

DV509-LF  
DIAPHRAGM VALVE

***OPERATING  
MANUAL***



**I&J FISNAR INC.**

2-07 Banta Place, Fair Lawn, NJ 07410-3002 USA  
TEL. (201)796 - 1477 FAX. (201)794 - 7034  
info@ijfisnar.com http://www.ijfisnar.com

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## GENERAL DESCRIPTION

The DV509-LF diaphragm valve is operated by air pressure, providing precise flow control for low to medium viscosity fluids. A diaphragm separates the air system from the material being delivered. DV509-LF is designed for use with a valve controller and reservoir tank.

Shot sizes may be fine tuned by turning the adjustment knob at the top of the valve; hence the DV509LF diaphragm valve is recommended for applications where micro deposits are required. Shot size and flow rate are controlled by the tip size, fluid pressure, diaphragm stroke and the duration that the valve is opened.

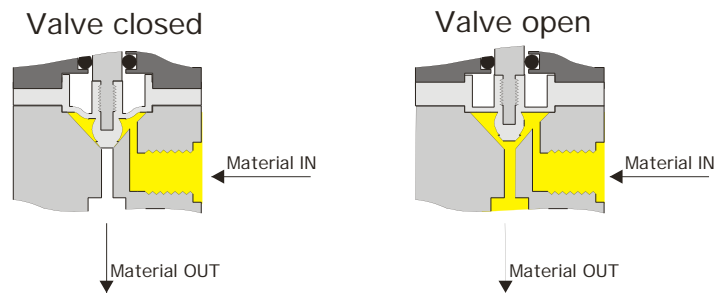
DV509-LF is recommended for use with the following types of fluids: cyanoacrylates, paints, inks, adhesives, glues, electrolytes.

## SPECIFICATIONS

Weight	:	3oz (85 gm)
Air pressure	:	50 to 100 psi (3.5 to 7 bar)
Maximum fluid pressure	:	28 psi (2 bar)
Maximum flow rate	:	5cc/sec
Maximum operating cycle	:	200 cycles per minute
Air inlet	:	10-32 thread with push-in fitting for 1/4 tube
Material inlet	:	1/8 NPT with compression fitting for 1/4 tube
Material outlet	:	M6 x 1.0 pitch with needle adapter

## OPERATING INSTRUCTIONS

Apply a minimum of 50 psi (3.5 bar) air pressure to the air inlet (located on the drive body) to open the valve. Use a 5 micron air filter to supply clean and dry air to the valve. The valve is designed to be opened by air pressure and closed by a return spring when air pressure is released.



Material is supplied to the material inlet (located on the valve head) through a 1/8 NPT port and is dispensed from the material outlet (through a needle adapter).

Do not apply air pressure or fluid pressure more than the standard specifications. The valve will vibrate slightly during the operation, so be sure to securely fix the valve.

Shot size may be fine tuned by turning the adjustment knob at the top of the valve. The normal stroke is 0.04" (1 mm), but it can be reduced using a screwdriver (the flow rate will decrease).

If the stroke is reduced to less than 0.04", the operation of the valve may become unstable. To avoid this, increase the air pressure over 50 psi.

The air inlet and material inlet can be turned at an angle of 90° degrees. Remove the needle adapter and take off the four screws, then rotate the valve head to the desired position.

Use new seal tape when reassembling the needle adapter.

## **CLEANING**

It is recommended to clean the wet body after using the valve, especially when the valve is used to dispense naturally hardening types of materials. Clean the valve by continuously dispensing a liquefied detergent before such material hardens. Carefully select a suitable detergent depending upon the material.

When disassembling the wet body of the valve for cleaning, make sure to clean the valve head, diaphragm and needle adapter.

## **DISASSEMBLING AND ASSEMBLING**

When disassembling and assembling the DV509-LF valve, be careful not to damage the following parts:

- |                                |                          |
|--------------------------------|--------------------------|
| (1) Diaphragm                  | (4) Piston               |
| (2) Valve head                 | (5) Inside of drive body |
| (3) Joint surface of each body | (6) O-ring               |

### **Disassembling the wet body**

- (1) Remove the needle adapter (561954) with a wrench or pliers and using a screwdriver take off the four screws (561956).
- (2) Remove the head fixed plate (561953) and valve head (561948).
- (3) Remove the diaphragm (561947) by turning counterclockwise.

### **Assembling the wet body**

- (1) Adjust the diaphragm to the piston (561949), and screw until the screw stop position. Excessive screwing will damage the diaphragm.
- (2) Adjust the valve head to the diaphragm. Pass the screws through the head fixed plate and through the valve head, then screw in. Be careful not to screw in too tightly.
- (3) Use new seal tape around the threads of the needle adapter. Four drops of instant adhesive should then be applied to the ring region below the threads on the needle adapter. Carefully screw the needle adapter to the valve head.

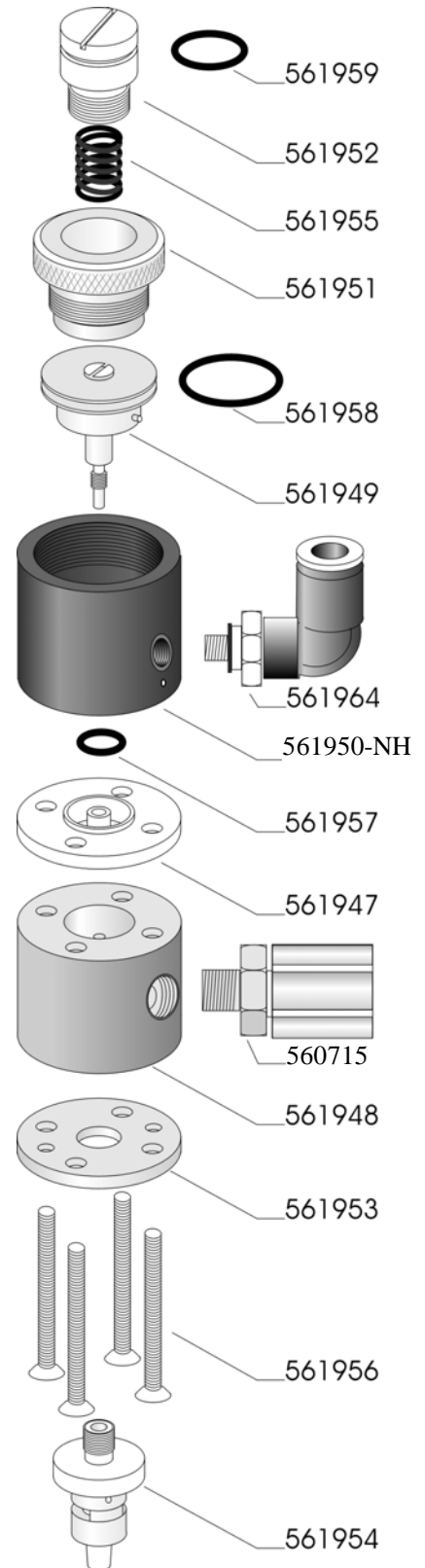
### Disassembling the drive body

- (1) Remove the stroke adjust (561952) using a screwdriver.
- (2) Take out the spring (561955).
- (3) Take off the stop body (561951).
- (4) Take out the piston pushing up from the shaft on the other side.
- (5) Remove the push-in fitting (561964) from the drive body (561950-NH).
- (6) O-rings are provided with the stroke adjust, piston and drive body.

As the valve operates, the O-rings will wear out and must be replaced.

### Assembling the drive body

- (1) Flush air inside of the drive body using an air gun and then carefully assemble the push-in fitting (561964) in the drive body.
- (2) Insert the O-ring (561958) onto the piston and apply a coat of silicone grease.
- (3) Fix the parallel pin (0.04" (1mm) dia) on the piston into the groove of the drive body.
- (4) Assemble the stop body.
- (5) Put the O-ring (561959) onto the stroke adjust. Do not apply a coat of silicone grease.
- (6) Put the spring into the drive body and screw the stroke adjust to the same level with the stop body.



## TROUBLESHOOTING

No.	PROBLEM	CAUSE	SOLUTION
1	<p>Air leaks from stroke adjust and stop body.</p> <p>1. Air leaks only when the valve is turned ON.</p> <p>2. Air leaks while valve is ON.</p>	<p>1. Compressed air leaks when piston operates.</p> <p>2. O-ring (561958) of piston is damaged.</p>	<p>1. Normal.</p> <p>2. Replace the O-ring.</p>
2	<p>Air leaks from the check port.</p> <p>1. Air leaks only when the valve is turned ON.</p> <p>2. Air leaks while valve is ON.</p>	<p>1. Compressed air leaks when piston operates.</p> <p>2. O-ring (561957) of drive body is damaged.</p>	<p>1. Normal.</p> <p>2. Replace the O-ring.</p>
3	Material leaks from the check port.	Diaphragm (561947) is damaged	Replace the diaphragm.
4	Material leaks from the material outlet.	Diaphragm (561947) and valve head (561948) are damaged.	Replace the diaphragm and the valve head.

No.	PROBLEM	CAUSE	SOLUTION
5	Material is not dispensed.	<ol style="list-style-type: none"> <li>1. Operating air is not properly connected.</li> <li>2. Operating air pressure does not reach the required level.</li> <li>3. Valve doesn't open.</li> <li>4. Material is not fed to valve.</li> <li>5. Dispensing tip is clogged.</li> <li>6. Material is hardened inside the valve.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check air connection, etc. and connect properly.</li> <li>2. Check the supplied air pressure, filter regulator pressure and controller pressure. Adjust the required pressure.</li> <li>3. Check if the stroke adjust is excessively screwed. Adjust properly.</li> <li>4. Increase fluid pressure - max 28 psi (2 bar) - and reduce feed distance.</li> <li>5. Replace the tip.</li> <li>6. Disassemble and clean valve, or replace parts.</li> </ol>
6	Material doesn't stop.	<ol style="list-style-type: none"> <li>1. Valve is not turned OFF. Piston doesn't return.</li> <li>2. Spring (561955) is damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check if the air pressure is released. Check controller.</li> <li>2. Replace the spring.</li> </ol>
7	Material is not clearly cut off after valve is turned OFF.	<ol style="list-style-type: none"> <li>1. There are air bubbles in the valve.</li> <li>2. Inner diameter of tip is too small.</li> <li>3. Stroke adjust is not screwed enough into the stop body.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fully purge the air bubbles.</li> <li>2. Replace with larger size tip.</li> <li>3. Screw the stroke adjust to the same level with the stop body.</li> </ol>



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**TECHNICAL  
 SERVICE  
 INFORMATION**

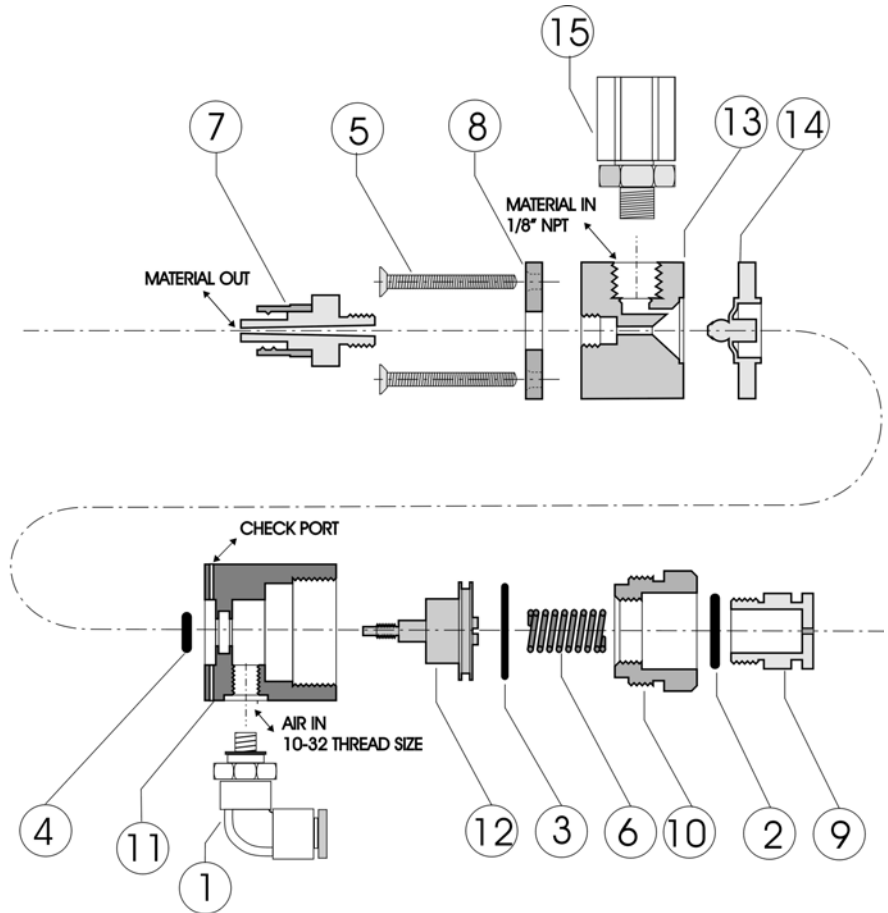
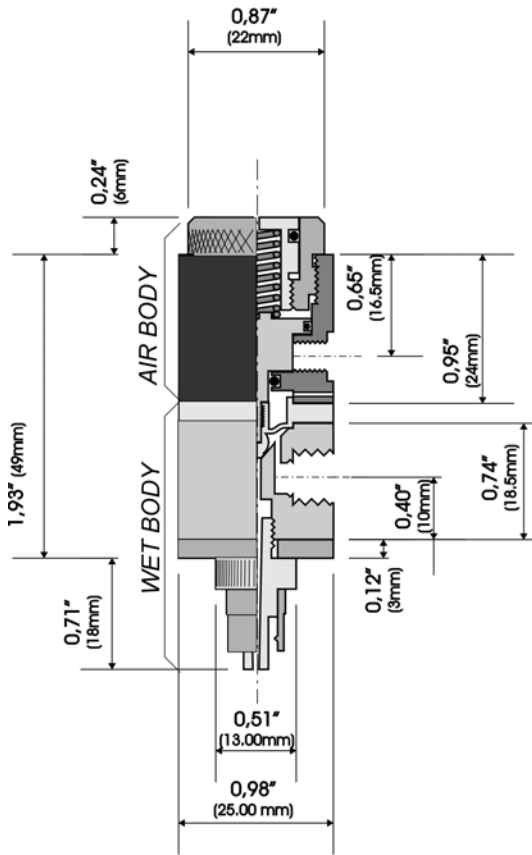
SHEET 1 OF 1

REVISION

A AUG 1, 2006

**PRODUCT  
 DESCRIPTION**

**DV509-LF DIAPHRAGM VALVE**



NO.	PART NUMBER	DESCRIPTION	QTY.	NO.	PART NUMBER	DESCRIPTION	QTY.
9	561952	Stroke Adjust, Stainless Steel	1				
8	561953	Head Fixed Plate, Stainless Steel	1	17*	560524	Hose Assembly Set, 6 Feet, P.E.	1
7	561954	Needle Adapter, Teflon	1	16*	561415	Tubing 6 Feet, 1/4" O.D., P.E. L.D.	1
6	561955	Spring, Steel	1	15	560715	Male Conn. 1/4 Tube-1/8 Pipe, Nylon	1
5	561956	Dosing Unit Assy. Screw, St. St.	4	14	561947	Diaphragm, Teflon	1
4	561957	O-Ring, Buna	1	13	561948	Valve Head, Fluoroplastic	1
3	561958	O-Ring, Buna	1	12	561949	Piston, Aluminum Alloy (Almite)	1
2	561959	O-Ring, Buna	1	11	561950-NH	Drive Body, Aluminum Alloy (Almite)	1
1	561964	Male Elbow Push-In Fitting	1	10	561951	Stop Body, Aluminum Alloy (Almite)	1

\* Not Shown

DRAWN BY: D. KITANSKI

DATE DRAWN: 8/1/06

FILE NAME: \DV509-LF