Prodigy® Porcelain Enamel Manual Powder Spray Gun

Customer Product Manual
Part 1093482-02

Issued 4/12

For parts and technical support, call the Industrial Coating Systems Customer Support Center at (800) 433-9319

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Contact Us

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

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Prodigy® Porcelain Enamel Manual Powder Spray Gun

Safety

Read and follow these safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to 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.
- 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.
- 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.

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.

Fire Safety (contd)

- 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.

Grounding inside and around the booth openings must comply with NFPA requirements for Class II, Division 1 or 2 Hazardous Locations. Refer to 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.

Aggressive Substances

If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection provided by the equipment is not compromised.

Aggressive substances: e.g. acidic liquids or gases that may attack metals, or solvents that may affect polymeric materials.

Suitable precautions: regular checks as part of routine inspections or establishing from the material's data sheets that it is resistant to specific chemicals.

Please contact Nordson Corporation if you are concerned or unsure about the suitability of the product with relation to coming into contact with particularly aggressive substances.

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.

Description

The Prodigy Porcelain Enamel Manual Powder Spray Gun uses specially designed conical and flat-spray nozzles to atomize, shape, and spray porcelain enamel powder delivered by Nordson HDLV® (high-density powder, low-velocity air) pumps. The gun is controlled by a Prodigy Manual Gun Interface control unit, which can be mounted on a wall, a stand, or the railing of an operator platform.

Features

- 8-mm flexible tubing used for powder delivery
- Separate high voltage and powder paths.
- Special pattern control trigger toggles between user-programmable high and low pattern air and powder flows.
- Shipped with a 70° conical nozzle and a dual-slot flat-spray nozzle. Optional conical and flat spray nozzles are available in both plastic and ceramic. Cross nozzles are available in plastic only.
- User-friendly controller with LCD display.
- Up to 10 user-programmable coating recipes.

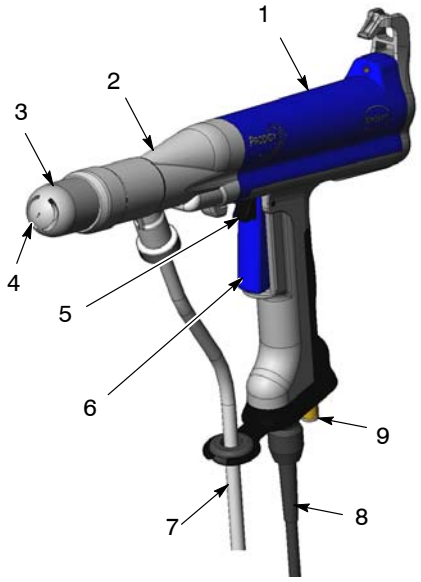


Figure 1 Prodigy Manual Powder Spray Gun

1. Gun body
2. Adapter
3. Conical nozzle
4. Nozzle electrode
5. Pattern control trigger
6. Trigger
7. Flexible powder tubing (8 mm)
8. Control cable
9. Pattern air fitting (6 mm)

Note: Powder and pattern air tubing are not shipped with the spray gun. Tubing is included in manual gun systems.

Description *(contd)*

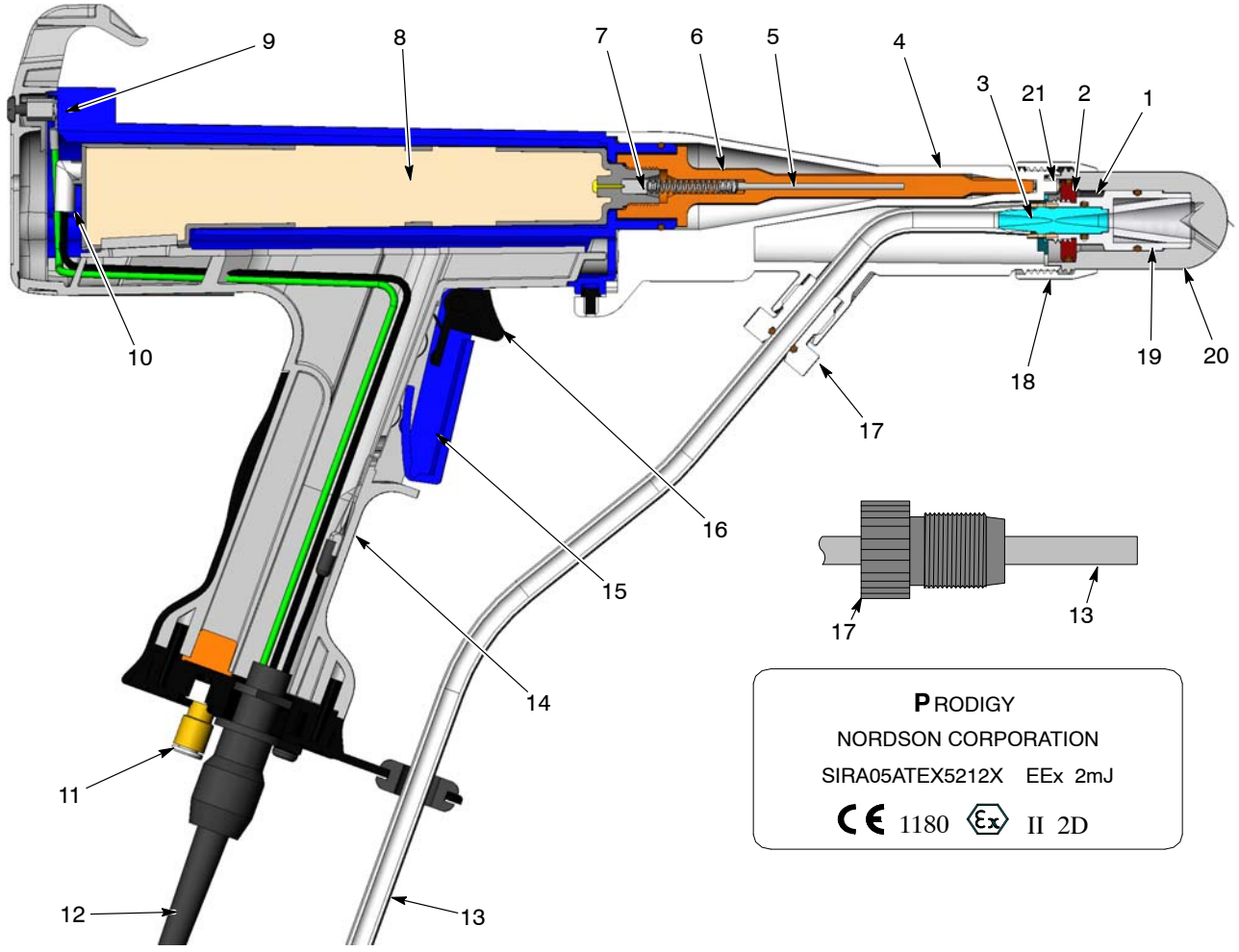


Figure 2 Spray Gun Section View

1. Nozzle electrode*
2. Nozzle electrode ring*
3. Tubing adapter
4. Gun adapter
5. Resistor
6. Resistor holder
7. Contact spacer
8. Voltage multiplier
9. Ground stud
10. Cable/multiplier connection
11. 6-mm tube fitting (pattern air)
12. Control cable
13. 8-mm flexible powder tubing
14. Switch keypad
15. Spray trigger
16. Pattern control trigger
17. Lock knob
18. Retainer nut
19. Nozzle insert*
20. Nozzle*
21. Adapter spring plunger

Note: Parts marked with an asterisk (*) are part of the nozzle assembly. Powder and pattern air tubing are included with manual gun systems only.

Specifications

Specifications are subject to change without notice.

Electrical Output	
Maximum rated output voltage at the electrode:	95 kV ± 10%
Maximum rated output current at the electrode:	100 µA ± 10%
Air Pressure and Flow Requirements	
Minimum input air:	4 bar (60 psi)
Maximum input air:	6.9 bar (100 psi)
Pattern air:	5.9 bar (85 psi), 6–57 l/min. (0.2–2.0 scfm)
Temperature Requirements	
Maximum ambient temperature	40 °C (104 °F)

Air Quality Requirements

Powder spray systems require clean, dry, oil-free compressed air. Moist or oil-contaminated air can cause the powder to clog in the pump, powder feed tubing, or spray gun.

Use 3-micron 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 6.9 bar (100 psi).

Equipment Rating

This applicator is rated for use in a potentially explosive environment: Class II, Division I, Group F & G, Zone 21 or Zone 22.

Installation

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

WARNING: Installation in Europe shall carried out by suitably trained personnel in accordance with the applicable code of practice. EN60079-14

Cable and Pattern Air Tubing

See Figure 2.

1. Connect the control cable (12) to the gun controller receptacle labeled GUN and tighten the cable nut securely.

   NOTE: Refer to page 21 for optional 4 and 6-meter extension cables. Do not use more than two extension cables.

NOTE: Powder and pattern air tubing are supplied with manual gun systems or can be ordered separately. Refer to page 21 for tubing part numbers.

2. Connect blue 6-mm pattern air tubing from the appropriate pattern air outlet fitting on the pump control cabinet to the tube fitting (11) on the gun handle.

Determining Powder Tubing Lengths

To achieve maximum powder flow, the end-to-end length of the suction and delivery tubing must be within the ranges shown.

- Keep the suction tubing as short as possible within the limits shown.
- Keep the delivery tubing as close to 20 m (65.5 ft) as possible. Using shorter lengths increases the possibility of surging.
- Route the powder tubing on the floor, especially if the delivery tubing must be longer than 20 m (65.55 ft). The pump will still deliver powder through longer lengths of tubing, but at a reduced flow rate.

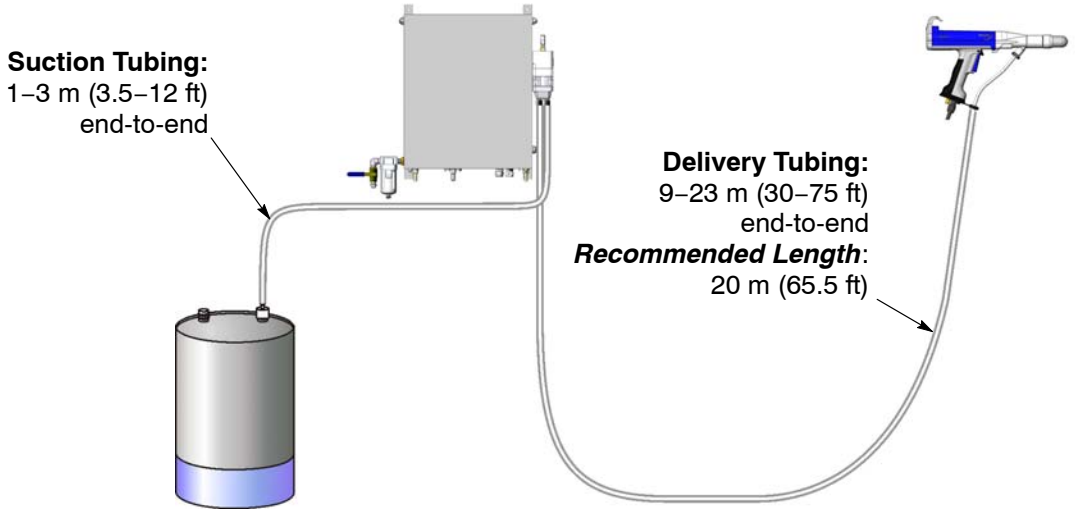


Figure 3 Determining Powder Tubing Length

Coiling the Powder Tubing

Your Prodigy system will deliver consistent powder flow if the powder tubing is coiled using these guidelines:

- Keep the loops in the coil at least 1 m (3.25 ft) in diameter.
- Have as few loops as possible in the coil.
- Lay the coil flat on the floor. Do not hang the coil vertically or powder will settle at the bottom of the coil when the gun is triggered off and surge when the gun is triggered on again.

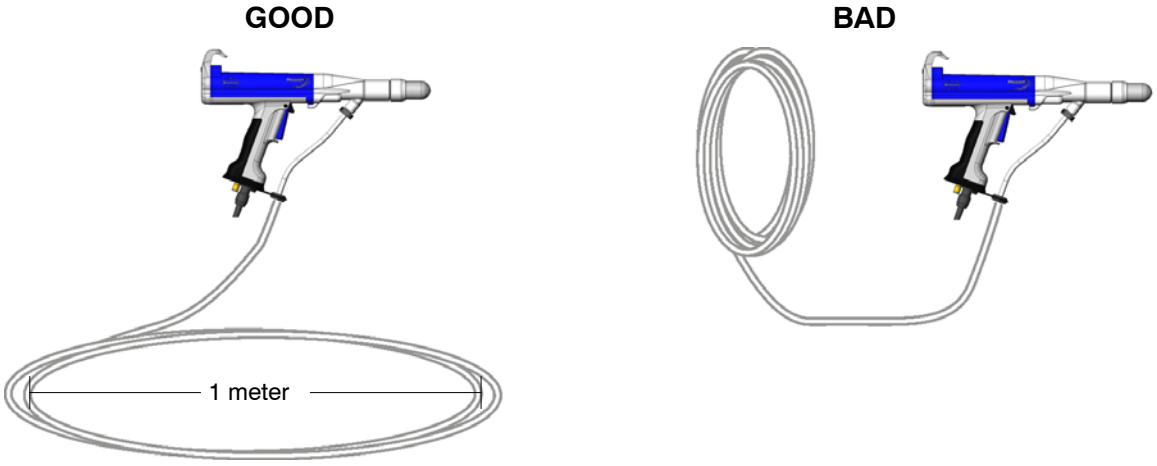


Figure 4 Coiling the Powder Tubing

Tubing Installation

NOTE: Use a tubing cutter to cut the 8-mm powder delivery and suction tubing to the desired lengths. The ends must be square. Refer to page 21 for an optional tubing cutter.

Gun Connection

See Figure 2. Use this procedure to install flexible powder tubing.

1. Remove the nozzle and tubing adapter.
2. Thread the lock knob (17) into the gun body and tighten.
3. Push the tube insertion tool (a length of mesh sleeving) through the lock knob and out the front of the gun until you can grasp the end. Refer to the spray gun parts list for the tool part number.
4. Insert the end of the flexible tubing into the knob end of the mesh sleeving, then pull on the gun end of the sleeving, until you pull the tubing through the knob and out the end of the gun.
5. Install the tubing adapter (3) into the end of the flexible tubing.
6. Gently pull the tubing back through the lock knob until the tubing adapter is up against the flange molded in the end of the gun adapter.

   NOTE: Make sure the adapter spring plunger (21) fits through the notch in the tubing adapter.

7. Install the nozzle (20) over the end of the tubing adapter and thread the nozzle nut onto the gun adapter until snug.

Pump Connection

1. Route the delivery tubing to the appropriate powder pump, coiling it as shown on page 6.
2. See Figure 5. Remove the rear (outlet) retaining nut (1) and O-ring (2) from the pump.
3. Install the O-ring (3) onto the tubing adapter (3), until it is up against the adapter flange.
4. Install the end of the adapter into the pump.
5. Install the retaining nut over the end of the barbed adapter, thread the nut onto the wear block, and tighten it finger-tight.
6. Push the flexible powder tubing (4) over the barbed end of the adapter.
7. Connect the suction tubing as described in the pump manual or the Color-on-Demand installation manual.
8. Use cable ties to bundle together the gun control cable, pattern air tubing, and powder tubing.

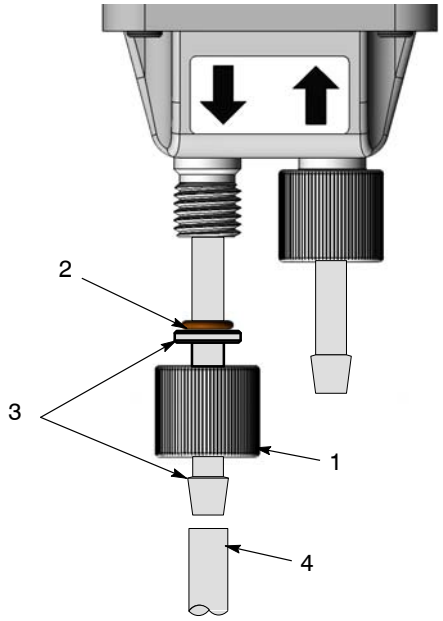


Figure 5 Delivery Tubing Connection to Pump

1. Tube retaining nut
2. O-ring
3. Barbed tubing adapter
4. Flexible tubing

ATEX Special Condition For Safe Use:

This applicator shall only be used with the Prodigy Manual Controller.

Operation

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

All gun functions are set and controlled by the manual gun controller.

Presets

A preset is a group of spray settings. The gun controller provides 10 presets. Use the presets to save optimal spray settings for parts with different features.

Gun ON LED

The LED on the end plate lights when the spray trigger is pulled and high voltage is generated.

Pattern Control Trigger

The pattern control trigger toggles between the preset settings (High mode) and the Low mode settings. Use it to change the pattern air and powder flow as needed when part features change. When in Low mode, a down-pointing arrow (⇓) is appears to the right of the gun icon.

NOTE: If you change presets while spraying in Low mode, the controller immediately switches to High mode, spraying with the new preset settings.

Maintenance

WARNING: Inspection and maintenance of this equipment in Europe shall carried out by suitably trained personnel in accordance with the applicable code of practice. EN60079-17

Daily: Blow off the gun exterior with low-pressure compressed air and wipe it clean with a soft cloth.

Weekly: Manually perform a hard purge, then remove the retaining nut, nozzle, and tubing adapter and clean them. Inspect the tubing adapter and nozzle for wear. Replace any worn parts.

Inspect the barbed tubing adapter(s) at the pump and/or hopper for wear and replace if necessary.

Periodically: Check the resistance of the voltage multiplier and resistor with a megohm meter as described in *Continuity and Resistance Checks* on page 12. Replace any components that do not meet the specifications.

As Required: Disassemble the nozzle and clean the internal parts. Replace any worn parts. Refer to *Nozzle Disassembly and Cleaning* on the following page for instructions.

Nozzle Disassembly and Cleaning

Requirements: Nozzle Tool 1073682

1. Hold the nozzle firmly in one hand. Thread the tool onto the threaded end of the insert until it bottoms out on the electrode ring.

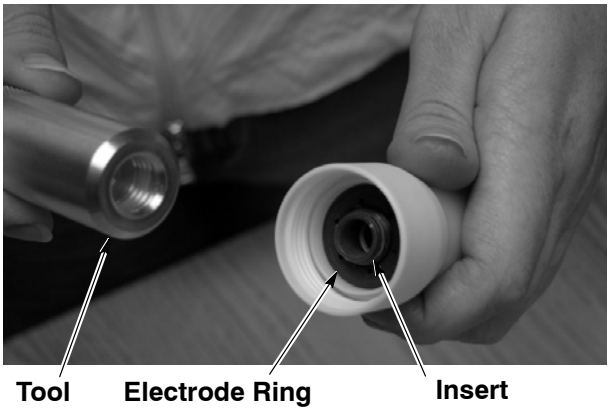


Figure 6 Nozzle Disassembly Step 1 (Shown with Nut Installed)

2. Turn the tool clockwise while pulling on it until the electrode ring/insert assembly comes out of the nozzle.

NOTE: If the electrode is pulled out of the nozzle shell, be careful to not lose it. The dual slot nozzle has the electrode glued in.

Figure 7 Nozzle Disassembly Step 2A

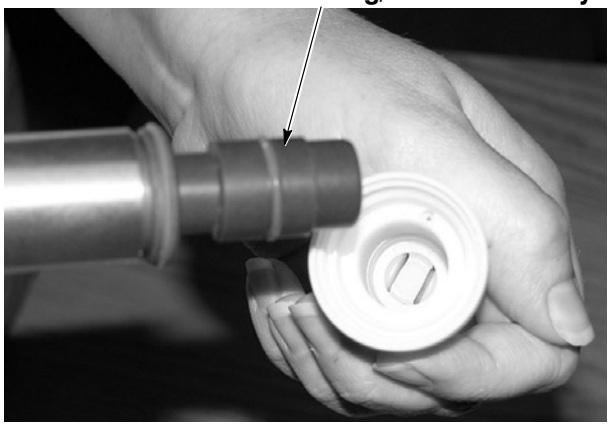


Figure 8 Nozzle Disassembly Step 2B (New Style Assembly Shown)

3. Unscrew the tool from the electrode ring/insert assembly and blow off the assembly with compressed air.

Figure 9 Nozzle Disassembly Step 3 (New Style Shown)

4. Place the nozzle and nozzle nut in an ultrasonic cleaner to remove any impact fusion, then blow them off with compressed air. If desired, remove the nozzle nut from the nozzle by sliding the nut forward then turning it clockwise to unscrew it.

Nozzle Disassembly and Cleaning

(contd)

5. Blow off the insert and filter. If the filter is clogged with powder, remove it and replace it with a new one. When removing the new style filter from the insert, be careful not to scratch the inside surface of the insert.

See Figure 10 to re-assemble the nozzle.

1. Make sure the electrode ring is threaded all the way onto the insert.
2. Thread the tool onto the threaded end of the insert.
3. Turn the tool counterclockwise to remove it from the insert. Check the nozzle. The electrode ring should be approximately $^1/_4$ inch inside the nozzle lip.

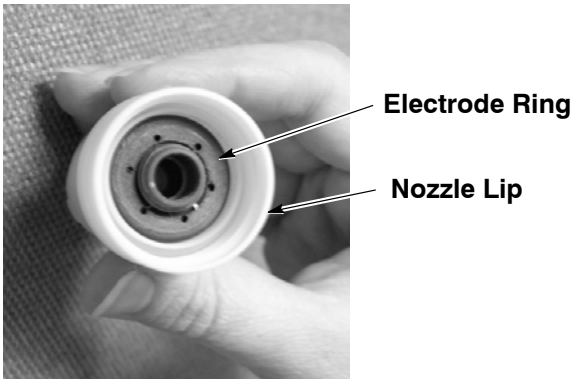


Figure 10 Nozzle Re-assembly

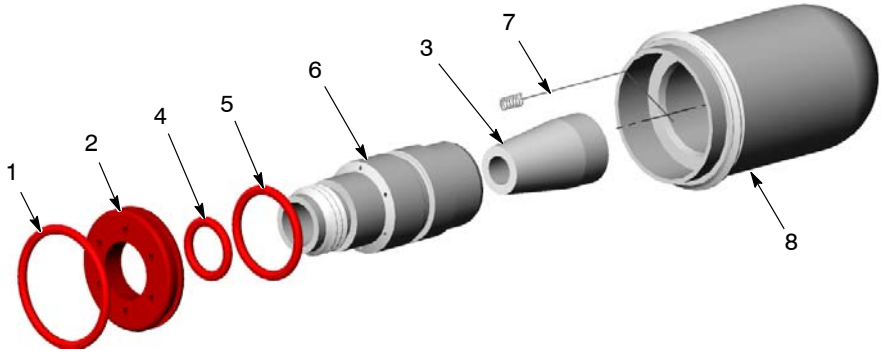


Figure 11 Internal Components of Nozzle Assemblies

1. O-ring (electrode ring)
2. Electrode ring
3. Filter
4. O-ring (insert, internal)
5. O-ring (insert, external)
6. Insert
7. Electrode
8. Nozzle shell

Note: All internal components, except the electrodes, are the same for all nozzles. For flat-spray, cross, and pinpoint nozzles, the electrode is glued into the nozzle shell with epoxy and cannot be replaced separately.

Troubleshooting

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

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

Problem	Possible Cause	Corrective Action
1. Unsteady or inadequate powder flow	Problem with powder pump	Refer to pump manual for troubleshooting.
	Blockage in powder tubing	Perform a hard purge to clear tubing. Replace tubing if partially or completely blocked.
	Plugged nozzle	Remove nozzle and clean.
2. Uneven pattern	Insufficient pattern air flow	Increase pattern air flow.
	Worn powder tube	Remove powder tube from gun and check for worn passageway.
3. Loss of wrap, poor transfer efficiency	Low electrostatic voltage	Increase the electrostatic voltage (kV or μA setting).
	Poorly grounded parts	Check the conveyor chain, rollers, and part hangers for powder buildup. The resistance between the parts and ground must be 1 megohm or less. For best results, 500 ohms or less is recommended.
	Poor connection in high voltage path inside spray gun	Perform the *Multiplier and Resistor Assembly Resistance Tests* on page 12.
	Fault in controller	Refer to *Troubleshooting* in the gun controller manual.
4. No kV output from the spray gun (LED on the spray gun does not light)	Damaged control cable	Perform the control cable continuity tests on page 14. If an open or short is found, replace the cable.
	Fault in controller	Refer to *Troubleshooting* in the gun controller manual.
5. No kV output from the spray gun (LED on the spray gun lights)	Faulty voltage multiplier or poor connection in high voltage path inside spray gun	Perform the resistance tests on page 12. Check all high voltage path connections.
6. No kV output and no powder output	Faulty trigger switch or control cable	Perform the control cable continuity tests on page 14, and the trigger switch test on page 14.
	Faulty controller wiring harness	Check the wiring between the GUN receptacle and the circuit board.
	Faulty controller circuit board	Check the circuit board as described in the controller manual.

Continuity and Resistance Tests

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

Use the following tests to isolate problems with the voltage multiplier or resistor, control cable, and trigger switch.

Multiplier and Resistor Assembly Resistance Test

Resistance tests must be made with a 500 volt megohm meter.

CAUTION: Short together the three pins in the multiplier receptacle, or the designated pins in the control cable, before testing the continuity and resistance of the multiplier/resistor/electrode assembly. If not shorted, the multiplier could be damaged.

Use the optional shorting plug shown in Figure 13 when testing resistance from the multiplier receptacle to the adapter spring plunger. Refer to *Options* in *Parts* for the shorting plug part number.

Resistance Test – Control Cable End to Adapter Spring Plunger

1. See Figure 12. Remove the nozzle.
2. Disconnect the control cable from the manual control unit.
3. Short together cable connector pins J1–2, J1–3, and J1–4 and connect them to the positive megohm meter probe.
4. Connect the negative megohm meter probe to the adapter spring plunger.

The megohm meter reading should be 350–420 megohms. If the reading is out of this range, test the resistor separately. If the resistor passes the test, replace the multiplier.

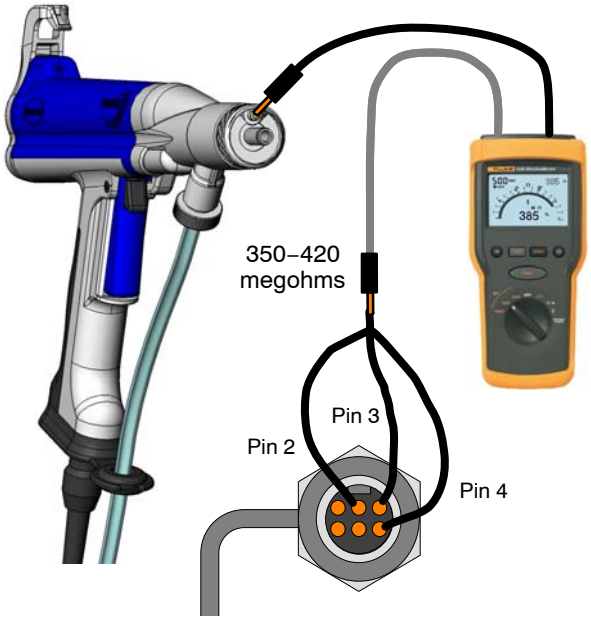


Figure 12 Resistance Test – Cable End to Spring Plunger

Resistance Test Using the Optional Shorting Plug

1. See Figure 13. Remove the end cap and nozzle from the spray gun.
2. Disconnect the multiplier connector from the multiplier receptacle.
3. Connect the shorting plug connector to the multiplier receptacle.
4. Connect the megohm meter positive probe to the shorting plug ring-tong terminal and the negative probe to the adapter spring plunger. (If the reading is infinite, switch the probes).
5. The megohm meter should read 350–420 megohms. If the reading is out of this range, test the resistor separately. If the resistor passes the test, replace the multiplier.

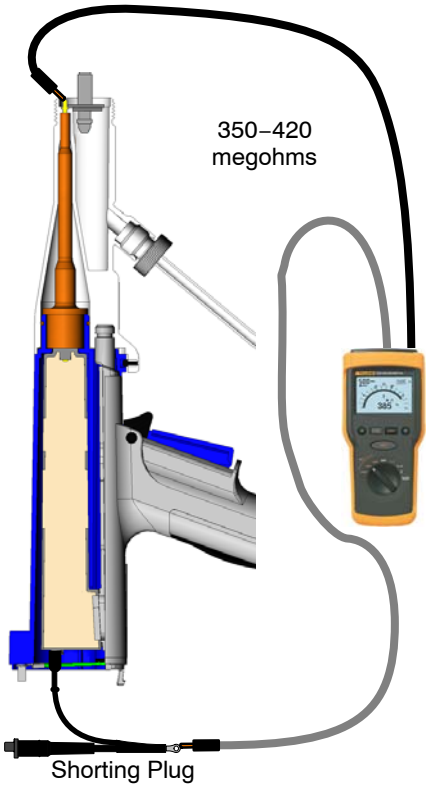


Figure 13 Test with Shorting Plug

Resistor Resistance Test

1. Remove the resistor/electrode assembly as described in *Resistor and Electrode Replacement* on page 17.
2. See Figure 14. Connect the megohm meter probes to the resistor spring and electrode spring.

The megohm meter reading should be 153–187 megohms. If it is out of this range, replace the resistor. If it is within this range, but the multiplier/resistor resistance check was out of range, replace the multiplier.

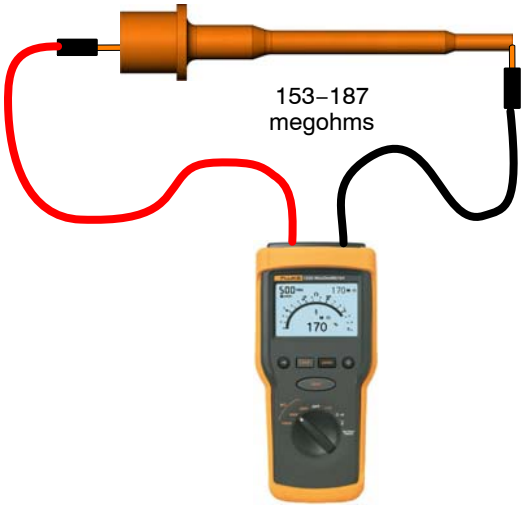


Figure 14 Resistor Resistance Test

Control Cable Continuity Tests

Make continuity tests with a standard ohmmeter. Use the following table and Figure 15.

NOTE: The first two tests in the following table can be made by disconnecting the cable from the manual control unit. All other tests require disconnecting the J2, J3, and ground connectors from the gun as described in *Control Cable Replacement* on page 15.

Test for continuity between:
J1 pins 1 and 2, spray trigger pressed
J1 pins 2 and 5, pattern air trigger pressed
J1 pin 1 and J3 pin 1
J1 pin 2 and J2 pin 3 and J3 pin 2
J1 pin 3 and J2 pin 1
J1 pin 4 and J2 pin 2
J1 pin 5 and J3 pin 3
J1 pin 6 and ground terminal

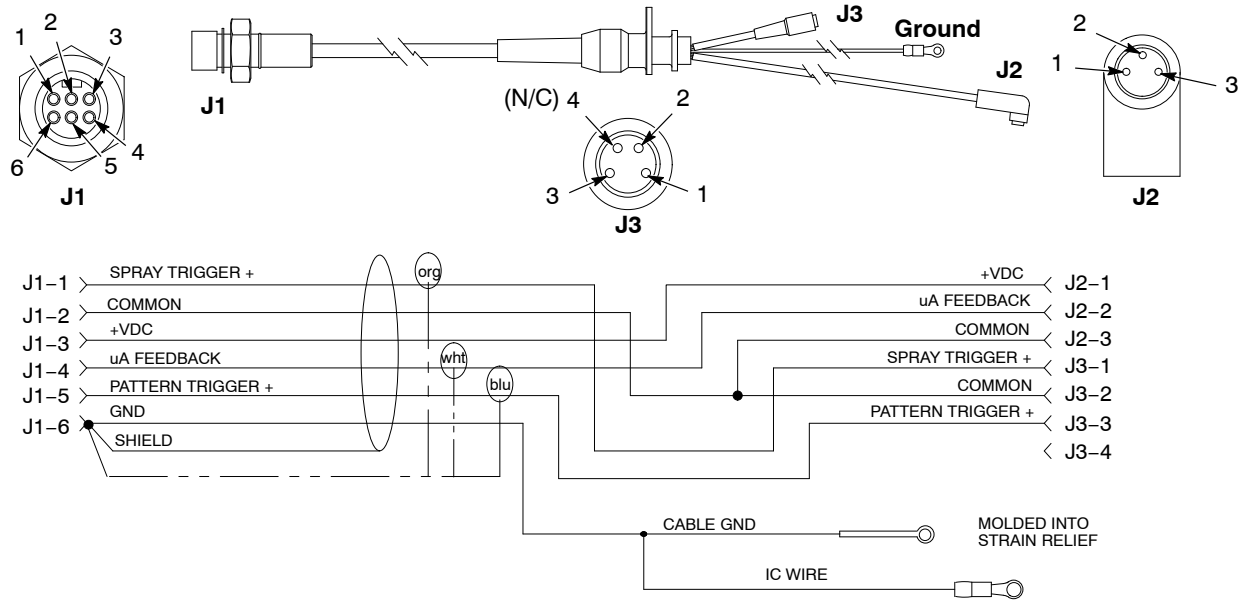


Figure 15 Control Cable Continuity Tests

Trigger Switch Continuity Test

Disconnect the control cable from the trigger switch, as described in *Cable Replacement* on page 15.

Test for continuity using the following table and Figure 16.

Pins	Trigger	Results
1 and 2	Off (Open)	No continuity
	On (Closed)	Continuity
2 and 3	Off (Open)	No continuity
	On (Closed)	Continuity

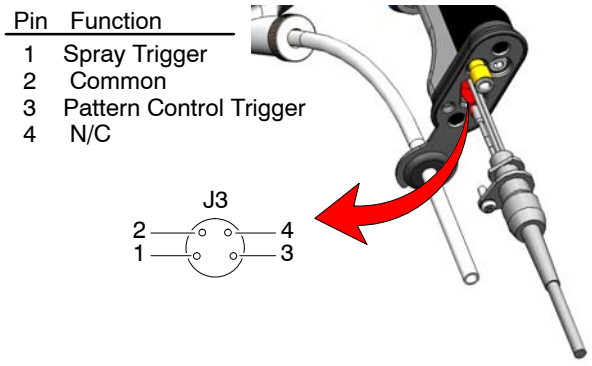


Figure 16 Trigger Switch Continuity Test

Repair

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

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

Nozzle and Powder Tubing Replacement

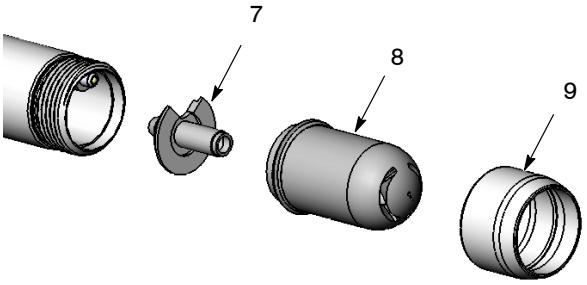


Figure 17 Remove the Nozzle and Tubing Adapter

1. Shut off the controller power switch.
2. See Figure 17. Unscrew and separate the retaining nut (9) and nozzle (8) assembly from the spray gun.
3. Pull the tubing adapter (7) from the powder tube.

Figure 18 Remove the Lock Knob and Powder Tubing

4. See Figure 18. Unscrew the locking knob (5) on the gun adapter (6).
5. Pull the powder tubing out through the gun adapter.
6. Install new powder tubing by following the *Tubing Installation* procedure on page 7.
7. Screw the new nozzle back into the retaining nut, then install the nozzle onto the spray gun.

Control Cable Replacement

1. Shut off the gun controller power switch and remove the powder tubing from the gun. Refer to *Nozzle and Powder Tubing Replacement*.
2. Remove the spray gun from the spray area (at least one meter (3 ft) from the spray booth).
3. See Figure 19. Remove the screw (31) securing the cable (32) to the bottom of the gun handle.
4. Rotate the cable to release it from the handle base. Gently pull down on the cable until you can grasp the trigger switch receptacle (23).
5. Disconnect the trigger cable plug (J3) from the trigger switch receptacle.

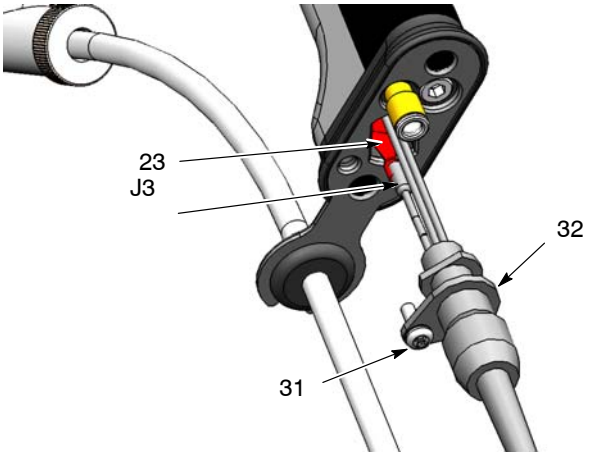


Figure 19 Disconnecting the Control Cable from the Handle

Control Cable Replacement (contd)

6. See Figure 20. Remove the end cap screw (17) and end cap (16) from the gun body.

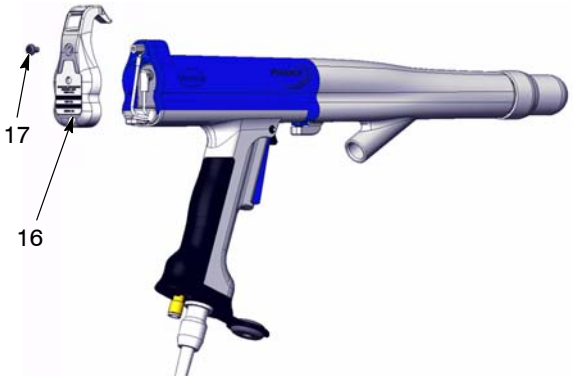


Figure 20 Removing the End Cap

7. See Figure 21. Disconnect the multiplier connector (J2) from the multiplier receptacle.
8. Remove the post and lock washer (13, 12) to disconnect the ground terminal (GND).

Figure 21 Disconnecting the Control Cable

9. See Figure 22. Lift up on the back of the gun body (11) to unsnap it from the handle, then push the body forward to separate it from the handle (19).

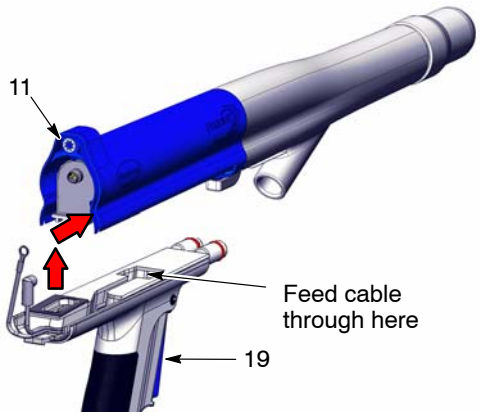


Figure 22 Separating the Gun Body from the Handle

10. Feed the ground and multiplier wiring through the opening in the handle.
11. Perform the previous steps in reverse to install a new cable.

Resistor Replacement

Resistor Removal

1. See Figure 17. Unscrew the nozzle (8) and retaining nut (9) from the spray gun.
2. Pull the tubing adapter (7) out of the powder tubing.
3. See Figure 23. Unscrew the lock knob (5) and pull the powder tubing out of the gun adapter (6).
4. Loosen the set screw (3) in the bottom on the gun adapter.

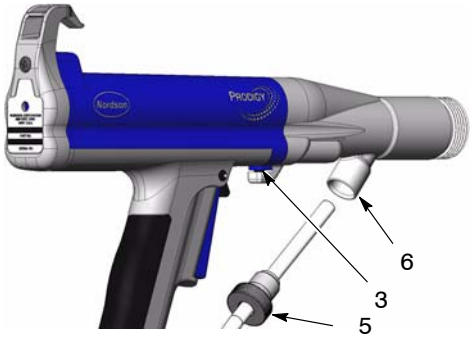


Figure 23 Loosening the Adapter Set Screw

5. See Figure 24. Pull the gun adapter straight off the gun body (11).

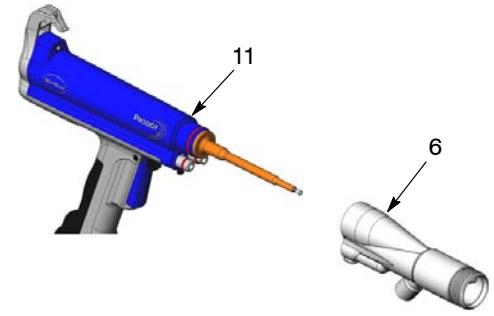


Figure 24 Removing the Adapter

6. See Figure 25. Unscrew the resistor holder (1) from the multiplier (15).

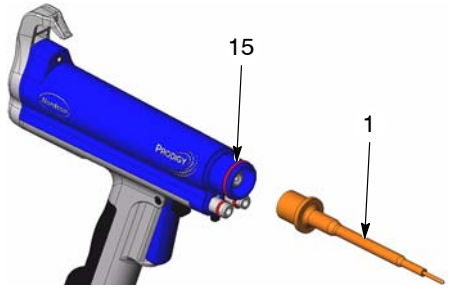


Figure 25 Removing the Resistor Holder

7. See Figure 26. Remove the contact spacer (14) from the multiplier well. Wipe the dielectric grease off the contact spacer.

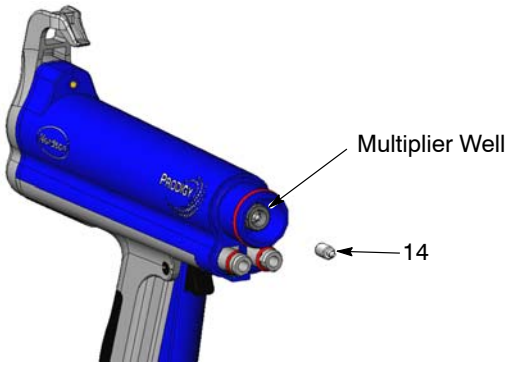


Figure 26 Removing the Contact Spacer

8. See Figure 27. Remove the resistor (2) from the resistor holder (1).
9. Clean and inspect the resistor holder. Replace the holder if you find carbon tracks or pin holes.

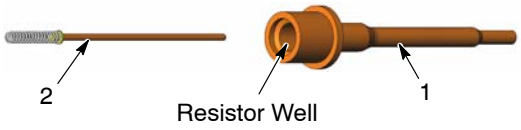


Figure 27 Removing the Resistor from the Holder

Resistor Installation

1. See Figure 27. Inject approximately 0.60 cc of dielectric grease into the resistor well.
2. Insert the resistor into the resistor holder (1) until it bottoms out, then fill the resistor well with approximately 0.8 cc of dielectric grease.
3. See Figure 26. Insert the contact spacer into the multiplier well. Fill the multiplier well with dielectric grease.
4. See Figure 25. Screw the resistor holder onto the multiplier.
5. See Figures 24 and 23. Install the adapter on the gun body. Tighten the set screw.
6. See Figure 17. Install the powder tubing by following the *Tubing Installation* procedure on page 7.
7. Replace the nozzle and retaining nut on the spray gun.

Multiplier Replacement

Removal

1. Remove the resistor holder. Refer to steps 1–6 of the *Resistor Replacement* procedure.
2. Remove the end cap and disconnect the control cable. Refer to steps 6–8 of the *Control Cable Replacement* procedure.
3. Push the multiplier out of the gun body from the front.
4. See Figure 28. Remove the contact spacer (14) from the multiplier well. Clean the dielectric grease off the contact spacer.

Figure 28 Removing the Contact Spacer

Assembly

1. See Figure 28. Insert the contact spacer into the multiplier well. Fill the multiplier well with dielectric grease.
2. Install the multiplier into the gun body.
3. Fill the resistor holder well with dielectric grease. Refer to *Resistor Installation* instructions.
4. See Figure 25. Screw the resistor holder onto the multiplier.
5. See Figures 24 and 23. Install the adapter over the electrode and resistor holders. Tighten the set screw.
6. See Figure 21. Connect the ground wire to the gun body with the lockwasher and post. Connect the multiplier connector (J3) to the multiplier receptacle.
7. See Figure 20. Install the end cap on the gun body with the screw.
8. See Figure 17. Install the powder tubing by following the *Tubing Installation* procedure on page 7.
9. Replace the nozzle and retaining nut on the spray gun.

Parts

Spray Gun Parts

Item	Part	Description	Quantity	Note
—	1093481	GUN, porcelain enamel, manual, 95 kV, Prodigy	1	
1	1077264	• HOLDER, resistor, Prodigy, manual, generation 2	1	
2	1053912	• KIT, resistor, cable, series	1	
3	982455	• SCREW, set, M6 x 1 x 8, nylon, black	1	
5	1047934	• KNOB, lock, powder tube	1	
4	940117	• O-RING, silicone, 0.312 x 0.438 x 0.063 in.	3	
6	1077421	• KIT, adapter/spring plunger assembly, generation II	1	
7	1093487	• TUBE, barb assembly, PE manual gun, Prodigy	1	
8	1062166	• KIT, nozzle, 100 degree, conical	1	A
9	1078850	• NUT, retaining	1	
10	940212	• O-RING, silicone, 0.938 x 1.063 x 0.063 in.	1	
11	1074027	• BODY, handgun, Prodigy	1	
12	983416	• WASHER, lock, internal, M4, steel, zinc	1	
13	288553	• POST, spacer, hex	1	
14	1053595	• SPACER, contact	1	
15	288552	• POWER SUPPLY, 95 kV, negative	1	B
16	- - - - - -	• CAP, end, handgun	1	
17	982800	• SCREW, pan, recessed, M4 x 6, black, zinc	1	
18	1069680	• GASKET, cover, handgun	1	
19	288561	• HANDLE, w/cover, handgun	1	
19A	288534	• • GASKET, base, hand gun	1	
20	288541	• TRIGGER, purge, handgun	1	
21	1093489	• TRIGGER, with actuator, manual gun, Prodigy	1	
22	288537	• PIVOT, threaded, gun, M5	1	
23	288549	• SWITCH, keypad, trigger/purge	1	
24	288550	• PAD, ground, small, handgun	1	B
25	288538	• BASE, handle, handgun	1	
26	1077437	• GROMMET, Buna-N, $^{1}/_{2}$-in. ID x 1.00 in. OD x $^{9}/_{32}$	1	
27	288545	• BRACKET, hose, handgun	1	
28	982801	• SCREW, oval, recessed, M4 x 20, black, zinc	2	
29	328524	• CONNECTOR, male, w/integral hex, 6 mm tube x M5	1	
30	973402	• PLUG, pipe, socket, flush, $^{1}/_{8}$ in. NPT, zinc	1	
31	982825	• SCREW, pan head, rec, M4 x 12, with integral lock washer bezel, black, zinc	1	
32	1080539	• KIT, cable, handgun, Prodigy, 6 meter	1	B
33	1073682	• TOOL, insertion/extractor, nozzle	1	
NS	1073706	• KIT, nozzle, flat spray, dual slot, converging angle, 1 mm	1	A
NS	1093513	• SLEEVING, mesh, tube insertion tool	1	C

NOTE A: Refer to page 22 for conical nozzles and components; pages 24 and 25 for flat spray, cross, and pinpoint nozzles and components.

B: Refer to page 21 for options.

C: Use this tool to install flexible power tubing through the lock knob.

NS: Not Shown

Spray Gun Parts *(contd)*

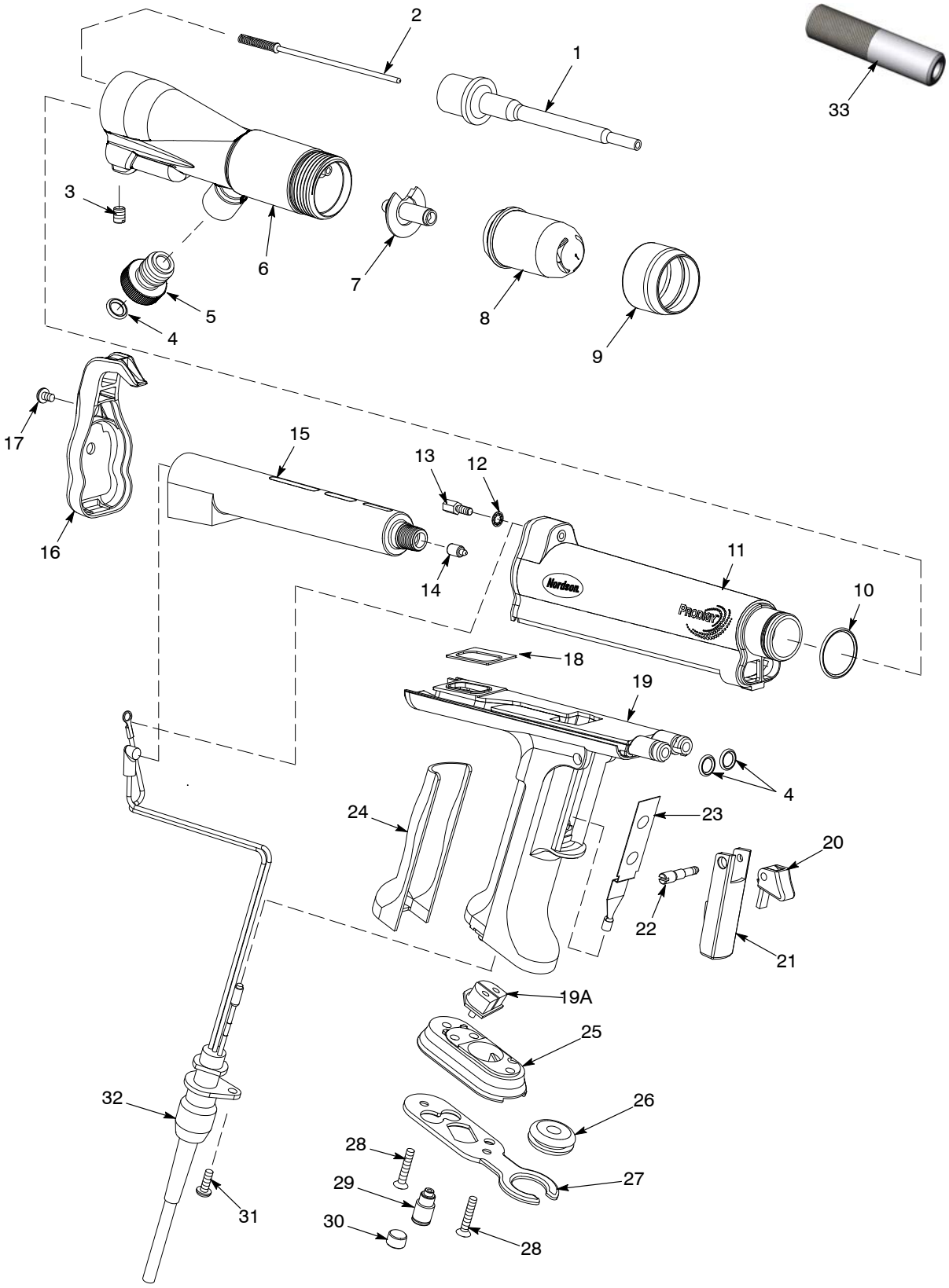


Figure 29 Prodigy Porcelain Enamel Manual Spray Gun

Service Kits

Part	Description	Note
1080539	KIT, cable, handgun, Prodigy, 6 meter	
1053912	KIT, resistor, cable, series	
1077424	KIT, resistor holder, Prodigy, generation II	
NOTE A: Refer to spray gun parts list for quantity one part numbers.		

Options

Part	Description	Note
288544	PAD, ground, medium, hand gun	A
302112	POWER SUPPLY, 95 kV, positive	
245733	APPLICATOR, dielectric grease	B
161411	PLUG, shorting, IPS	C
1073027	CABLE, handgun, 4 meter extension	D
1077430	LANCE EXTENSION, 150 mm, Prodigy, generation II	E
1077431	LANCE EXTENSION, 300 mm, Prodigy, generation II	E
NOTE A: For operators with larger hands. Replaces standard pad. B: Carton of 12 3-cc dielectric grease applicators. C: Use for testing multiplier/resistor/electrode resistance. D: Do not add more than two extension cables to the gun cable. E: Instruction sheet 1080399, shipped with lance extensions, contains spare parts list for extensions.		

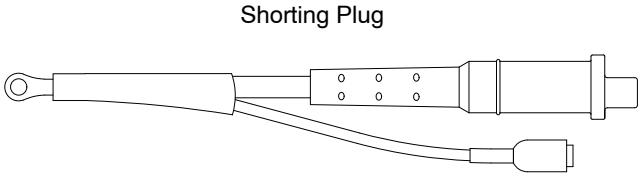


Figure 30 Options

Powder and Air Tubing

Powder and air tubing are not supplied with the spray gun.

Part	Description	Note
1081783	TUBING, powder, 8 mm x 6 mm, 100 ft.	
1080388	TUBING, powder, 8 mm x 6 mm, 500 ft.	
900742	TUBING, polyurethane, 6/4 mm, blue (Air)	
1062178	TUBING CUTTER, 12 mm or less	
1078006	ADAPTER, tube, barb, powder, Prodigy pump, generation II	

Conical Nozzles

Refer to Figure 32 for replaceable nozzle components.

Part	Description	Effective Pattern Size	Usage	Note
Plastic Nozzles for Organic and PE Powders				
1062223	KIT, nozzle, 70 degree, conical	4–6 inches (101–152 mm)	General use on manual or automatic guns	A
1062160	• NOZZLE, 70 degree, conical (shell)			B
1062166	KIT, nozzle, 100 degree, conical	6–8 inches (152–230 mm)	General use on manual or automatic guns	A
1062161	• NOZZLE, 100 degree, conical (shell)			B
1073819	KIT, nozzle, conical, 40 degree, conical	2–4 inches (51–102 mm)	Manual coating and touch-up	A
1073818	• NOZZLE, 40 degree, conical (shell)			B
Ceramic Nozzles for PE Powders Only				
1601098	KIT, nozzle, 70 degree, conical, TP/PE	4–6 inches (101–152 mm)	General use on manual or automatic guns	A
1601106	• NOZZLE, 70 degree, conical, TP/PE (shell)			B
1601099	KIT, nozzle, 100 degree, conical, TP/PE	6–8 inches (152–230 mm)	General use on manual or automatic guns	A
1601107	• NOZZLE, 100 degree, conical, TP/PE (shell)			B
1601097	KIT, nozzle, conical, 40 degree, conical, TP/PE	2–4 inches (51–102 mm)	Manual coating and touch-up	A
1601105	• NOZZLE, 40 degree, conical, TP/PE (shell)			B
NOTE A: Complete nozzle assembly B: Nozzle shell only. Does not include internal components.				

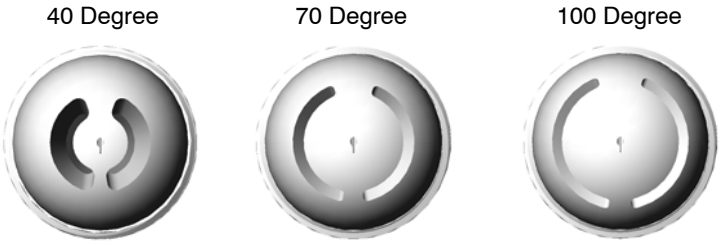


Figure 31 Conical Nozzles

Conical Nozzle Components

Refer to the spray guns parts list for the nozzle tool used to assemble and disassemble nozzles.

Item	Part	Description	Quantity	Note
1	940203	O-RING, silicone, 0.875 x 1.00 x 0.063 in.	1	
2	1047537	ELECTRODE ring	1	
3	940126	O-RING, silicone, 0.375 x 0.50 x 0.063 in.	1	
4	940163	O-RING, silicone, 0.625 x 0.75 x 0.063 in.	1	
5	1073625	INSERT, metric, conical/flat nozzles	1	
6	1073624	CONE, porous, nozzle	1	A
7	1062177	ELECTRODE, spring contact, 0.094 dia, Prodigy	1	
NOTE A: Also available in quantities of 10. Order kit 1073707.				

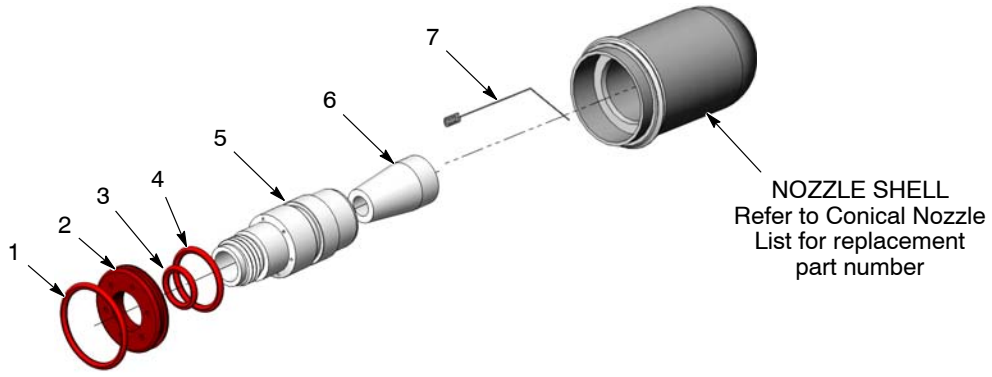


Figure 32 Conical Nozzle Components

Flat Spray and Cross Nozzles

Refer to Figure 34 for replaceable nozzle components.

Part	Description	Effective Pattern Size	Usage	Note
Plastic Nozzles for Organic and Porcelain Enamel Powders				
1073706	KIT, nozzle, flat spray, dual slot, 1 mm	8–10 inches (203–254 mm)	General use on manual or automatic guns	A
1073726	• KIT, nozzle, dual slot, shell w/electrode			B
1077584	NOZZLE assembly, cross, Prodigy, 4-slot, 60 degree	3–5 inches (76–127 mm)	Manual coating and touch-up	A
1077893	• NOZZLE, shell w/electrode, cross, Prodigy, 4-slot, 60 degree			B
1077585	NOZZLE assembly, cross, Prodigy, 4-slot, 90 degree	2–4 inches (51–102 mm)	Manual coating and touch-up	A
1077894	• NOZZLE, shell w/electrode, cross, Prodigy, 4-slot, 90 degree			B
1077586	NOZZLE assembly, cross, Prodigy, 6-slot, 60 degree	2–3 inches (51–76 mm)	Manual coating – deep recesses	A
1077895	• NOZZLE, shell w/electrode, cross, Prodigy, 6-slot, 60 degree			B
Ceramic Nozzles for Porcelain Enamel Powders Only				
1601096	KIT, nozzle, flat spray, dual slot, TP/PE	8–10 inches (203–254 mm)	General use on manual or automatic guns	A
1601104	• KIT, nozzle, dual slot, shell w/electrode, TP/PE			B

NOTE A: Complete nozzle assembly.
B: Nozzle shell with electrode only, does not include internal components.

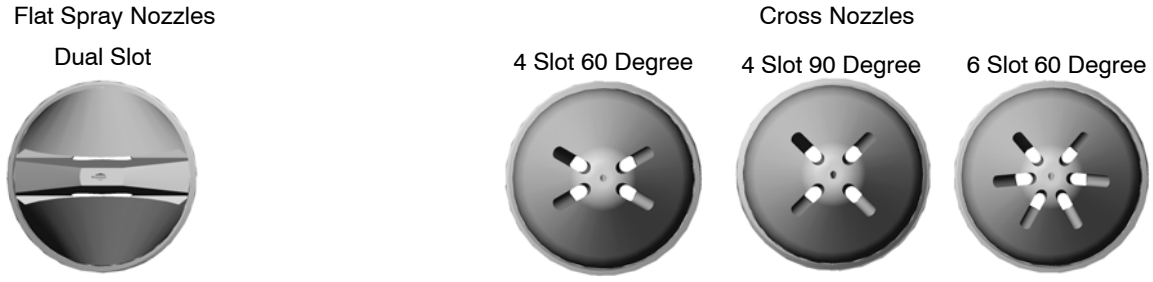


Figure 33 Flat Spray, Cross, and Pinpoint Nozzles

Flat Spray and Cross Nozzle Components

Refer to the spray guns parts list for the nozzle tool used to assemble and disassemble nozzles.

Item	Part	Description	Quantity	Note
–	—	• NOZZLE ASSEMBLIES	1	A
1	940203	• O-RING, silicone, 0.875 x 1.00 x 0.063 in.	1	
2	1047537	• ELECTRODE ring	1	
3	940126	• O-RING, silicone, 0.375 x 0.50 x 0.063 in.	1	
4	940163	• O-RING, silicone, 0.625 x 0.75 x 0.063 in.	1	
5	1073625	• INSERT, metric, conical/flat nozzles	1	
6	1073624	• CONE, porous, nozzle	1	B
7	—	• NOZZLE shell with electrode	1	A
NOTE A: Refer to Nozzle parts list on previous page for part numbers. B: Also available in quantities of 10. Order kit 1073707.				

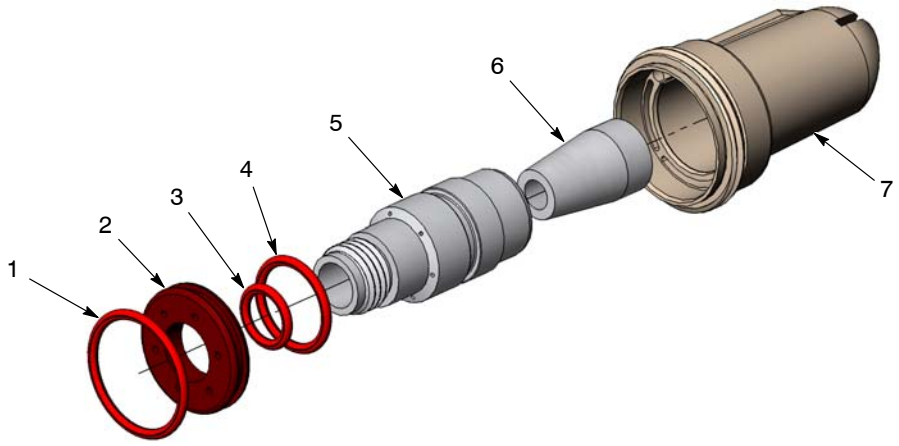


Figure 34 Flat Spray Nozzle Components

DECLARATION of CONFORMITY

Nordson Corporation
declare under our sole responsibility that the products

Prodigy Porcelain Enamel Automatic Powder Spray Applicator used with Prodigy iControl.

Prodigy Porcelain Enamel Manual Powder Spray Applicator used with the Prodigy Manual Gun Controller.

to which this declaration relates complies with the following Directives:

- Machinery Directive 89/37/EEC
- EMC Directive 2004/108/EEC
- Low Voltage Directive 2006/95/EC

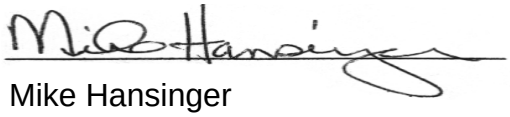
The conformity is under observance of the following standards or standards documents:

EN12100 EN1953 IEC60417	EN60079-0 EN50050 - Manual EN50177 - Automatic EN61241-1	EN61000-6-3 EN61000-6-2 EN55011 FM7260

Type of protection:
- 2 mJ, Type A, Ambient Temperature: 0 °C + 40 °C

- Porcelain Enamel powders are not flammable. The application of these powders does not create a potentially explosives atmosphere. These applicators do not fall under the ATEX Directive. The energy level of these applicators is at a safe level and is not a shock or fire hazard. Some of the standards listed are standards under the ATEX Directive. The equipment has been designed to meet these standards.

Quality Certificate
DNV=ISO9001



Date: 28 January 2009

Mike Hansinger
Manager Engineering Development
Industrial Coatings

Nordson