

# Encore<sup>®</sup> Automatic Porcelain Enamel HD Powder Spray Gun

Customer Product Manual

Part 1605438-05

Issued 07/25

**For parts and technical support, call the Industrial Coating  
Systems Customer Support Center at (800) 433-9319 or  
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Address all correspondence to:

Nordson Corporation  
Attn: Customer Service  
555 Jackson Street  
Amherst, OH 44001

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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 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.
- 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 SDS 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.

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.

## 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.

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## Section 2

# Description

The Encore<sup>®</sup> Automatic Porcelain Enamel (PE) HD Powder Spray Gun electrostatically charges and sprays porcelain enamel (frit) powder coatings. The guns are used with the Nordson Encore iControl<sup>®</sup> System or Encore HD manual controllers for robot applications, which provide electrostatic voltage control, electrode air-wash air, and powder pump air.

The gun is equipped with a 100 kV integral electrostatic power supply and electrode air-wash to prevent powder from collecting on the electrode. The guns have a straight-through powder path to minimize impact fusion.

A ceramic conical nozzle and a 38-mm deflector are shipped with the gun. Optional equipment includes:

- 8, 12, and 16-meter (26, 39, 52-ft) control cables
- 4-meter (13 ft) extension cable
- 4-ft (121 cm) fixed or articulating bar mounts
- Ion collector kit
- 4 and 6-mm flat spray nozzles
- 4 and 6-mm corner spray nozzles

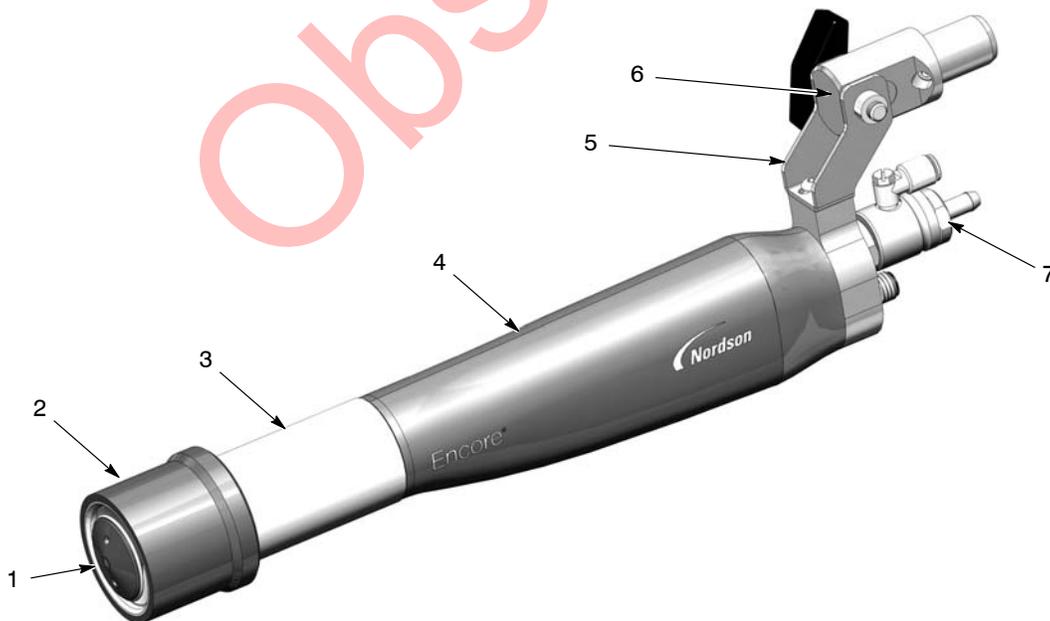


Figure 2-1 Encore Automatic PE HD Powder Spray Gun with Conical Nozzle

- |                             |                     |                        |
|-----------------------------|---------------------|------------------------|
| 1. Conical deflector        | 4. Gun body         | 6. Tube adapter        |
| 2. Conical pattern adjuster | 5. Mounting bracket | 7. Powder hose adapter |
| 3. Nozzle nut               |                     |                        |

## Specifications

Input Rating	Output Rating
+/- 19 VAC, +/-1 A (Peak)	100 KV, 100 $\mu$ A

- Air Quality: <5 $\mu$  particulates, dew point <10 °C (50 °F)
- Max Relative Humidity: 95% non-condensing
- Ambient Temperature Rating: +15 to +40 °C (59–104 °F)
- This applicator is used with porcelain enamel powders which are non-flammable.

## Dimensions and Weight

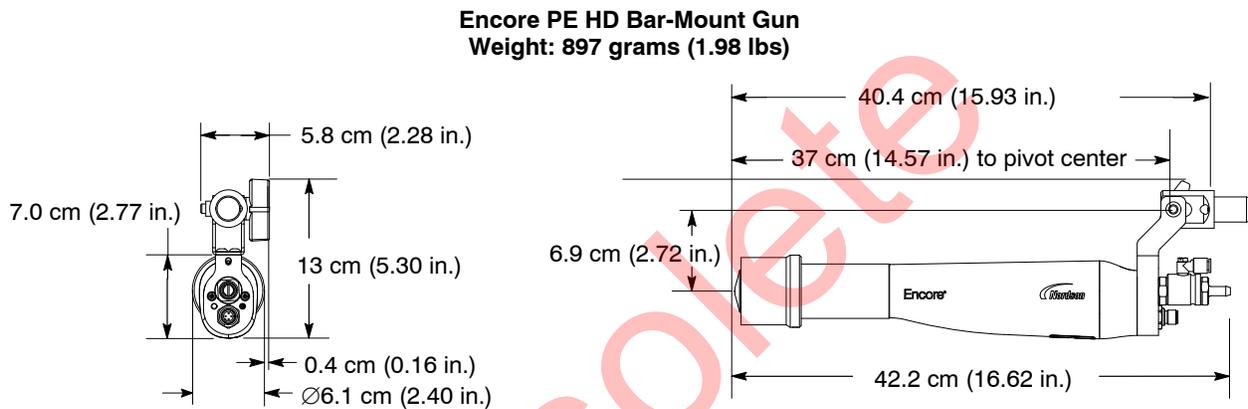


Figure 2-2 Gun Dimensions and Weight (with Conical Nozzle)

## Serial Number Label

**NOTE:** The gun serial number contains the location, year, and month it was manufactured. The serial number starts with “AA10A”. The “AA” indicates that the product was built in Amherst, Ohio. The “10” indicates the year 2010. The final letter “A” indicates the month of January, “B” would be February, and so on.

**ENCORE PE-HD**

P/N: XXXXXXXX      S/N: XYYYX00000

**MAX. OUTPUT: 100KV**      **U.S. PATENT**  
**Ta: +15°C TO +40°C**      **D712,013**        
**DISCHARGE ENERGY LEVEL 2mJ TYPE A-P**

**NORDSON CORPORATION, AMHERST, OHIO, U.S.A.**

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## *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.

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### Standard Articulated Bar Mount Kit

1. See Figure 3-1. Install the tube adapter (3) into the end of the adjusting rod (9) and secure it by tightening the set screw (10) with a 4-mm hex key.
  - To move the gun tip from side to side, loosen the right button screw (1).
  - To tilt the gun tip up or down, loosen the tilt knob (4).
  - To rotate the adjusting rod or slide the adjusting rod forward or back, loosen the locking handle (5).
2. Position the clamp (7) on a 1 inch mounting bar and tighten the clamp handle (6).
3. Bundle the powder hose, 4-mm clear electrode air-wash tubing, and gun cable together and secure them to the adjusting rod with Nordson Velcro straps. Connect them to the spray gun as shown in Figure 3-3.

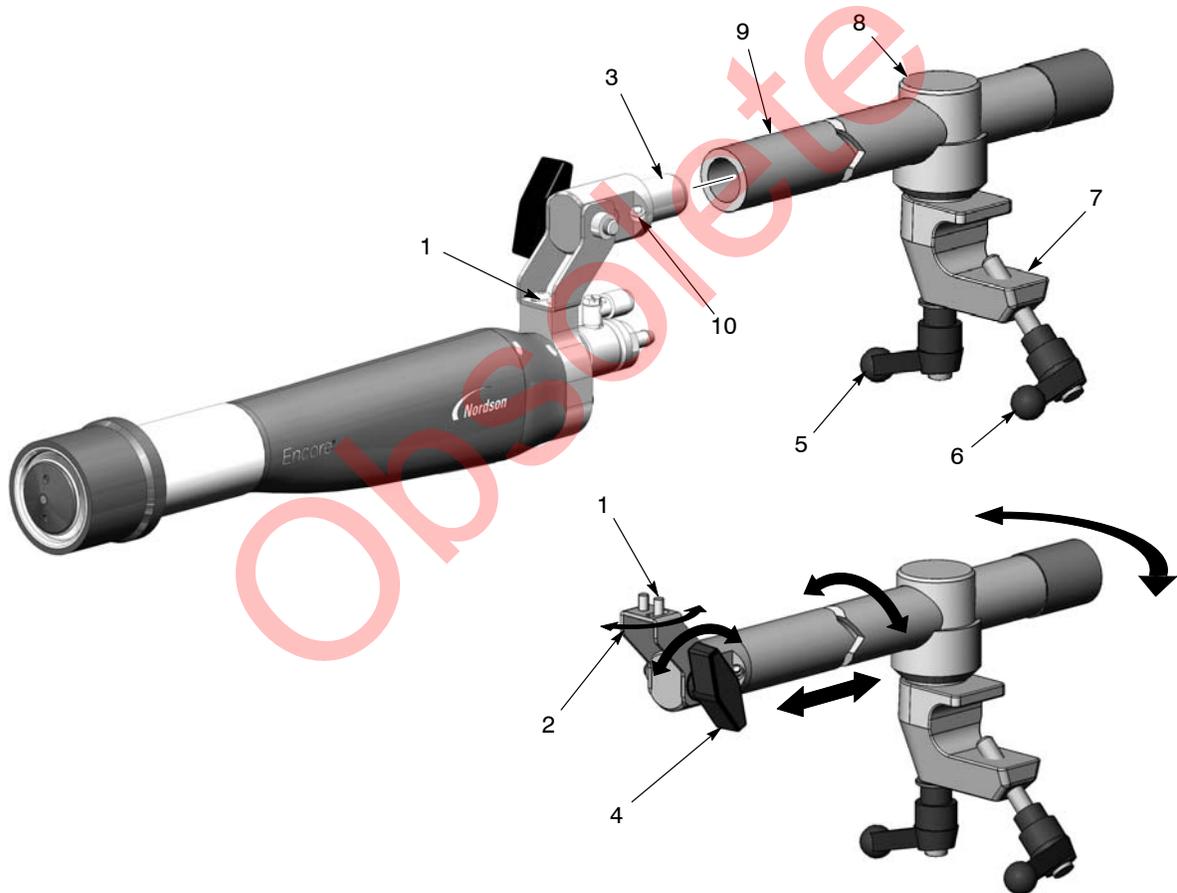


Figure 3-1 Standard Articulated Bar-Mount Gun Mounting

- |                  |                   |                  |
|------------------|-------------------|------------------|
| 1. Button screws | 5. Locking handle | 8. Locking body  |
| 2. Tilt bracket  | 6. Clamp handle   | 9. Adjusting rod |
| 3. Tube adapter  | 7. Clamp          | 10. Set screw    |
| 4. Tilt knob     |                   |                  |

## Optional Articulated and Fixed Gun Bar Mount Kits

See Figure 3-2. The optional bar mount kits have large inner diameter adjusting rods (1), through which the powder hose, air tubing, and gun cable can be routed. The tube adapter (2) shipped with the spray gun cannot be used with these kits. It must be exchanged for the tube adapter provided with the kits.

1. Unscrew and remove the knob and washer (5, 4) from the gun mounting bracket (3).
2. Remove the standard tube adapter (not shown) from the gun mounting bracket.
3. Slide the end of the optional tube adapter (2) into the gun mounting bracket and align the hole in the end of the tube adapter with the holes in the gun mounting bracket.
4. Install the knob and washer through the mounting bracket and tighten.
5. See Figure 3-3. Pull (in the following order) the gun cable, 4-mm clear electrode air-wash tubing, and powder hose through the end mounting tube and out the cutout. Connect them to the spray gun as shown in Figure 3-3.

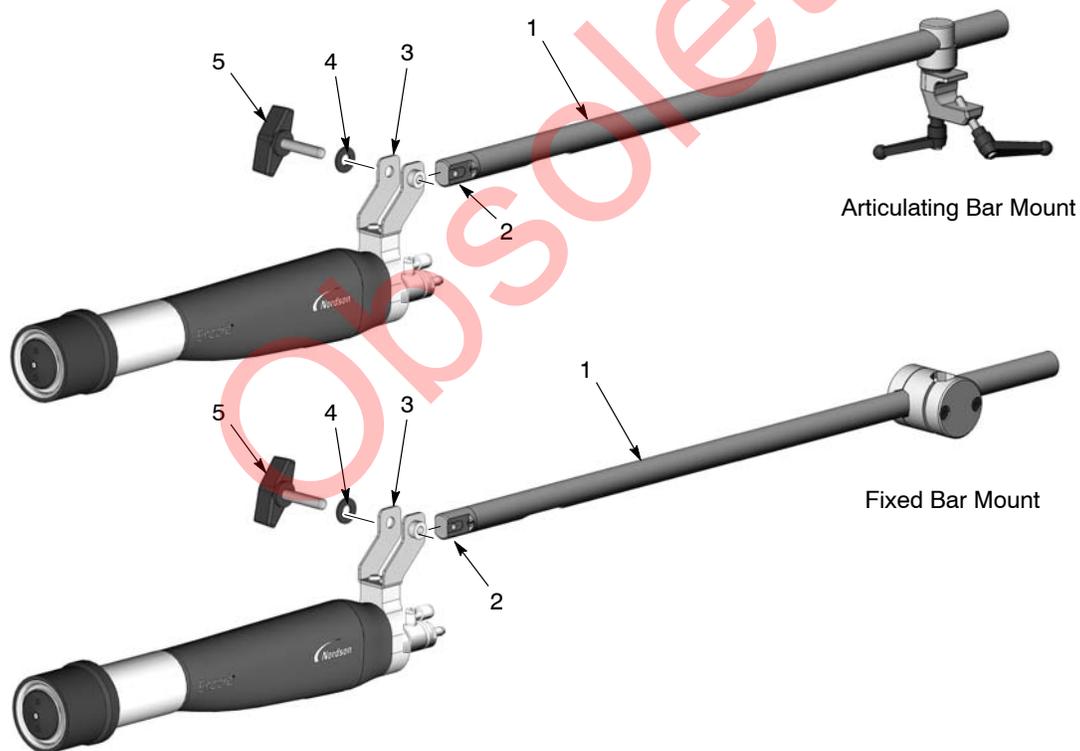


Figure 3-2 Optional Gun Bar Mount Kits

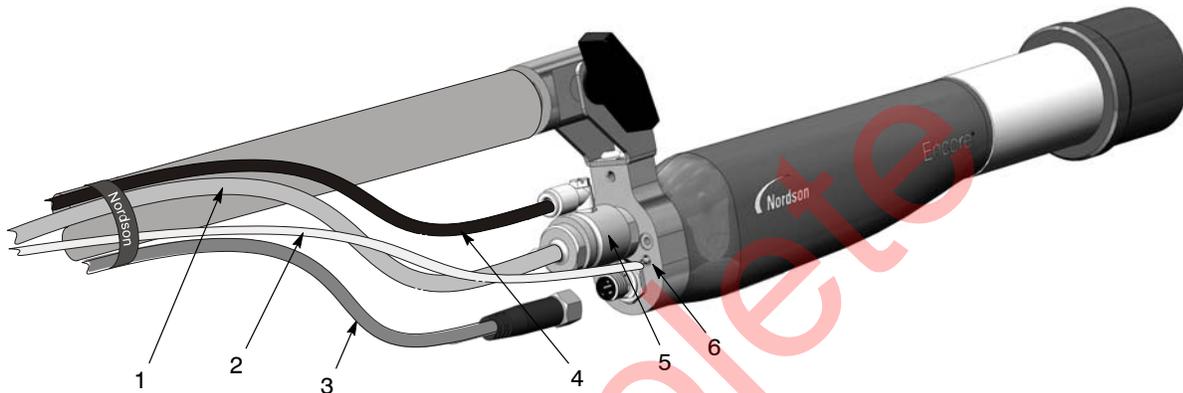
- |                  |                      |         |
|------------------|----------------------|---------|
| 1. Adjusting rod | 3. Bar mount bracket | 5. Knob |
| 2. Tube adapter  | 4. Washer            |         |

## Gun Connections

See Figure 3-3.

1. Connect the powder hose (1) to the hose adapter (5).
2. Connect the 4-mm clear electrode air-wash tubing (2) to the barbed fitting (6).
3. Connect the gun cable (3) to the receptacle and tighten the cable nut securely.
4. Connect the atomizing air tubing (4) to the atomizing air fitting, as shown.

### Standard Bar Mount Connections



### Optional Bar Mount Connections

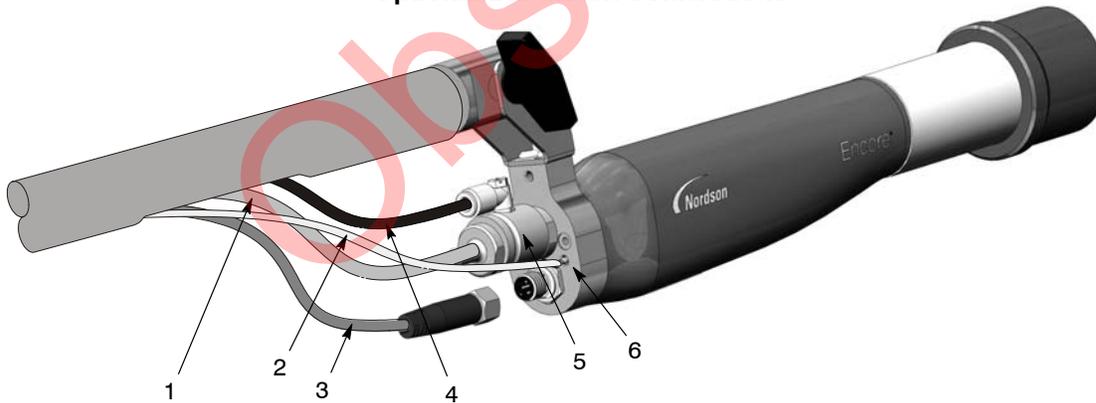


Figure 3-3 Gun Connections – Conical Nozzle Shown

- |                              |                         |                   |
|------------------------------|-------------------------|-------------------|
| 1. Powder hose               | 3. Gun cable            | 5. Hose adapter   |
| 2. Electrode air wash tubing | 4. Atomizing air tubing | 6. Barbed fitting |

## Optional Ion Collector Installation

The ion collector collects ions emitted from the gun's charging electrode instead of allowing them to deposit on the part. This reduces the rate of charge buildup in the powder deposited on the part, which may reduce defects in the cured coating such as pinholing and orange peel, and can improve the smoothness and appearance of cured powder coatings.

After installing the ion collector, adjust the collector rod position for best results as described in *Adjusting the Ion Collector Rod*.

1. See Figure 3-4. Install the mounting block (1) on the gun with the M5 lock washer and screw (2, 3).
2. Insert the collector rod (5) into the block and secure it with the M5 x 8 set screw (4) included in the ion collector kit.
3. Slide the multi-point tip (6) onto the nozzle nut and attach it to the collector rod with the M3 screw (7).

**NOTE:** Remove the pattern adjust sleeve from the conical nozzle before installing the multi-point tip.

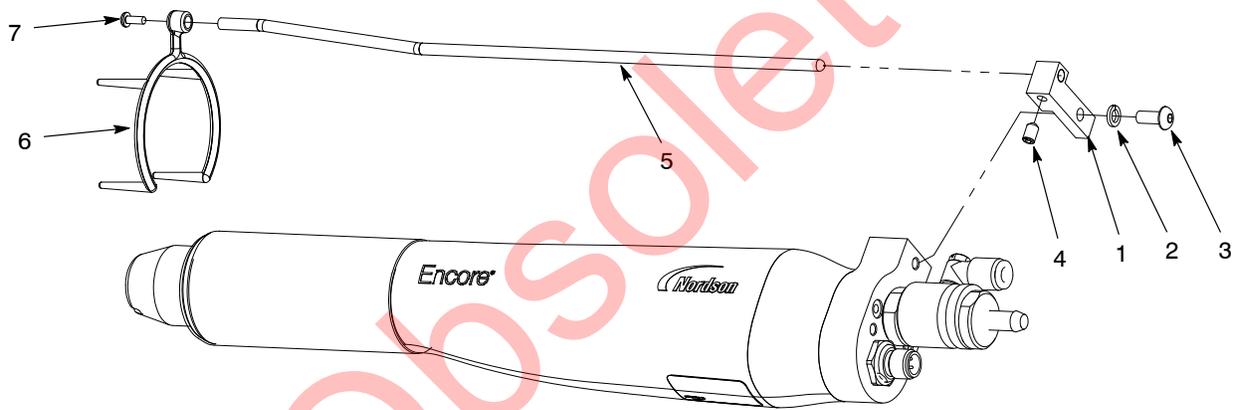


Figure 3-4 Ion Collector Installation – Flat Spray Nozzle Shown

- |                   |                     |                    |
|-------------------|---------------------|--------------------|
| 1. Mounting block | 4. M5 x 8 set screw | 6. Multi-point tip |
| 2. Lock washer    | 5. Collector rod    | 7. M3 screw        |
| 3. M5 screw       |                     |                    |

## Adjusting the Ion Collector Rod

Use this procedure to find the optimum position of the multi-point tip for the application.

**NOTE:** If the ion collector tips are too far away from the tip of the electrode, the ion collector will not collect any ions or improve the appearance of the cured coating.

**NOTE:** If the ion collector tips are too close to the tip of the electrode, powder particles may not be charged efficiently and the powder transfer efficiency may be reduced.

### Adjusting the Ion Collector Rod *(contd)*

1. Before installing the ion collector rod on the gun, coat several parts. Note the current ( $\mu\text{A}$ ) shown on the control unit display when coating the parts. Cure the coatings.
2. Install the ion collector kit on the gun.
3. See Figure 3-4. Loosen the set screw (4) and move the multi-point tip away from the front end of the gun.
4. Turn on the electrostatic voltage and spray powder with a part in front of the gun. Slide the rod forward until the current shown on the control unit display is 5 to 7  $\mu\text{A}$  higher than that displayed in step 1. Tighten the set screw.
5. Cure the coating on the test parts. Compare the surface finish on these parts with the finish on the parts coated in step 1 (before the ion collector kit was installed).
6. If the desired improvement in the surface finish has not been obtained, loosen the set screw and slide the rod forward approximately 1-in. Tighten the set screw.
7. Repeat this test procedure until the desired improvement in surface finish is obtained.

### Changing From Conical to Flat or Corner Spray Nozzle

See Figure 3-5. To change from the standard conical nozzle to a flat or corner spray nozzle, you will need to order:

- the nozzle desired (8)
- a new nozzle nut (4)
- a flat spray electrode holder kit (items 6, 9, and 10).

Refer to page 9-2 for optional nozzles, nozzle nut, and electrode holder kit.



**WARNING:** Turn off the spray gun and ground the electrode before performing this procedure. Failure to observe this warning could result in a severe electrical shock.



**CAUTION:** The deflector cap (1) and deflector (2) must be removed before removing the nozzle nut from the gun. If they are not removed first, the spring (item 2, Figure 7-5) in the electrode support will be damaged and will have to be replaced.

1. With your finger, hold the deflector (2) from turning while you unscrew the deflector cap (1).
2. Pull the deflector off the conical electrode holder (5).
3. Unscrew the nozzle nut (4) and remove it along with the pattern sleeve (3) and conical nozzle from the gun.
4. Remove the electrode support (7) and clean it with a blow gun.
5. Unscrew the conical electrode holder from the electrode support.

6. Insert the new electrode (6) into the flat electrode holder (10).
7. Screw the flat electrode holder into the electrode support.
8. Install the 6-mm ID x 20-mm long polyurethane wear sleeve (9) over the end of the flat electrode holder.
9. Install the flat spray or corner spray nozzle (8) into the new nozzle nut (4), then install the nozzle nut on the spray gun.

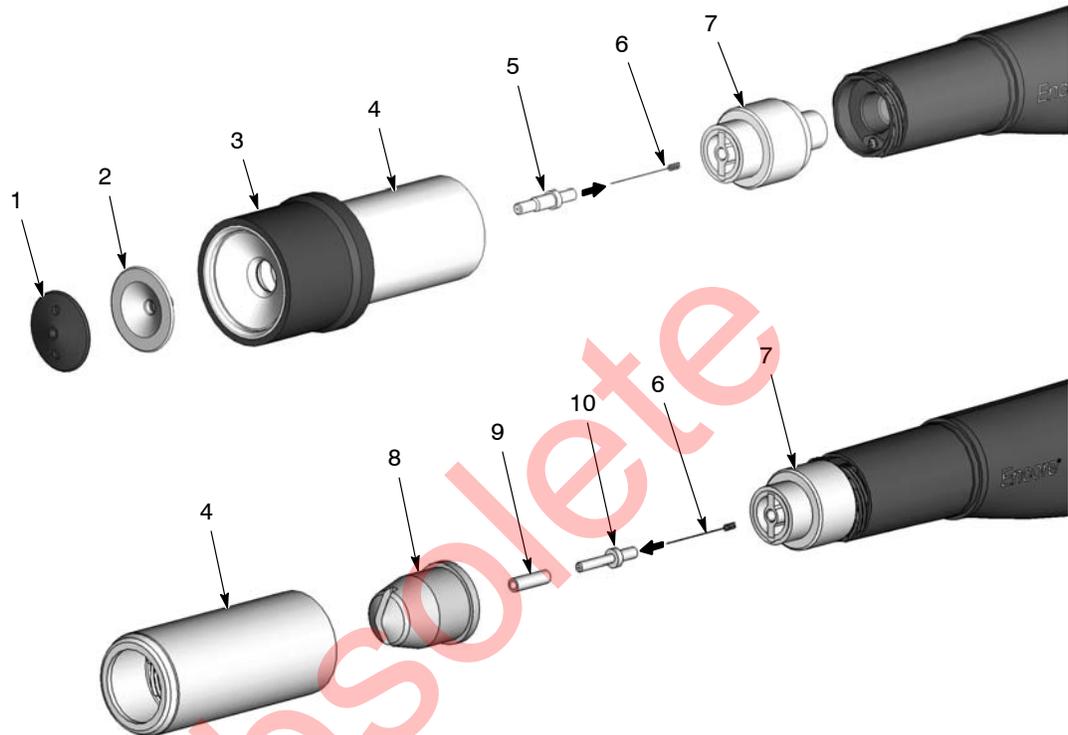


Figure 3-5 Changing From Conical to Flat or Corner Spray Nozzle

- |                   |                             |                           |
|-------------------|-----------------------------|---------------------------|
| 1. Deflector cap  | 5. Conical electrode holder | 8. Flat spray nozzle      |
| 2. Deflector      | 6. Electrode                | 9. Wear sleeve            |
| 3. Pattern sleeve | 7. Electrode support        | 10. Flat electrode holder |
| 4. Nozzle nut     |                             |                           |

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## 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.

Automatic and manual control of electrostatic output, air-wash air flow, and pump air flow, are provided by the Nordson iControl System or the Encore HD manual controllers for robot applications. Gun triggering and positioning are provided by the iControl System, a Nordson axis controller, or a PLC supplied either by Nordson or the customer. Refer to your controller manual for programming information and instructions.

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## Section 5

# Maintenance



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

### Daily Maintenance

**NOTE:** Depending on your application, you may not need to perform this procedure every day. If you regularly perform color changes with a powder feed center, the spray gun is purged internally each time a color change is performed. If this is the case, perform this procedure every 2–3 days.

1. Purge the spray guns, then shut them off.
2. See Figure 3-5. Remove the nozzle from the gun:  
**Conical Nozzle:** Unscrew the deflector cap (1), then remove the deflector (2). Unscrew the nozzle nut (4) and remove it along with the nozzle and pattern sleeve (3) from the gun.  
**Flat or Corner Spray Nozzle:** Unscrew the nozzle nut (4) and remove it along with the nozzle (8) from the gun.
3. Pull the electrode support (7) out of the gun.
4. Disconnect the powder hose from the gun.
5. Blow out the gun from the powder hose connector toward the front end.
6. If you are using a conical nozzle, pull the pattern sleeve (3) off the nozzle nut and nozzle. Clean all parts removed with a low-pressure blow gun. Wipe the parts with a clean, dry cloth.
7. Inspect the ceramic nozzles, pattern sleeve, and electrode support and holder for wear. Replace worn or damaged parts.
8. Check the hose adapter and powder tube inside the gun for wear and replace if worn or damaged.
9. Re-assemble the gun and return to service.

### Weekly Maintenance

Check the resistance of the power supply and electrode support assembly with a megohm meter, as described in the troubleshooting procedures. Replace the power supply, electrode support resistor, or both, if the resistance readings do not fall within the specified ranges. Refer to *Continuity and Resistance Checks* in the *Troubleshooting* section for more information.

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## 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.

These troubleshooting procedures cover only the most common problems. Refer to the *Encore iControl Hardware Manual* for control-related problems. If you cannot solve a problem with the information provided in these manuals, contact your local Nordson representative for help.

**NOTE:** iFlow<sup>®</sup> modules are used to control pump air flow. Refer to your iControl manuals for problems related to iFlow modules.

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## General Troubleshooting Chart

Problem	Possible Cause	Corrective Action
<b>1. Uneven pattern, unsteady or inadequate powder flow</b>	Blockage in spray gun, powder hose, or pump	<ol style="list-style-type: none"> <li>Purge the spray gun. Remove the nozzle and electrode support and clean them.</li> <li>Disconnect the powder hose from the spray gun and blow out the powder tube with an air gun.</li> <li>Disconnect the powder hose from the pump and gun and blow out the hose. Replace the hose if it is clogged with powder.</li> <li>Disassemble and clean the pump.</li> <li>Adjust pump assist air. See pump manual for more information.</li> </ol>
	Nozzle, deflector, or electrode support worn, affecting pattern	<p>Remove, clean, and inspect the nozzle, deflector, and electrode support. Replace worn parts as necessary.</p> <p>If excessive wear is a problem, reduce the flow and atomizing air.</p>
	Damp powder	Check the powder supply, air filters, and dryer. Replace the powder supply if contaminated.
	Low pump air flow/pressure	Adjust pump air flow/pressure.
	Improper fluidization of powder in feed hopper	<p>Increase the fluidizing air pressure.</p> <p>If the problem persists, remove the powder from the hopper. Clean or replace the fluidizing plate if contaminated.</p>
	iFlow module out of calibration	Perform the Re-Zero Procedure in the iControl hardware manual.
<b>2. Voids in powder pattern</b>	Worn nozzle or deflector	Remove and inspect the nozzle or deflector. Replace worn parts.
	Plugged electrode support or powder tube	Remove the electrode support and clean it. Remove powder tube if necessary and clean it.
	Electrode air-wash flow too high	Air-wash flow is controlled by a fixed orifice. Refer to your controller manual for more troubleshooting information.
<b>3. Loss of wrap, poor transfer efficiency</b>	Low electrostatic voltage	Increase the electrostatic voltage.

*Continued...*

Problem	Possible Cause	Corrective Action
	Poor electrode connection	Remove the nozzle and electrode support. Clean the electrode and check for carbon tracking or damage. Check the electrode support resistance as shown on page 6-5. If the electrode support is good, remove the gun power supply and check its resistance as shown on page 6-5.
	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.
<b>4. No kV output from the spray gun (display shows 0 kV when gun triggered), but powder is spraying</b>	Damaged gun cable	Perform the <i>Gun Cable Continuity Checks</i> on page 6-6. If an open or short is found, replace the cable.
	Spray gun power supply shorted	Perform the <i>Power Supply Resistance Test</i> on page 6-5.
<b>5. No kV output from the spray gun (interface shows kV output) but powder is spraying</b>	Spray gun power supply open	Perform the <i>Power Supply Resistance Test</i> on page 6-5.
	Damaged gun cable	Perform the <i>Gun Cable Continuity Test</i> on page 6-6. If an open or short is found, replace the cable.
<b>6. Powder build up on the electrode tip</b>	Insufficient electrode air-wash flow	Air-wash flow is controlled by a fixed orifice. Check the air-wash tubing, and check for flow at the output fitting when the gun is triggered on. Refer to your controller manual for more troubleshooting information.
<i>Continued...</i>		

Problem	Possible Cause	Corrective Action
<b>7. Low powder flow or powder flow surging</b>	Low supply air pressure	The iControl console and the Encore HD manual controller for robot applications both require air supply pressure to be greater than 5.86 bar (85 psi).
	iFlow module air pressure regulator set too low	Adjust the iControl regulator to 5.86 bar (85 psi). Refer to the iFlow Air Flow Verification Kit instruction sheet.
	Supply air filter plugged or filter bowl full – water contamination of flow controller	Remove bowl and drain water/dirt. Replace filter element if necessary. Clean system, replace components if necessary.
	Air tubing kinked or plugged	Check flow and atomizing air tubing for kinks.
	Pump not assembled correctly	Check and re-assemble pump.
	Pick-up tube blocked	Check for debris or bag (VBF units) blocking pick-up tube.
	Fluidizing air too high	If fluidizing air is set too high the ratio of powder to air will be too low.
	Fluidizing air too low	If fluidizing air is set too low the pump will not operate at peak efficiency.
	Powder hose plugged	Blow out powder hose with compressed air.
	Powder hose kinked	Checked for a kinked powder hose.
	Incorrect pump assist air setting	Adjust pump assist air. See pump manual for more information.
	Gun powder path plugged	Check hose connector, powder tube, and electrode support for impact fusion or debris. Clean as necessary with compressed air.
<b>8. No KV when gun is triggered ON, powder flow OK</b>	KV set to zero	Change KV to a positive value.
	Check the Alarm screen for messages.	Refer to your controller manual for troubleshooting procedures.
<b>9. No powder flow when gun is triggered ON, kV OK</b>	Input air turned OFF	Check the iControl console air supply.

### Power Supply Resistance Test

Use a megohm meter to check the resistance of the power supply, from the J2-3 feedback terminal at the connector to the contact pin inside the front end. The resistance should be between 280–320 megohms. If the reading is infinite, switch the meter probes. If the resistance falls outside this range, replace the power supply.

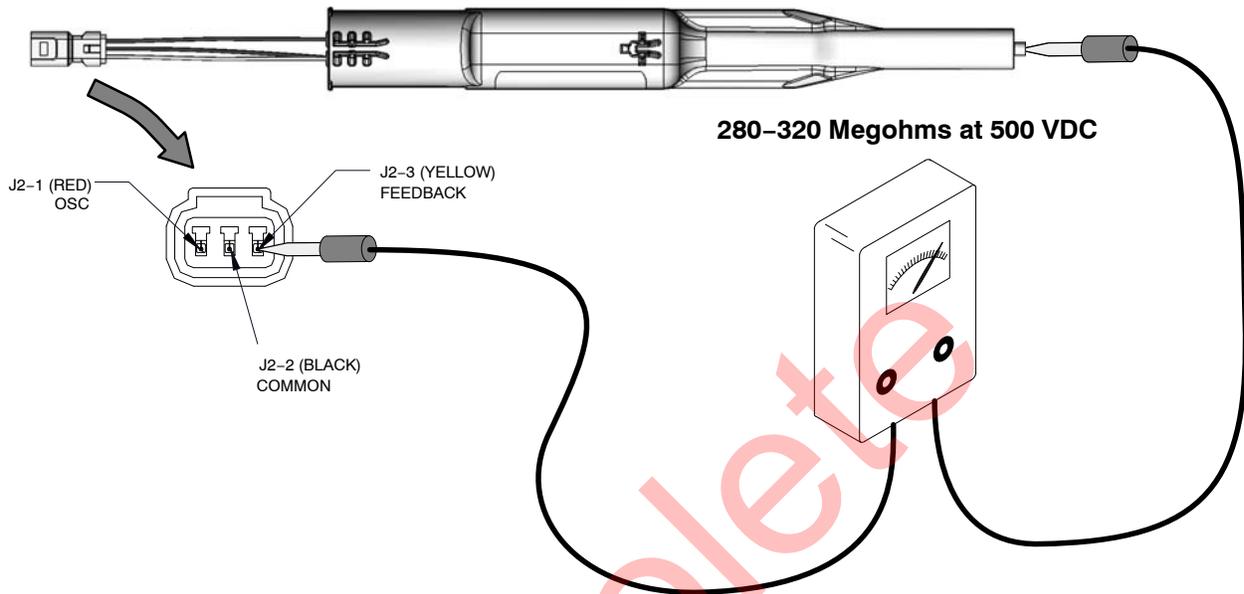


Figure 6-1 Power Supply Resistance Test

### Electrode Support Resistance Test

Use a megohm meter to measure the resistance of the electrode support assembly from the contact ring on the back to the electrode in the front. The resistance should be 19–21 megohms. If the resistance is out of this range repair or replace the electrode support assembly .

Refer to Electrode Support Repair on page 7-5 to repair the electrode support assembly.

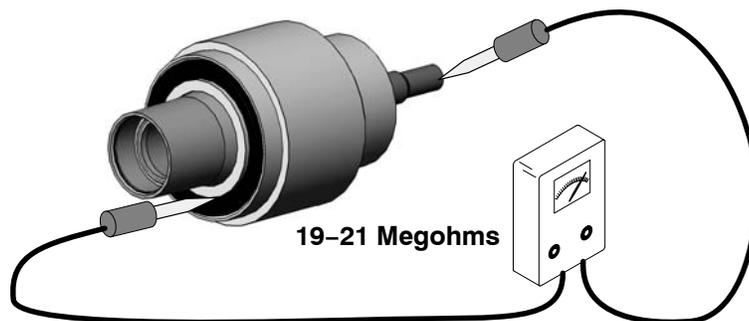


Figure 6-2 Electrode Support Resistance Test

## Cable Continuity Tests

Use a standard ohmmeter to check the gun cables and harness for continuity.

### Gun Receptacle Harness

This harness connects the power supply (voltage multiplier) to the gun cable.

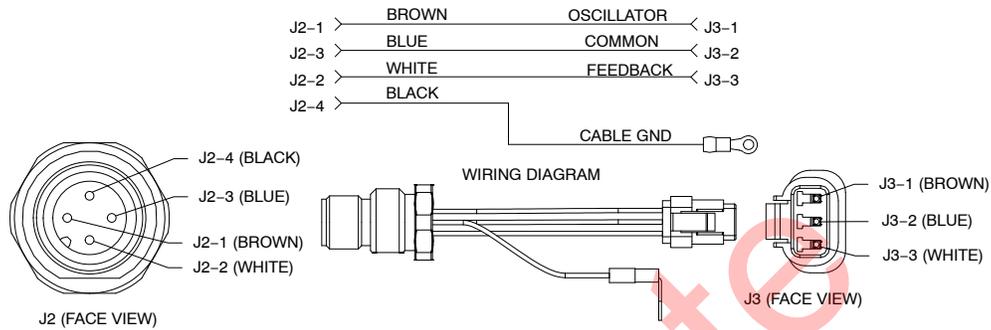


Figure 6-3 Gun Receptacle Harness

### Gun Extension Cable

This 4-meter cable is optional.

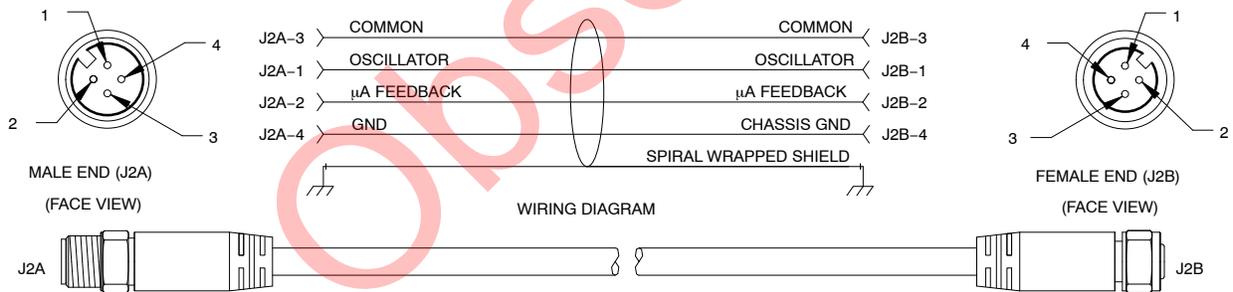


Figure 6-4 Gun Extension Cable

### Standard Gun Cables

These cables are available in 8, 12, and 16-meter (26, 39, 52 ft) lengths.

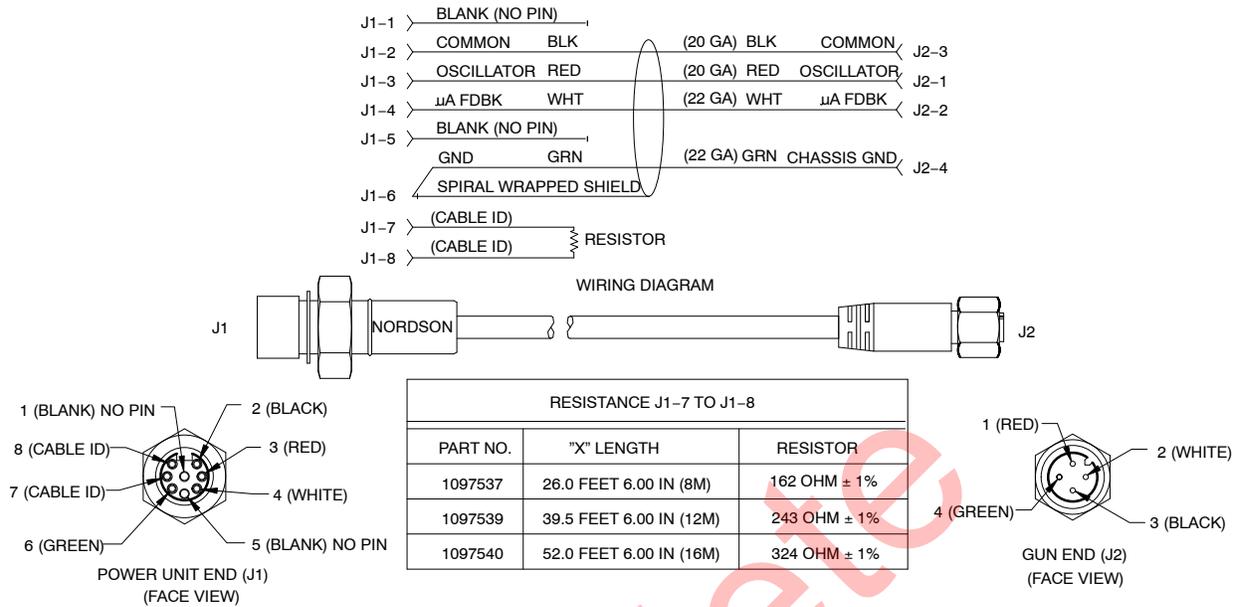


Figure 6-5 Gun Cable

Obsolete

## 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.

### Preparation

1. Shut off the electrostatic voltage and powder pump air at the controller. Purge the gun to blow any remaining powder out of the powder hose and gun.
2. Blow off the exterior of the gun, then disconnect the powder hose, gun cable, and air wash tubing from the gun.
3. Remove the gun from the mounting bar and move it to a clean workbench.

### Replacing the Powder Tube



**WARNING:** Wear protective gloves during this procedure.

1. Unscrew the hose adapter with powder tube (29) from the end cap (28) and pull it out of the spray gun. The powder tube should come out with the hose adapter.

**NOTE:** If the powder tube separates from the hose adapter fitting, carefully remove the tube from the end cap wearing protective gloves.

2. Insert the powder tube into the end cap and through the gun bodies, then thread the adapter into the end cap and tighten securely.

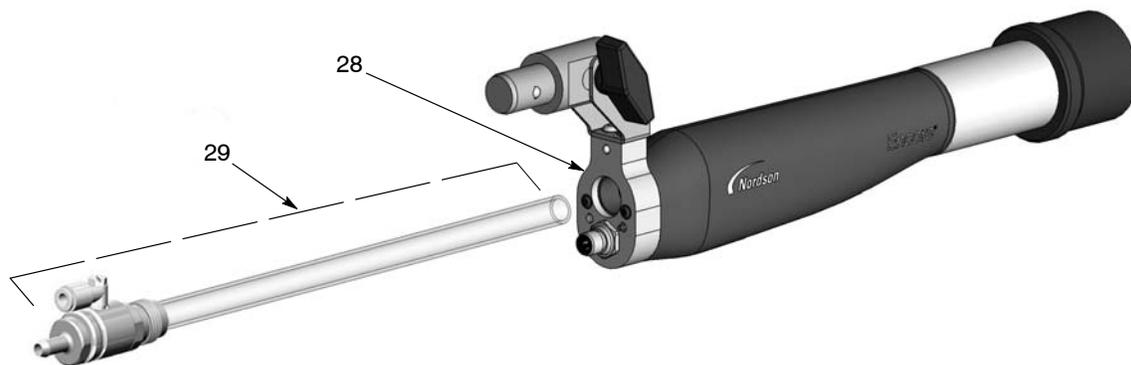


Figure 7-1 Powder Tube Replacement

29. Hose adapter with powder tube

28. End cap

## Replacing the Power Supply

1. Remove the nozzle and electrode support assembly as described on page 3-6. If using a conical nozzle, always remove the deflector cap and deflector first.
2. Remove the hose adapter and powder tube as described on page 7-1.
3. See Figure 7-2. Unscrew and remove the two socket-head screws (31) and internal-toothed lock washers (32) from the end cap (28).
4. Carefully separate the end cap/rear body assembly (27, 28) from the front body assembly.

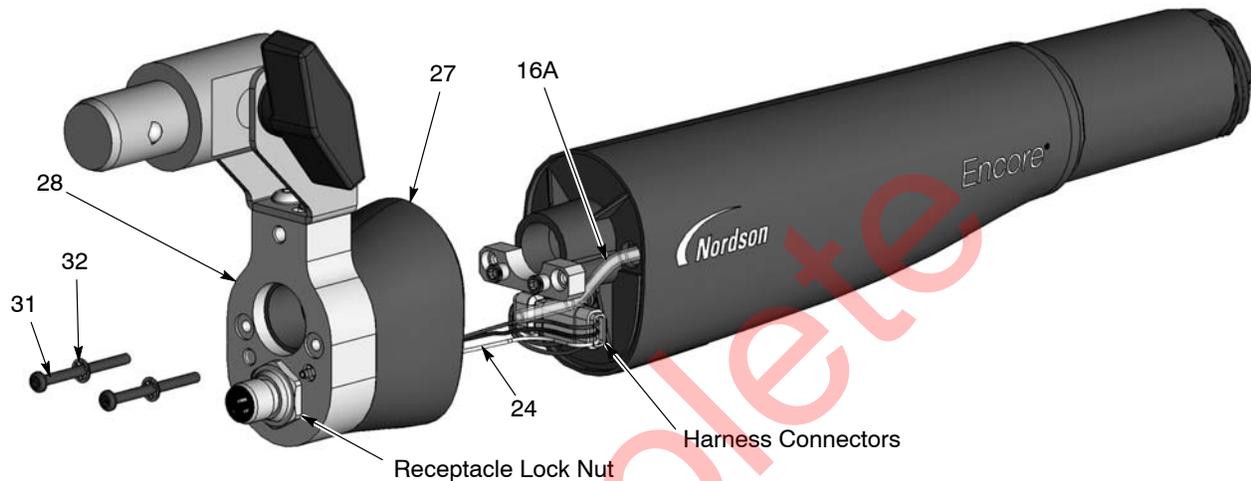


Figure 7-2 Gun Disassembly – Powder Tube Replacement

16A. Filter assembly  
24. Receptacle harness

27. Rear body  
28. End cap

31. Screws  
32. Lock washers

5. Insert a small flat-bladed screwdriver into the slot on the harness connectors and separate the receptacle harness (24) from the power supply harness.
6. See Figure 7-3. Disconnect the clear air wash tubing from the barbed fitting (23) inside the rear body.
7. **If replacing the cable receptacle, barbed fitting, or rear gun body:**
  - a. See Figure 7-3. Use a 4-mm hex wrench to remove the hex head screw (25) and washer (26), and disconnect the ground terminal.
  - b. Use a 1/4-in. deep well socket to unscrew the barbed fitting. Remove it and the lock washer from the end cap.
  - c. See Figure 7-2. Unscrew the lock nut from the receptacle, then remove the receptacle and harness from the end cap.
  - d. If replacing the rear gun body, separate the rear gun body from the end cap. Install the end cap on a new rear gun body.
  - e. Discard the nut that is included with the new barbed fitting, then with the lock washer installed on the fitting, install it through the rear gun body and thread it into the end cap. Tighten the fitting securely.

- f. Install a new receptacle into the end cap/rear gun body and secure it with the lock nut.
- g. See Figure 7-3. Connect the ground terminal to the end cap with the hex head screw and washer (25, 26).

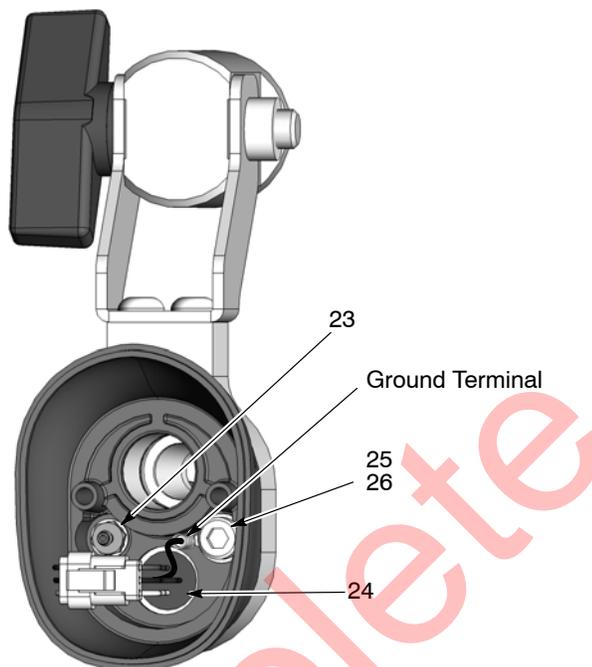


Figure 7-3 Gun Disassembly – Cable Receptacle and Barbed Fitting Replacement

- |                      |                 |
|----------------------|-----------------|
| 23. Barbed fitting   | 25. Screw       |
| 24. Cable receptacle | 26. Lock washer |

8. Carefully remove the two small 3-mm Allen nuts (21) holding the screw plate (20) against the bulkhead (19). Thread adhesive is used on the stud threads.
9. Remove the screw plate, then the bulkhead, from the gun body (16).
10. Slide the power supply (17) out of the gun body. Note how the ridges on the power supply and gun body act as locator guides.
11. If installing new air wash tubing and filter (filter assembly, 16A), pry the filter out of the front of the gun body and pull the tubing through the front. Install a new filter assembly in the gun body.
12. Install a new power supply into the gun body, making sure the locator guides mate properly, and press on the rear of the power supply to ensure it is seated against the contact in the front.
13. Check the bulkhead gasket (18). If it is damaged, remove it and replace it with a new one.

## Replacing the Power Supply (contd)

14. Install the bulkhead in the gun body, routing the power supply harness and air wash tubing through the appropriate holes.
15. Install the screw plate over the studs, apply a drop of Loctite 222 thread adhesive to each stud, then install the nuts on the studs and tighten them to 0.45 N•m (64 inch-ounces).
16. See Figure 7-3. Connect the air wash tubing to the barbed fitting, and the power supply harness to the cable receptacle harness.
17. See Figure 7-2. Install the end cap and rear gun body assembly on the gun body, making sure not to pinch the harness wires.
18. Install the two socket-head screws and lockwashers (31, 32) in the end cap and torque the screws to 0.55 N•m (79 inch-ounces).
19. See Figure 7-1. Install the powder tube (22) into the adapter (30) with a twisting motion to insert the tube past the internal O-ring until it is fully seated.
20. Insert the powder tube into the end cap and through the gun bodies, then thread the adapter into the end cap and tighten securely.

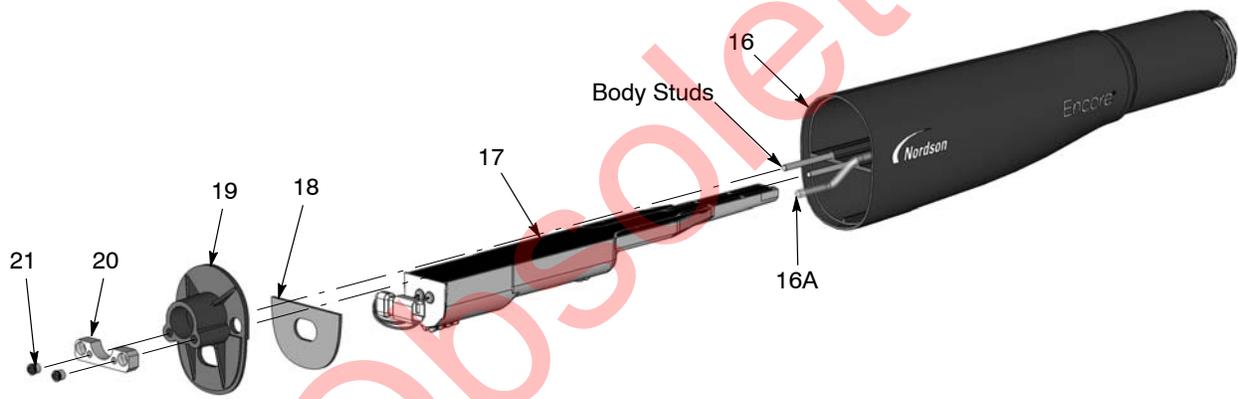


Figure 7-4 Gun Disassembly – Power Supply Replacement

- |                      |              |                 |
|----------------------|--------------|-----------------|
| 16. Body             | 18. Gasket   | 20. Screw plate |
| 16A. Filter assembly | 19. Bulkhead | 21. Nuts        |
| 17. Power supply     |              |                 |

## Electrode Support Sleeve Replacement

### Electrode Support Details:

- The electrode support consists of items 1–4 shown in Figure 7-5.
- The sleeve and spring (1, 2) are sold as a kit.
- The support assembly (3) contains a resistor. If the resistor fails, the entire assembly must be replaced.
- The electrode and electrode holder (10, 11) are sold separately. Conical and flat/corner spray nozzles use different electrode holders.

Before removing the sleeve from the support, make sure you have a replacement kit on hand. The spring will be damaged when the sleeve is pulled out of the support. The spring conducts the electrostatic voltage to the electrode.

1. Unscrew the electrode holder (10) and remove the electrode (11).
2. Pull the sleeve (1) out of the support (3).
3. Pull the spring (2) out of the sleeve and ceramic spider (4).
4. Pull the spider out of the sleeve. Inspect the spider and sleeve for wear and damage. Discard worn or damaged parts.
5. Install the spider into the keyways in the sleeve, aligning the holes in both.
6. Install a new spring into the holes in the sleeve and spider.
7. Carefully compress the spring, align the sleeve key and support keyway, and insert the sleeve into the support until the spring snaps into the hole inside the support.
8. Install the electrode into the electrode holder, then screw the electrode holder into the spider.

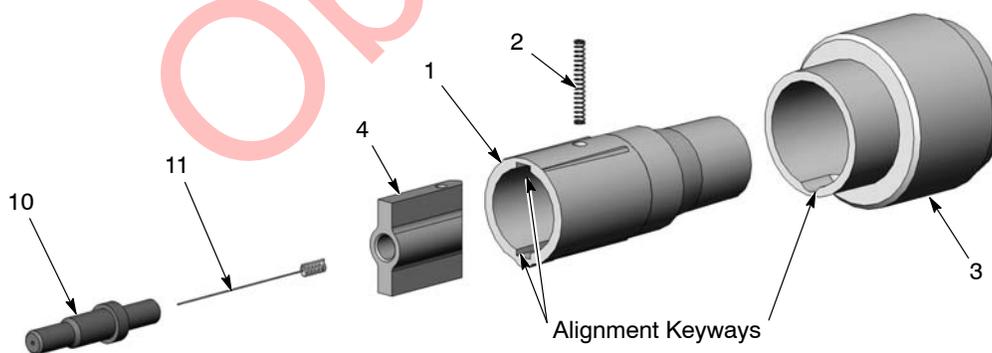


Figure 7-5 Electrode Support Sleeve Replacement

- |                       |                     |                      |
|-----------------------|---------------------|----------------------|
| 1. Sleeve             | 3. Support assembly | 10. Electrode holder |
| 2. Compression spring | 4. Spider           | 11. Electrode        |

Obsolete

## Section 8

# Parts

### Introduction

To order parts, call the Nordson Industrial Coating Systems Customer Support Center at (800) 433-9319 or contact your local Nordson representative.

### 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 Parts Illustration

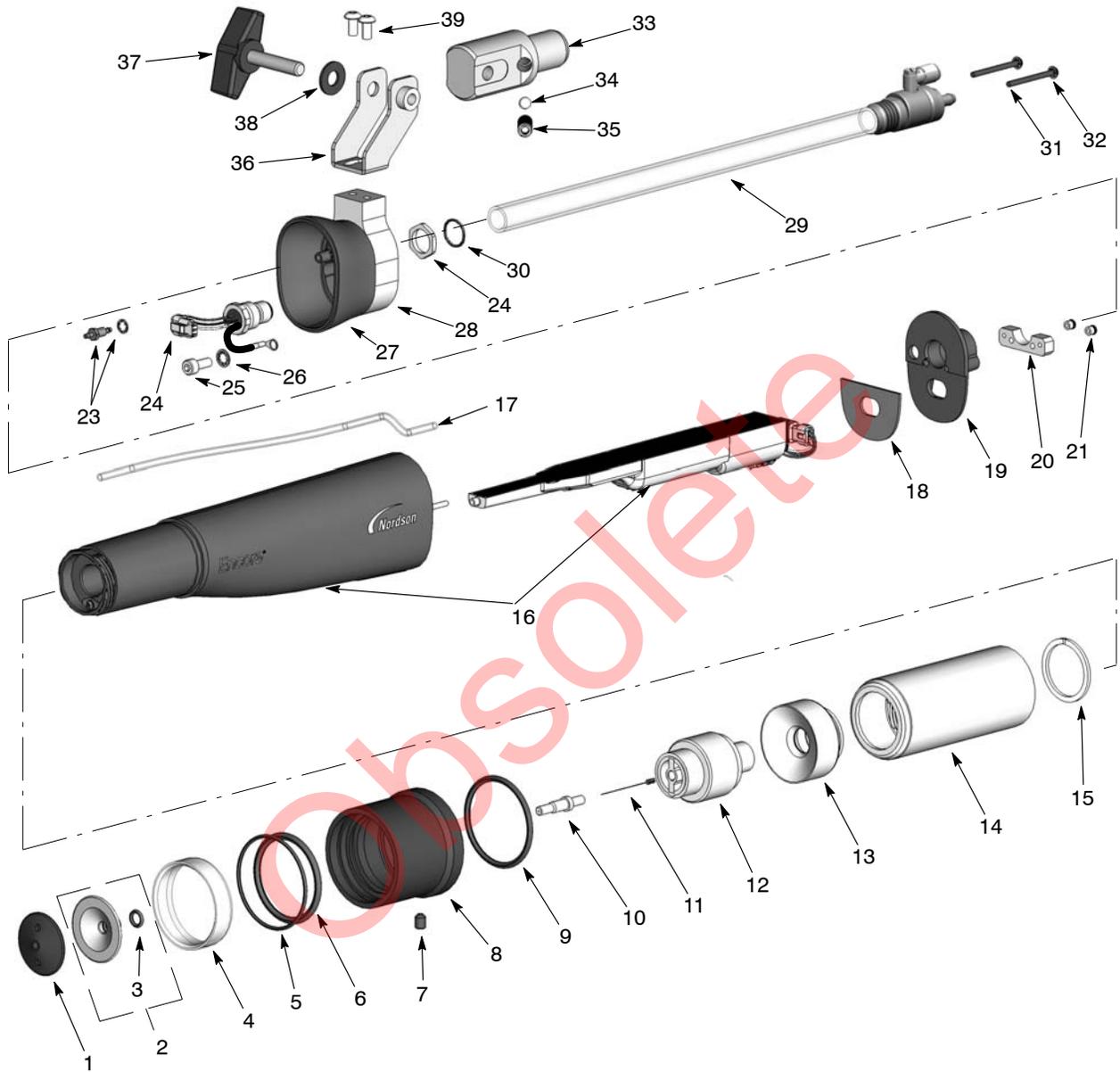


Figure 8-1 Spray Gun Parts

## Spray Gun Parts List

See Figure 8-1.

Item	Part	Description	Quantity	Note
–	1605440	SPRAY GUN, auto, bar mount, Encore PE HD	1	
1	1601811	• RETAINER, deflector, 38 mm, Encore PE HD	1	A
2	245523	• DEFLECTOR, 38 in. diameter, ceramic	1	A
3	945016	• • O-RING, silicone, 0.251, x 0.400 x 0.074 in.	1	A
4	246578	• INSERT, Pyrex	1	A
5	940331	• O-RING, silicone, 2.00 x 2.175 x 0.063 in.	1	A
6	942240	• O-RING, hotpaint, 1.75 x 2.00 x 0.125 in.	1	A
7	982455	• SCREW, set, M6 x 1.0 x 8, nylon, black	1	A
8	1601433	• SLEEVE, pattern shaper, Encore PE HD	1	A
9	1602039	• O-RING, Buna N, 46 x 3, 70 Duro	1	A
10	1601814	• HOLDER, electrode, conical, Encore PE HD	1	A
11	1602041	• ELECTRODE, spring contact, Encore PE HD	1	A
12	1601423	• SUPPORT ASSEMBLY, electrode, Encore PE HD	1	B
13	1601430	• NOZZLE, conical, ceramic, Encore PE HD	1	A
14	1601431	• NUT, nozzle, Encore PE HD	1	A
15	1601422	• RING, retaining, nozzle, Encore PE HD	1	A
16	1608279	• KIT, negative power supply/auto body, Encore	1	C
17	1088558	• • FILTER ASSEMBLY, handgun	1	
18	1088052	• GASKET, multiplier cover, handgun, Encore PE HD	1	
19	1097520	• BULKHEAD, body, front, auto, Encore PE HD	1	
20	1101381	• PLATE, screw	1	
21	1097522	• NUT, Allen, 4–40, stainless steel	2	
23	1081616	• FITTING, bulkhead, barb, dual, 10–32 x 4 mm	1	
24	1097514	• RECEPTACLE, gun harness	1	
25	815666	• SCREW, socket, M5 x 0.8 x 12, zinc	1	
26	983127	• WASHER, lock, internal, M5, zinc	1	
27	1097518	• BODY, gun rear, auto, Encore PE HD	1	
28	1601420	• CAP, end, bar gun, Encore PE HD	1	
29	1608284	• KIT, external diffuser with tube, Encore PE HD	1	
30	940160	• • O-RING, hotpaint, 0.625 x 0.75 x 0.063 in.	1	
31	1605696	• SCREW, skt head, M3 x 35 mm	2	
32	983520	• WASHER, lock, internal, M3, steel, zinc	2	
33	1097546	• ADAPTER, tube, mount, bar	1	
34	1097545	• BALL, chrome steel, 6.5 mm diameter, 25, C63	1	
35	345385	• SCREW, set, flat, M8 x 20, fastener	1	
36	1097542	• BRACKET, mount, bar	1	
37	1102293	• KNOB, T-handle, 5/16–18 x 1.5	1	
38	1102294	• WASHER, flat, 0.34 x 0.74 x 0.06, nylon	1	
39	982503	• SCREW, button, socket, M5 x 10, zinc	1	
NS	939247	• CLAMP, hose, Snap-It	1	
<p>NOTE A: Refer to Optional Nozzles on page 9-2 for flat and corner spray nozzles. Conical and flat/corner spray nozzles use different electrode holders and a new nozzle nut is also required.</p> <p>B: Refer to Figure 8-4 and parts list for repair parts for the electrode support assembly.</p> <p>C: Application Specific: Order part number 1609053 if a positive power supply is needed. The positive power supply is sold separately from the gun body (1098453).</p>				

## External Diffuser Kit

### External Diffuser with Tube Kit

See Figure 8-2.

Item	Part	Description	Quantity	Note
-	1608284	KIT, external diffuser with tube, Encore PE HD	1	
1	1605432	<ul style="list-style-type: none"> <li>ADAPTER ASSY, external diffuser, Encore PE HD</li> </ul>	1	A

NOTE A: See Figure 8-3.

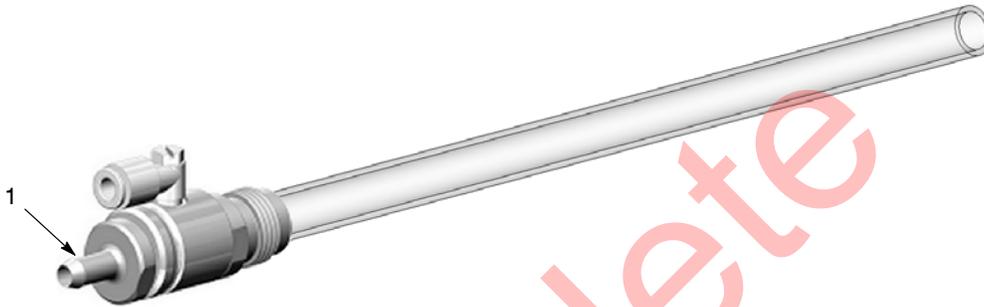


Figure 8-2 External Diffuser with Tube Kit

### Adapter Assembly Kit

See Figure 8-3.

Item	Part	Description	Quantity	Note
-	1605432	KIT, adapter assembly, external diffuser, Encore PE HD	1	
1	-----	<ul style="list-style-type: none"> <li>Adapter, Encore PE HD</li> </ul>	1	
2	940117	<ul style="list-style-type: none"> <li>O-RING, silicone, 0.312 x 0.438 x 0.063</li> </ul>	1	

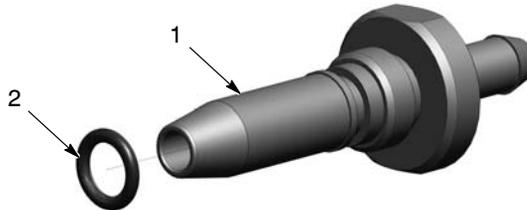


Figure 8-3 Adapter Assembly Kit

## Electrode Support Repair Parts

See Figure 8-4.

Item	Part	Description	Quantity	Note
-	1601423	SUPPORT ASSEMBLY, electrode, Encore PE HD	1	
1	1602193	• KIT, sleeve, Encore PE HD	1	
2	1601429	• • SPRING, compression, 0.088 OD x 0.75 long	1	
3	1602192	• KIT, electrode support, Encore PE HD	1	
4	1601428	• SPIDER, ceramic, Encore PE HD	1	

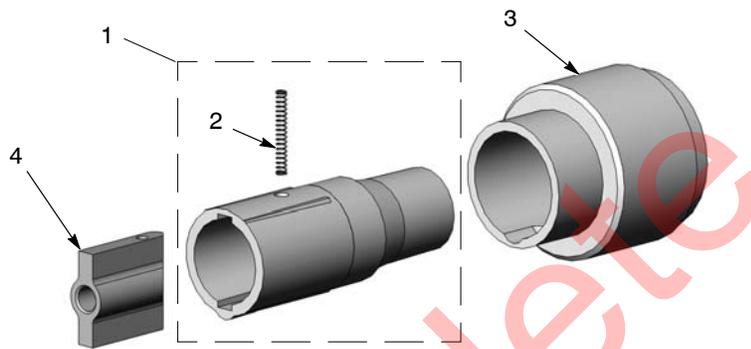


Figure 8-4 Electrode Support Repair Parts

Obsolete

## Section 9

# Options

### Cables

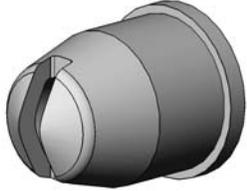
These cables connect the spray gun to the gun controller (Encore iControl Integrated Control Unit or Encore PE HD Automatic Controller).

Part	Description	Note
1097537	CABLE, auto, Encore, 8 meter (26.25 ft)	
1097539	CABLE, auto, Encore, 12 meter (39.4 ft)	
1097540	CABLE, auto, Encore, 16 meter (52.5 ft)	
1601344	CABLE, extension, Encore auto, 4 meter (13.1 ft)	A
NOTE A: Use between spray gun and 8, 12, or 16 meter cable.		

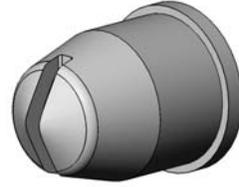
### Optional Flat and Corner Spray Nozzles

Spray guns are shipped with a conical nozzle. If replacing the conical nozzle with an optional flat or corner spray nozzle, order a new nozzle nut and flat spray electrode holder kit along with a nozzle.

**1601744**  
**6 mm Flat Spray Nozzle**



**1601745**  
**4 mm Flat Spray Nozzle**



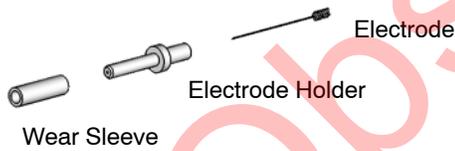
**1601748**  
**6 mm Corner Spray Nozzle**



**1601749**  
**4 mm Corner Spray Nozzle**



**1602194**  
**Flat Spray Electrode Holder Kit**



**1601431**  
**Nozzle Nut**

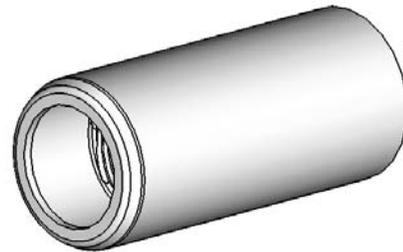


Figure 9-1 Optional Flat and Corner Spray Nozzles

## Standard Articulating Gun Bar

This gun bar is used with the tube adapter shipped with the spray gun. It clamps onto 1-in. diameter mounting bars.

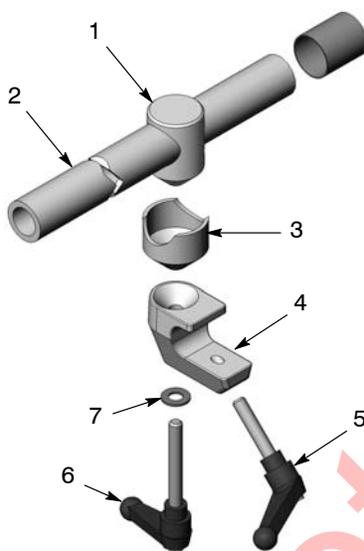


Figure 9-2 Standard Articulating Gun Bar

Item	Part	Description	Quantity	Note
-	341727	GUN BAR, aluminum, 1.25-in. OD x 4 ft., assembly	1	
1	327732	• BODY, locking, 1.25 in. diameter	1	
2	327704	• ROD, adjusting, aluminum, 1.25 in. OD x 4 ft	1	
3	327733	• SLEEVE, locking, 1.25 in. diameter	1	
4	248669	• BODY, adjust mounting	1	
5	248957	• HANDLE, adjust, $\frac{3}{8}$ -16 x 1.77 in.	1	
6	249074	• HANDLE, adjust, $\frac{3}{8}$ -16 x 2.75 in.	1	
7	983061	• WASHER, flat, 0.406 x 0.812 x 0.065 in., zinc	1	

### Optional Articulating Gun Bar

This gun bar allows the powder hose, air tubing, and gun cable to be routed through the adjusting rod to the rear of the gun. It includes a tube adapter that replaces the standard tube adapter shipped with the spray gun.

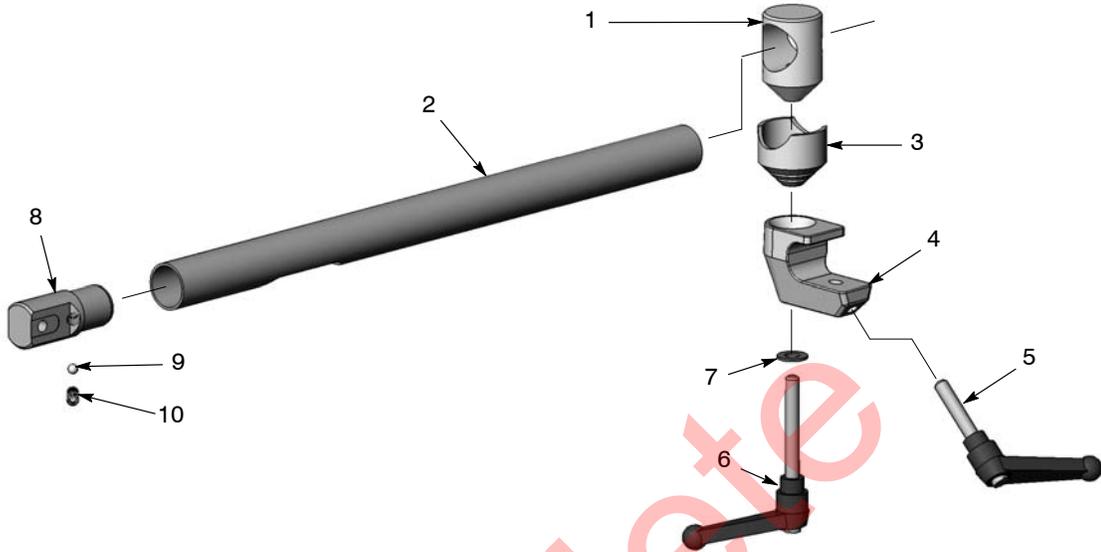


Figure 9-3 Optional Articulating Gun Bar

Item	Part	Description	Quantity	Note
-	1601743	KIT, articulating bar mount, 4 ft., Encore PE HD	1	
1	327732	• BODY, locking, 1.25 in. diameter	1	
2	1601444	• ROD, adjusting, stainless steel, 1.25 in. OD x 4 ft	1	
3	327733	• SLEEVE, locking, 1.25 in. diameter	1	
4	248669	• BODY, adjust mounting	1	
5	248957	• HANDLE, adjust, $\frac{3}{8}$ -16 x 1.77 in.	1	
6	249074	• HANDLE, adjust, $\frac{3}{8}$ -16 x 2.75 in.	1	
7	983061	• WASHER, flat, 0.406 x 0.812 x 0.065 in., zinc	1	
8	1601432	• ADAPTER, tube, mount, bar, Encore PE HD	1	
9	1097545	• BALL, chrome steel, 6.5 mm dia., 25, C63	1	
10	345385	• SCREW, set, flat, M8 x 20, fastener	1	

## Optional Fixed Gun Bar

This gun bar allows the powder hose, air tubing, and gun cable to be routed through the adjusting rod to the rear of the gun. It includes a tube adapter that replaces the standard tube adapter shipped with the spray gun.

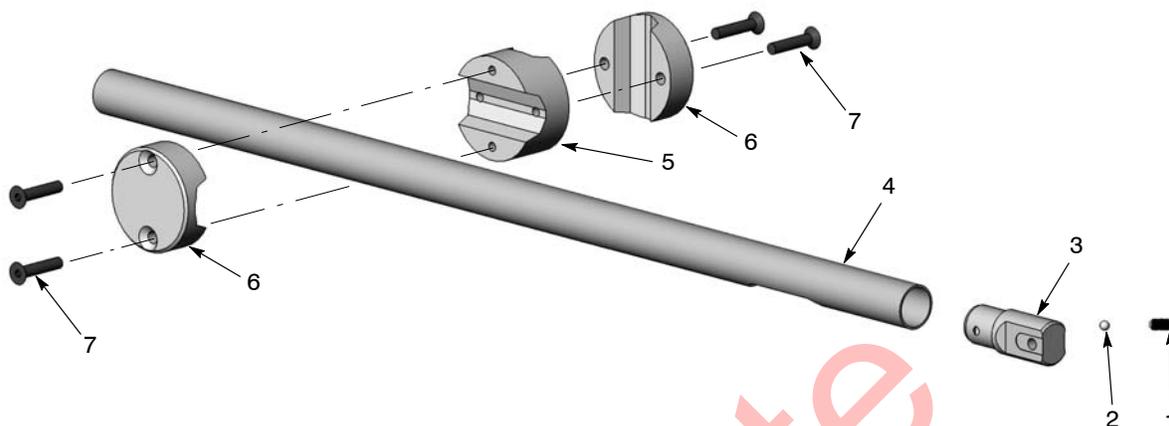


Figure 9-4 Optional Fixed Gun Bar

Item	Part	Description	Quantity	Note
-	1601742	KIT, universal, bar mount, 4 ft., Encore PE HD	1	
1	345385	• SCREW, set, flat, M8 x 20, fastener	1	
2	1097545	• BALL, chrome steel, 6.5 mm dia., 25, C63	1	
3	1601432	• ADAPTER, tube, mount, bar, Encore PE HD	1	
4	1601444	• ROD, adjusting, stainless steel, 1.25 in. OD x 4 ft	1	
5	1103254	• CLAMP, bar, transition, universal	1	
6	1103253	• CAP, clamp, bar, universal	2	
7	1103423	• SCREW, flat, socket, M8 x 40, steel, black oxide	4	

### Optional Ion Collector Kit

Refer to page 3-5 or the instruction sheet supplied with the ion collector kit for installation and adjustment instructions.

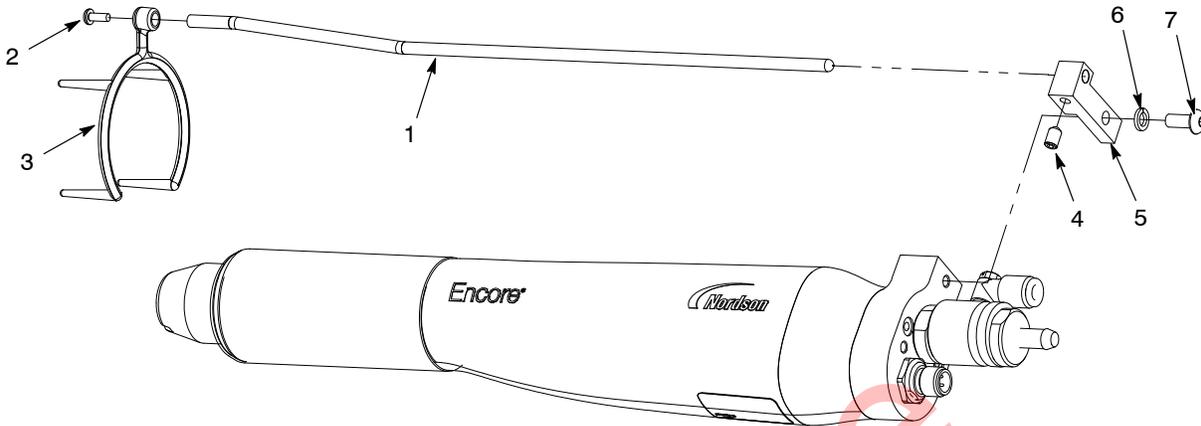


Figure 9-5 Ion Collector Kit

Item	Part	Description	Quantity	Note
-	1602227	KIT, collector, ion, Encore PE HD	1	
1	-----	• ROD, ion collector, offset	1	
2	982017	• SCREW, pan, rec, M3 x 8, zinc	1	
3	-----	• TIP, ion collector, multi-point	1	
4	1097543	• SCREW, set, nylon tip, M5 x 8, black	1	
5	-----	• BLOCK, ion collector, Encore PE HD	1	
6	983401	• WASHER, lock, split, M5, steel, zinc	1	
7	982636	• SCREW, button, socket, M5 x 12, zinc	1	

# DECLARATION of Conformity

## Product: Encore Porcelain Enamel Automatic Applicator

**Models:** Encore PE – HD Auto Applicators for use with Encore HD iControl. OR in Robot applications, the Encore PE – HD Auto Applicator can be used with an Encore HD / XT Manual Interface and its associated Powder Supply cabinet.

**Description:** This is an automatic electrostatic powder spray system, including applicators, control cables and associated controllers used for spraying porcelain enamel powders. The porcelain enamel powders are non-flammable. The spray area is classified as non-hazardous.

### Applicable Directives:

2006/42/EC - Machinery Directive  
2014/30/EU - EMC Directive  
2014/36/EU - Low Voltage Directive

### Standards Used for Compliance:

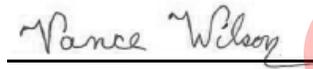
EN/ISO12100 (2010)	EN61000-6-3 (2007)
EN1953 (2009)	EN61000-6-2 (2005)
EN60204 (2006)	EN55011 (2009)
EN50177 (2009)	

### Principles:

This product has been manufactured according to good engineering practice. The product specified conforms to the directive and standards described above.

Applicator energy level is less than 2mJ, Type A-P, per EN50177

DNV - ISO 9001 CERT



Vance Wilson  
**Engineering Manager**  
**Industrial Coating Systems**

Date: 16 Aug 2016

### 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



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