BAN SEOK®
BAN SEOK PRECISION IND., CO., LTD.
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BV-520P

User Manual

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Contents

1. Specifications

Size: 114.6mm x 26.9mm (4.510” x 1.060” diameter)

Weight: 300g

Fluid inlet thread: 1/8 PT Female

Fluid outlet: M3.5 x 0.6P TAP

Air pressure required: 4.8 bar (70 psi)

Maximum input fluid pressure: 21 bar (300 psi)

Mounting: 1/4-20 Thread UNC DP5 (Air Cylinder Body)
M6 x 1P DP5 TAP (Fluid Chamber)

Operation frequency: Exceeds 400 per minute

Output variation: +- 1% nominal

2. Construction

Air cylinder body: SUS 303

Fluid chamber: SUS 303

Piston: SUS 303

Needle: SUS 303

Tip adapter/needle seat: SUS 303

Needle packing: Teflon

3. How the Valve Operate

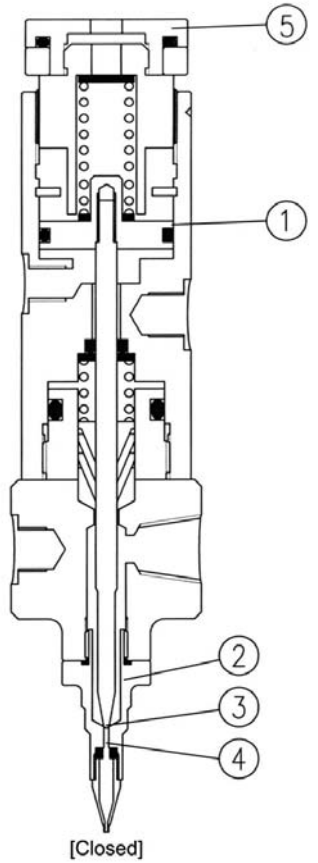
The BV-520 valve is a normally closed, fail-safe, adjustable opening needle valve.

The amount of fluid dispensed is determined by length of time the valve is open;fluid reservoir pressure; needle stroke; and fluid viscosity.

The BV-520 requires 4.8 bar (70 psi) air pressure. This air pressure acting on the piston ① retracts the piston and needle ② from the needle seat ③, permitting fluid flow from the output ④. Piston and needle stroke and fluid flow are controlled by the stroke control knob ④.

Once the cycle is complete, air is exhausted back through the valve controller, ensuring rapid and positive fluid shutoff.

The BV-520 can be operated in any position without affecting flow. Vibration normally has no effect on performance. The valve can be moved in and out of dispense position at high-cycle rates (such as a reciprocation device installed on a production line) without affecting dispensing performance.



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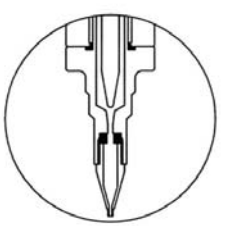
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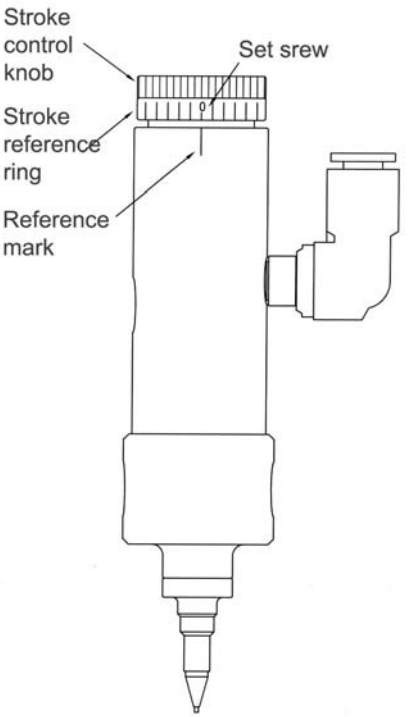
4. Stroke Control Reference



The Stroke Control Reference feature is used to calibrate the stroke control setting or document the dispensing process.

To calibrate the valve, the stroke control knob is first closed all the way. The set screw is then loosened and the stroke reference ring turned so that the zero on the reference ring is aligned with one of the two reference marks engraved on the valve body. When the set screw is tightened, the valve is calibrated.

5. Setup

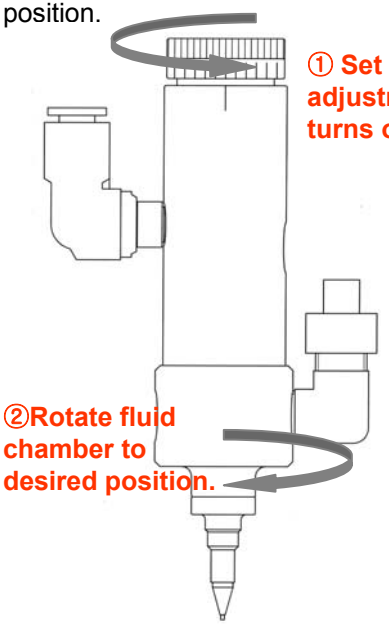
Mount the BV-520 valve with an appropriate fixture, using the ¼-20 Thread UNC DP5 on the air cylinder body or using M6 x 1P DP5 TAP on the fluid chamber.

Connect the control air line to the valve controller or other pneumatic switch that is used to control operating air to the valve.

Connect the fluid feed hose to the fluid inlet fitting and fluid reservoir.

The valve fluid chamber with inlet fitting can be rotated to prevent possible interference with machine parts.

To reposition the fluid chamber, first turn the needle stroke control out two full turns ①, then rotate the chamber ② to the desired position.



Note: Do not rotate fluid chamber more than one complete turn.

Fill the fluid reservoir.

After filling, check to be certain the reservoir cover is secured and that all connections are tight.

Set the reservoir pressure. For low viscosity fluids, start with a pressure of approximately 0.3 bar (5 psi). For higher viscosity, use 1.4 to 2.8 bar (20 to 40 psi). Increase or decrease as necessary.

Note: If solvents or other watery fluids are to be dispensed in very small amounts, specify 0 to 1.0 bar (0 to 15 psi) precision regulator to control reservoir pressure.

Set the needle stroke. Start at one full turn open.

Set the valve control air pressure to 4.8 bar (70 psi).

Open the valve with an air pulse long enough to fill the valve and start fluid flow. Then test the dispensed amount with a nominal time setting.

Increase or decrease reservoir pressure, needle stroke and valve open time to arrive at the desired deposit size.

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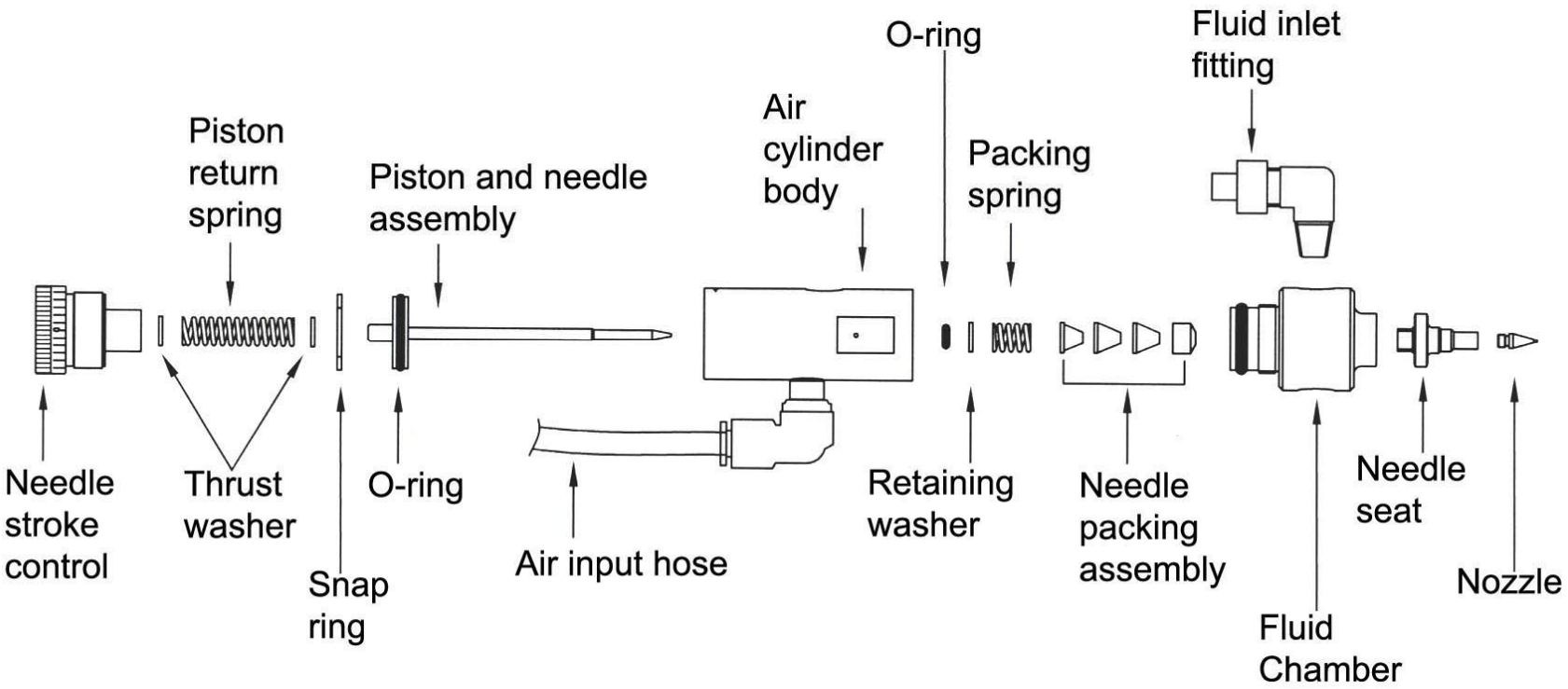
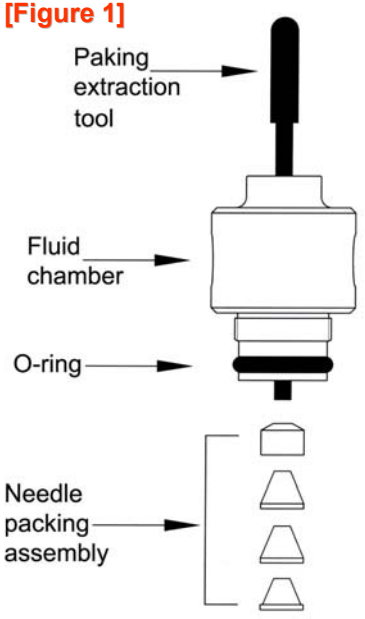
6. BV-520 Exploded View



7. Maintenance and Cleaning

[Figure 1]



Normal cleaning is accomplished by purging with appropriate solvent. The needle seat can be removed (after the reservoir pressure has been bled off) for cleaning without demounting the valve.

CAUTION: Always relieve the reservoir pressure and disconnect the power before performing any maintenance on the system.

To thoroughly clean valve chamber and replace needle packing:

1. Remove the needle stroke control and piston return spring to prevent damage to the needle and seat during reassembly. Turn counterclockwise until free.

2. Remove the inlet fitting and seat assembly from the fluid chamber.

3. Remove the fluid chamber from the cylinder body by turning counterclockwise until free. Then remove the O-ring from the fluid chamber.

4. Remove the needle packings from the fluid chamber. Insert through outlet end of the fluid chamber and gently push out the packings (see Figure 1). – Packing extraction tool is not included. Do not use sharp instruments to scrape or clean these components. Scratches may cause the valve to leak.

5. Remove any remaining packings and the packing spring from the needle.

Note: The lower cylinder needle O-ring is held in place by a flat retaining washer that also serves as the packing spring seat. The washer may come out with the spring. Ensure that it is back in place before reinstalling the packing spring (see Figure 2).

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6. Clean the needle with a cloth dampened in solvent.

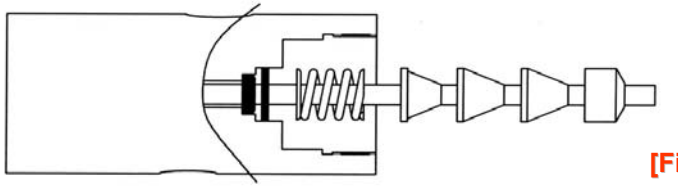
7. Lubricate the needle with lubricant. Reinstall the needle packing spring and new packing kit in accordance with Figure 2.

8. Install a new O-ring on the fluid chamber. Screw the cylinder onto the fluid chamber. Hand tighten only. The chamber can be turned back out up to one turn to orient the fluid inlet fitting to the desired position.

9. Reinstall the tip adapter/seat assembly.

10. To reinstall the piston return spring, first put one thrust washer over the spring pilot (at the top of the piston), then the other thrust washer into the needle stroke control, followed by the spring.

11. Reinstall the needle stroke control by aligning the piston return spring with the spring pilot. Turn the needle stroke control clockwise until it stops and then back it out the the desired setting.



[Figure 2]

7. Maintenance and Cleaning

To replace the piston and needle assembly or piston O-ring:

1. Remove the needle stroke control by turning counterclockwise until free.

2. Remove the piston return spring and thrust washers located on each end of the spring.

3. Remove the snap ring using snap ring pliers.

4. Pull the piston and needle assembly out of the cylinder, using small pliers on the spring pilot (at the top of the piston).

Note: The piston and needle assembly is replaced as a unit and cannot be disassembled.

5. Clean the cylinder body wall and apply lubricant.

6. Replace the O-ring on the piston, apply lubricant, then reinstall in the cylinder.

7. Reinstall the snap ring.

8. To reinstall the piston return spring, first put one thrust washer over the spring pilot, then the other thrust washer into the needle stroke control, followed by the spring.

9. Reinstall the needle stroke control by aligning the piston return spring with the spring pilot. Turn the needle stroke control clockwise until it stops and then back it out to the desired setting.

Note: Do not over tighten the needle stroke control, or needle damage will occur.

Note: After performing maintenance, the valve should be leak tested before it is returned to service.

To leak test the valve:

1. Set the needle stroke control knob at two turns open.

2. Shut off actuating air. Install an air hose in the valve's fluid inlet and connect it to a 7 bar (100 psi) air supply.

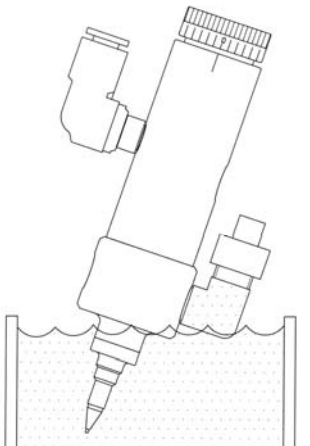
3. Submerge the needle seat and nozzle in a container of water. If air bubbles appear, perform the following procedure to reseat the parts:

To reseat the needle seat and nozzle assembly:

1. Disconnect or shut off all air to the valve.

2. Open the needle stroke control two turns.

3. Using an appropriate wrench, loosen the needle seat one full turn, then turn it back in and retighten. This causes any small irregularities on the needle and seat to conform with one another and become a matched set.



4. Restore actuating air and cycle the valve a few times, then perform the leak test again.

5. Steps 3 and 4 may be repeated up to three times to obtain satisfactory results.

6. If the valve continues to leak after three attempts to reseat the needle, replace the needle seat and nozzle.

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8. Troubleshooting Guide

Valve Trouble	Possible cause and correction
No fluid flow.	▶ Air operating pressure may be too low. Increase air pressure to 4.8 bar (70 psi). ▶ The reservoir air pressure may not be high enough. Increase pressure. ▶ The needle stroke adjustment may be closed. If it is closed, open counterclockwise one full turn. ▶ Material may have clogged the valve head or output needle seat and nozzle. ▶ Clean the valve. (Refer to Maintenance & Cleaning)
Steady drip.	▶ A steady drip can be caused by a worn needle and seat, or a particle holding the needle off the seat. ▶ Remove the needle seat and nozzle, clean and inspect the needle and seat for wear. Replace worn or damaged parts.
Fluid leaks out the drain hole	▶ Fluid leaking out the drain hole on the side of the valve indicates the needle packings are worn. ▶ Replace needle packings.
Inconsistent deposits.	Inconsistent deposits can result if: ▶ Air pressure controlling the valve is fluctuating. ▶ Air pressure supplying the reservoir is fluctuating. ▶ Air pressure controlling the valve is less than 4.8 bar (70 psi.) ▶ Check to be sure the air pressures are constant and the valve operating air pressure is 4.8 bar (70 psi). The time the valve is open must be constant. ▶ Check to be sure the valve controller is providing a consistent output.