Auto-Flo[™] Automatic Dispensing Valve

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NORDSON CORPORATION • AMHERST, OHIO • USA

Safety	1
Qualified Personnel	1
Intended Use	1
Regulations and Approvals	1
Personal Safety	1
High-Pressure Fluids	1
Fire Safety	2
Halogenated Hydrocarbon Solvent Hazards	2
Action in the Event of a Malfunction	2
Disposal	2
Disposal	2
Theory of Operation	3
	3
Specifications	3
Installation	4
Inspection	4
Dispensing Valve Mounting	4
Mounting the Standalone	
Dispensing Valve	5
Mounting the Manifold-Mount	
Dispensing Valve	6
Supply Air Connection	7
Material Supply Line	7
Standalone Versions	7
Manifold Mount Versions	7
Nozzles	7
Temperature Conditioning	7

Operation	8
	8
Dispensing Valve Purging	8
Clearing a Blocked Nozzle	8
Maintenance	8
Troubleshooting	9
Repair	10
Removing the Valve from the Fixture	10
Disassembling the Dispensing Valve	10
Assembling the Dispensing Valve	10
Parts	11
Using the Illustrated Parts List	11
Standalone Dispensing Valve	12
Manifold Dispensing Valve	13

Contact Us

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Safety

Read and follow these safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to persons operating or servicing equipment.

Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

Intended Use

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- · operating equipment in excess of maximum ratings

Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- While operating manual spray guns, make sure you are grounded. Wear electrically conductive gloves or a grounding strap connected to the gun handle or other true earth ground. Do not wear or carry metallic objects such as jewelry or tools.
- If you receive even a slight electrical shock, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- Make sure the spray area is adequately ventilated.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

High-Pressure Fluids

High-pressure fluids, unless they are safely contained, are extremely hazardous. Always relieve fluid pressure before adjusting or servicing high pressure equipment. A jet of high-pressure fluid can cut like a knife and cause serious bodily injury, amputation, or death. Fluids penetrating the skin can also cause toxic poisoning.

If you suffer a fluid injection injury, seek medical care immediately. If possible, provide a copy of the MSDS for the injected fluid to the health care provider. The National Spray Equipment Manufacturers Association has created a wallet card that you should carry when you are operating high-pressure spray equipment. These cards are supplied with your equipment. The following is the text of this card:



WARNING: Any injury caused by high pressure liquid can be serious. If you are injured or even suspect an injury:

- Go to an emergency room immediately.
- Tell the doctor that you suspect an injection injury.
- Show him this card
- Tell him what kind of material you were spraying

MEDICAL ALERT—AIRLESS SPRAY WOUNDS: NOTE TO PHYSICIAN

Injection in the skin is a serious traumatic injury. It is important to treat the injury surgically as soon as possible. Do not delay treatment to research toxicity. Toxicity is a concern with some exotic coatings injected directly into the bloodstream.

Consultation with a plastic surgeon or a reconstructive hand surgeon may be advisable.

The seriousness of the wound depends on where the injury is on the body, whether the substance hit something on its way in and deflected causing more damage, and many other variables including skin microflora residing in the paint or gun which are blasted into the wound. If the injected paint contains acrylic latex and titanium dioxide that damage the tissue's resistance to infection, bacterial growth will flourish. The treatment that doctors recommend for an injection injury to the hand includes immediate decompression of the closed vascular compartments of the hand to release the underlying tissue distended by the injected paint, judicious wound debridement, and immediate antibiotic treatment.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment. Use only grounded air and fluid hoses. Check equipment and workpiece grounding devices regularly. Resistance to ground must not exceed one megohm.
- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Do not heat materials to temperatures above those recommended by the manufacturer. Make sure heat monitoring and limiting devices are working properly.

- Provide adequate ventilation to prevent dangerous concentrations of volatile particles or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits when working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Shut off electrostatic power and ground the charging system before adjusting, cleaning, or repairing electrostatic equipment.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Halogenated Hydrocarbon Solvent Hazards

Do not use halogenated hydrocarbon solvents in a pressurized system that contains aluminum components. Under pressure, these solvents can react with aluminum and explode, causing injury, death, or property damage. Halogenated hydrocarbon solvents contain one or more of the following elements:

Element	<u>Symbol</u>	<u>Prefix</u>
Fluorine	F	"Fluoro-"
Chlorine	CI	"Chloro-"
Bromine	Br	"Bromo-"
lodine	I	"lodo-"

Check your material MSDS or contact your material supplier for more information. If you must use halogenated hydrocarbon solvents, contact your Nordson representative for information about compatible Nordson components.

Action in the Event of a Malfunction

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out system electrical power. Close hydraulic and pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the system.

Disposal

Dispose of equipment and materials used in operation and servicing according to local codes.

Description

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

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 (4) off the seat (5). Material flows into the material inlet (3) and out of 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.

Specifications

Specifications are listed in the following table.

Dimensions in. (mm.)	
Length	1.75 (44.5)
Width	1.75 (44.5)
Height, without cap	3.64 (92.5)
Weight, oz (kg)	15.8 (0.44)
Maximum static fluid pressure rating, psi (bar)	5000 (345)
Actuating air pressure, psi (bar)	60–120 (4–8)



Figure 1 Cutaway View of Dispensing Valve

Valve-close air inlet
 Valve-open air inlet

3. Material inlet

4. Ball tip

5. Seat

Installation



WARNING: Allow only qualified personnel to perform the following tasks. 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.

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

See Figure 2 for the dimensions and specifications of the different ports and mounting holes in the dispensing valve body.



Figure 2 Dispensing Valve Port and Mounting Dimensions

1. Exhaust

2. Air inlet

3. Material inlet

Mounting the Standalone Dispensing Valve

See Figure 3 for standalone dispensing valve mounting specifications.



SUGGESTED MOUNTING ARRANGEMENT STANDARD GUN MOUNTING DIMENSIONS

Figure 3 Standalone Mounting Specifications

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

Mounting the Manifold-Mount Dispensing Valve

See Figure 4 for specifications when mounting the dispensing valve on a manifold. In addition to drilling the mounting holes (3), drill holes for the material inlet (1) and the air inlet (2).

The specifications for the material inlet (1) 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 the 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



Figure 4 Manifold–Mount Dimensions

- 1. Material inlet
- 2. Air inlet

- 3. Mounting surface holes
- 4. Dispensing valve body
- 5. Hollow dowel pin—2 shipped with each dispensing valve

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 60 psi (4 bar). The dispensing valve will not operate properly without the required amount of air pressure of 60–120 psi (4–8 bar). Dispensing performance will increase at higher pneumatic pressures.

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.

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

- 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.
- 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.

Temperature Conditioning

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

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

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

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



Figure 5 Temperature Conditioning the Dispensing Valve

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.

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.

Clearing a Blocked Nozzle

- 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.
- Remove the nozzle nut and nozzle. Clean the nozzle thoroughly with an appropriate solvent.
- 5. Install the nozzle.

Maintenance

Follow a preventive maintenance schedule to keep your dispensing valves operating efficiently.



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.

Frequency	Task	
Daily	Check the nozzle for wear. Replace if necessary.	
Periodically	Check the air lines and the material supply hose for leaks or damage. Replace lines and hoses if necessary.	
	Make sure the dispensing valve is mounted securely.	
	Clean the filter in the air supply line.	

Troubleshooting



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

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. **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 or nozzle nut	Dirty or damaged metal sealing surfaces	Clean the nozzle.
2.	Leaking through weep hole in valve body	Worn packing cartridge	Replace the packing cartridge.
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.

Repair



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



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

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

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.

Disassembling the Dispensing Valve

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

See Figure 6.

- 1. Remove the four 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 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. Tighten the screws (1) securely.



Figure 6 Typical Dispensing Valve Components

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

Parts

To order parts, call the Nordson Customer Service Center or your local Nordson representative. Use this five-column parts list, and the accompanying illustration, to describe and locate parts correctly.

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 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.

- 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.

ltem	Part	Description	Qty	Note
—	0000000	Assembly	1	
1	000000	Subassembly	2	А
2	000000	• • Part	1	



Figure 7 Auto-Flo Automatic Dispensing Valve

Standalone Dispensing Valve

See Figure 7 and the following parts list.

Item	Part	Part	Part	Description	Qty	Note
—	238418			Gun, Auto-Flo, standalone, polymyte	1	
—		238420		Gun, Auto-Flo, standalone, fluoromyte	1	
—			1016122	Gun, Auto-Flo, standalone, UHMW-PE	1	
1				 Screw, socket cap, M5 x 25 with O-ring 	4	
2	237942	237942	237942	Cap, air, cylinder, Auto-Flo	1	
3	237947	237947	237947	Spring, compression	1	
4				Cartridge, packing	1	А
5	982372	982372		 Screw, socket, M5 x 12 mm, black 	1	
6	323872	323872		 Key, lock, swivel, Auto-Flo 	1	
7	973466	973466	973466	 Plug, pipe flush, ¹/₁₆ in. with sealant 	1	В
8	971521	971521	971521	 Elbow, male, ¹/₄ tube x ¹/₈ NPT, high temperature 	2	В
NS	239788	239790	238345	Kit, cartridge packing	1	
NOTE A: Order the applicable packing cartridge kit.						
B: This fitting is used for temperature conditioning.						
NS: Not Shown						

Manifold Dispensing Valve

See Figure 7 and the following parts list.

Item	Part	Part	Part	Part	Description	Qty	Note
_	238421				Gun, Auto-Flo, manifold, polymyte	1	
—		238423			Gun, Auto-Flo, manifold, fluoromyte	1	
—			329460		Gun, Auto-Flo, manifold, peek	1	
—				1016123	Gun, Auto-Flo, manifold, UHMW-PE	1	
1					 Screw, socket cap, M5 x 25 with O-ring 	4	
2	237942	237942	237942	237942	Cap, air, cylinder, Auto-Flo	1	
3	237947	237947	237947	237947	Spring, compression	1	
4					Cartridge, packing	1	А
7	973466	973466	973466	973466	 Plug, pipe flush, ¹/₁₆ in. with sealant 	1	В
8	971521	971521	971521	971521	 Elbow, male, ¹/₄ tube x ¹/₈ NPT, high temperature 	2	В
NS	239788	239790	329463	238345	Kit, cartridge packing	1	
NOTE A: Order the applicable packing cartridge kit.							
B: This fitting is used for temperature conditioning.							
NS: Not Shown							

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