Trilogy™ Waterborne Electrostatic HVLP and Air Spray Automatic Gun

Customer Product Manual

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– English –
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For parts and technical support, call the Industrial Coating Solutions Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

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NORDSON CORPORATION • 100 NORDSON DR, AMHERST, OHIO 44001 • USA

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– Original document –

1093592-055

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Change Record

Revision	Date	Change
01	01/09	Initial Release
02	07/19	Not sure of update - no change record
03	06/23	Added waterborne safety information
04	11/23	Labels replaced with updated ones due to syntax error
05	10/24	Updated manufacturer address and label

Section 1
Safety

Introduction

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 Safety Data Sheets (SDS) 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 SDS 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 them this card
- Tell them 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 SDS 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	Symbol	Prefix
Fluorine	F	“Fluoro-”
Chlorine	Cl	“Chloro-”
Bromine	Br	“Bromo-”
Iodine	I	“Iodo-”

Check your material SDS 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.

Section 2
Description

Introduction

See Figure 2-1.

The Trilogy automatic electrostatic air spray/HVLP waterborne spray gun is designed to apply waterborne coating materials. It is used with the Nordson Iso-Flo system, which electrostatically charges waterborne coatings and delivers them to the spray gun while electrically isolating the charged coating from the coating supply. The electrostatic voltage is provided by a separate XPS 60 electrostatic power supply.

The spray gun is non-circulating and can be used with heated and unheated spray systems. If the coating material is heated then it must be circulated.

HVLP and air spray systems use low-pressure fluid sources, such as pressure pots, diaphragm pumps, or low-ratio piston pumps. They are commonly used to apply low to medium viscosity fluids to products requiring a high-quality finish.

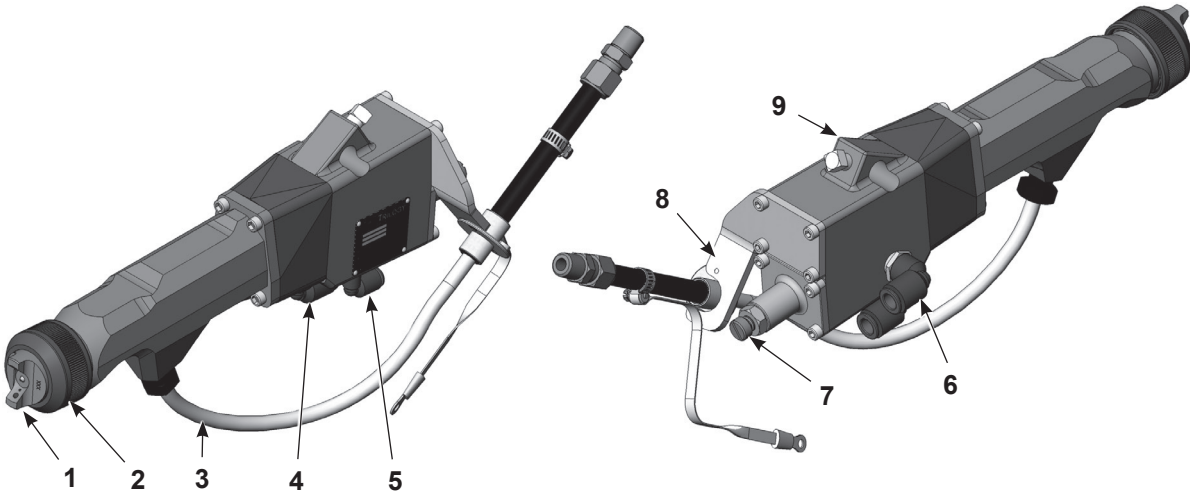


Figure 2-1 Trilogy Air Spray/HVLP Automatic Electrostatic Spray Gun

1. Air cap
2. Retaining ring
3. Fluid hose
4. Horn air inlet
5. Trigger air inlet
6. Atomizing air inlet
7. Flow adjust knob
8. Fluid hose bracket
9. Bar mount point

Spray Gun Features

The Trilogy spray gun features:

- adjustable fluid flow rate
- large air passages for higher air energy
- separate horn and atomizing air for superior spray control
- bellows-type packing cartridge

Spray Technology

The fluid tip and air cap you choose to use determines the spray gun technology: HVLP or air spray.

HVLP technology creates a soft spray with high transfer efficiency, reducing emissions of volatile organic compounds (VOCs). HVLP spray guns use high volumes of very low pressure pattern control (horn) and atomizing air (less than 0.69 bar (10 psi)). The high volume of pattern control air provides sufficient energy to shape the pattern of sprayed fluids. The low atomizing air pressure reduces fluid bounceback and overspray, which improves transfer efficiency.

HVLP atomization is typically coarser than air spray when used with high-viscosity fluids and high flow rates.

Air spray technology atomizes material at higher air pressures and lower air flows than HVLP spray guns. Air spray guns produce a very fine, atomized mist. This makes them useful for extremely fine finishing work.

Options

Options include a variety of fluid tips and air caps; air and fluid hoses; air pressure regulators; gauges; fittings; fluid hose; and quick exhaust valve. HVLP compliance kits are available for each HVLP air cap.

Coating Materials

The spray gun is compatible with a wide variety of waterborne coating materials including

NOTE: The seals installed in the spray gun are compatible with most coatings. If the coating material you use damages the seals, contact your Nordson Corporation representative for compatible replacements.

Theory of Operation

See Figure 2-2.

Electrostatic Charge

A manual Iso-Flo voltage block system delivers electrostatically charged and pressurized coating material to the spray gun on demand and electrically isolates the spray gun and fluid path from the grounded coating material supply. The electrostatic voltage is generated by an electrostatic power supply.

The charged coating material flows through a fluid supply hose (13) to the spray gun. As the charged coating material is sprayed it is attracted to the grounded workpiece.

Fluid Flow

Fluid enters the spray gun extension (3) and flows past the packing cartridge (7) to the fluid tip (5). When the gun is triggered air pushes the piston (11) back, pulling the needle (4) off its seat in the fluid tip, allowing fluid to flow out of the gun. The fluid adjuster (12) controls how far the needle is pulled off the seat, which determines fluid flow through the fluid tip.

The packing cartridge prevents fluid from flowing past it into the spacer (2) and gun body (1). The fluid flow is dead-ended at the spray gun when the trigger is released.

NOTE: If you are using an external fluid pressure regulator to adjust fluid flow then the fluid adjuster should be set to allow full flow when the gun is triggered.

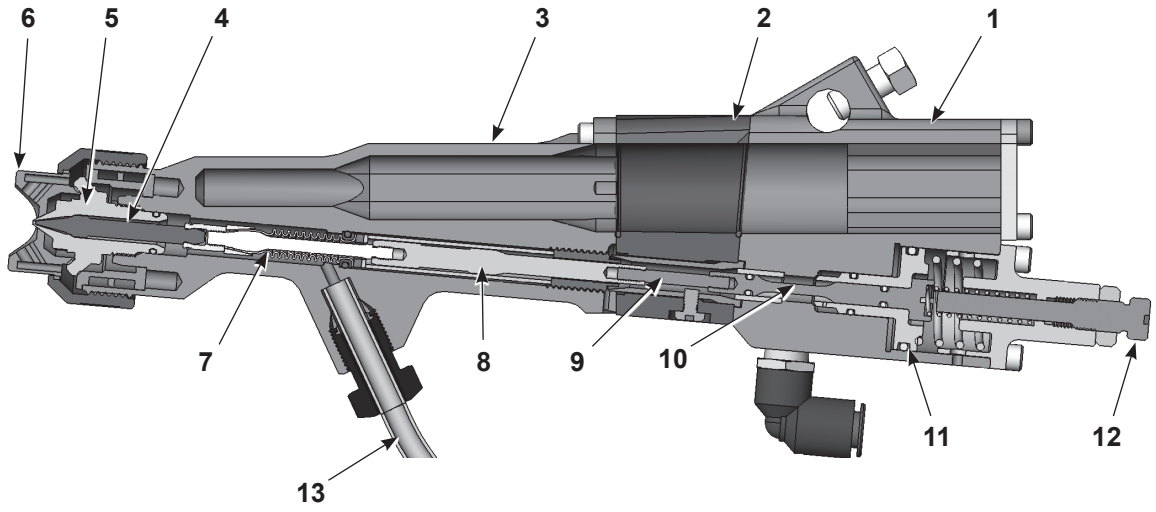


Figure 2-2 Spray Gun Components and Operation

1. Gun body
2. Spacer
3. Extension
4. Needle
5. Fluid tip
6. Air cap
7. Packing cartridge
8. Pull shaft
9. Adapter link
10. Connecting rod
11. Air piston
12. Fluid adjuster
13. Fluid hose

Air Flow

See Figure 2-1 and Figure 2-2. Air enters the spray gun body at three fittings, and is called trigger air, atomization air, and horn air.

Trigger air pushes the air piston (11) back, which allows atomization air to flow to the air cap (6). The air piston pulls on the connecting rod (10), adapter link (9), pull shaft (8), packing cartridge rod (7), and needle (4), allowing fluid to flow out of the fluid tip. Atomization air starts flowing before the fluid, which eliminates fluid spitting and poor atomization of the initial fluid flow.

Horn air flows directly to the air cap and shapes the spray pattern. The horn air flow is constant unless it is controlled by a separate external solenoid valve.

Specifications

Table 2-1 Dimensions

Dimensions	Metric (cm)	English (in.)
Height	12.3	4.8
Length	35.4	13.9
Width	7.9	3.1
NOTE: The spray gun dimensions include the fluid and air fittings.		

Table 2-2 Weight

Equipment	Metric (gm)	English (oz)
Air Spray/HVLP	1143.0	40.3
NOTE: The spray gun weight include the fluid and air fittings.		

Table 2-3 Operating Pressures

Parameter	Metric	English
Maximum air input pressure	6.9 bar	100 psi
Maximum fluid input pressure	6.9 bar	100 psi
Maximum fluid temperature	82°C	180°F
NOTE: Supply air must be particulate free (5 microns maximum) and oil-free. Use coalescing-type air filters.		

Table 2-4 Air Tubing Requirements

Air Hose	Metric	English
Length (optimum for HVLP)	7.6 m	25.0 ft
Minimum ID required for HDLP (horn and atomizing)	8 mm	5/16 in.

Table 2-5 Standard Fitting Sizes

Spray Gun Standard Fitting Sizes	
Atomization air	3/8-in. tubing
Horn air	3/8-in. tubing
Trigger air	3/4-in. tubing
Fluid fitting	Hose nut: 5/8-20 UN 2A threads, 3/8 in. tubing Ferrule set: 3/8-in.

Table 2-6 Electrostatics

Parameters	
Maximum voltage	60 kV
Maximum output current	100 microamps
Maximum energy supplied by XPS 60	141 millijoules

Table 2-7 Fluid Conductivity Range

Material Resistivity	Tube Length
Greater than 25 megohms/cm	Use the fluid hose that is included with the equipment or contact your Nordson representative.
Less than 25 megohms/cm	

Special Conditions for Safe Use in the European Union

The installation, operation, maintenance, and repair of the system equipment shall be in accordance with the Safety Instructions and the User's Manual supplied by the Manufacturer.

The power supply/control unit type XPS 60 and the Iso-Flo unit shall be installed only in a safe area.

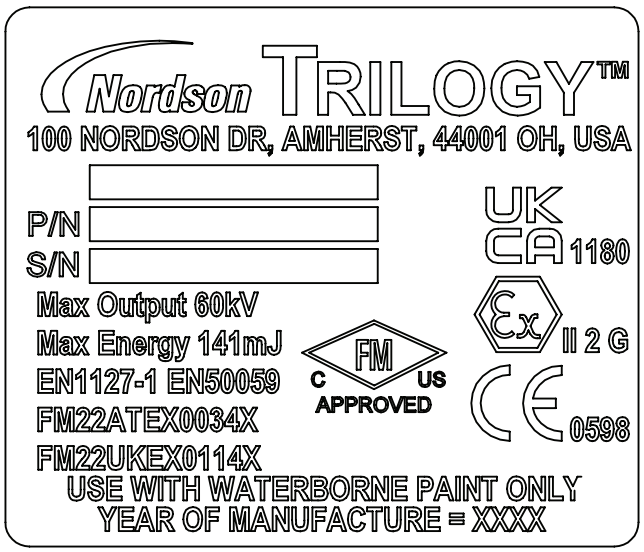


Figure 2-3 Safety label

Section 3
Installation

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

Preparation

CAUTION: Do not overtighten spray gun parts. Failure to observe this caution will result in equipment damage.

NOTE: Fluid tips, air caps, and air tubing are not shipped with the spray gun. You must order them separately, based on your application. If you order an HVLP air cap, you may also want to order the appropriate compliance kit. You will need one compliance kit for each air cap size you use.

NOTE: Compliance caps are used to verify compliance of non-electrostatic HVLP systems. Electrostatic guns are by themselves compliant spray technologies, so it is not necessary to verify air cap compliance. Instead, you may want to use a compliance kit to make sure the air cap pressure is at optimum level.

Before installation,

- remove the spray gun, brushes, and tool kit from the box.
- make sure you have the appropriate fluid tip and air cap for your application.
- make sure you have air tubing of the correct length, ID, and materials.

WARNING: Risk of fire and/or electrical shock if the spray gun and system components are not properly grounded.

- make sure the system is properly grounded.

NOTE: Inadequately grounded parts will adversely affect transfer efficiency and coating quality.

Typical 60 kV Waterborne System

Figure 3-1 shows the components of a typical electrostatic waterborne system. The fluid is electrostatically charged before it is delivered to the spray gun.

NOTE: Some components shown are optional. Make sure your system contains self-relieving shutoff valves for both air and fluid supply.

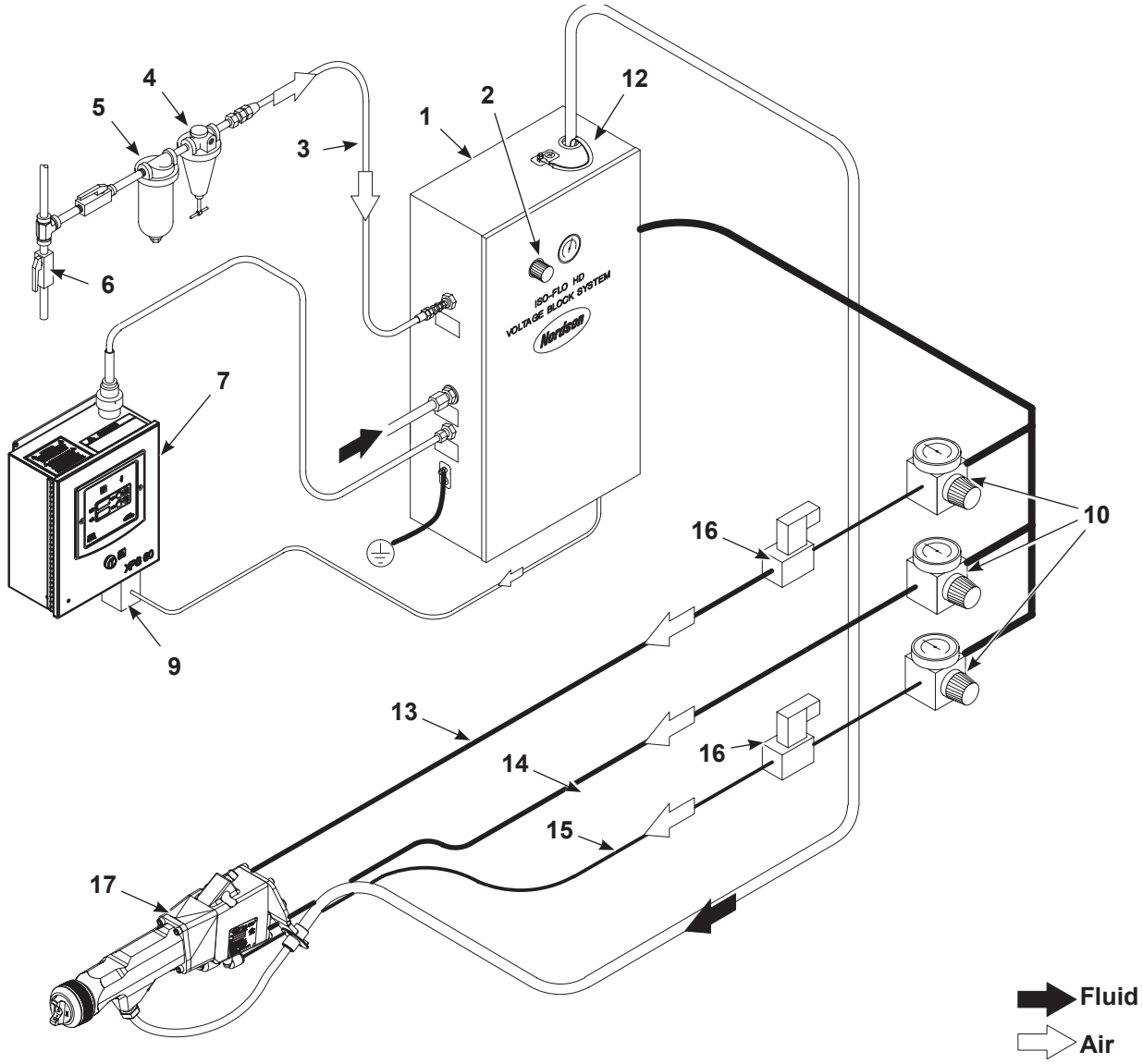


Figure 3-1 Typical 60 kV Waterborne Automatic System

1. 1. Iso-Flo HD voltage block system
2. Fluid pressure regulator/gauge
3. Fluid supply line
4. System air regulator
5. System air filter
6. Air supply drain valve
7. Electrostatic power supply
8. Air line from air flow sensor
9. Air flow switch
10. Air pressure regulators
11. Fluid hose
12. Fluid hose ground
13. Atomizing air tubing
14. Horn air tubing
15. Trigger air tubing
16. Solenoid valves
17. Spray gun

Mounting

See Figure 3-2. Secure the spray gun to a 1/2 in. mounting bar (1) with the square head set screw (2).

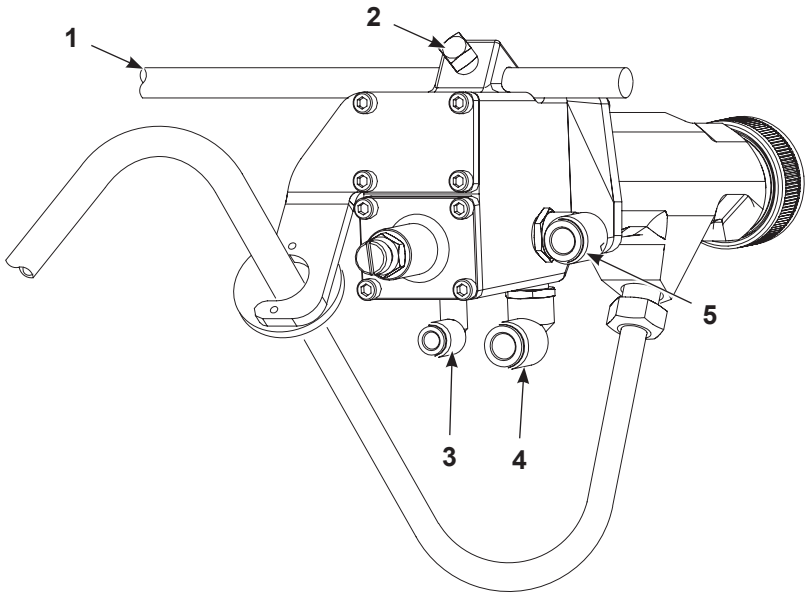


Figure 3-2 Typical Spray Gun Installation

1. Mounting bar
2. Square head screw
3. Trigger air − 1/4 in.
4. Horn air − 3/8 in.
5. Atomizing air − 3/8 in.

Air Connections

The air tubing supplying air to the spray gun should be no longer than 7.62 m (25 ft). Limit the number of restrictions in the air tubing to provide maximum air flow.

See Figure 3-2. Connect atomizing, horn, and trigger air tubing to the spray gun as follows:

- 3/8 in. tubing to horn (4) and atomizing (5) air fittings.
- 1/4 in. tubing to trigger (3) air fitting.

Fluid Hose Installation

WARNING: The spray gun body and all conductive parts must be grounded. Without a ground, a static charge could build up in the spray gun, resulting in shocks to the operator or sparking that could cause a fire. Resistance checks, from hose fitting to hose fitting, should be a part of your regular maintenance procedures.

The spray gun is shipped with a 7.62 meter (25 ft) waterborne fluid hose installed on the gun. The hose is equipped with a 3/8 in. NPT stainless steel fitting for connection to a fluid delivery system, and a ground wire with a ring-tong terminal.

NOTE: Refer to the Repair section for instructions on replacing the fluid hose with a new one.

Fluid Hose Connection to Delivery System

See Figure 3-1. Feed the end of the fluid hose (11) through the grommeted hole in the Iso-Flo cabinet labeled PAINT OUTLET and connect the hose to the fluid outlet fitting, or to a fluid regulator installed on the fitting, inside the cabinet. Connect the hose ground strap (12) to the ground stud next to the paint outlet hole.

If using a grounded pressure pot or other fluid delivery system instead of an Iso-Flo system, connect the hose to the fluid outlet and the hose ground strap to a true earth ground.

Securing the Air Tubing and Fluid Hose

Bundle together the fluid hose and air tubing where practical. Do the following to prevent wear and damage:

- Bundle the fluid hose and air tubing together with hook and loop tape, spiral-cut tubing, or similar devices. If you secure the hose and tubing to a stationary object at any point between the fluid delivery system and the gun, make sure the hoses can flex without strain.
- Do not tie the hose or tubing to moving machine members in areas where they must move or stretch.
- Do not kink the hose or tubing.
- Do not allow the hose or tubing to become abraded by sharp corners such as booth edges.
- Do not walk on the hose and tubing or run over them with heavy objects.
- If desired, cover the spray gun body, hose and tubing, and other equipment in the spray area with a grounded, conductive wrapping to keep them clean.

Fluid Tip and Air Cap Installation

See Figure 3-3. This procedure is for a new spray gun. If replacing a needle, fluid tip, or air cap, refer to the Repair section.

1. Unscrew the retaining ring (5).
2. Lubricate the fluid tip O-ring (2) with MagnaLube-G or an equivalent O-ring lubricant.

To prevent damage to the needle or fluid tip seat, trigger the gun (without turning on the electrostatics) to retract the needle while removing or installing the fluid tip.

3. Trigger the spray gun to retract the needle (1).
4. Install the fluid tip over the needle and screw it into the extension with the combination tool. Tighten snugly but do not overtighten.

CAUTION: Tightening the fluid tip beyond snug does not prevent or eliminate fluid leaks. If coating material leaks around the fluid tip replace the O-ring.

5. Install the air cap (4) into the retaining ring and thread the retaining ring onto the extension. Make sure the air cap is centered on the fluid tip. Hold the air cap in the desired position and tighten the retaining ring until it is snug. Do not overtighten the retaining ring.

NOTE: 991 and 992 air spray air caps are shipped permanently installed into retaining rings. These retaining rings cannot be used with the 985−988 air caps, which use the standard retaining ring shipped with the spray gun.

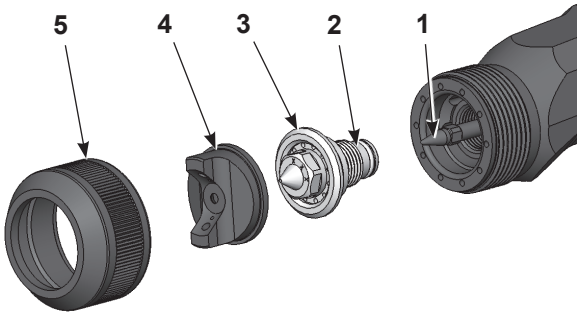


Figure 3-3 Fluid Tip and Air Cap Installation

1. Needle
2. Fluid tip O-ring
3. Fluid tip
4. Air cap
5. Retaining ring

Optional Quick-Exhaust Valve Kit

See Figure 3-4.

A quick-exhaust valve kit is available for applications requiring a faster air piston response. The kit includes the valve, a muffler, and a 1/8 in. NPT nipple.

1. Remove the elbow fitting (2) from the trigger port.
2. Apply PTFE tape to both ends of the nipple (1).
3. Install the nipple in the valve (3).
4. Apply PTFE tape to the muffler (4) and install it in the valve.
5. Apply pipe sealant adhesive to the threads of the elbow and install it in the valve.
6. Install the valve in the trigger port.

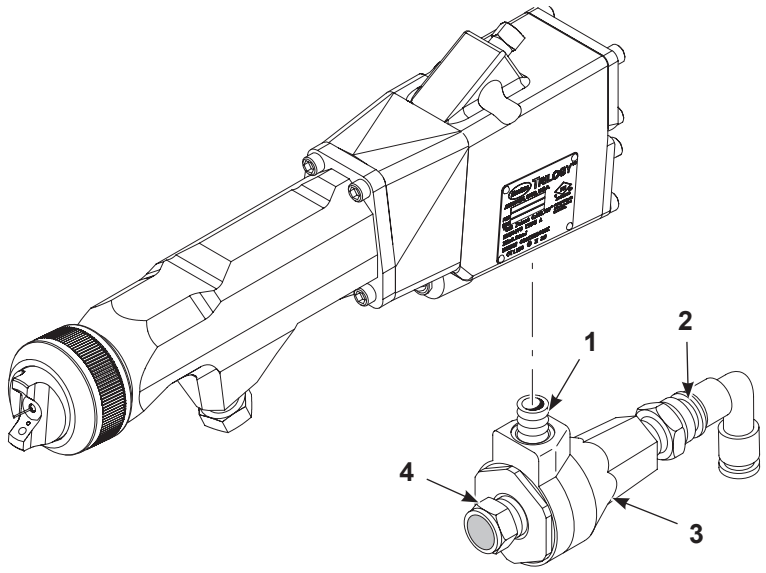


Figure 3-4 Optional Quick-Exhaust Valve Kit Installation

1. 1/8-in. NPT x 1/8-in. NPT nipple
2. 1/8-in. NPT x 1/4-in. T elbow fitting
3. Quick exhaust valve
4. Muffler

Section 4
Operation

Introduction

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

WARNING: This equipment can be dangerous unless it is used in accordance with the rules laid down in this manual.

WARNING: Do not exceed the maximum fluid pressure rating of 6.9 bar (100 psi). Failure to follow this warning may result in death or personal injury.

NOTE: Read this entire section before operating the spray gun.

Before operating the spray gun, make sure that

- the fluid tip is securely tightened and the air cap is correctly installed and secured with the retaining ring.
- all fluid and air connections are secure and leak-free. The fluid hose is grounded.
- air supply and fluid-delivery components are correctly installed. All conductive system components and flammable material containers are securely connected to a true earth ground.
- the operator station and spray area are clean and free of debris.

System Startup

NOTE: When starting a new spray system for the first time, flush the fluid-delivery system, hose, and spray gun with a cleaning solution compatible with the coating material to remove contaminants from the system. Remove the air cap from the spray gun before flushing solvent through the spray gun.

1. Turn on the spray booth exhaust fans.
2. Supply compressed air to the Iso-Flo system.
3. Start the fluid delivery system pump and pressurize the system with fluid. Do not exceed 6.9 bar (100 psi).
4. Turn on the fluid heater(s), if used. Do not exceed 82 <?>C (180 <?>F).
5. Check the fluid-delivery system and Iso-Flo system for leaks. Do not operate the system if any leaks are present.
6. Adjust the fluid and atomizing air pressure to achieve the optimum atomization and desired pattern width. Refer to Spray Pattern and Atomization Adjustments on page 4-2. Do not exceed 6.9 bar (100 psi).
7. Turn on the electrostatic power unit.

8. Make sure the spray gun is pointing into the spray booth. Trigger the spray gun and make sure the red kV indicator on the front panel of the electrostatic power unit lights to indicate that kV is on.
   If kV is off, make sure the electrostatic power unit is turned on. If the kV voltage indicator is flickering or is off, the air pressure supplied to the pressure switch may be inadequate to keep the pressure switch activated. Increase the air pressure to the switch.
9. Adjust the fluid pressure to obtain the desired atomization and spray pattern. Refer to Fluid Pressure and Flow Rate Adjustments on page 4-2.

Spray Adjustments

Fluid Pressure and Flow Rate Adjustments

Shut off the atomization and horn air and check the fluid flow rate.

For optimum atomization, an appropriate fluid pressure should provide an unatomized fluid stream that breaks at a distance of 25.4−35.6 cm (10−14 in.) from the fluid tip. If the fluid stream does not break properly at the desired flow rate, install a larger fluid tip and adjust the fluid pressure until the stream breaks 25.4−35.6 cm (10−14 in.) from the fluid tip.

NOTE: You should use an external fluid pressure regulator to control fluid flow and pressure. If one is installed, set the fluid adjuster to allow full flow when the gun is triggered.

For large flow rate changes, adjust the fluid pressure or use the next smallest or largest fluid tip.

For best results, leave the fluid flow adjusted to allow full fluid flow. If you have to limit the stroke to less than half the needle travel, you are using too large a fluid tip.

Always tighten the jam nut after making adjustments to the fluid flow. If you do not tighten the jam nut, the trigger action will cause the fluid adjuster to rotate in the housing, changing the needle travel and flow rate.

Spray Pattern and Atomization Adjustments

Obtaining the correct spray pattern, coating material atomization, and transfer efficiency for your application requires a combination of operator experience and experimentation. To obtain the best results, perform the following steps:

WARNING: Shut off the electrostatic power unit and ground the spray gun to remove any residual charge. Failure to observe this warning could result in personal injury.

1. Set the desired atomization and horn air pressure. If using HVLP air caps and fluid tips, the air pressure should be set to 0.69 bar (10 psi) or less.
   Use the lowest possible atomization air pressure to obtain proper atomization of the coating material. Increasing the air pressure provides finer atomization. Decreasing the air pressure provides coarser atomization.
2. Trigger the spray gun.
3. Adjust the horn air pressure to achieve the desired spray pattern.
   A higher pressure generates a wider and flatter fan pattern. Lowering the pressure decreases the pattern width and creates a rounder pattern.
4. Adjust the atomizing air pressure until you achieve the desired atomization and spray pattern.
   If necessary, adjust the fluid pressure at the fluid delivery systems. Use the lowest atomization air pressure possible along with the appropriate fluid pressure and flow rate to ensure maximum transfer rates and highest quality finishes.

5. If you are using a HVLP air cap and fluid tip: Test for optimum HVLP performance. Both atomizing and horn air pressures should be 0.69 bar (10 psi) or less for optimum transfer efficiency. Refer to HVLP Performance Testing on page 4-4**.**

Fluid Tips and Air Caps

CAUTION: To prevent damage to the needle or fluid tip seat, trigger the spray gun while removing or installing the fluid tip.

Different combinations of fluid tips and air caps can improve atomization and spray patterns with various coating materials and viscosities. If the fluid flow and air adjustments described previously do not produce the desired results, try a different combination of fluid tip and air cap.

A full range of airspray and HVLP fluid tips and air caps are available. Refer to the air cap and fluid tip selection guides included with this manual for part numbers. Refer to the Installation section for air cap and fluid tip installation instructions.

Shutdown

WARNING: Turn off the electrostatic power unit and ground the spray gun to remove any residual charge. Failure to observe this warning could result in personal injury.

WARNING: Shut off the fluid-delivery system and relieve the fluid pressure in the system before disconnecting any fluid connections or performing any maintenance and repair procedures. Failure to observe this warning could result in personal injury.

Short-Term Shutdown

For short-term breaks in production, no shutdown procedures are necessary. Deactivate the trigger air and wipe the air cap and fluid tip with a clean cloth dampened with a compatible cleaning solution.

Long Term Shutdown

1. Shut off the electrostatic power unit.
2. Shut off the atomizing and horn air.
3. Flush the fluid-delivery system, fluid hose, and spray gun with a compatible cleaning solution.

NOTE: Refer to the System Flushing on page 5-2 for recommended flushing and cleaning procedures.

4. Relieve system fluid pressure.
5. Trigger the spray gun to relieve any residual pressure.
6. Remove the air cap and fluid tip and clean them as described in the Maintenance section.

HVLP Performance Testing

To maintain optimum HVLP performance, both atomizing and horn pressures should be 0.69 bar (10 psi) or less. Each HVLP air cap has a corresponding HVLP compliance kit that consists of a modified air cap, air tubing, and pressure gauges. Kits must be ordered separately for each type of air cap. Refer to Section 8 Parts for kit part numbers.

NOTE: The 0.69 bar (10 psi) limit is for reference only. Many coating materials can be atomized using less pressure. Lower pressures will result in a softer pattern which, as long as the coating material is adequately atomized, provides better transfer efficiency.

After making an air pressure setting, perform an HVLP compliance test.

HVLP Compliance Test

WARNING: Shut off the fluid-delivery system and relieve system fluid pressure before performing a compliance test. Failure to observe this warning could result in personal injury.

NOTE: Use this procedure to adjust air cap performance in order to achieve optimum transfer efficiencies. It is acceptable to exceed pressure limits. The lower the air pressure, the softer the spray.

See Figure 4-1.

1. Turn off the electrostatic power unit and ground the spray gun.
2. Shut off the fluid-delivery system and relieve the fluid pressure.
3. Remove the production air cap and retaining ring and replace them with the compliance kit air cap (4) and retaining ring (1).
4. Trigger the spray gun to fully open the air valve.
5. Check the air pressure gauges (2, 3). Both atomization and horn pressures should be 0.69 bar (10 psi) or less.
6. If the atomization pressure exceeds 0.69 bar (10 psi), reduce the regulated air supply pressure and check the atomization quality.
7. If the horn air pressure exceeds 0.69 bar (10 psi), reduce the air pressure and check the pattern size.
8. Install the production air cap and check the fluid atomization.

NOTE: You can check the atomization quality with the compliance cap installed. Make sure the gauge tubing is not crimped or interfering with the spray pattern.

9. If atomization quality is unacceptable, install the next size larger air cap or increase the air pressure above the optimum level.

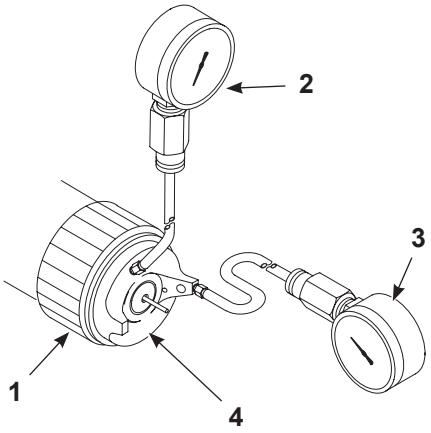


Figure 4-1 Using the HVLP Compliance Kit

1. Retaining ring
2. Atomization air gauge
3. Horn air gauge
4. Compliance air cap

Section 5
Maintenance

Introduction

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

The spray gun requires very little routine maintenance beyond cleaning. For best results, keep the spray gun as clean as practical.

NOTE: Three spray gun covers are provided with each spray gun. Keeping the spray gun clean can minimize wrapback and improve transfer efficiency.

Daily

Perform the following procedure at the end of each work shift:

WARNING: Shut off the electrostatic power unit and ground the spray gun to remove any residual charge. Failure to observe this warning could result in personal injury.

WARNING: Shut down the system and relieve all fluid and air pressures before performing these procedures. Failure to observe this warning could result in injury.

1. Turn off the electrostatic power unit and ground the spray gun to remove any residual charge.
2. Shut off the atomization and horn air supply.
3. Flush the fluid-delivery system, fluid hose, and spray gun with a compatible cleaning solution.
4. Relieve system fluid pressure.
5. Trigger the gun to relieve any residual pressure.

CAUTION: Trigger the spray gun to pull the needle out of the seat before removing the fluid tip. This will prevent damage to the needle and the seat.

6. Remove the air cap and fluid tip.

CAUTION: Use a non-conductive cleaning solution compatible with your coating material. Cleaning with conductive cleaning solutions can result in loss of kV, carbon tracking, and permanent damage to spray gun components.

CAUTION: Use only a Nordson cleaning brush to clean the fluid tip and air cap. Using metal tools will damage the fluid tip and air cap, causing faulty spray patterns.

CAUTION: Avoid cleaning the spray gun with pressurized cleaning solutions. Pressurized solutions can penetrate into spray gun cavities, potentially damaging spray gun components.

7. Remove the O-ring from the fluid tip. Soak the fluid tip and air cap in a suitable non-conductive cleaning solution to dissolve any accumulated coatings, then use the brush included with the spray gun to clean them.
8. Clean the spray gun extension with a clean cloth dampened with non-conductive cleaning solution. Do not soak the spray gun in solution.
9. Blow the fluid tip, air cap, and spray gun dry with an OSHA-approved blowgun.
10. Replace the O-ring on the fluid tip. Apply O-ring lubricant to the O-ring.

Periodically

Periodically flush the system and clean the spray gun components. The frequency of these procedures will vary depending on the application and coating material being used.

WARNING: Shut off the electrostatic power unit and ground the spray gun to remove any residual charge. Failure to observe this warning could result in personal injury.

WARNING: Shut down the system and relieve all fluid and air pressures before performing these procedures. Failure to observe this warning could result in injury.

CAUTION: Use a non-conductive cleaning solution compatible with your coating material. Cleaning with conductive solutions can result in carbon tracking and loss of kV.

CAUTION: Avoid cleaning the spray gun with pressurized solutions. Pressurized solutions can penetrate into spray gun cavities, potentially damaging spray gun components.

System Flushing

1. Relieve system air and fluid pressure and make sure the spray gun cannot be activated.
2. Turn off the electrostatic power unit and ground the spray gun to remove any residual charge.
3. Point the spray gun into a grounded waste container. Trigger the spray gun to drain the spray gun and fluid tubing.
4. Remove the retaining ring and air cap.
5. Turn on the cleaning solution supply and adjust it to the lowest possible pressure.
6. Trigger the spray gun and allow cleaning solution to flow until it runs clear.
7. Turn off the cleaning solution supply and relieve the pressure.

Spray Gun Cleaning

CAUTION: Use a non-conductive cleaning solution compatible with your coating material. Cleaning with conductive cleaning solution can result in carbon tracking and loss of kV.

CAUTION: Use only a Nordson cleaning brush to clean the fluid tip and air cap. Using metal tools will damage the fluid tip and air cap, causing faulty spray patterns.

Routine Cleaning

NOTE: Trigger the spray gun to pull the needle off of the seat before removing the fluid tip. This will prevent damage to the needle and or the seat.

1. Turn off the electrostatic power unit and ground the spray gun to remove any residual charge.
2. Shut off the atomization and horn air supply.
3. Remove the air cap and fluid tip.
4. Disconnect the fluid tubing and air tubing.
5. Point the spray gun down and clean the front of the spray gun with a soft-bristled brush dampened with a compatible cleaning solution.

NOTE: Pointing the spray gun down at a slight angle will prevent any solutions from entering the air passages and possibly damaging the air seals. Most air seals are not universally compatible with all cleaning solutions and can be damaged.

6. Dampen a soft cloth with a compatible cleaning solution. Point the spray gun downward and clean the exterior.
7. Clean the fluid tip, air cap, and retaining ring with a soft-bristled brush and a compatible cleaning solution. Remove the O-ring and soak the fluid tip in solution if necessary.
8. Trigger the gun to retract the needle, then install the fluid tip on the gun. Install the air cap and retaining ring.
9. Connect the air and fluid tubing.

Extensive Cleaning

For more extensive cleaning, disassemble the spray gun and clean each part. Once disassembled, the extension and body can be soaked in cleaning solution and scrubbed. Remove O-rings before soaking any parts in cleaning solution.

NOTE: Allow parts that have been soaked or heavily washed in cleaning solution to dry thoroughly (overnight) before assembling and reusing the spray gun.

Section 6
Troubleshooting

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

Introduction

WARNING: Shut off the electrostatic power unit and ground the spray gun to remove any residual charge before performing any troubleshooting procedures. Failure to observe this warning could result in personal injury.

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.

This section contains troubleshooting procedures for:

- common spray gun problems.
- spray pattern and film-build faults.

When multiple causes exist for a problem, they are listed in order of importance.

Common Problems

Problem	Possible Cause	Corrective Action
1. Spray gun spitting	Clogged or damaged needle or fluid tip	Clean or replace the needle and/or fluid tip.
	Partially plugged or dirty air cap	Clean the air cap.
	Air bubbles in fluid stream	Bleed air from the fluid delivery system; check for leaks in the fluid delivery system or excessive agitation in the fluid reservoir.
	Fluid pressure too low	Increase the fluid pressure.
2. Air leaks	Foreign matter on the air piston seal or seat	Remove and clean the air valve stem and seat.
	Worn or damaged air piston O-rings or other air seals	Replace the air piston O-rings or other seals, using the correct seals or the air seal kit.
3. Fluid leak from front of spray gun	Worn or damaged fluid tip O-ring	Replace the fluid tip O-ring.
	Worn or damaged needle or seat	Replace the fluid tip if the needle seat is damaged. Replace the needle if it is damaged.

Continued...

Problem	Possible Cause	Corrective Action
4. Fluid leaking from rear of extension	Worn or damaged packing cartridge O-ring	Replace the O-ring.
	Worn or damaged packing cartridge	Replace the packing cartridge (packing cartridge cannot be repaired).
5. Spray pattern not affected by air adjustments	No air to spray gun	Make sure air is being supplied to the gun. Check for blockage in the air tubing. Adjust the supply air regulators.
	Plugged holes in air cap	Clean the air cap.
6. Low or erratic fluid flow	Fluid delivery system malfunction	Check the fluid delivery system.
	Blockage within the spray gun, fluid tubing, or fluid-delivery system	Flush the system. If necessary, repair or replace clogged or damaged components.
	Low fluid pressure	**WARNING:** Do not exceed the maximum fluid pressure rating of 6.9 bar (100 psi). Slowly increase the fluid pressure until the desired fluid flow is obtained.
	Fluid too viscous	Lower the fluid viscosity.
7. Coarse spray	Air pressure too low for fluid flow rate	Decrease the fluid flow rate or increase the atomizing air pressure. Change the air cap and fluid tip.
	Fluid viscosity too high for atomizing air pressure	Increase the atomizing air pressure, use a larger air cap, or decrease fluid viscosity.
	Obstructed atomizing air orifice	Clean the air cap and exterior surface of the fluid tip.
	Damaged fluid tip or air cap	Inspect the fluid tip and air cap; replace them if they are damaged.
8. Excessive overspray	Atomization air pressure too high	Decrease the atomization air pressure.
	Fluid pressure is too high	Use a larger fluid tip and decrease the fluid pressure.
9. Excessive bounce back	Atomizing air and fluid pressures too high	Decrease the pressures.
	Horn air pressure too high	Decrease the horn air pressure.
10. Dry spray	Spray gun too far away from substrate	Move the spray gun closer to the substrate.
	Horn air pressure too high or fluid pressure too low	Decrease the horn air pressure or increase fluid pressure. Change the air cap or fluid tip.
11. Coating material is wrapping back	Spray gun needs to be cleaned	Clean the spray gun. Refer to Spray Gun Cleaning on page 5-3. Use a gun cover.

Spray Pattern/Film Build Troubleshooting

Figure 6-1 illustrates common spray pattern and film-build faults.

Problem	Possible Cause	Corrective Action
1. Blown pattern (1)	Horn air pressure too high	Decrease the horn air pressure.
	Fluid pressure too low	Increase the fluid pressure.
2. Heavy top (3), bottom (2), left (4) or right (5) pattern	Partially clogged air cap or fluid tip	Rotate the air cap and activate the spray gun. If the problem persists, clean the air cap. If the problem still persists, clean the fluid tip or inspect the air cap and fluid tip for damage. Replace if necessary.
	Fluid viscosity incorrect	Change the fluid viscosity.
3. Heavy center (6)	Atomization or horn pressure too low	Increase the atomization and horn air pressure.
	Fluid pressure too high	Decrease the fluid pressure.
	Fluid viscosity too low	Increase the fluid viscosity.
4. Spitting (7)	Air in fluid line	Purge the air from the fluid-delivery system.
	Atomization or horn pressure too low	Increase the atomization air and fluid pressure and/or increase the horn air pressure.
	Fluid too viscous	Decrease the fluid viscosity.
5. Runs and sags	Air in fluid line	Purge air from the fluid-delivery system.
	Atomization air pressure too low	Increase the atomization air pressure and decrease fluid pressure.
	Fluid pressure too low	Increase the atomization air pressure and decrease the fluid pressure.
	Spray gun too close to the substrate	Move the spray gun farther from the substrate.
	Horn air pressure is too low	Increase the horn air pressure.
	Fluid too viscous	Decrease the fluid viscosity.
6. Dry spray	Atomization air pressure too high	Decrease the atomization air pressure.
	Spray gun too far from the substrate	Move the spray gun closer to the substrate.
	Horn air pressure too high	Decrease the horn air pressure.
	Fluid viscosity incorrect	Change the fluid viscosity.
7. Poor coverage in recesses	Atomization air pressure too high	Decrease the atomization air.
	Fluid pressure too low	Increase the fluid pressure.
	Spray gun too far from the substrate	Move the spray gun closer to the substrate.

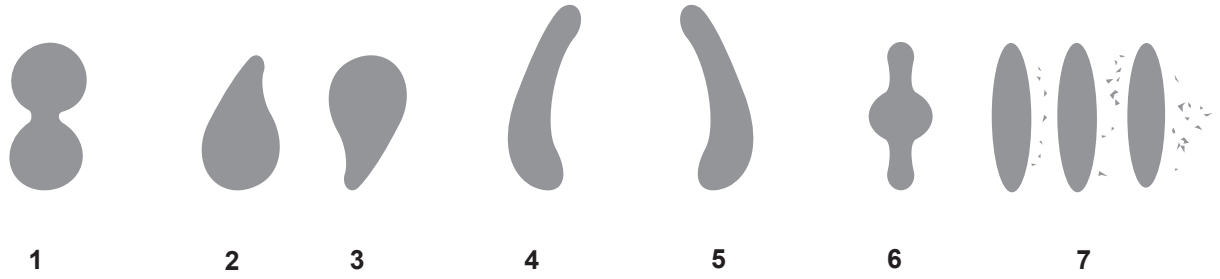


Figure 6-1 Common Spray Pattern Faults

1. Blown pattern
2. Heavy bottom
3. Heavy top
4. Heavy left side
5. Heavy right side
6. Heavy center
7. Spitting

Electrostatic Troubleshooting

Problem	Possible Cause	Corrective Action
1. No electrostatic voltage, or the electrostatic voltage is low or erratic	Coating material is grounding out	Inspect the hose and repair or replace it as necessary.
	Defective electrostatic power supply, electrostatic cable, cable connection, or control circuit	Check the electrostatic equipment and repair or replace as necessary. Refer to the appropriate electrostatic power supply or automatic Iso-Flo system manual.
	Leaking packing cartridge	Check the packing cartridge for leaks. Clean the packing cartridge bore and install a new packing cartridge and dielectric grease.
2. Supply system malfunction	Supply system grounding out	Check the supply system.

Section 7
Repair

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

WARNING: Shut off the electrostatic power unit. Ground the spray gun remove any residual charge. Failure to observe this warning could result in personal injury.

WARNING: Shut off the fluid-delivery system. Relieve the fluid pressure in the system. Failure to observe this warning could result in an injection injury.

WARNING: Use only Nordson replacement parts to repair the spray gun. Deviating from the repair instructions, using unauthorized parts, or making unauthorized modifications can result in personal injury or death and/or the loss of approvals by agencies such as Factory Mutual Research Corporation (FM).

CAUTION: Do not overtighten threaded parts. Failure to observe this caution will result in equipment damage.

NOTE: Tighten all fittings until snug or to the specified torques. Because the spray gun uses O-ring seals, further tightening provides no benefit and could damage plastic threads.

NOTE: The numeric callouts in this section match the item numbers in the spray gun parts list. Refer to the Parts section for replacement parts and kits and ordering information. Items in the repair section that are not called out in the spray gun parts list are identified with alphabetic callouts.

Tools/Supplies Required

Before beginning any of the repair tasks described in this section, make sure you have the following tools and supplies:

- See Figure 7-1: Combination tool provided with your spray gun
- Needle nose pliers (provided with your spray gun)
- 5/32-in. hex wrench
- Flat-blade screwdriver
- Small Phillips-head screwdriver
- Service kits and replacement parts
- Removable threadlocking adhesive
- Dielectric grease
- O-ring grease (MagnaLube G or equivalent PTFE-based grease)
- Pipe/thread/hydraulic sealant adhesive

NOTE: Refer to the Parts section for service kits and individual part numbers.

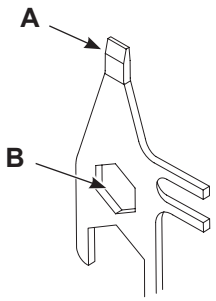


Figure 7-1 Combination Tool

A. Screwdriver B. Fluid tip tool

Preparation for Repair

1. Turn off the electrostatic power unit and ground the spray gun to remove any residual charge.
2. Flush the fluid-delivery system, fluid tubing, and spray gun.
3. Turn off the fluid delivery system. Relieve system fluid pressure. Trigger the gun to relieve any residual pressure.
4. Shut off the atomizing, horn, and trigger air supply.
5. Disconnect the cordset from the extension cable.
6. Disconnect the fluid and air tubing from the spray gun and move the spray gun to a clean, dry, flat surface.
7. Remove the air cap and fluid tip so they will not be damaged while repairing the gun.

Air Cap, Fluid Tip, and Needle Replacement

1. Turn off the electrostatic power unit and ground the spray gun.
2. Turn off the fluid delivery system and relieve the fluid pressure. Trigger the gun to relieve any residual pressure.
3. See Figure 7-2. Unscrew the retaining ring (3) from the extension (6). Remove the air cap (A).

CAUTION: To prevent damage to the needle or fluid tip seat, trigger the gun while removing or installing the fluid tip.

Trigger the gun and keep it triggered while unscrewing the fluid tip (B) from the extension.

4. Grasp the needle (4) with your fingers and pull it out of the packing cartridge (7). If necessary, hook the bent needle-nose plier jaws under the corners of the needle flats to remove it. Do not scratch the needle.
5. Install a new needle into the end of the packing cartridge. It will snap into place.
6. Make sure the O-ring (C) is installed in the groove in the new fluid tip. Apply O-ring grease to the O-ring.

CAUTION: Do not overtighten threaded parts. Failure to observe this caution will result in equipment damage.

7. Trigger the gun and keep it triggered while screwing the new fluid tip in the extension. Tighten the fluid tip snugly, without overtightening it.
8. Install the air cap (A) into the retaining ring and thread the retaining ring onto the extension. Make sure the air cap is centered on the fluid tip. Hold the air cap in the desired position and tighten the retaining ring until it is snug. Do not overtighten the retaining ring.

NOTE: 991 and 992 air spray air caps are shipped installed into retaining rings. These retaining rings cannot be used with the 985−988 air spray air caps, which use the standard retaining ring shipped with the spray gun.

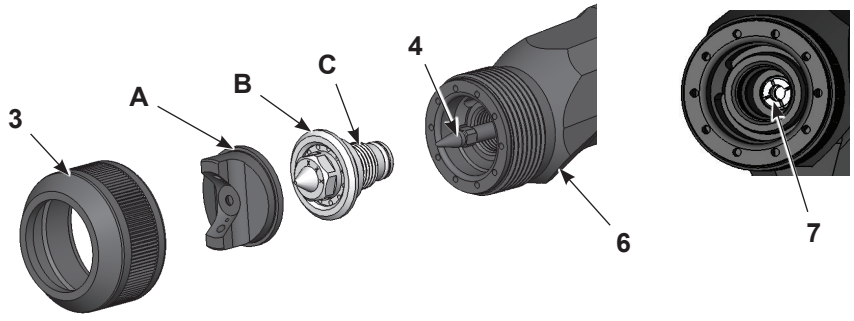


Figure 7-2 Air Cap, Fluid Tip, and Needle Replacement

3. Retaining ring
4. Needle
6. Extension
7. Packing Cartridge
A. Air cap
B. Fluid tip
C. Fluid tip O-ring

Air Seal Replacement

Disassembly

1. Prepare the spray gun for repair as described in Preparation for Repair.

2. See Figure 7-3. Remove the four socket screws (21) with a 5/32-in. hex wrench.

NOTE: The springs (27, 28) will push the fluid adjuster housing (29) away from the gun body as you loosen the socket screws (21). Hold onto the housing while removing the screws.

3. Remove the adjuster housing (29) from the gun body.

4. Remove and inspect the springs (27, 28) and replace them if worn or damaged.

NOTE: Normally there will be no reason to remove the fluid adjuster (31) from the housing (29). If the fluid adjuster must be replaced, lubricate the fluid adjuster shaft with O-ring grease before reinstalling it in the housing. Screw the fluid adjuster into the housing 1-1/2 turns, then tighten the jam nut (30). This is a starting point only for flow adjustment.

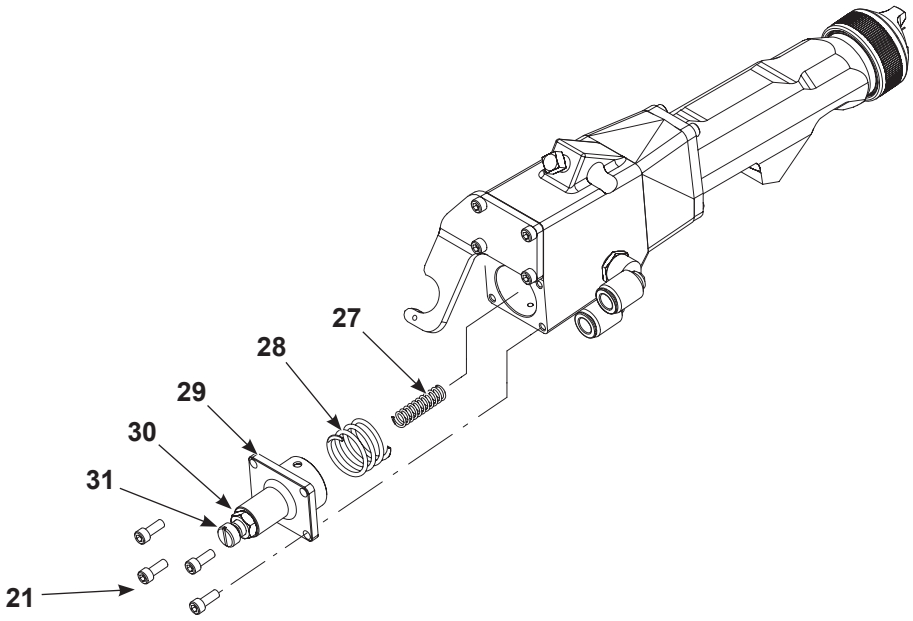


Figure 7-3 Removing the Fluid Adjuster and Springs

21. Screws (4)	28. Piston return spring	30. Jam nut
27. Fluid return spring	29. Adjuster housing	31. Fluid adjuster

5. See Figure 7-4**.** Remove the anti-pivot screw (15) from the spacer (12).

6. Insert a flat-blade screwdriver into the gun body (17) and turn the connecting rod (26) counterclockwise until it rotates freely. This will disconnect the connecting rod and adapter link (16) from the pull shaft (9).

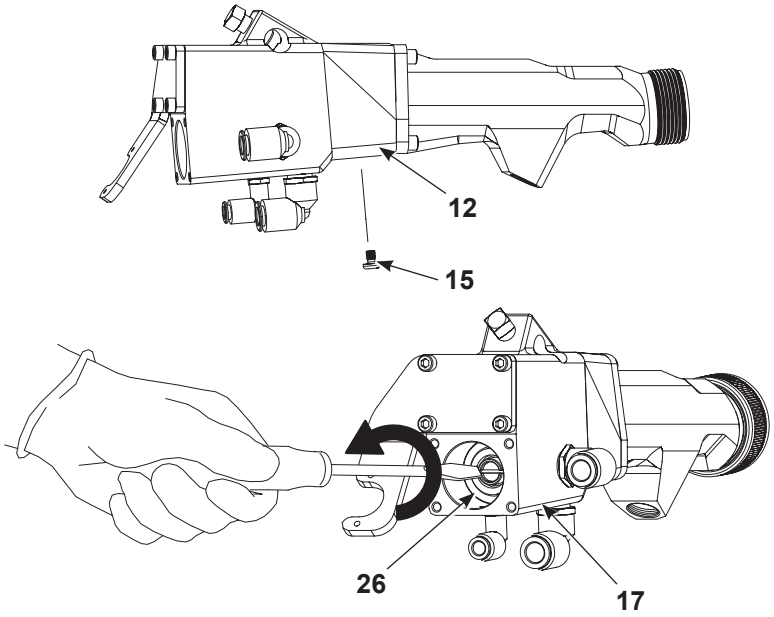


Figure 7-4 Disconnecting the Connecting Rod from the Puller Shaft

12. Spacer
15. Anti-pivot screw
17. Gun body
26. Connecting rod

7. See Figure 7-5 and Figure 7-6. Remove the four screws (1, 2). Pull the extension (6) away from the spacer (12).

NOTE: To remove and replace the packing cartridge, refer to Packing Cartridge Replacement on page 7-8.

8. Pull the spacer (12) away from the body.
9. Hold the adapter link (16) with a wrench while using a screwdriver to unscrew the connecting rod (26) from the link.

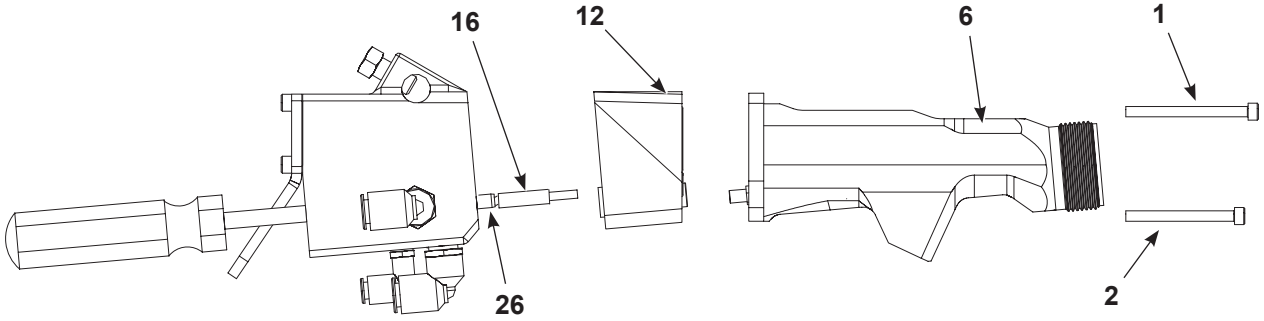


Figure 7-5 Disconnecting the Connecting Rod from the Adapter Link and the Puller Shaft

1. Screws (2.25 in.)
2. Screws (2 in.)
6. Extension
12. Spacer
16. Adapter link
26. Connecting rod

10. Push the connecting rod (26) and piston (23) out of the gun body (17).

11. Replace all the O-rings shown in Figure 7-6 with the O-rings included in the air seal O-ring kit. Apply O-ring grease to the O-rings and the piston bore in the body.

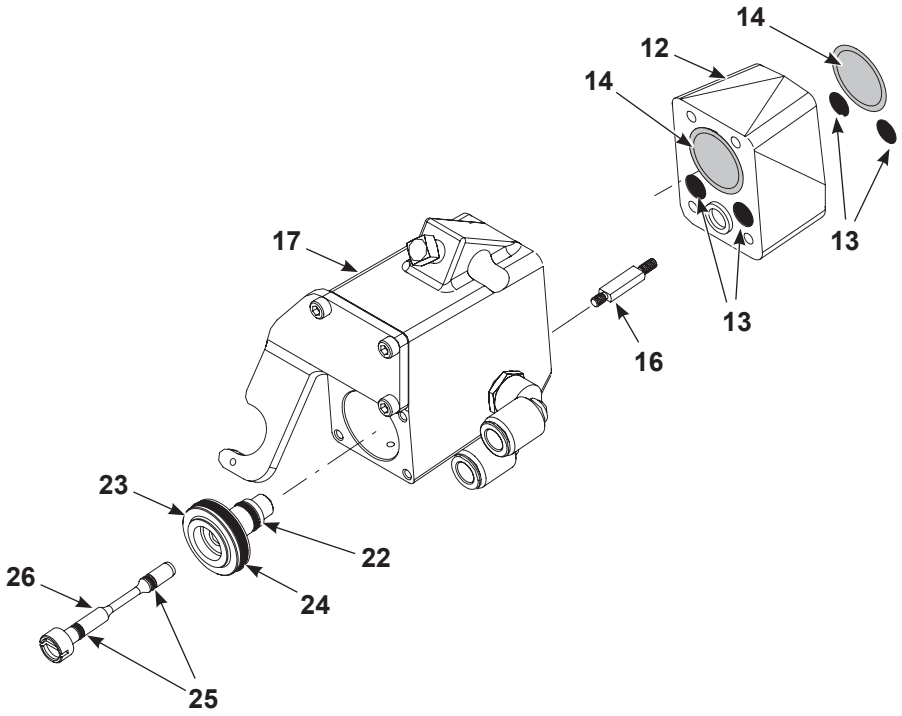


Figure 7-6 Removing the Spacer and Piston from the Gun Body

12. Spacer
13. O-rings (4 small)
14. O-rings (2 large)
16 Adapter link
17. Body
22. Piston O-ring (small)
23. Piston
24. Piston O-ring (large)
25. Connecting rod O-rings (2)
26. Connecting rod

Re-Assembly

See Figure 7-2, Figure 7-3, Figure 7-4, Figure 7-5, Figure 7-6, and Figure 7-7.

1. Insert the connecting rod (26) through the piston, then install the piston (23) into the body (17).
2. Apply Loctite 242 removable threadlocking adhesive to the short threads of the adapter link (16), then screw the adapter link into the end of the connecting rod.
3. Install the spacer (12) over the adapter link.
4. Install a needle (4) into the packing cartridge (7) and install a fluid tip (B) on the extension.
5. Slide the spacer up against the body, then install the extension (6) on the spacer.

6. Secure the extension (6) and spacer (12) to the body (17) with the four screws (1, 2). The 2-in. long screws go in the bottom holes, the 2.25-in. screws in the top. Tighten the screws to 2.27−2.83 N•m (20−25 in.-lb).
7. Turn the connecting rod (26) clockwise with a screwdriver so that the adapter link screws into the pull shaft (9) until it bottoms out with a small amount of resistance.
8. Push the gauge plug (A, included with the spray gun) into the piston bore and hold it firmly.
9. Insert the screwdriver through the gauge plug hole and turn the connecting rod (26) counterclockwise to back it out until it contacts the inner surface of the gauge plug.
10. Look through the threaded hole in the bottom of the spacer to see if one of the flats on the adapter link (16) is lined up with the hole. If not, turn the connecting rod clockwise, up to 1/2 turn, to align a flat with the screw hole.
11. Thread the anti-pivot screw (15) into the spacer until the screw head bottoms out. The screw should not contact the adapter link (16).

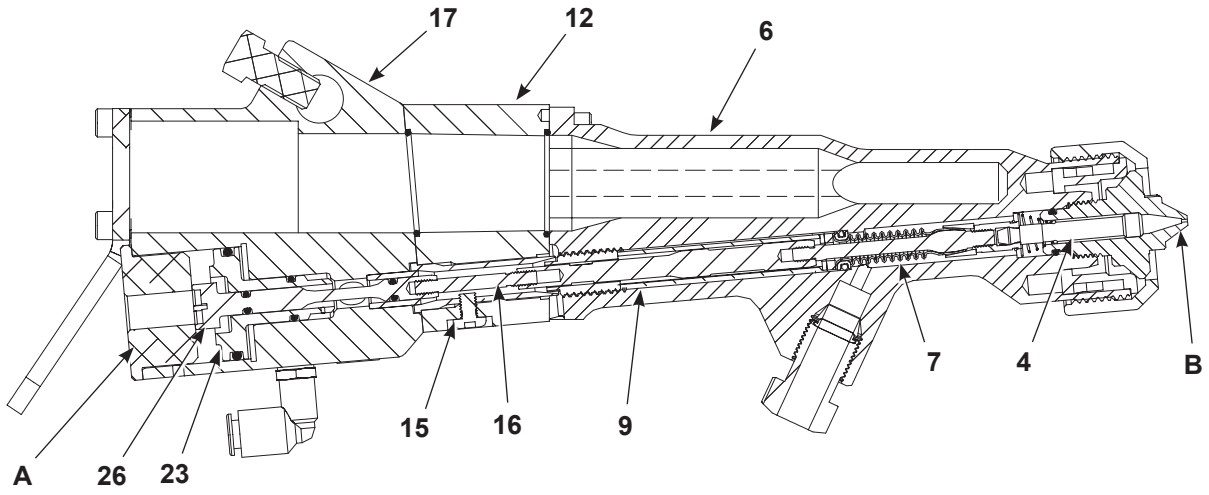


Figure 7-7 Re-Assembly

A. Gauge plug
B. Fluid tip
4. Needle
6. Extension
7. Packing cartridge
9. Pull shaft
12. Spacer
15. Anti-pivot screw
16. Adapter link
17. Body
23. Piston
26. Connecting rod

12. Remove the gauge plug.
13. Refer to Figure 7-3. Coat the springs (27 and 28), adjuster shaft (31), and inside of adjuster housing (29) with O-ring grease.
14. Install the large spring inside the adjuster housing, and the small spring over the adjuster shaft.
15. Install the adjuster housing on the gun body and secure it with the four screws (21). Tighten the screws to 2.27−2.83 N•m (20−25 in.-lb).

Packing Cartridge Replacement

CAUTION: If the packing cartridge leaks, it is important to thoroughly clean the packing cartridge bore in the extension with a compatible non-conductive solvent to remove any residual coating material. Failure to do so may result in loss of kV.

CAUTION: Do not overtighten threaded parts. Failure to observe this caution will result in equipment damage.

The only serviceable parts of the packing cartridge are the external O-ring. If replacing the O-ring does not stop the packing cartridge from leaking, you must replace the packing cartridge.

Removal

1. Prepare the gun as described in Preparation for Repair on page 7-2.
2. Remove the air cap, fluid tip, and needle as described in Air Cap, Fluid Tip, and Needle Replacement on page 7-3.
3. Refer to Air Seal Replacement on page 7-4. Perform Steps 2 through 7 of the Disassembly procedure.
4. See Figure 7-8. Unscrew the packing cartridge retainer (10) from the extension (6).
5. Pull the pull shaft/sleeve/packing cartridge assembly (7, 8, 9) out of the extension.
6. Remove the sleeve, then unscrew the packing cartridge from the pull shaft.

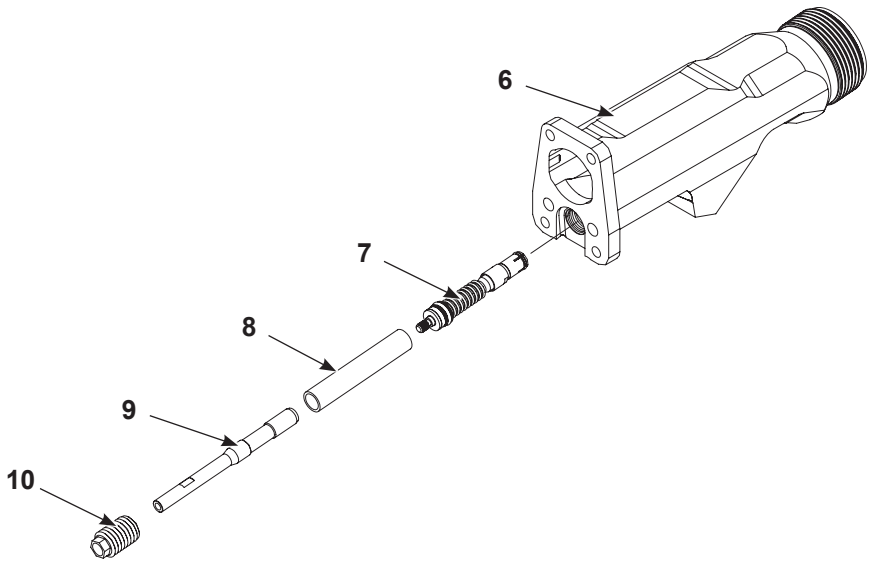


Figure 7-8 Re-Assembly

6. Extension
7. Packing cartridge
8. Sleeve
9. Pull shaft
10. Packing cartridge retainer

Installation

WARNING: Apply dielectric grease as instructed in this procedure. Failure to follow instructions could result in damage to the spray gun and could compromise the safety and performance of the gun.

1. Before re-assembling the spray gun, clean the extension thoroughly to remove any residual coating material.
2. See Figure 7-8. Apply a removable threadlocking adhesive (Loctite24 2 or equivalent) to the threads of the new packing cartridge (7).
3. Screw the pull shaft (9) onto the packing cartridge.
4. Lubricate the exterior of the packing cartridge with O-ring grease.
5. Apply a liberal coating of dielectric grease to the pull shaft.
6. Slide the sleeve (8) over the pull shaft and up against the packing cartridge.
7. Apply a thin coat of dielectric grease to the outside of the sleeve.
8. Insert the sleeve/pull shaft/packing cartridge assembly into the extension.
9. Apply O-ring grease to the inside diameter of the packing cartridge retainer and to the end of the pull shaft.
10. Install the packing cartridge retainer over the pull shaft and screw it into the extension. Tighten the retainer hand-tight (0.56 Nm (5 in.-lb) maximum). Do not overtighten the retainer.
11. Install the extension (6) onto the spacer.
12. Refer to the Re-Assembly section. Perform Steps 6 through 15 to re-assemble the spray gun.

Fluid Hose Replacement

Fluid Hose Connection to Gun

See Figure 7-9.

1. Remove the cap from the gun end of the hose. The ferrule set (A, B) and hose nut (C) are already installed on the fluid hose. Make sure the conical ends of the ferrules are facing toward the end of the hose.
2. Insert the fluid hose into the extension until it bottoms out.
3. Thread the hose nut (C) into the extension until it is hand-tight, then tighten 1-1/4 turns past hand-tight.

NOTE: The above procedure swages the new ferrules permanently onto the fluid hose. If you disconnect the hose from the gun you only need to tighten the hose nut 1/4 turn past hand-tight when re-installing the hose.

4. Install the hose collar (E) onto the bracket (F) and secure it with the two screws (D). The collar is part of the fluid hose and the screws are shipped with the hose.

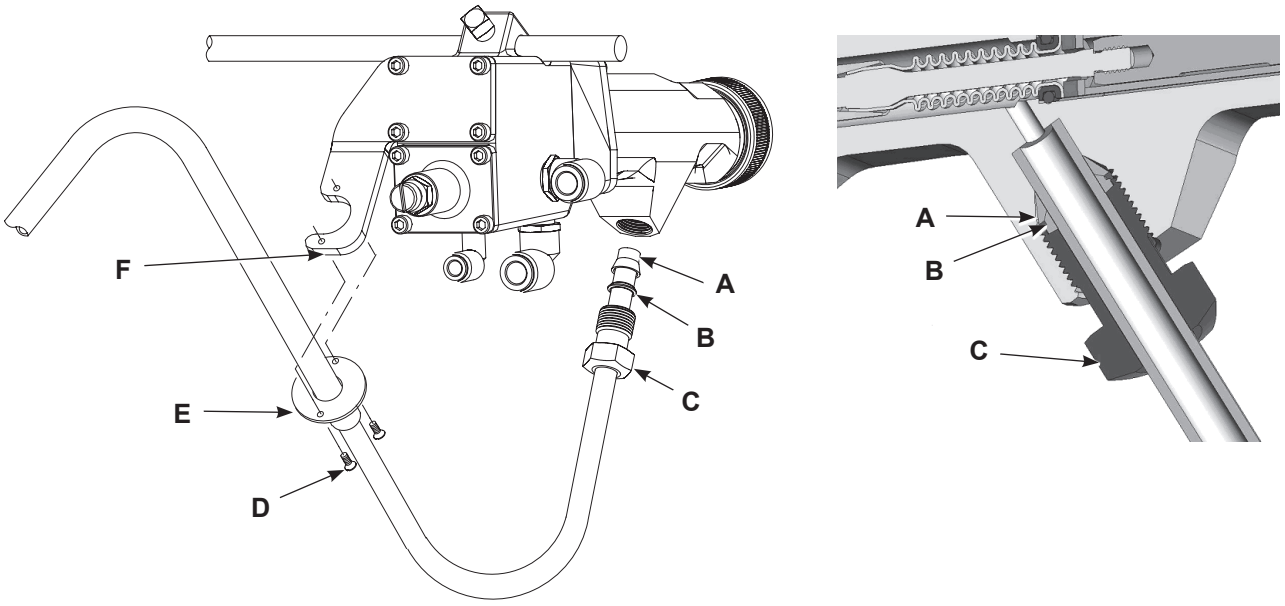


Figure 7-9 Fluid Hose Connection to Gun

A. Large ferrule	C. Hose nut	E. Horse collar
B. Small ferrule	D. Screws (2)	F. Bracket

Fluid Hose Connection to Delivery System

See Figure 7-10.

Feed the end of the fluid hose (C) through the grommeted hole in the Iso-Flo cabinet labeled PAINT OUTLET (D) and connect the hose to the fluid fitting (A), or to a fluid regulator (B), inside the cabinet. Connect the hose ground strap to the ground stud (E) next to the paint outlet hole.

If using a pressure pot instead of an Iso-Flo system, connect the hose to the fluid outlet and the hose ground strap to a true earth ground.

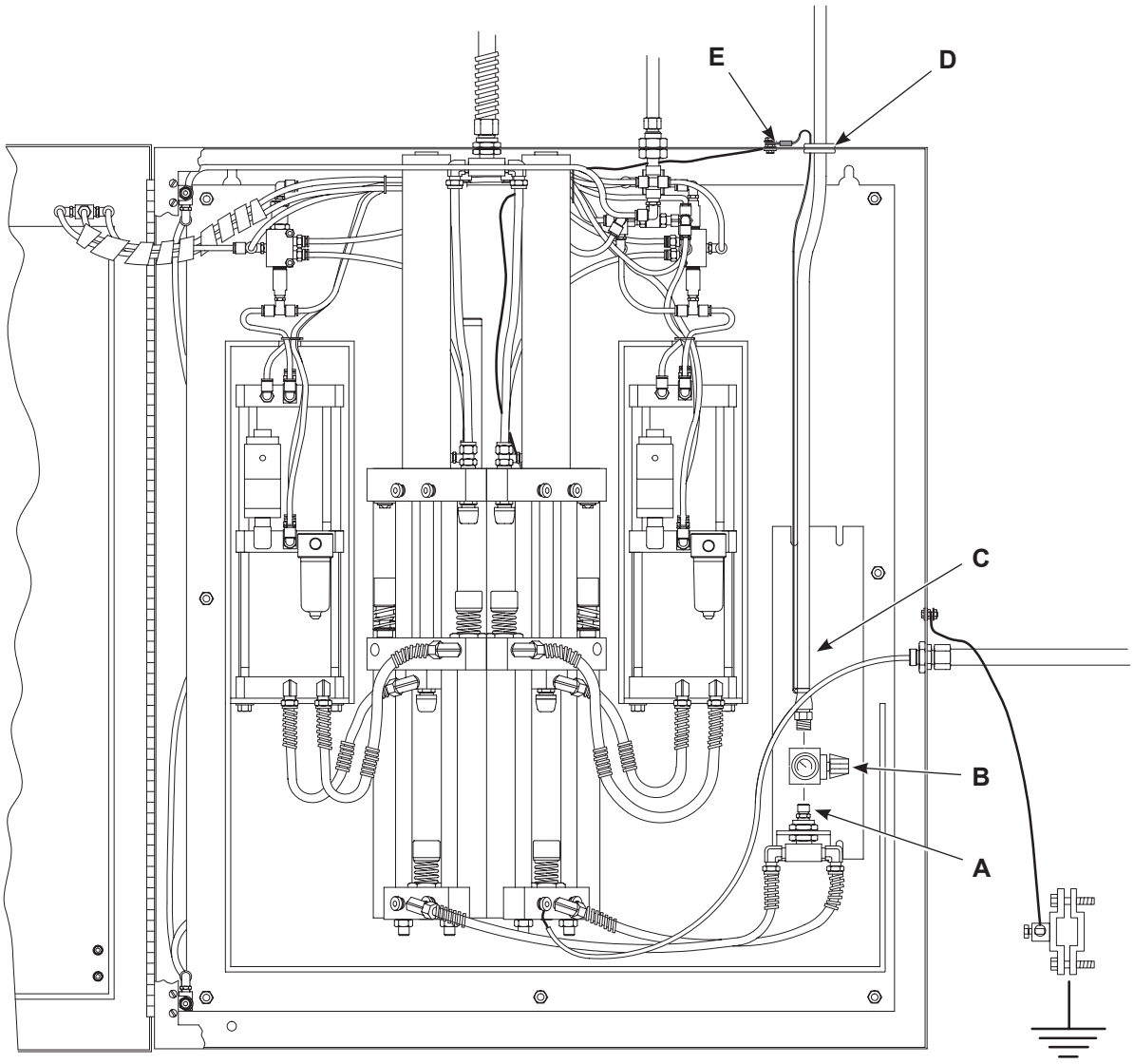


Figure 7-10 Fluid Hose Connection to Iso-Flo System

A. Fluid outlet fitting
B. Fluid regulator (optional)
C. Fluid hose
D. Grommeted fluid outlet hole
E. Ground stud

Service Illustration and Notes

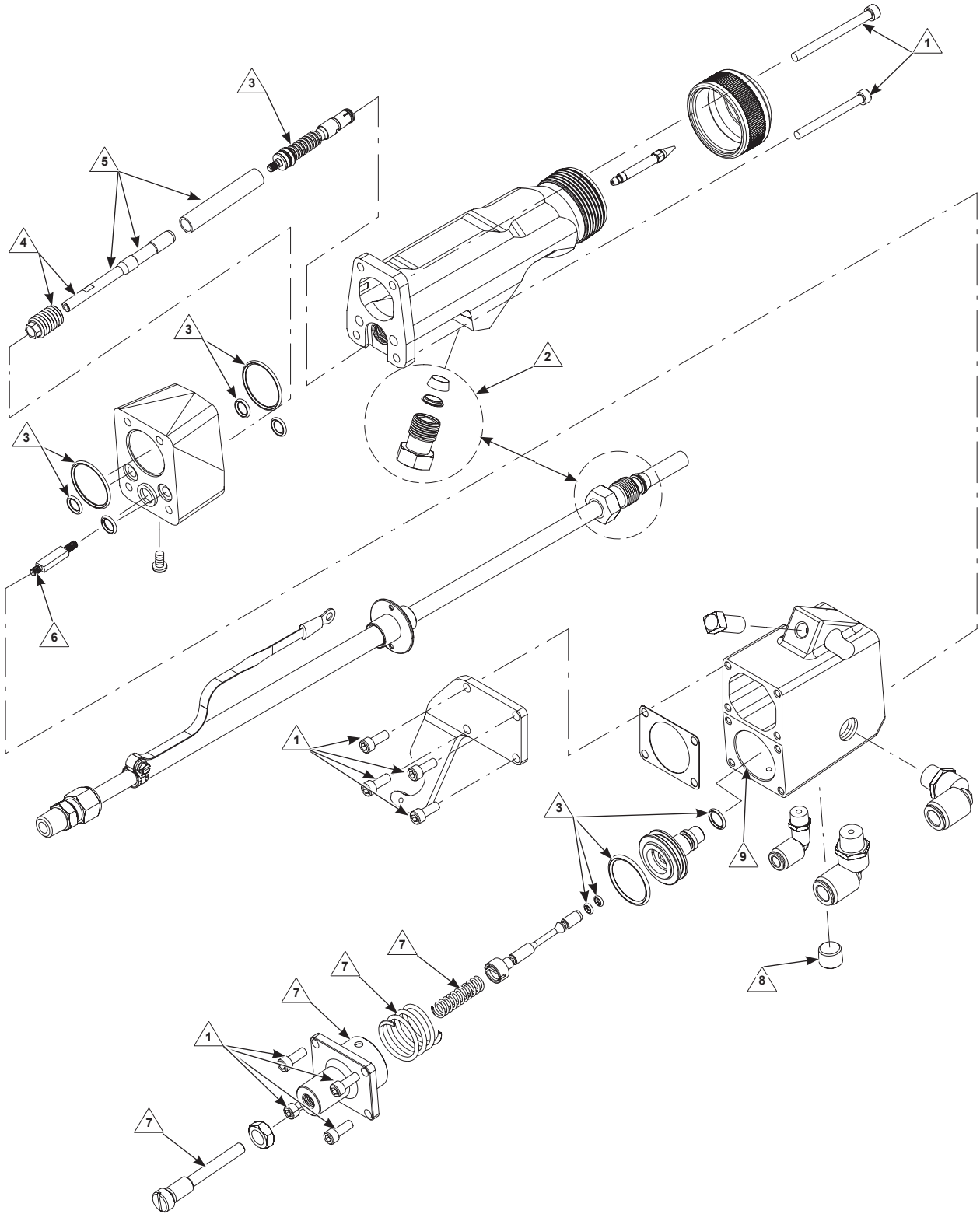


Figure 7-11 Spray Gun Service Notes

Table 7-1 Spray Gun Service Notes

Note	Item	Description
1	Screws	Tighten the screws to 2.27−2.83 N•m (20−25 in.-lb).
2	Ferrule and hose nut	On first installation, tighten 1-1/4 turns past hand tight. On re-installation, tighten 1/4 turns past hand tight.
3	O-rings and packing cartridge	Apply MagnaLube-G O-ring grease to all O-rings, and the bellows and seal portion of the packing cartridge.
4	Pull shaft, packing cartridge retainer	Apply MagnaLube G O-ring grease to ID and the threads of the packing cartridge retainer and to the end of the pull shaft before installing the retainer over the pull shaft. Tighten the retainer hand tight (0.56 Nm (5 in-lb) maximum).
5	Pull shaft, sleeve	Apply a liberal coating of dielectric grease to the indicated areas of the pull shaft. Apply a thin coating of dielectric grease to the OD of the sleeve
6	Adapter link	Apply Loctite 242 removable threadlocking adhesive to the shot threads of the adapter link before screwing the connecting rod onto the link
7	Adjuster shaft, housing, springs, body	Apply MagnaLube G O-ring grease to the adjuster shaft, the ID of the adjuster housing, the springs, and the piston bore of the body.
8	Plug	Apply pipe thread adhesive to the plug if removed and reinstalled
9	Piston bore in body	Apply MagnaLube-G O-ring grease to the circumference of the piston bore before installing the piston in the body.

Section 8
Parts

Introduction

To order parts, call the Nordson Finishing Customer Support Center at (800) 433-9319 or your local Nordson representative. Use the parts lists and accompanying illustrations to locate and describe parts correctly.

Spray Gun Parts

NOTE: Before ordering parts for your spray gun, review the appropriate procedure in the Repair or Installation section to make sure you are ordering the correct parts, lubricant, and adhesives to complete the procedure.

See Figure 8-1.

Item	Part	Description	Quantity	Note
—	1090981	GUN, automatic, low pressure, waterborne	1	
1	338909	• CAPSCREW, socket head, #10−24 x 2.25 in., stainless steel	2	
2	338910	• CAPSCREW, socket head, #10−24 x 2 in., stainless steel	2	
3	1089398	• RING, retaining, air cap, Trilogy	1	
4	1089361	• NEEDLE, Trilogy, bellows, solid	1	
6	1094724	• KIT, extension, Trilogy, Watermark	1	
7	1094777	• KIT, cartridge, Trilogy	1	
7A	940118	• • O RING, hot paint, 0.313 x 0.438 x 0.063 in.	1	
8	1095878	• RETAINER, sleeve, bellows cartridge	1	
9	1093946	• SHAFT, pull, Trilogy	1	
10	325749	• RETAINER, packing cartridge, electrostatic	1	
11	1094725	• KIT, hose, Trilogy, low pressure, auto, 25 ft	1	
11A	1090625	• • FERRULE, set, 0.375 in. ID	1	A
11B	1089413	• • NUT, hose, 0.38 in.	1	A
11C	346725	• • MACHINE SCREW, flathead, #4−40, 0.25 in., stainless	2	
12	1093812	• SPACER, electrostatic, Trilogy, auto, assembly	1	B
13	940110	• O-RING, hotpaint, 0.313 x 0.438 x 0.063 in.	4	B, C
14	336499	• O-RING, PTFE, 1.05 x 0.07 in.	2	B, C
15	1093599	• SCREW, anti-pivot, #10−32, Trilogy	1	
16	1093799	• ADAPTER, link-pin #8−32 UNC-2A Trilogy	1	
17	336620	• BODY, piston block, automatic	1	
18	981405	• SCREW, square, set, 3/8−16 x 0.75 in., cup, zinc	1	
19	336626	• GASKET, cable bracket, Kinetix, automatic	1	
20	1046550	• BRACKET, cable, automatic, 60 kV, waterborne	1	
21	981104	• SCREW, socket, #10−24 x 0.50 in., zinc	8	

Continued...

Item	Part	Description	Quantity	Note
22	940125	• O-RING, Viton, 0.375 x 0.50 x 0.063 in.	1	C
23	243975	• PISTON, air	1	
24	941210	• O-RING, Viton, 1.063 x 1.25 x 0.094 in.	1	C
25	940063	• O-RING, Viton, 0.125 x 0.25 x 0.063 in.	2	C
26	325693	• ROD, connecting, automatic	1	
27	325537	• SPRING, fluid return, high pressure	1	
28	241176	• SPRING, compression, 1.24 x 1.093 OD x 0.094 in.	1	
29	336623	• HOUSING, adjuster, electrostatic, automatic	1	
30	984156	• NUT, hex, jam, 3/8−24, brass	1	
31	325692	• ADJUSTER, fluid, low pressure	1	
32	972119	• ELBOW, male, 1/4-in. tube x 1/8 in. NPT	1	
33	972183	• ELBOW, male 3/8-in. tube x 1/4 in. NPT	2	
34	973410	• PLUG, pipe, socket, standard, 1/4 in., zinc	1	
NS	156098	• BAG, polyethylene	3	D
NS	1094480	• KIT, tools, low pressure, Trilogy	1	
NS	901905	• • BRUSH (wooden toothbrush type)	1	
NS	247066	• • BRUSH	1	
NS	336642	• • WRENCH, Kinetix, combination tool	1	
NS	1028630	• • PLIERS, needle nose, bent, Kinetix		

NOTE: A. Included in 1094775 Kit, Ferrule, 3/8 in., Low Pressure.

B. Included in 1093816 Spacer, Electrostatic, Trilogy, Automatic, Assembly

C. Included in 336656 Kit, Air Seal Service.

D. Order 106403 for a quantity of 10 cover bags.

NS: Not Shown

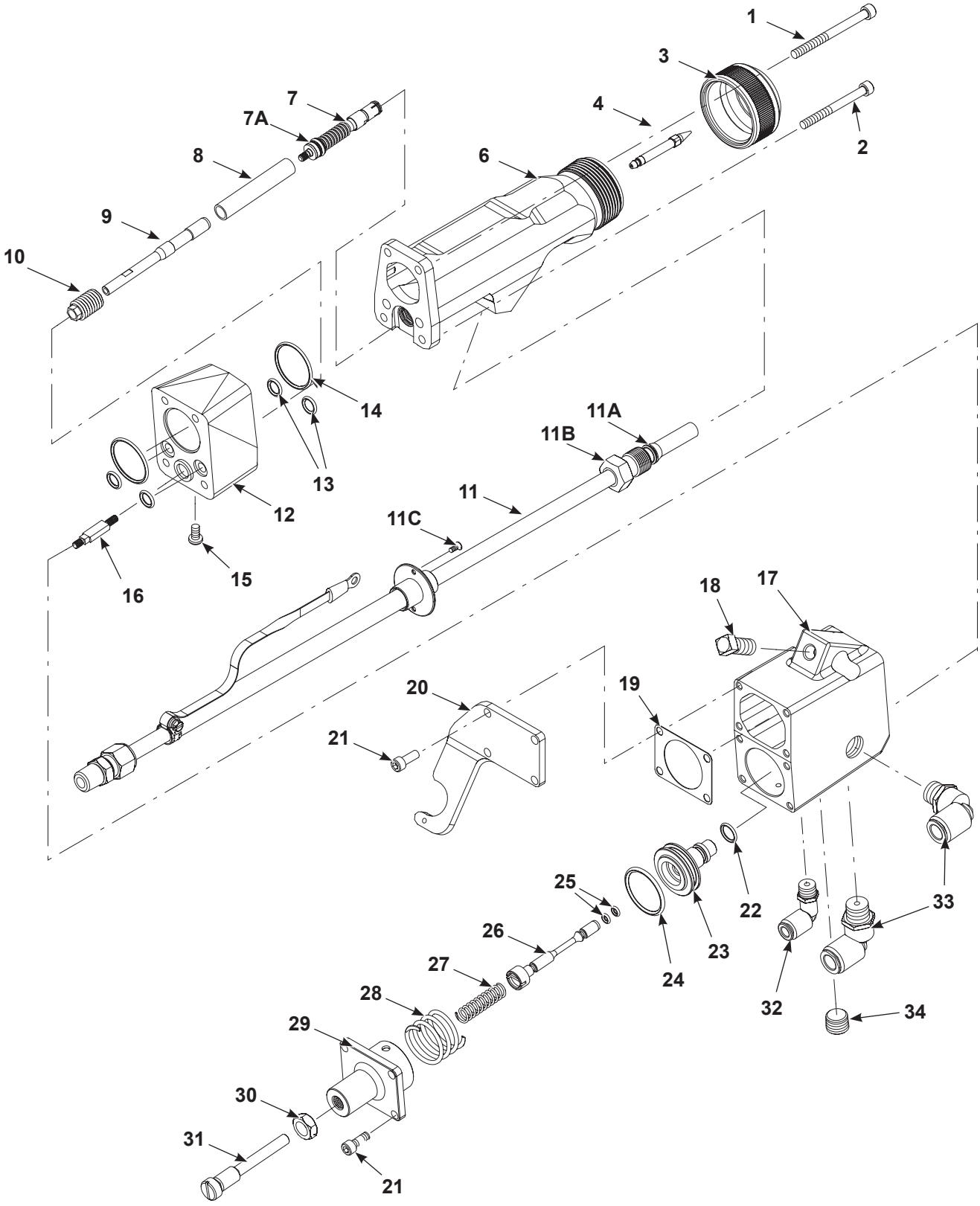


Figure 8-1 Trilogy Waterborne Air spray and HVLP Automatic Electrostatic Spray Gun

Repair Kits

Air Seal

Item	Part	Description	Quantity	Note
—	336656	AIR SEAL KIT, automatic	1	
13	940110	• O-RING, hotpaint, 0.313 x 0.438 x 0.063 in.	4	
14	336499	• O-RING, PTFE, 1.05 x 0.07 in.	2	
22	940125	• O-RING, Viton, 0.375 x 0.50 x 0.063 in.	1	
24	941210	• O-RING, Viton, 1.063 x 1.25 x 0.094 in.	1	
25	940063	• O-RING, Viton, 0.125 x 0.25 x 0.063 in.	2	

Packing Cartridge

Item	Part	Description	Quantity	Note
7	1094777	KIT, cartridge, Trilogy	1	
7A	940118	• O RING, hot paint, 0.313 x 0.438 x 0.063 in.	1	

Ferrule Kit

Item	Part	Description	Quantity	Note
–	1094775	KIT, ferrule, 3/8 in., low pressure	1	
11A	1090625	• • FERRULE, set, 0.375 ID	1	
11B	1089413	• • NUT, hose, 3/8 in.	1	

Recommended Spare Parts

Keep the following parts in inventory to avoid unplanned downtime. Quantities listed support a single spray gun. Adjust order quantities based on the number of spray guns in service.

Part	Description	Quantity	Note
336656	KIT, air seal, automatic	1	
1094777	KIT, cartridge, Trilogy	1	
1094724	KIT, extension, Trilogy, Watermark	1	
336642	WRENCH, Trilogy, combination tool	1	
106403	BAG, polyethylene, (quantity of 10)	1	
900349	LUBRICANT, O-ring, (MagnaLube) , 0.75-oz tube	1	
247658	DIELECTRIC GREASE, applicator, 10 cc, 12 count	1	
------	FLUID TIP	1	A
------	AIR CAP	1	A
1094725	KIT, hose, Trilogy, low pressure, automatic, 25 ft	1	
1094775	KIT, ferrule, 3/8 in., low pressure	1	
1094023	POSTER, parts, solventborne, automatic, Trilogy	1	
NOTE: A. Refer to the fluid tip and air cap selection guides included with this manual for part numbers.			

Optional Kits

Adhesives, Sealants, and Lubricants

Use these adhesives, sealants, and lubricants when repairing your unit. Refer to the Repair or Installation sections in this manual for application instructions.

Part	Description	Quantity
900481	ADHESIVE, pipe/thread/hydraulic sealant (Loctite High Temp SS567 for stainless steel threads)	1
900464	THREADLOCKING ADHESIVE (Loctite Removable 242)	1
900349	PTFE-FILLED LUBRICANT, O-ring, (MagnaLube) , 0.75-oz tube	1
247658	DIELECTRIC GREASE, applicator, 10 cc, 12 count	1

Optional Quick-Exhaust Valve

Part	Description	Quantity
325529	MUFFLER/EXHAUST VALVE KIT	1
973000	• NIPPLE, steel, schedule 40, 1/8 in., 0.75 in.	1
901262	• VALVE, exhaust	1
272556	• MUFFLER, low profile, 1/4-in. NPT	1

Tubing and Accessories

Part	Description	Quantity	Note
900509	AIR TUBING, polyethylene, 0.25-in. OD x 0.04-in. wall	AR	A
900511	AIR TUBING, polyethylene, 0.375-in. OD x 0.062-in. wall	AR	A
900556	AIR TUBING, nylon, 0.25-in. OD x 0.035-in. wall	AR	A
900557	AIR TUBING, nylon, 0.375-in. OD x 0.05-in. wall	AR	A

NOTE: A. Air tubing must be ordered separately, in increments of one foot.

AR: As Required

Air Caps and Fluid Tips

Refer to the publications included with this manual to select and order aircaps and fluid tips for your spray gun and application:

- TC−09−01: Air Spray Air Caps and Fluid Tips
- TC−09−02: HVLP Air Caps and Fluid Tips

HVLP Compliance Kit Parts

Item	Part	Description	Quantity	Note
—	------	COMPLIANCE KIT	1	A
1	325643	• GAUGE, air, 1.5-in. diameter, 0−30 psi	2	
2	972937	• CONNECTOR, female, 1/8-in. tube x 1/8-in. NPT"	2	
3	------	• TUBING, 1/8-in. diameter, gray (18 in.)	AR	
4	------	• CAP, compliance, HVLP	1	A, B
5	971620	• • CONNECTOR, barbed, #3-56 x 1/8 in., brass	2	

NOTE: A. Refer to the Trilogy HVLP Fluid Tip and Air Cap Selection Chart included with this manual for the correct part number.

B. Compliance caps can be ordered separately corresponding to different air caps used.

AR: As Required

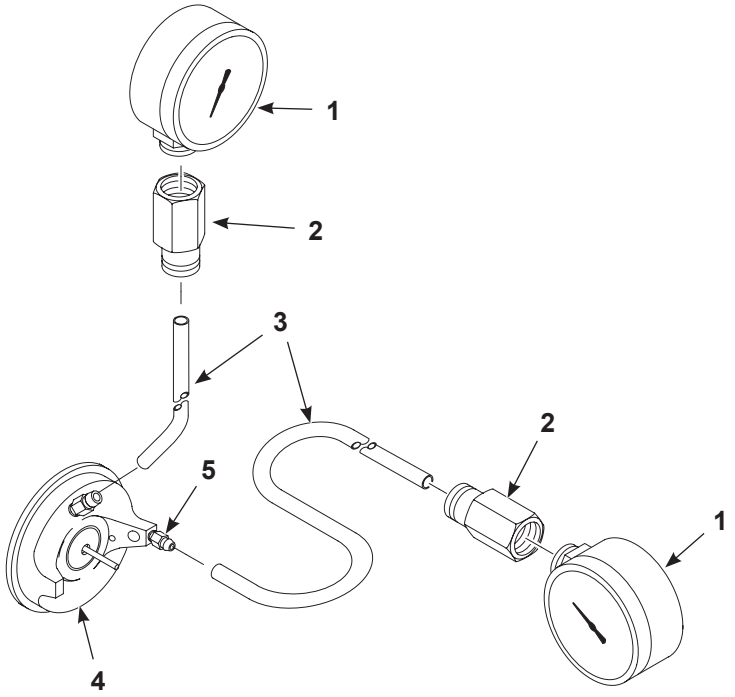
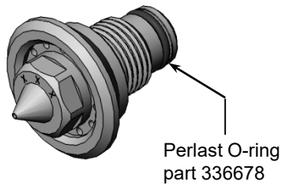


Figure 8-2 HVLP Compliance Kit Parts

Trilogy™ Air Spray Fluid Tip and Air Cap Selection Chart

FLUID TIPS

- Understand the flow rate required for your application. Flow rate is a function of film build, pattern width, line speed, coating material solids, and gun travel speed.
- After making your initial choice, have the next lower and higher size fluid tip on hand as well.
- Flow-rate the nozzle with the coating material.
- Make sure that the un-atomized fluid stream breaks between 10 and 14 inches. Change the fluid tip to obtain the correct flow rate and fluid stream break instead of increasing or decreasing the fluid pressure.
- All fluid tips include a Perlast O-ring 336678. Optional O-rings are: Kalrez 709774, Hotpaint 940120.

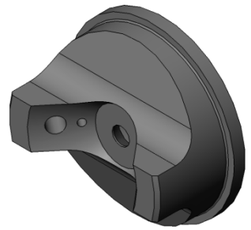


Air Spray Fluid Tip

Part	Orifice Diameter
1089619*	0.012
1089631*	0.020
1089632	0.030
1089634	0.040
1089635	0.046
1089636	0.059
1089637	0.070
1089638	0.080
1089639	0.090
1089641	0.100

* These fluid tips are intended for use with Trilogy waterborne guns only.

AIR CAPS

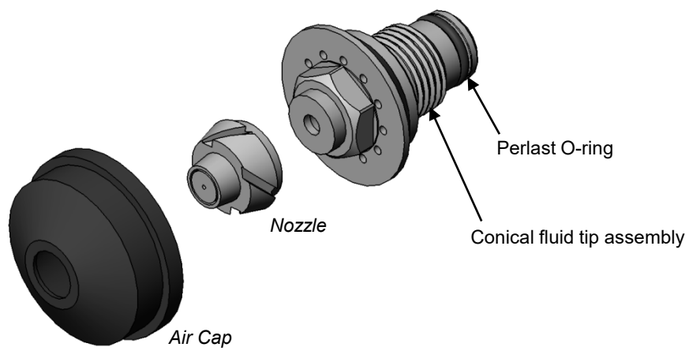


Air Spray Air Cap

AIR CAP	AIR CAP MARKING	ATOMIZATION AIR PRESSURE	SCFM	FLOW RATE	FAN WIDTH PATTERN	USAGE
245985	985	Less than 2.41 bar (35 psi)	8.2 @ 20 psi	0.059–0.295 l/min (2–10 oz/min)	15.24–30.48 cm (6–12 in.)	Universal air cap; low flow rates
245986	986	2.07–4.14 bar (30–60 psi)	12 @ 40 psi	0.236–0.355 l/min (8–12 oz/min)	30.48–45.72 cm (12–18 in.)	Medium flow rates
245987	987	1.38–4.14 bar (20–60 psi)	16 @ 40 psi	0.296–0.592 l/min (10–20 oz/min)	30.48–45.72 cm (12–18 in.)	High flow rates, must use for fluid tips 0.80 in. and larger
245988	988	Less than 2.41 bar (35 psi)	12 @ 40 psi	0.059–0.326 l/min (2–11 oz/min)	30.48–45.72 cm (12–18 in.)	Low flow rates, high solids or metallics
1092156	991	Less than 2.76 bar (40 psi)	8 @ 15 psi	0.059–0.326 l/min (2–11 oz/min)	Less than or equal to 40.64 cm (16 in.)	Low flow rates, high viscosities
1092157	992	Less than 2.76 bar (40 psi)	8 @ 15 psi	0.059–0.326 l/min (2–11 oz/min)	Less than or equal to 40.64 cm (16 in.)	Low flow rates, high solids or metallics

Conical Nozzle Kits

	10-in. Nozzle Kit 1103490	13-in. Nozzle Kit 1610748
Air Cap	1089649	1089692
Nozzle	247777	247778
Fluid Tip	1103511	1103511
Nozzle Insert	247779	247780
O-Ring	336678	336678



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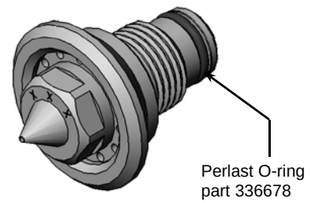
Trilogy™ Air Spray Fluid Tip and Air Cap Selection Chart

Refer to the appropriate Trilogy Spray Gun manual for other parts.

Trilogy™ HVLP Fluid Tip and Air Cap Selection Chart

FLUID TIPS

- Understand the flow rate required for your application. Flow rate is a function of film build, pattern width, line speed, coating material solids, and gun travel speed.
- After making your initial choice, have the next lower and higher size fluid tip on hand as well.
- Flow-rate the nozzle with the coating material.
- Make sure that the un-atomized fluid stream breaks between 10 and 14 inches. Change the fluid tip to obtain the correct flow rate and fluid stream break instead of increasing or decreasing the fluid pressure.
- All fluid tips include a Perlast O-ring 336678. Optional O-rings are: Kalrez 709774, Hotpaint 940120.

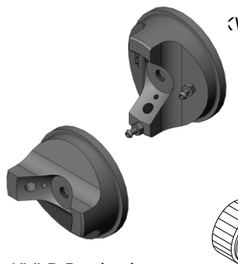


HVLP Fluid Tip

Part	Orifice Diameter
1089574	0.030
1089575	0.035
1089576	0.040
1089577	0.050
1089578	0.060
1089579	0.070
1089580	0.080
1089581	0.100

AIR CAPS

- A larger air cap will provide lower cap pressures and higher air flow, but may yield coarser atomization.
- Lower air cap pressures produce a softer spray and theoretically, improved transfer efficiency.
- Smaller air caps will produce finer atomization.
- Smaller air caps will require higher air cap pressures to atomize.
- Smaller fluid tips will work best with smaller air caps.
- Larger fluid tips will work best with larger air caps.
- As the fluid tip ID increases, the airflow through the atomizing section of the air cap decreases, as a result, there is less air available for atomization.
- Higher viscosity coatings and higher flow rates require more airflow for atomization.
- Atomizing air and horn air are completely independent in automatic spray guns.



KVLP Production Air Cap

KVLP Compliance Air Cap

Compliance Kit

DESCRIPTION	PART
General purpose air caps	1092132
	1092133
	1092134
Very light viscosity, low solids air caps	1092119
	1092130
	1092131
Heavy viscosity, high solids, high flow	1092135
	1092137
	1092138

AIR CAP LOCATER	COATING CHARACTERISTICS	MAXIMUM AIRFLOW (SCFM)	TYPICAL COATINGS
A	Very light viscosity, very low solids, (<25%) Low flow (<5 oz/min)	10–12	Stains, wash primers, bleaches, fine finish
B	Light viscosity, low solids (25–30%) Low flow (<5 oz/min) to medium flow (5–10 oz/min)	13–15	Stains, wash primers, ADPRO, lacquer clear coat, fine finish
C	Light viscosity, low solids (25–30%) Medium flow (5–10 oz/min)	17–20	Primers, ADPRO, lacquer clear coat, metallics, solid colors, enamels, urethanes, waterbornes
	Medium viscosity, medium solids (30–50%) Low flow (<5 oz/min)		
D	Medium viscosity, medium solids (30–50%) Medium flow (5–10 oz/min) to high flow (10–20 oz/min)	22–25	Metallics, solid colors, enamels, urethanes, waterbornes, plural component, corrosion protection
	Heavy viscosity, high solids (>75%) Low flow (<5 oz/min)		
E	Medium viscosity, medium solids (30–50%) High flow (10–20 oz/min) to very high flow (>20 oz/min)	28–34	High solids enamels and urethanes, high solids waterbornes, plural component, corrosion protection
	Heavy viscosity, high solids (>75%) Medium flow (5–10 oz/min) to high flow (10–20 oz/min)		
X	Not recommended		

AIR CAP PART NUMBER (Atomizing Air Hole Diameter in inches)									
Tip Orifice (inches)	**1092119 (0.140)**	**1092130 (0.150)**	**1092131 (0.160)**	**1092132 (0.170)**	**1092133 (0.190)**	**1092134 (0.210)**	**1092135 (0.230)**	**1092137 (0.250)**	**1092138 (0.270)**
0.030	A	A	B	B	C	D	E	X	X
0.035	A	A	B	B	C	D	E	E	X
0.040	A	A	B	B	C	D	E	E	E
0.050	A	A	A	B	C	C	D	E	E
0.060	X	A	A	A	B	C	D	E	E
0.070	X	X	A	A	B	C	D	E	E
0.080	X	X	X	A	B	C	D	E	E
0.100	X	X	X	X	X	B	C	D	E
Compliance Air Cap	1094642	1094643	1094644	1094645	1094646	1094647	1094648	1094649	1094650
NOTE: Compliance air caps are modified caps for testing air pressure ONLY.									
Compliance Kits	1094668	1094669	1094680	1094681	1094682	1094683	1094684	1094685	1094 686
NOTE: Compliance kits include caps, gauges, and air tubing. Compliance kits are modified for testing ONLY.									

TC-09-02
Issued 4/09

Trilogy ™ HVLP Fluid Tip and Air Cap Selection Chart

Refer to the appropriate Trilogy Spray Gun manual for other parts.

Nordson

Instruction Sheet
Document Number TCP0182-02

ATEX/EX Safety Instruction

Description of Equipment

See Figure 1 and Figure 2.

Trilogy® Hand-held Waterborne System and a Trilogy Automatic Waterborne System include an XPS60 (60kV Max) controller/ power supply connected by a resistive core, shielded high voltage cable, to an Iso-Flo® voltage block system.

The high voltage cable delivers the 60kV charge from the power supply to the Iso-Flo.

The waterborne coatings are charged in the Iso-Flo unit reservoir. The Iso-Flo unit reduces the distance to the applicator for the charged system, lowering the system capacitance, thus lowering the energy of the system.

There are different Iso-Flo units for Manual and Automatic.

A fluid hose takes the charged paint from the Iso-Flo unit to the Automatic or Manual Trilogy Waterborne Spray applicators. The Trilogy applicators, both manual (hand-held) and automatic are low pressure spray guns.

Since the paint is already charged when it gets to the applicator, there are no electrical components and no electrode in the spray applicators.

Electrical Characteristics

Application	Specification
Trilogy Waterborne Applicator	
Ambient temperature	0-40 °C (32-104 °F)
Maximum current	100µA
Maximum energy	141mJ
Maximum voltage	60kV
XPS 60 Power Supply	
Maximum current out	100µA
Maximum voltage out	60kV
Rated current	65VA/2A
Rated Frequency	50 / 60 Hz
Rated Voltage	100-240VAC
HD Iso-Flo System / VC Iso-Flo System	
Maximum voltage	60kV

Waterborne Equipment Safety info:

- electrostatic hand-held spraying equipment shall only be used with non-ignitable liquid coating material with a conductivity of less than 2000 µS/cm;
- electrostatic hand-held spraying equipment shall only operate with direct current having a sinusoidal ripple of not more than 10 % of the rms value;
- electrostatic hand-held spraying equipment shall only be operated by competent persons;
- protective clothing to be worn, including gloves, shall comply with EN 1149-5. The measured insulation resistance shall not exceed 100 MΩ;
- electrostatic hand-held spraying equipment shall be used only in spraying areas according to EN 12215, or under equivalent ventilation conditions;
- electrostatic hand-held spraying equipment shall be interlocked with the forced ventilation;
- all conductive components of the system, like for instance floors, walls, ceilings, protective gratings, transport devices, workpieces, reciprocators or constructional parts, etc. within the spraying area, except for parts which are at high voltage for operational reasons, shall be connected to the earthing system. Parts of the booth shall be earthed in accordance with EN 12215.
- electrostatic hand-held spraying equipment shall only be operated in a safe and sound state.

Damaged equipment shall be put out of operation immediately and shall be replaced or repaired;

- spare parts can have safety relevant properties;
- only original spare parts shall be used, which are also subject to a quality assessment (e.g. production control);
- worn parts shall be replaced immediately;
- only electrically conducting containers shall be used for cleaning liquids; the containers shall be earthed;
- non-ignitable cleaning agents shall be preferred;
- appropriate measures shall ensure that the resistance to earth of the jig shall not exceed 1 MΩ, measured at 500 V or 1000 V.
- all references required for a correct operation of the equipment;
- mode of functioning of the safety devices;
- measures in case of disturbances and repairs;
- This electrostatic hand-held spraying equipment could present hazards if it is not operated according to the information given in the instruction manual;
- footwear to be worn by the operator shall comply with EN ISO 20344. The measured insulation resistance shall not exceed 100 MΩ;
- it shall be ensured that excess of coating material (overspray) will be collected reliable.

Test Intervals of Repeated Tests

Table 1 Test Intervals

Subclause	Reference	Test Interval
5.2	Earthing measures	Weekly
6.2.1	Interlocking of forced ventilation and electrostatic hand-held spraying equipment	Yearly
6.2.2	Check of electrostatic hand-held spraying equipment for damage	Weekly
The test intervals shown are recommended per EN50059.		

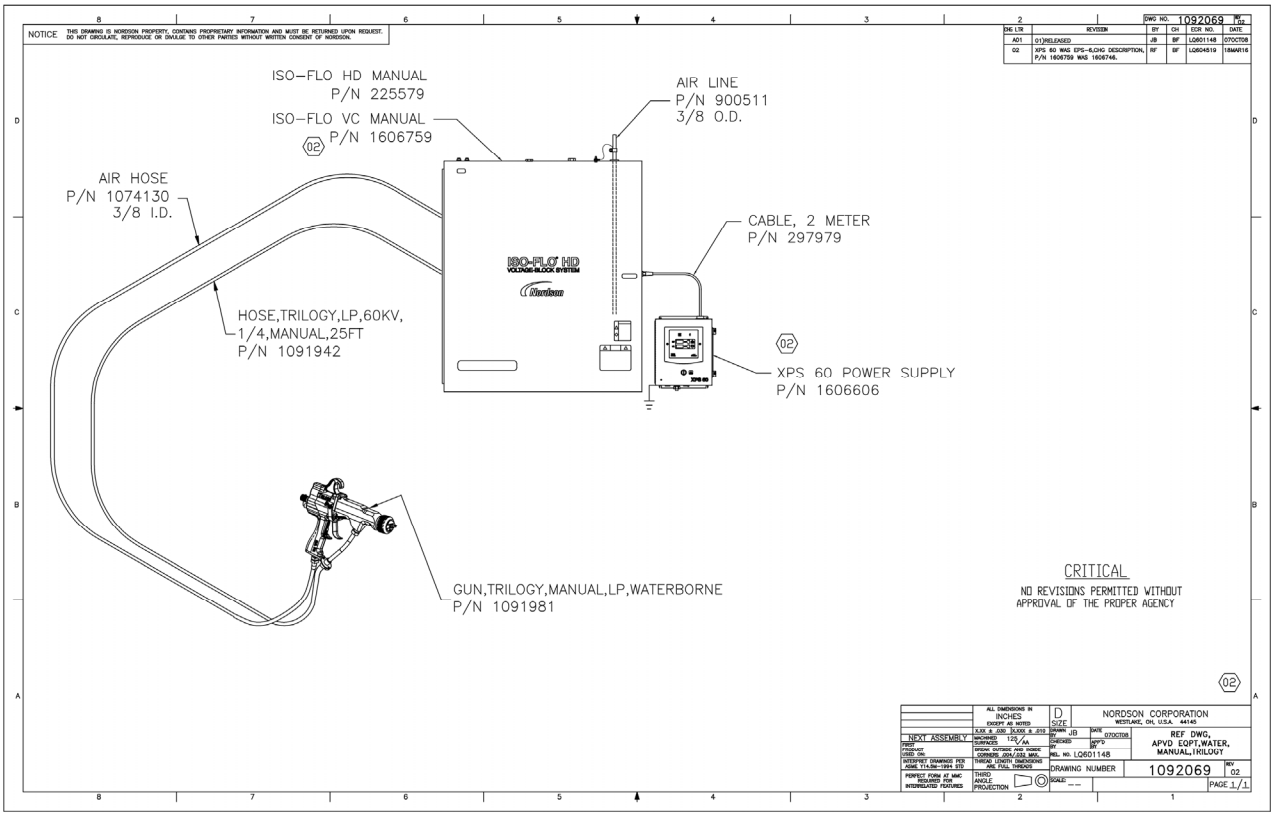


Figure 1 Manual System

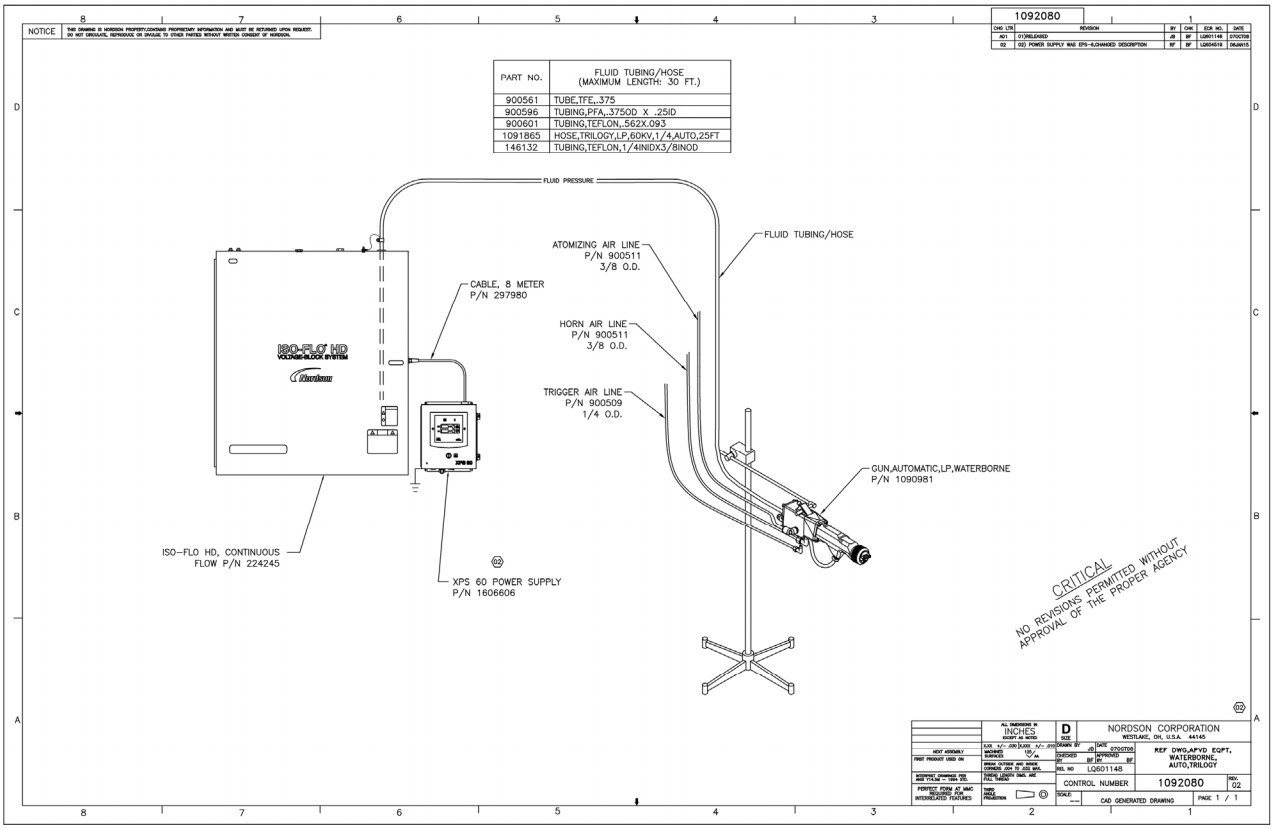


Figure 2 Automatic System

Safety Instructions For Installation In Hazardous Areas

Before the installation READ CAREFULLY the INSTRUCTION MANUAL of the Trilogy liquid applicator and the associated apparatus HD Iso-Flo, VC Iso-Flo and XPS60.

For installation, maintenance and cleaning of the system, refer and read carefully information on paragraph 4 of the manuals concerning hand-held and automatic guns.

Installation and use of this equipment shall be carried out by suitably trained personnel.

TRILOGY WATERBORNE SYSTEM shall be installed and maintained according to the applicable standards regarding safety requirements of electrostatic application equipment for non-ignitable liquid coating material (waterborne).

The user is the solely responsible for the proper use and maintenance.

The user shall not repair the equipment.

WARNING: Use equipment only for its intended purpose. It is forbidden to use the HAND-HELD AND AUTOMATIC WATERBORNE SYSTEM in a different way not included in the instruction manual. Nordson® Corporation is not responsible for damages caused by an improper and/or dangerous use.

Issued 04/23

EU DECLARATION of CONFORMITY

This Declaration is issued under the sole responsibility of the manufacture.

Product: Trilogy Hand-Held and Automatic WaterBorne Spray Systems

Models: Trilogy Hand-Held and Automatic Spray Applicators, ISO-FLO HD Manual and Auto, ISO-FLO VC Manual, XPS60 high voltage power supply controller.

Description: The Trilogy hand held liquid waterborne applicator used with the manual ISO-FLO HD or ISO-FLO VC and the XPS 60 controller. The Trilogy automatic liquid waterborne applicator used with the automatic ISO-FLO HD and the XPS 60 controller.

Applicable Directives:
2006/42/EC - Machinery Directive
2014/30/EU - EMC Directive
2014/34/EU - ATEX Directive

Standards Used for Compliance:

EN/ISO12100 (2010)	EN50059 (2018)	EN61000-6-3 (2007 AMD 2012)
EN60204-1 (2018)	EN1127-1 (2019)	EN61000-6-2 (2005)
		EN55011 (2016 AMD 2017)

Type of Protection:
- Ambient Temperature: 0ºC to +40ºC
- Ex II 2 G, 141mJ = Trilogy Spray Applicators
- Ex II (2) G = ISO-FLO units and XPS 60 controller

ATEX Product Certificates:
- FM22ATEX0034X (Waterborne System) (Dublin, Ireland)

ATEX Surveillance
- 0598 SGS Fimko Oy (Helsinki, Finland)
- 2809 FM Approvals Europe Ltd (Dublin, Ireland)

Date: 10October2022

Jeremy Krone
Supervisor Product Development Engineering
Industrial Coating Systems
Amherst, Ohio, USA

Nordson Authorized Representative in the EU
Person authorized to compile the relevant technical documentation.
Contact: Operations Manager
Industrial Coating Systems
Nordson Deutschland GmbH
Heinrich-Hertz-StraBe 42-44
D-40699 Erkrath

UK DECLARATION of Conformity

This Declaration is issued under the sole responsibility of the manufacture.

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Models: Trilogy Hand-Held and Automatic Spray Applicators, ISO-FLO HD Manual and Auto, ISO-FLO VC Manual, XPS60 high voltage power supply controller.
Description: The Trilogy hand held liquid waterborne applicator used with the manual ISO-FLO HD or ISO-FLO VC and the XPS 60 controller. The Trilogy automatic liquid waterborne applicator used with the automatic ISO-FLO HD and the XPS 60 controller.

Applicable UK Regulations:
Supply Machinery Safety 2008
Electromagnetic Compatibility Regulation 2016
Equipment & Protective Systems Intended for use in Potentially Explosive Atmosphere Reg 2016, UKSI 2016 :1107 (as amended)

Standards Used for Compliance:

EN/ISO12100 (2010)	EN50059 (2018)	EN61000-6-3 (2007 AMD 2012)
EN60204-1 (2018)	EN1127-1 (2019)	EN61000-6-2 (2005)
		EN55011 (2016 AMD 2017)

Type of Protection:
- Ambient Temperature: 0ºC to +40ºC
- Ex II 2 G, 141mJ = Trilogy Spray Applicators
- Ex II (2) G = ISO-FLO units and XPS 60 controller

Certificates:
- FM22UKEX0114X = (Waterborne) (Maidenhead, Berkshire, UK)

ATEX Surveillance
- 0598 SGS Fimko Oy (Helsinki, Finland)
- 1725 FM Approvals Ltd (Maidenhead, Berkshire, UK),

Date: 10October2022

Jeremy Krone
Supervisor Product Development Engineering
Industrial Coating Systems
Amherst, Ohio, USA

Nordson Authorized Representative in the EU
Person authorized to compile the relevant technical documentation.
Contact: Operations Manager
Industrial Coating Systems
Nordson Deutschland GmbH
Heinrich-Hertz-StraBe 42-44
D-40699 Erkrath