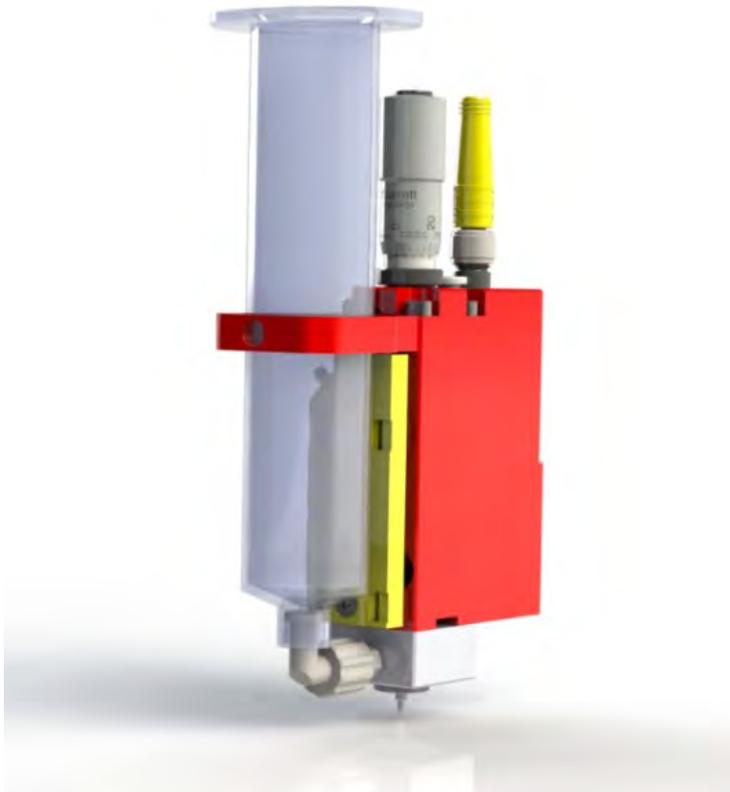




**WHERE  
PRECISION  
DRIVES  
PRODUCTION**



# **SJ100**

## **OWNER'S MANUAL**

**Revision C**

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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

<b>Main Office</b>	<b>PVA</b> <b>Six Corporate Drive</b> <b>Halfmoon, NY 12065</b> <b>Tel +1-518-371-2684</b> <b>Fax +1-518-371-2688</b> <b>Website <a href="http://www.pva.net">http://www.pva.net</a></b> <b>Email <a href="mailto:info@pva.net">info@pva.net</a></b>
<b>Technical Support</b>	<b>Tel +1-844-734-0209</b> <b>Email <a href="mailto:cs@pva.net">cs@pva.net</a></b>

## 1.2 Document History

Revision	Revision Date	Reason for Changes
Revision A	November 2017	Initial Release
Revision B	August 2018	Dwell Time Corrected
Revision C	September 2019	Operating Air Pressure Updated

***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.***

## 1.3 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*



*Pinch hazard from moving parts. Avoid contact.*



*Do not remove protective guarding.*

## 1.4 Theory of Operation

The SJ100 valve is a non-contact dispense valve that applies small shots of fluid as individual dots or in rapid succession. Only three components come in contact with fluid: the fluid body, needle, and nozzle. With this design you can dispense at speeds up to 140Hz. The SJ100 is designed to dispense coatings and other low viscosity materials with very fine control.

## 1.5 Personal Protective Equipment

Operators must use eye protection because material contents are under pressure. Always wear gloves when handling materials and solvents. Refer to MSDS sheets on the material being dispensed for other precautions.

## 1.6 Waste Disposal

Dispose of all used parts and materials in accordance with local laws and regulations.

## 2.Setup

Before you operate the valve, know the valve components. Do the steps instructed below for safe and correct operation.

### 2.1 Overview

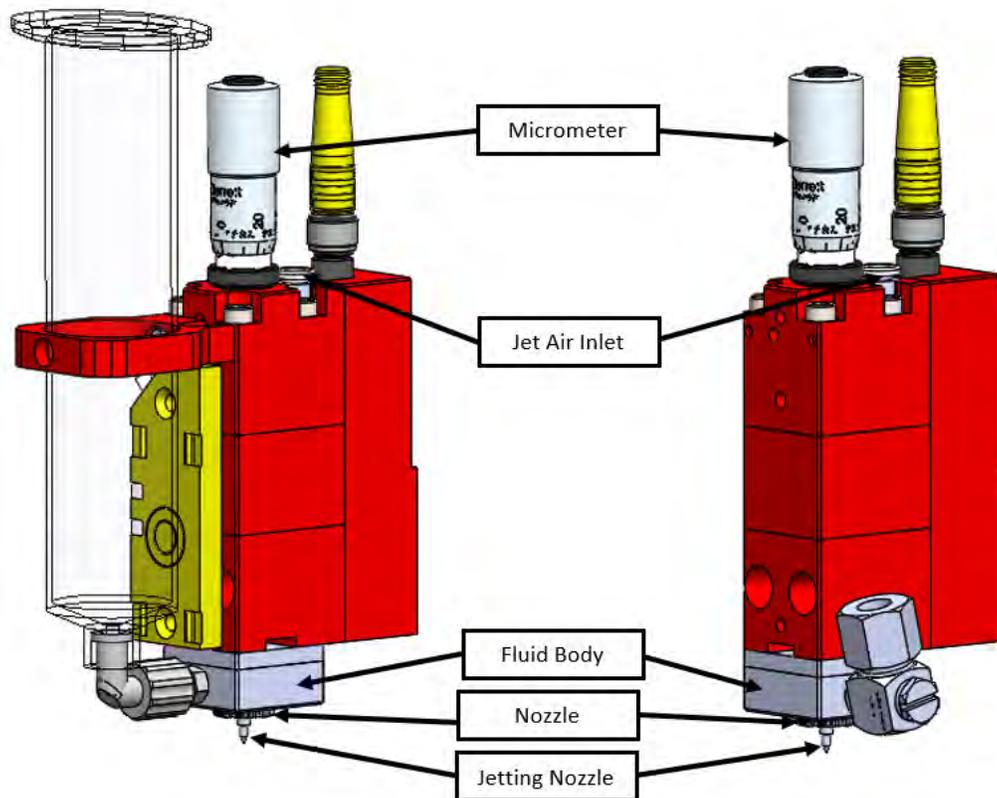


Figure 1: Pump Components

## 3. Operation

**NOTE:** Refer to Section 6 for part reference numbers.

**NOTE:** Use only compatible solvents and materials or the seals and O-rings will be damaged.

### 3.1 Install Jet nozzle

1. Use Portal to set the jet valve to “Open” or set the air pressure to 0 psi.
2. Turn the nozzle retaining cap counterclockwise to remove it.

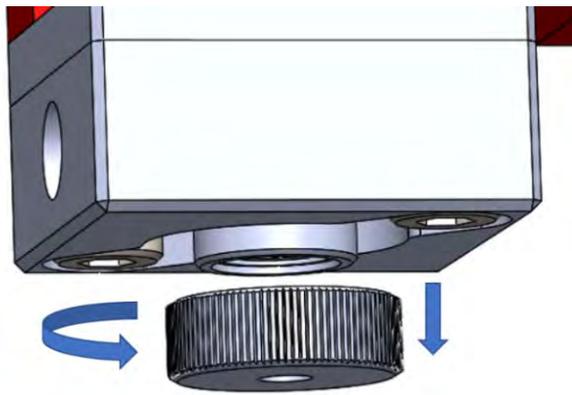


Figure 2: Remove the Retaining Cap

3. Install the jetting nozzle.

**NOTE:** Make sure the nozzle O-ring is installed on nozzle.



Figure 3: Jetting Nozzle with O-ring

4. Push the nozzle retaining cap up over the jetting nozzle and turn it clockwise to install the nozzle.

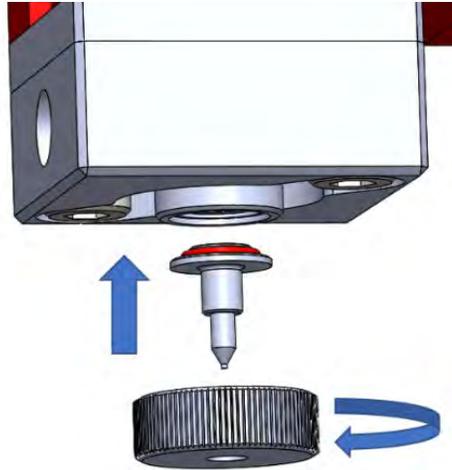


Figure 4: Install the Nozzle

5. Use Portal to set the jet valve to “Close” or increase the jet pressure.

### 3.2 Set the Valve Stroke

Do the procedure below to adjust the micrometer and set the valve stroke as necessary.

1. Turn the micrometer counterclockwise to increase the valve stroke.
2. Turn the micrometer clockwise to decrease the valve stroke.

***NOTE: A larger valve stroke will result in larger dot sizes. Nominal valve stroke is recommended at 0.01” but will be material and application dependent.***

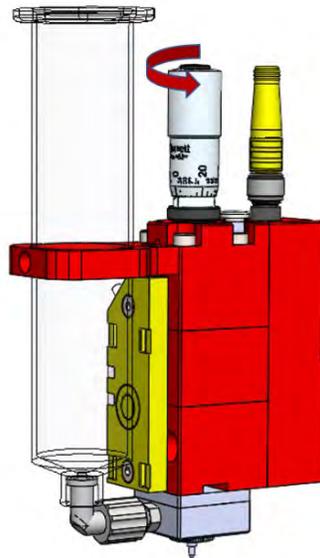


Figure 5: Micrometer

### 3.3 Prime the Valve

1. Connect the material syringe or the material line.
2. Make sure the material supply pressure is on or set to “SUP”.
3. Set the material supply pressure to 5 psi.
4. Examine the fluid reservoir, connections, and valve for leaks.

### 3.4 Set Fluid Pressure

1. Use Portal to set the valve to open.
2. Start at 5 psi and increase the fluid pressure until a steady stream or a continuous flow of dots exits the nozzle. Fluids react differently, some may curl up or pool at the nozzle outlet.
3. Once the necessary flow is achieved, use Portal to close the valve.

### 3.5 Set Jet Pressure

Jet pressure is the force that pushes the fluid out of the jet when it is dispensed. Too little jet pressure, and the fluid will not leave the nozzle completely and accumulate on the nozzle. Too much jet pressure, and the fluid will have satellites or splatter when it hits the surface of the product. The jet pressure must be set between 45-65 psi to work correctly.

1. Set the operating air pressure at 45 psi to start.
2. Dispense the material and examine the nozzle and surface that was dispensed on for buildup, splatter, or satellites.
3. Adjust the jet pressure until the results are correct.

**NOTE:** *The maximum jet pressure is 65 psi.*

### 3.6 Shutdown

- Release the pressure in the system, refer to the workcell manual for additional information.

### 3.7 Cleaning Procedure

1. Reduce the material pressure to 0 psi.
2. Reduce the jet pressure to 0 psi.
3. Remove the material fitting.
4. Remove the nozzle retainer.
5. Remove the nozzle.
6. Remove the two screws securing fluid body.
7. Remove the fluid body.
8. Clean the end of the jetting needle with a recommended solvent.
9. Clean the removed wetted components with a recommended solvent.
10. Examine the needle and the O-rings for damage.
11. Replace any damaged components.

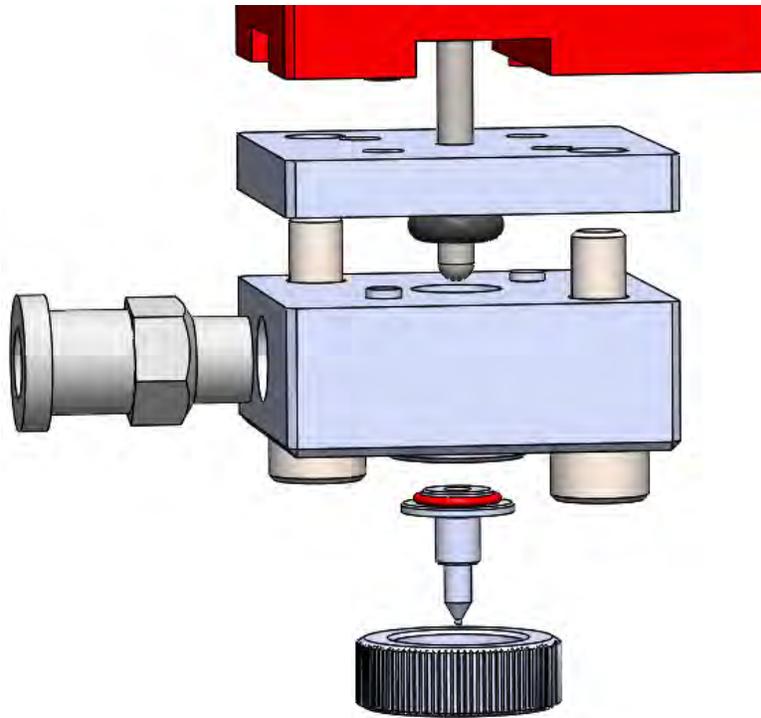


Figure 6: Disassemble the Valve

## 4. Maintenance

Interval	Action
Daily	<ul style="list-style-type: none"><li>• Examine the material outlets for contamination and cured material.</li></ul>
Weekly	<ul style="list-style-type: none"><li>• Examine the material containers or cartridges for signs of cured or dried material.</li></ul>
Shutdown	<ul style="list-style-type: none"><li>• Flush or clean the system.</li><li>• Clean or replace the nozzle plate, diaphragm, and feed tube.</li></ul>

### 4.1 Flush the System

1. Supply the valve with the recommended solvent.
2. Increase the material pressure.
3. Make sure the solvent is dispensed in a purge cup, and dispense 250 drops. Do this 5-6 times until the solvent is clear.
4. Turn off the material pressure.
5. Remove the solvent supply.
6. Remove and clean the jetting nozzle and the fluid body.
7. Clean the jetting needle.
8. Reassemble the valve.

## 5. How to Use the Valve with Portal

If your valve is on a workcell that has PVA Portal, use the screens that follow to operate the valve. Refer to the Portal manual for more information.

**NOTE:** Titles for the valve specific settings may say Jetter, JDX or SJ100. In this manual they will be shown as JDX.

**NOTE:** Screens may differ based on customer specific configuration.

The gauges that are related to the jet valve can be seen in any mode. Select the **Gauges** tab in the Systems tab section of the screen, the **(#1) Pressure, Material Syringe** pressure and **Vacuum Pressure** gauges are related to the jet valve.

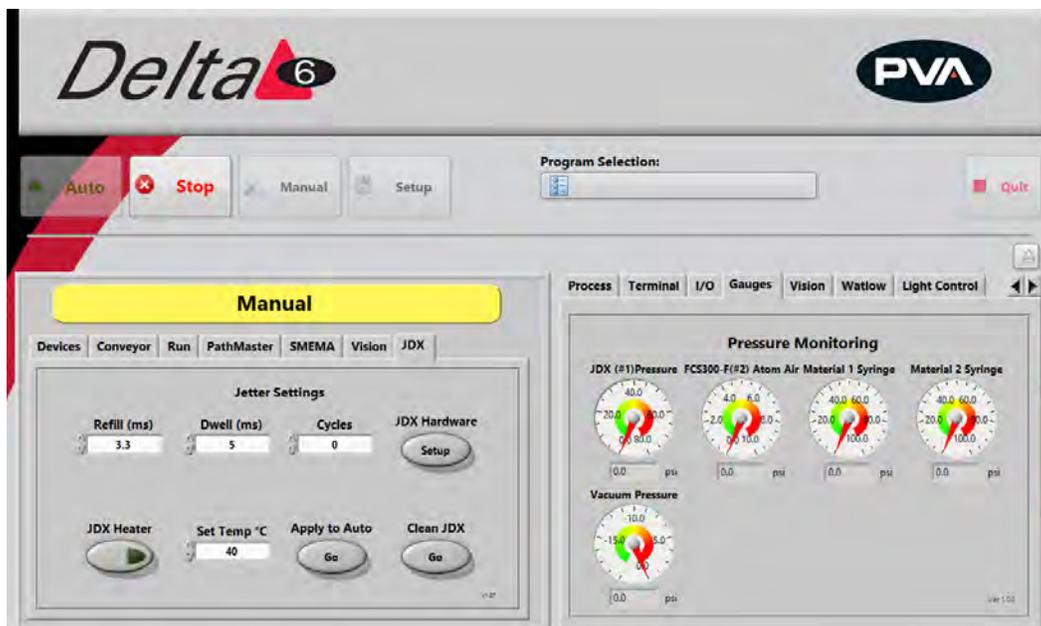


Figure 7: Example Jetter Gauges

## 5.1 Setup Mode

The settings that are used in Auto Cycle can be changed in Setup mode, as shown below.

1. Select Setup mode.
2. Select the **Setup Tree** tab.

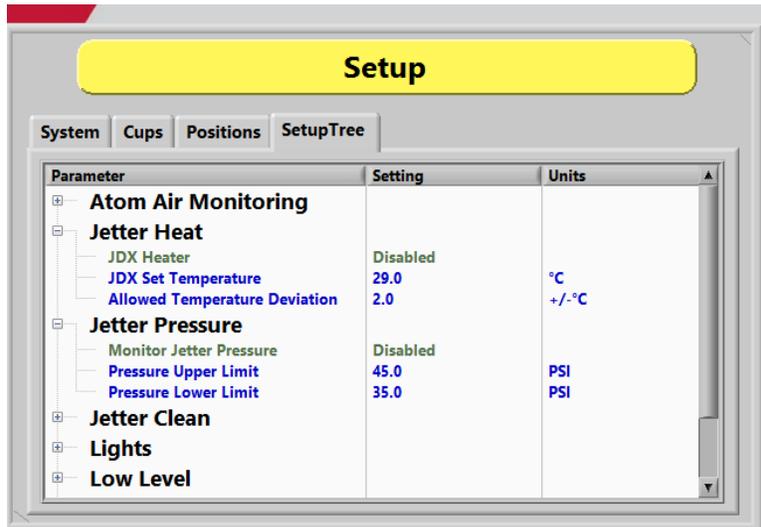


Figure 8: Setup Tree Tab

3. Select the + symbol next to a Parameter to expand the setup tree. Expanded options are in color.

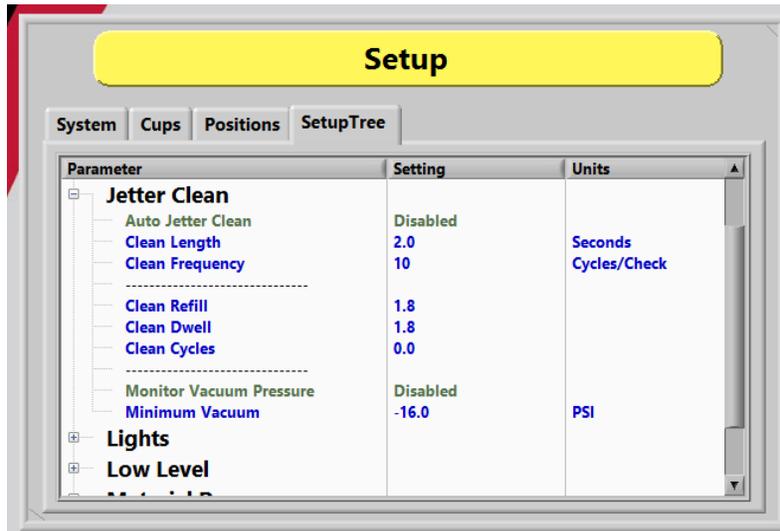


Figure 9: Clean Settings

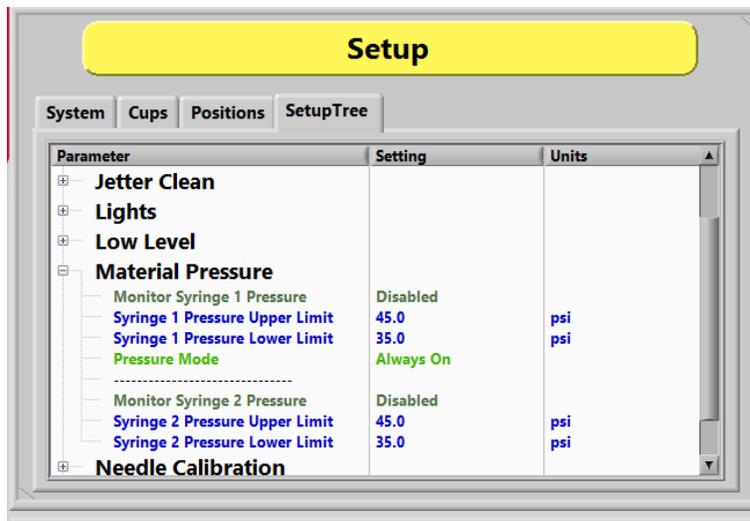


Figure 10: Pressure Settings

4. Double click on any parameter to open an edit window. Select the button to enable or disable an option. To adjust a value, use the arrows or type the value in the value box shown.
5. Select "Done" to keep the change or "Cancel" to exit without making any changes.

***NOTE: Most settings for the Jet Valve are set with the PVA Jet Valve Controller.***

## 5.2 Valve Positions

1. Select the **Positions** tab from Setup mode.
2. Select the necessary position from the menu.
3. Select the **Teach “Go”** button.
4. A message will be shown on the screen and the teach pendant **Teach** light will come on. Use the teach pendant to move the valve to the necessary position, and select the **“Teach”** button. The location for the selected position will be set.

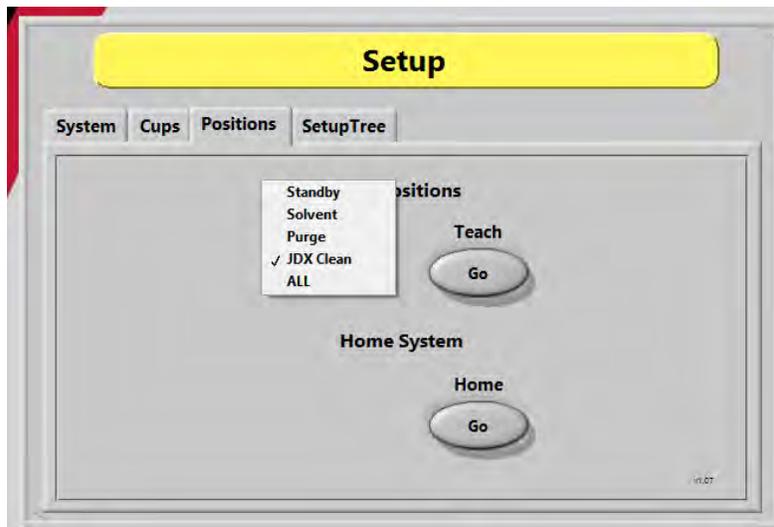


Figure 11: Clean Positions

5. Select the **Home “Go”** button to home the workcell.

## 5.3 Select a Recipe

To operate the valve in Manual mode, do the steps below.

1. Select Manual mode.
2. Select the **JDX** tab.
3. Use the up and down arrows to increase or decrease the value for the necessary valve parameter (Refill, Dwell, Cycles).
4. Select the **JDX Hardware “Setup”** button to set the valve to open for disassembly or service. The screen will show a message about the valve.

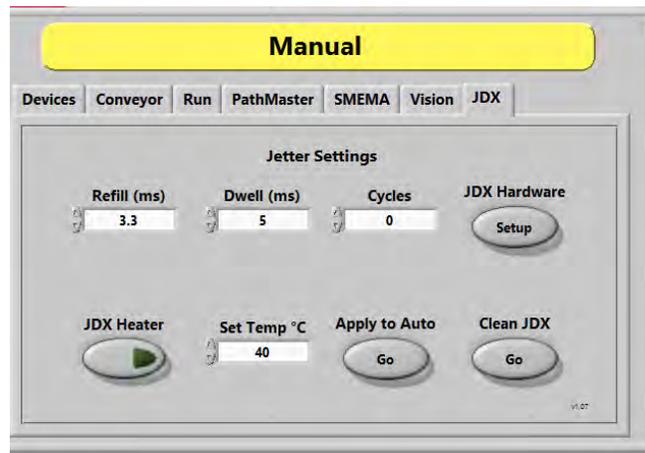


Figure 12: Manual Mode, Jetter Tab

**NOTE:** *These settings and changes apply only in Manual mode, unless you select the Apply to Auto “Go” button.*

5. The parameters shown will be used when the “**Purge**” button on the teach pendant is used, or when the valve is operated in the **Run** tab.
6. Select **Apply to Auto “Go”** to set all the values and settings shown on this page for Auto Cycle for the selected program.
7. Select the **Clean JDX “Go”** button to move the valve to the vacuum cup.

## 5.4 PathMaster

Below is an example screen with a path template for the jet valve. Refer to the PathMaster manual for more information on how to create path programs.

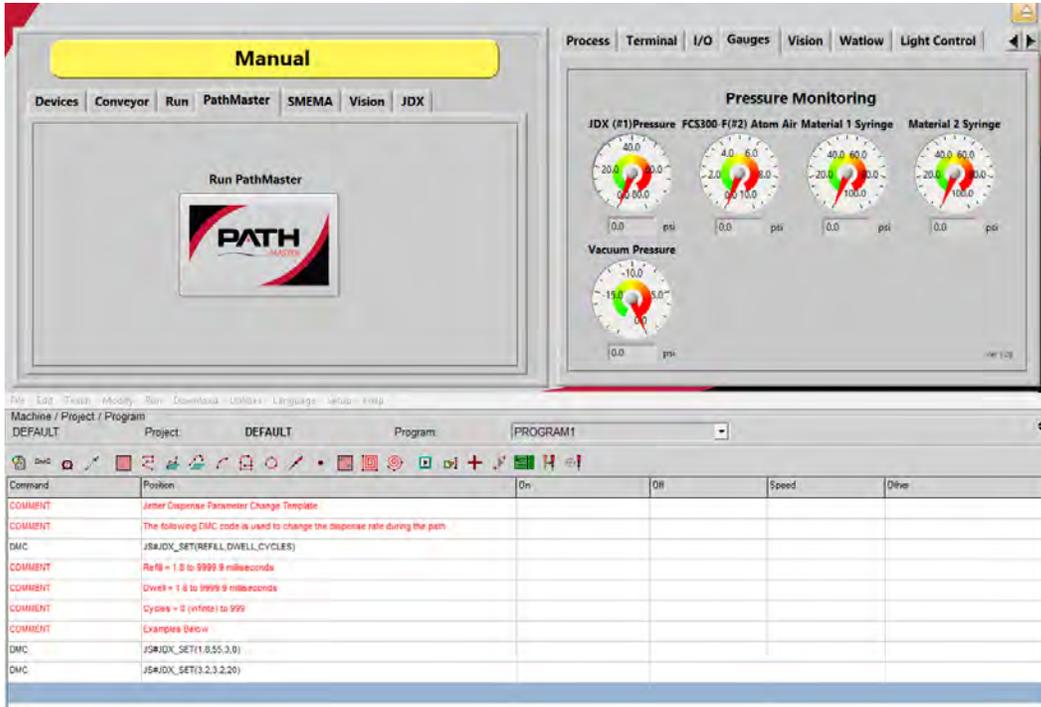


Figure 13: PathMaster With Path Example

## 6. Exploded View

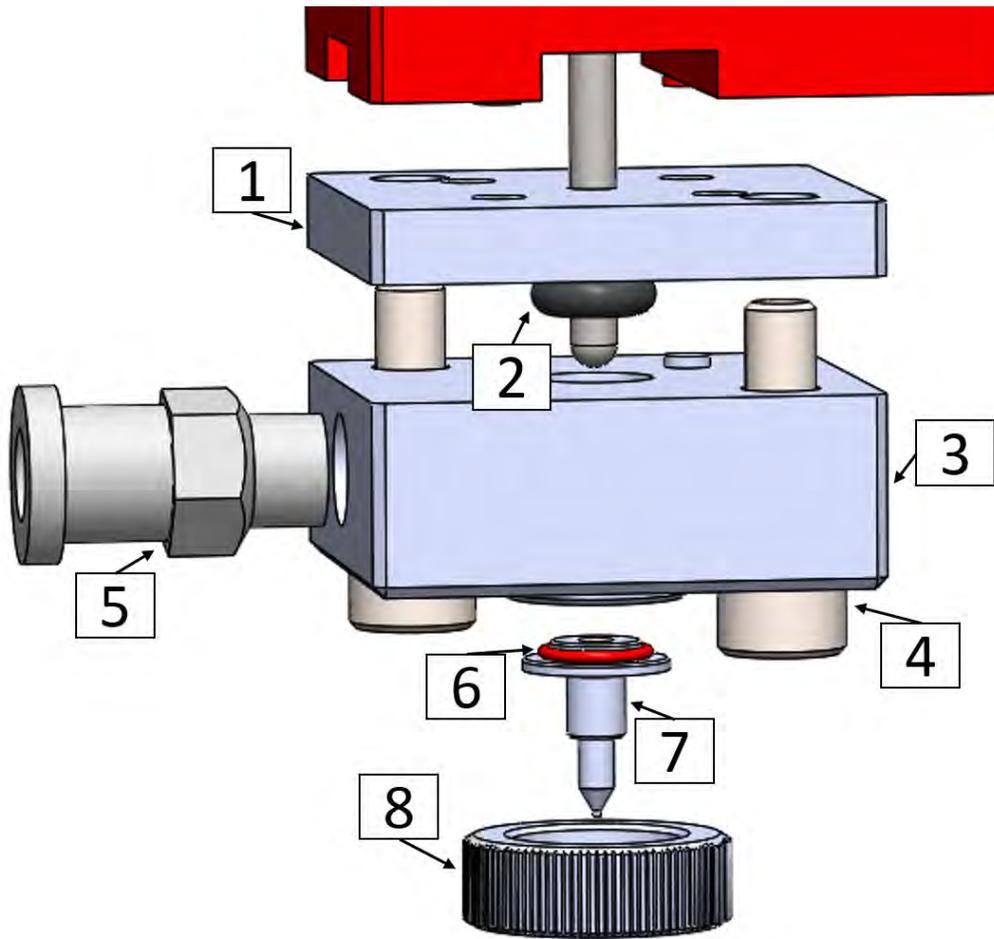


Figure 14: Exploded View

### 6.1.1 Item Numbers and Descriptions

Item	Description	Part Number	QTY
1.	Air Body	614-9798-1	1
2.	O-ring seal	VLV-004K	1
3.	Fluid body	614-8127-2	1
4.	Fluid body screw	SHCS M3x0.5 X 12 (12NHX)	2
5.	Material fitting assembly	Fitting- CFLT-1032M-WN Elbow- CMFMER-WN Luer lock ring- CLFSR-WN	1 1 1
6.	Nozzle O-ring	Material dependent	1
7.	Nozzle	Material dependent	1
8.	Nozzle retainer	614-9801-1	1

## 7. Spare Parts

Below, the spare parts are highlighted and numbered. Refer to your bill of materials and schematic for specific options on your pump.

Description	Part number	Notes
Replacement Extended Nozzle Insert – 75µm	03-2673	
Replacement Extended Nozzle Insert – 125µm	03-2675	
Replacement Extended Nozzle Insert – 200µm	03-2678	
Nozzle O-ring	NP09-2830	
Fluid Body O-ring	VLV-004K	
PVA JDX Feedtube	112-09307	
75µm Nozzle cleaning kit	CL-75	
125µm Nozzle cleaning kit	CL-125	
200µm Nozzle cleaning kit	CL-200	

**Table 1: Replacement Parts and Accessories**

Contact PVA for information on replacement parts or to order.

## 8. Technical Specifications

Table 2: SJ100 Technical Specifications

Weight	Approximately 275g (0.6lbs)
Material inlet	Female #10-32
Operating fluid pressure	10-60 psi
Operating air pressure	45-65 psi
Viscosity range	1-1000 Cps
Maximum speed	Up to 140 Hz continuous duty
Wetted parts	303, carbide, FFKM
Refill time	>3.5 msec
Dwell time	> 6.5 msec
Fluid syringe sizes	5, 10, 30 and 50 cc, also available for a reservoir setup

## 9. Troubleshooting

Troubleshooting Problem	Possible Cause	Corrective Action
Material does not dispense	<ul style="list-style-type: none"> <li>• Material cured in nozzle plate</li> <li>• Nozzle is clogged</li> <li>• Material accumulation around nozzle</li> </ul>	<ul style="list-style-type: none"> <li>• Disassemble and clean nozzle</li> <li>• Clean outside of nozzle with wipe or vacuum purge</li> </ul>
Material leaks from the nozzle plate	<ul style="list-style-type: none"> <li>• Jet pressure is too low</li> <li>• Jet needle is worn or dirty</li> <li>• Nozzle is worn or dirty</li> </ul>	<ul style="list-style-type: none"> <li>• Increase the jet pressure, the maximum pressure is 90 psi</li> <li>• Clean or replace jet needle</li> <li>• Clean or replace nozzle plate</li> </ul>
Material leaks from between fluid body and air body	<ul style="list-style-type: none"> <li>• Fluid body O-ring is worn or dirty</li> </ul>	<ul style="list-style-type: none"> <li>• Clean fluid body</li> <li>• Clean or replace O-ring</li> </ul>
Material splatters	<ul style="list-style-type: none"> <li>• Jet pressure is too high</li> </ul>	<ul style="list-style-type: none"> <li>• Decrease jet pressure</li> <li>• Increase distance to target substrate</li> </ul>
Dispense size is inconsistent	<ul style="list-style-type: none"> <li>• Nozzle is clogged</li> <li>• Material thickens when static</li> </ul>	<ul style="list-style-type: none"> <li>• Disassemble and clean nozzle</li> <li>• Run pre-dispense routine or add purge sequence at start of dispense</li> </ul>

## 10. Notes

# 11. 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: \_\_\_\_\_

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