



INSTALLATION, OPERATION, AND MAINTENANCE MANUAL  
FOR WELKER® inFLOW™ LITE LIGHT LIQUID SAMPLE / INJECTION PUMP

MODEL  
SS09 inFLOW™ LITE

DRAWING NUMBER  
AD243EJ

MANUAL NUMBER  
IOM-255

REVISION  
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# TABLE OF CONTENTS

	SAFETY	3
1.	PRODUCT INFORMATION	4
1.1	Introduction	4
1.2	Product Description	4
1.3	Specifications	5
1.4	Equipment Diagrams	6
2.	INSTALLATION & OPERATION	8
2.1	Before You Begin	8
2.2	Installation	9
2.3	Operation	12
2.4	Verifying the Sample Volume	13
3.	MAINTENANCE	14
3.1	Before You Begin	14
3.2	Standard Maintenance	15
3.3	Troubleshooting Guidelines	23
	APPENDIX	24
	Referenced or Attached Documents	24

# SAFETY

## IMPORTANT SAFETY INFORMATION READ ALL INSTRUCTIONS



NOTES emphasize information and/or provide additional information to assist the user.



CAUTION messages appear before procedures that could result in damage to equipment if not observed.



WARNING messages appear before procedures that could result in personal injury if not observed.

*This manual is intended to be used as a basic installation of operation guide for the Welker® inFlow™ Lite Light Liquid Sample / Injection Pump. For further information and instructions, please refer to the Installation, Operation, and Maintenance (IOM) Manuals for each individual component. A list of relevant component IOM Manuals is provided in the Appendix to this manual.*

*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 in this manual. Correct installation and operation, however, are the responsibility of the end user. Welker® reserves the right to make changes to this manual and all products in order to improve performance and reliability.*

### BEFORE YOU BEGIN

Read these instructions completely and carefully.

**IMPORTANT** – Save these instructions for local inspectors' use.

**IMPORTANT** – Observe all governing codes and ordinances.

Note to Installer – Leave these instructions with the end user.

Note to End User – Keep these instructions for future reference.

Installation of this inFlow™ Lite Light Liquid Sample / Injection Pump is of a mechanical and electrical nature.

Proper installation is the responsibility of the installer. Product failure due to improper installation is not covered under the warranty.

If you received a damaged inFlow™ Lite Light Liquid Sample / Injection Pump, please contact a Welker® representative immediately.

Phone: 281.491.2331  
Address: 13839 West Bellfort Street  
Sugar Land, TX 77498

# SECTION 1: PRODUCT INFORMATION

## 1.1 Introduction

We appreciate your business and your choice of Welker® products. The installation, operation, and maintenance liability for this equipment becomes that of the purchaser at the time of receipt. Reading the applicable *Installation, Operation, and Maintenance (IOM) Manuals* 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 Welker® at 1.281.491.2331.

*\*The following procedures have been written for use with standard Welker® parts and equipment. Assemblies that have been modified might have additional requirements and specifications that are not listed in this manual.*

## 1.2 Product Description

The Welker® SSO9 inFlow™ Lite Light Liquid Sample / Injection Pump is designed to be incorporated into a liquid sampling system to collect and inject product into a sample container or to be incorporated into an injection system to collect and inject liquid chemical into a natural gas pipeline. The Welker® inFlow™ Lite Light Liquid Sample / Injection Pump is designed to keep liquids—such as propane or butane—chilled through the constant circulation of product through the fast loop. This action keeps the chiller body temperature consistently cool. Samples are extracted from the circulated product while the sample, which experiences a temporary pressure drop and potential rise in temperature, is kept cool by the chiller body. The sample is then injected into some type of sample container such as a constant pressure cylinder. The physical properties of the product are thus maintained by keeping its temperature consistently chilled.

When incorporated into a Welker® sampling or injection system, the inFlow™ Lite Light Liquid Sample / Injection Pump is mounted and tubed by the manufacturer. In automatic operations, the system is pneumatically controlled from a Programmable Logic Controller (PLC) or other signal control system. Collection and injection may be performed manually or remotely by actuating the solenoid, which controls the pump action of the inFlow™ Lite Light Liquid Sample / Injection Pump.



For this manual, the term “Programmable Logic Controller” (PLC) will refer to the PLC, DCS, or other signal control used by the customer.

*Welker® might custom design the SSO9 inFlow™ Lite Light Liquid Sample / Injection Pump to suit the particular application and specifications of each customer.*

## 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. Please note that the specifications may vary depending on the customization of your equipment.

**Table 1: Welker® inFlow™ Lite Light Liquid Sample / Injection Pump Specifications**

Applications	Composite Sampling or Liquid Chemical Injection
Product(s) (Sampled)	Clean Light Liquids, Such as Propane and Butane, and Chemicals Compatible With the Seal Material
Materials of Construction	316/316 L Stainless Steel Wetted Parts, Anodized Aluminum, PTFE, and FFKM Others Available
Maximum Allowable Operating Pressure (Injection)	2160 psig @ -45 °F to 120 °F (149 barg @ -42.7 °C to 48.8 °C)
Maximum Allowable Operating Pressure (Power End)	225 psig (15 barg)
Actuation Pressure	30 psig–225 psig (2–15 barg)
Utility Requirement	Pneumatic Supply
Inline Process Connections	3/8" FNPT
Sample Volume	0.25 – 7.50 cc
Operation	Piston-Operated
Approximate Weight	18 lb
Approximate Dimensions	16 1/8" x 4" x 4 7/8" (Length x Width x Height)
Features	Chiller Body Chiller Body Cover Fast Loop Configuration Indicator Rod
Options	CE Compliance CRN Alberta Certification

1.4 Equipment Diagrams

Figure 1: Welker® inFlow™ Lite Light Liquid Sample / Injection Pump Connections Diagram

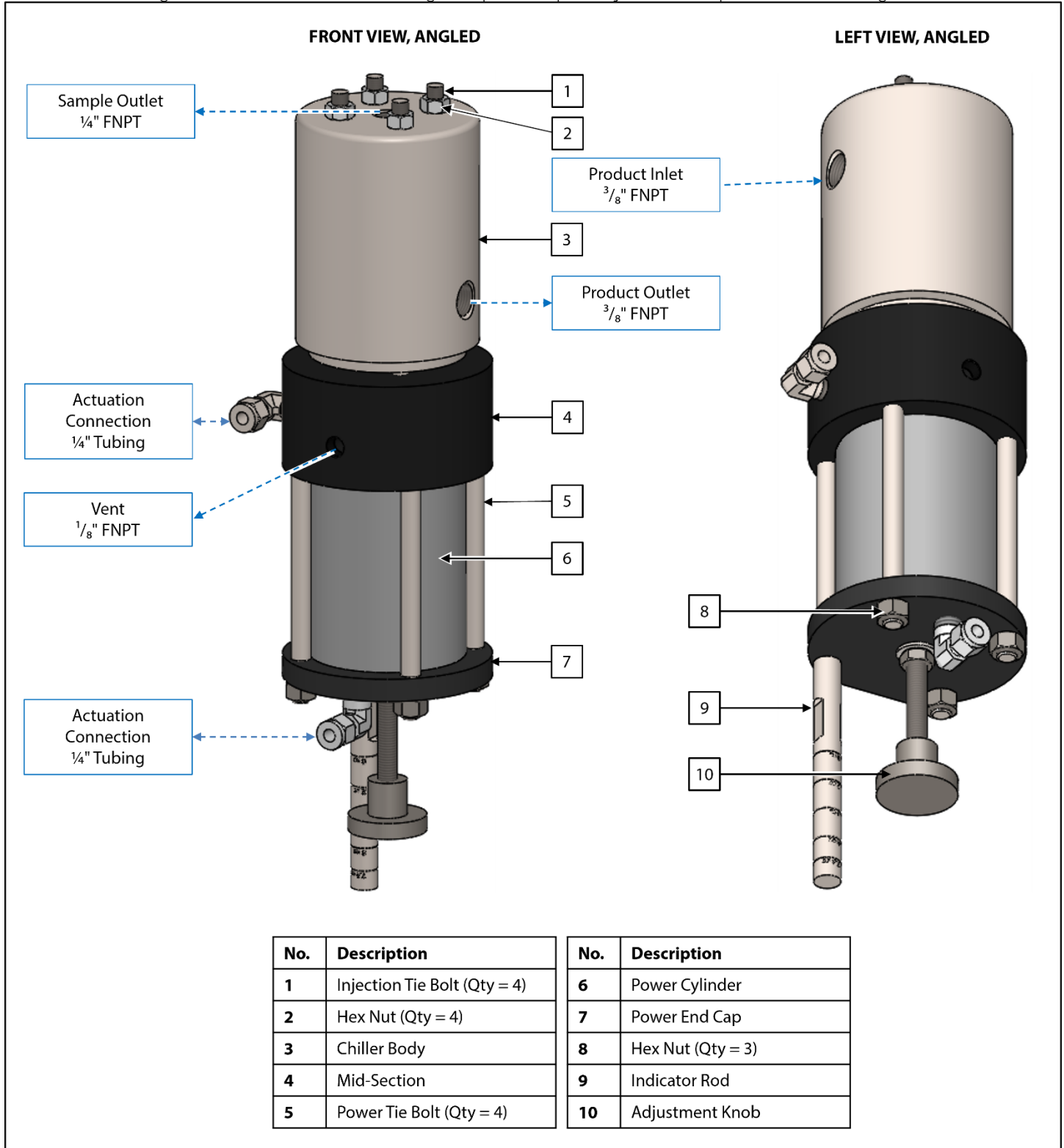
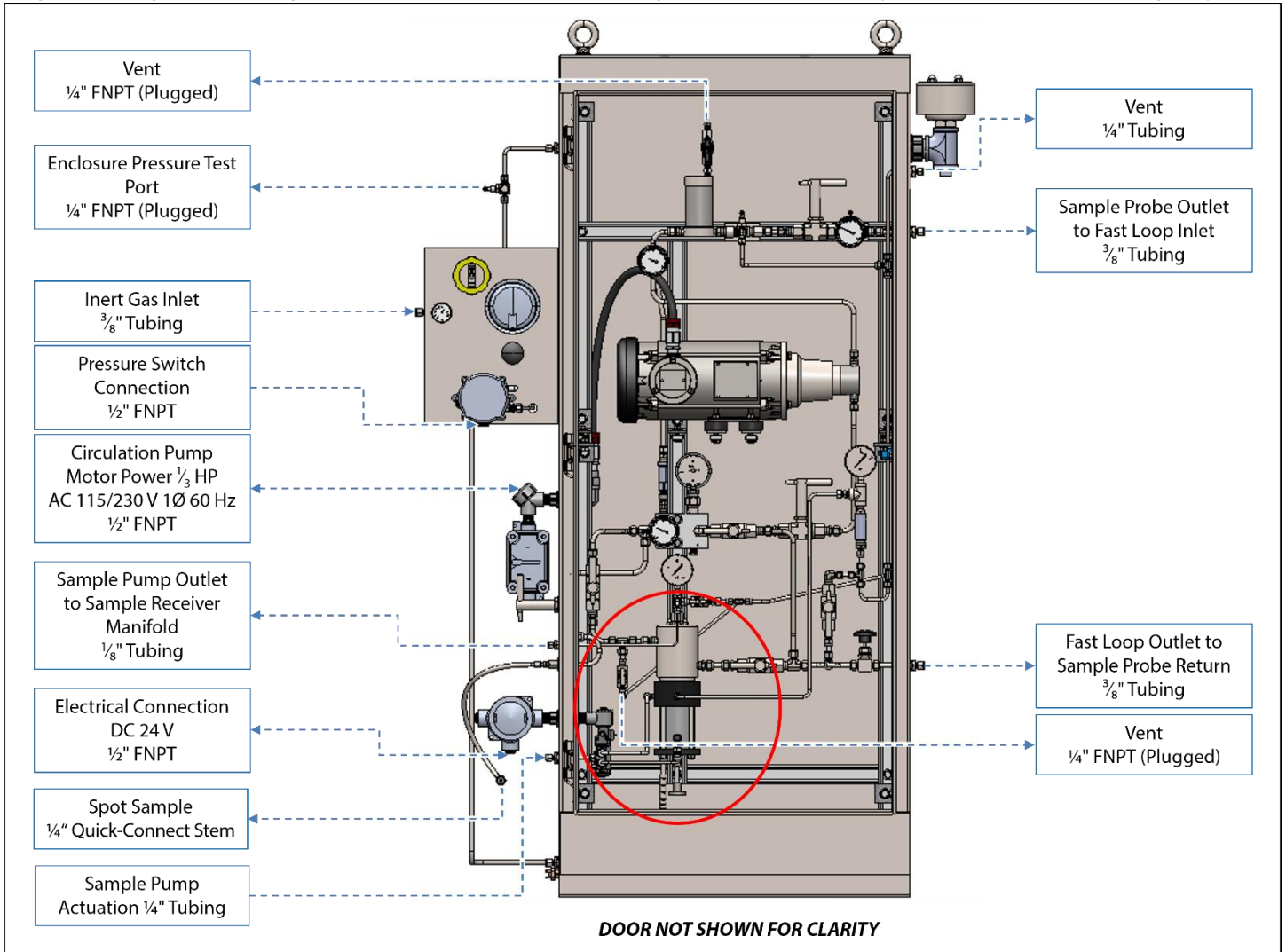


Figure 2: Diagram Showing an Example of the inFlow™ Lite Light Liquid Sample / Injection Pump Within a Larger System



## SECTION 2: INSTALLATION & OPERATION

### 2.1 Before You Begin



After unpacking the Welker® SSO9 inFlow™ Lite Light Liquid Sample / Injection Pump, check it for compliance and any damage that might have occurred during shipment. Immediately contact a Welker® representative if you received a damaged unit.



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



The Welker® inFlow™ Lite Light Liquid Sample / Injection Pump may be used alone or as part of a complete system. Note that these instructions are written for an inFlow™ Lite Light Liquid Sample / Injection Pump used as part of a complete system. If used alone or with equipment from a company other than Welker®, the unit should be installed and operated in a manner consistent with the instructions in this *Installation, Operation, and Maintenance (IOM) Manual*.



All electrical connections must meet local and national electric codes, and excessive weight added to the conduit run must be supported.

During installation and operation, Welker® recommends having the following items available should they be needed:

1. Crescent Wrench
2. Gloves
3. Hex Key Set
4. Phillips Head Screwdriver
5. Spare Parts Kit
6. Tweezers

The procedures described in this manual regarding the installation and operation of the Welker® inFlow™ Lite Light Liquid Sample/ Injection Pump should be performed at a clean area.



Should a new seal or seals be required during installation or operation, new seals supplied in spare parts kits should be lightly lubricated before being installed to ease the installation of the seals and reduce the risk of damage when positioning them on parts. Wipe excess lubricant from the seals, as it may adversely affect analytical instrument results.



For sample-exposed seals, Welker® recommends non-hydrocarbon-based lubricants, such as Krytox®. For non-sample-exposed seals, Welker® recommends either non-hydrocarbon-based lubricants or silicone-based lubricants, such as Molykote® 111.



Be certain to turn off ALL electrical power before accomplishing the installation.



## 2.2 Installation



The pipeline MUST BE depressurized prior to installing and removing the Welker® inFlow™ Lite Light Liquid Sample / Injection Pump.

1. Set up the entire system according to the appropriate *Installation, Operation, and Maintenance (IOM) Manual(s)*.
2. Purge the inFlow™ Lite of any trapped air by pressurizing the product line and then slightly opening the vent on the inFlow™ Lite (*Figure 1*). Once liquid appears, close the vent.
3. Check for leaks and repair as necessary.
4. Set the PLC to the desired sampling frequency based on the sampling actuation equations provided (*Figure 3*).

Figure 3: Sampling Frequency Equations

<b>Liquid Sampling, Proportional-to-Flow Collection</b>	
<b>Equation 1: Number of Samples Needed</b>	$\text{Number of Samples Needed to Fill to 80\%} = \frac{(\text{Container Size (cc)} * 0.8)}{\text{Bite Size (cc)}}$
<b>Equation 2: Proportional-to-Flow</b>	$\text{Volume of Flow Between Sample Grabs} = \frac{\text{Batch Size (Total Volume to Be Sampled)}}{\text{Number of Samples Needed (Eq. 1)}}$
Use <b>Equation 1</b> to determine the number of actuations needed. Use <b>Equation 2</b> to determine how often (after what volume of flow) to take each sample.	
<b>Liquid Sampling, Timed Collection</b>	
<b>Equation 1: Number of Samples Needed</b>	$\text{Number of Samples Needed to Fill to 80\%} = \frac{(\text{Container Size (cc)} * 0.8)}{\text{Bite Size (cc)}}$
<b>Equation 2: Proportional-to-Flow</b>	$\text{Time Between Sample Grabs} = \frac{\text{Total Time in Sample Period}}{\text{Number of Samples Needed (Eq. 1)}}$
Use <b>Equation 1</b> to determine the number of actuations needed. Use <b>Equation 2</b> to determine how often (after what volume of flow) to take each sample.	

5. Please note that, when sampling liquid product, the sample container should NEVER be filled above 80% of its capacity. Operators should be familiar with the physical properties of the liquid being sampled. Some product will require more room for expansion—for example, the capacity ratio might be 70%/30% or 60%/40%.



Note that the sample volume of the inFlow™ Lite is adjustable between 0.25 and 7.5 cc per actuation. Therefore, the number of samples needed to fill a sample container will vary according to the container's capacity at 80% and the size of the sample grab. For example, the Welker® LS-14 is 3 US gallons @ 80%. There are 3,785 cc in 1 US gallon.

6. The PLC should be programmed to halt sampling once the sample container reaches 80% (or other designated) capacity.

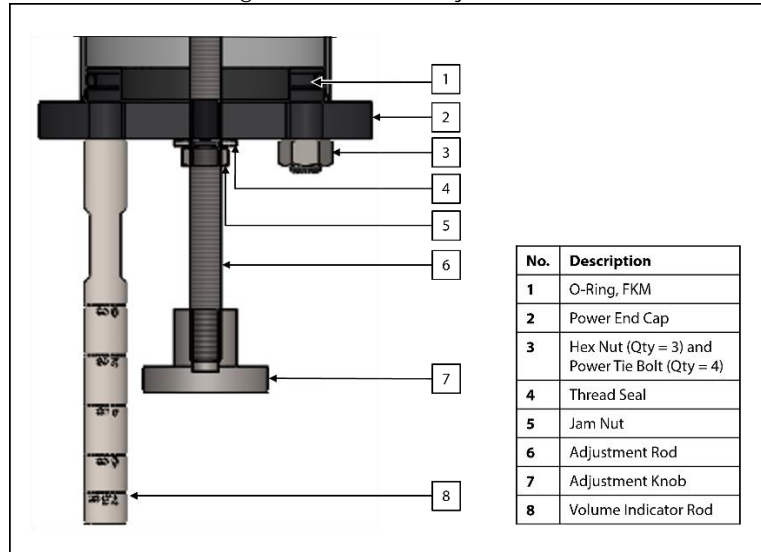


Collection and injection of the inFlow™ Lite can be visually verified by referring to any of the following:

- A sight glass installed between the inFlow™ Lite and the injection point.
- A flow indicator or flow switch.
- The volume indicator on the connected sample container.

- As necessary, adjust the sample volume of the inFlow™ Lite (Figure 4).

Figure 4: Volume Adjustment



Loosen the jam nut on the adjustment rod.  
 To increase the volume, turn the adjustment knob counterclockwise.  
 To decrease the volume, turn the adjustment knob clockwise.  
 Tighten the jam nut on the adjustment rod to secure the adjustment rod at the desired volume.



Ensure that the jam nut is tightened to the thread seal prior to beginning operation. The pump will not operate correctly unless the jam nut is properly tightened. A leak test may be performed to verify that the jam nut has been properly tightened.

- Once the inFlow™ Lite is circulating product and collecting and injecting properly, purge the inFlow™ Lite of any trapped air and/or contaminants. See *Purging the inFlow™ Lite*, for instructions on purging the inFlow™ Lite. Note that the inFlow™ Lite must be part of a system.
- After the purge cycle, the inFlow™ Lite may be put into operation.

### Purging the inFlow™ Lite



The inFlow™ Lite should be purged prior to each new round of sampling.

- In order to purge the inFlow™ Lite, it must be part of a system. Please reference *IOM-P319*, which is listed in the *Appendix* to this manual, for purging details.



Take all necessary precautions and wear appropriate personal protective equipment (PPE) to protect from potential harm caused by exposure to the injection product.



If desired, a small hose may be connected to the vent valve to collect any product that might appear at the vent outlet.

- Once all air has been purged from the chiller body / injection end cap, tighten the vent valve cap.
- As necessary, adjust the injection volume.



Loosen the jam nut on the adjustment rod.  
To increase the volume, turn the adjustment knob counterclockwise.  
To decrease the volume, turn the adjustment knob clockwise.  
Tighten the jam nut on the adjustment rod to secure the adjustment rod at the desired volume.



Ensure that the jam nut is tightened to the thread seal prior to beginning operation. The pump will not operate correctly unless the jam nut is properly tightened. A leak test may be performed to verify that the jam nut has been properly tightened.

4. As necessary, open any valves restricting the flow of product to the pipeline.

### Verifying Pump Operation

1. Pump operation can be verified by energizing the solenoid to actuate the inFlow™ Lite. Manually or remotely energize the solenoid and repeatedly actuate the inFlow™ Lite to verify pump operation.
2. As the inFlow™ Lite strokes, verify liquid is being injected.



Collection and injection of the inFlow™ Lite can be visually verified by referring to any of the following:

- A sight glass installed between the inFlow™ Lite and the injection point.
- A flow indicator or flow switch.
- The volume indicator on the connected sample container.

3. Once pump operation has been verified, manually or remotely de-energize the solenoid.

### Controller Configuration

1. Program the PLC to inject the desired amount of product into the sample container at the desired frequency. Refer to the *Installation* section of this manual for instructions.
2. Once the PLC has been configured and pump operation has been verified, sample injection may begin.

## 2.3 Operation

1. Ensure that the sample container (e.g., constant pressure cylinder) connected to the sample outlet is pre-charged.
2. Set the PLC to the desired sampling frequency based on the sampling equations provided (*Figure 3*).



Never fill the sample container above 80% of its capacity. This is to allow at least 20% room for product expansion should the container be exposed to increased temperatures. Operators should be familiar with the physical properties of the liquid being sampled. Some product will require more room for expansion—for example, the capacity ratio might be 70%/30% or 60%/40%.



Note that the sample volume of the inFlow™ Lite is adjustable between 0.25 and 7.5 cc per actuation. Therefore, the number of **samples needed to fill a sample container will vary according to the container's capacity at 80% and the size of the sample grab**. For example, the Welker® LS-14 is 3 US gallons @ 80%. There are 3,785 cc in 1 US gallon.

3. The PLC will automatically begin operation once a flow signal is received.
4. The PLC will automatically activate the solenoid to collect product in the inFlow™ Lite and inject product into the connected sample container (e.g., constant pressure cylinder).
5. Product will be constantly circulated through the chiller body, ensuring that the chiller body remains cooled by the product. Once the PLC begins operation, product instead will be pulled from the circulation stream and injected into the connected sample container. When product is pulled from the circulation stream, it will experience a drop in pressure that is associated with an increase in temperature. This increase in temperature will be negated by the chilling effect that remains in the chiller body.
6. Sampling continues automatically until the desired volume of sampled product has been collected in the sample container (e.g., constant pressure container).
7. Once sampling is complete, the sample container can be removed and prepared for transport to a laboratory for analysis, in accordance with company policy and procedure.
8. Prior to removing the sample container from the inFlow™ Lite, isolate the inFlow™ Lite from pipeline pressure by closing pipeline inlet valve P<sub>1</sub> and pipeline return valve P<sub>2</sub> or the customer-supplied valve installed to the sample outlet check valve.



Failure to isolate the inFlow™ Lite from pipeline pressure prior to removing the connected sample container (e.g., constant pressure cylinder) could result in free flow of product through the check valve.



If desired, a valve may be installed to the sample outlet check valve prior to installing a sample container (e.g., constant pressure cylinder). This would allow the operator to close one valve to isolate the inFlow™ Lite from pipeline pressure instead of closing inlet P<sub>1</sub> valve and return valve P<sub>2</sub>.

9. Prior to starting a new round of sampling, purge the system and the inFlow™ Lite. See Section 2.2, Installation, for instructions on purging the inFlow™ Lite.
10. Once the system and the inFlow™ Lite have been purged of any air and/or contaminants, a new round of sampling may begin.

## 2.4 Verifying the Sample Volume

1. Connect a graduated constant pressure cylinder to the sample outlet of the inFlow™ Lite, if one is not already connected.



Welker® recommends using a graduated constant pressure cylinder with volume indicator to ease verification of the sample volume.

2. Decide how many actuations will be taken into the graduated constant pressure cylinder to verify the sample volume.



Welker® recommends a minimum of ten (10) actuations to verify the sample volume.

3. Activate the sample function manually or remotely so that the collection and injection volume of the inFlow™ Lite can be verified. The sample function can be activated manually by pushing the manual override button on the solenoid or remotely from the PLC.
4. Capture product in the graduated constant pressure cylinder until the predetermined number of actuations has been taken.
5. Once the predetermined number of actuations has been taken, release the manual override button on the solenoid or deactivate the sample function from the PLC.
6. Calculate the sample volume by dividing the volume of product captured in the graduated constant pressure cylinder by the number of actuations taken.
7. As necessary, adjust the sample volume.



Loosen the jam nut on the adjustment rod.  
To increase the volume, turn the adjustment knob counterclockwise.  
To decrease the volume, turn the adjustment knob clockwise.  
Tighten the jam nut on the adjustment rod to secure the adjustment rod at the desired volume.



Ensure that the jam nut is tightened to the thread seal prior to beginning operation. The pump will not operate correctly unless the jam nut is properly tightened. A leak test may be performed to verify that the jam nut has been properly tightened.

# SECTION 3: MAINTENANCE

## 3.1 Before You Begin

1. Welker® recommends that the unit have standard yearly maintenance under normal operating conditions. In cases of severe service, dirty conditions, excessive usage, or other unique applications that might lead to excess wear on the unit, a more frequent maintenance schedule might be appropriate.
2. Please note that Welker® recommends purging the unit following the completion of each sample batch collection. Please see *Section 2.2, Installation, Purging the inFlow™ Lite*, for instructions.
3. Prior to maintenance or disassembly of the unit, it is advisable to have a repair kit available for repairs to the system in case of unexpected wear or faulty seals.



New seals supplied in spare parts kits should be lightly lubricated before being installed to ease the installation of the seals and reduce the risk of damage when positioning them on parts. Wipe excess lubricant from the seals, because it might adversely affect analytical instrument results.



For sample-exposed seals, Welker® recommends non-hydrocarbon-based lubricants, such as Krytox®. For non-sample-exposed seals, Welker® recommends either non-hydrocarbon-based lubricants or silicone-based lubricants, such as Molykote® 111.



After the seals are installed, the outer diameter of shafts and inner diameter of cylinders may be lubricated to allow smooth transition of parts.

2. All maintenance and cleaning of the unit should be performed on a smooth, clean surface.
3. Welker® recommends having a/an (specific tool) available for maintenance. Please note that the ext tools required might vary by model.
4. Welker® recommends having the following tools available for maintenance. Please note that the exact tools required might vary by model.
  - a. Clean Rags
  - b. Hex Key Set
  - c. Large (10") Crescent Wrench
  - d. Seal Pick
  - e. Torque Wrench

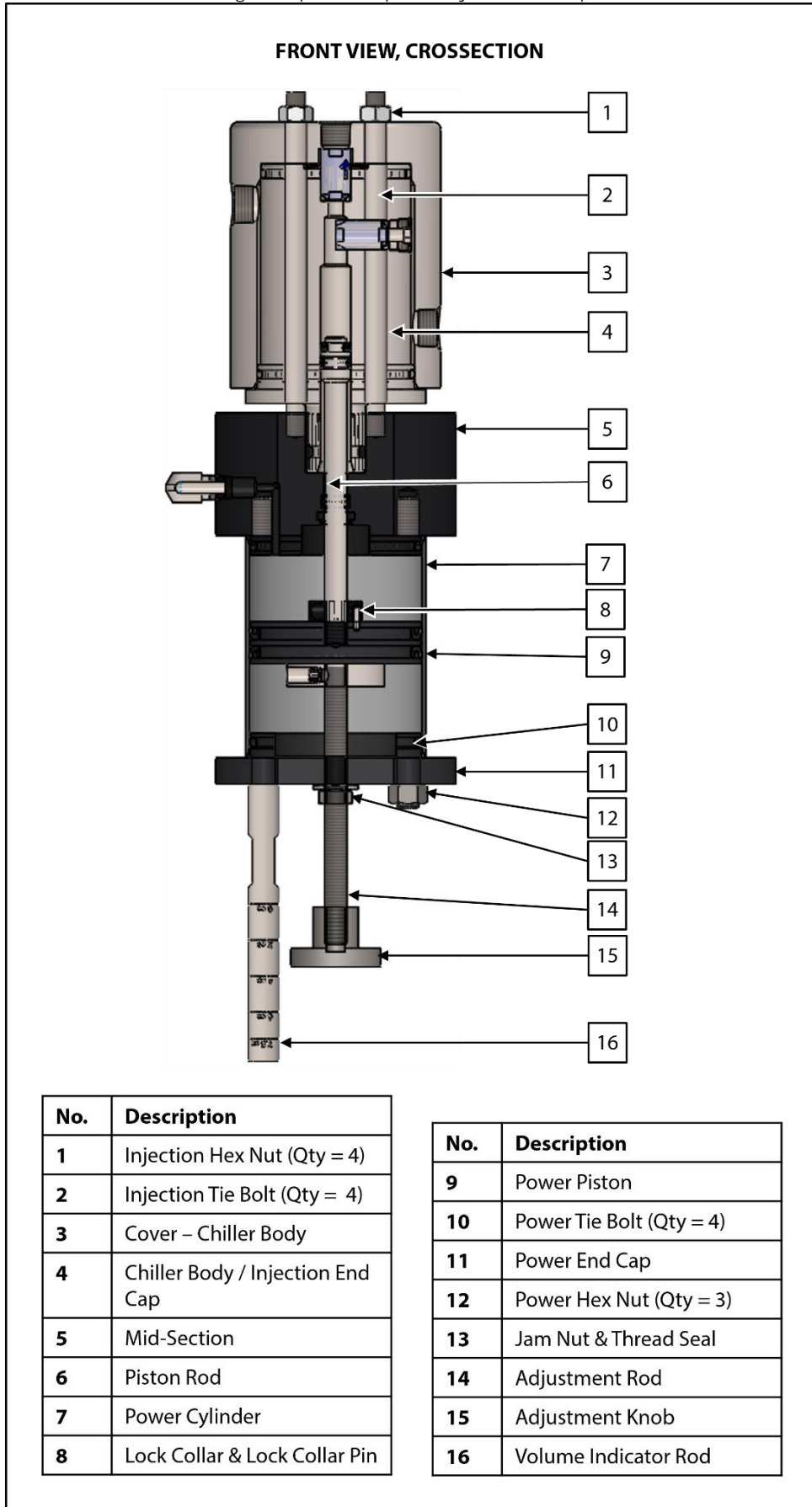
## 3.2 Standard Maintenance



Check valves for leaks and repair as necessary during reinstallation. If maintenance on a leaking valve is required, the inFlow™ Lite must be isolated from pipeline pressure before maintenance can safely be performed.

1. Close pipeline inlet valve P<sub>1</sub> and return valve P<sub>2</sub> to isolate the inFlow™ Lite from pressure.
2. Ensure that the inFlow™ Lite has been purged of all product. See *Section 2.2, Installation, Purging the inFlow™ Lite*, for instructions.
3. Ensure that the power and injection sections of the inFlow™ Lite have been depressurized by loosening any tubing connected to the power section or by turning off the connected pneumatic supply and then actuating the solenoid.
4. Disconnect all tubing from the inFlow™ Lite.

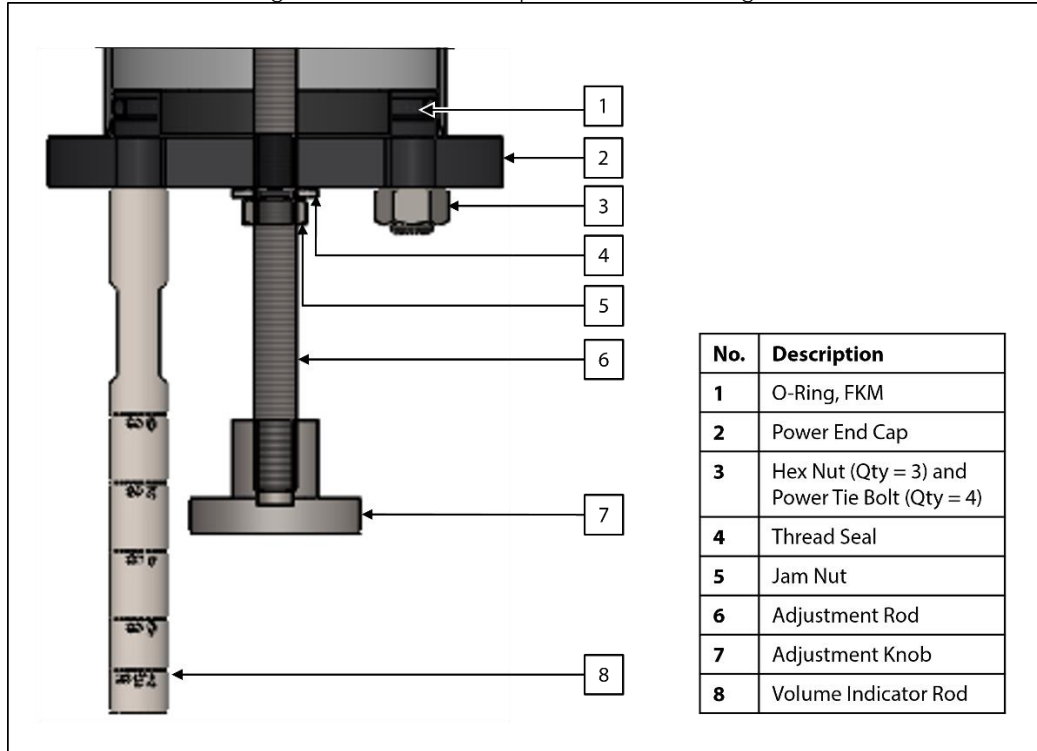
Figure 5: Welker® inFlow™ Lite Light Liquid Sampler / Injection Pump Standard Maintenance Diagram





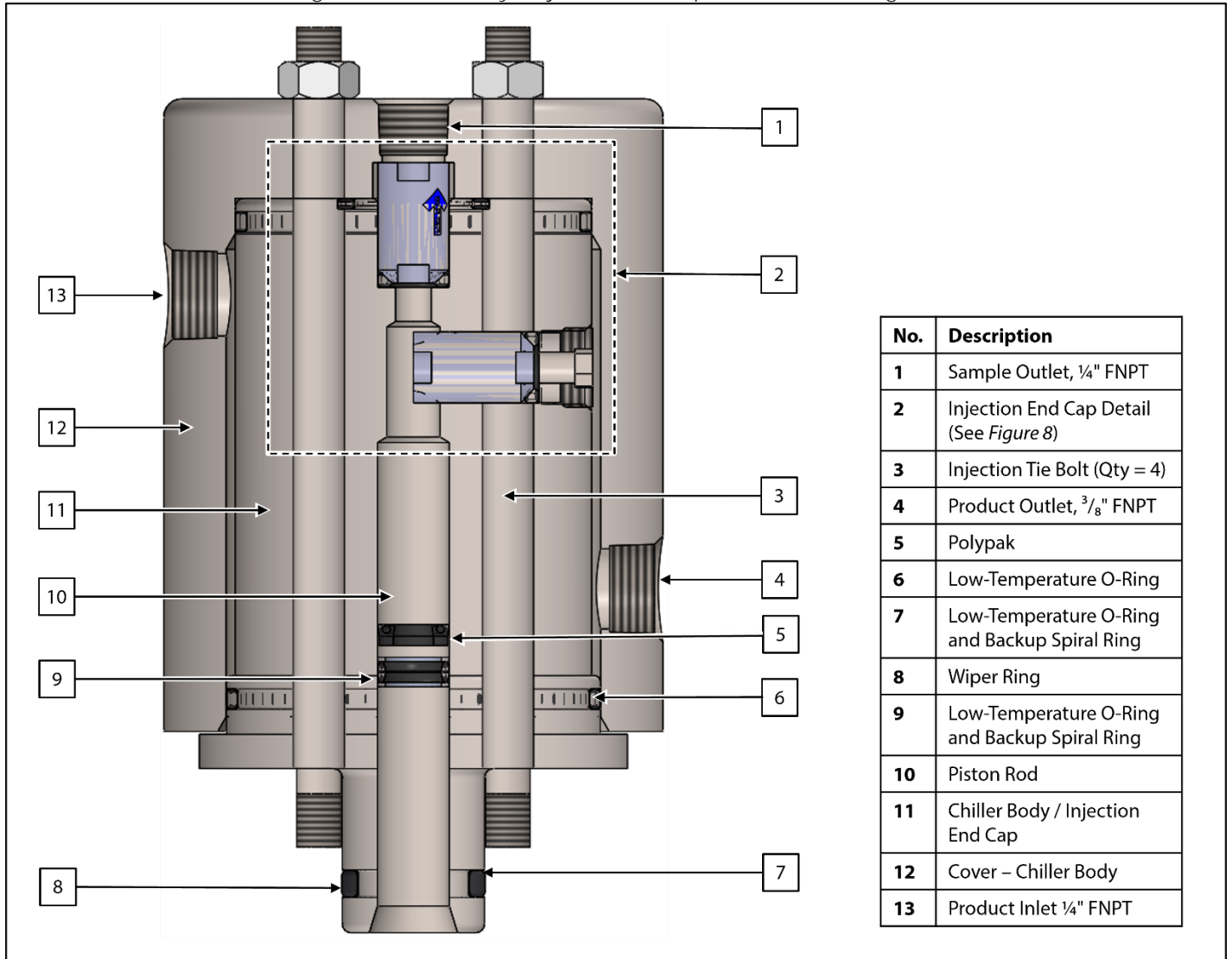
5. Remove the power end hex nuts (*Figure 5*).
6. Remove the power end cap from the power cylinder. Note that the indicator rod with bumper pad will be removed with the power end cap (*Figure 9*).
7. Carefully remove the power cylinder from the power cylinder mid-section, taking care not to damage the honed surface of the cylinder. Note that the power piston and power rod will remain attached to the mid-section.
8. Remove the injection hex nuts (*Figure 5*).
9. Gently pull the chiller body cover / injection end cap assembly from the piston rod / mid-section assembly (*Figure 5*).

Figure 6: Power End Cap Maintenance Diagram



10. Remove the O-ring from the power end cap (*Figure 6*) and wipe the O-ring groove clean.
11. Place a new O-ring on the power end cap.

Figure 7: Chiller Body / Injection End Cap Maintenance Diagram



12. Gently pull the chiller body cover off the chiller body / injection end cap (Figure 7).
13. Remove the inlet and outlet cartridge check valves and associated O-rings (Figure 7 and Figure 8) from the chiller body / injection end cap and wipe the seal grooves clean.
14. To perform maintenance on the cartridge check valves, refer to the *Installation, Operation, and Maintenance (IOM) Manual* for the cartridge check valve (listed in the *Appendix* to this *IOM*).
15. Place new O-rings in the chiller body / injection end cap (Figure 5, Figure 7, and Figure 8).

Figure 8: Chiller Body / Injection End Cap Detail Maintenance Diagram

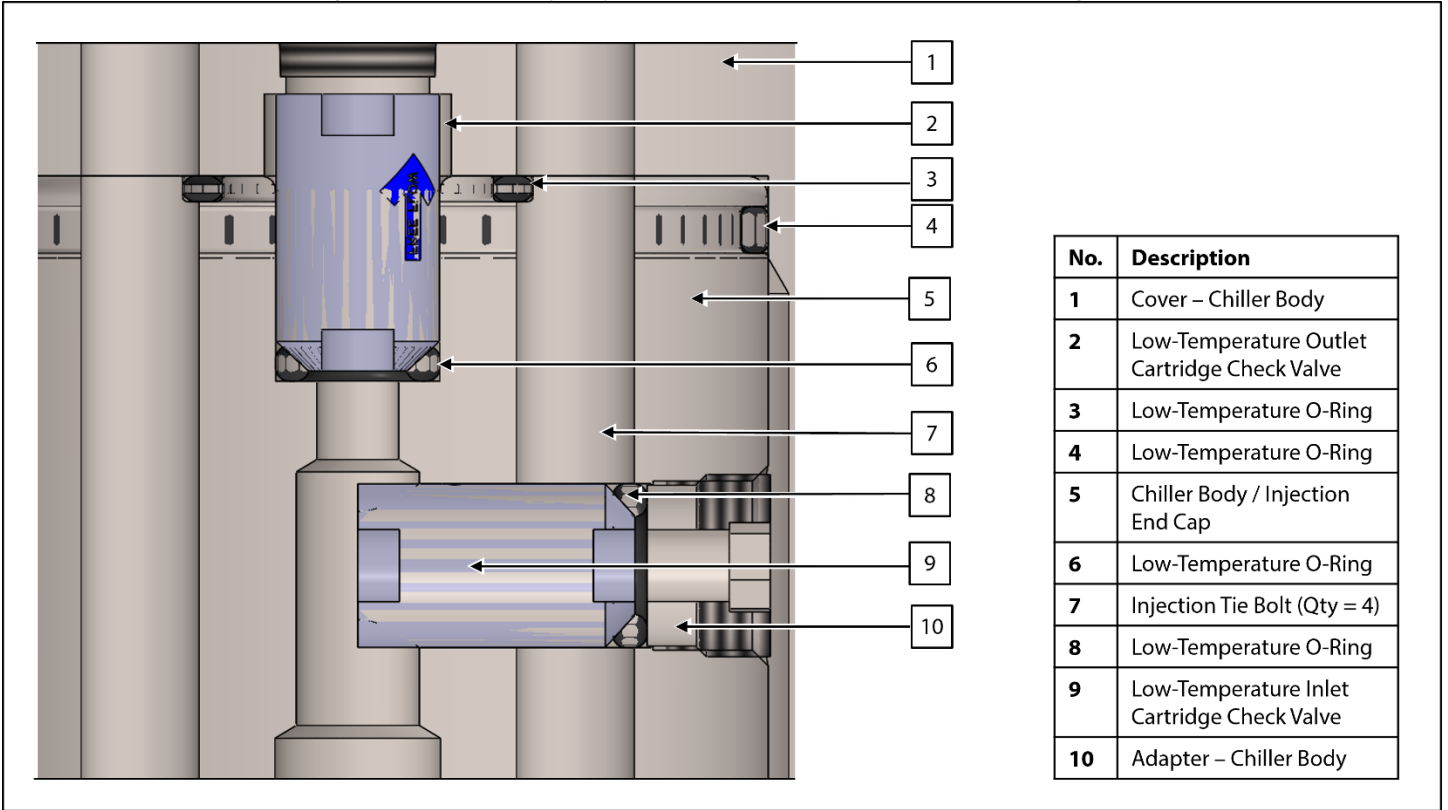
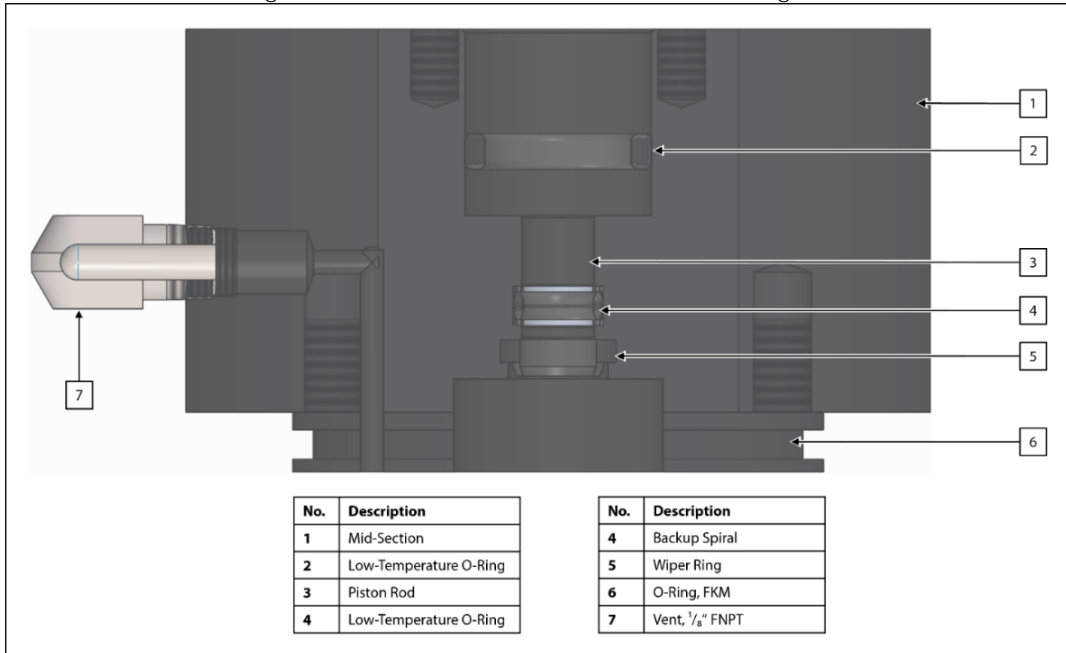
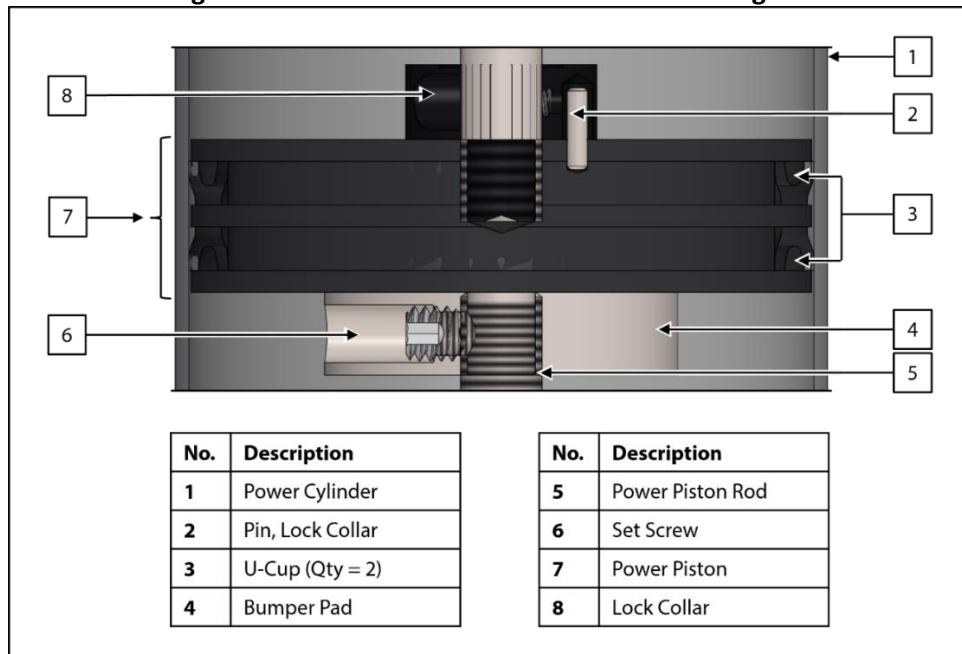


Figure 9: Mid-Section Detail Maintenance Diagram



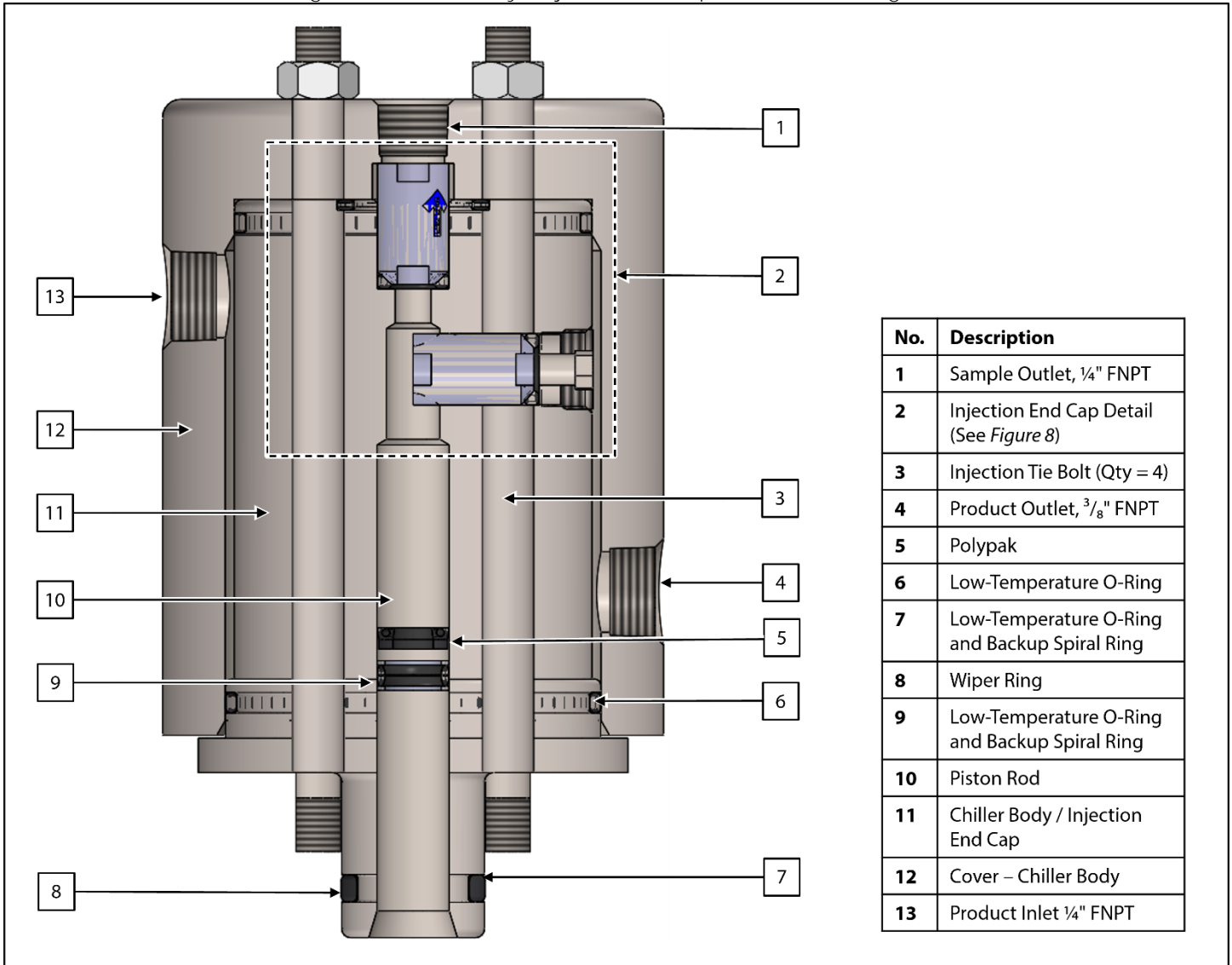
16. Loosen the lock collar and slide it away from the power piston (*Figure 10*). This will reveal the lock collar pin. Remove the pin and set it in a clean, safe place.
17. Unscrew the power piston from the piston rod, taking care not to scratch or damage the piston rod (*Figure 10*).
18. Pull the piston rod from the mid-section.
19. Remove the O-rings, backup, and wiper ring from the mid-section (*Figure 9*) and wipe the seal grooves clean.
20. Place new O-rings and backup in the mid-section.
21. Inspect the wiper ring for any damage. Replace as necessary.
22. Closely examine the honed surface of the power cylinder, because scratches or pits can cause the seals to leak. If scratches or pits are present, the unit might need to be repaired or replaced. Contact Welker® for service options.

Figure 10: Power Piston Detail Maintenance Diagram



23. Remove the U-cups from the power piston and wipe the seal grooves clean (*Figure 10*).
24. Place new U-cups on the power piston. The U-cups should be installed so that they face opposite directions.

Figure 11: Chiller Body / Injection End Cap Maintenance Diagram

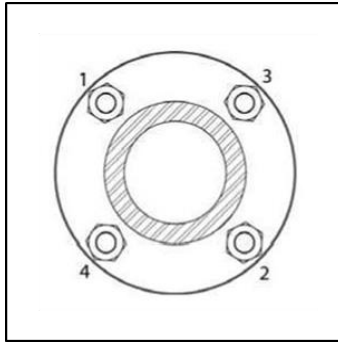


25. Remove the O-ring, backups, and PolyPak® from the power piston rod and wipe the seal grooves clean.
26. Remove the O-rings from the chiller body / injection end cap (Figure 5 and Figure 11) and wipe the seal grooves clean.
27. Place a new O-ring, backups, and PolyPak® on the power piston rod.
28. Place new O-rings on the chiller body / injection cap.
29. Closely examine the surface finish on the chiller body / injection end cap, because scratches or pits might cause the seals to leak. If scratches or pits are present, the unit might need to be repaired or replaced. Contact Welker® for service options.

## Reassembly

30. Install the cartridge check valves to the chiller body / injection end cap (*Figure 8*).
31. Fit the chiller body / injection end cap into the chiller body cover (*Figure 5*).
32. Slide the chiller body / injection end cap into the chiller body cover.
33. Gently push the chiller body cover until it seals with the chiller body / injection end cap.
34. Carefully slide the power cylinder base (i.e., mid-section) onto the injection assembly. Gently push the mid-section until it seals with the chiller body assembly.
35. Following a cross-bolting sequence, install the injection tie bolts through the body to the injection cylinder base, then tighten the four (4) injection hex nuts to 15–20 ft-lb with a torque wrench (*Figure 12*).

Figure 12: Cross-Bolting Sequence



36. Insert the piston rod through the mid-section.
37. Ensure that the piston rod is screwed into the power piston assembly and that the lock collar is tightened, with the lock collar pin in place.
38. Slide the power cylinder over the power piston and onto the mid-section. Gently push the power cylinder until it seals with the mid-section.
39. Gently push the power piston assembly with the power piston rod end first into the injection assembly until the power piston rests on the mid-section.
40. Gently push the power end cap into the power cylinder until it seals with the power cylinder.
41. Following a cross-bolting sequence, install the power tie bolts through the power end cap to the power cylinder base. Then tighten the three (3) power hex nuts to 10–15 ft-lb with a torque wrench (*Figure 12*). (One of the power tie bolts will include the indicator rod, which in turn is attached to the bumper pad.)
42. The inFlow™ Lite is now ready to follow the steps in the *Installation* section of this manual.

### 3.3 Troubleshooting Guidelines

Table 2: Welker® inFlow™ Lite Light Liquid Sample / Injection Pump Troubleshooting Guidelines		
Issues	Possible Causes	Solutions
The inFlow™ Lite is not collecting the correct sample volume.	The adjustment knob is not set correctly.	Loosen the jam nut on the adjustment rod. To increase the volume, turn the adjustment knob counterclockwise. To decrease the volume, turn the adjustment knob clockwise. Ensure that the jam nut is tightened to the thread seal prior to beginning operation. The pump will not operate correctly unless the jam nut is properly tightened. A leak test may be performed to verify that the jam nut has been properly tightened.
Product is not flowing through the inFlow™ Lite.	When part of a system, the inFlow™ Lite will have valves on the inlet and outlet ports. The inFlow™ Lite sample pump inlet valve and sample pump outlet valve might not be open.	Ensure that sample pump inlet valve and sample pump outlet valve are open.
The inFlow™ Lite is not actuating properly.	When part of a system, the inFlow™ Lite will be connected to a solenoid that is connected to a pneumatic supply. The pneumatic supply might be too low or not operating.  The solenoid might not be operating properly.	Inspect the pneumatic supply to ensure that air is supplied at the appropriate pressure.  Check the solenoid using the manual override button to ensure proper operation. If operating improperly, refer to the <i>Installation, Operation, and Maintenance (IOM) Manual</i> for the solenoid. Ensure that the mufflers on the solenoid exhaust ports are stainless steel, because other materials might corrode and prevent the solenoid from operating properly.

## APPENDIX: REFERENCED OR ATTACHED DOCUMENTS

Welker® *Installation, Operation, and Maintenance (IOM) Manuals* suggested for reference or for use with this unit:

- IOM-011: Welker® Constant Pressure Cylinders With Tracker Tube (Non-Mixer)—Models CP-2G, CP-5G, CP-2G With Premium Purge
- IOM-012: Welker® Constant Pressure Cylinder—High Pressure—Models CP-2HP and CP-5HP
- IOM-013: Welker® Constant Pressure Cylinders With Tracker Tube and Gravity Mixer—Models CP2GM and CP5GM
- IOM-014: Welker® Constant Pressure Cylinder With Welker® Magnetic Indicator (With Gravity Mixer)—Model CP2GM-HP
- IOM-033: Welker® Relief Valve—Models RV-1, RV-2, RV-2CP, RV-3
- IOM-063: Welker® Constant Pressure Cylinders With Welker® Solid Indicator, Syringe T-Handle, or Vortex Mixer—Models CP2SI, CP5SI, CP52SY, CP5SY, CP35SY, CP2M, CP5M, CP35M
- IOM-105: Welker® NV-1 and NV-2 Instrument Valves
- IOM-115: Welker® Constant Pressure Cylinders—High Pressure With Welker® Solid Indicator, T-Handle, and Vortex Mixer—Model CP2M-HP
- IOM-P319: Welker® Light Liquid Sampling System—Part LIQFEF0Q00026017

Other *Installation, Operation, and Maintenance (IOM) Manuals* suggested for reference or for use with this unit:

- Kepner Products Company Kepsel® Cartridge Insert Valves (Welker® IOM-V078)

Welker® drawings and schematics suggested for reference or for use with this unit:

- Assembly Drawing: AD243EJ (inFlow™ Lite Light Liquid Sampler / Injection Pump, Low-Temperature, Fast-Loop Configuration)



