

Instructions

IMPORTANT: Keep for future reference

P/N 108 835A

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AD-31 Handguns

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Safety

Safety instructions contained in this section and throughout this document apply to tasks that may be performed with or on the unit. Warnings related to specific safety concerns are included within the text as appropriate. It is very important that these safety instructions are always followed. Failure to do so could result in personal injury and/or damage to the unit or other equipment.

With this in mind, here are some basic safety recommendations:

- Read and become familiar with this Safety section prior to installing, operating, maintaining, or repairing the unit.
- Read and follow the warnings which appear within the text and are related to specific tasks.
- Store this document within easy reach of personnel operating or maintaining the unit.
- Wear personal protective equipment and clothing such as safety goggles and gloves.
- Familiarize yourself with and follow all safety instructions prescribed by your company, general accident-prevention regulations, and government safety regulations.

Safety Symbols

The following symbols are used to warn against dangers or possible sources of danger. Become familiar with them! Failure to heed a warning could lead to personal injury and/or damage to the unit or other equipment.



WARNING: Failure to observe may result in personal injury or death.



WARNING: Risk of electrical shock. Failure to observe may result in personal injury or death.



WARNING: Disconnect equipment from the line voltage.



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



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



WARNING: System or material pressurized. Relieve pressure. Failure to observe may result in serious burns.



CAUTION: Failure to observe may result in equipment damage.



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

Qualified Personnel

Operators or maintenance workers are regarded as being “qualified personnel” when they have gained, through training and experience, an understanding of the manner in which the unit is to be operated, serviced, and repaired and are familiar with relevant regulations concerning safe workplace practices.

Intended Use

The unit is designed and intended to be used only for the purpose described in the *Description* section. Uses not in accordance with that section or as described in this document are considered unintended uses and not in accordance with governing regulations.



WARNING: Use of this equipment in ways other than described in this document may result in personal injury, death, or equipment damage.

The following actions of the owner or operator of the unit are some, but not all, examples of unintended use which would permit Nordson to claim it is not responsible for personal injury or property damage arising from such unintended use:

- Unapproved modifications or changes to the unit
- Failure to comply with the safety instructions
- Failure to comply with instructions concerning installation, use, operation, maintenance, or repair, or when these tasks are carried out by unqualified personnel
- Use of inappropriate or incompatible foreign materials or auxiliary equipment

Safety

- Failure to observe workplace safety rules or regulations issued by government authorities or safety councils

Installation and Electrical Connections



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

- All electrical, pneumatic, gas, and hydraulic connections and installations of hot melt equipment may only be carried out by qualified personnel. Be sure to observe installation instructions for components and accessories.
- Equipment must be properly grounded and fused according to its rated current consumption (see ID plate).
- Cables which run outside the unit must regularly be checked for wear or damage.
- Power supply wire gauge and insulation must be sufficient to handle rated current consumption.
- Cables must never be squeezed or pinched. Do not locate cables or hoses in high traffic areas.

Operation

The unit should be operated by qualified personnel in accordance with the instructions presented in this document.



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

- Never allow the unit to be operated by personnel under the influence of substances which reduce their reaction times, or who are not able to operate the equipment for physical reasons.
- Prior to each startup of the unit, check protection and warning devices and make sure they are fully functional. Do not operate the unit if these devices are not functioning properly.
- When the removal of safety equipment is required for installation, maintenance, or repair of the unit, it must be re-connected immediately upon completion of the work.

- Prior to startup of the unit, check to make sure all safety guards and safety equipment are in place and functioning properly.
- In a humid environment, only equipment featuring a corresponding class of protection may be operated.
- Do not operate the unit in an explosive environment.
- Keep parts of the body or clothing away from rotating parts. Do not wear loose articles of clothing when operating or servicing units with rotating parts. Take off wrist watches, rings, necklaces, or similar pieces of jewelry and pin up or cover long hair before performing any work on or with the unit.
- To carry out measurements on work pieces, switch off the unit and wait until it comes to a standstill.
- Never point hand guns or applicator nozzles at yourself or other persons.

Less-obvious Dangers



WARNING: An operator or service technician working with the unit should be aware of less-obvious dangers that often cannot be completely minimized at production sites:

- Exposed surfaces of the unit which cannot be practically safeguarded. They may be hot and take time to cool after the unit has been operating.
- The possibility that electrical potentials may remain in the unit after the unit was de-energized
- Hot melt material and vapors
- Hydraulically or pneumatically operated parts of the unit
- Parts winding something up or down which are not covered

Action in the Event of Unit Malfunction

If the unit malfunctions, switch it off immediately.

- Turn the circuit breaker or main power switch OFF.
- Have the unit repaired by qualified personnel only.

Safety

Danger of Burns

Contact with hot melt materials or hot areas of the unit may produce a severe skin burn.



WARNING: Hot! Risk of burns. Wear heat-protective clothing, safety goggles, and/or heat-protective gloves.



- Be extremely careful when using hot melt material. Even solidified material may still be very hot.
- Always wear protective clothing which safely covers all exposed parts of the body.

In case of burns:

- Immediately cool affected skin areas using cold, clean water.
- Do not forcefully remove hot melt material from the skin.
- Immediately seek medical attention.

Maintenance/Repair

Allow only qualified personnel to perform the procedures described in this document. When performing such tasks, wear protective clothing and equipment.



WARNING: Even when the circuit breaker or main power switch is OFF, the unit is still electrically energized. Complete the following steps prior to maintenance or repair:

- Disconnect, lock out, and tag external power supply.
- To ensure the external power supply is disconnected, attempt to operate the unit. If the unit does not energize, proceed with maintenance or repair work.
- If the unit energizes, repeat the disconnect, lock out, and tag procedure. Re-test the unit.

- Follow the specific instructions provided in this manual to release the system pressure in the entire unit.
- Secure pneumatically- or hydraulically-operated equipment against uncontrolled movement.
- Only use parts which do not compromise the safety of the unit. Only use genuine Nordson parts.
- Always use tools with insulated handles when removing or installing components.

Cleaning

NOTE: Always refer to the material manufacturer's Material Safety Data Sheet (MSDS) or material information sheet before working with any hot melt material.



WARNING: Never clean any aluminum part or flush any system using halogenated hydrocarbon fluids. Examples of common halogenated hydrocarbons are: dichloromethylene, 1,1,1-trichloroethylene, and perchloroethylene. Halogenated hydrocarbons may react violently with aluminum parts.



WARNING: Fire, open flame, and smoking are prohibited when cleaning fluids are used. Observe all explosion prevention regulations. Cleaning fluids may only be heated using temperature-controlled and explosion-protected heaters.

- Never use an open flame to clean the unit or components of the unit.
- Use only cleaning fluids designed or intended to be used with the hot melt material being used in the unit. Never use paint fluids under any circumstances.
- Note the flash point of the cleaning fluid used. Only use a controlled heating method to heat fluids.
- Ensure sufficient room ventilation to draw off generated vapors. Avoid prolonged breathing of vapors.

Safety

Thermoplastic Hot Melt Material

NOTE: Always refer to the material manufacturer's Material Safety Data Sheet (MSDS) or material information sheet before working with any hot melt material.

- Ensure the work area is adequately ventilated.
- Do not exceed recommended processing temperatures. Doing so creates a danger to personnel due to decomposition of the material.

Equipment and Material Disposal

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

Polyurethane Reactive ("PUR") Hot Melt Material

NOTE: Always refer to the material manufacturer's Material Safety Data Sheet (MSDS) or material information sheet before working with any hot melt material.



WARNING: Exercise extreme caution and always provide adequate ventilation when using reactive materials.



WARNING: Only use PUR material in units that are designed to process such material. Using PUR material in units that cannot process them can cause damage to the unit and premature reaction of the hot melt material.



WARNING: PUR material contains isocyanate ingredients which will irritate skin, mucous membranes of eyes and respiratory passages.



WARNING: Persons with existing asthmatic conditions may experience difficulty in breathing.

Because isocyanate ingredients are found in various concentrations in reactive materials produced by different manufacturers, it is imperative that the material manufacturer's MSDS or material information sheet be consulted BEFORE using reactive material. Pay particular attention to the discussion of material toxicity, health effects, and reactivity condition.

There are certain universal safety guidelines that should be followed when using any reactive material:

- Recommended processing temperatures must not be exceeded.
- When handling and using reactive material, always wear thermally protective gloves and long-sleeved clothing.
- Wear chemical goggles to reduce the potential of eye contact.
- Have eye washes available and provide a cold water source for burn treatment.
- The regular use of barrier cream for hands and face is recommended for skin protection.
- Do not eat, drink, smoke, or store food in working areas where PUR material is being processed.
- Wash hands thoroughly after working with reactive material.
- Remove hot melt material vapors using suitable extraction ventilation equipment.
- Use appropriate respiratory equipment where there is the danger of inhaling isocyanate vapors or other ingredients contained in the PUR material in concentrations exceeding permissible limit values.
- In case of very high concentrations of harmful substances, or if you are unsure of the environmental conditions, respiratory protective equipment (operating independent of the surrounding air) must be used.
- Do not operate the unit with PUR materials if you are unsure that ALL adequate safety measures have been taken.

Description

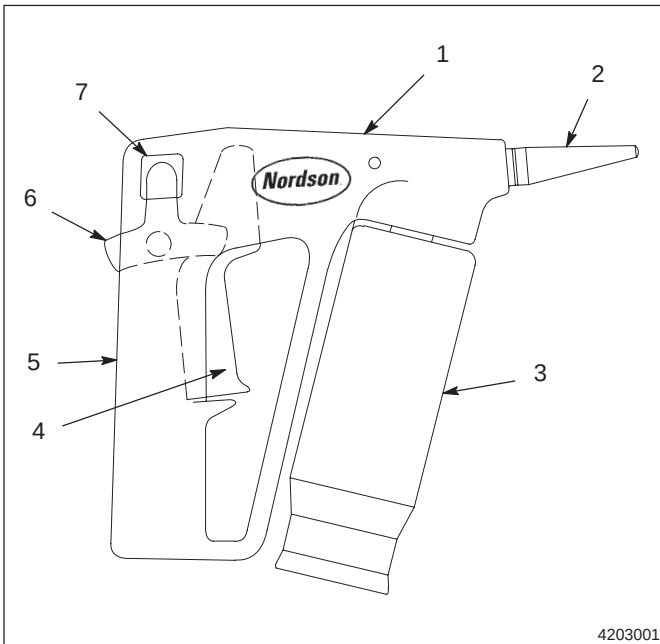


Figure 1 Typical AD-31 Handgun

- | | |
|-----------------|-------------------------------|
| 1. Gun Body | 5. Handle |
| 2. Nozzle | 6. Trigger Lock |
| 3. Pivot Sleeve | 7. Gun Slot (for hanging gun) |
| 4. Trigger | |

Nordson Series AD-31 Handguns may be used only for manually dispensing hot melt adhesives, sealants, and other thermoplastic materials.

The Series AD-31 Handguns include several models for a variety of dispensing patterns, including solid or foamed extrusion beads, atomized spray patterns, and swirl spray patterns. For handling high viscosity or filled materials, the AD-31 LBS extrusion handgun incorporates a large ball-and-seat and larger flow paths.

Depending on the applicator design, handguns employ either a preset thermostatic temperature sensor or an RTD (resistance temperature detector) sensor. RTD sensing provides temperature control precision by reducing temperature fluctuations that could negatively affect flow and cause char formation. A wide operating temperature range of 65° to 230 °C (150° to 450 °F) provides additional application versatility.

A typical AD-31 extrusion handgun is shown in Figure 1. The gun consists of the following components:

- Gun Body
- Handle
- Pivot Sleeve
- Trigger Lock
- Trigger
- Nozzle
- Gun Slot (for hanging gun)

Daily Operation

Startup



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



1. At the applicator, bring the adhesive to application temperature.



WARNING: Do not swivel or trigger the gun while it is cold.

2. Turn on the applicator pump. Adjust the system hydraulic pressure to the value required for the application. The recommended adhesive hydraulic pressure range is 2.41 - 4.83 MPa (350 - 700 psi).



WARNING: For most extrusion applications, adhesive should not project further than 18 in. from the nozzle when the gun is fired in the horizontal position. Otherwise, system hydraulic pressure may be too high, resulting in poor pattern control and harm to personnel or equipment.

3. Place the trigger lock in the unlocked position (see Figure 2).
4. Aim the handgun so the nozzle is pointing at the substrate.
5. Begin dispensing adhesive by squeezing the handgun trigger toward the handle.
6. Stop dispensing adhesive by releasing the trigger.

Shutdown



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



1. Place the trigger lock in the locked position (see Figure 2).

2. Turn off power to the applicator pump as described in your applicator technical manual.

- Systems with a piston pump:

Reduce pump air pressure to zero and disconnect the supply air line to the pump.

Place the air pump ON/OFF switch in the OFF position.

- Systems with a gear pump:

Turn the motor speed dial to 0%.

Place the motor ON/OFF (or START/STOP) switch in the OFF (or STOP) position.

3. Place the trigger lock in the unlocked position (see Figure 2).

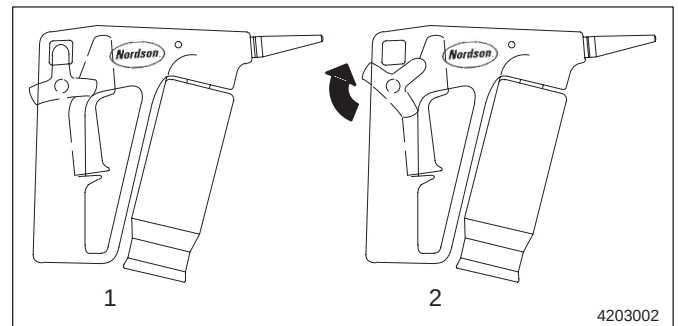


Figure 2 Lock Positions

1. Unlocked position

2. Locked position

4. Place a suitable waste container, capable of withstanding adhesive temperatures of 230 °C (450 °F), on the floor near the dispensing point.
5. Aim the gun so the nozzle points into the container.
6. Drain adhesive from the handgun by squeezing the trigger toward the handle. Continue dispensing adhesive until system hydraulic pressure is relieved and the gun is drained of adhesive. Properly dispose of the drained adhesive.
7. Place the trigger lock in the locked position (see Figure 2).
8. Hang the handgun by the gun slot at the top of the handle.
9. Relieve any residual hydraulic pressure as described in the following topic.
10. Shut down the applicator as described in your applicator operator instructions or technical manual.

Daily Operation

Relieving Hydraulic Pressure

Remove system pressure before disassembling and replacing any gun components.

1. Heat the system to operating temperature.



WARNING: System or material pressurized. Relieve pressure. Failure to observe may result in serious burns.

2. Follow the procedures described in your applicator technical manual to relieve system pressure. In general, relieving system pressure requires that you perform **all** of the following actions that are appropriate for your unit:

- Systems with a piston pump:

Reduce pump air pressure to zero and disconnect the supply (incoming) air line.

Place the air pump ON/OFF switch in the OFF position.

- Systems with a gear pump:

Turn the motor speed dial to 0%.

Place the motor ON/OFF (or START/STOP) switch in the OFF (or STOP) position.

3. Shield the area and the operator.
4. Trigger all handguns to relieve any trapped hydraulic pressure.

5. Place the trigger lock in the locked position (see Figure 2).

6. Reduce air pressure to the handgun by reducing gun air pressure to zero at the regulator (spray and swirl guns only).



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

7. Wear heat-protective safety gloves.
8. Place a pan under the drain valve and drain the unit manifold by following the procedure described in the applicator technical manual.



CAUTION: Equipment damage can occur if the applicator drain valve is turned with anything other than a screwdriver. Use only a screwdriver to turn the drain valve.

9. Use a screwdriver to open the drain valve.
10. Allow the manifold to drain as completely as possible.
11. Use a screwdriver to close the drain valve.
12. Properly dispose of the drained adhesive.

Daily Maintenance

Cleaning Exterior Surfaces

Clean all exterior gun and nozzle surfaces daily. Use a cleaning fluid such as Nordson Type R fluid. Accumulated hot melt material forms char, which can cause unreliable operation of the applicator.



WARNING: Risk of death or serious injury from explosion or fire if Nordson Type R fluid is heated above 245 °C (475 °F). Do not use Type R fluid on surfaces that are above 245 °C (475 °F).

Weekly Maintenance

Cleaning the Nozzle

Clean gun nozzles weekly unless operating experience indicates that a different schedule must be followed. Depending on several factors, nozzle cleaning may be required more or less frequently than once a week. Among the factors affecting cleaning frequency are the plant environment and the adhesive used.

CAUTION: Gun nozzles can be damaged if an open torch, drill, or broach is used for cleaning. Use only a pin-type probe to clean a nozzle.

To clean a nozzle on a Series AD-31 Handgun:

1. Heat the system to the adhesive manufacturer's recommended application temperature.
2. Relieve the system hydraulic pressure. (Refer to *Relieving Hydraulic Pressure* in *Daily Operation*.)
3. Disconnect and lock out power to the main circuit breaker for the applicator input power line.
4. Place the trigger lock in the locked position (see Figure 2).
5. Use an appropriate size wrench to loosen the nozzle.

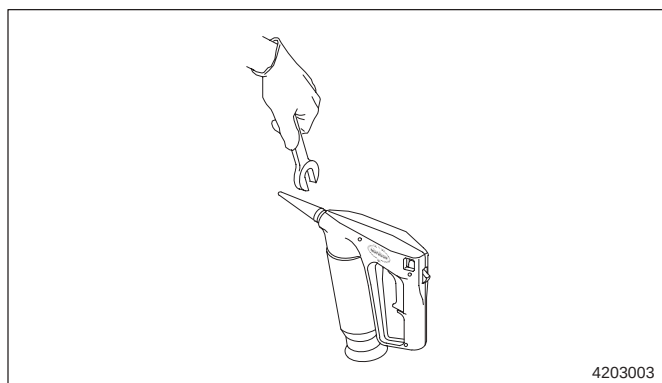


Figure 3 Removing a Nozzle

6. Remove the nozzle.
7. Place the nozzle in a container of Nordson Type R fluid and heat the container to the adhesive melting point using a controlled heating source.



WARNING: Risk of death or serious injury from explosion if Nordson Type R fluid is heated above 245 °C (475 °F). To maintain Type R fluid at a safe temperature, use a controlled heating source, such as a deep-fat fryer or hot plate with a temperature controller.



WARNING: Risk of death or serious injury from fire hazard if Nordson Type R fluid is heated using an open flame or an unregulated heat source. To maintain Type R fluid at a safe temperature, use a controlled heating source, such as a deep-fat fryer or hot plate with a temperature controller.



WARNING: Risk of death or serious injury from fire or toxic fumes. Use extreme care in selecting a cleaning fluid other than Type R fluid. Cleaning fluids other than Type R may present a toxic or a fire hazard, even at room temperature.



CAUTION: Sludge formation can occur on a nozzle if an incompatible cleaning fluid is used with the hot melt adhesive. If a fluid other than Nordson Type R fluid is used, test the fluid with a small sample of the adhesive for compatibility before using the fluid in the hot melt system.

NOTE: Another method of cleaning nozzles is to place them in an ultrasonic cleaner filled with Type R fluid.

8. Clean the nozzle bore by using a pin-type probe.

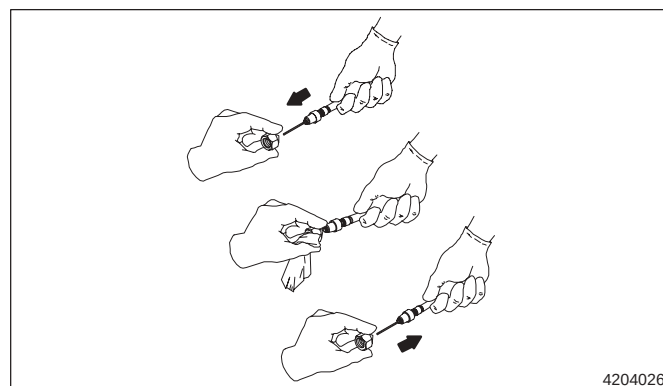


Figure 4 Cleaning a Nozzle with a Pin-type Probe

9. Reassemble the nozzle onto the gun.
10. Restore the system to normal operation by following the startup procedures in the applicator technical manual.

Technical Data

Specifications				
Type of Pattern:	AD-31: AD-31S: AD-31SW: AD-31SW-WP:	extrusion spray swirl swirl wide pattern		
Maximum Operating Temperature:	230 °C (450 °F)			
Maximum Hydraulic Pressure:	10.34 MPa (1500 psi)			
Extrusion Nozzle Orifice Diameters: ¹	Standard: 0.5 to 2 mm (0.020 to 0.093 in.) Extended: 0.6 to 4 mm (0.025 to 0.156 in.)			
Spray Pattern Width/Nozzle: ¹	AD-31S: AD-31SW: AD-31SW-WP:	51 to 203 mm (2 to 8 in.) 6 to 38 mm (0.25 to 1.5 in.) 38 to 152 mm (1.5 to 6 in.)		
Spray Air Pressure: ²	AD-31S: AD-31SW: AD-31SW-WP:	0.28 to 0.56 MPa (40 to 80 psi) 0 to 0.1 MPa (0 to 15 psi) 0.03 to 0.56 MPa (5 to 80 psi)		
Maximum Air Consumption: ³	AD-31S: AD-31SW: AD-31SW-WP:	4 scfm 1.2 scfm 2.5 scfm		
Electrical Requirements:	230 VAC, 50/60 Hz 115 VAC, 50/60 Hz 100 VAC, 50/60 Hz			
Weight:	AD-31: AD-31S: AD-31SW: AD-31SW-WP:	0.8 kg (1.75 lb) 1.5 kg (3.25 lb) 0.8 kg (1.75 lb) 0.8 kg (1.75 lb)		
Dimensions:		Length-mm (in.)	Depth-mm (in.) ⁴	Width-mm (in.)
	AD-31, AD-31SW, AD-31SW-WP	188 (7.38)	160 (6.31)	41 (1.62)
	AD-31S	213 (8.40)	210 (8.25)	53 (2.08)
¹ Nozzles must be ordered separately.				
² Recommended range.				
³ Includes operating air and spray air requirements.				
⁴ Without nozzle.				