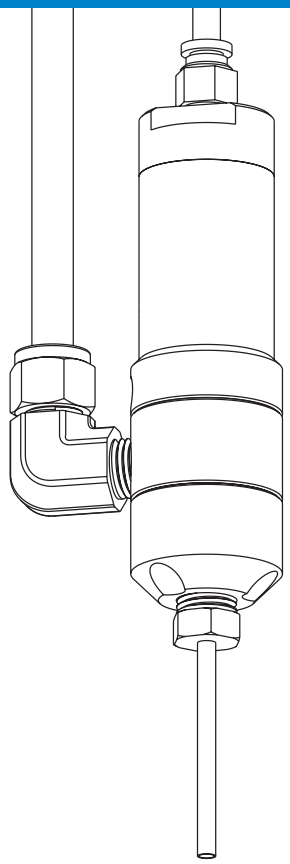
736HPA-NV High Pressure Valve

Operating Manual



Electronic pdf files of Nordson EFD manuals are also available at www.nordsonefd.com

Nordson EFD

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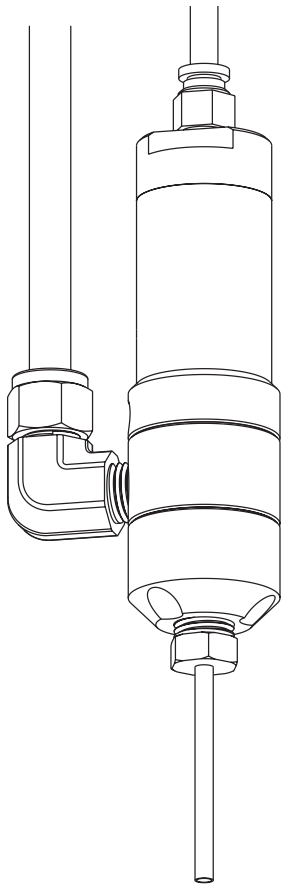
Introduction

This manual provides specifications, operating, installation, and troubleshooting information for the 736HPA-NV high pressure dispense valve.

The 736HPA-NV is a normally closed, air-actuated, balanced spool-type valve designed to operate at fluid pressures up to 172 bar (2500 psi). Ideal for consistent dispensing of industrial sealants and greases, the 736HPA-NV valve is simple to use and will operate many millions of cycles without wear or leakage.



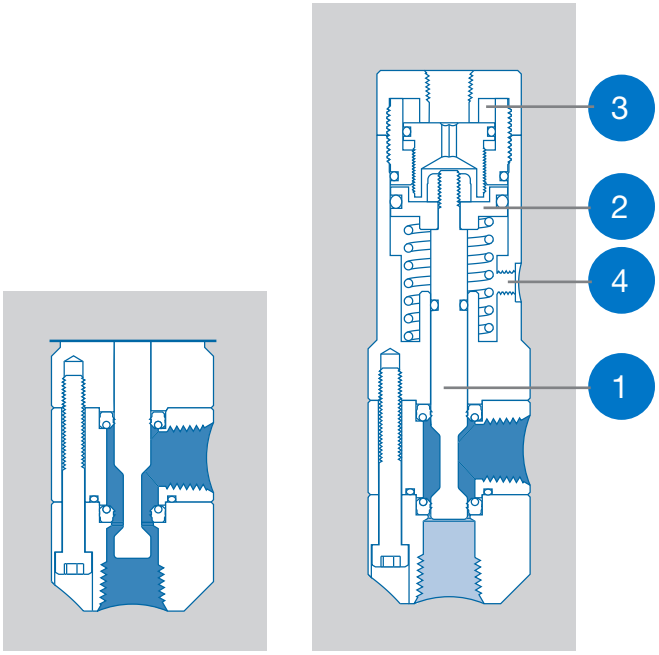
How the Valve Operates

When air pressure at 4.8 bar (70 psi) is applied, the piston shifts the shaft 1 to the open position, allowing fluid to flow. At the end of the cycle, spring force on the piston 2 shifts the shaft to the closed position, stopping fluid flow. During the closing action, the 736HPA-NV valve provides snuff-back of fluid for clean cutoff.

The stroke adjustment 3 can be used to regulate the snuff-back to an amount appropriate for the fluid being dispensed. Stroke adjustment can also be used to reduce fluid surge when the valve opens to ensure consistent bead widths and dot profiles. Refer to “Valve Stroke Adjustment” on page 11 for instructions.

When dispensing very thick fluids at high cycle rates, the double-acting feature ensures rapid closure. A double-actuating air input 4 is provided on the side of the air cylinder to allow double-acting operation using air pressure to both open and close the valve.

The amount of fluid dispensed is determined by valve open-time, fluid pressure, dispensing tip size, and fluid viscosity.



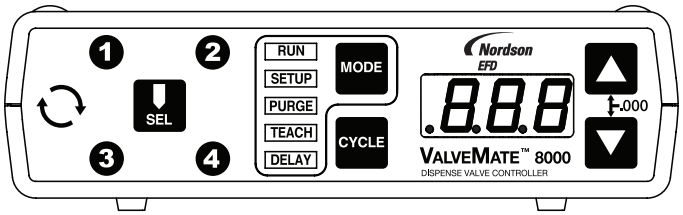
Open Closed

How the Valve is Controlled

The ValveMate™ 8000 provides easy adjustment of valve output for maximum end-user convenience and efficiency. Valve open time is the primary control of deposit size. The 8000 puts push-button adjustment of valve open time where it needs to be — at the valve.

The ValveMate 8000 features micro-processor circuity for extremely precise control of deposit size. Feed lines can be purged, initial deposit sizes set, and adjustments made quickly and easily at the dispensing station, without stopping the production line.

NOTE: For consistent dispense valve operation and easy adjustment of valve output, Nordson EFD recommends using the ValveMate 8000 controller for all automatic, semi-automatic, and benchtop applications. Nordson EFD automated dispensing systems integrate with ValveMate controllers for operating all pneumatic and BackPack™ dispense valves.



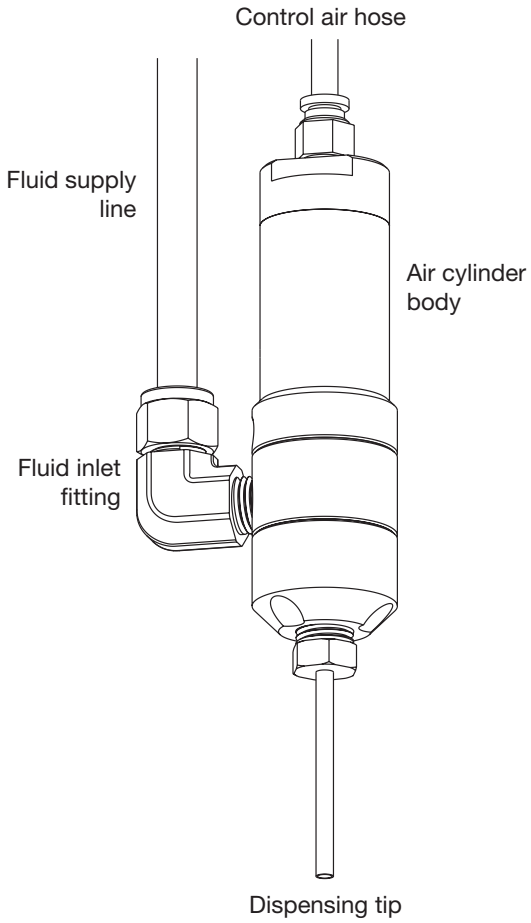
Important Note: Order your 1-, 2-, 3- or 4-solenoid manifold block assembly separately. Consult EFD for recommendations.

Specifications

NOTE: Specifications and technical details are subject to change without prior notification.

Item	Specification
Size	134.4 mm length x 35.1 mm diameter (5.29" x 1.38")
Weight	544.0 g (19.2 oz)
Actuating air pressure required	4.8–6.2 bar (70–90 psi)
Maximum fluid pressure	172 bar (2500 psi)
Fluid inlet	1/4 NPT female
Fluid outlet	1/4 NPT female
Mounting	5/16-24 UNF tapped hole or adjustable mounting block
Cycle rate	Exceeds 400 per minute
Air cylinder body	303 stainless steel
Fluid body	303 stainless steel
Outlet cap	303 stainless steel
Piston	Hard-coated anodized aluminum
Spool (piston shaft)	Hard-chrome coated stainless
Spool seals	Polyester elastomer (Hytrel®) (Viton® optional)
Maximum operating temperature	43° C (110° F)

Operating Features



Installation

Prior to installing this valve, read the associated reservoir and valve controller operating instructions to become familiar with the operation of all components of the dispensing system.

⚠ CAUTION

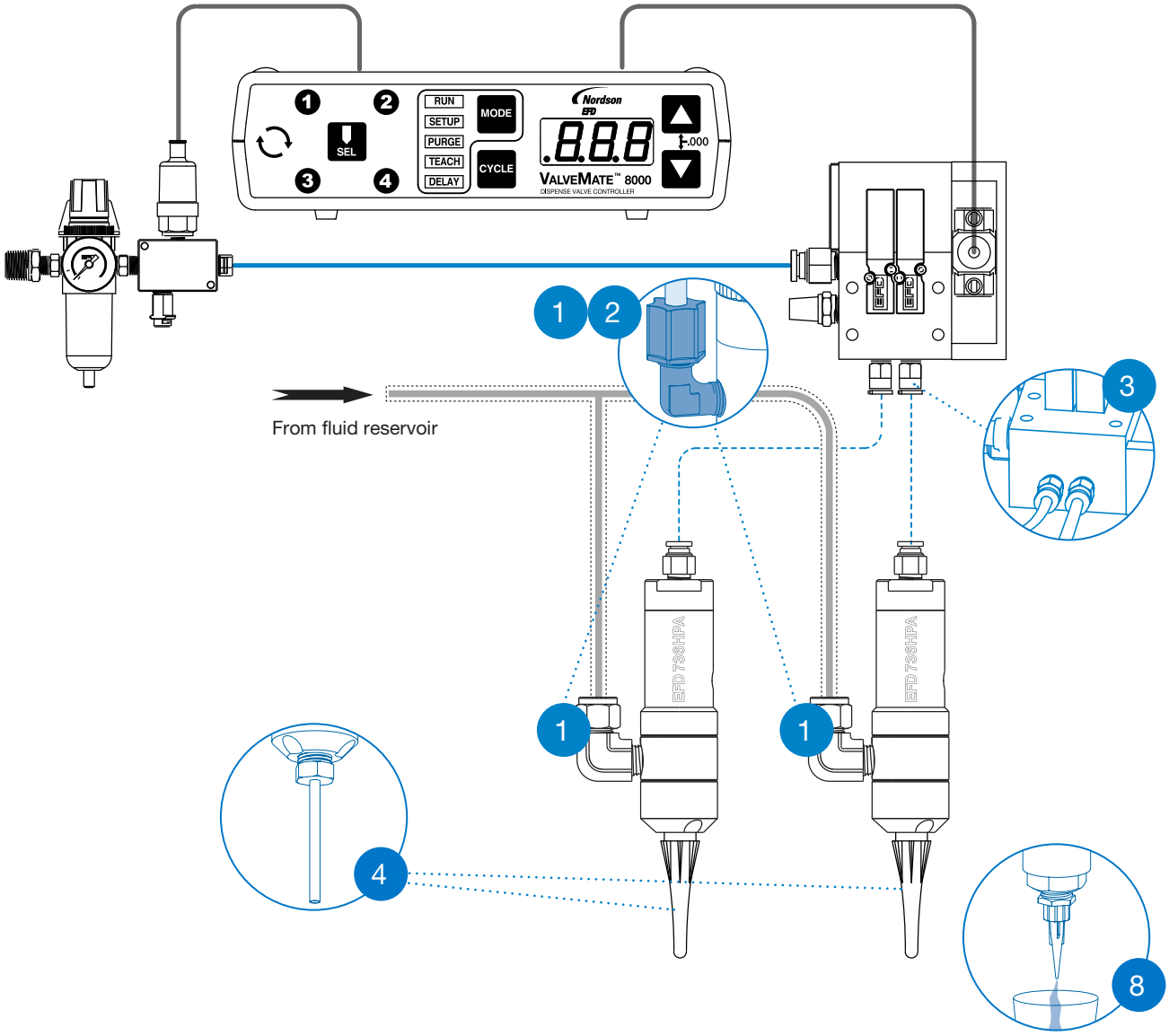
Do not thread fluid inlet fittings too far into the valve. Doing so can obstruct the piston shaft, causing leakage, poor dispensing performance, and damage to the valve.

1. Thread the fluid inlet fitting into the fluid inlet hole.

   NOTE: The fluid inlet fitting and hose must be obtained from a high pressure pump supplier. Ensure that the hose and fitting are rated for the maximum operating pressure of the pump system.

2. Connect the fluid feed hose to the fitting.
3. Connect the valve control air hose to the ValveMate 8000 controller solenoid pack used to control valve open time.
4. Install an appropriate threaded nozzle on the valve output or use a dispensing tip adapter (#7016941) with EFD SafetyLok™ dispensing tips.
5. Ensure that all fluid and air connections are tight.
6. Ensure that the valve operating pressure is set at 4.8 bar (70 psi).
7. Ensure that the delivery pump pressure does not exceed 172 bar (2500 psi).
8. Place a cup under the dispensing tip or nozzle and actuate the valve until fluid flows steady.
9. Set the desired flow rate by adjusting the fluid pressure or changing the outlet tip size.

NOTE: Set the desired deposit size by adjusting the valve open time. Refer to the valve controller operating manual.



Valve Service Procedures

Follow these procedures to properly disassemble and reassemble the valve. Inspect, clean, and replace components as needed. Refer to “Replacement Parts” on page 13 for part numbers and for an exploded diagram of the valve components.

Tools and Supplies

- 1/8" hex wrench
- 5/32" hex wrench
- 5/16-24 UNF threaded rod
- (2) 8" adjustable wrenches
- Nye gel lubricant





Valve Disassembly

1.
   - Insert the 5/16-24 UNF threaded rod into the fluid body mounting hole.
   - Holding the rod, use an 8" adjustable wrench to loosen the air cylinder cap.



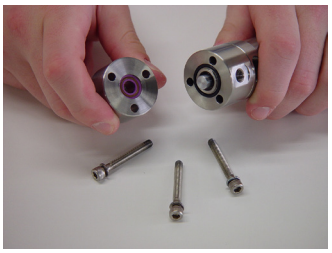
2.
   - Un-thread the air cylinder cap and separate it from the air cylinder body.





3.
   - Use the 5/32" hex wrench to remove the three (3) bolts from the outlet cap, then remove the outlet cap from the fluid chamber.





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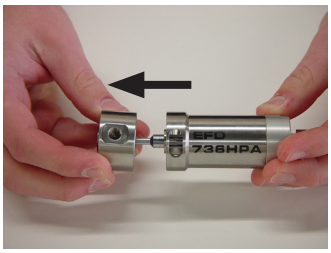
Valve Service Procedures (continued)

Valve Disassembly (continued)

4. • Remove the fluid chamber from the air cylinder body.

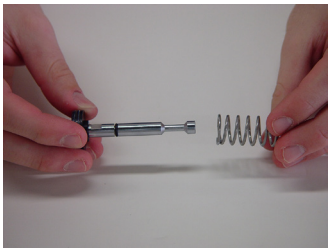


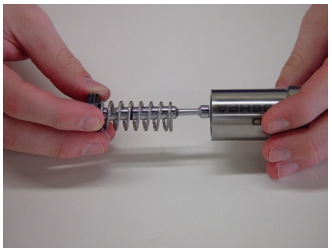
5. • Un-thread the air cylinder cap and separate it from the air cylinder body.





6. • Remove the piston, shaft, and spring from the air cylinder body.
   • Remove the spring from the shaft.





Inspection and Cleaning

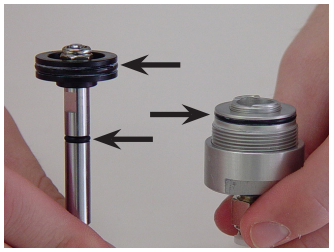
- Inspect all threads. Replace any worn or damaged parts. Refer to “Replacement Parts” on page 13 for part numbers.
- Clean all parts with a solvent compatible with the fluid being dispensed.

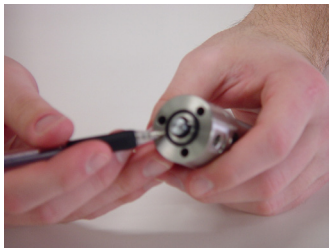
Valve Service Procedures (continued)

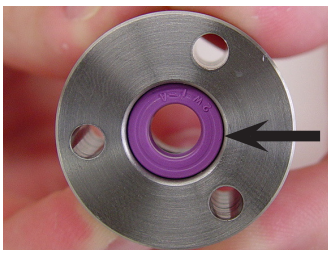
Valve Reassembly

1. • Replace the seals / O-rings with new seals / O-rings.

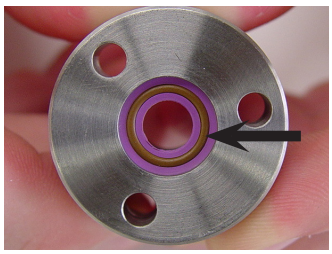
   NOTE: Be careful not to damage the seal cavities when removing the seals from the outlet cap and the fluid chamber.







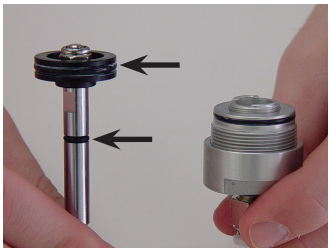
Fluid body seal
(O-ring NOT visible)



Outlet cap seal
(O-ring VISIBLE)

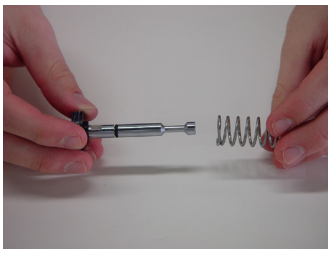
2. • Apply a film of lubricant to the following:
   - Piston O-ring
   - Piston shaft O-ring
   - Air cylinder wall

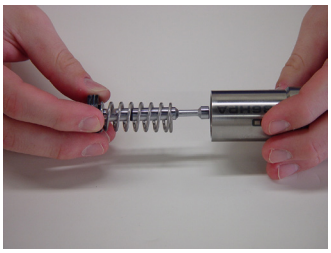
   NOTE: Do not lubricate the outlet cap seal.





3. • Place the piston return spring on the piston-and-shaft assembly and install the assembly in the air cylinder body.





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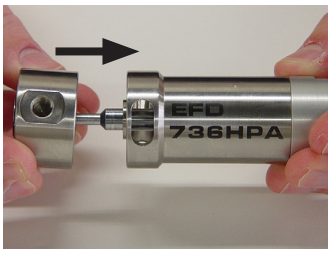
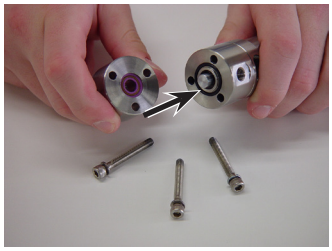
Valve Service Procedures (continued)

Valve Disassembly (continued)

4. • Install the fluid body on the air cylinder body.



5. • Install the outlet cap on the fluid body, making sure the black O-ring is present inside the fluid body cavity.
   • Tighten the three bolts to 3.4–1.0 N•m (30–35 in.-lb).





6. • Install the air cap on the air cylinder body by pushing on the cap to compress the spring and simultaneously turning the cap to engage the threads.



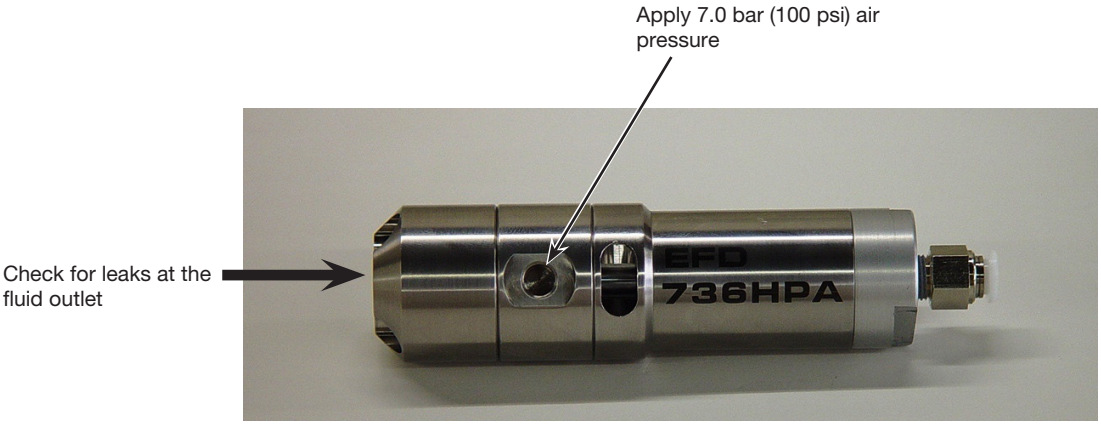
7. • Insert the 5/16-24 UNF threaded rod into the fluid body mounting hole.
   • Holding the rod, use an 8" adjustable wrench to tighten the air cylinder cap to 10.8–13.6 N•m (8–10 ft-lb).
   • Continue to “Pressure Testing” on page 10.



Valve Service Procedures (continued)

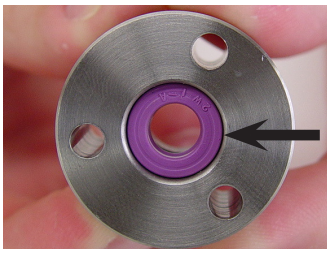
Pressure Testing

1. When reassembly is complete, pressure-test the valve by applying 7.0 bar (100 psi) air pressure to the fluid inlet.
2. Apply soapy water and check for leaks at the fluid outlet.

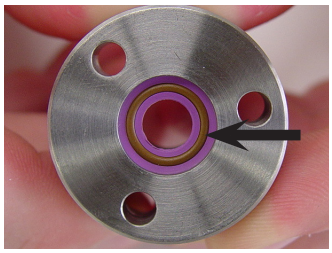


If the valve leaks at the fluid outlet after reassembly:

3. Remove the outlet cap and fluid body.
4. Verify that the seals on the outlet cap and fluid chamber are properly installed, as shown below. If not, install them correctly and reassemble the valve.



Fluid body seal
(O-ring NOT visible)



Outlet cap seal
(O-ring VISIBLE)

Valve Service Procedures (continued)

Valve Stroke Adjustment

The stroke is adjusted by moving the stroke limit stop. You will need a 5/64" hex wrench to adjust the valve stroke.

1. To access the stop, first remove the air input hose from the push-in air coupling by pushing down on the release ring while pulling up on the tubing.
2. Insert a 5/64" hex wrench through the air coupling and engage the stroke limit stop.
3. Adjust the stop toward or away from the piston to vary the stroke:
   - To decrease the amount of opening surge and closing snuff-back, extend the limit stop by turning the wrench clockwise.
   - To increase the amount of surge and snuff-back, retract the limit stop by turning the wrench counterclockwise.

   NOTE: Adjusting the stroke does not affect the flow rate.
4. Reinstall the air input hose by pushing the hose into the coupling.

   NOTE: For striping applications, fluid surge can be reduced further by lowering the valve operating air pressure down to, but not below, 2.7 bar (40 psi).

Part Numbers

Part #	Description
7013449	736HPA-NV valve, chromium-plated spool
7028951	736HPA-NV valve, titanium nitride-coated spool

Accessories

1/4 NPT Metal Nozzles

Stainless steel, 38.1 mm (1.5") long. ID Size

Part #	Gauge	mm	(in.)
7014850	7	3.81	(0.150)
7014848	10	2.69	(0.106)
7014842	12	2.16	(0.085)
7014844	14	1.60	(0.063)
7014846	16	1.20	(0.047)

Polyethylene Nozzles

Plastic nozzles with 1/4 NPT thread. Nozzles may be cut or shaped as required. Supplied (10) nozzles per package.

Part #	Size
7018555	63.5 mm long x 3.2 mm opening (2 1/2" x 1/8")
7018557	63.5 mm long x 1.6 mm opening (2 1/2" x 1/16")
7018559	101.6 mm long x 1.6 mm opening (4" x 1/16")
7018561	101.6 mm long x 0.8 mm opening (4" x 1/32")

Accessories (continued)

Dispensing Tip Adapter

Accepts all EFD dispensing tips.

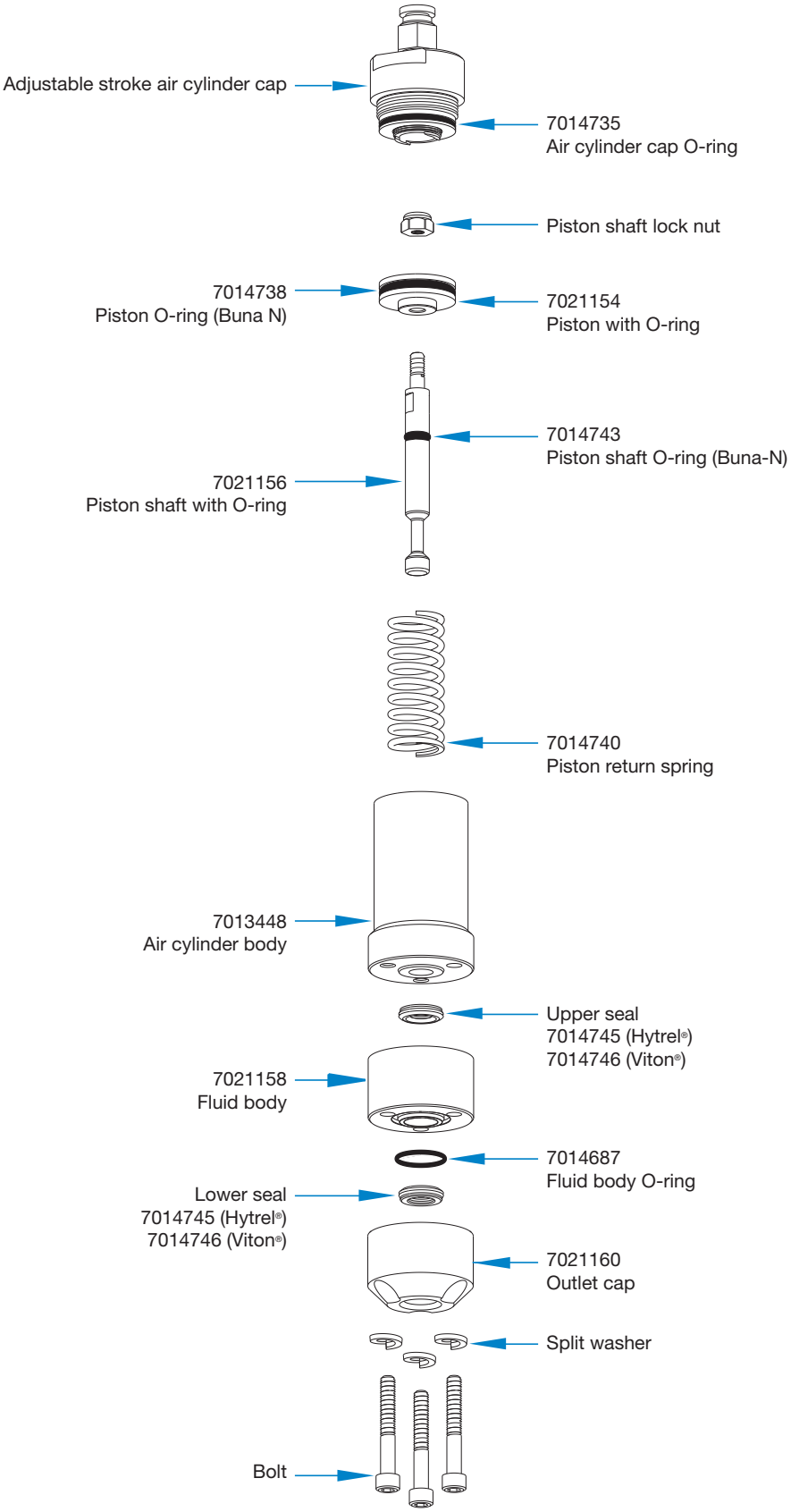
Part #	Description
7021197	Adapter for use with metal tips
7021186	Adapter for use with disposable plastic tips

Universal Valve Mount

Use with all EFD valves for easy valve mounting.

Part #	Description
7020507	Universal valve mount

Replacement Parts



Troubleshooting

No fluid flow

- If the valve operating pressure is too low, the valve will not open. Increase air pressure to 4.8 bar (70 psi) for timed shots and to 2.7 bar (40 psi) minimum for stripes.
- The fluid pressure may not be high enough. Increase pressure.
- The dispensing tip may be clogged. Replace tip.
- Fluid may have solidified in the fluid body. Clean the fluid body.

Fluid drools after the valve closes, eventually stopping

- This is caused by air trapped in the outlet section of the fluid body or if the fluid has entrapped air. The air will expand after the valve closes, causing extrusion until the air reaches atmospheric pressure. Purge the valve by dispensing at a steady flow until air is removed.
- If the fluid has entrapped air, degas it before dispensing.

Fluid drips at a steady rate after the valve closes

- A steady drip indicates failure of the seal due to particle build-up or wear. Replace the seal.
- Fluid leakage can also occur when a fluid inlet fitting is threaded too far into the valve, thus obstructing the piston shaft. Ensure that the fluid inlet fitting is properly installed.

Valve responds slowly when opening and closing

- Valve response is related to control air line length and size. EFD valves are supplied with 5 feet of 4 mm (5/32") ID tubing attached. Any additional length or size change will affect response time. Ensure that the length and size have not been changed.

Fluid flows out above upper seal

- Fluid flowing out above the upper seal indicates a worn upper seal. Replace the seal.

Inconsistent deposits

- Inconsistent deposits can result if the air pressure controlling the valve and / or fluid pressure is fluctuating, or if the valve operating pressure is less than 4.8 bar (70 psi). Check air pressures and the valve operating pressure.
- The time the valve is open must be consistent. Ensure that the valve controller is providing a consistent output.

Notes

NORDSON EFD ONE YEAR LIMITED WARRANTY

This Nordson EFD product is warranted for one year from the date of purchase to be free from defects in material and workmanship (but not against damage caused by misuse, abrasion, corrosion, negligence, accident, faulty installation, or by dispensing material incompatible with equipment) when the equipment is installed and operated in accordance with factory recommendations and instructions.

Nordson EFD will repair or replace free of charge any defective part upon authorized return of the part prepaid to our factory during the warranty period. The only exceptions are those parts which normally wear and must be replaced routinely, such as, but not limited to, valve diaphragms, seals, valve heads, needles, and nozzles.

In no event shall any liability or obligation of Nordson EFD arising from this warranty exceed the purchase price of the equipment.

Before operation, the user shall determine the suitability of this product for its intended use, and the user assumes all risk and liability whatsoever in connection therewith. Nordson EFD makes no warranty of merchantability or fitness for a particular purpose. In no event shall Nordson EFD be liable for incidental or consequential damages.

This warranty is valid only when oil-free, clean, dry, filtered air is used, where applicable.

Nordson

EFD

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