SCF®-A1 Automatic Spray Gun

Part 108 237C

NORDSON CORPORATION ● AMHERST, OHIO ● USA

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Notice

Trademarks

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SCF-A1 Automatic Spray Gun

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. Refer to the National Fire Protection Association (NFPA) standard 33 and to federal, state, regulatory agency, and local codes for rules and regulations covering installation and operation of spray systems.
- obtain and read Material Safety Data Sheets (MSDS) for all materials used.

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.

Safety Symbols *(contd)*

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

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

Safety Symbols (contd)

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 this 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

Installation

Read the installation section of all system component manuals before installing your Nordson equipment. A thorough understanding of system components and their requirements will help you to install this equipment safely and efficiently.

WARNING: Failure to follow these safety procedures can result in personal injury or death.

- Allow only qualified personnel to install Nordson equipment.
- Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Install all electrical, pneumatic, gas, and hydraulic connections to local code.
- Install locking, manual, shutoff valves in the air supply lines to the system. This allows you to relieve air pressure and lock out the pneumatic system before undertaking maintenance and repairs.
- Install a locking disconnect switch or breaker in the service line ahead of any electrical equipment.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Ground all electrically conductive equipment. Ungrounded conductive equipment can store a static charge which could ignite a fire or cause an explosion if a hot spark is discharged.
- Route electrical wiring, electrostatic cables, and air hoses and tubing along a protected path. Make sure they will not be damaged. Do not bend electrostatic cables around a radius of less than 6 in. (152 mm).
- Install safety interlocks and approved, fast-acting fire detection systems. These shut down the spray system and any flammable liquid supply if a ventilation or electrical problem occurs, a fire is detected, or other emergency situation develops.

Installation (contd)

- Make sure the spray area floor is conductive to ground and that the operator's platform is grounded.
- Use only designated lifting points or lugs to lift and move heavy equipment. Always balance and block loads when lifting to prevent shifting. Lifting devices must be inspected, certified, and rated for a greater weight than the equipment being lifted.
- Do not use unapproved fluid hoses. Solvents may cause them to deteriorate rapidly which may allow flammable or pressurized material to escape.
- Protect components from damage, wear, and harsh environmental conditions.
- Allow ample room for maintenance, material supply container drop-off and loading, panel accessibility, and cover removal.
- Protect equipment with safety devices as specified by applicable safety regulations.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.

Operation

Only qualified personnel, physically capable of operating the equipment and with no impairments to their judgement or reaction times, should operate this equipment.

Read all component manuals before operating this equipment. A thorough understanding of system components and their operation will help you operate the system safely and efficiently.

- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.
- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks, locked-out electrical disconnects, or pneumatic valves.

***Operation** (contd)*

- Know where *EMERGENCY STOP* buttons, shutoff valves, and fire extinguishers are located. Make sure they work. If a component malfunctions, shut down and lock out the equipment immediately.
- Before operating, make sure all conductive equipment, objects being sprayed, and fluid containers are connected to a true earth ground.
- Never operate equipment with a known malfunction or leak.
- Never point handguns or applicator nozzles at yourself or other persons.
- Never touch exposed electrical connections on equipment while the power is ON.
- Do not operate the equipment at pressures higher than the rated maximum working pressure of any component in the system.
- Shut off moving equipment before taking measurements or inspecting workpieces.
- Know the pinch points, temperatures, pressures, and material composition for all equipment that you are working with. Recognize potential hazards associated with these and exercise appropriate caution.
- Wear shoes with conductive soles, such as leather, or use grounding straps to maintain a connection to ground when working with or around electrostatic equipment.
- Do not wear or carry metallic objects (jewelry or tools) while working with or around electrostatic equipment. Ungrounded metal can store a static charge and cause harmful shocks.
- Maintain skin-to-metal contact between your hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If wearing gloves, cut away the palm or fingers.
- Shut off electrostatic power supplies and ground gun electrodes before making adjustments to powder spray guns.
- If you notice electrical arcing in a spray area, shut down the system immediately. An arc can cause a fire or explosion.
- Keep parts of the body or loose clothing away from rotating parts. Remove personal jewelry and cover or tie back long hair.

Operation *(contd)*

- Wear National Institute of Occupational Safety and Health (NIOSH) approved respirators while operating spray equipment and when performing maintenance and cleaning tasks.
- Wear eye protection when operating spray equipment.
- Wear gloves and protective clothing to protect your skin from materials.
- Keep paint pumps, pressure pots, and containers of flammable coating materials or solvents far enough away from spray booths to prevent their inclusion in a booth fire.
- Do not smoke in the spray area. A lit cigarette could ignite a fire or cause an explosion.
- Treat all high-pressure fittings and hoses as if they could leak. High-pressure compressed air can be injected under the skin and cause serious injury or death.
- Do not use materials that will corrode the equipment.
- Do not attempt to operate electrical equipment if standing water is present.
- Wash exposed skin frequently with soap and water, especially before eating or drinking. Do not use solvents to remove coating materials from your skin.

Less-Obvious Dangers

Operators should also be aware of less-obvious dangers in the workplace that often cannot be completely eliminated:

- exposed surfaces on the equipment which may be hot or have sharp edges and cannot be practically safeguarded
- electrical equipment which may remain energized after the equipment has been shut off
- vapors and materials which may cause allergic reactions or other health problems
- automatic hydraulic, pneumatic equipment, or mechanical parts that may move without warning
- unguarded, moving mechanical assemblies

Action in the Event of a System or Component Malfunction

Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power. Close and lock out hydraulic and pneumatic shutoff valves and relieve pressures.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component according to instructions provided in its manual.

Maintenance and Repair

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks. Only persons who are properly trained and familiar with Nordson equipment are permitted to service this equipment.

- Always wear appropriate protective clothing and use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in your equipment manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Disconnect, lock out, and tag electrical power at a disconnect or breaker in the service line ahead of electrical equipment before servicing.
- Relieve air and fluid pressures before servicing equipment. Follow the specific instructions in this manual.
- Use only genuine Nordson replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.

WARNING: Note the flash point of the cleaning solvent used. Only use controlled methods and equipment, such as temperature-controlled or explosion-protected heaters, to heat cleaning solvent. Observe explosion-prevention regulations and follow applicable safety instructions.

- Refer to the MSDS before using solvents to clean this equipment. The MSDS will provide use, storage, and disposal information about the solvent. Read this information carefully and follow instructions.

Maintenance and Repair *(contd)*

- Never use an open flame to clean the unit or components of the unit.
- Do not store flammable materials in the spray area or room. Keep paint pumps, pressure pots, and containers of flammable coating materials or solvents far enough away from spray booths to prevent their inclusion in a booth fire. If a fire or explosion occurs, flammable materials in the area will increase the chances and the extent of personal injuries and property damage.
- Make sure that the room where you are working is sufficiently ventilated. Avoid breathing vapors over prolonged periods of time.
- Check interlock systems periodically to ensure their effectiveness.

WARNING: Operating faulty or electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make resistance checks part of your periodic maintenance program.

- Check all ground connections periodically with a megohm meter. Resistance to ground must not exceed one megohm. If sparks or arcing occur, shut down the system immediately.
- Connect all disconnected equipment ground cables and wires after servicing the equipment. Ground all conductive equipment.

WARNING: Service lines connected to panel disconnect switches will still be energized unless power is shut off at another disconnect ahead of the panel. Make sure the power is off before servicing. Wait 5 minutes for capacitors to discharge after shutting off the electrical power.

- Turn off the electrostatic power supply and ground the gun electrode before adjusting or cleaning the nozzles, fluid tips, or air caps.
- If a “power on” test is required, perform the test carefully and then shut off and lock out power as soon as the test is over.
- Never troubleshoot the power supply without first disconnecting all external power supplies and discharging the high-voltage capacitors with an insulated screwdriver.
- Ground electrodes and electrostatic cable ends before touching them.

Maintenance and Repair (contd)

- Do not attempt to service electrical equipment if there is standing water present. Do not service electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.
- Keep high-voltage connection points clean and insulated with dielectric grease or oil.
- Do not attempt to service a moving piece of equipment. Shut off the equipment and lock out power. Secure equipment to prevent uncontrolled movement.

Material and Solvent Precautions

WARNING: Hot! Risk of burns. Wear heat-protective clothing, eye protection with side shields and/or heat-protective gloves.

Heated materials may cause severe burns on contact. Remember that some materials, even solid materials, may retain heat for some time. If you are burned by a heated material, immediately cool the affected skin with lots of cool, clean water. Do not try to remove hot, melted material from the skin. Seek immediate medical attention.

High-pressure fluids, unless they are safely contained, are extremely hazardous. A jet of high-pressure fluid can act like a knife or needle, penetrate skin and muscle, and inject itself into your body. Injected fluids can cause toxic poisoning.

Do not treat an injection injury as minor. Seek medical care immediately. Inform the medical staff at the hospital that you have an injection injury and identify the fluid that was injected. If possible, give the doctor copies of the MSDS for the injected fluid and for any additives, such as solvents, that are in the injected fluid.

Also, Nordson recommends that you carry a National Safety Equipment Manufacturers Association (NSEMA) wallet card to give to emergency medical staff in the event of an injection injury. These cards are supplied with the equipment. Additional cards are available free from Nordson Corporation.

Material and Solvent Precautions *(contd)*

WARNING: Injection hazard. Do not go near a known leak in a hose or fitting, and stay clear of all spray nozzles or orifices. Do not point an applicator at yourself or other personnel. The high-pressure fluid into the body causing serious injury or death.

To prevent an injection injury, take some basic safety precautions when operating your equipment.

- Always handle spray applicators carefully. Do not point a pressurized gun at yourself or other personnel.
- Never place hands, fingers, or other parts of your body directly over a spray nozzle or in front of a leak in a high-pressure system.
- Never “back-flush” the nozzles. Blocking a nozzle causes the high-pressure fluid to reverse direction and can lead to an injection injury.
- Always relieve system pressure before servicing equipment. Trigger all applicators and bleed off system pressure.

Halogenated hydrocarbon solvents can cause an explosion when used with aluminum components in a pressurized fluid pumping system (pumps, heaters, filters, valves, spray guns, and tanks). The explosion could cause serious bodily injury, death, or substantial property damage. No available stabilizers will prevent this violent reaction from happening.

WARNING: Never use halogenated hydrocarbon solvents to clean aluminum parts or to flush any system. Cleaning agents, coatings and paints, or adhesives may contain halogenated hydrocarbon solvents. Obtain and read the MSDS for each material and solvent being used.

- Use nonhalogenated solvents.
- Contact your solvent supplier to determine whether your existing materials and solvents contain halogenated hydrocarbons or to obtain a suitable, nonhalogenated hydrocarbon solvent for cleaning and flushing your system.

Material and Solvent Precautions *(contd)*

- See Table 1. Check the labels on your solvent containers. Halogenated hydrocarbon solvents can be recognized if any of the following elements are listed in the name of the product or as an ingredient:

Element	Symbol	Prefix
Flourine	F	“Flouro-”
Chlorine	Cl	“Chloro-”
Bromine	Br	“Bromo-”
Iodine	I	“Iodo-”

If you are now using halogenated hydrocarbon solvents in pressurized systems with aluminum components, perform the following steps:

- Pump the system empty, shut off the pumps, and relieve the system pressure.
- Disassemble and inspect the system components. Replace any damaged or corroded parts.
- Thoroughly clean all noncorroded parts with nonhalogenated hydrocarbon.
- Contact your coatings, solvent, or adhesive supplier for a nonhalogenated solvent to thoroughly flush the entire system before operating it.
- If you must continue to use halogenated hydrocarbon solvents, consult your Nordson representative about compatible Nordson components.

Material and Solvent Precautions (contd)

Table 1 Solvents Containing Halogenated Fluids

Chlorinated Solvents	Iodinated Solvents	Brominated Solvents	Fluorocarbon Solvents
Carbon Tetrachloride	Ethyl Iodide	Ethylene Dibromide	Dichlorofluoromethane
Chloroform	Methyl Iodide	Methyl Bromide	Trichlorofluoromethane
Ethylene Dichloride	N-butyl Iodide	Methylene Chlorobromide	Freon
Methylene Chloride	Propyl Iodide		
1-1-1 Trichloroethane			
Monochlorobenzene			
Orthodichlorobenzene			
Perchloroethylene			
Trichloroethylene			

Disposal

Dispose of equipment and materials used in operation and cleaning according to your local regulations.

2. Description

See Figure 1.

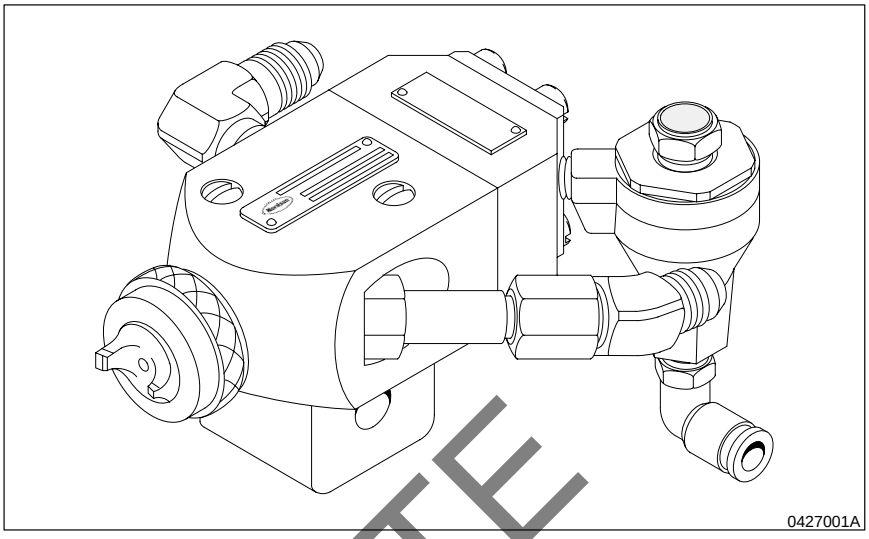

Fig. 1 SCF-A1 automatic spray gun

The Nordson Model SCF-A1 automatic spray gun is used with Nordson Super-Critical Fluid (SCF) systems. The Nordson SCF systems utilize the UNICARB process, developed by Union Carbide Corporation, in which super-critical carbon dioxide (CO_2) is mixed with heated, pressurized coating materials (resins).

The SCF System

When CO_2 reaches a super-critical stage (at a pressure of 73.7 bar (1070 psi) and a temperature of 31 °C (87 °F)), it acts as a thinner and lowers the viscosity of coating materials to normal spray levels. This reduces the use of organic solvents by up to 80 percent.

The system supplies the mixture to the gun(s) at 82.7–172.3 bar (1200–2500 psi) pressure, and temperatures of 38–82 °C (100–180 °F).

Refer to the documentation supplied with your Nordson SCF system for further information.

CAUTION: Coating materials must be specially formulated for use with SCF systems. Contact your Nordson representative, Union Carbide Corporation, or a coatings formulator for a suitable coating.

Mounting Requirements

The SCF-A1 automatic spray gun can be mounted either on a gun mover or in a stationary position.

Theory of Operation

See Figure 2.

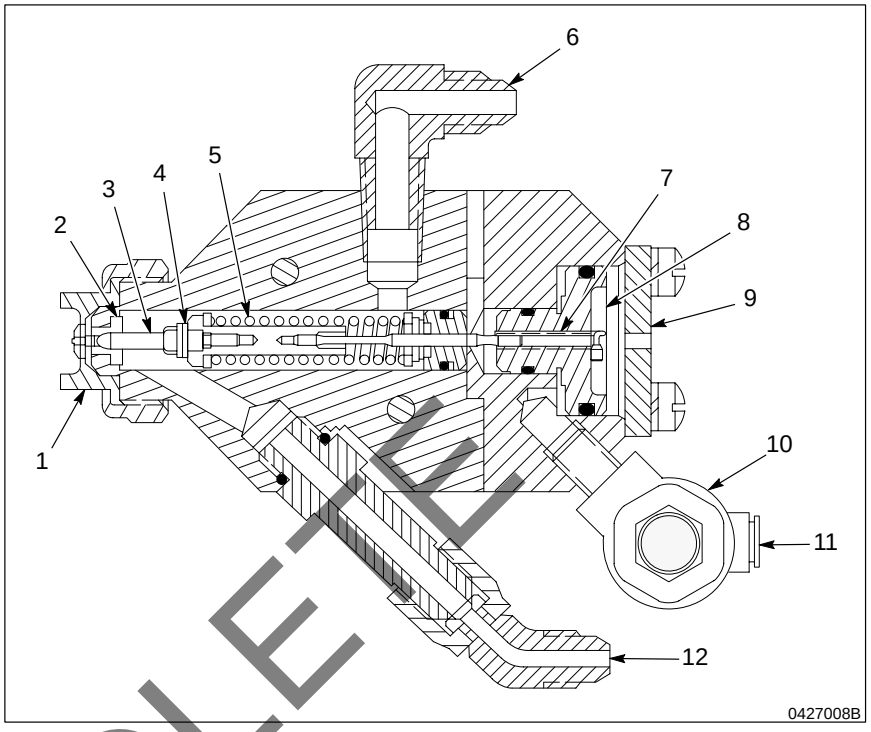

Fig. 2 Cross section of SCF-A1 automatic spray gun

1. Nozzle
2. Seat
3. Ball tip assembly
4. Lock washer
5. Packing cartridge
6. Material inlet (or outlet)
7. Pin
8. Piston
9. Piston plate
10. Exhaust valve
11. Air inlet
12. Material outlet (or inlet)

When the Gun Is Triggered

The SCF-A1 automatic spray gun is air-actuated through the use of an external solenoid. When the gun is triggered, air enters through its inlet (11) and forces the piston (8) back toward the piston plate (9). The piston pin (7) rests between the groove in the piston and the flat side of the packing cartridge (5) and, along with the lock washer (4), keeps the packing cartridge from unscrewing itself.

As the piston retracts, it compresses the packing cartridge (5), pulling the ball tip assembly (3) away from the seat (2). This allows the mixture of CO_2 and coating material(s) to enter through the material inlet (6). The mixture then passes through the opening at the seat and exits at the nozzle (1) where it is partially atomized. Material atomization is completed outside of the nozzle.

When the Gun Is Not Triggered

When the gun is not being triggered, the mixture of CO_2 and coating material(s) is continuously recirculated through the gun and back into the system through the material outlet (12). This ensures an even spray pattern and reduces clogging by keeping a consistent mixture in the gun. When triggering of the gun is stopped, the air is exhausted through the exhaust valve (10).

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.

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

WARNING: Material may contain Carbon Dioxide (CO_2) as a liquid at high pressures. Spray area must be well-ventilated per applicable regulations.

Mounting

See Figure 3.

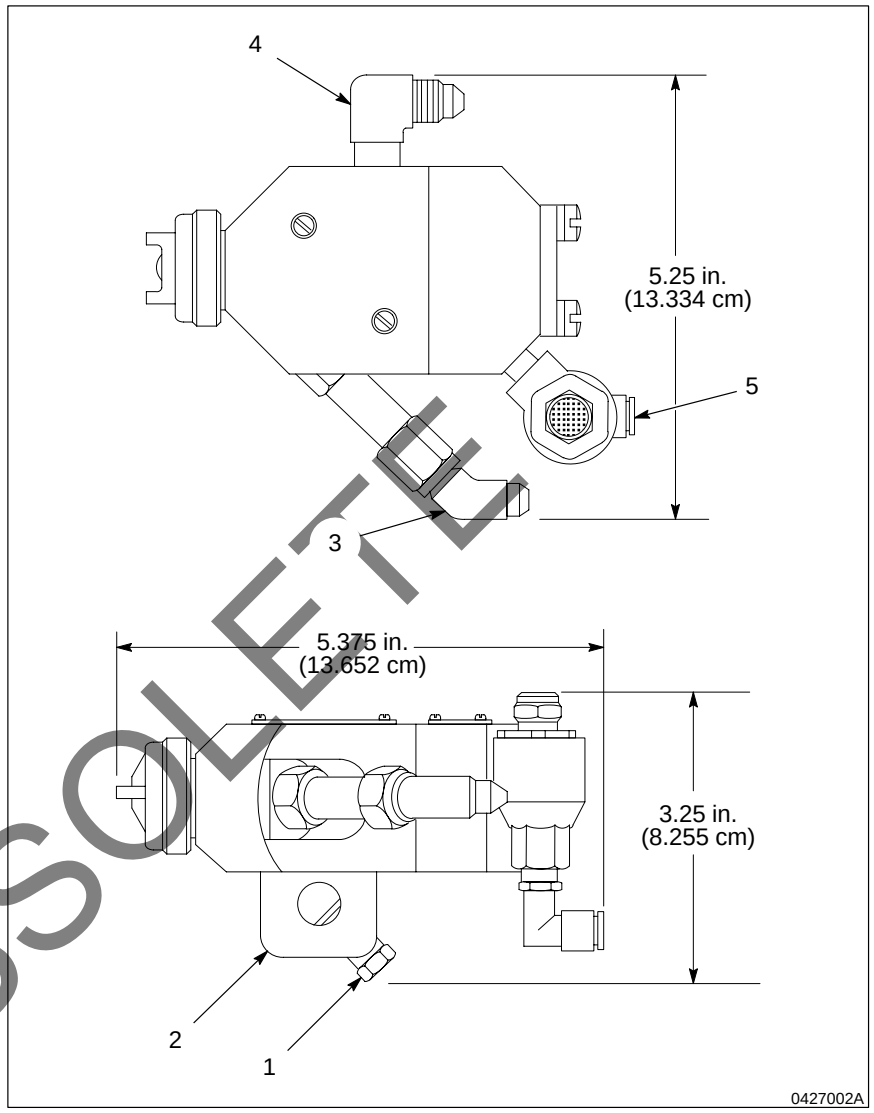

Fig. 3 Mounting the SCF-A1 Automatic Spray Gun

1. Square head screw
2. Mounting block
3. Material outlet (or inlet) port — 45° swivel elbow
4. Material inlet (or outlet) port — $^1/_2$-20 JIC x $^1/_4$ NPT male elbow
5. Air supply inlet

Mounting (contd)

The SCF-A1 automatic spray gun can be mounted either on a gun mover or in a stationary position using a 1.27-cm- ($^1/_2$-in.-) round bar. Follow the procedures below:

1. To mount the gun:
   a. Loosen the square head screw (1).
   b. Slide the mounting bar through the gun's mounting block (2).
   c. Align the gun and tighten the square head screw.

NOTE: Either fluid port can function as an inlet or outlet depending on how the gun is mounted. However, Nordson Corporation recommends that the 45° swivel elbow (3) be used as the outlet port in circulating systems and as the dead-end port in non-circulating systems. Contact your Nordson Corporation representative to order the O-ring plug necessary to dead-end the gun at the swivel elbow port.

2. Attach the material inlet and outlet hoses to the gun ($^1/_2$-20 JIC hose fittings). Contact your Nordson representative for the proper type of hose to use with your system.

3. Attach the air supply to the gun ($^1/_4$-in. OD tube) at the air supply inlet (5).

4. Operation

This section covers basic operating procedures for the SCF-A1 automatic spray gun.

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

WARNING: Material may contain Carbon Dioxide (CO_2) as a liquid, at high pressures. Spray area must be well-ventilated per applicable regulations.

Startup

For first time startup, make sure that the Nordson SCF system is properly installed. Refer to your system manual(s).

First Time Start Up

1. Set the air pressure at 3.4–8.2 bar (50–120 psi) and trigger the gun. Adjust the pressures as necessary.

2. Flush the system with solvent as described in the Nordson SCF system manual(s).

Daily Start Up

Perform the following steps when starting up the SCF-A1 gun:

1. Check all connections for tightness. Refer to the system manual for any specific information not supplied here.

2. Reinstall the nozzle, if removed for cleaning during maintenance.

3. Attach a supply of compressed air to the system.

4. Turn on main power to the system.

WARNING: Do not operate the heater until the fluid delivery system is fully pressurized and fluid is circulating. If fluid does not circulate properly, heat can build up and cause an explosion or fire.

5. Once the fluid is circulating, turn the heaters on (if heaters are used with your system).

6. Trigger the gun(s) and begin spraying. Adjust the pressures as needed. Refer to the system manual for additional guidance.

Shutdown

Perform the following steps when shutting down operation of the SCF-A1 gun.

1. Flush the system with a compatible cleaning solvent and shut down the system according to the procedures in the Nordson SCF system manual(s).

2. Press the stop key to begin the shutdown procedure.

Shutdown (contd)

WARNING: Always turn off the power to the heaters and allow them to cool before shutting down the circulating pump. Failure to do so could result in a fire or explosion from overheated coating materials.

3. Turn off the power to any heater used with the system. Do not turn the circulating pump off until the material in the system has cooled.
4. Reduce the pump air supply pressure to zero and shut off the system air supply.
5. Inspect the gun(s) for any signs of wear or damage. Clean and repair as necessary.

5. Maintenance

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

Daily

Perform the following steps daily to properly maintain the SCF-A1 gun:

1. Follow the system maintenance checks outlined in the Nordson SCF system manual(s).
2. Flush the gun with a solvent compatible with the coating material. See your Nordson SCF system manual(s) for the solvent flush procedure.
3. Remove and soak the nozzle in a compatible solvent. If necessary, use a Nordson nozzle broach and clean the nozzle as described in its corresponding Nordson manual.

Periodic

Perform the following steps periodically to properly maintain the SCF-A1 gun:

1. Inspect the gun for wear and damage. Replace or repair any parts as necessary.
2. Replace the packing cartridge if it is worn or damaged. Refer to the *Repair* section for instructions on replacing the packing cartridge.

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.

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.

Problem	Possible Cause	Corrective Action
1. Leaking around nozzle or ball and seat assembly	Dirty or damaged sealing surfaces	Remove and clean the nozzle or ball and seat; replace if necessary.
2. Leaking through exhaust holes in body	Worn or damaged packing cartridge	Replace the packing cartridge.
3. Spitting	Dirty or worn ball and seat	Clean or replace the ball and seat.
	Dirty nozzle	Clean the nozzle.
	Air trigger supply not exhausting quickly	Check the exhaust valve operation and replace, if necessary. Use air pressure gauge at gun air inlet to verify.
	Air trigger lines too long	Mount the solenoid as closely as possible to the gun.
4. On/off cycle response poor or non-existent	Air piston assembly worn or out of adjustment	Adjust or replace the air piston assembly.
	Low air pressure to air solenoid	Increase the air pressure.
	Air trigger lines too long	Mount the solenoid as closely as possible to the gun.
	Air trigger supply not exhausting quickly	Check the exhaust valve operation and replace, if necessary. Use air pressure gauge at gun air inlet to verify.
	Dirty or clogged fluid passages and/or packing cartridge	Flush gun with compatible solvent, disassemble, and clean. Replace packing cartridge, if necessary.

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.

Packing Cartridge Replacement

This section details the procedures followed to replace an SCF-A1 gun packing cartridge. See Figure 4.

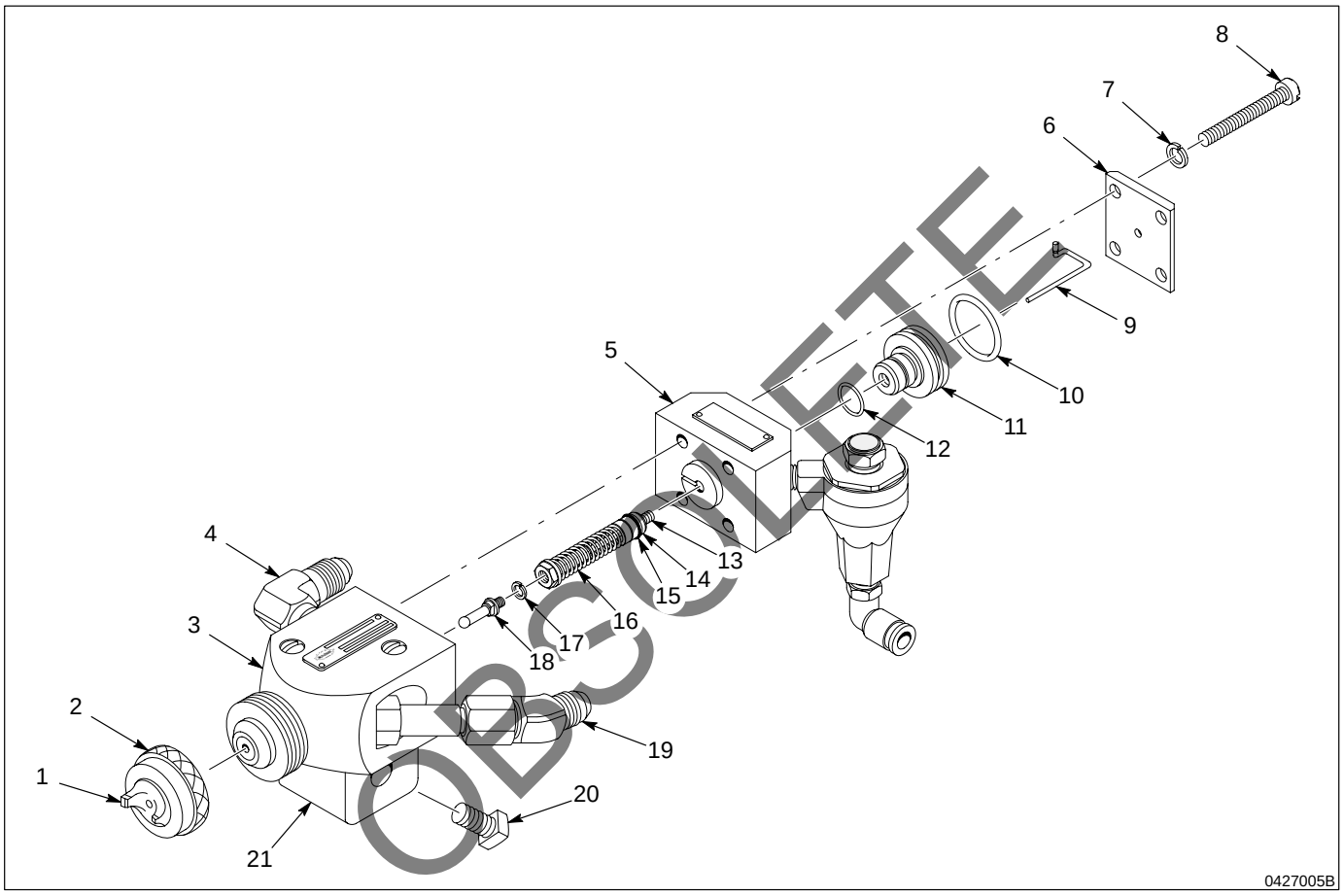

Fig. 4 SCF-A1 gun disassembled

1. Nozzle nut
2. Nozzle
3. Gun body
4. Material inlet (or outlet)
5. Piston housing
6. Piston plate
7. Lock washer
8. Fillister head screw
9. Piston locking pin
10. O-ring
11. Piston
12. O-ring
13. Packing cartridge threads
14. O-ring
15. Back-up ring
16. Packing cartridge
17. Lock washer
18. Ball tip assembly
19. Material outlet (or inlet)
20. Square head screw
21. Mounting block

See Figure 4

Gun Disassembly

1. Flush the gun with a compatible cleaning solvent as detailed in the Nordson SCF system manual(s).

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

2. After all pressures have been relieved, trigger the gun(s) to relieve line pressure. Open/close the filter drain-off valve before attempting to remove any hoses from the gun.

3. Remove the trigger air supply line and the material inlet/outlet (4 and 19) lines attached to the gun.

4. Loosen the square head screw (20) that secures the gun's mounting block (21) to the mounting bar.

NOTE: To preserve the alignment of the gun, the gun can be freed from the mounting block by removing the two fillister head screws and lock washers (Figure 5, (4 and 3)) that secure the mounting block to the gun body.

5. Follow the procedure below to separate the piston housing (5) and packing cartridge (16) from the gun body:

   a. Remove four fillister head screws (8) and lock washers (7) that secure the piston housing to the gun body (3).

   b. Remove the piston plate (6).

   c. Remove the piston locking pin (9).

   d. Carefully turn the packing cartridge counterclockwise to free it from the piston and piston housing.

6. Unscrew the ball tip assembly (18) from the packing cartridge. Use two wrenches to clasp the flats on the ball tip and the packing cartridge hex head nut.

7. Free the piston (11) from the piston housing and replace the old O-rings (10 and 12).

8. Loosen and remove the nozzle nut (1) from the gun body.

9. Clean the gun parts with a compatible cleaning solvent and wipe them dry before reassembling the gun.

See Figure 4

Gun Assembly

1. Install new, well-lubricated O-rings (10 and 12) on the piston (11) and insert it into the piston housing (5).

2. The packing cartridge is shipped with its back-up ring (15) and O-ring (14) pre-installed. Be sure to lubricate the O-ring.

3. Thread the ball tip assembly (18) and lock washer (17) into the new packing cartridge (16). Use two wrenches to clasp the flats on the ball tip and the packing cartridge hex head nut.

4. Note the location of the flat on the packing cartridge threads (13).

5. Secure the packing cartridge (16) to the piston (11) by inserting the packing cartridge threads (13) through the piston housing (5) and thread it into the piston. Tighten until the end of the packing cartridge threads is roughly flush with the bottom of the screwdriver slot in the end of the piston. Tighten further only until the flat on the packing cartridge threads is aligned with the pin groove and insert the piston locking pin (9).

6. Slowly insert the piston housing and packing cartridge into the gun body (3). Be careful not to damage the packing cartridge.

7. Verify that there is a gap between the piston housing and the gun body of anywhere from 0.025–0.229 cm (0.010–0.090 in.) wide. The gap allows the ball tip assembly (18) to seat tightly.

8. Position the piston plate (6) onto the piston housing. Insert the four fillister head screws (8) and lock washers (7) through the piston plate, piston housing, and into the gun body. Tighten the screws and lock washers securely.

9. Slide the gun and mounting block (21) over the mounting bar and tighten using the square head screw (20).

NOTE: If you removed the gun from its mounting block, reattach the gun by using the two fillister head screws and lockwashers (Figure 5, (4 and 3)).

10. Attach all fluid and air hoses to their respective fittings.

11. Install the nozzle (2) and nozzle nut (1) onto the gun body.

8. Parts

To order parts, call 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.

SCF-A1 Automatic Spray Gun Parts

See Figure 5

Item	Part	Description	Quantity	Note
—	141 880	Gun, SCF-A1	1	
1	- - - - - -	• Body, SCF-A1 gun	1	
2	972 177	• Elbow, male, 37, $^1/_2$-20 x $^1/_4$, sstl	1	
3	983 120	• Washer, lock, e, spt, #10, stl, ni	2	
4	981 127	• Screw, fillister, 10-32 x 2.000, sl, zn	2	
5	152 208	• Ball tip assembly	1	C
6	983 070	• Washer, lock, e, spt, #6, 316 ss	1	C
7	141 863	• Cartridge, packing, SCF-A1 gun	1	C
8	954 012	• • Back-up ring, single, $^3/_8$ x $^1/_2$	1	A
9	945 124	• • O-ring, EPR 80, 0.375 x 0.500 x 0.062	1	A
10	141 878	• Housing, piston, SCF-A1 gun	1	
11	940 134	• O-ring, Viton, 0.438 x 0.562 x 0.062	1	A,C
12	138 311	• Piston, air, SCF-A1 gun	1	
13	941 210	• O-ring, Viton, 1.062 x 1.250 x 0.094	1	A,C
14	138 362	• Pin, piston locking	1	C
15	141 877	• Plate, SCF-A1 air piston	1	
16	983 135	• Washer, lock, e, hi-col, $^1/_4$, stl, ni	4	
17	981 245	• Screw, fillister, $^1/_4$-20 x 2.000, sl, zn	4	
18	272 556	• Muffler, low profile, $^1/_4$ NP	1	
19	901 262	• Valve, exhaust	1	
20	972 119	• Elbow, male, $^1/_4$ tube x $^1/_8$ NPT	1	
21	973 000	• Nipple, steel, sched, 40, $^1/_8$, .75	1	
22	972 301	• Elbow, 45°, swivel, 5/16 tube	1	
23	972 302	• Connector, long, $^5/_{16}$ t x $^1/_2$-20	1	
24	941 134	• • O-ring, Buna N, 0.426 x 0.566 x 0.070	1	A
25	141 881	• Block, mounting, SCF-A1 gun	1	
26	981 405	• Screw, square, set, $^3/_8$-16 x 0.750, cup, zn	1	
27	141 860	• Nut, SCF-M1, nozzle	1	
28	- - - - - -	Nozzle	1	B

NOTE A: These items are included in the SCF-A1 Gun O-ring Service Kit, part 145 327.

B: This item is sold and shipped separately. Consult your Nordson Corporation representative to order the proper fluid tip for your material application.

C: These items are included in the SCF-A1 Gun Packing Gland Service Kit, part 144 075.

SCF-A1 Automatic Spray Gun
Parts (contd)

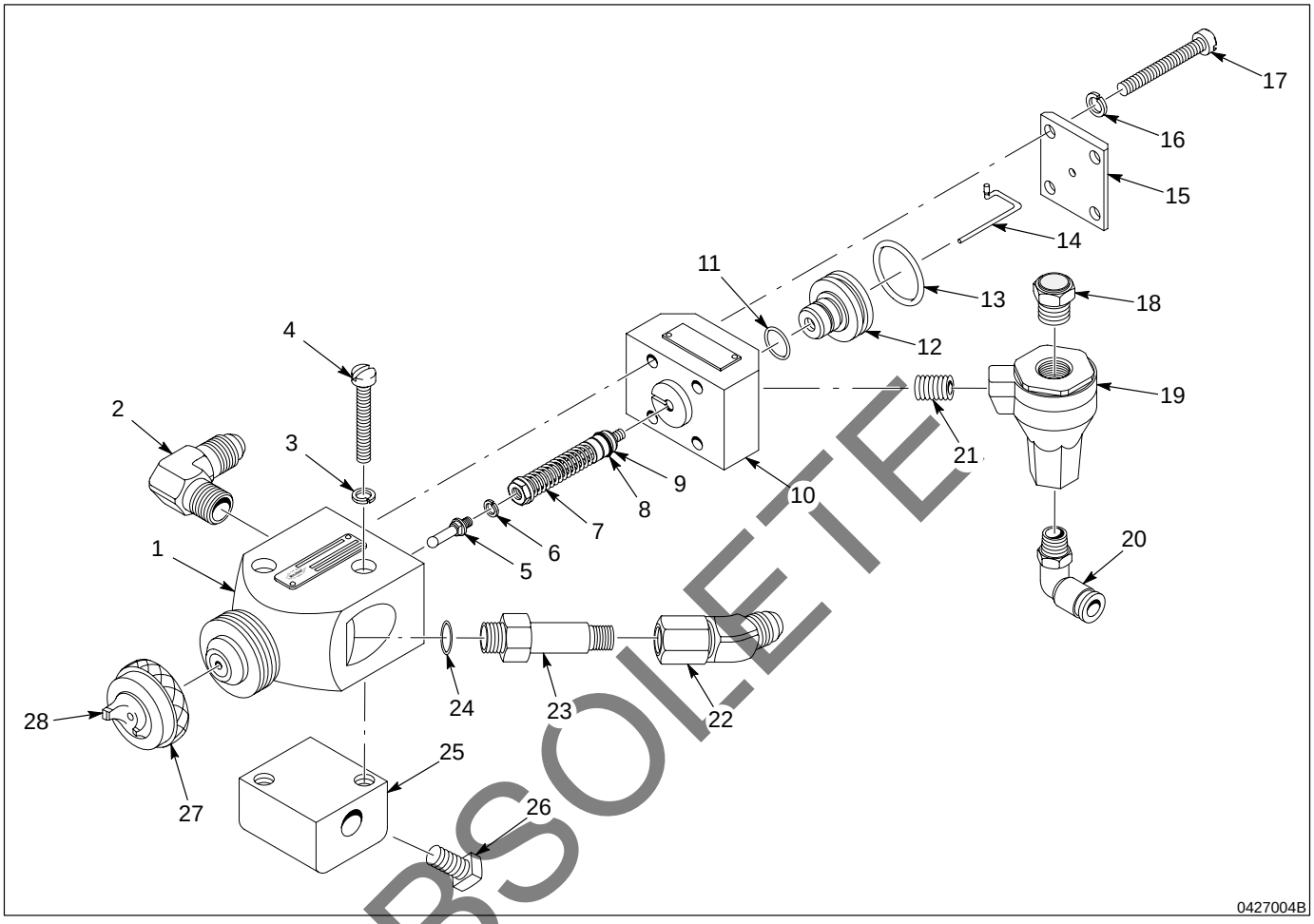

Fig. 5 Exploded view of SCF-A1 automatic spray gun

Service Kit List

See Figure 5

O-Ring Service Kit

Item	Part	Description	Quantity	Note
—	145 327	Service kit, O-ring, SCF-A1	—	
8	954 012	• Back-up ring, single, $^{3}/_{8}$ x $^{1}/_{2}$	1	
9	945 124	• O-ring, EPR 80, 0.375 x 0.500 x 0.062	1	
11	940 134	• O-ring, Viton, 0.438 x 0.562 x 0.062	1	
13	941 210	• O-ring, Viton, 1.062 x 1.250 x 0.094	1	
24	941 134	• O-ring, Buna N, 0.426 x 0.566 x 0.070	1	

Packing Gland Service Kit

Item	Part	Description	Quantity	Note
—	144 075	Service kit, SCF-A1, packing	—	
5	152 208	• Ball tip assembly	1	
6	983 070	• Washer, lock, e, spt, #6, 316 ss	1	
7	141 863	• Cartridge, packing, SCF-A1 gun	1	
11	940 134	• O-ring, Viton, 0.438 x 0.562 x 0.062	1	
13	941 210	• O-ring, Viton, 1.062 x 1.250 x 0.094	1	
14	138 362	• Pin, piston locking	1	

9. Specifications

Dimensions

See Figure 6.

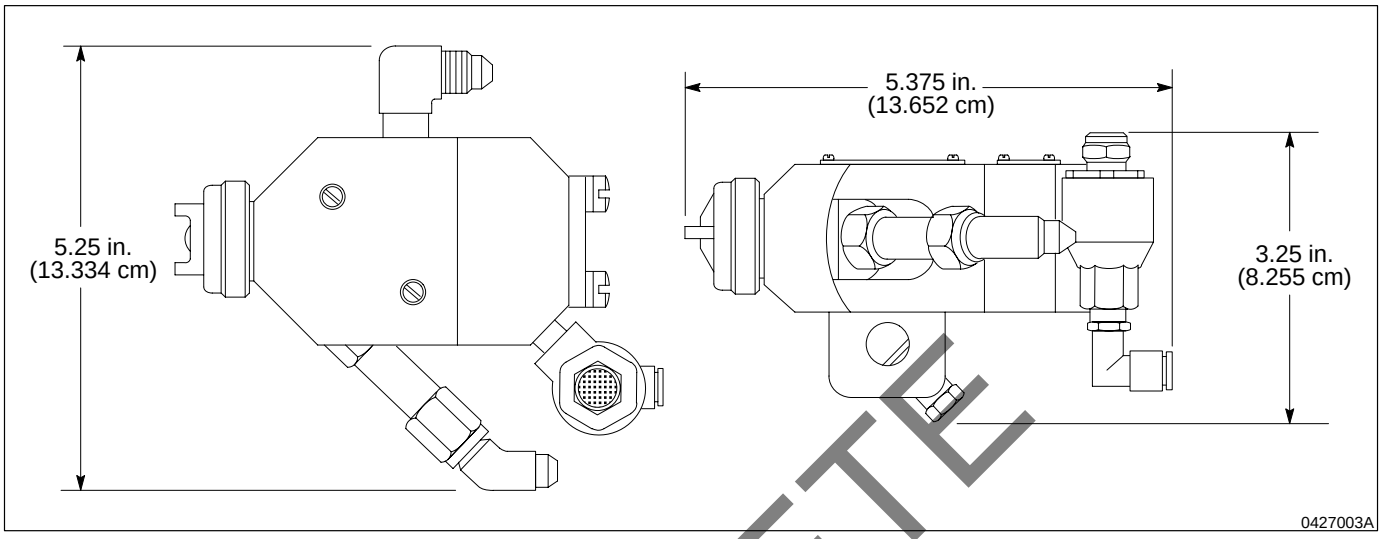

Fig. 6 SCF-A1 gun dimensions

Mounting Requirements

Mount the SCF-A1 automatic spray gun on either a gun mover or in a stationary position with a 1.27-cm- ($^1/_2$-in.-) round bar.

Hose Fittings

Material inlet and outlet: $^1/_2$-20 JIC hose fittings

Air supply to the gun: $^1/_4$-in. OD tube

Trigger Air Pressure

Air is supplied to the gun at 3.4–8.2 bar (50–120 psi).

Coating Material Pressure and Temperature

Coating material is delivered to the gun at 82.7–172.3 bar (1200–2500 psi) and 38–82 °C (100–180 °F).