



INNOVATION. **PRECISION.** EXCELLENCE.

SPP
Servo Piston Pump Manual
Revision B

Precision Valve & Automation
6 Corporate Drive
Halfmoon, NY 12065





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1. Introduction

Before you operate this system, read the operation and setup manual. This will help you to become familiar with the product and ensure successful operation.

If any questions or problems arise, contact PVA's Technical Support department.

1.1 PVA Contact Information

Main Office

PVA

6 Corporate Drive

Halfmoon, NY 12065

Tel +1-518-371-2684

Fax +1-518-371-2688

Website: <http://www.pva.net>

Email: info@pva.net

Technical Support

Tel +1-844-734-0209

Email: cs@pva.net

1.2 Document History

Revision	Revision Date	Reason for Changes
REV B	December 2022	Dispense Volume Change
REV A	April 2021	Initial Release

Note: All photographs and CAD model representations in this document are a "general representation" of the system and its components. The actual appearance of the system and its components can differ based upon customer specific configuration.

1.1 Safety

Certain warning symbols are affixed to the machine and correspond to notations in this manual. Before operating the system, identify these warning labels and read the notices described below. Not all labels may be used on any specific system.



Always wear approved safety glasses when you operate or work near the workcell.



Before you operate the system, read and understand the manuals provided with the unit.



Never put hands or tools in areas with this symbol when the machine is in operation. A dangerous condition may exist.



Read and understand the manuals provided with the unit before any repairs or maintenance is done. Only a qualified individual should do service.



Use caution when there are pressurized vessels. Find and repair any leaks immediately. Always wear appropriate safety equipment when you work with pressurized vessels or vessels that contain chemicals



Shear hazard from moving parts. Avoid contact.



Do not remove protective guarding.



In situations where inattention could cause either personal injury or damage to equipment, a warning notice is used.



Do not smoke near the machine. Always have a fire extinguisher available for emergency use.



Before performing any repairs or maintenance to the system, turn off power and lock out the power disconnect switch.



Warning notices are used to emphasize that hazardous voltages, current, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use. Only qualified personnel should enter areas designated with this symbol.



Laser light source present. Do not stare directly into the beam. Do not use in the presence of highly reflective surfaces



Pinch hazard from moving parts. Avoid contact.



Hot surface. Avoid contact.



Warning, Ultraviolet (UV) light hazard. Do not look directly at the UV light source.



This product meets EU standards for health, safety, and environmental protection.



Warning, no open flames.



Electrostatic sensitive device warning. Observe precautions for handling.

1.2 System Description

PVA's SPP Servo Piston Pump system is the ideal choice for precise metered dispensing of heavily filled and abrasive materials. The SPP's piston displacement design is equipped with a tungsten carbide sleeve that provides a zero dead space shot meter and long service life under adverse conditions.

An inert barrier fluid provides no contact with the atmosphere, keeping seals lubricated and free from material crystallization. The SPP system is perfect for moisture sensitive fluids like isocyanate urethanes.

Via a menu-driven HMI, the closed loop servo drives enable the programming of several functions including shot size, mix ratio, flow rate, pressure control, recirculation, and auto purge.

2. Maintenance

2.1 Remove the Pump

Prior to removing the pump, it is important to relieve all pressure in the lines. This will ensure a safe and cleanly removal of the pump.

1. Disable the pump.

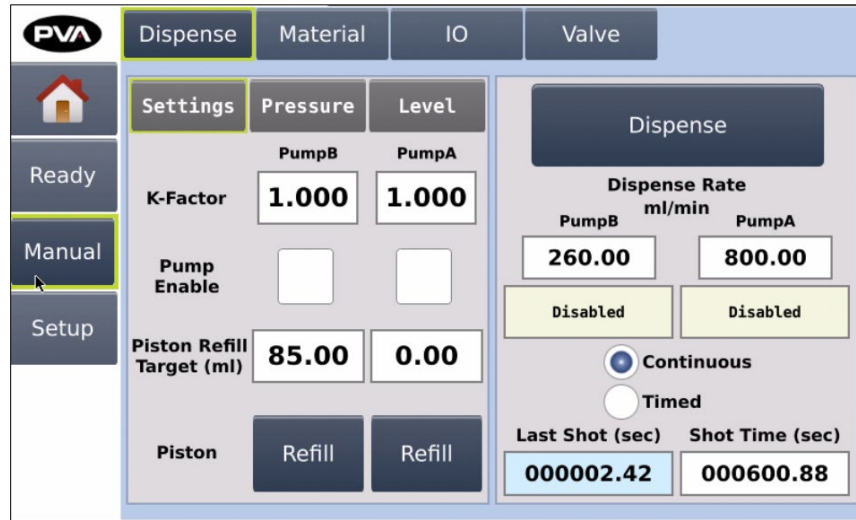


Figure 1: Disable Pump

2. Enable the valve.

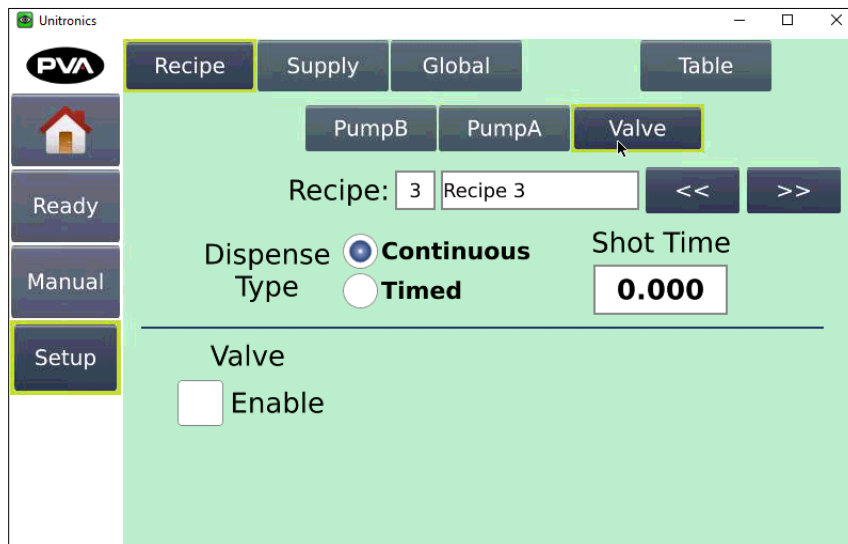


Figure 2: Enable Valve

3. Select the **Dispense** button.

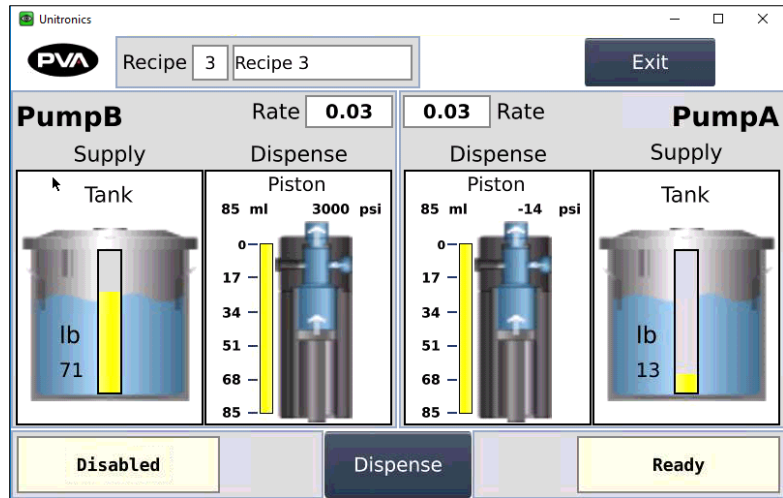


Figure 3: Dispense

4. Turn the pressure off on the tank.

Note: The main air must be turned off.



Figure 4: Turn Main Air Off

5. Remove the hoses from the top and side of the SPP.

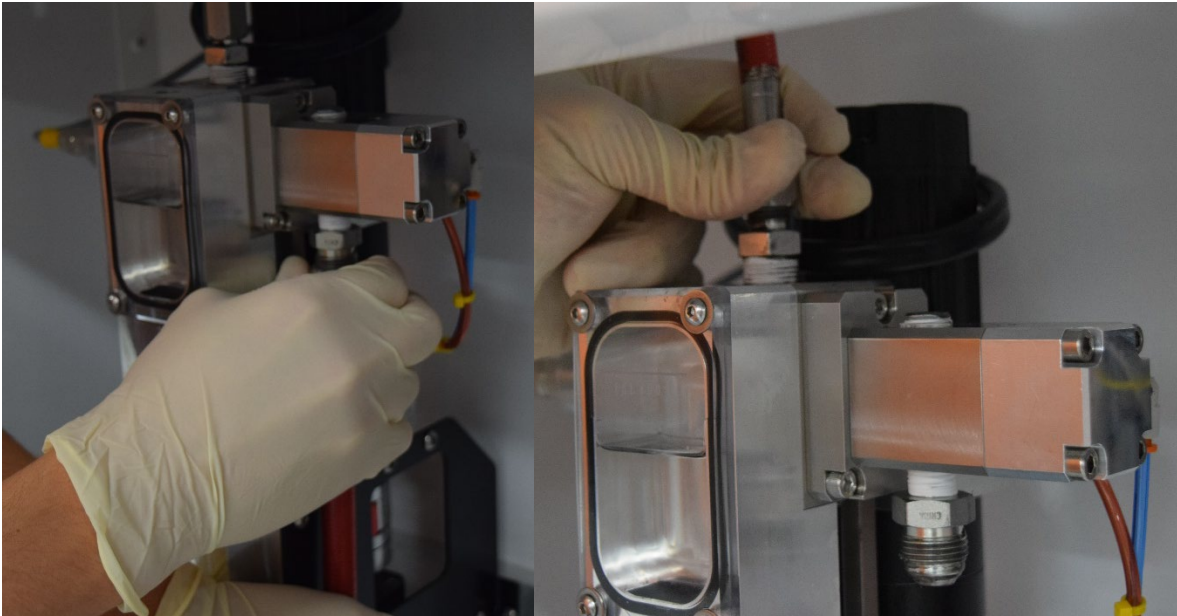


Figure 5: Remove Hoses from SPP

6. Disconnect the power transducer cable.



Figure 6: Disconnect Power Transducer Cable

7. Remove all airlines.

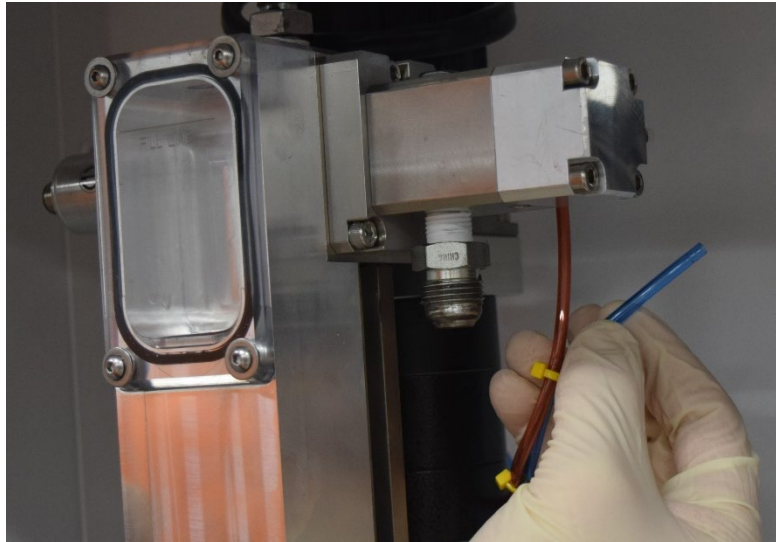


Figure 7: Remove Air Lines

8. Use a 3 mm hex key to remove the two front screws on both sides of the SPP.

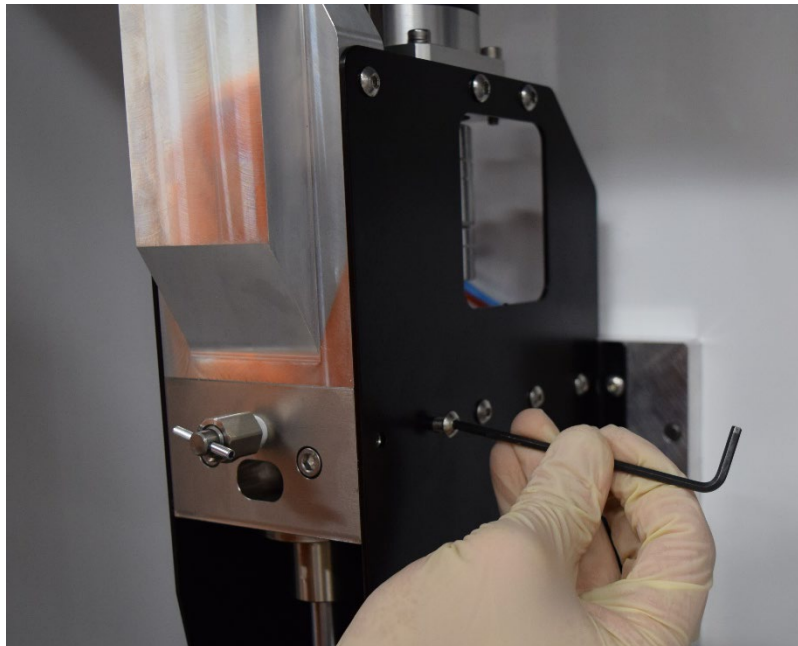


Figure 8: Remove Front Screws

9. Use a 5 mm hex key to remove the M6 bolts from the front of the SPP.

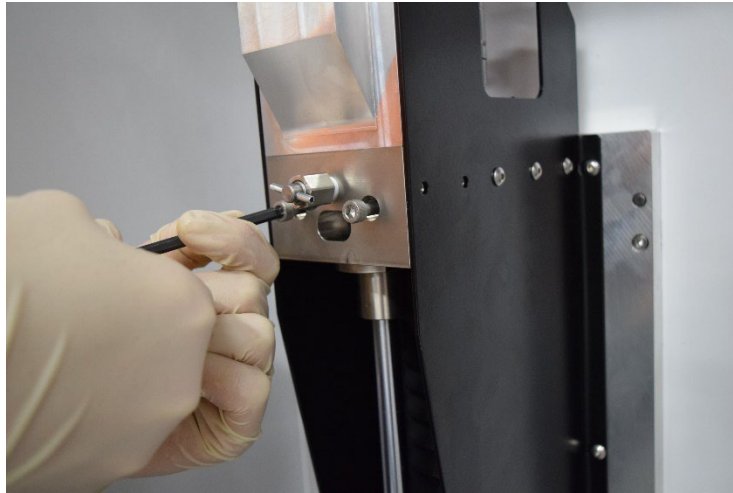


Figure 9: Remove Front Bolts

10. Remove the SPP from the Endurance cart.



Figure 10: Remove SPP from Endurance

2.2 Pump Maintenance

1. Push the metering rod to discard the excess material.



Figure 11: Push Rod to Discard Material

2. Use a 6 mm hex key to remove the four M6 screws from the upper manifold block.



Figure 12: Remove Screws from Upper Manifold Block

3. Separate the sleeve rod assembly.



Figure 13: Separate Sleeve Rod Assembly

4. Remove the piston from the sleeve.



Figure 14: Remove Piston from Sleeve

5. Place an adjustable wrench on the flat part of the piston.
6. Use a flathead screwdriver to turn the screw counterclockwise and remove the lip seal screw.



Figure 15: Remove Lip Seal Screw

7. Remove the wear ring from the wear ring groove.



Figure 16: Remove Wear Ring

8. Remove the seal from the piston assembly.



Figure 17: Remove Seal

9. Install the new seal on the piston assembly.
10. Install the wear ring groove on the piston assembly. Ensure that the chamfer is facing down.



Figure 18: Install Wear Ring Groove

11. Install the wear ring onto the wear ring groove.



Figure 19: Install Wear Ring

12. Reattach the piston assembly to the rod.

13. Use a 4 mm hex key to remove the M5 socket head cap screws.



Figure 20: Remove M5 Socket Head Cap Screws

14. Use a 4 mm hex key to remove the four M5 screws. Remove the seal plate.



Figure 21: Remove Screws and Seal Plate

15. Remove the o-rings and clean the material with a cotton tipped applicator.



Figure 22: Remove O-Rings and Clean

16. Replace the o-rings.

17. Use a 4 mm hex key to remove the air cap.



Figure 23: Remove Air Cap

18. Remove the seal spacer.

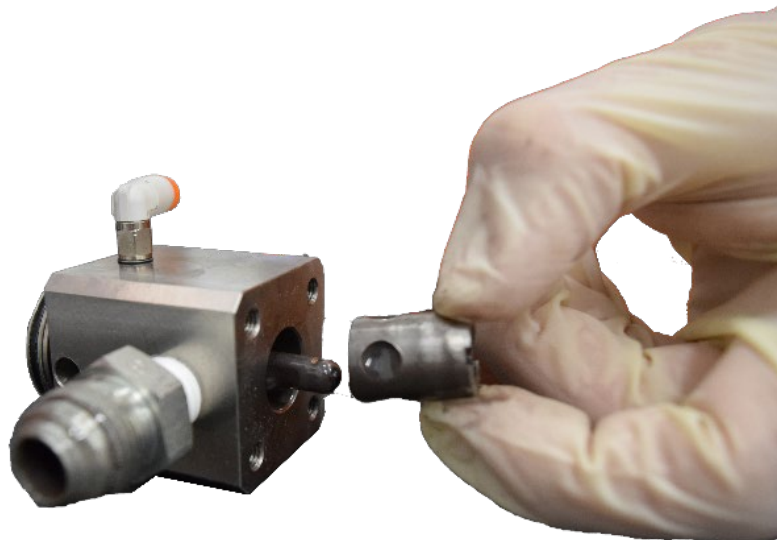


Figure 24: Remove Seal Spacer

19. Place the wrench around the sealing rod and use a 2.5 mm hex key to remove the air cap entry screw.



Figure 25: Remove Air Cap Entry Screw

20. Remove the rod and clean with a cotton tipped applicator.



Figure 26: Remove Rod and Clean

21. Remove the old seals and replace with new seals supplied in spare parts kit.

Note: Reference the FCC150 Manual for full seal replacement instructions.

22. Install the seal spacer in the orientation shown in the picture below.



Figure 27: Install Seal Spacer

23. Replace the air cap, install the spring (replace if needed), attach the air cap and install the screws.



24. Install the valve assembly over the air cap assembly.



25. Install the screws onto the air cap using a 4 mm hex key.

26. Use a hex key to remove the linear bearing.



Figure 28: Remove Linear Bearing

27. Remove the retaining washer.

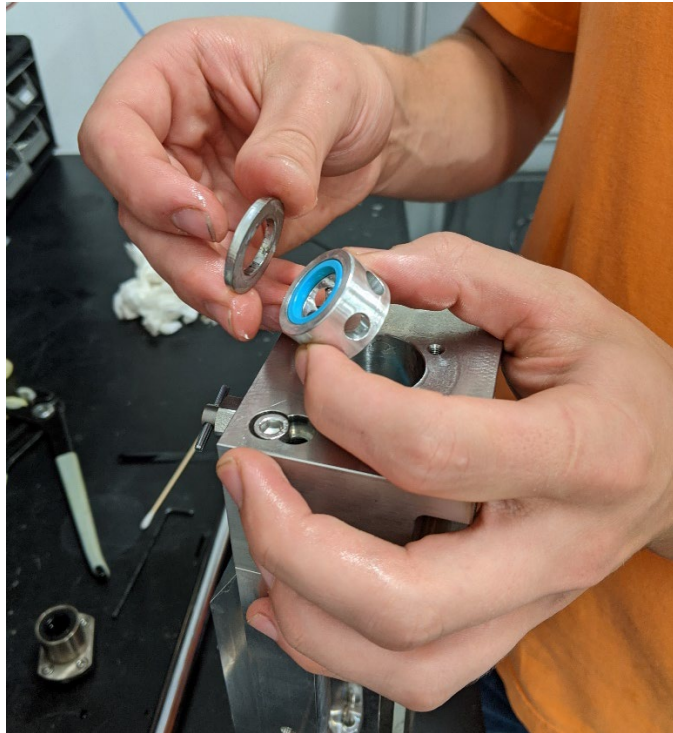


Figure 29: Remove Retaining Washer

28. Remove the lubricating fluid seal insert and two seals.

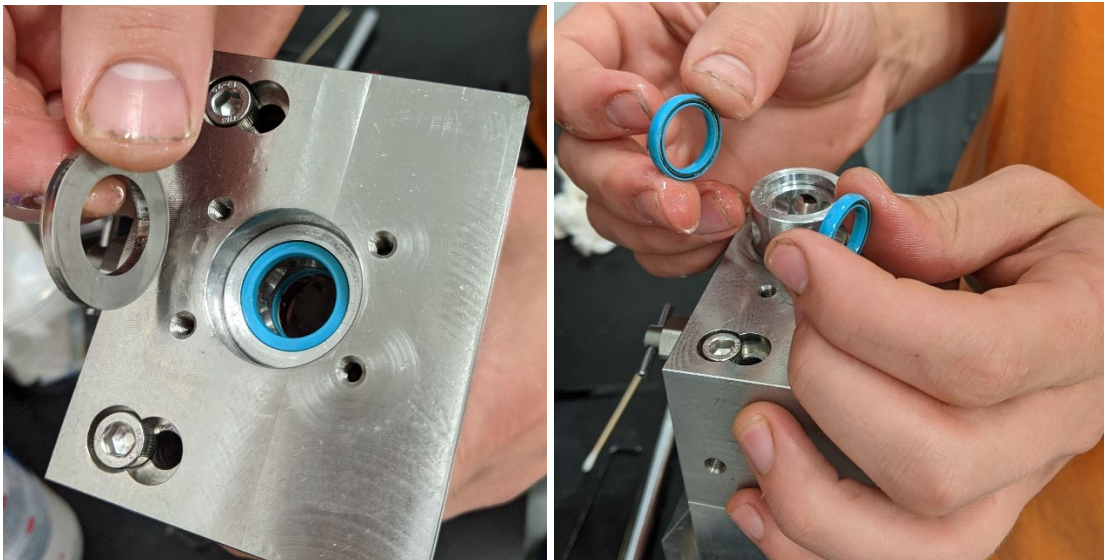


Figure 30: Remove Seal Insert and Seals

29. Replace the seals.

30. Reinstall the removed parts in the following order:

- Seal 1
- Seal Insert
- Seal 2
- Retaining Washer.

31. Reinstall the linear bearing.

32. Replace the o-ring. Ensure an o-ring is installed on each retaining end of the carbide sleeve.



Figure 31: Replace O-Ring

33. Install the sleeve.

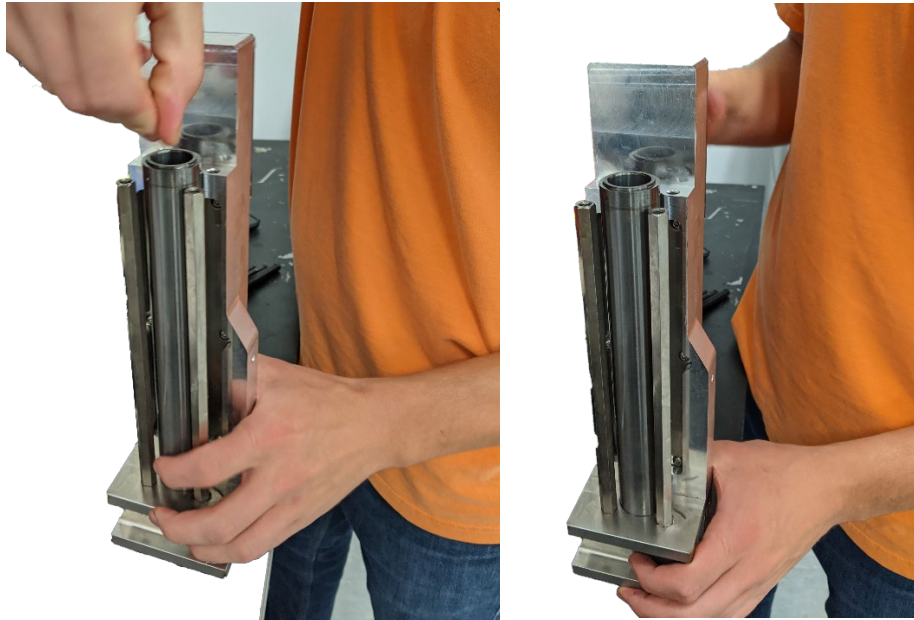


Figure 32: Install Sleeve

34. Install the metering piston into the sleeve. Be sure to carefully install the piston so that the wear ring and sleeve are undamaged.



Figure 33: Install Piston

35. Push the metering sleeve through the bottom of the metering body.

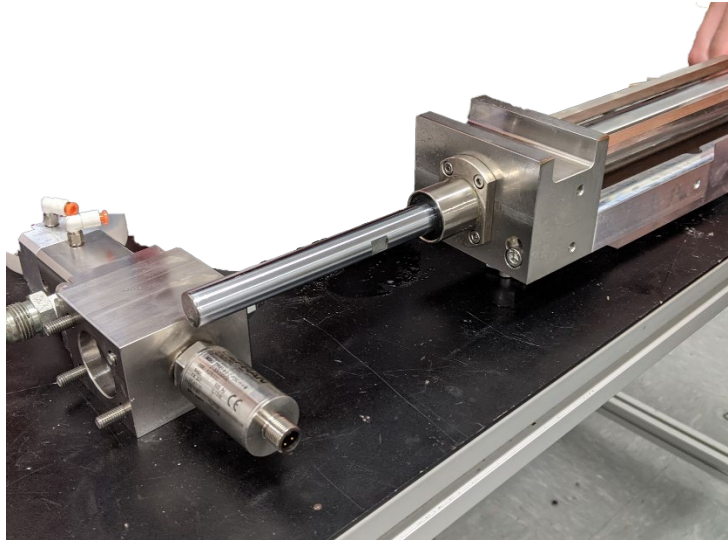


Figure 34: Push Metering Sleeve

36. Reattach the upper manifold block.

37. Install the four M6 screws using a 6 mm hex key.



Figure 35: Install Upper Manifold Block

2.3 Install Pump

1. Reinstall the SPP on the Endurance. Use a 5 mm hex key to reinstall the M6 bolts to the front of the pump.



Figure 36: Install SPP on Endurance

2. Use a 3 mm hex key to install the two front screws on both sides of the SPP.

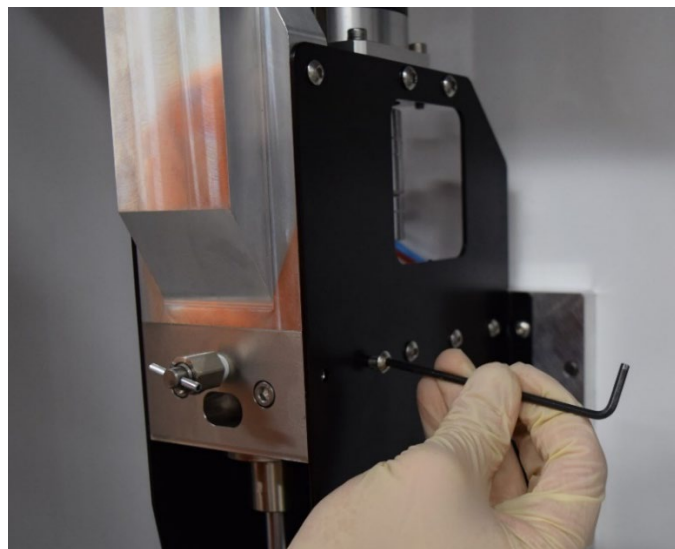


Figure 37: Install Front Screws

3. Add throat seal lubricant to the marked fill line.



Figure 38: Add Material to Fill Line

4. Reattach the hoses to the top and side of the SPP.

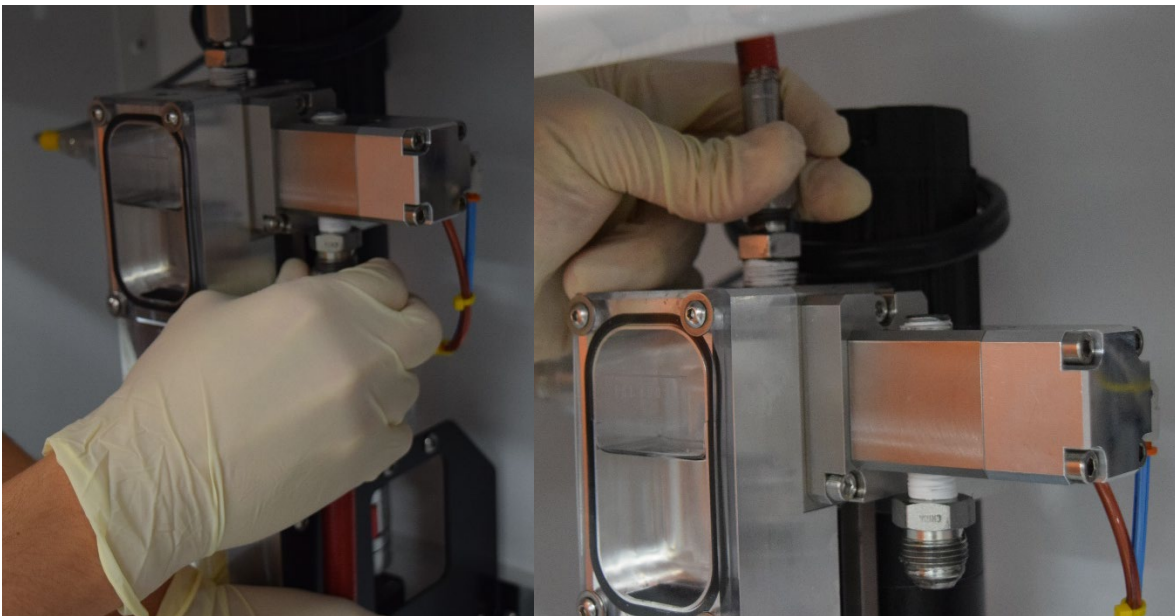


Figure 39: Attach Hoses to SPP

5. Reconnect the power transducer cable.



Figure 40: Reconnect Power Transducer Cable

6. Reconnect all airlines.

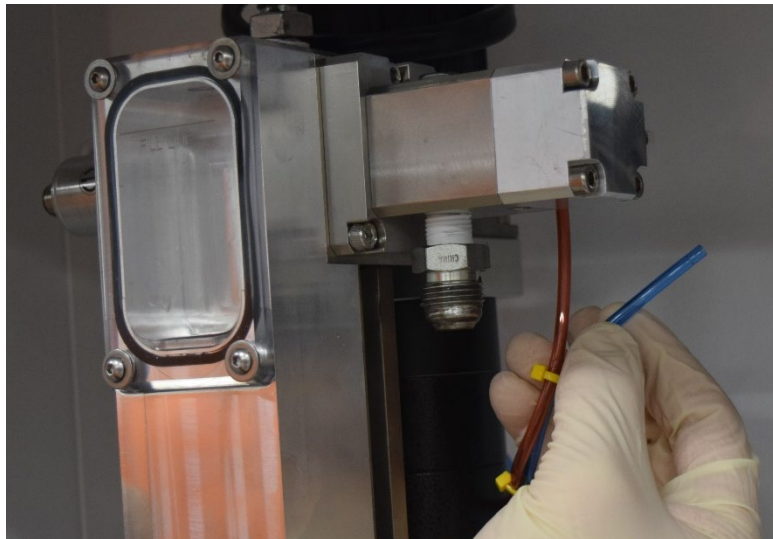


Figure 41: Connect Air Lines

3. Technical Specifications

3.1 Shot Volume

3.1.1 Single Component

- **Minimum:** 0.1 ml
- **Maximum:** 80 ml

3.1.2 Dual Component

- **Minimum:** 0.2 ml
- **Maximum:** 160 ml

***Based on 1:1 Ratio**

3.2 Flow Rate

3.2.1 Single Component

- **Minimum:** 1 ml/min
- **Maximum:** 600 ml/min

3.2.2 Dual Component

- **Minimum:** 2 ml/min
- **Maximum:** 1200 ml/min

***Based on 1:1 Ratio**

3.3 Two Component Mix Ratio

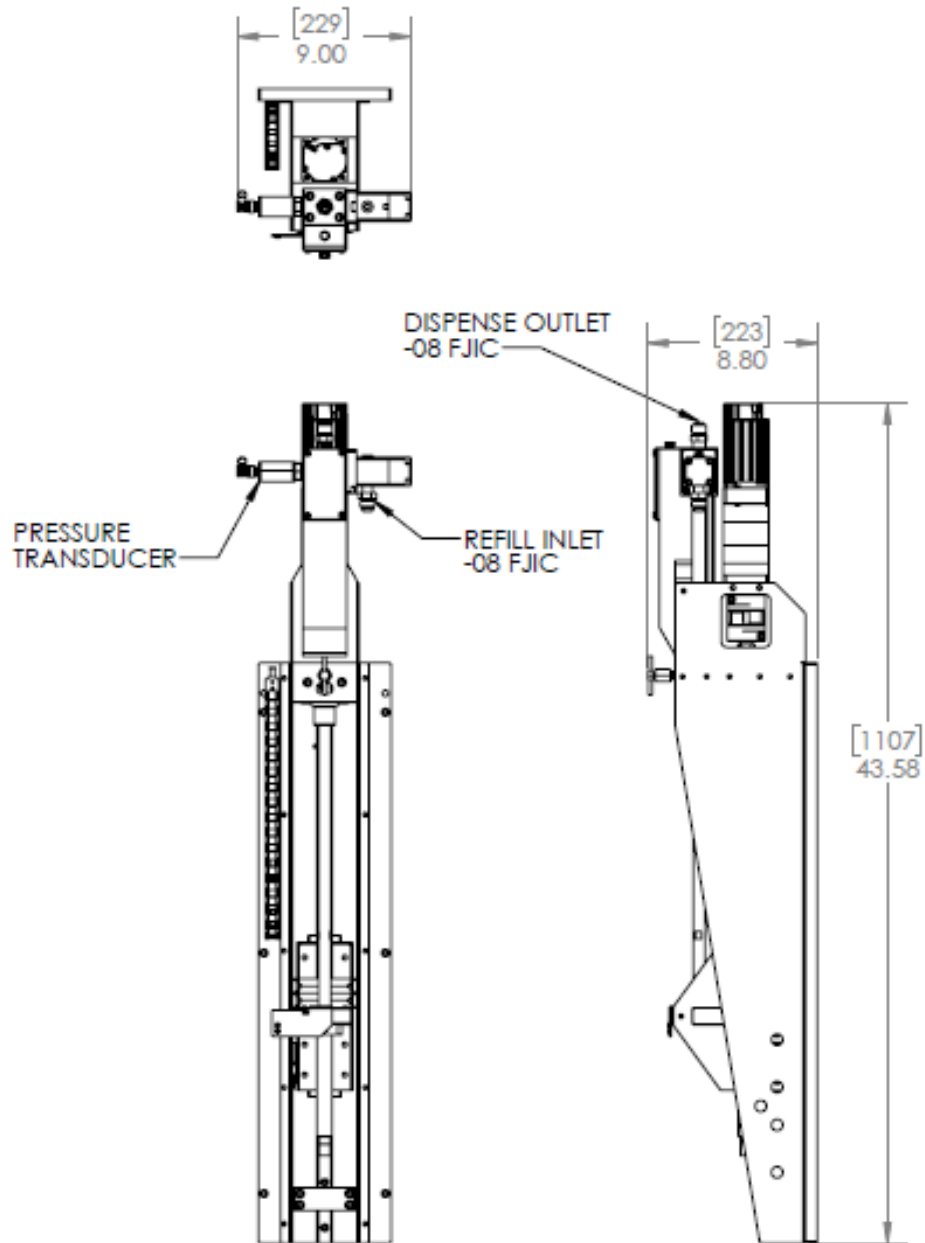
The two-component mix ratio is 1:1 - 15:1.

***For mix ratios exceeding 10:1, please consult PVA Sales Engineering.**

3.4 Maximum Pressure

The maximum pressure is 2500 psi.

4. Drawings



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6. Notes



7. Warranty

PVA Warranty Policy

PVA warrants the enclosed product against defects in material or workmanship on all components for one year from the date of shipment.

The warranty does not extend to components damaged due to misuse, negligence, or installation and operation that are not in accordance with the recommended factory instructions. Unauthorized repair or modification of the enclosed product, and/or the use of spare parts not directly obtained from PVA (or from factory authorized dealers) will void all warranties.

All PVA warranties extend only to the original purchaser. Third party warranty claims will not be honored at any time.

Prior to returning a product for a warranty claim, a return authorization must be obtained from PVA's Technical Support department. Authorization will be issued either via the telephone, facsimile, or in writing upon your request.

To qualify as a valid warranty claim, the defective product must be returned to the factory during the warranty period. Upon return, PVA will repair (or replace) all components found to be defective in material or workmanship.

(Retain this for your records)

Product Information:

PRODUCT: _____

SERIAL NUMBER: _____

DATE OF PURCHASE: _____