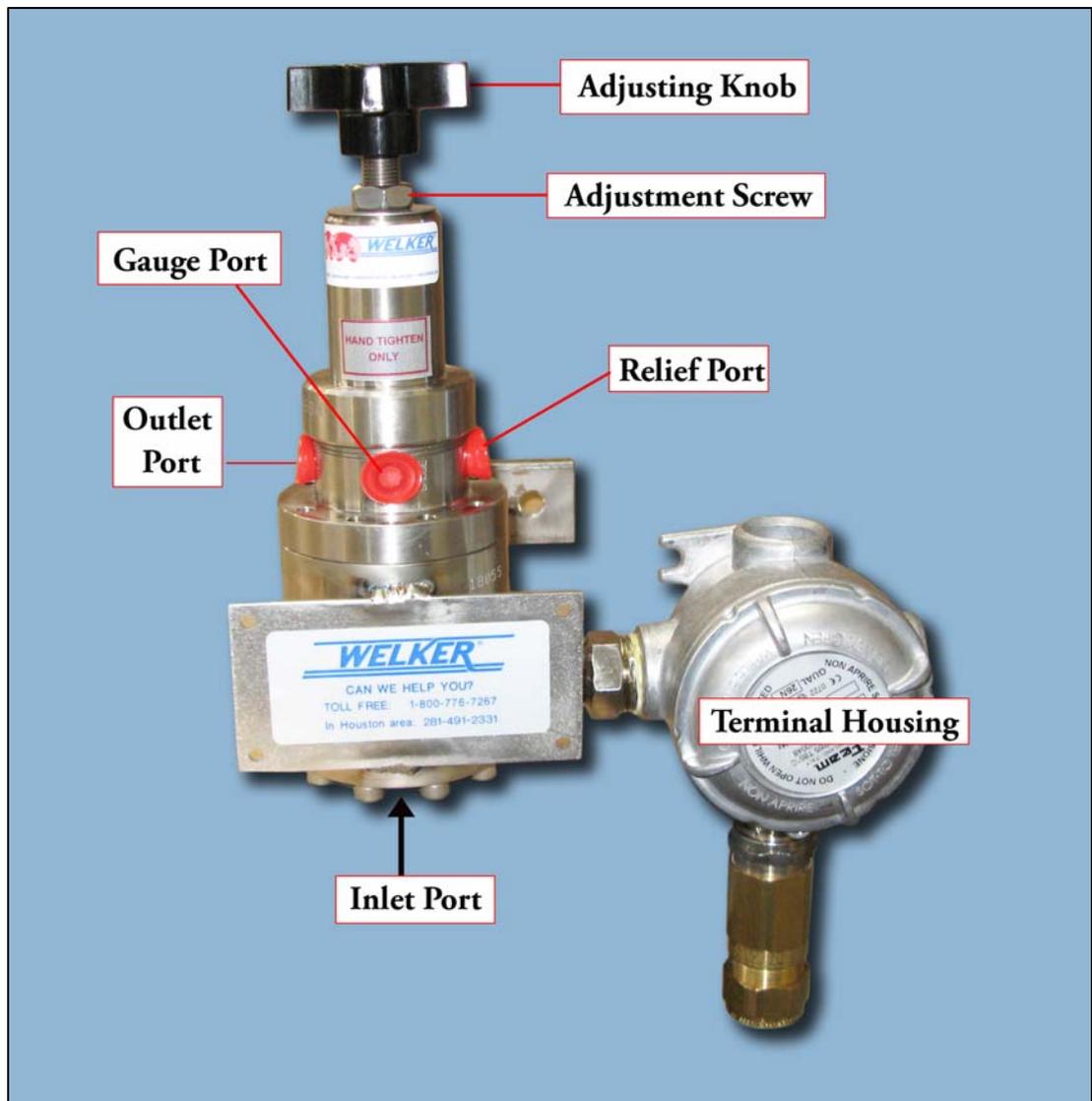
**Figure 1**

**Adjustable Relief Valve (optional)**

The adjustable relief valve functions as a safety device for the unit. During continuous sampling and transportation of the cylinder, the relief valve assures that the device maintains a constant pressure and does not exceed maximum allowable pressure. The valve will relieve any pressure that exceeds the set pressure.

# SPECIFICATIONS

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**Figure 2**

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

# SPECIFICATIONS

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## **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>General</b>	
Products	Gases
Materials of Construction	316 Stainless Steel, Viton <sup>®</sup> , and PTFE (others available)
Sample Outlet Connection	1/4" FNPT
Sample Inlet Connection	1/4" FNPT
Auxiliary Connections	1/4" FNPT
Maximum Allowable Inlet Pressure*	2,160 psi @ -20° F to 100° F 148 bar @ -29° C to 37° C)
Output Range	0-100 psi @ -20° F to 100° F (0-7 bar @ -29° C to 37° C)

\*Maximum allowable pressures and temperatures may vary depending on pipeline connection device.

# INSTALLATION & OPERATION

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## 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 by the shipping company.

#### 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
- Thread sealant

**N** NOTE

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

### 2.2 Instructions

2.2.1 Connect a gauge to the gauge port on the regulator.

2.2.2 Connect the relief valve to the relief valve port on the regulator (see Figure 2).

**N** NOTE

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

2.2.3 Use a safe, auxiliary gas supply to set the relief to the proper pressure (*refer to the relief valve manual*).

2.2.4 Remove the lid of the terminal housing.

2.2.5 Connect the appropriate 230 VAC electrical wiring to the terminal strip in the terminal housing (see Figure 4).

2.2.6 Attach conduit to the terminal housing to cover the wiring.

2.2.7 Use tubing to connect from the outlet port on the regulator to the inlet of the instrument.

2.2.8 Use tubing to connect the inlet supply to the inlet port on the regulator.

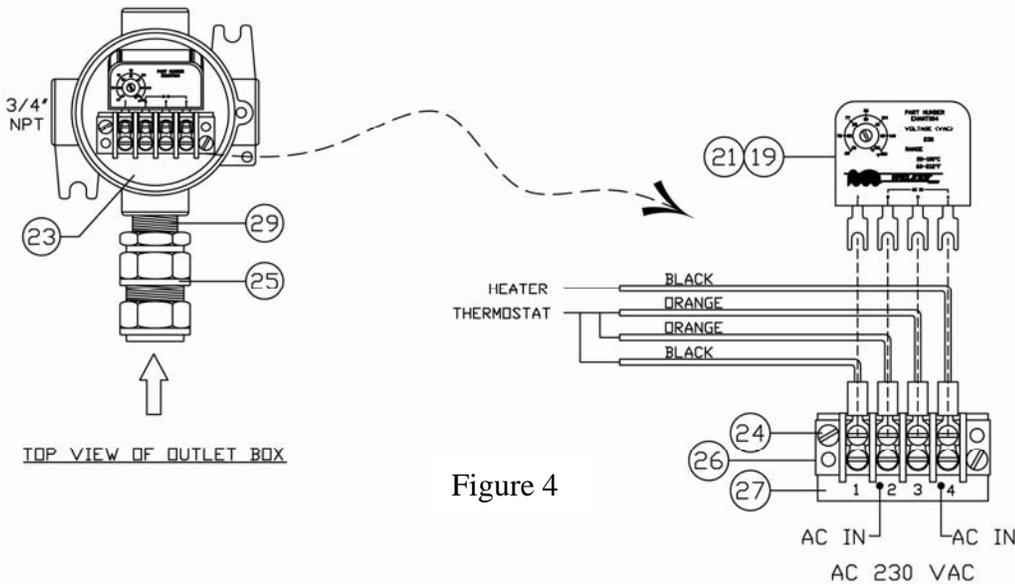
# INSTALLATION & OPERATION

## **W** WARNING

Do not turn on the inlet supply at this time. Turning on the inlet supply before the relief valve is set could result in overpressurizing the instrument.

## **N** NOTE

Welker recommends installing an upstream filter if the product has solid particles or possible hydrocarbon liquids. The filter should be installed on the connection to the regulator inlet.



- 2.2.9 Set the thermostat to the desired temperature.
- 2.2.10 Allow the device to heat for 30-60 minutes.
- 2.2.11 Close all valves connected to the regulator.
- 2.2.12 Turn on the inlet supply to pressurize the regulator inlet.
- 2.2.13 Loosen or tighten the adjusting screw until the gauge reads the desired pressure for outlet (see Figure 5).
- 2.2.14 Tighten the nut on the adjusting screw to secure it into place.
- 2.2.15 Check the entire system for leaks.
- 2.2.16 The regulator is now in operation.



Figure 5

# MAINTENANCE

## 3 MAINTENANCE INSTRUCTIONS

### 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.

#### **!** CAUTION

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

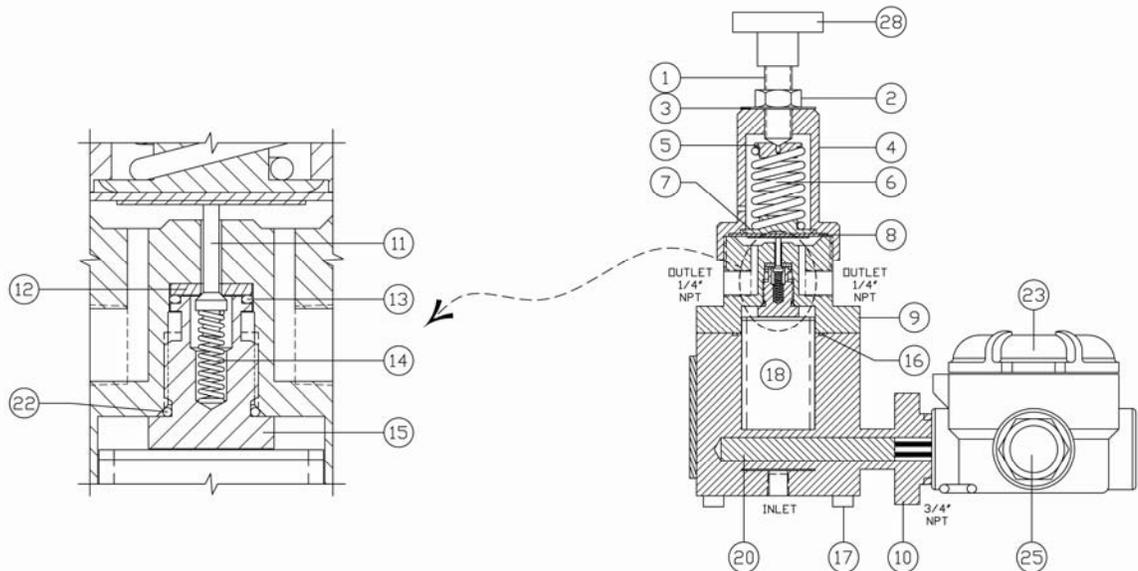
#### Recommended Tools

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
- 6" and 10" channel lock pliers
- Cleaning solvent

**Figure 6**

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



# MAINTENANCE

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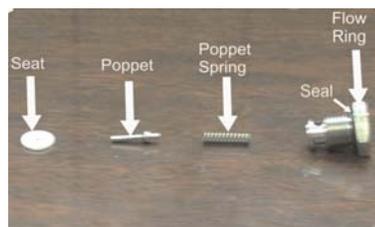
## 3.2 Instructions

- 3.2.1 Turn off the inlet supply pressure to the regulator inlet.
- 3.2.2 Disconnect the inlet supply from the regulator inlet port.
- 3.2.3 Disconnect the instrument from the regulator outlet port.
- 3.2.4 Shut down all electrical connections to the regulator.
- 3.2.5 Open the lid of the terminal housing (Part 23).
- 3.2.6 Disconnect the incoming electrical wiring.
- 3.2.7 Remove the conduit.
- 3.2.8 Loosen the nut (Part 2) on the adjusting screw (Part 1).
- 3.2.9 Loosen the adjusting screw to relieve tension on the spring (Part 6).
- 3.2.10 Loosen and remove the spring housing (Part 4).
- 3.2.11 Remove the top spring guide (Part 5) and the spring.
- 3.2.12 Remove the bottom spring guide (Part 7).
- 3.2.13 Remove the diaphragm (Part 8). Inspect for wear and replace if necessary.
- 3.2.14 Set the bottom spring guide back into place on top of the diaphragm.
- 3.2.15 Set the spring back into place.
- 3.2.16 Set the top spring guide back into place on top of the spring.
- 3.2.17 Reattach the spring housing (Part 4) securely.
- 3.2.18 Loosen and remove the eight cap screws (Part 17).
- 3.2.19 Remove the heating chamber (Part 10).
- 3.2.20 Unscrew the flow ring (Part 15) from the regulator body (Part 9).
- 3.2.21 Replace the seals (Part 22 & Part 13) around the flow ring.

### **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.

- 3.2.22 Remove the poppet spring (Part 14) and the poppet (Part 11) (also see Figure 7).



**Figure 7**

- 3.2.23 Examine the poppet and poppet spring. If deep scratches are present, they will need to be replaced.
- 3.2.24 Use a pointed instrument to carefully pick the seat (Part 12) out of the body.
- 3.2.25 Examine the seat and replace if necessary.
- 3.2.26 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 the regulator.

- 3.2.27 Guide the poppet into the seat.
- 3.2.28 Reattach the poppet spring and flow ring.
- 3.2.29 Tighten the flow ring securely.
- 3.2.30 Remove the chamber insert (Part 18) and clean it with solvent.
- 3.2.31 Reconnect the heating chamber to the regulator body.
- 3.2.32 Replace the eight cap screws.



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