



*Installation, Operation, and  
Maintenance Manual*

*Welker<sup>®</sup> Micro Purge Sampling System  
Model  
MPSS*

*Manual No. 127*

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 the Welker equipment described above. Correct operating and/or installation techniques, however, are the responsibility 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.

#### **Notes, Cautions, and Warnings**



**Notes** emphasize information or set it off from the surrounding text.



**Caution** messages appear before procedures that, if not observed, could result in damage to equipment.



**Warnings** are alerts to a specific procedure or practice that, if not followed correctly, could cause personal injury.

\*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.\*

### 1.2 DESCRIPTION OF PRODUCT

The Welker<sup>®</sup> Micro Purge Sampling System is designed to provide the user with a quality sample while utilizing a reduced-size format. It is equipped with a compact and efficient Micro Purge Sample Pump that provides Welker's original fresh purge sample.

This system is enclosed in an insulated hot-pressed glassfiber enclosure.



# SPECIFICATIONS

## 1.3 SPECIFICATIONS



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.**

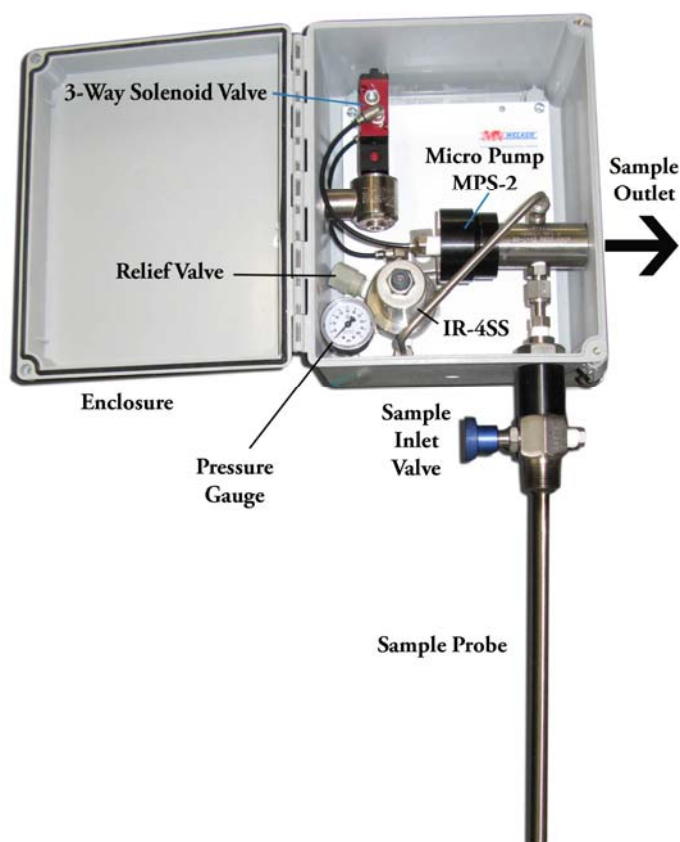
Overall System Specifications (Standard)	
<b>Products Sampled:</b>	Gases
<b>Materials of Construction:</b>	316 stainless steel, aluminum, Viton <sup>®</sup> , and PTFE
<b>Maximum Allowable Operating Pressure:</b>	1,440 psi (99.28 bar)
<b>Sample Outlet Connection:</b>	1/4" NPT
<b>Pipeline Connection:</b>	1/2" NPT or 3/4" NPT
<b>Temperature Range:</b>	-20°F to 120°F (-28.9°C to 48°C)
<b>MPS-2 Injection Volume:</b>	.25cc
<b>Instrument Regulator Outlet Pressure:</b>	20-100 psi (1.38 to 6.89 bar)
<b>Electrical Connections:</b>	6 VDC, 12VDC, 24VDC, or 6TC timer

Overall System Specifications (Options)	
<b>Sample Outlet Connections:</b>	A: 1/4" NPT Integral relief no bypass B: 1/4" NPT Integral bypass manifold C: 1/4" Pipe fitting bypass manifold kit
<b>Cylinder Holder Options:</b>	A: None (customer supplied) B: Cylinder holder for single cavity cylinder (CH2) C: Elbow/nipple only
<b>Cylinder Options:</b>	0: No cylinder (customer supplied) A: 1qty - 300cc at 100% volume single cavity cylinder B: 1 qty - 500cc at 100% volume single cavity cylinder C: 2 qty - 300cc at 100% volume single cavity cylinders D: 2 qty - 500cc at 100% volume single cavity cylinders
<b>Cylinder Hook-Up Kit Options:</b>	0: None A: Cylinder hook-up kit

# SPECIFICATIONS

## 1.4 SYSTEM COMPONENTS

- NPT Sample Probe Base with 8”
- Enclosure
- Mounting Plate
- Welker MPS-2 Gas Sample Pump
- Integral Relief (Check Valve)
- IR-4SS Instrument Regulator
- Relief Valve
- 3-Way Solenoid Valve
- Pressure Gauge
- Welker Valve NV-1
- All associated fittings, tubing, etc.



## 1.5 PRINCIPLE OF OPERATION

1. The product will flow from the sample probe to the sample inlet on the bottom the MPS-2 sample pump.
2. Before sampling, a valve attached to the bypass manifold can be opened, which will force pipeline pressure to purge the sample cylinder through the manifold block and out the valve on the bottom of the cylinder using the fill-and-empty or continuous-purge method of sampling. (Note: When using the system sample outlet option “A” without a bypass manifold, the positive pressure of helium or evacuated cylinder methods of sampling must be used.)
3. Gas will flow through the sampler and into the regulator that will regulate the sample to the pressure needed to supply the instruments.
4. When the solenoid is energized, pipeline gas will flow through the sample pump, regulator, solenoid, and then to the back side of the piston inside the sampler. This will force the fresh representative sample collected in the sampler through the check valve and into the sample cylinder. The sample gas used to operate the sampler will then be vented off when the solenoid is de-energized.
5. At the end the sample period, the representative sample collected in the cylinder should be removed and transported to the lab for analysis, and a clean cylinder should be installed in the same position.

# INSTALLATION & OPERATIONS

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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.



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.



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

### 2.2 INSTALLATION INSTRUCTIONS

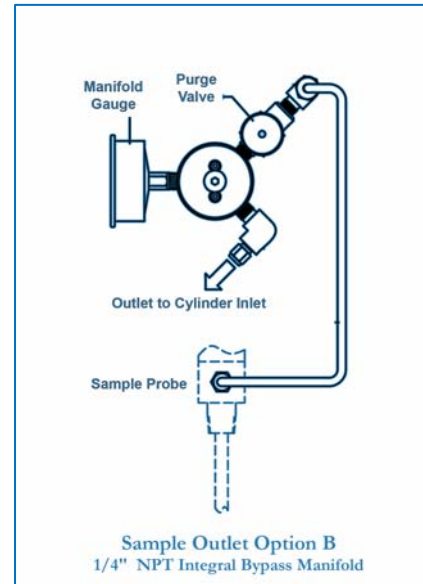
- 1. Make sure all valves are closed on the system.**
2. Before installing sampler onto the pipeline thread-o-let, be sure the probe is cut to a length that will reach into the center one-third of the pipeline. The sampler should be located in the least turbulent area available of the flowing stream, i.e., not in a header or blowdown stack and away from obstructions, elbows, or partially closed valves.
3. Connect the “sample out” port on the sampler to the sample container. The cylinder (container) should be located as close to the sampler as is possible. When necessary, use small diameter stainless steel tubing ( $\frac{1}{8}$ ” tubing is preferred, and is included in the cylinder hook-up kit) to tube from the sample outlet to the sample container.
4. Make the appropriate electrical hook-ups at this time to the solenoid and controller. Power supply will vary according to selected solenoid. If you have the 6TC timer option, refer to the Welker IOM-002 (attached) for connection and set-up.
5. The regulator will reduce the pipeline supply pressure to the proper pressure necessary to operate the solenoid safely. The regulator attached to this system will be factory set at 65 psi; see Welker IOM-025 (attached) for instructions on how to check the regulator to ensure the settings did not change in transit.
6. The regulator is equipped with a relief valve to relieve pressure and protect the equipment in case of a seal leak or other failure of the regulator. This relief valve will be factory set at 75 psi. See Welker IOM-033 attached for instructions on how to check the relief to ensure the settings did not change in transit.
7. With all valves remaining closed, open the valve on the sample probe to allow product to enter the system, check for leaks, and then proceed to purge instructions.

# INSTALLATION & OPERATIONS

## 2.3 PURGING THE CYLINDER

(SAMPLE OUTLET WITH BY-PASS OPTION B OR C)

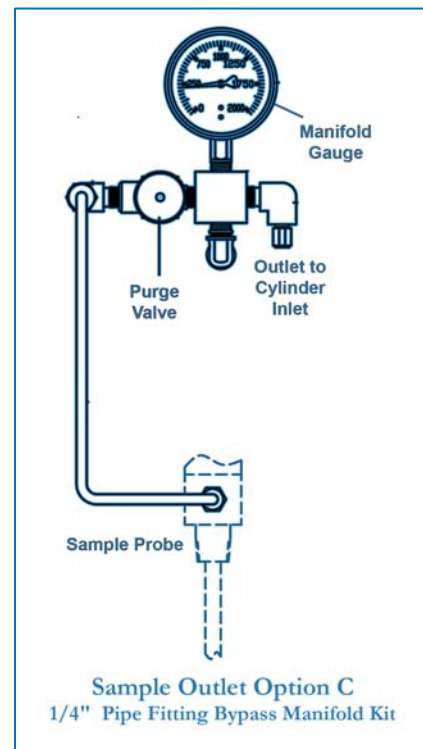
1. Open the purge valve, which is attached to the manifold.
2. Open the top and bottom valves on the single cavity cylinder and allow pipeline pressure to purge the cylinder and associated fittings.
3. For proper purging, please use the fill-and-empty method or continuous-purge method found in the Gas Processors Association standard 2166-86 "Obtaining Natural Gas Samples for Analysis by Gas Chromatography."
4. While the system is pressured up, check the entire system and container for leaks at full line pressure, as any leaks will contaminate the sample.



## 2.4 SAMPLING

(SAMPLE OUTLET WITH BY-PASS OPTION B OR C)

1. Close the purge valve.
2. Allow the pressure to bleed until the manifold gauge reads zero.
3. Close the bottom valve on the cylinder, and leave the top valve on the cylinder open.
4. Activate the controller so the solenoid will start actuating.
5. Allow the sampler to take .25cc of sample per actuation until the cylinder is full. The manifold gauge will reach pipeline pressure when the cylinder is 100% full (in a 300cc cylinder this is approximately 1,200 actuations, and approximately 2,000 actuations in a 500cc cylinder. If the cylinder continues to collect sample once it is full, the pressure will increase.



## 2.5 PURGING THE CYLINDER

(SAMPLE OUTLET WITH NO BY-PASS OPTION A)

1. Actuate the pump a few times to push the old sample out of the tubing and fittings between the sample and the cylinder, tighten the fitting again. Crack (loosen) the final fitting between the cylinder and the system enough to allow gas to escape.

# INSTALLATION & OPERATIONS

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2. If you have an evacuated cylinder, open the top valve on the cylinder, and proceed to section 2.6 to begin sampling.
3. If you have a helium-filled cylinder, open both the top and bottom valves on the cylinder, and actuate the solenoid to displace the helium. Close the bottom valve on the cylinder, leaving the top valve open, and proceed to section 2.6 to begin sampling.
4. For proper purging, please use the positive pressure of helium or evacuated cylinder methods of sampling found in the Gas Processors Association standard 2166-86 "Obtaining Natural Gas Samples for Analysis by Gas Chromatography."
5. While the system is pressured up, check the entire system and container for leaks at full line pressure, as any leaks will contaminate the sample.

## 2.6 SAMPLING

(SAMPLE OUTLET WITH NO BY-PASS OPTION A)

1. Activate the flow rate controller so the solenoid will start actuating.
2. Allow the sampler to take .25cc of sample proportional to the rate of flow of the sampler using your company guidelines for fill volume. If company policy is to fill the cylinder to 100% capacity it will take approximately 1,200 actuations.

## 2.7 REMOVING AND REPLACING THE CYLINDER

1. Deactivate the flow controller so the solenoid will stop actuating.
2. Close the top valve on the cylinder.
3. Remove the cylinder.
4. Replace the cylinder with a clean one.
5. Purge the cylinder following instructions in Step 2.3 or 2.5, then begin the new sample process.



# MAINTENANCE

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## 3. MAINTENANCE

### 3.1 GENERAL

Prior to maintenance or disassembly the unit, it is advisable to have a repair kit handy for the system in case of 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.



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



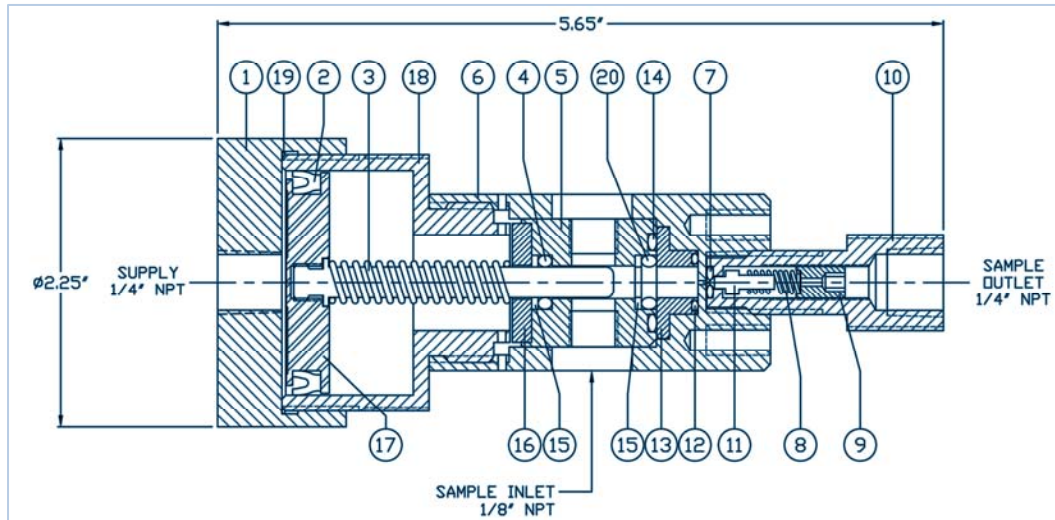
Do not dig into the metal surfaces of the parts when removing O-rings from the grooves. New seals supplied in spare parts kits are not lubricated. They should be lightly coated with lubrication grease (Dow Corning 111 [DC 111] grease or equivalent lubricant) before they are installed into the equipment.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

### 3.2 SYSTEM MAINTENANCE

1. Disconnect the electrical connections.
2. Depressurize the system, and close all valves.
3. Remove the sample system from the probe.
4. Disconnect the tubing and remove individual components Micro Purge Sampler, Regulator, and relief.
5. Follow instructions in component IOM Manuals for complete maintenance procedures of regulator, relief and valve(s):
  - Welker NV-1 Valves: *Welker IOM-105*
  - Welker IR-4SS High Flow Regulator: *Welker IOM-025*
  - Welker RV-1 Relief Valve: *Welker IOM-033*
6. Follow instructions in section 3.3 on next page to complete maintenance procedures of Micro Pump.
7. Once maintenance is complete, reconnect all tubing and replace individual components.
8. See section 2.1 to reinstall the system.

# MAINTENANCE

## 3.3 MPS-2 PUMP MAINTENANCE



1. Unscrew cap (part #1) from motor housing (part #9).
2. Remove piston (part #17), spring (part #3), and spring retainer (part #16).
3. Inspect piston (part #17) for scratches or pits, and replace if necessary. The piston has a polished surface and should be free from scratches or abrasions. Slightly lubricate before reassembly.
4. Replace the u-cup (part #2).
5. Remove flow ring (part #5) and replace the seals on each end (parts #4, #15, #7, and #14). Inspect the bearing (part #13) and replace if necessary.
6. Remove relief cap (part #10) from body.
7. Remove poppet (part #11) and spring (part #8) by unscrewing spring adjuster (part #9).
8. Inspect poppet for scratches and clean relief cap.
9. Replace O-ring (part #7).
10. Reassemble in reverse order. Do not overtighten screwed connections. They are O-ring sealed and need only be snug.



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