Model A7AA Air Assisted Airless Gun

Customer Product Manual
Part 108 046C

OBSOLETE

NORDSON CORPORATION ● AMHERST, OHIO ● USA

Nordson Corporation welcomes requests for information, comments and inquiries about its products. General information about Nordson can be found on the Internet using the following address: http://www.nordson.com.

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Notice

Trademarks

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Model A7AA Air Assisted Airless Gun

1. 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 in the spray area. 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 while 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	Symbol	Prefix
Fluorine	F	“Fluoro-”
Chlorine	Cl	“Chloro-”
Bromine	Br	“Bromo-”
Iodine	I	“Iodo-”

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.

2. Description

See Figure 1. The model A7AA gun is a compact, high-cycle, air assisted airless spray gun. The A7AA is designed to spray solvent or waterborne coatings, and may be used in a wide variety of applications. The wetted parts of the A7AA gun are constructed of stainless steel for corrosion resistance. The A7AA can be used for dead-end or circulating applications. It is also suitable for use in heated systems up to 92 °C (200 °F) or ambient fluid systems.

Due to its fast trigger cycle capability, the A7AA may be used for ultra high speed applications as well as common product finishing. Its simple design and rugged construction provide for long service life and easy field maintenance. In the event of a gun failure, several repair kits are provided to reduce downtime.

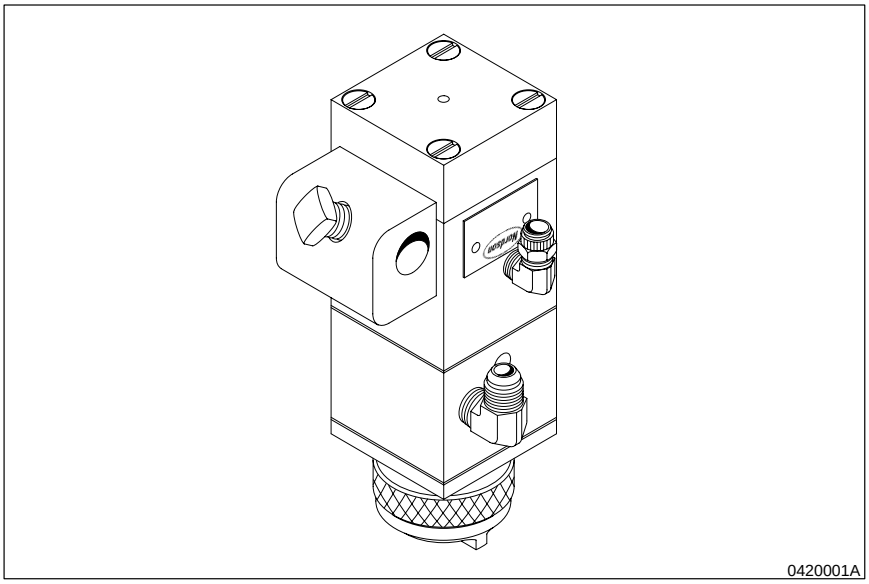

Fig. 1 Model A7AA Air Assisted Airless Gun

Theory of Operation

In normal operation, the air is turned on just before fluid exits the nozzle and is turned off just after the fluid stops flowing. This overlap is designed to eliminate gun spitting.

See Figure 2. When the gun is triggered, the entering air (2) lifts the piston assembly (1), and allows the packing cartridge (3) and the ball tip (4) to rise. The rising piston assembly also opens a path for the assist air, entering at (8). The coating material enters at (7) and passes through the opening in the seat (5). The coating material exits the nozzle (6), where it is partially atomized. As the coating material exits the nozzle, the material stream is further atomized by the assist air which flows around the nozzle. When the air pressure is removed, the ball tip returns to the seat and stops the flow of coating material and assist air.

The air piston can be adjusted to provide an air assist on/off function, or the piston may be set for continuous bleed. This is commonly used on high speed stitching applications where the cycle time is extremely short.

If faster or slower gun actuation is desired, the packing cartridge adjuster (9) may be adjusted in or out.

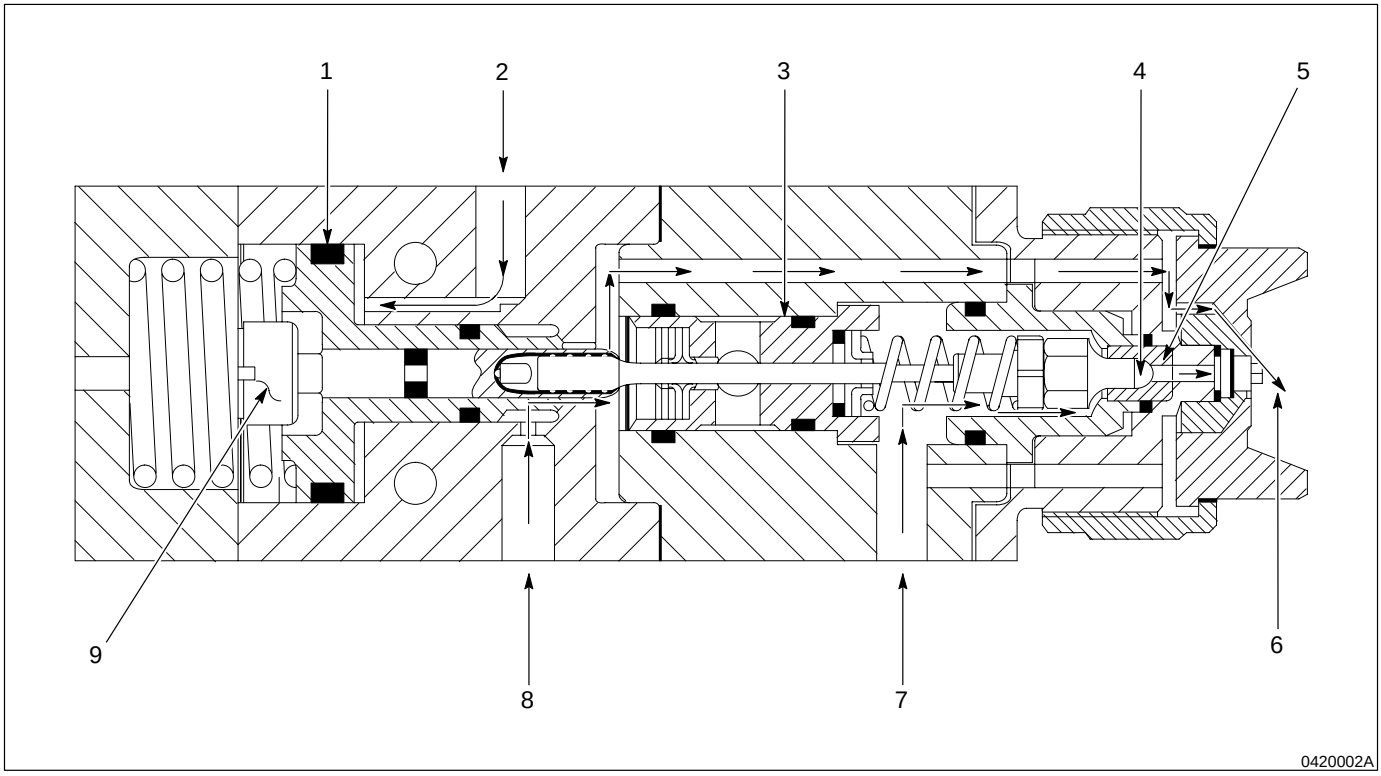

Fig. 2 A7AA Gun

1. Piston assembly
2. Air entrance
3. Packing cartridge
4. Ball tip
5. Seat
6. Nozzle
7. Coating entrance
8. Assist air entrance
9. Packing cartridge adjuster

3. Installation

See Figure 3.

NOTE: The A7AA can be mounted to a 12.7 mm (0.5 in.) round bar. The gun or the mounting bar should be mounted in such a way as to allow for easy removal for service. Slide the mounting bar through the mounting hole on the gun body (1), then tighten the square-head screw (2).

CAUTION: Do not over tighten fluid fittings. Over tightening may cause damage to the gun body.

1. Connect a $^1/_2$-20 JIC coupled airless fluid hose to the $^1/_2$-20 JIC fluid fittings (4). Material will flow in either direction.

2. Connect a pneumatic hose to carry clean, regulated air to the $^1/_8$ NPT street elbow (3) located directly beneath the gun nameplate.

3. Connect an electro-pneumatic solenoid with a dump port via an air hose to the gun at the $^1/_8$ NPT street elbow.

NOTE: It is not recommended that long air hoses be used between the gun and the solenoid. Long hoses cause a pneumatic delay, producing slow gun on/off cycling, spitting, and premature wear of the ball and seat. Three to six meters (ten to twenty feet) of hose is normal.

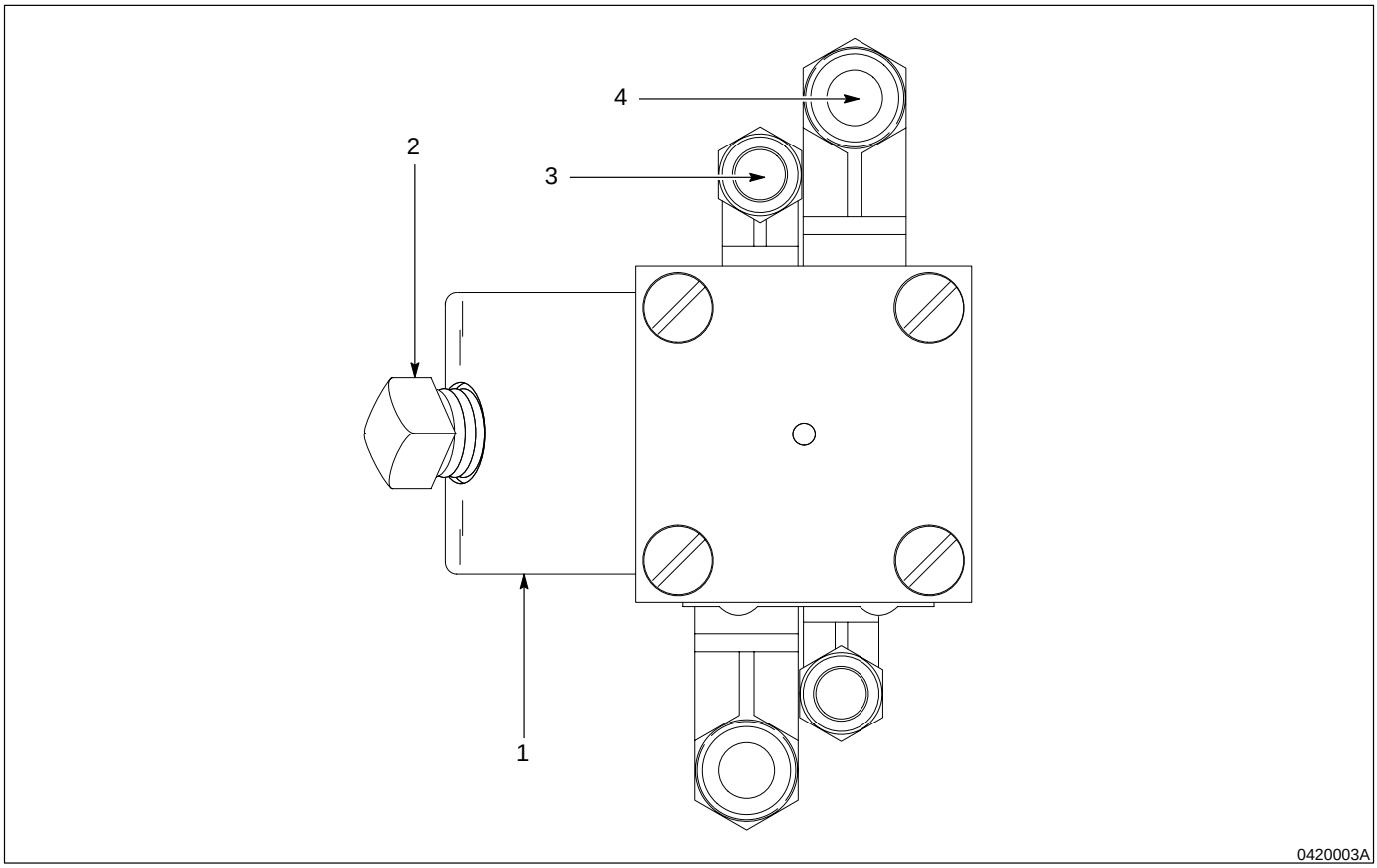

Fig. 3 Installation of A7AA Guns

1. Gun body
2. Square head screw
3. Street elbow
4. Fluid fittings

3. Installation (contd)

The A7AA gun is normally used as part of a larger spraying system. A typical installation is show in Figure 4.

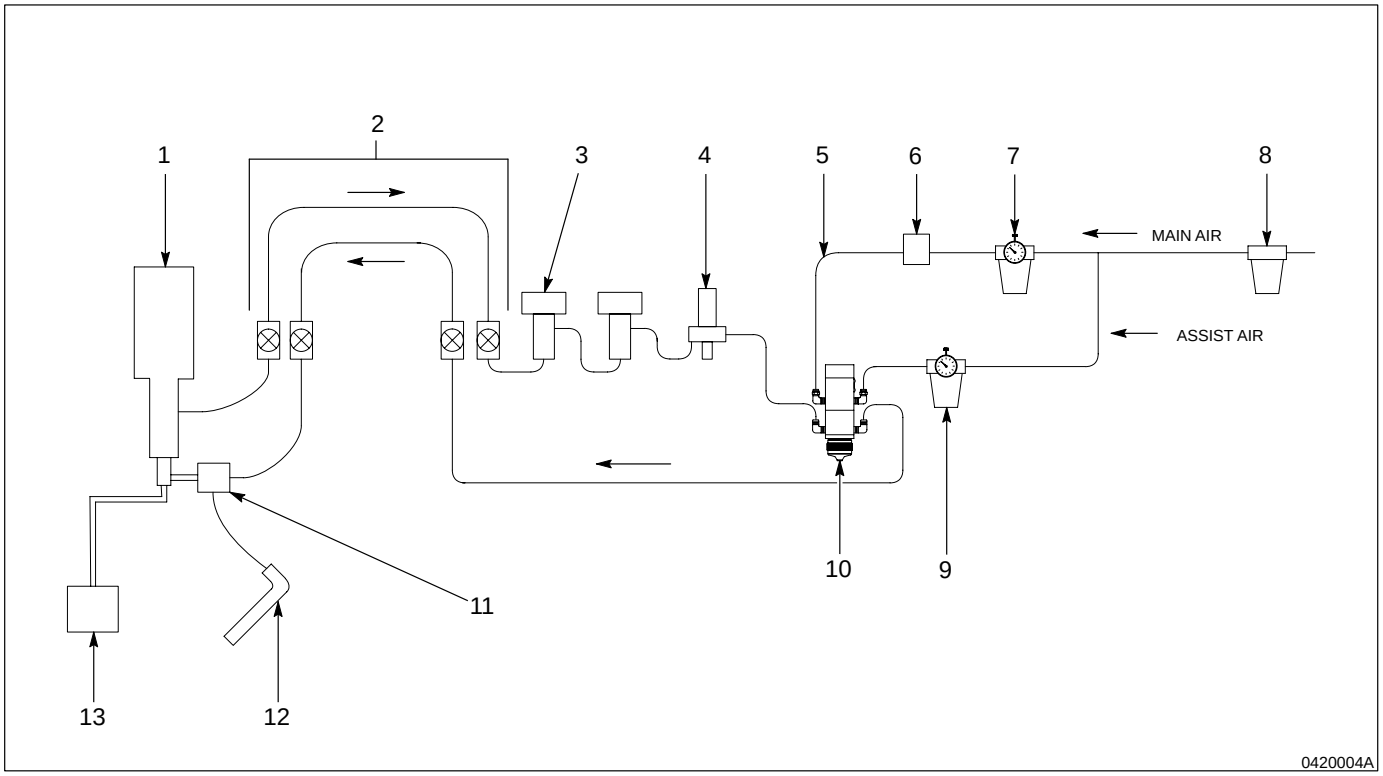

Fig. 4 Typical A7AA Installation

1. Pump
2. Ball valves
3. Heaters
4. Fluid Filter
5. Actuating air
6. Solenoid
7. Regulator
8. Filter
9. Regulator
10. A7AA gun
11. Circulating valve
12. Drain off
13. Coating

Quick-Exhaust Valve

For high speed gun triggering (stitching) or for actuating the A7AA over long distances, use an optional quick-exhaust valve. Refer to the *Options* section for ordering information. The A7AA gun may also be installed so that several guns can be fired by the same solenoid. This requires using a quick-exhaust valve and two air sources.

When using this option, the actuation air must be constant but may be from any convenient air source. It is also important to use a small ID air line ($^1/_8$ inch or less) for the trigger air from the solenoid to the quick exhaust valve. An installation using this option is shown in Figure 5.

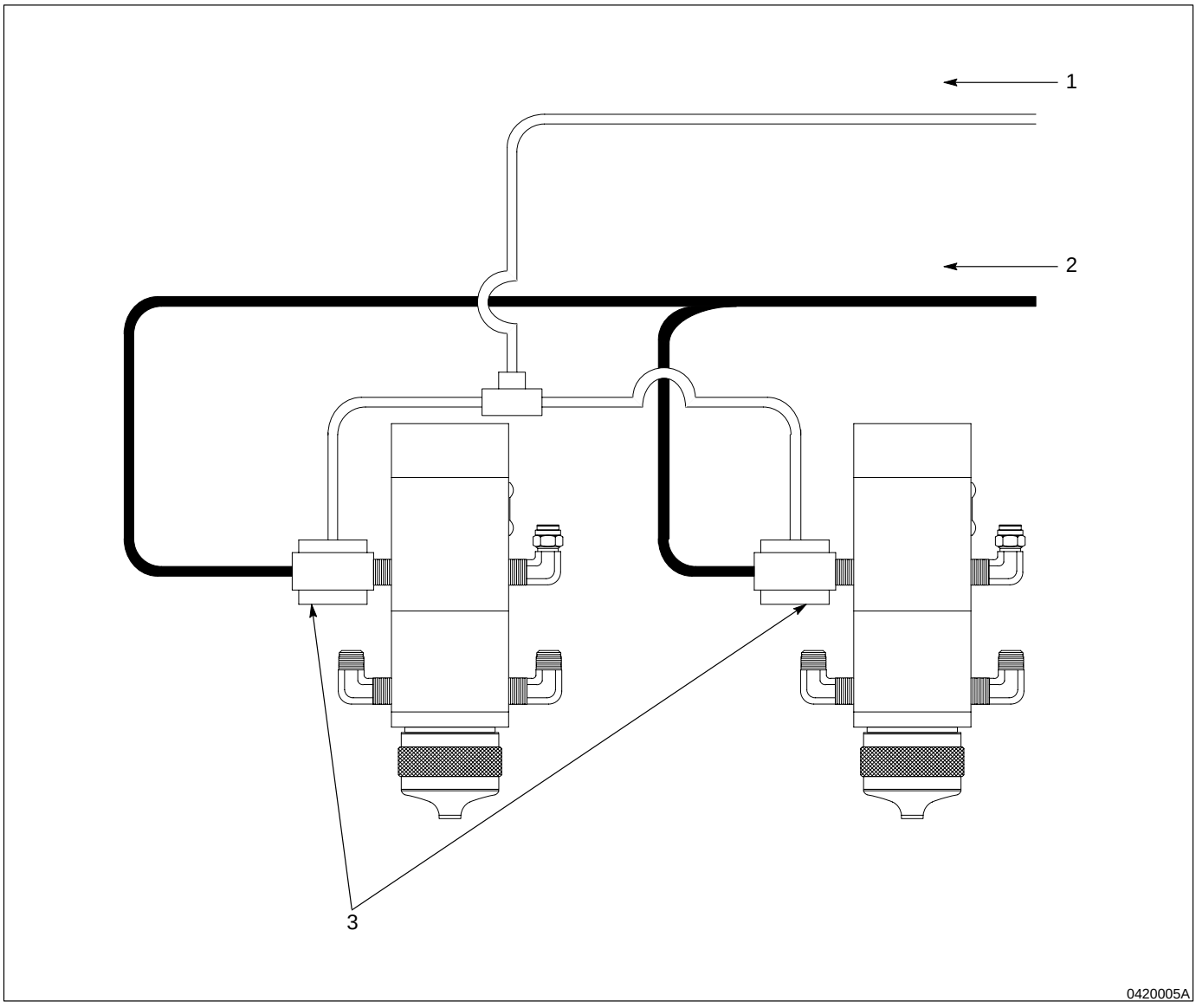

Fig. 5 Optional A7AA Installation

1. Trigger air from solenoid
2. Gun actuation air
3. Quick exhaust valves

4. Operation

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

1. If necessary, configure the controller per its manual.
2. Set the material pressure to the recommended operating level per your Nordson representative.
3. Turn on air and material flow.
4. Check for leaks at the air and material connections.

Shutdown

To shutdown the system:

1. Turn off power to the controller.
2. Turn off air and material to the system.

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 this warning may result in serious injury.

Periodically perform the following:

1. Check the air lines and the material supply hose for leaks, kinks or damage. Replace lines and hoses when necessary.
2. Make sure the A7AA gun is mounted securely.
3. Make sure the air supply filters are clean and dry.
4. Check for leaks at the connections of air and material.

6. 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.

Troubleshooting Chart

The following table lists possible A7AA malfunctions.

Problem	Possible Cause	Corrective Action
1. Leaking around the nozzle or nozzle retaining nut	Dirty or damaged nozzle seal or sealing surfaces	Relieve pressure to the system. Remove nozzle retaining nut. Clean or replace nozzle, nozzle seal, or ball and seat.
2. Leaking through exhaust holes in gun body directly behind fittings	Worn packing cartridge	Replace packing cartridge and seal kit.
3. Spitting	Dirty or worn ball tip or seat	Clean or replace ball tip and seat.
	Long trigger air lines	Mount solenoid on gun or as close as possible. Use optional dump valves or air release valves. Refer to the *Options* section.
	Air trapped in the fluid system	Circulate fluid for several minutes to purge air from the system.
	Air overlap adjustment is incorrectly adjusted	Adjust packing cartridge adjuster.
4. ON/OFF cycle response poor or non-existent	Air piston assembly worn or out of adjustment	Adjust or replace air piston assembly.
	Low air pressure to air solenoid	Increase the air pressure. The air pressure should be between 2.76–4.14 bar (40–60 psi).
	Long trigger air lines	Mount the solenoid on the gun or as close as possible.
	High fluid pressure	Reduce the fluid pressure at the pump. The maximum pressure is 117 bar (1700 psi).

7. Repair

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

The repair section consists of disassembly and assembly of the gun.

Gun Disassembly

Disassemble the gun as follows:

1. If possible, flush the gun with clean solvent before removing the gun from the system.
2. Remove both fluid and air pressure to the gun.
3. See Figure 6. Loosen the square head screw (14). If the position of the gun in relation to the material being coated is critical, the gun may also be removed by removing two fillister head screws (9). This allows the gun to be removed from the mounting block (13).
4. Remove the four screws (1).
5. Lift the air cylinder cover (2) and spring (3) from the air cylinder housing (12).
6. Using a screwdriver, remove the packing cartridge adjuster (4). Remove the air piston (7) from the air cylinder housing (12).
7. Remove the four screws (26).
8. Separate the gun body (16) from the air cylinder housing (12). Remove the seat holder (25).
9. Remove the ball seat retainer (23), O-rings (19, 24) and seat (22) from the seat holder (25).
10. Push the packing cartridge (20) and ball tip (22) from the gun body (16).
11. Remove the ball tip (22) from the packing cartridge (20).

Gun Assembly

Reverse the disassembly procedure but replace all O-rings. Coat all O-rings with lubricant and cover all fitting threads with tape before installing.

8. 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 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.

A7AA Airless Gun

See Figure 6.

Item	Part	Description	Quantity	Note
—	103 754	Gun, A7AA, stainless steel, pounds	1	
1	981 138	• Screw, oval, 10-32 x 1.000, slotted, zinc	4	
2	103 735	• Cover, air cylinder	1	
3	241 176	• Spring, compression, 1.240 x 1.093 OD x 0.094 in.	1	
4	103 725	• Adjuster, packing, cartridge	1	
5	940 063	• O-ring, Viton, 0.125 x 0.250 x 0.063 in.	1	
6	941 210	• O-ring, Viton, 1.063 x 1.250 x 0.094 in.	1	
7	243 975	• Piston, air	1	
8	940 125	• O-ring, Viton, 0.375 x 0.50 x 0.063 in.	1	
9	981 127	• Screw, fillister, 10-32 x 2.00, slotted, zinc	2	
10	983 120	• Washer, lock, e, split, #10, stainless, nickel	2	
11	971 403	• Elbow, male, $^1/_4$ tube x $^1/_8$ NPT, brass	2	
12	103 752	• Housing, air cylinder	1	
13	153 158	• Block, mounting	1	
14	981 405	• Screw, square, set, $^3/_8$-16 x 0.750 cup, zinc	1	
15	103 724	• Gasket, $^1/_{75}$ square x 0.015 thick	1	
16	103 753	• Body, gun, stainless steel, A7AA	1	
17	972 177	• Elbow, male, 37, $^1/_2$-20 x $^1/_4$, stainless steel	2	
18	117 312	• Gasket, 1.75 square x 0.062 thick	1	
19	940 150	• O-ring, Hotpaint, 0.563 x 0.688 x 0.063 in.	2	
20	153 090	• Cartridge packing	1	
21	940 134	• • O-ring, Viton, 0.438 x 0.563 x 0.063 in.	1	
22	103 722	• Tip, ball, with seat, A7AA	1	
23	103 743	• Retainer, ball seat	1	
24	940 100	• O-ring, Hotpaint, , 0.250 x 0.375 x 0.063 in.	1	
25	103 750	• Holder, seat, stainless steel	1	
26	981 294	• Screw, oval, 10-32 x 2.250, slotted, zinc	4	
27	103 738	• Ring, retaining	1	
NS	901 905	• Brush	1	
NS	973 415	• Plug, pipe, socket, standard, $^1/_4$ stainless steel	1	
NS	152 999	• Wrench	1	
NS	901 911	• Wrench, adjustable, module	2	

NS: Not Shown

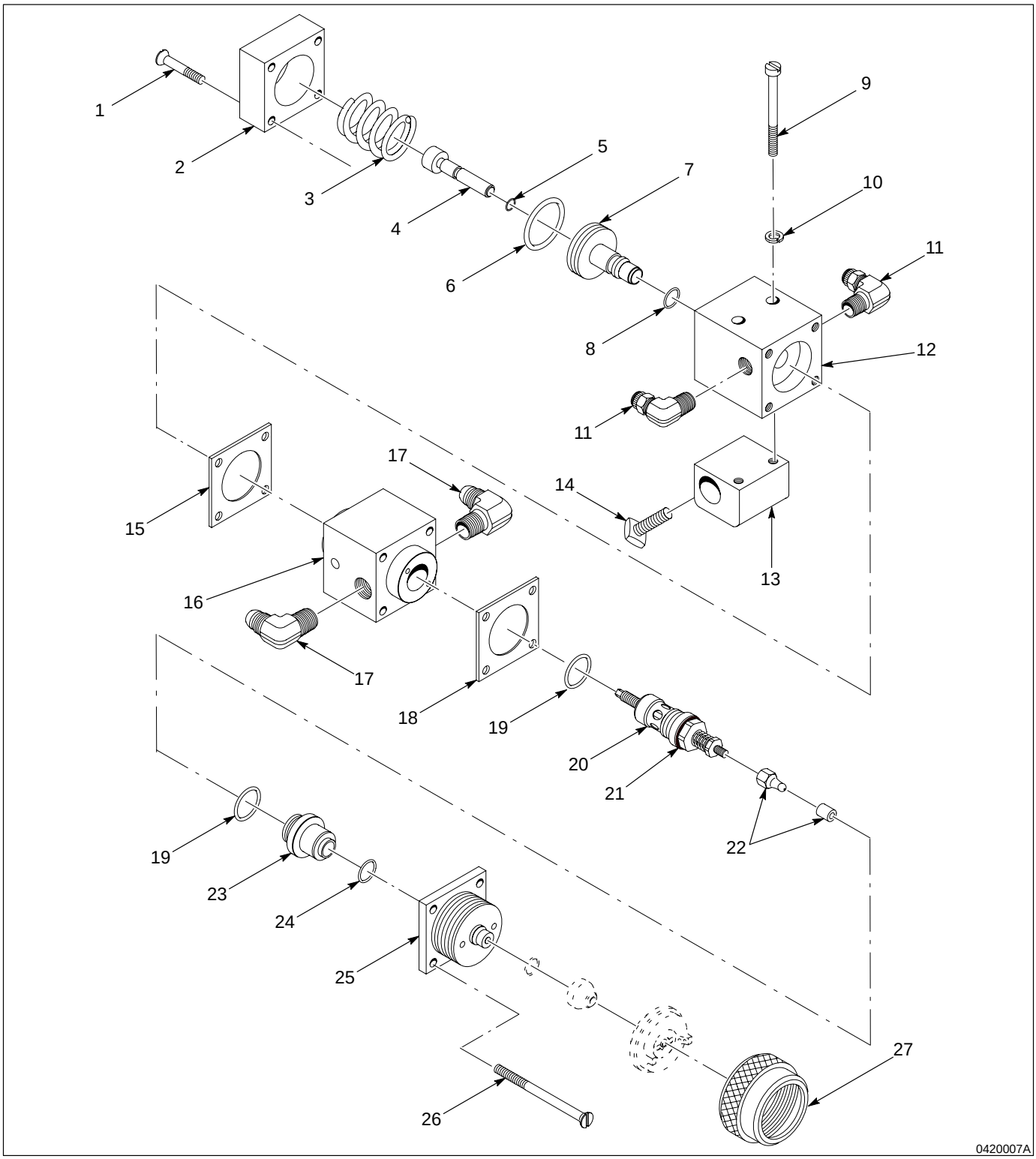

Fig. 6 A7AA Airless Gun

Seal Service Kit

See Figure 6.

Item	Part	Description	Quantity	Note
—	103 728	Service kit, seal, A7AA	1	
5	940 063	• O-ring, Viton, 0.125 x 0.250 x 0.063 in.	1	
6	941 210	• O-ring, Viton, 1.063 x 1.250 x 0.094 in.	1	
8	940 125	• O-ring, Viton, 0.375 x 0.500 x 0.063 in.	1	
15	103 724	• Gasket, 1.75 square x 0.015 thick	1	
18	117 312	• Gasket, 1.75 square x 0.062 thick	1	
19	940 150	• O-ring, Hotpaint, 0.563 x 0.688 x 0.063 in.	2	
24	940 100	• O-ring, Hotpaint, 0.250 x 0.375 x 0.063 in.	1	

Ball Tip With Seat Service Kit

See Figure 6.

Item	Part	Description	Quantity	Note
—	103 726	Service kit, ball tip with seat	1	
19	940 150	• O-ring, Hotpaint, 0.563 x 0.688 x 0.063 in.	2	
22	103 722	• Tip, ball, with seat, A7AA	1	
24	940 100	• O-ring, Hotpaint, 0.250 x 0.375 x 0.063 in.	1	

Recommended Spare Parts

The following lists the recommended spare parts. Refer to the *Options* section or contact your Nordson representative for a complete list of nozzles available.

Part	Description	Quantity
103 728	Service kit, seal, A7AA	1
103 726	Service kit, ball tip with seat	1
153 090	Cartridge packing	1
901 905	Brush	1
152 999	Wrench	1
901 911	Wrench, adjustable, module	2

9. Options

Options include nozzles, air cap and equipment.

Nozzles and Air Cap

For a complete list of nozzles, refer to the Nordson Airless Nozzle Catalog. Nozzles can also be made to customer specifications. Contact your Nordson representative for more information.

NOTE: The digits following the description refer to the flow rate and fan width. For example, part 123 601 has a nominal flow rate of 0.03 gallons/minute and a minimal fan pattern eight inches wide at a distance of ten inches from the substrate.

Part	Description
123 601	Nozzle, x-cut, 0.03/08
123 602	Nozzle, x-cut, 0.04/10
123 603	Nozzle, x-cut, 0.06/08
123 604	Nozzle, x-cut, 0.06/10
123 605	Nozzle, x-cut, 0.06/12
123 606	Nozzle, x-cut, 0.06/18
123 607	Nozzle, x-cut, 0.09/06
123 608	Nozzle, x-cut, 0.09/08
123 609	Nozzle, x-cut, 0.09/10
123 610	Nozzle, x-cut, 0.09/12
123 611	Nozzle, x-cut, 0.09/14
123 612	Nozzle, x-cut, 0.09/18
123 613	Nozzle, x-cut, 0.14/08
123 614	Nozzle, x-cut, 0.14/10
123 615	Nozzle, x-cut, 0.14/12
123 616	Nozzle, x-cut, 0.14/14
123 617	Nozzle, x-cut, 0.14/16
123 618	Nozzle, x-cut, 0.20/10
123 619	Nozzle, x-cut, 0.20/12
123 620	Nozzle, x-cut, 0.20/18
123 621	Nozzle, x-cut, 0.30/14
123 622	Nozzle, x-cut, 0.06/14
123 623	Nozzle, x-cut, 0.075/14
123 624	Nozzle, x-cut, 0.06/14
115 463	Air cap

Equipment

The following table lists optional equipment.

Part	Description
161 340	Fluid filter
110 911	Fluid filter, stainless steel
244 777	Circulation valve
244 778	Circulation valve, stainless steel
094 000	Nozzle broach, 0.003 in.
094 002	Nozzle broach, 0.006 in.
901 262	Air exhaust valve
901 028	Quick-exhaust, air release valve
901 479	Air regulator, 0–6.89 bar (0–100 psi)
901 264	Gauge, 0–6.89 bar (0–100 psi)
129 463	Air regulator, 0–2.07 bar (0–30 psi) (for air assist air)
901 240	Gauge, 0–2.07 bar (0–30 psi) (for air assist air)
248 532	Fixed orifice regulator

10. Specifications

Specifications for the A7AA gun are listed below.

Dimensions

See Figure 7.

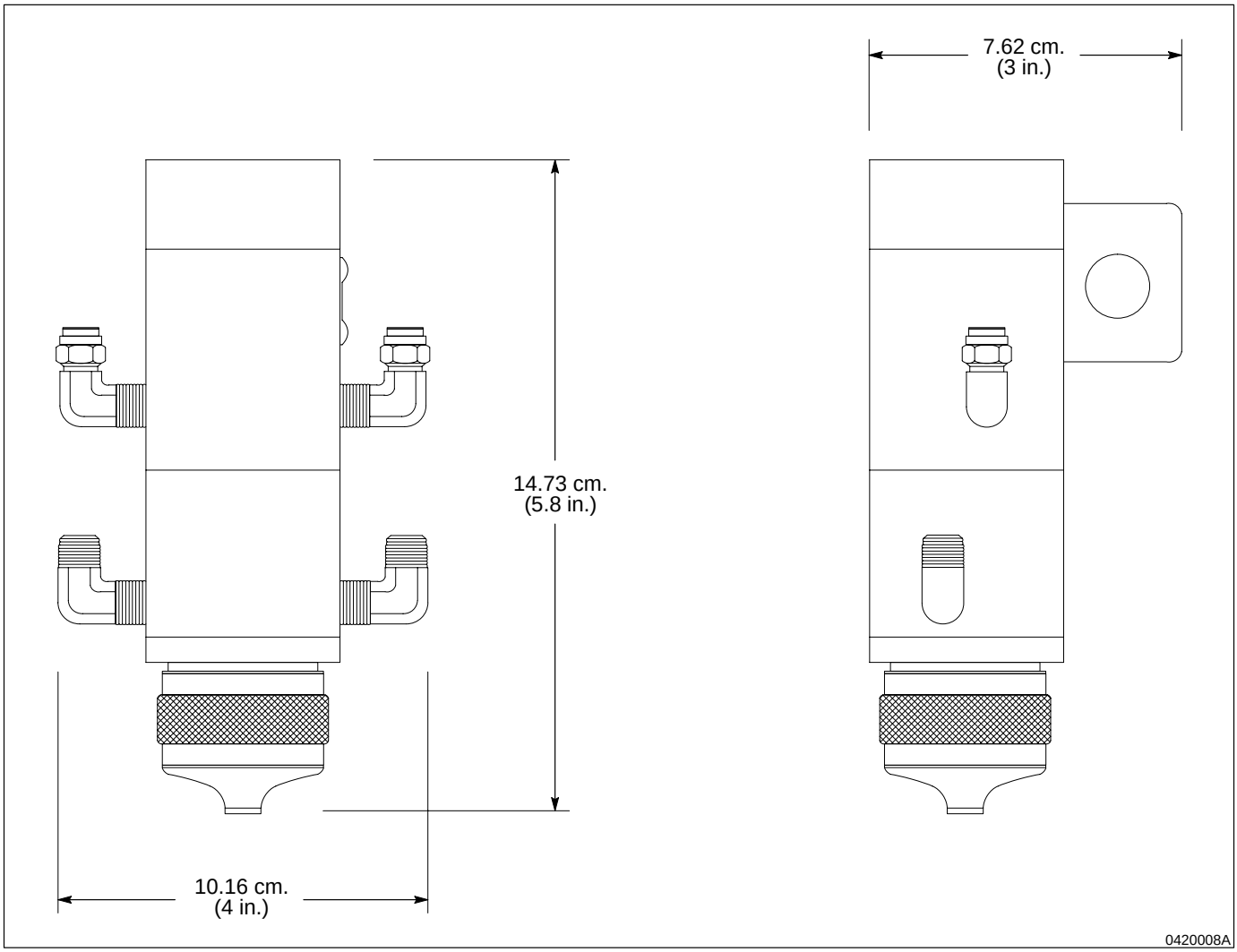

Fig. 7 System Dimensions

Weight

1400 grams (3.09 lbs)

Pressures

Air pressures are listed below.

Air	Minimum	Maximum
Trigger	276 kpa (40 psi)	758 kpa (110 psi)
Assist	0	758 kpa (110 psi)
Fluid	0	1034 kpa (1500 psi)