

Versa-Spray® IPS Manual Electrostatic Porcelain Enamel Powder Spray Gun

Customer Product Manual
Part 106586G02

Issued 11/06

**For parts and technical support, call the Industrial Coating
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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 all 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.

All phases of equipment installation must comply with all federal, state, and local codes.

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 any 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.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- 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.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Provide adequate ventilation to prevent dangerous concentrations of volatile materials or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits while working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- 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.

Grounding



WARNING: Operating faulty electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make resistance checks part of your periodic maintenance program. If you receive even a slight electrical shock or notice static sparking or arcing, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.

All work conducted inside the spray booth or within 1 m (3 ft) of booth openings is considered within a Class 2, Division 1 or 2 Hazardous location and must comply with NFPA 33, NFPA 70 (NEC articles 500, 502, and 516), and NFPA 77, latest conditions.

- All electrically conductive objects in the spray areas shall be electrically connected to ground with a resistance of not more than 1 megohm as measured with an instrument that applies at least 500 volts to the circuit being evaluated.
- Equipment to be grounded includes, but is not limited to, the floor of the spray area, operator platforms, hoppers, photoeye supports, and blow-off nozzles. Personnel working in the spray area must be grounded.
- There is a possible ignition potential from the charged human body. Personnel standing on a painted surface, such as an operator platform, or wearing non-conductive shoes, are not grounded. Personnel must wear shoes with conductive soles or use a ground strap to maintain a connection to ground when working with or around electrostatic equipment.
- Operators must maintain skin-to-handle contact between their hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If gloves must be worn, cut away the palm or fingers, wear electrically conductive gloves, or wear a grounding strap connected to the gun handle or other true earth ground.
- Shut off electrostatic power supplies and ground gun electrodes before making adjustments or cleaning powder spray guns.
- Connect all disconnected equipment, ground cables, and wires after servicing equipment.

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 electrical power. Close pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the equipment.





Disposal

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

Safety Labels

Table 1-1 contains the text of the safety label on this equipment. The safety label is provided to help you operate and maintain your equipment safely.

Table 1-1 Safety Label

Item	Part	Description
1.		<div>  <p>WARNING: The following procedures <u>MUST</u> be followed when working with this electrostatic spray equipment. Failure to follow these instructions may result in a fire and/or serious personal injury. Display this warning on the spray booth.</p> </div> <div>  <ol style="list-style-type: none"> 1. NO SMOKING. Keep open flames, hot surfaces, and sparks from torches or grinding away from booth. 2. Turn the electrostatic power unit <u>off</u> when the spray gun is not in use. 3. Shut down immediately in event of fire. 4. Maintain ground circuit on all conductive objects below 1 megohm to prevent sparking. (ANSI/NFPA 33, Chapter 9, or local codes) 5. Shut down operation and correct grounds if sparking occurs. 6. Install fixed fire suppression system in accordance with ANSI/NFPA 33, Chapter 7 (or local codes), before operating with combustible powder. 7. Install automatic flame detectors in accordance with ANSI/NFPA 33, Chapter 7 (or local codes), before operating automatic guns. 8. Examine all equipment at the beginning of each work period and repair or replace any damaged, loose, or missing parts. 9. Before cleaning or performing any maintenance on the electrostatic spray gun, turn off the power unit and ground the nozzle. Maintain electrostatic spray equipment in accordance with instruction manual. Do not deviate. Do not substitute parts from other manufacturers. </div> <div>  <ol style="list-style-type: none"> 10. Operator must be grounded to prevent shocks from static electricity. Floor surface must be conductive. Footwear and gloves must be static dissipative in accordance with ANSI Z41-1991 (or local codes). </div> <div>  <ol style="list-style-type: none"> 11. Air velocity through all booth openings must meet local requirements and contain powder within the booth. If powder escapes from the booth, shut down operation and correct the malfunction. 12. Powder may be toxic or be a nuisance dust hazard. Refer to supplier's MSDS. If exposed to dust during operation, maintenance, or clean up, operators must use appropriate personal protective equipment. 13. Do not use compressed air or organic solvents for removal of powder from skin or clothing. Do use soap and water. Wash hands before eating or smoking. 14. Guns, feeders, booths, etc., may be cleaned with clean dry air at 25 psig (1.7 bar). </div>

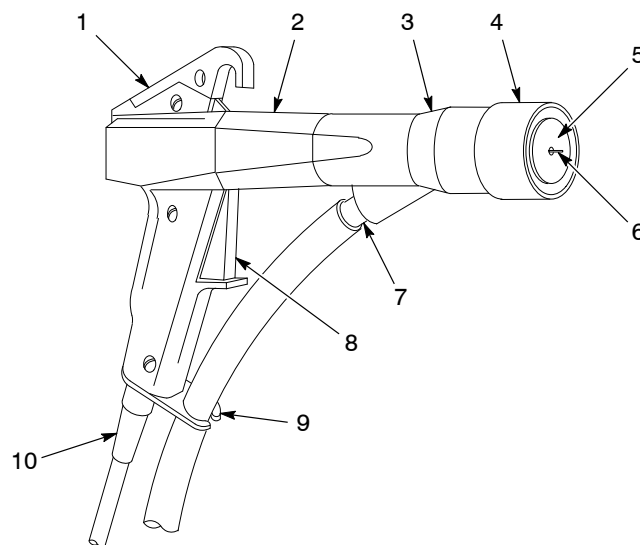
Section 2

Description

Introduction

The Nordson Versa-Spray integral power supply (IPS) manual electrostatic porcelain enamel (PE) spray gun electrostatically charges and sprays porcelain enamel (frit) powders.

The spray gun is used with a Nordson Versa-Spray IPS control unit, which supplies low-voltage dc power to the voltage multiplier in the spray gun. The multiplier generates the high electrostatic voltage needed for powder coating. The operator adjusts the electrostatic voltage at the control unit. This voltage generates an electrical field (corona) around the gun electrode. As the powder particles are sprayed through this field they pick up an electrical charge and are attracted to the grounded parts in front of the spray gun. The current at the electrode is limited to safe levels by a resistor installed between the multiplier and the electrode.



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Figure 2-1 Versa-Spray IPS Manual Porcelain Enamel Powder Spray Gun

- | | |
|--------------------------|----------------------|
| 1. Hanger | 6. Electrode |
| 2. Extension | 7. Feed hose adapter |
| 3. Powder inlet body | 8. Trigger |
| 4. Pattern adjust sleeve | 9. Hose bracket |
| 5. Deflector | 10. Cable |

Introduction *(contd)*

See Figure 2-1. The spray pattern is controlled by the electrostatic field, the shape of the nozzle used, and air velocity. Powder is supplied to the spray gun by a porcelain enamel powder pump. The pump uses compressed air to draw the powder from a feed hopper, atomize it, and force it through the feed hose to the spray gun.

There are no controls on the spray gun except the trigger (8) and the pattern adjust sleeve (4). Voltage controls and powder pump air pressure regulators are housed in the IPS control unit.

Options

Refer to the *Parts* section for part numbers and illustrations for the options listed below. Contact your Nordson Corporation representative for more information about these options.

Option	Description
Power Cable: 4-, 8-, and 12-meter lengths	Carries low-voltage dc power from the IPS control unit to the multiplier, returns a current feedback signal, and includes the trigger circuit.
Nozzles	
ceramic conical nozzle and 38-mm deflector	Standard
ceramic barrel deflector for the conical nozzle	Optional
ceramic flat-spray nozzle	Optional
Powder Feed Hose	1/2-in. ID polyurethane powder feed hose

Specifications

Maximum rated output voltage at the electrode: 80,000 volts $\pm 10\%$

Maximum rated output current at the electrode: 0.180 mA $\pm 10\%$

This equipment is rated for use in an explosive environment (Class II, Division I).

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.

Feed Hose, Cable, and Air Tubing Connections



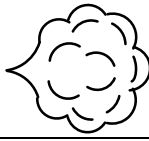

WARNING: All electrically conductive equipment in the spray area must be grounded. Ungrounded or poorly grounded equipment can store an electrostatic charge which can give personnel a severe shock, or arc and cause a fire or explosion.

1. See Figure 3-1. Connect the feed hose (1) from the powder pump (2) outlet to the hose adapter on the underside of the powder inlet body. Pinch the hose and snap it into the hose bracket at the base of the gun handle.

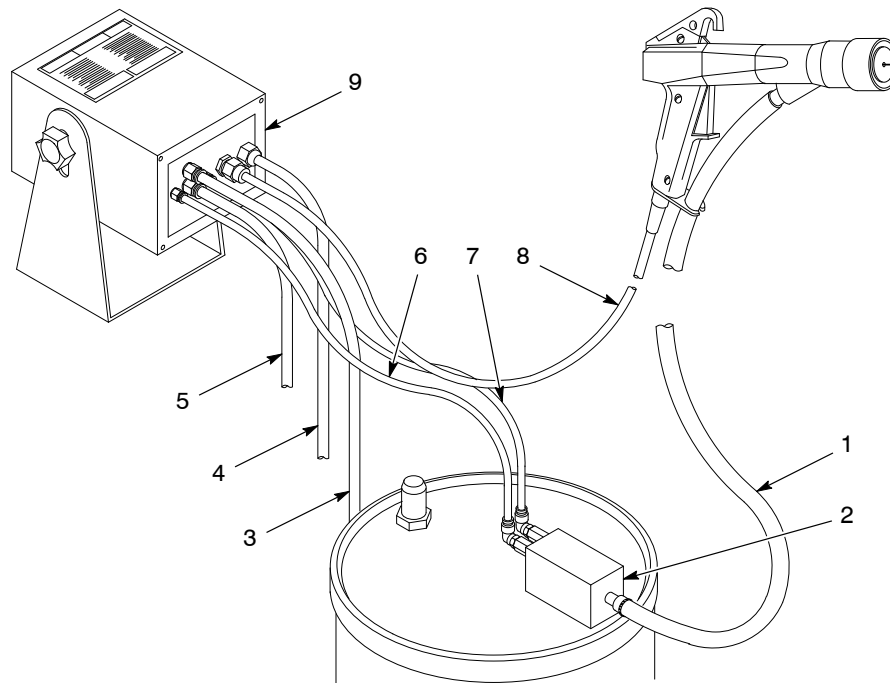
NOTE: Keep the powder feed hose as short as possible. The hose should not be more than 12-m (39-ft) long. Longer lengths may cause uneven powder flow.

2. Wrap spiral-cut tubing around the feed hose at the pump outlet and where necessary to prevent the hose from kinking and blocking the flow of powder.
3. Connect the gun cable (8) to the GUN OUTPUT receptacle at the rear of the IPS control unit (9). Secure the cable to the control unit with the retaining nut on the cable end.
4. Refer to Table 3-1 to connect tubing to the control unit, powder pump, hopper, and air supply.
5. Establish a path for the feed hose and gun cable. Make sure the hose and cable cannot be abraded, cut, or run over by heavy equipment.

Table 3-1 Air Tubing Connections

Item in Figure 3-1	Tubing Size (mm)	Control Unit Air Fitting	Other Connection
3	10	AUX	Feed hopper plenum/fluidizing air
5	10	IN	System air supply
6	6	 Flow rate port	Connector F on powder pump
7	6	 Atomizing port	Connector A on powder pump

Feed Hose, Cable, and Air Tubing Connections *(contd)*



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Figure 3-1 Feed Hose, Air Tubing, and Cable Connections

- | | | |
|--------------------------|-------------------------|-------------------------|
| 1. Feed hose | 4. Control unit power | 7. Atomizing air tubing |
| 2. Powder pump | 5. Supply air tubing | 8. Gun cable |
| 3. Fluidizing air tubing | 6. Flow rate air tubing | 9. IPS control unit |

Air Quality

Powder spray systems require clean, dry operating air. Moist or otherwise contaminated air can cause the powder to clog in the pump venturi throat, feed hose, or spray gun passages. Moist air can also cause grounding or arcing.

Use filter/separators with automatic drains and a refrigerated or regenerative desiccant-type air dryer that can produce a 3.4 °C (38 °F) or lower dewpoint at 7 bar (100 psi).

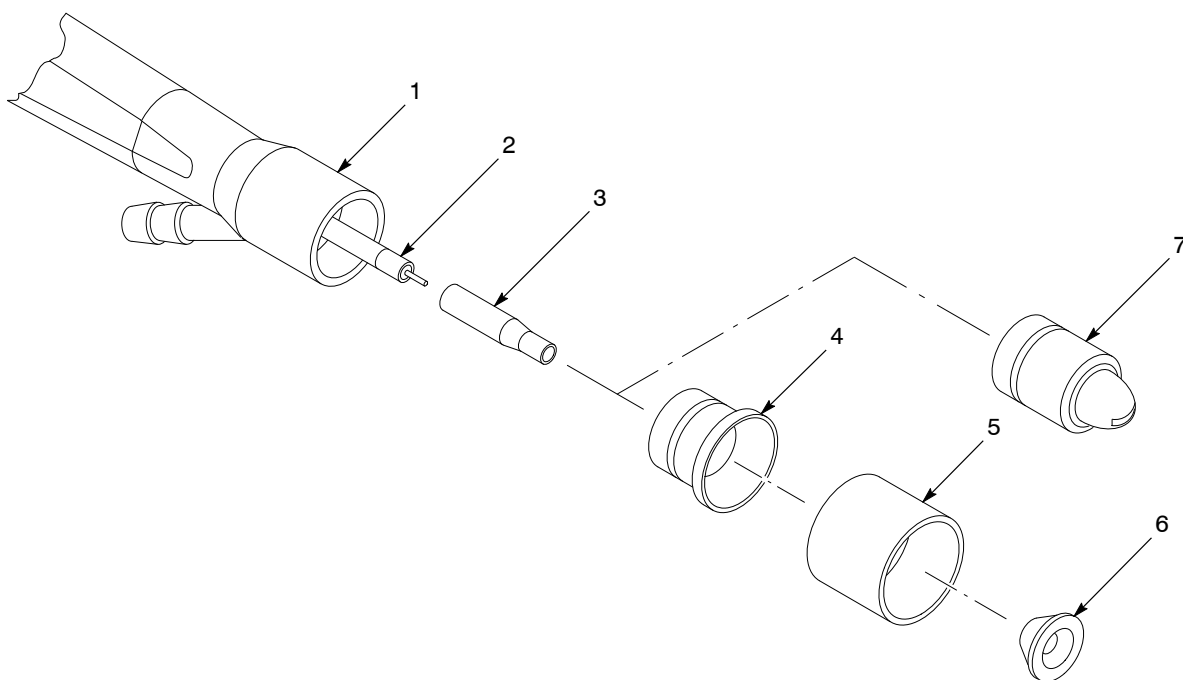
Optional Flat-Spray Nozzle Installation



WARNING: Turn off the electrostatic voltage and ground the gun electrode before performing the following tasks. Failure to observe this warning could result in a shock.

See Figure 3-2.

1. Remove the deflector (6), pattern adjust sleeve (5), wear sleeve (3), and nozzle (4).
2. Clean powder from the powder inlet body (1) and resistor probe (2). If necessary, disconnect the powder feed hose, loosen the set screw in the underside of the powder inlet body, and remove the powder inlet body from the extension.
3. Install the wear sleeve (3) over the end of the resistor probe. Be careful not to bend the end of the electrode. Do not use the flat-spray nozzle without the wear sleeve.
4. Push the flat-spray nozzle (7) into the powder inlet body as far as it will go.



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Figure 3-2 Optional Flat-Spray Nozzle Installation

- | | | |
|----------------------|--------------------------|----------------------|
| 1. Powder inlet body | 4. Nozzle | 6. Deflector |
| 2. Resistor probe | 5. Pattern adjust sleeve | 7. Flat-spray nozzle |
| 3. Wear sleeve | | |

Section 4

Operation



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

Startup



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



WARNING: Do not operate the spray gun if the resistor and multiplier resistances are not within the ranges specified in this manual. Failure to observe this warning may result in personal injury, fire, and property damage.

Before turning on the IPS control unit, make sure that the

- booth exhaust fan is on,
- powder recovery system is operating, and
- powder supply in the feed hopper is adequately fluidized.

Refer to the appropriate equipment manuals for startup procedures.

1. Make sure the cable, feed hose, and air tubing are correctly connected to the spray gun, powder pump, and IPS control unit.
2. Turn the IPS control unit main power switch to the on position.
3. Adjust the control unit air pressure regulators:

NOTE: The pressures given are average starting points. Pressures will vary according to required film build, line speed, and part configuration. Adjust the pressures to obtain the desired results.

Air Pressure	Typical Setting	Description
Flow rate	1.4 bar (20 psi)	Controls the volume of the powder delivered to the spray gun.
Atomizing	2.1 bar (30 psi)	Controls the velocity and density (powder-to-air ratio) of the powder.

Startup *(contd)*



WARNING: The operator must maintain skin contact with the the gun handle. If wearing gloves, cut away the palm. Failure to observe this warning could result in a severe shock.

4. Point the spray gun into the booth, pull the trigger, and test the spray pattern. Adjust the flow rate and atomizing air pressures and pattern adjust sleeve until you obtain the desired pattern.
5. Turn the kV potentiometer dial clockwise until it stops.
6. Coat a few parts and adjust the kV potentiometer dial until you obtain the desired results.

Shutdown

1. Turn the kV potentiometer dial counterclockwise until it stops.
2. Turn the control unit power switch to the off position.
3. Ground the gun electrode.
4. Perform the *Daily Maintenance* procedures.

For information on operating other components of your powder spray system, refer to the appropriate manuals.

Maintenance



WARNING: Turn off the electrostatic voltage and ground the gun electrode before performing the following tasks. Failure to observe this warning could result in a shock.

Daily Maintenance

The following procedure will help maintain the spray gun's powder path.

1. See Figure 4-1. Disconnect the powder feed hose off of the feed hose adapter (14). Squeeze the powder feed hose to remove it from the hose bracket.
2. Point the spray gun into the booth and blow the powder out of the hose and spray gun with low-pressure compressed air. Never blow air through the powder feed hose from the spray gun into the pump.
3. Remove the pattern adjust sleeve (8), deflector (12), and nozzle (7). If you are using a flat-spray nozzle, remove the nozzle.
4. Remove the wear sleeve (5) from the resistor probe (2).
5. Remove the feed hose adapter. Loosen the set screw (13) and pull the powder inlet body (4) from the extension (1).
6. Clean the removed parts and the extension and resistor probe with an OSHA-approved low-pressure air gun and a clean cloth. Carefully remove any fused powder with a wooden or plastic dowel or similar tool. Do not use tools that will scratch the plastic. Powder will build up and impact-fuse on scratches.



CAUTION: Do not use any solvent other than alcohol to clean the spray gun. Do not immerse the assembled spray gun or loose parts in alcohol.

7. If necessary, wipe the parts with a cloth dampened with isopropyl or ethyl alcohol.
8. Inspect all O-rings and replace them if they are damaged.
9. Inspect the powder path parts. Replace worn parts as necessary.
10. Assemble the spray gun. Rotate the nozzle parts at least 30° from their previous positions to prevent uneven wear and lopsided patterns.

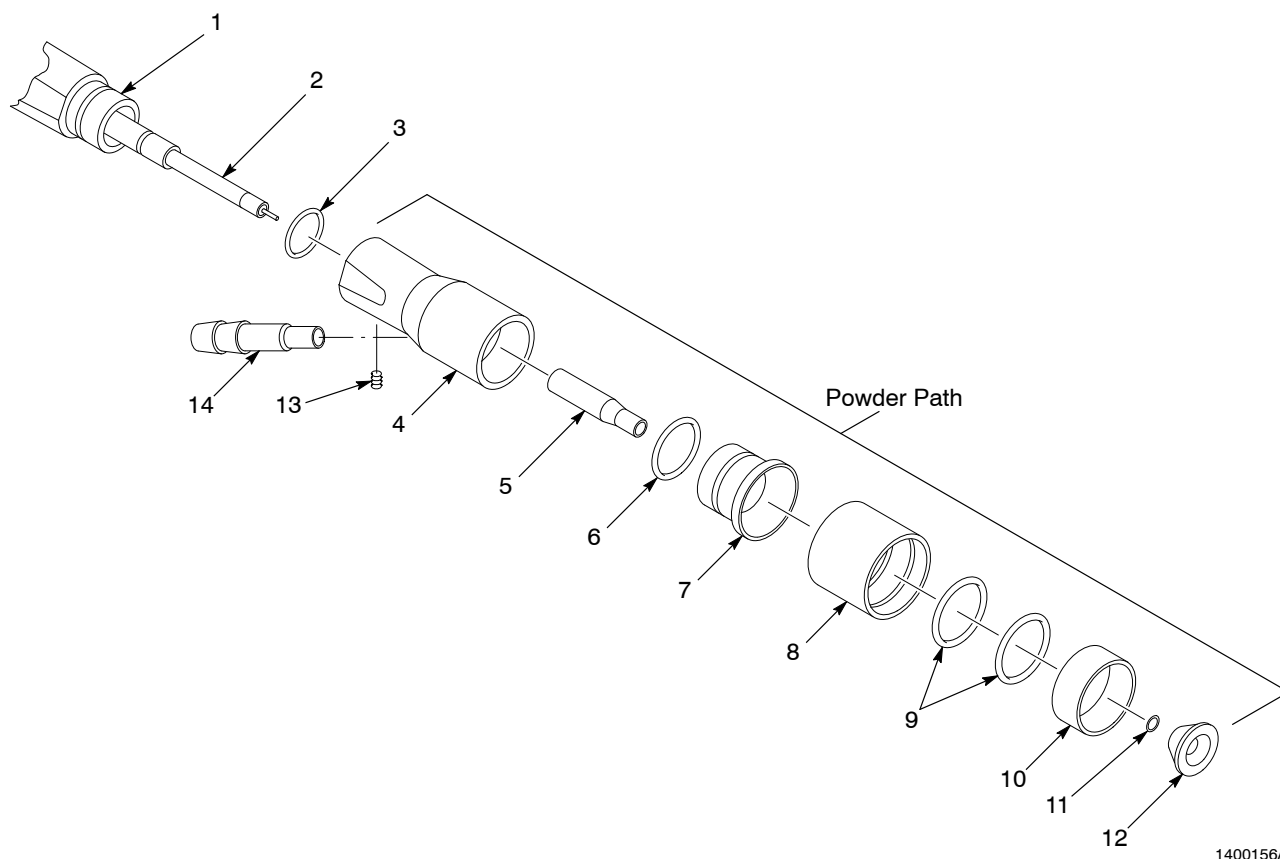


Figure 4-1 Powder Path Repair

- | | | |
|-----------------------|-----------------------------|------------------------|
| 1. Extension | 6. O-ring (nozzle) | 11. O-ring (deflector) |
| 2. Resistor probe | 7. Nozzle | 12. Deflector |
| 3. O-ring (extension) | 8. Pattern adjust sleeve | 13. Set screw |
| 4. Powder inlet body | 9. O-rings (pattern sleeve) | 14. Feed hose adapter |
| 5. Wear sleeve | 10. Pyrex insert | |

Weekly Maintenance

Check the resistance of the multiplier/resistor probe assembly with a megohmmeter, as described in the *Troubleshooting* section. Replace the multiplier or resistor, or both, if the resistance readings do not fall within the specified ranges.

Section 5

Troubleshooting



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

This section contains troubleshooting procedures. These procedures cover only the most common problems that you may encounter. If you cannot solve the problem with the information given here, contact your local Nordson representative for help.

Perform continuity and resistance checks if you are having problems with the electrostatic components of the spray gun. Use the procedures at the end of this section to perform these checks.

- multiplier/resistor assembly continuity and resistance
- resistor continuity and resistance
- gun cable continuity

Problem	Possible Cause	Corrective Action
1. Uneven pattern, unsteady or inadequate powder flow	Blockage in spray gun, feed hose, or pump	Disconnect the feed hose from the pump. Blow out the hose with compressed air. Disassemble the spray gun and pump and clean them. Replace the hose if it is clogged with fused powder.
	Deflector or nozzle worn, affecting pattern	Remove the deflector and nozzle. Clean and inspect them. Replace worn parts. If excessive wear or impact-fusion is a problem, reduce the flow rate and atomizing air pressures.
	Damp powder	Check the powder supply, air filters, and dryer. Replace the powder supply, if it is contaminated.
	Low atomizing or flow rate air pressure	Increase the atomizing and/or flow rate air pressures.
	Improper fluidization of powder in hopper	Increase the fluidizing air pressure. Remove the powder from hopper and clean or replace the fluidizing plate if contaminated.
<i>Continued...</i>		

Problem	Possible Cause	Corrective Action
2. Voids in powder pattern	Worn nozzle or deflector	Remove the deflector and nozzle. Inspect and replace them if worn.
	Plugged powder path	Remove the nozzle parts and powder path from the spray gun and clean them.
3. Loss of wrap, poor transfer efficiency	Low electrostatic voltage	Increase the electrostatic voltage.
	Resistor or IPS control unit failure	Check the multiplier/resistor probe assembly with a megohmmeter for 195–260 megohms at 500 volts. If the reading is out of this range, check the resistor probe separately.
	Poorly grounded parts	Check the conveyor chain, rollers, and part hangers for powder buildup. Clean them and check the resistance between the parts and a true earth ground. The resistance must be 1 megohm or less. For best results, 500 ohms or less is recommended.
4. No kV output from spray gun	Malfunctioning trigger switch	Check for continuity between pins 1 and 2 (control unit end of cable) with the switch actuated. If no continuity is found, replace the cable.
	Damaged gun cable	Check the continuity of the cable wires, from pin to pin. Replace the cable if any opens or shorts are found.
	Malfunctioning voltage multiplier	Use the optional shorting plug and a megohmmeter to check the continuity and resistance of the multiplier/resistor assembly for 195–260 megohms at 500 volts. No burn-throughs or arc tracks should be visible on any spray gun parts.
	Failed spray gun resistor	Check the resistor with a megohmmeter for 153–187 megohms at 500 volts.
	Malfunctioning IPS control unit	Check for 21 Vdc between pins 2 and 3 (gun end of cable) with the trigger depressed. Refer to the IPS control unit manual, if this voltage is not present.

Continuity and Resistance Checks



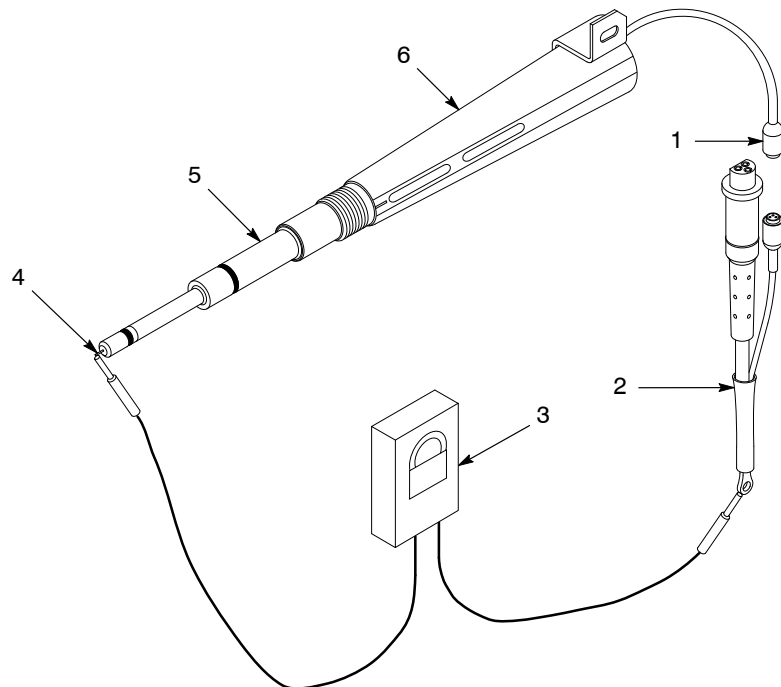
WARNING: Turn off the electrostatic voltage and ground the gun electrode before performing the following tasks. Failure to observe this warning could result in a severe shock.

Multiplier/Resistor Assembly Continuity and Resistance Check

NOTE: All three pins on the input side of the multiplier must be shorted together when you check continuity. Failure to do so could damage the multiplier.

See Figure 5-1.

1. Connect the shorting plug (2) to the multiplier connector (1).
2. Connect the megohmmeter (3) probes to the shorting plug ring-tong terminal and electrode (4). If you get an infinite reading, switch the megohmmeter probes.
3. The megohmmeter should read between 195 and 260 megohms at 500 volts. If the reading is out of this range, unscrew the resistor probe from the multiplier and check the resistor separately (refer to *Resistor Continuity and Resistance Check*). If the resistor reading is within the range specified, replace the multiplier.



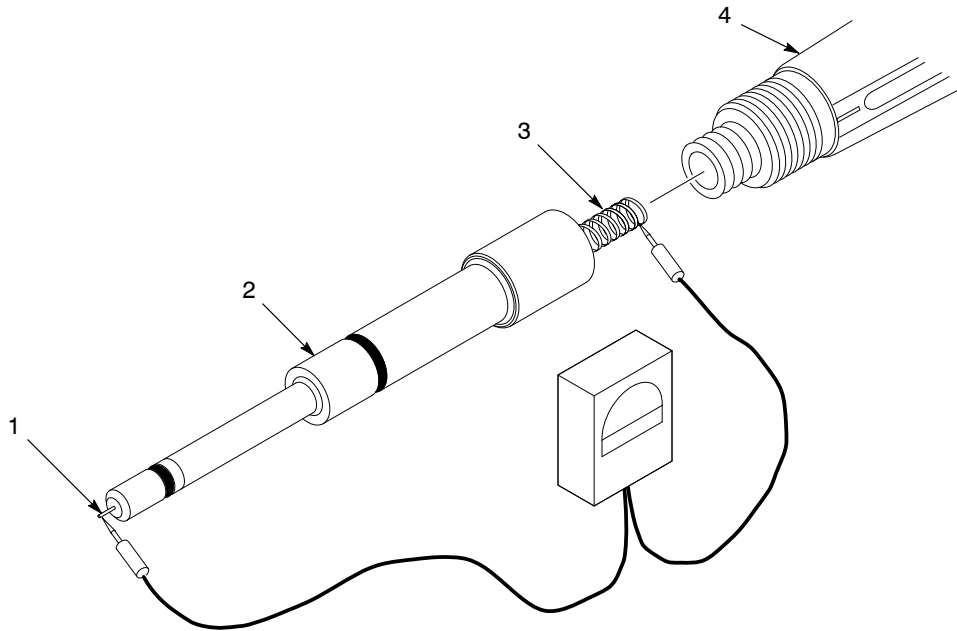
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Figure 5-1 Multiplier/Resistor Assembly Continuity and Resistance Check

- | | |
|-------------------------|-------------------|
| 1. Multiplier connector | 4. Electrode |
| 2. Shorting plug | 5. Resistor probe |
| 3. Megohmmeter | 6. Multiplier |

Resistor Continuity and Resistance Check

1. Perform steps 1 through 3 under *Multiplier/Resistor Assembly Continuity and Resistance Check*.
2. See Figure 5-2.
Unscrew the resistor probe (2) from the multiplier (4).
3. Check the resistor with a megohmmeter. The megohmmeter should read between 153 and 187 megohms at 500 volts. If the reading is out of this range, replace the resistor probe.



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Figure 5-2 Resistor Continuity and Resistance Check

- | | | |
|-------------------|--------------------|---------------|
| 1. Electrode | 3. Resistor spring | 4. Multiplier |
| 2. Resistor probe | | |

Gun Cable Continuity Check

Cable pins and wire colors are shown in See Figure 5-3. To make sure the cable is not damaged, perform the following checks for continuity with a standard ohmmeter.

Table 5-1 Continuity Checks

Control Unit End Pins	Gun End Pins and Terminals
1 and 2	Close trigger switch
2	2
3	3
4	1
5	No connection
6	Ring-tong terminal

Table 5-2 Manual Gun Cable Functions

Control Unit End Pins	Function
1	Trigger
2	Negative (Common)
3	Positive (+21Vdc)
4	μ A Feedback
5	Open
6	Ground

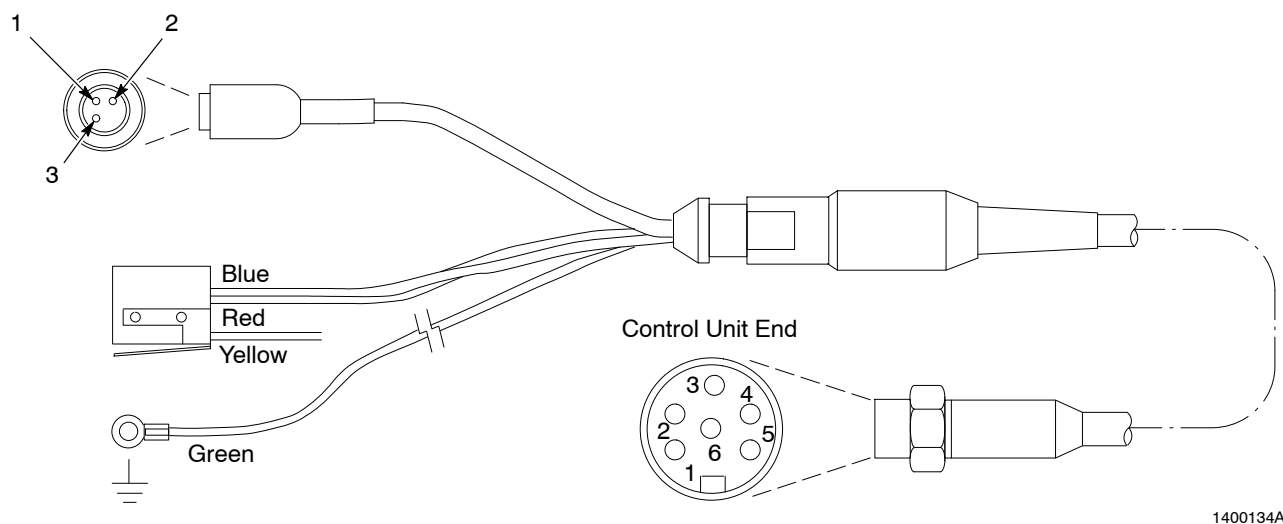


Figure 5-3 Gun Cable Continuity Check

Section 6

Repair



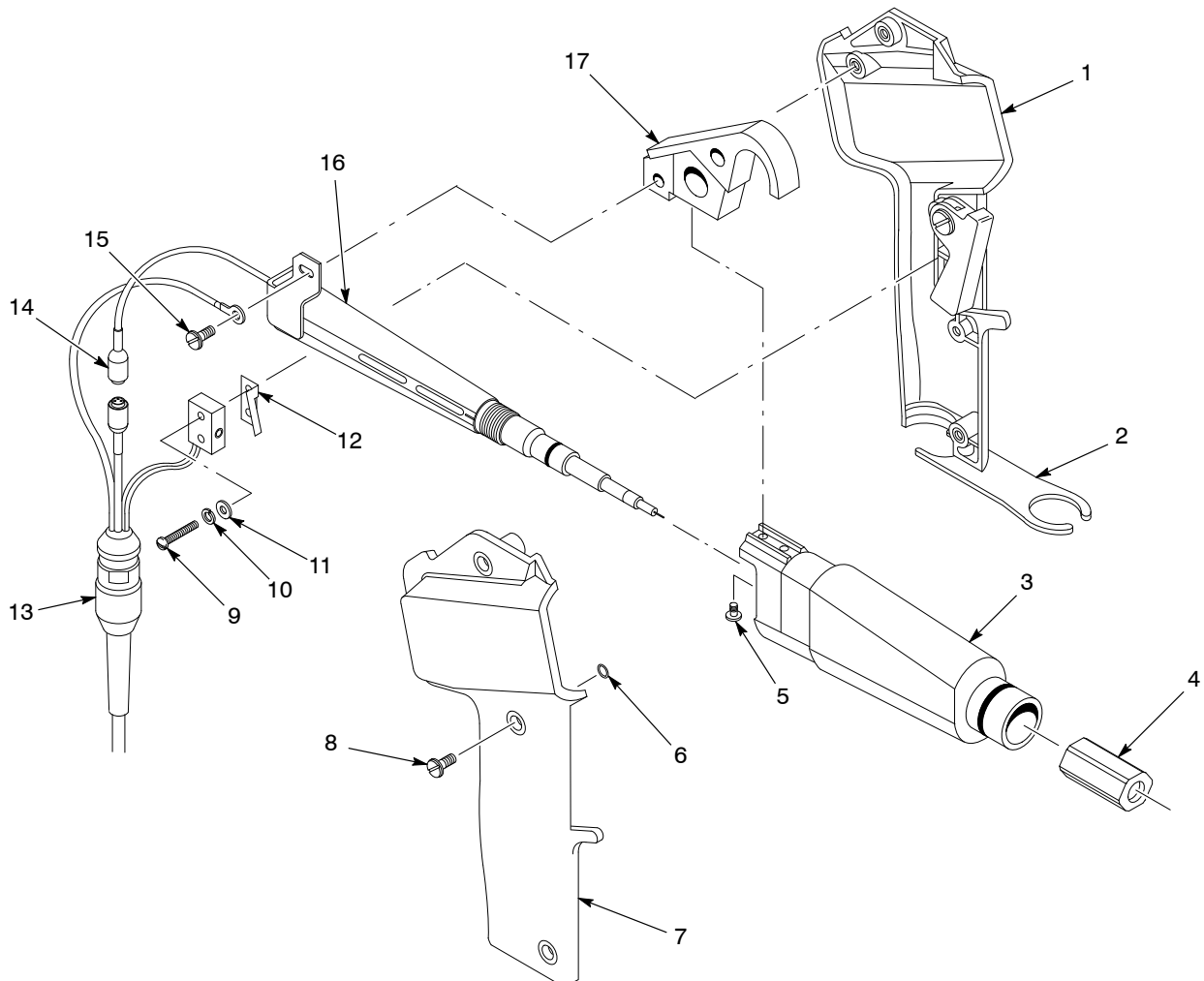
WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

Multiplier Replacement

Multiplier service kits contain a new multiplier/resistor probe assembly and extension. Follow these steps to replace your old multiplier with a new multiplier/resistor probe assembly.

1. Remove the nozzle and powder path parts as described in the *Daily Maintenance* procedure in the *Operation* section.
2. See Figure 6-1. Loosen the three captive screws (8) in the cover (7). The O-rings (6) hold the screws in the cover. Lift the cover off the handle (1).
3. Remove the screw (15) securing the multiplier heat sink bracket to the hanger (17). Remove the cable ground wire (later versions only).
4. Loosen the connector swivel nut, and disconnect the cable (13) from the multiplier connector (14).
5. Remove the extension (3) and multiplier (16) from the handle.
6. Loosen and remove the cable nut (4). Use a wrench if necessary.
7. Remove the multiplier from the extension.
8. If you are replacing the old extension with the new one included in the kit, remove the two screws (5) that secure the hanger to the extension, and remove the hanger. Install the hanger on the new extension.
9. Perform the disassembly steps in reverse to install the new multiplier/resistor assembly in your spray gun.

Multiplier Replacement *(contd)*



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Figure 6-1 Multiplier and Cable Replacement

- | | | |
|-----------------|-----------------------|--------------------------|
| 1. Handle | 7. Cover | 13. Cable |
| 2. Hose bracket | 8. Captive screws (3) | 14. Multiplier connector |
| 3. Extension | 9. Screws (2) | 15. Screw (1) |
| 4. Cable nut | 10. Lock washers (2) | 16. Multiplier |
| 5. Screws (2) | 11. Flat washers (2) | 17. Hanger |
| 6. O-rings (3) | 12. Switch actuator | |

Cable Replacement

1. Remove the cover from the handle and disconnect the cable from the multiplier as described in *Multiplier Replacement*.
2. See Figure 6-1. Remove the two screws (9), lock washers (10), and flat washers (11). Remove the trigger switch and actuator (12) from the handle (1).
3. Rotate the hose bracket (2) slightly, and release the cable (13). Note how the cable fits into the hose bracket.
4. Fit the new cable into the hose bracket and route the ground wire around the end of the multiplier. Secure the ground wire to the hanger (17) with the screw (15).
5. Connect the cable to the multiplier connector (14) and arrange the wiring so that it will not be pinched between the handle and the cover when the cover is installed.
6. The cable service kit includes new screws (9), washers (10, 11), and a switch actuator (12). Install the actuator on the trigger switch and secure both to the two threaded inserts in the handle with the screws and washers.
7. Install the cover (7) on the handle.

Resistor Replacement

1. Remove the multiplier and resistor probe from the extension as described in *Multiplier Replacement*.
2. See Figure 6-2. Unscrew the old resistor probe (2) from the multiplier (4). Clean the multiplier well (5).
3. Remove the shipping container and protective caps from the new probe.



WARNING: All air in the multiplier well, resistor holder, and contact tip must be replaced by dielectric grease. High voltage can arc through air pockets, affect electrostatic performance, possibly burn through the spray gun, and create a fire or explosion hazard.

4. Inject dielectric grease into the multiplier well (5) until it is completely full. Use the 3-cc applicator supplied with the kit.
5. Fill the new resistor spring (3) and the resistor probe cavity (6) completely with dielectric grease.
6. Unscrew the contact tip (1) from the resistor probe (2).
7. Screw the new resistor probe onto the multiplier. Do not overtighten.
8. Apply dielectric grease to the threads of the new contact tip and into the end of the probe.
9. Screw the contact tip into the resistor probe. Do not overtighten. Wipe excess grease off the contact tip and multiplier.
10. Install the probe and multiplier into the extension and secure them with the cable nut. Connect the cable to the multiplier and assemble the spray gun.

Contact Tip Replacement

1. Remove the nozzle and powder path parts as described in the *Daily Maintenance* procedure in the *Operation* section. Wipe powder off the resistor probe.
2. See Figure 6-2. Unscrew the damaged contact tip (1) from the end of the resistor probe (2).
3. Apply dielectric grease to the threads of the new contact tip and into the end of the probe.
4. Screw the new contact tip into the resistor probe. Do not overtighten.

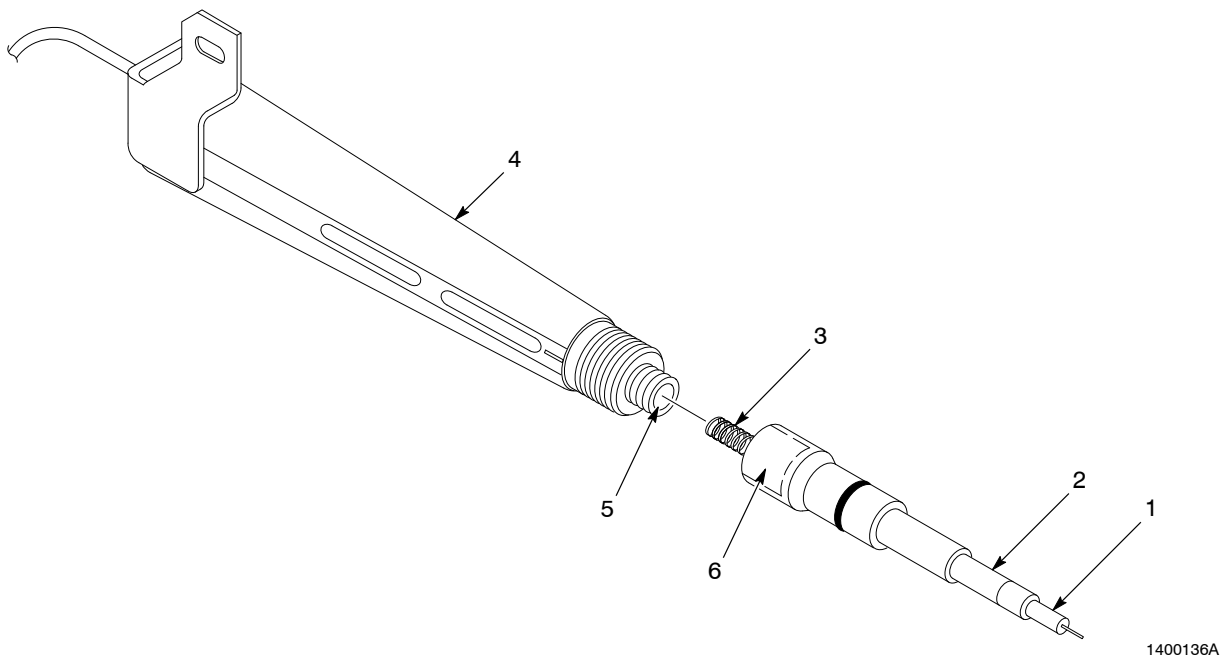


Figure 6-2 Resistor and Contact Tip Replacement

- | | | |
|-------------------|--------------------|--------------------------|
| 1. Contact tip | 3. Resistor spring | 5. Multiplier well |
| 2. Resistor probe | 4. Multiplier | 6. Resistor probe cavity |

Section 7

Parts

Introduction

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

Using the Illustrated Parts List

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (—) is used when the part number applies to all parts in the illustration.

The number in the Part column is the Nordson Corporation part number. A series of dashes in this column (-----) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

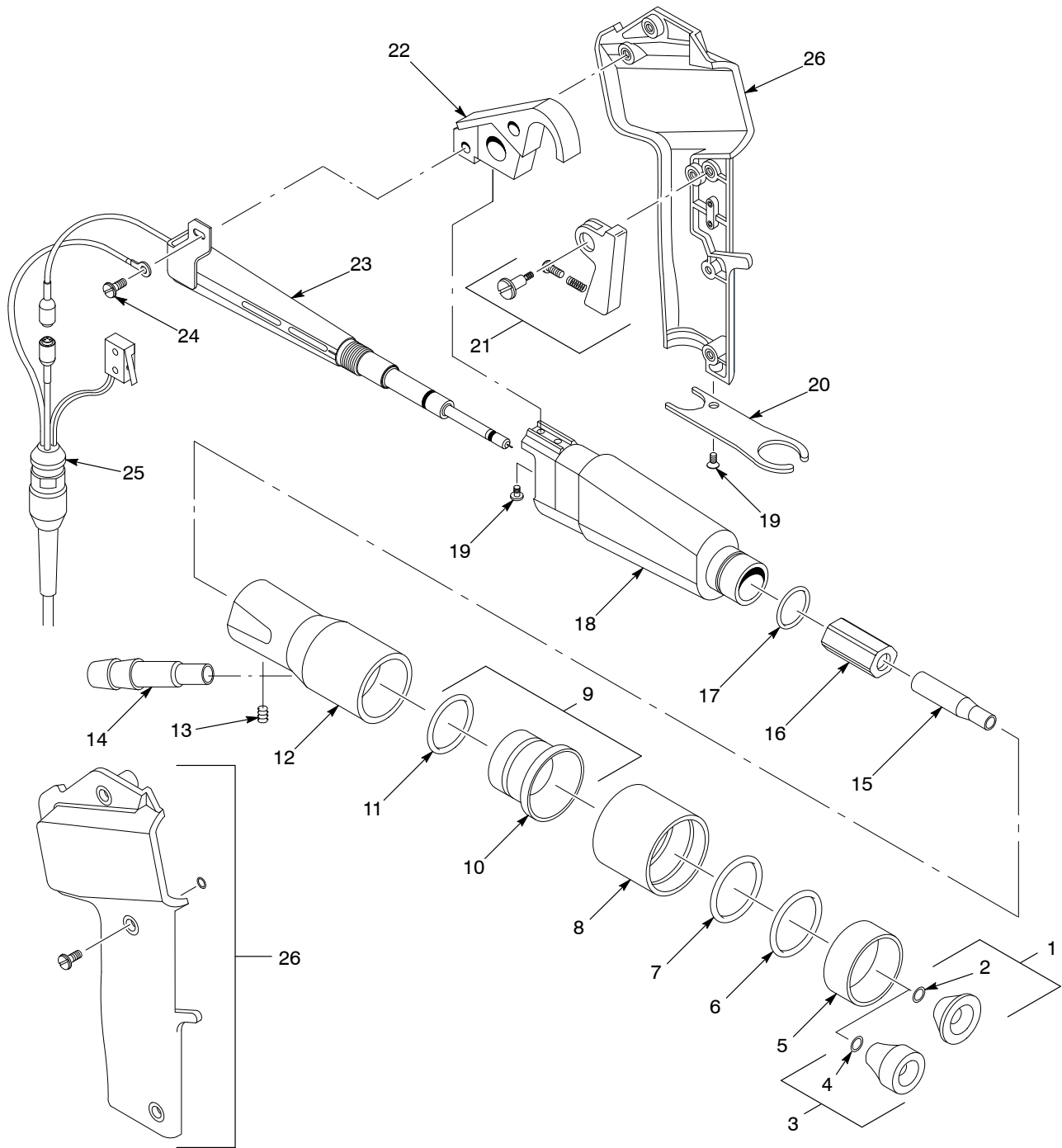
Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

Item	Part	Description	Quantity	Note
—	0000000	Assembly	1	
1	000000	• Subassembly	2	A
2	000000	• • Part	1	

Spray Gun Assembly

See Figure 7-1.

Item	Part	Description	Quantity	Note
—	158258	HAND GUN, porcelain enamel, 80 kV, 4 m, Versa-Spray	1	
—	158259	HAND GUN, porcelain enamel, 80 kV, 8 m, Versa-Spray	1	
1	245523	• DEFLECTOR, 38 mm, with O-ring, ceramic	1	
2	945016	• • O-RING, silicone, 0.251 x 0.400 x 0.074 in.	1	
3	246823	• DEFLECTOR, barrel, with O-ring, ceramic	1	
4	945016	• • O-RING, silicone, 0.251 x 0.400 x 0.074 in.	1	
5	246578	• INSERT, Pyrex	1	
6	940331	• O-RING, silicone, 2.000 x 2.175 x 0.063 in.	1	
7	942240	• O-RING, hot paint, 1.750 x 2.00 x 0.125 in.	1	
8	159427	• ADJUSTER, pattern, porcelain enamel hand gun	1	
9	245521	• NOZZLE, powder gun, ceramic	1	
10	246180	• • NOZZLE, gun, powder, ceramic	1	
11	942161	• • O-RING, silicone, 1.125 x 1.375 x 0.125 in.	1	
12	153988	• BODY, inlet, porcelain enamel, Versa-Spray	1	
13	982455	• SCREW, set, M6 x 1 x 8, nylon, black	1	
14	245434	• CONNECTOR, inlet, powder, ceramic	1	
15	101128	• SLEEVE, ceramic	1	
16	984165	• NUT, cable retainer	1	
17	940243	• O-RING, silicone, 1.125 x 1.250 x 0.063 in.	1	
18	125613	• EXTENSION	1	A
19	982098	• SCREW, flat head, slotted, M4 x 6, zinc	3	
20	132345	• BRACKET, cable/tube, retaining	1	
21	160104	• TRIGGER SERVICE KIT, Versa-Spray	1	B
22	125616	• HANGER, hand gun, modular	1	
23	1014050	• MULTIPLIER SERVICE KIT, porcelain enamel, 80 kV, negative, with probe	1	A, B
24	982327	• SCREW, chez head, slotted, M4 x 12, zinc	1	
25	-----	• CABLE SERVICE KIT	1	B
26	160103	• HANDLE SERVICE KIT, Versa-Spray	1	B
NOTE A: The extension is included in multiplier service kit, part 1014050. Refer to <i>Multiplier Service Kit</i> for more information.				
B: Refer to <i>Service Kits</i> in this section for the parts included in these assemblies.				



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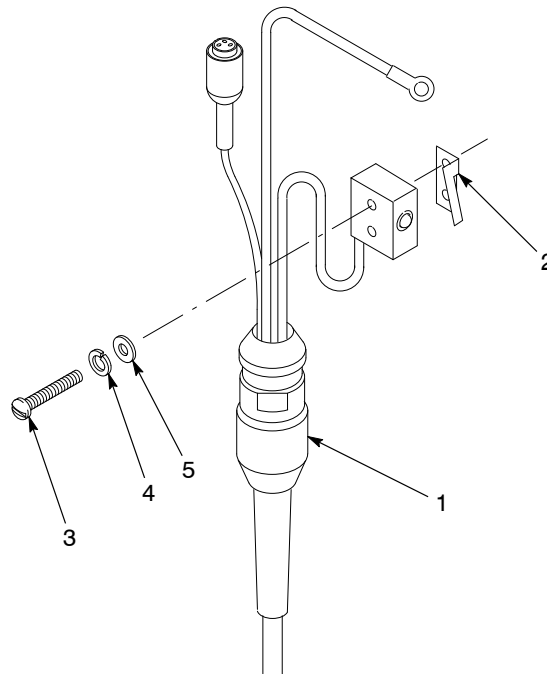
Figure 7-1 Versa-Spray IPS Manual Porcelain Enamel Powder Spray Gun Assembly

Service Kits

Cable Service Kits

See Figure 7-2.

Item	Part	Description	Quantity	Note
—	133716	4 METER CABLE, service kit, IPS	1	
—	133715	8 METER CABLE, service kit, IPS	1	
—	163408	12 METER CABLE, service kit, IPS	1	
1	-----	• CABLE, 5 wire	1	
2	132336	• ACTUATOR, switch	1	
3	1070246	• SCREW, pan head, #2-56 x 0.437, slotted, zinc	2	
4	983113	• LOCK WASHER, e, split, 2, steel, zinc	2	
5	983510	• WASHER, flat, e, 0.094 x 0.188 x 0.250 in., brown	2	



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Figure 7-2 Cable Service Kits

Multiplier Service Kit

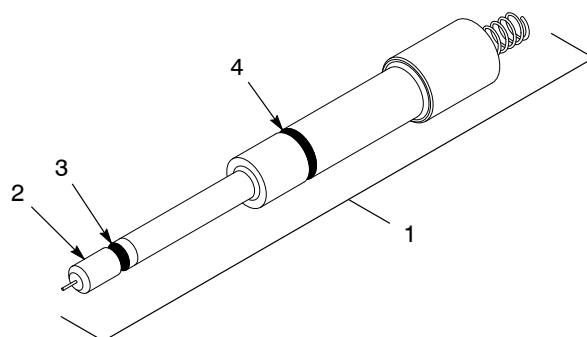
The multiplier kit includes the resistor, multiplier, and extension. If replacing only the resistor, order the *Resistor Service Kit* shown in this section.

Part	Description	Note
1014050	MULTIPLIER SERVICE KIT, porcelain enamel, 80 kV, negative, with probe	
125613	• EXTENSION	
154963	• RESISTOR HOLDER SERVICE KIT, porcelain enamel	
-----	• MULTIPLIER, porcelain enamel, 80 kV, Versa-Spray	

Resistor Service Kit

See Figure 7-3.

Item	Part	Description	Quantity	Note
1	154963	RESISTOR HOLDER SERVICE KIT, porcelain enamel	1	
2	1053112	• CONTACT, cable	1	
3	-----	• • O-RING, silicone, 1/8-in. ID x 1/4-in. OD	1	
4	940117	• O-RING, silicone, 0.312 x 0.438 x 0.063 in.	1	
NS	245732	• APPLICATOR, dielectric grease	1	
NS: Not Shown				



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Figure 7-3 Resistor Service Kit

Handle Service Kit

See Figure 7-4.

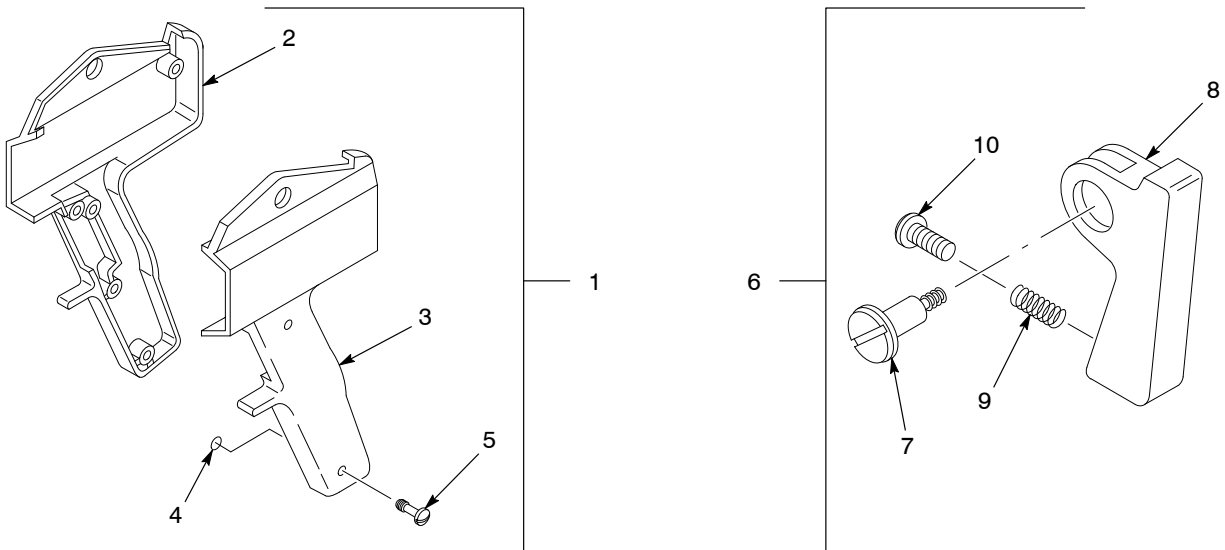
Item	Part	Description	Quantity	Note
1	160103	HANDLE SERVICE KIT, Versa-Spray	1	A
2	-----	• HANDLE, gun	1	
3	-----	• HANDLE, cover	1	
4	940060	• O-RING, Viton, 0.125 x 0.250 x 0.063 in.	3	
5	981626	• SCREW, captive, slotted, M4 x 12, black	3	

NOTE A: Customer must provide spray gun part number and serial number when ordering.

Trigger Service Kit

See Figure 7-4.

Item	Part	Description	Quantity	Note
6	160104	TRIGGER SERVICE KIT, Versa-Spray	1	
7	132334	• PIVOT, trigger	1	
8	125617	• TRIGGER, hand gun, modular	1	
9	133783	• SPRING, trigger, return	1	
10	982370	• SCREW, pan head, slotted, M2 x 5, zinc	1	



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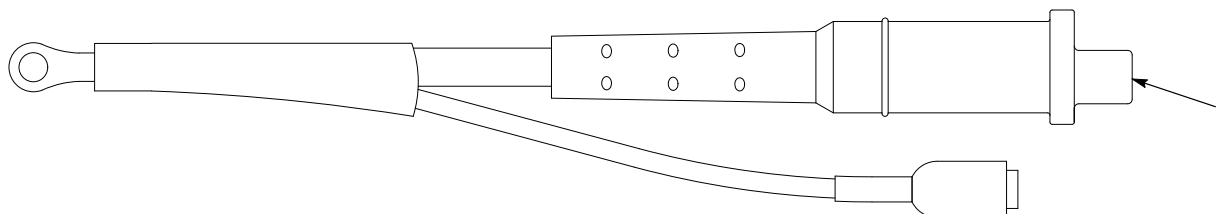
Figure 7-4 Handle and Trigger Service Kits

Miscellaneous Parts

Shorting Plug

See Figure 7-5.

Item	Part	Description	Quantity	Note
1	161411	PLUG, shorting, IPS	1	



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Figure 7-5 Shorting Plug

Powder Feed Hose

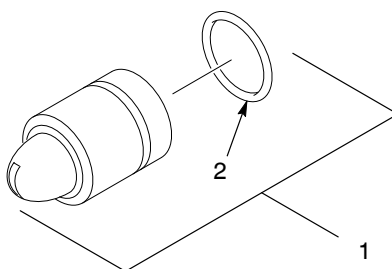
Order powder feed hose in increments of one foot.

Part	Description	Note
900724	TUBING, polyurethane, 1/2-in. ID	

Optional Flat-Spray Nozzle

See Figure 7-6.

Item	Part	Description	Quantity	Note
1	248282	NOZZLE, flat fan, frit, with O-ring	1	
1	1074636	NOZZLE, 6 mm flat, ceramic, with O-ring	1	
1	1074637	NOZZLE, 4 mm flat, 45 deg., ceramic, with O-ring	1	
2	942161	• O-RING, silicone, 1.125 x 1.375 x 0.125 in.	1	A
NOTE A: This O-ring is included with all three flat spray nozzles				



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Figure 7-6 Flat-Spray Nozzle

