

Auto-Flo[™] Air-Assist Automatic Dispensing Valve

Customer Product Manual
Part 303 793A



NORDSON CORPORATION • AMHERST, OHIO • USA

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Auto-Flo™ Air-Assist Automatic Dispensing Valve

1. Safety

This section contains general safety instructions for using your Nordson equipment. Task- and equipment-specific warnings are included in other sections of this manual where appropriate. Note all warnings and follow all instructions carefully. Failure to do so may result in personal injury, death, or property damage.

To use this equipment safely,

- read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- store this manual within easy reach of personnel installing, operating, maintaining, or repairing this equipment.
- follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies.
- obtain and read Material Safety Data Sheets (MSDS) for all materials used. Contact your material supplier for this information.

Safety Symbols

Become familiar with the safety symbols presented in this section. These symbols will alert you to safety hazards and conditions that may result in personal injury, death, or property and equipment damage.



WARNING: Failure to observe this warning may result in personal injury, death, or equipment damage.



WARNING: Risk of electrical shock. Failure to observe this warning may result in personal injury, death, or equipment damage.

Safety Symbols (contd)



WARNING: Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.



WARNING: Risk of explosion or fire. Fire, open flames, and smoking prohibited.



WARNING: Wear protective clothing, safety goggles, and approved respiratory protection. Failure to observe may result in serious injury.



WARNING: Hot! Risk of burns. Wear heat-protective clothing, safety goggles with side shields and/or heat-protective gloves depending on the symbol shown.



WARNING: System or material pressurized. Relieve pressure. Failure to observe this warning may result in serious injury or death.



WARNING: Injection hazard. Do not point this device at yourself or other personnel. Failure to observe this warning may result in serious injury or death.



CAUTION: Failure to observe may result in equipment damage.



CAUTION: Hot surface. Failure to observe may result in burns.

Qualified Personnel

“Qualified personnel” is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations, and have been trained to safely install, operate, maintain, and repair the equipment. It is the responsibility of the company operating the equipment to see that its personnel meet these requirements.

Intended Use



WARNING: Use of this equipment in ways other than described in this manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in this manual.

Nordson Corporation cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death, or property damage. Unintended uses may result from taking the following actions:

- making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine Nordson replacement parts
- failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards
- using materials or auxiliary equipment that are inappropriate or incompatible with your Nordson equipment
- allowing unqualified personnel to perform any task

2. Description

The Auto-Flo air-assist automatic dispensing valve is used in a variety of applications to dispense adhesives, sealants, and other materials. Made of aluminum, this valve is lightweight and versatile.

The Auto-Flo air-assist automatic dispensing valve is rated for a maximum pressure of 345 bar (5000 psi).

Theory of Operation

See Figure 1.

When air is supplied to the valve-open air inlet (2), the piston is pushed upward, pulling the ball tip (5) off the seat (4). Material flows in the material inlet (6) and out the nozzle. When air is shut off from the valve-open air inlet, a spring on top of the piston forces the ball tip back in the seat and stops material dispensing. For faster dispensing response, install a quick-release valve in the air supply line near the valve-open air inlet. For optimal performance, supply air to the valve-close air inlet (1). The air forces the piston downward to return the ball tip to the seat quickly.

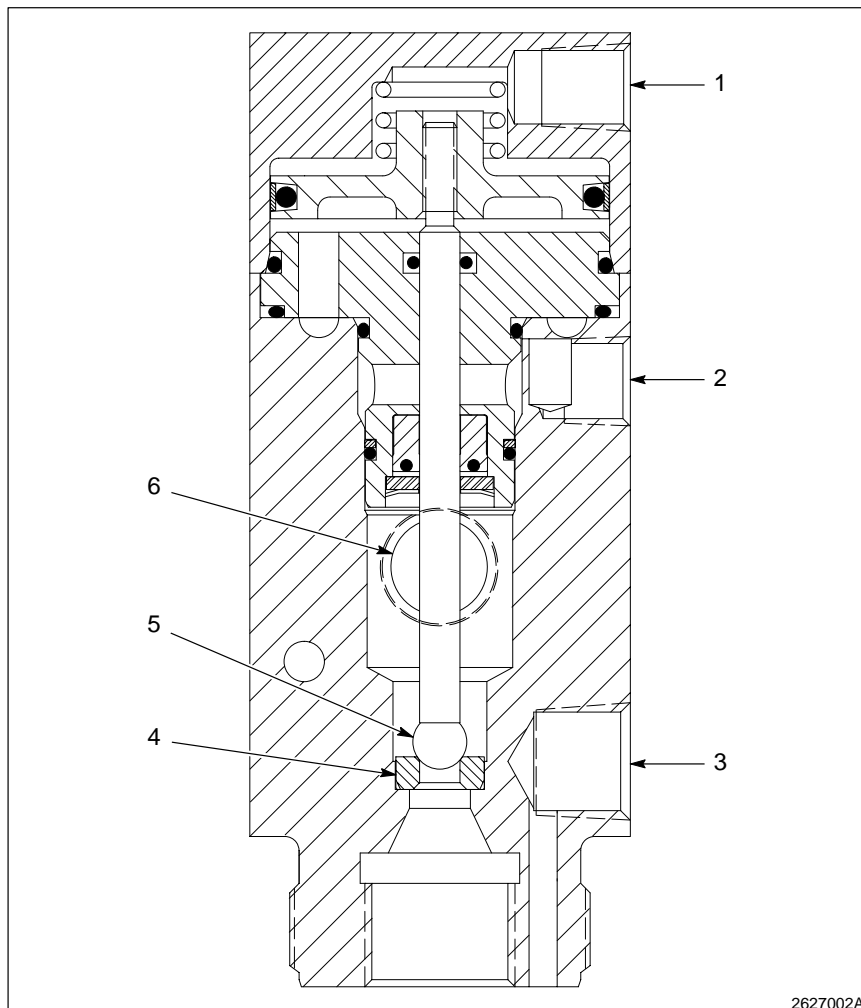


Fig. 1 Cutaway view of dispensing valve

- | | |
|--------------------------|-------------------|
| 1. Valve-close air inlet | 4. Seat |
| 2. Valve-open air inlet | 5. Ball tip |
| 3. Air-assist air | 6. Material inlet |

3. Installation



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Inspection

Inspect the dispensing valve for damage. If any damage is visible, contact a Nordson representative immediately.

Dispensing Valve Mounting



WARNING: System or material pressurized. Relieve pressure. Failure to observe this warning may result in serious injury or death.

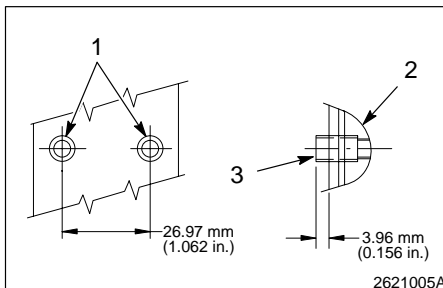


Fig. 2 Mounting dimensions

1. Mounting plate holes
2. Dispensing valve body
3. Hollow dowel pin (2 shipped with each dispensing valve)

The Auto-Flo air assist automatic dispensing valve can be mounted to fixed, mobile, and robotic fixtures. Mounting configurations may vary greatly. Consult your Nordson service representative for specific information on your application.

See Figure 2. Figure 2 shows the mounting plate preparation specifications for mounting the standalone dispensing valve.

To prepare the mounting plate or manifold surface, drill two holes into the mounting surface to accept the hollow dowel pins. The specifications for the mounting plate holes are

- drill 0.165 in. diameter x 0.63 in. deep, maximum
- counterbore 0.320–0.328 in. diameter x 0.187 in. deep
- tap for an M5 x 0.8-6H threads x 0.50 in. deep or #10-32 threads x 0.50 in. deep

NOTE: Disregard the following instructions if you are mounting the standalone dispensing valve.

Mounting the Manifold Mount Dispensing Valve

See Figure 3. Figure 3 shows the mounting plate preparation specifications for mounting the dispensing valve on a manifold. In addition to drilling the mounting holes (3), you must also drill holes for the material inlet (1) and the air inlet (2).

The specifications for the material inlet (1) are as follows:

- drill 0.230–0.240 in. diameter x the required depth
- counterbore 0.375–0.379 in. diameter x 0.050–0.052 in. deep

The specifications for the air inlet (2) are as follows:

- drill 0.201–0.211 in. diameter x the required depth
- counterbore 0.375–0.379 in. diameter x 0.050–0.052 in. deep

Two holes for temperature conditioning fittings are located below the mounting holes. If your manifold mount dispensing valve needs to be temperature conditioned, drill the mounting surface holes as follows:

- drill two through holes 0.250 in. diameter for water
- counterbore 0.437–0.441 in. diameter x 0.050–0.052 in. deep

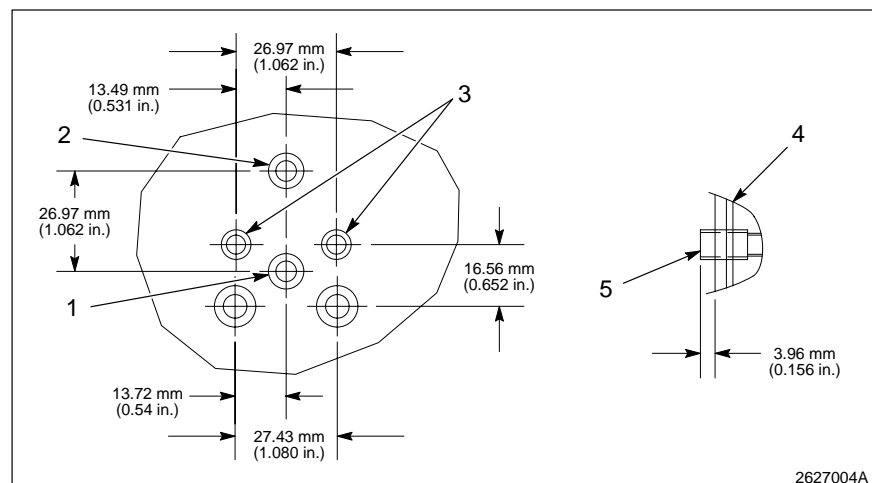
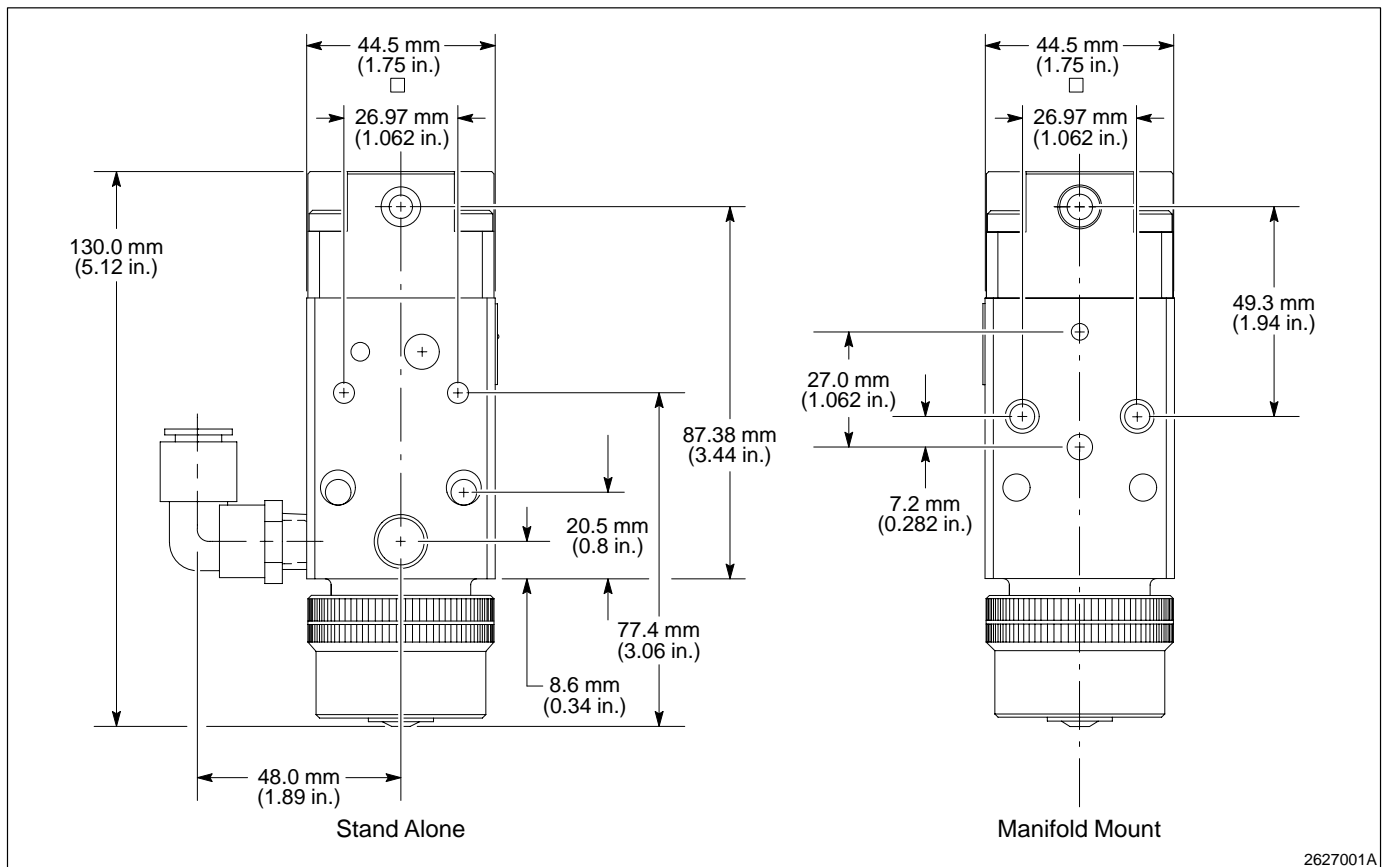


Fig. 3 Mounting dimensions—manifold mount dispensing valves

- | | |
|---------------------------|--|
| 1. Material inlet | 4. Dispensing valve body |
| 2. Air inlet | 5. Hollow dowel pin (2 shipped with each dispensing valve) |
| 3. Mounting surface holes | |

Mounting the Manifold Mount Dispensing Valve (contd.)

See Figure 4. Figure 4 shows the dimensions and specifications of the different ports and mounting holes drilled in the dispensing valve body.



2627001A

Fig. 4 Dispensing valve mounting dimensions

Supply Air Connection

See Figure 1.

Air must be supplied to the valve-open air inlet (2). Multiple valves can be activated with the single air supply. A spring will force the valve closed when air is shut off to the valve-open air inlet. To obtain quicker response:

- mount an air-operated, quick-release valve near the valve-open air inlet, or
- supply air to the valve-close air inlet (1).

Supply air must be taken from an oil-free shop air outlet that will maintain a pressure of at least 4 bar (60 psi). The dispensing valve will not operate properly without the required amount of air pressure (4 to 8 bar (60 to 120 psi)). Dispensing performance will increase at higher pneumatic pressures.

Air-assist air (3) must be regulated.

Material Supply Line

Use the following guidelines to make the necessary material supply connection to the dispensing valve.

Standalone Versions

If a standard material fitting is required, use either a straight fitting or a 90° elbow with a JIC-6 hose connection ($\frac{9}{16}$ -18 thread).

NOTE: The standalone dispensing valve has two material inlet ports located on opposite sides of the body. Use one port and plug the other.

If your application requires using a swivel, refer to the *Nordson High Pressure Swivel Connections* manual for appropriate swivel part numbers, connector sizes, and configurations. *Nordson High Pressure Swivel Connections* also contains more detailed information about installing swivels and the swivel lock key.

If additional assistance is needed, contact your Nordson representative.

Standalone Versions (contd.)

Use the following procedure to install a swivel and swivel key.

1. Install the O-ring plug (shipped with the dispensing valve) into the port on the side of the dispensing valve that displays the Nordson nameplate.
2. Connect a Nordson swivel to the material inlet on the opposite side of the Nordson nameplate.
3. Install the swivel lock key using either of the two holes located above the material inlet swivel. The swivel lock will hold the swivel's nut in place while allowing the swivel to rotate when the dispensing valve or material inlet line is moved.

Manifold Mount Versions

Manifold mount versions have a single material inlet port on the mounting face of the dispensing valve. Install the O-rings shipped with the dispensing valve into the material inlet and air inlet before mounting the dispensing valve onto a manifold.

Nozzles

Your Nordson representative can help select the correct nozzles for your applications. Nozzle selection depends on the type of material being dispensed, the desired bead size, and your production rate requirements.

4. Operation



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Introduction

Begin material dispensing by activating the valve-open air through the A port of the solenoid valve. Stop dispensing by turning off the air through the A port. For air-assisted closure, activate the valve-close air through the B port of the solenoid valve. Make sure that the air-assist air for airspray is turned on and regulated.

Dispensing Valve Purging

After the dispensing valve has been installed, purge it to remove air from the material hose and nozzle. Place a material waste container under the nozzle.

Purge the dispensing valve until material flows freely from the nozzle.

5. Maintenance



WARNING: System or material pressurized. Relieve pressure. Failure to observe this warning may result in serious injury or death.



WARNING: Wear protective clothing, safety goggles, and approved respiratory protection. Failure to observe may result in serious injury.



Daily

- Check the nozzle for wear. Replace it when necessary.

Periodically

- Check the air lines and the material supply hose for leaks or damage. Replace lines and hoses when necessary.
- Make sure the dispensing valve is mounted securely.
- Clean the filter in the air supply line.

6. Troubleshooting



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Introduction

This section contains troubleshooting procedures. These procedures cover only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local Nordson representative for help.

Troubleshooting Charts

NOTE: Some problems presented in this section may originate with other components in the system and not with the dispensing valve. If the corrective actions described here do not solve the problem, see the appropriate system manuals for further suggestions.

Problem	Possible Cause	Corrective Action
1. Leaking around nozzle	Dirty or damaged metal sealing surfaces	Clean the nozzle.
2. Leaking through weep hole in valve body	Worn packing cartridge	Replace the packing cartridge and install the seal kit.
3. Dispensing valve responds slowly	Air piston assembly worn or out of adjustment	Replace the packing cartridge.
	Low air pressure to solenoid	Increase the air pressure to the solenoid.
	Long air supply lines to valve	Mount the solenoid on the valve or as close as possible.

7. Repair



WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.



WARNING: Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.

Disconnect, lock out, and tag electrical power at a disconnect or breaker in the service line ahead of electrical equipment before servicing.



WARNING: System or material pressurized. Relieve pressure. Failure to observe this warning may result in serious injury or death.

Clearing a Blocked Air Cap

1. Shut off air pressure to the drum unloader.
2. Bleed off residual pressure through the in-line pressure relief valve in the material supply line. This valve should be located near the drum unloader.
3. Shut off and lock out all power to the system.
4. Remove the retaining ring and air cap. Clean the nozzle thoroughly with an appropriate solvent.
5. Reinstall the retaining ring and air cap.

Removing the Valve from the Fixture

1. Shut off the drum unloader.
2. Purge the dispensing valve to relieve the pressure in the hose and valve.
3. Shut off and lock out all power to the system.
4. Disconnect the material supply hose from the material inlet fitting on the valve.
5. Disconnect the air lines from the valve.
6. Remove the valve from the fixture.

Temperature Conditioning

The dispensing valve can be temperature conditioned using a fluid system to heat the material between 15°–65° C (60°–150° F). The temperature-conditioned material is then pumped to the dispensing valve. Use the following procedure to modify the dispensing valve to accept the temperature conditioning material.

NOTE: Disregard this procedure if temperature conditioning is not required.

See Figure 5.

1. Screw in the two $\frac{1}{8}$ NPT elbows into the holes marked 1.
2. Screw in the $\frac{1}{16}$ NPT pipe plug into the hole marked 2.

NOTE: The two $\frac{1}{8}$ NPT elbows and the $\frac{1}{16}$ pipe plug are included with the dispensing valve.

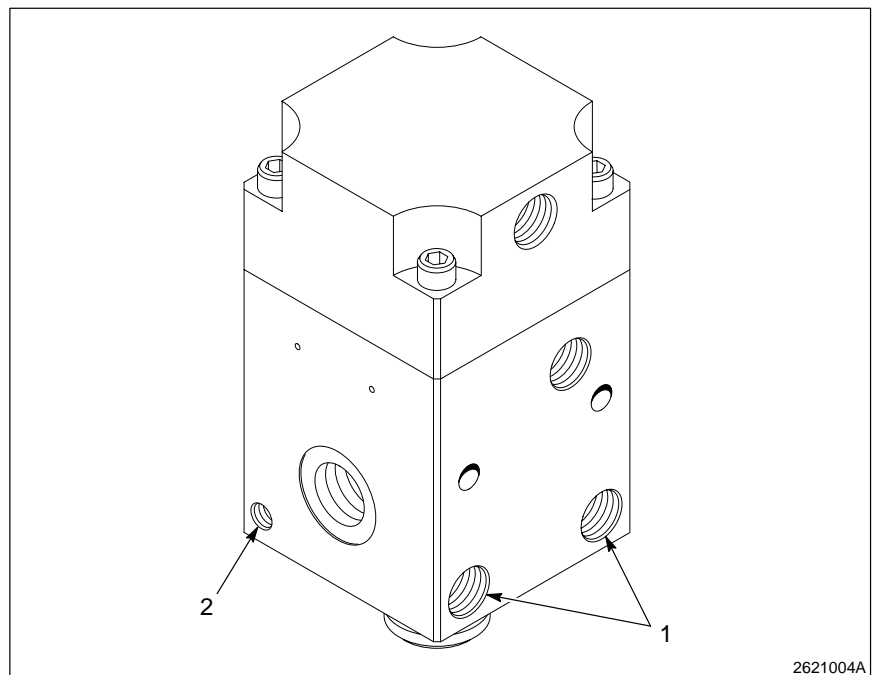


Fig. 5 Temperature conditioning the dispensing valve

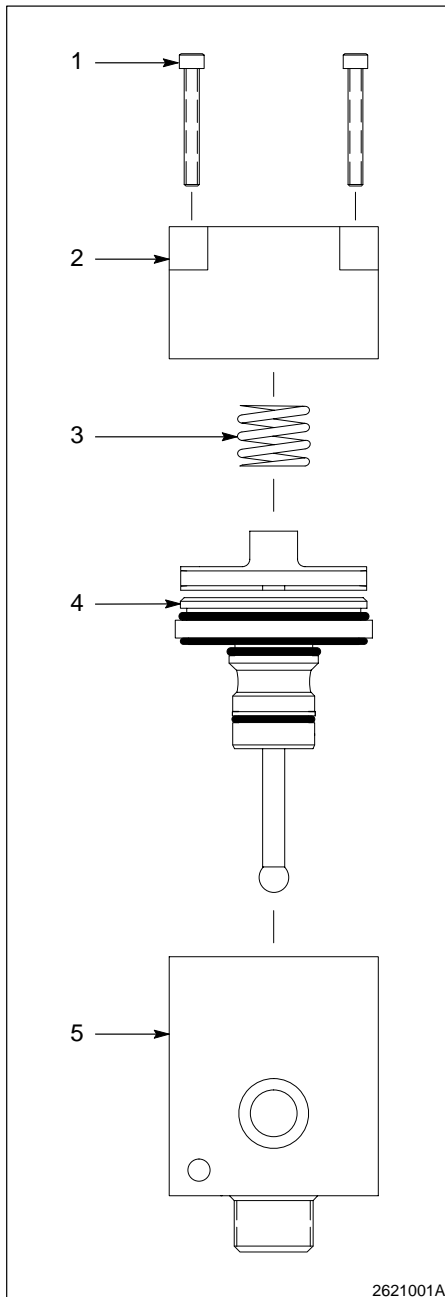
Disassembling the Dispensing Valve

Fig. 6 Dispensing valve components

1. Screw
2. Air cylinder cap
3. Spring
4. Packing cartridge
5. Body

Follow these steps to disassemble the Auto-Flo air-assist automatic dispensing valve.

See Figure 6. Figure 6 shows a typical dispensing valve. Your valve body may differ.

1. Remove the screws (1) and air cylinder cap (2) from the body (5).
2. Remove the spring (3).



CAUTION: Do not damage the dispensing valve body seals while removing the packing cartridge.

3. Use a small screwdriver, to pry the packing cartridge (4) from the body.

Assembling the Dispensing Valve

See Figure 6. Follow these steps to assemble the Auto-Flo air-assist automatic dispensing valve.

1. Insert the packing cartridge (4) into the dispensing valve body (5).
2. Place the spring (3) on top of the packing cartridge (4).
3. Place the air cylinder cap (2) on top of the dispensing valve body.
4. Secure with screws (1).

8. Parts

To order parts, contact your distributor or local Nordson representative. Use this five-column parts list, and the accompanying illustration, to describe and locate parts.

Using the Illustrated Parts List

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (—) is used when the part number applies to all parts in the illustration.

The six-digit number in the Part column is the Nordson Corporation part number. A series of dashes in this column (- - - - -) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

Item	Part	Description	Quantity	Note
—	000 000	Assembly	1	
1	000 000	• Subassembly	2	A
2	000 000	• • Part	1	

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

**Auto-Flo Air-Assist
Dispensing Valve**

See Figure 7.

Item	Part	Part	Description	Quantity	Note
—	238 426		Gun, Auto-Flo, spray, SAE-6, stand alone	1	
—		308 501	Gun, Auto-Flo, spray, manifold mount	1	
1	-----	-----	• Screw, socket, cap, m5 x 25 with O-ring	4	
2	237 942	237 942	• Cap, air, cylinder, Auto-Flo	1	
3	-----	-----	• Spring, compression	1	
4	-----	-----	• Cartridge, packing	1	A
5	982 372		• Screw, socket, M5 x 12 mm	1	
6	323 872		• Key, lock, swivel	1	
7	973 466	973 466	• Plug, pipe, flush, $\frac{1}{16}$ with sealant	1	B
8	100 293	100 293	• Air cap, spray 0.172 dia or	1	
9	244 971	244 971	• Retaining ring	1	
10	971 521	971 521	• Elbow, male, $\frac{1}{4}$ tube x $\frac{1}{8}$ NPT, h.t.	2	B
NS	973 574		• Plug, O-ring, straight thread, $\frac{9}{16}$ -18	1	C
NS	239 788	239 788	Kit, cartridge and piston	1	A

NOTE A: The packing cartridge is available only in the packing cartridge kit, part 239 788. The kit includes packing cartridge, piston, and all seals.

B: Fitting used for temperature conditioning.

C: Shipped with gun. Used opposite the material supply port.

NS: Not Shown

Air-Assist Dispensing Valve
(contd)

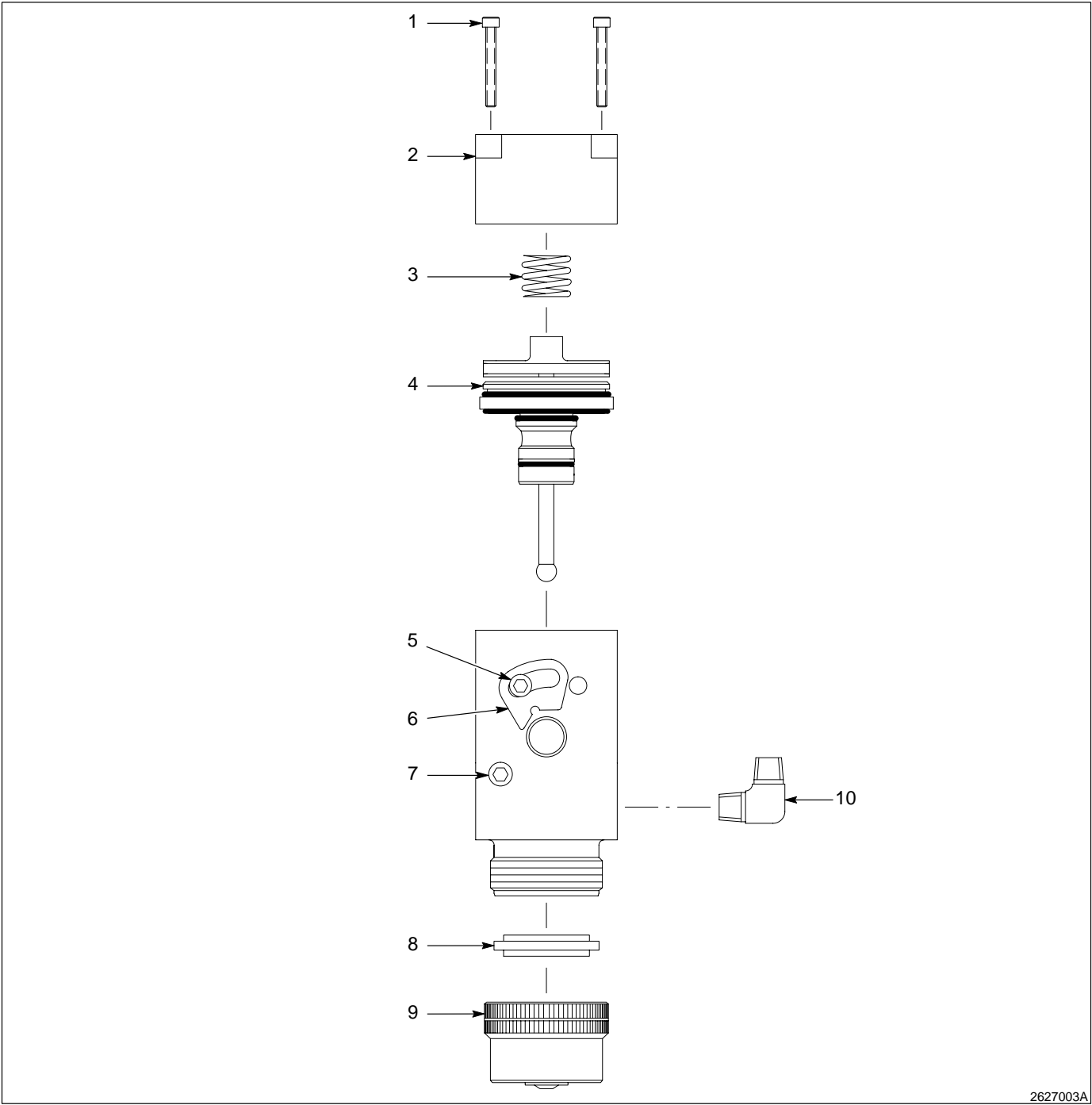


Fig. 7 Auto-Flo air-assist automatic dispensing valve

9. Specifications

	Auto-Flo
Dimensions, mm (in.)	
Length	44.5 (1.75)
Width	44.5 (1.75)
Height	130.0 (5.12)
Weight, kg (oz)	0.44 (15.8)
Maximum static fluid pressure rating, bar (psi)	345 (5000)
Actuating air pressure, bar (psi)	4–8 (60–120)