

Versa-Spray® II IPS Electrostatic Manual Powder Spray Gun

Customer Product Manual

Part 107017J

Issued 5/06

**For parts and technical support, call the Industrial Coating
Systems Customer Support Center at (800) 433-9319 or
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Section 1

Safety

Introduction

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

Make sure all equipment documentation, including these instructions, is accessible to all persons operating or servicing equipment.

Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

Intended Use

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

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

Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing any moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Provide adequate ventilation to prevent dangerous concentrations of volatile materials or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits while working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Grounding



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

Grounding inside and around the booth openings must comply with NFPA requirements for Class 2, 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.

Safety Labels

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

Table 1-1 Safety Label

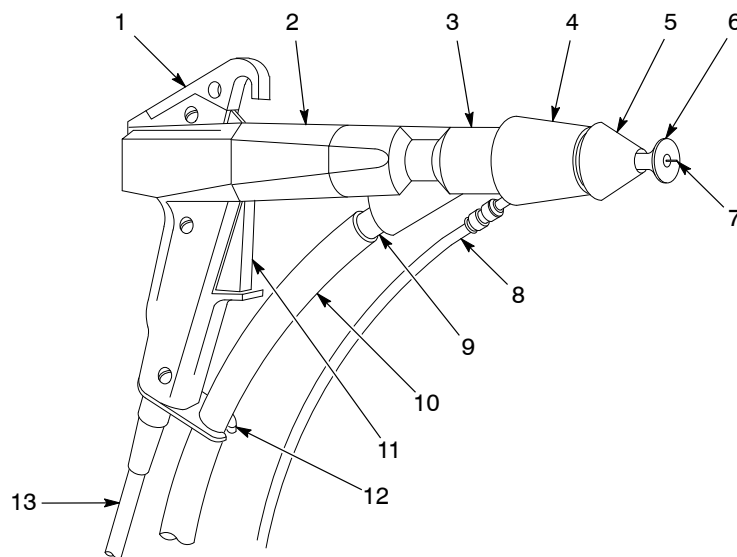
Item	Part	Description
1.	244664	<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="margin-bottom: 10px;">  <p>WARNING: The following procedures <u>MUST</u> be followed when working with this electrostatic spray equipment. Failure to follow these instructions may result in a fire and/or serious personal injury. Display this warning on the spray booth.</p> </div> <div style="margin-bottom: 10px;">  <ol style="list-style-type: none"> 1. NO SMOKING. Keep open flames, hot surfaces, and sparks from torches or grinding away from booth. 2. Turn the electrostatic power unit <u>off</u> when the spray gun is not in use. 3. Shut down immediately in event of fire. 4. Maintain ground circuit on all conductive objects below 1 meg ohm to prevent sparking. (ANSI/NFPA 33, Chapter 9, or local codes) 5. Shut down operation and correct grounds if sparking occurs. 6. Install fixed fire suppression system in accordance with ANSI/NFPA 33, Chapter 7 (or local codes), before operating with combustible powder. 7. Install automatic flame detectors in accordance with ANSI/NFPA 33, Chapter 7 (or local codes), before operating automatic guns. 8. Examine all equipment at the beginning of each work period and repair or replace any damaged, loose, or missing parts. 9. Before cleaning or performing any maintenance on the electrostatic spray gun, turn off the power unit and ground the nozzle. Maintain electrostatic spray equipment in accordance with instruction manual. Do not deviate. Do not substitute parts from other manufacturers. </div> <div style="margin-bottom: 10px;">  <ol style="list-style-type: none"> 10. Operator must be grounded to prevent shocks from static electricity. Floor surface must be conductive. Footwear and gloves must be static dissipative in accordance with ANSI Z41-1991 (or local codes). </div> <div>  <ol style="list-style-type: none"> 11. Air velocity through all booth openings must meet local requirements and contain powder within the booth. If powder escapes from the booth, shut down operation and correct the malfunction. 12. Powder may be toxic or be a nuisance dust hazard. Refer to supplier's MSDS. If exposed to dust during operation, maintenance, or clean up, operators must use appropriate personal protective equipment. 13. Do not use compressed air or organic solvents for removal of powder from skin or clothing. Do use soap and water. Wash hands before eating or smoking. 14. Guns, feeders, booths, etc., may be cleaned with clean dry air at 1.7 bar (25 psig). <p>If you have any questions concerning this electrostatic spray equipment, call (440) 988-9411, and ask to speak with the Powder Systems Group Technical Service Department.</p> </div> </div>

Section 2

Description

Introduction

The Versa-Spray II integral power supply (IPS) manual powder spray gun electrostatically charges and sprays organic powder coatings. The integral power supply (multiplier) is user-replaceable. The spray gun is used with a Versa-Spray II three-gauge IPS control unit and a standard or low-flow powder pump.



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Figure 2-1 Versa-Spray II IPS Manual Powder Spray Gun with Gun Air Option

- | | |
|------------------------------------|-----------------------|
| 1. Hanger | 8. Gun air tubing |
| 2. Extension | 9. Feed hose adapter |
| 3. Powder inlet body | 10. Feed hose |
| 4. Nozzle extension (gun air only) | 11. Trigger |
| 5. Nozzle | 12. Feed hose bracket |
| 6. Deflector | 13. Cable |
| 7. Electrode | |

Versions

See Figure 2-1.

The spray gun is available with a positive or negative multiplier and a 4-, 8-, or 12-meter, low-voltage power and control cable (13). All versions come with a standard conical nozzle (5) with 19-mm deflector (6). They can also be ordered with a nozzle extension (4) with electrode cleaning air (gun air). Gun air flows through the nozzle extension and out around the electrode (7) to prevent some powder coatings such as metallics from building up on the electrode.

Operation

The Versa-Spray II control unit supplies low-voltage dc power to the voltage multiplier housed in the spray gun's extension and body. The multiplier generates the high electrostatic voltage needed for powder coating. The voltage generates a high-strength electrostatic field between the spray gun and the grounded part in front of the spray gun. The electrostatic field produces a corona discharge around the electrode. A resistor in the spray gun between the multiplier and the electrode limits the current output to safe levels.

Compressed air pumps the powder from the feed hopper, conveys it through the feed hose to the spray gun, and propels it toward the workpieces. As the powder particles are sprayed through the corona, they pick up an electrostatic charge and are attracted to the workpieces.

The spray pattern is controlled by the shape of the nozzle used, the speed of the powder-conveying air as it exits the nozzle, and the electrostatic field generated between the electrode and the grounded workpiece. There are no controls on the spray gun except the trigger. The voltage controls and the powder pump flow rate and atomizing air pressure regulators are housed in the IPS control unit. A non-adjustable restrictor on the control unit rear panel controls the gun air pressure. The pump and gun air start flowing when the trigger is pulled.

Options

Refer to the *Options* section in this manual for part numbers and illustrations for the options listed below. Contact your Nordson representative for more information about these options.

Nozzles and Deflectors

Nozzles and deflectors are available in the following sizes and configurations:

- 32- and 45-mm conical nozzles
- 14-, 16-, 19-, and 26-mm deflectors for conical nozzles
- 2.5-, 3-, 4-, and 6-mm Tivar and GFT (glass-filled PTFE) flat spray nozzles for organic powders
- 60° and 90° Cross-Cut nozzles
- castle nozzle (six radial slots)

Lance Extensions

Lance extensions are used to extend the length of the powder path to help spray powder into recesses and interior corners. The extensions are equipped with 26-mm conical nozzles and are available in 150-, 300-, and 450-mm (6-, 12-, and 18-in.) lengths.

Feed Hoses and Adapters

The spray gun is equipped with a feed hose adapter for a 1/2-in. ID powder feed hose. A low-flow hose adapter can be ordered for use with a low-flow hose (3/8-in. ID).

Purge Adapters

Two purge adapters are available, one for non-metallic powders and one for metallic powders. The purge adapter is used to clean accumulated powder from the powder inlet body and nozzle. The purge adapter replaces the standard feed hose adapter. The feed hose connects directly to the purge adapter.

Upgrade Kits

Upgrade kits are available to add a nozzle extension to a Versa-Spray II spray gun. A fitting kit is available that connects to the air input port of a Versa-Spray control unit and delivers air at the proper pressure to the spray gun. A kit is also available that upgrades a Versa-Spray control unit and manual spray gun by adding the AFC function to the control unit and the Versa-Spray II conical nozzle and deflector to the spray gun.

Ion Collector Kits

The ion collector can improve the smoothness and appearance of cured powder coatings. It collects ions emitted from the spray gun's charging electrode instead of allowing them to deposit on the part. This can reduce 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.

Three kits are available: one for standard spray guns with or without nozzle extensions; and two for guns with 150- or 300-mm lance extensions, with or without nozzle extensions.

Specifications

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

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

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

Section 3

Installation



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



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

See Figure 3-1.

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



NOTE: Keep the powder feed hose as short as possible, no more than 12 m (39 ft) long if using $\frac{1}{2}$ -in. ID hose, or 4 m (13 ft) long if using $\frac{3}{8}$ -in. ID hose. Longer lengths may cause uneven powder flow.

2. To prevent the feed hose from kinking and cutting off the flow of powder, wrap spiral-cut tubing around the feed hose at the pump outlet and any other place necessary. Use spiral-cut tubing to bundle together the feed hose, cable, and air tubing below the gun handle.
3. Connect the gun cable (9) to the GUN OUTPUT receptacle at the rear of the IPS control unit (10). Secure the cable to the control unit with the retaining nut on the cable end.
4. Connect the air tubing to the control unit, feed hopper, and spray gun as described in Table 3-1.

NOTE: If you are installing gun air tubing, remove the plug from the control unit GUN port. Wrap the restrictor threads with PTFE tape. Install the restrictor and connector that is shipped with the spray gun or included in the gun air kit in the GUN port.

5. Establish a path for the feed hose, air tubing, and gun cable. Make sure the hose and cable cannot be abraded, cut, or run over by heavy equipment.

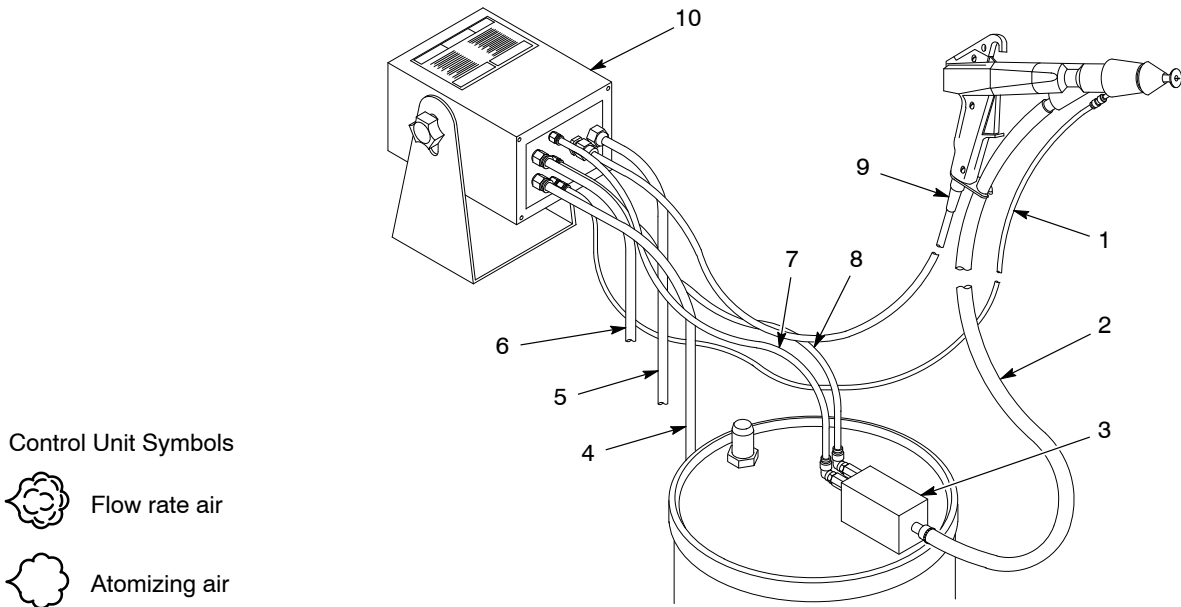
Table 3-1 Air Tubing Connections

Item in Figure 3-1	Tubing Size and Color	Control Unit Air Fitting	Other Connection
1	6 mm (clear)	GUN	Gun nozzle extension (optional)
4	10 mm (black)	AUX	Feed hopper (or box feeder pneumatic vibrator motor) air fitting
6	10 mm (black)	IN	System air supply (Refer to <i>Air Quality</i>)
7	6 mm (black)	Flow Rate Air 	Powder pump Fitting F
8	6 mm (blue)	Atomizing Air 	Powder pump Fitting A

Air Quality

Powder spray systems require clean, dry, oil-free operating air. Moist or oil-contaminated air can cause the powder to clog in the pump venturi throat, feed hose, or gun passages.

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 7 bar (100 psi).



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

- | | | |
|-----------------------------------|------------------------------|------------------------------|
| 1. 4-mm Gun air tubing (optional) | 5. Control unit power | 8. 6-mm Atomizing air tubing |
| 2. Feed hose | 6. 10-mm Air supply tubing | 9. Gun cable |
| 3. Powder pump | 7. 6-mm Flow rate air tubing | 10. IPS control unit |
| 4. 10-mm Fluidizing air tubing | | |

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.



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

Startup



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

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

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

Refer to the appropriate equipment manuals for startup procedures.

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

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

Air Pressure	Typical Setting	Description
Flow rate	1.4 bar (20 psi)	Controls the volume of the powder delivered to the spray gun.
Atomizing	2.1 bar (30 psi)	Controls the velocity and density (powder-to-air ratio) of the powder.
Gun (optional)	Fixed	Prevents powder from building up on the electrode.

Startup *(contd)*



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

4. Point the spray gun into the booth, pull the trigger, and test the spray pattern. Adjust the flow rate and atomizing air pressures until you obtain the desired pattern.

NOTE: The following steps describe electrostatic voltage settings made on a Versa-Spray II control unit that includes AFC controls. A Versa-Spray II gun can be used with older Versa-Spray control units without AFC controls. Only the kV mode will be available unless the optional current limit kit is installed. Refer to the control unit manual for specific instructions.

5. Use the control unit's kV/AFC dial to select an operating mode:
 - **kV Mode:** Push the dial in. Rotate it fully clockwise for maximum voltage.
 - **AFC Mode:** Pull the dial out. Rotate it to position 4, which represents approximately 40 μA (microamps).
6. Set the control unit's kV/ μA switch to view the desired output value on the digital display.

NOTE: When a spray gun is first put into service, set the kV/AFC dial to the kV mode. Turn the dial to the maximum setting and record the μA output with no parts in front of the spray gun. Monitor the μA output daily under the same conditions. A significant increase in μA output indicates a probable short in the spray gun resistor. A significant decrease indicates a failing resistor or voltage multiplier.

7. Coat a part and adjust the voltage settings (kV or AFC) and air pressures to achieve the desired results.

Shutdown



WARNING: Turn off the electrostatic voltage and ground the gun electrode before making adjustments to the spray gun or nozzle.

1. Turn the control unit main power switch to the off position. Ground the gun electrode to discharge any residual voltage.
2. Perform the *Daily Maintenance* procedure.

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

Maintenance



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

Daily Maintenance

1. Disconnect the powder feed hose from the pump. Point the spray gun into the booth and blow the powder out of the hose and spray gun with low-pressure compressed air. Never blow air through the powder feed hose from the spray gun into the pump.
2. See Figure 4-1. Remove the nozzle parts (items 4–7) from the spray gun.
3. Loosen the set screw (8) and pull the powder inlet body (3) straight off the gun.
4. Clean the parts with a low-pressure air gun. Wipe the parts with a clean, dry cloth.
5. Blow powder off the resistor probe (2) and extension (1). Wipe them with a clean, dry cloth. Carefully remove fused powder from the parts with a wooden or plastic dowel or similar tool. Do not use tools that will scratch the plastic. Powder will build up and impact-fuse on any scratches.

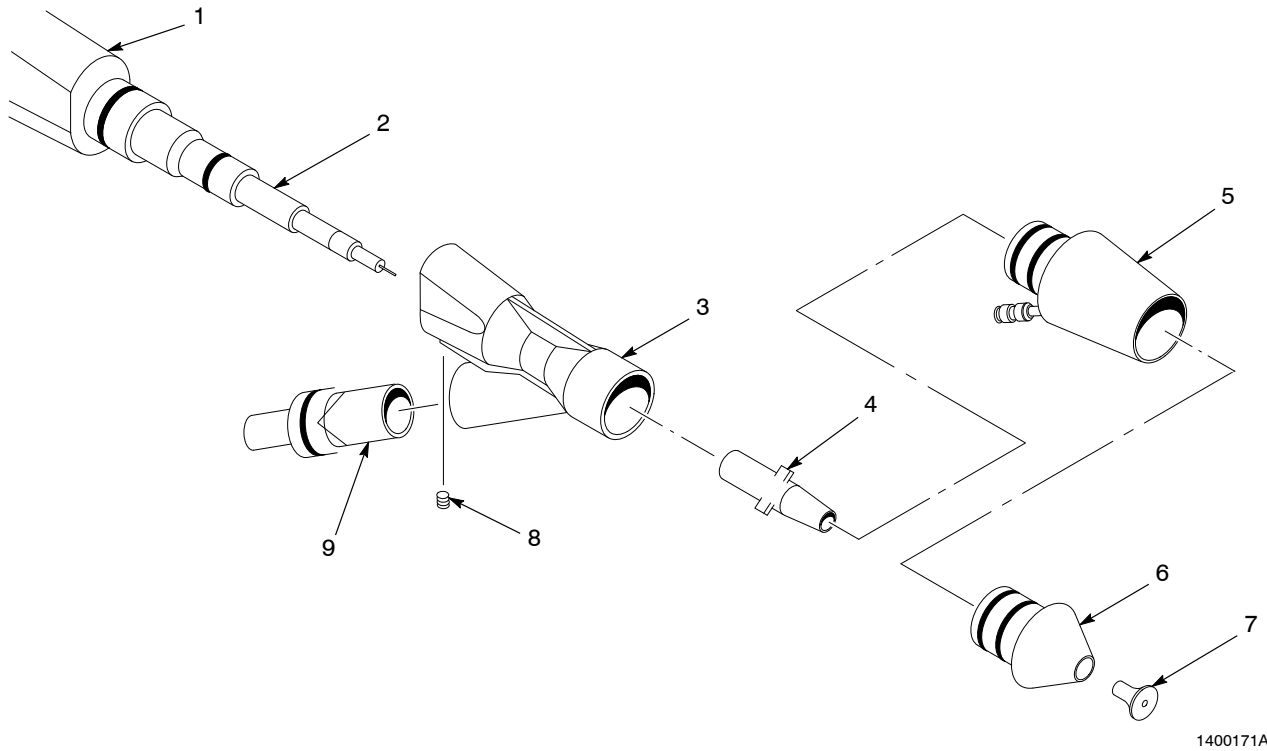
NOTE: If necessary, use a cloth dampened with isopropyl or ethyl alcohol to clean the powder path parts. Remove the O-rings first. Do not immerse the spray gun in alcohol. Do not use any other solvents.

6. Inspect the powder path parts for wear. Replace worn parts.
7. Assemble the spray gun. Rotate items (4), (6), (7), and (9) at least 30° from their previous position to prevent uneven wear and lopsided patterns.

Weekly Maintenance

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

Weekly Maintenance (contd)



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Figure 4-1 Daily Maintenance

- | | | |
|----------------------|-------------------|-----------------|
| 1. Extension | 4. Wear sleeve | 7. Deflector |
| 2. Resistor probe | 5. Nozzle adapter | 8. Set screw |
| 3. Powder inlet body | 6. Conical nozzle | 9. Hose adapter |

Note: Item 4 is used only on guns without air. Item 5 is used only on guns with air.

Section 5

Troubleshooting



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

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

If you are having problems with the electrostatic components of the spray gun, check their continuity and resistance with the procedures at the end of this section.

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

No.	Problem	Page
1.	Uneven pattern; unsteady or inadequate powder flow	5-1
2.	Voids in powder pattern	5-2
3.	Loss of wrap; poor transfer efficiency	5-2
4.	No kV output from spray gun	5-2

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

Continued...

Problem	Possible Cause	Corrective Action
1. Uneven pattern; unsteady or inadequate powder flow <i>(contd)</i>	<p>Low atomizing or flow rate air pressure</p> <p>Improper fluidization of powder in hopper</p>	<p>Increase the atomizing and/or flow rate air pressures.</p> <p>Increase the fluidizing air pressure. Remove the powder from hopper and clean or replace the fluidizing plate, if contaminated.</p>
2. Voids in powder pattern	<p>Worn nozzle or deflector</p> <p>Plugged powder path</p>	<p>Remove the deflector and nozzle. Inspect and replace them if worn.</p> <p>Remove the nozzle parts and powder path from the spray gun and clean them.</p>
3. Loss of wrap; poor transfer efficiency	<p>Low electrostatic voltage</p> <p>Resistor or IPS control unit failure</p> <p>Poorly grounded parts</p> <p>Failed nozzle extension resistor</p>	<p>Increase the electrostatic voltage.</p> <p>Check the multiplier/resistor probe assembly with a megohmmeter for 195–270 megohms at 500 volts. If the reading is out-of-range, check the resistor probe separately.</p> <p>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.</p> <p>Check the resistor with a megohmmeter for 18–22 megohms at 500 volts.</p>
4. No kV output from spray gun	<p>Malfunctioning trigger switch</p> <p>Damaged gun cable</p> <p>Malfunctioning voltage multiplier</p> <p>Failed gun resistor</p> <p>Malfunctioning IPS control unit</p> <p>Failed nozzle extension resistor</p>	<p>Check for continuity between pins 1 and 2 (control unit end of cable) with the switch actuated. If no continuity is found, replace the cable.</p> <p>Check the continuity of the cable wires, from pin to pin. Replace the cable if any opens or shorts found.</p> <p>Use the optional shorting plug and a megohmmeter to check the continuity and resistance of the multiplier/resistor assembly for 195–270 megohms at 500 volts. No burn-throughs or arc tracks should be visible on any parts.</p> <p>Check the resistor with a megohmmeter for 153–187 megohms at 500 volts.</p> <p>Check for 21 Vdc between pins 2 and 3 (spray gun end of cable) with the trigger depressed.</p> <p>Check the resistor with a megohmmeter for 18–22 megohms at 500 volts.</p>

Continuity and Resistance Checks

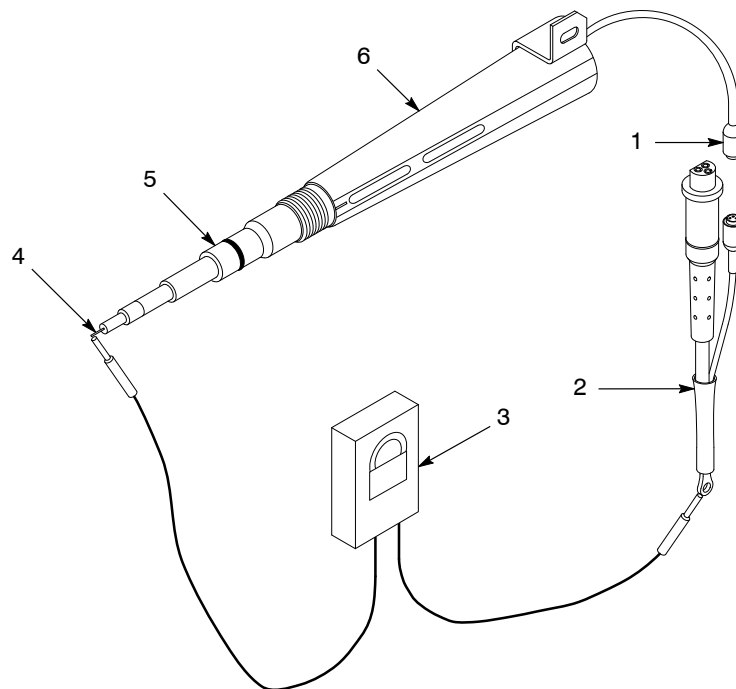


WARNING: Turn off the electrostatic voltage and ground the gun electrode before performing the following tasks. Failure to observe this warning could result in a severe shock.

NOTE: All three pins in the multiplier connector must be shorted together to check the continuity and resistance of the multiplier or multiplier/resistor assembly, or the multiplier could be damaged. The optional shorting plug makes these tasks easy. Refer to the *Options* section for the part number.

Multiplier/Resistor Assembly Resistance Check

1. See Figure 5-1. Connect the shorting plug (2) to the multiplier connector (1).
2. Connect the megohmmeter (3) probes to the shorting plug ring-tong terminal and electrode (4). If you get an infinite reading, switch the probes.
3. The megohmmeter should read between 195 and 270 megohms at 500 volts. If the reading is out of this range, check the resistor separately (refer to *Resistor Continuity and Resistance Check*). If the resistor reading is within the range specified, replace the multiplier.



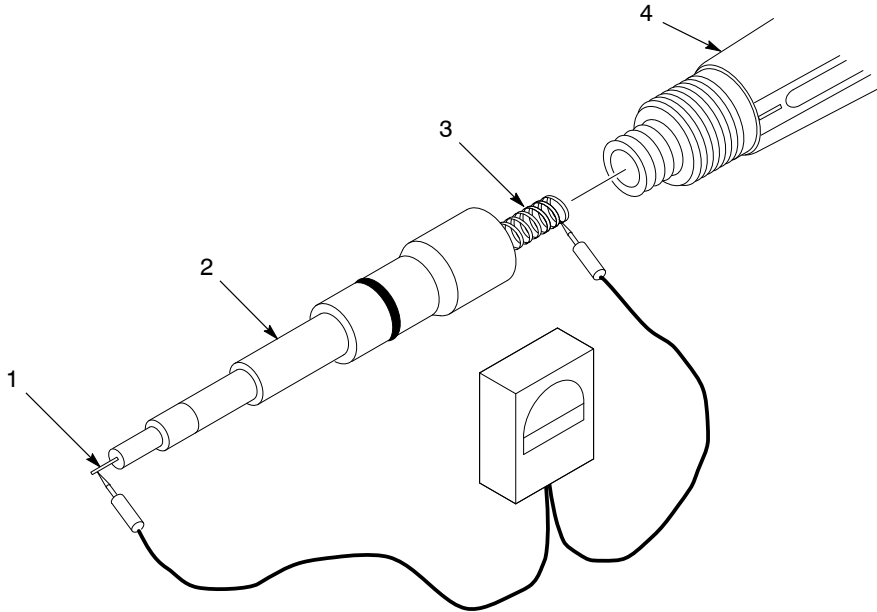
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Figure 5-1 Multiplier/Resistor Assembly Resistance Check

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

Resistor Resistance Check

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



1400133A

Figure 5-2 Resistor Resistance Check

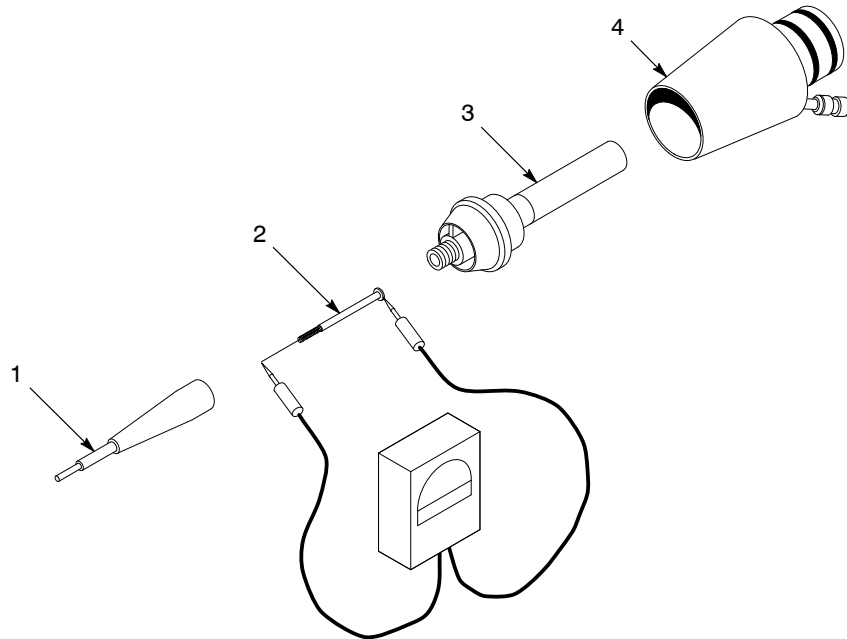
1. Electrode
2. Resistor probe

3. Resistor spring

4. Multiplier

Nozzle Extension Resistor Resistance Check

1. See Figure 5-3. Remove the resistor holder/spider/wear sleeve/ assembly (1, 2, 3) from the nozzle adapter (4).
2. Unscrew the resistor holder (1) from the spider/wear sleeve assembly (3) and remove the resistor (2).
3. Check the resistor with a megohmmeter. The megohmmeter should read between 18 and 22 megohms at 500 volts. If the reading is out of this range, replace the resistor.



1400196A

Figure 5-3 Nozzle Extension Resistor Resistance Check

- | | | |
|--------------------|-----------------------|-------------------|
| 1. Resistor holder | 3. Spider/wear sleeve | 4. Nozzle adapter |
| 2. Resistor | | |

Gun Cable Continuity Checks

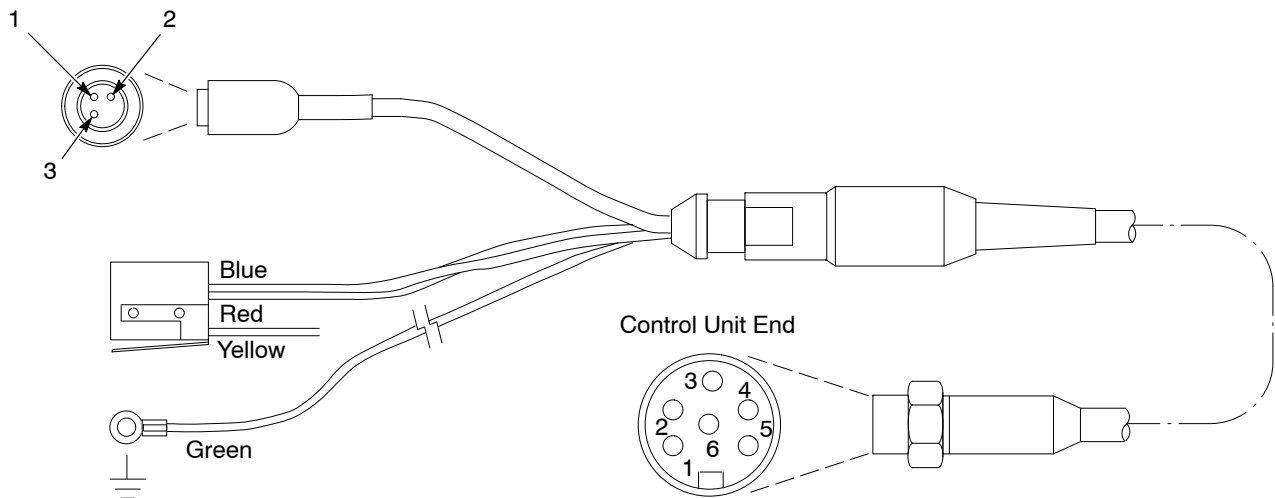
Cable pins and wire colors are shown in Figure 5-4. To make sure the cable is not damaged, check for continuity with a standard ohmmeter.

Table 5-1 Control Unit End Pin Functions

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

Table 5-2 Gun Cable Continuity Checks

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



1400134A

Figure 5-4 Gun Cable Continuity Check

Section 6

Repair



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

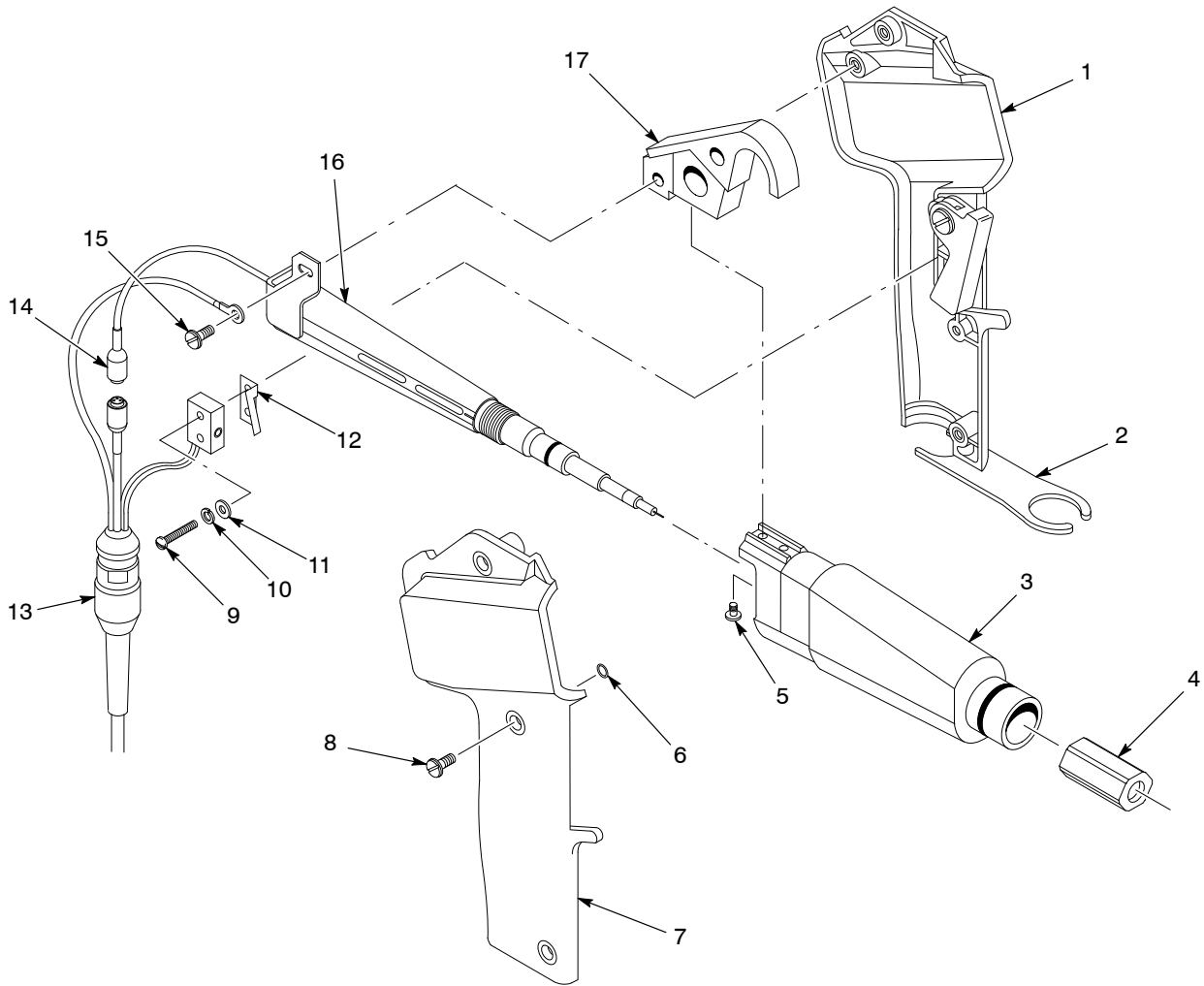
Multiplier Replacement

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

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

Cable Replacement

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



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Figure 6-1 Multiplier and Cable Replacement

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

Resistor Replacement

Resistor service kits contain a new resistor, holder, and contact tip. They are assembled, greased, and ready to be installed on a multiplier. A 3-cc applicator filled with dielectric grease is included.

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



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

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

Contact Tip Replacement

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

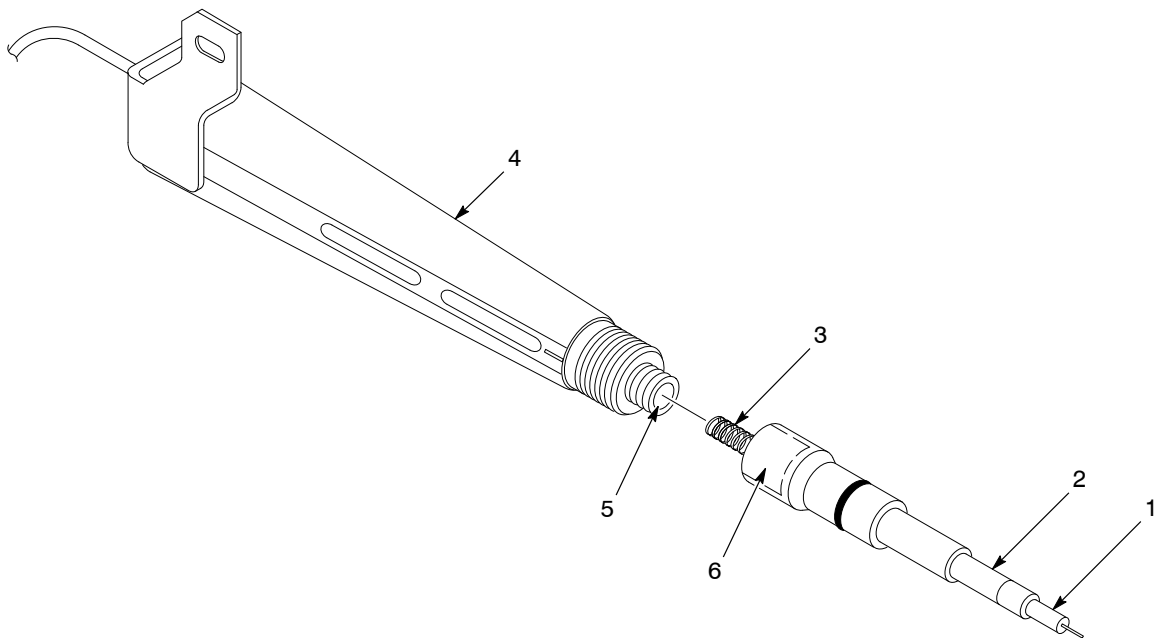


Figure 6-2 Resistor and Contact Tip Replacement

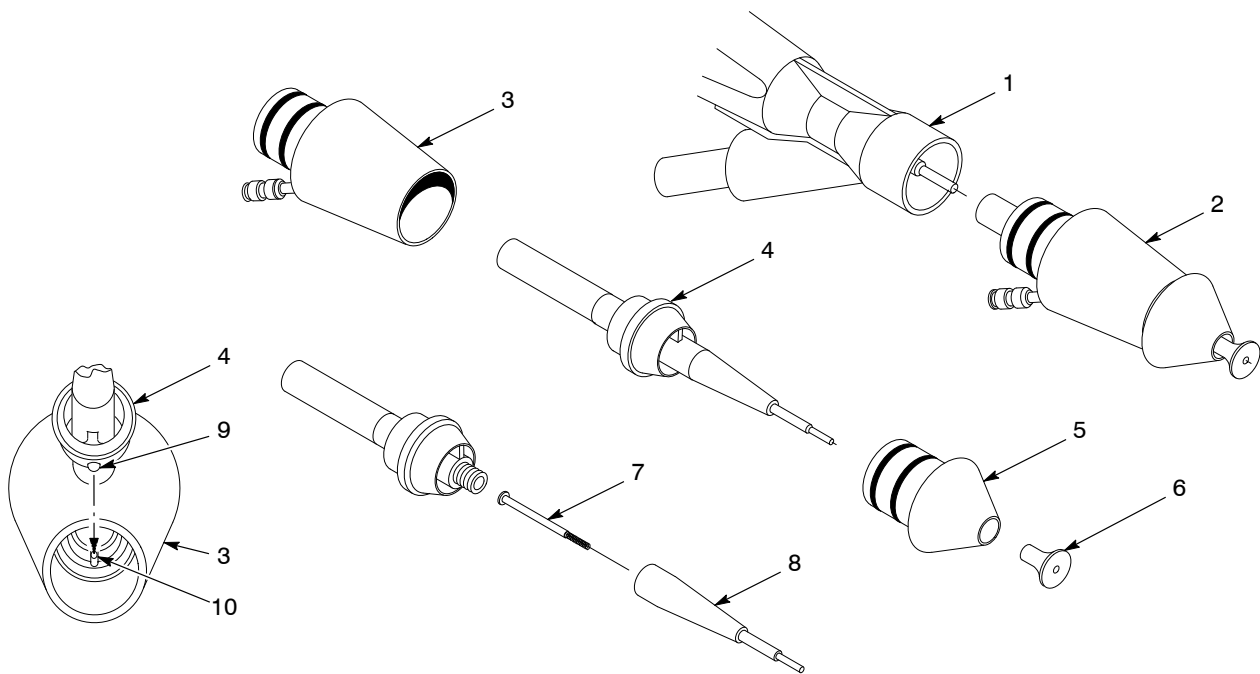
- | | | |
|-------------------|--------------------|--------------------------|
| 1. Contact tip | 3. Resistor spring | 5. Multiplier well |
| 2. Resistor probe | 4. Multiplier | 6. Resistor probe cavity |

Note: Clean item 5, grease items 1, 3, 5, and 6.

Nozzle Extension Resistor Replacement

This resistor in this procedure is only used on spray guns with electrode cleaning air.

1. See Figure 6-3. Remove the nozzle extension (2) from the powder inlet body (1).
2. Remove the deflector (6) and conical nozzle (5).
3. Push the wear sleeve/spider/resistor holder assembly (4) out of the nozzle adapter (3).
4. Unscrew the resistor holder (8) from the spider and remove the resistor (7).
5. Install the new resistor in the holder and screw the resistor holder onto the spider finger-tight.
6. Align the pin (9) on the spider with the slot (10) in the nozzle adapter. Press the wear sleeve/spider/resistor holder assembly into the nozzle adapter.
7. Finish assembling the nozzle extension and install it onto the powder inlet body.



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Figure 6-3 Nozzle Extension Resistor Replacement

- | | | |
|---------------------------------------|-------------------|--------------------|
| 1. Powder inlet body | 5. Conical nozzle | 8. Resistor holder |
| 2. Nozzle extension | 6. Deflector | 9. Pin |
| 3. Nozzle adapter | 7. Resistor | 10. Slot |
| 4. Wear sleeve/spider/resistor holder | | |

Section 7

Parts

Introduction

To order parts, call the Nordson Customer Service Center or your local Nordson representative. Use this five-column parts list, and the accompanying illustration, to describe and locate parts correctly.

Using the Illustrated Parts List

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

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

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

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

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

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

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

Versa-Spray II IPS Manual Spray Gun Parts Lists

Spray Gun Part Number Reference Chart

Spray gun part numbers are not included in the parts lists. Check the identification plate on your spray gun for the part number, then use the appropriate parts list for ordering replacement parts. If you have added a nozzle extension to a spray gun, use the parts list for spray guns with air.

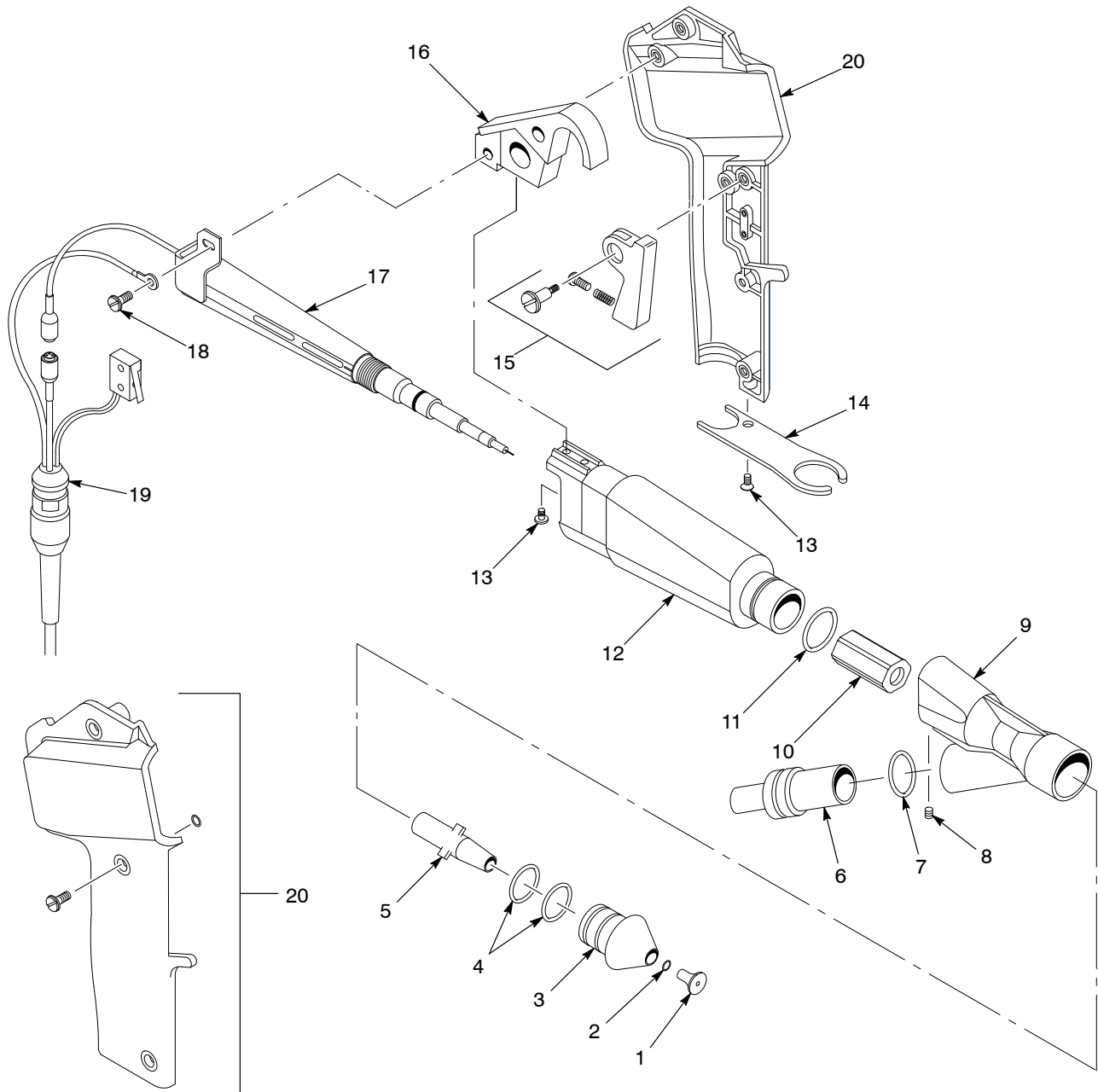
Guns without Air			Guns with Air		
Gun Part Number	Cable Length (Meters)	Multiplier Polarity	Gun Part Number	Cable Length (Meters)	Multiplier Polarity
173125	4	Negative	173131	4	Negative
173126	8	Negative	173132	8	Negative
173127	12	Negative	173133	12	Negative
173128	4	Positive	173134	4	Positive
173129	8	Positive	173135	8	Positive
173130	12	Positive	173136	12	Positive

Guns without Air

See Figure 7-1.

Item	Part	Description	Quantity	Note
1	173138	DEFLECTOR, 19 mm, Versa-Spray II, with O-ring	1	
2	940084	• O-RING, silicone, 0.188 x 0.312 x 0.063 in.	1	
3	173139	NOZZLE, short, Versa-Spray II, with O-ring	1	
4	941181	• O-RING, silicone, 0.875 x 1.063 x 0.094 in.	2	
5	132348	SLEEVE, wear, conical	1	
6	134386	ADAPTER, hose, with O-ring, universal	1	
7	940163	• O-RING, silicone, 0.625 x 0.750 x 0.063 in.	1	
8	982455	SCREW, set, M6 x 1.0 x 8, nylon, black	1	
9	125612	BODY, inlet, powder	1	
10	984165	NUT, cable retainer	1	
11	940243	O-RING, silicone, 1.125 x 1.250 x 0.063 in.	1	
12	125613	EXTENSION	1	
13	982098	SCREW, fillet head, slotted, M4 x 0.7 x 6	3	
14	132345	BRACKET, cable/tube retaining	1	
15	160104	SERVICE KIT, trigger, Versa-Spray	1	A
16	125616	HANGER, handgun, modular	1	
17	-----	KIT, multiplier, with resistor probe	1	A
18	982327	SCREW, chez head, slotted, M4 x 12, zinc	1	
19	-----	SERVICE KIT, cable	1	A
20	160103	SERVICE KIT, handle, Versa-Spray	1	A

NOTE A: Refer to *Service Kits* in this section for contents of kits. Some parts in kits can be ordered separately.



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Figure 7-1 Versa-Spray II Guns without Air

Guns with Air

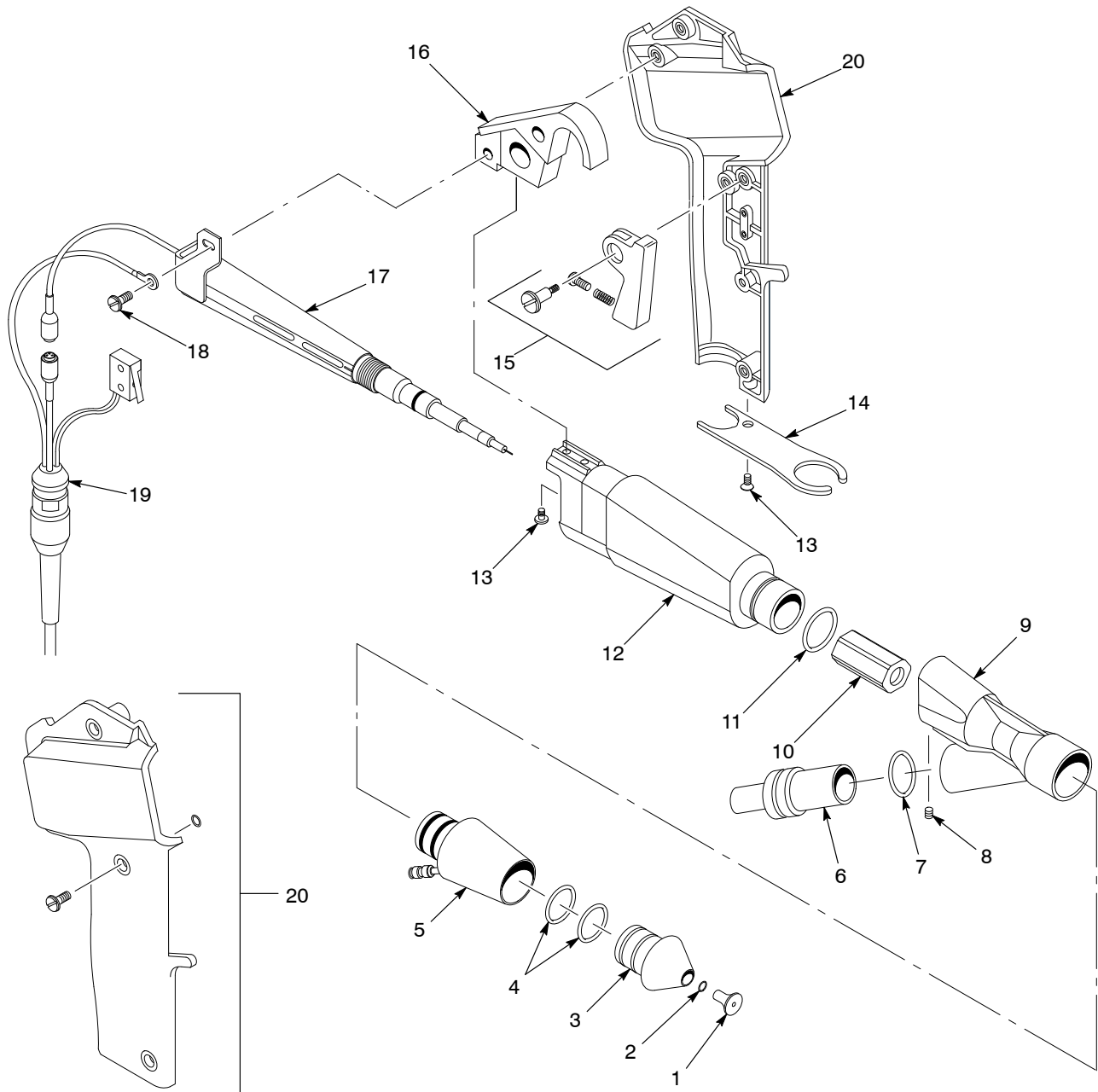
See Figure 7-2.

Item	Part	Description	Quantity	Note
1	173138	DEFLECTOR, 19 mm, Versa-Spray II, with O-ring	1	
2	940084	• O-RING, silicone, 0.188 x 0.312 x 0.063 in.	1	
3	173139	NOZZLE, short, Versa-Spray II, with O-ring	1	
4	941181	• O-RING, silicone, 0.875 x 1.063 x 0.094 in.	2	
5	183334	KIT, extension, nozzle	1	A
6	134386	ADAPTER, hose, with O-ring, universal	1	
7	940163	• O-RING, silicone, 0.625 x 0.750 x 0.063 in.	1	
8	982455	SCREW, set, M6 x 1.0 x 8, nylon, black	1	
9	125612	BODY, inlet, powder	1	
10	984165	NUT, cable retainer	1	
11	940243	O-RING, silicone, 1.125 x 1.250 x 0.063 in.	1	
12	125613	EXTENSION	1	
13	982098	SCREW, fillet head, slotted, M4 x 6	3	
14	132345	BRACKET, cable/tube retaining	1	
15	160104	SERVICE KIT, trigger, Versa-Spray	1	A
16	125616	HANGER, handgun, modular	1	
17	-----	KIT, multiplier, with resistor probe	1	A
18	982327	SCREW, chez head, slotted, M4 x 12, zinc	1	
19	-----	SERVICE KIT, cable	1	A
20	160103	SERVICE KIT, handle, Versa-Spray	1	A
NS	972141	CONNECTOR, male, 6-mm tube x 1/8-in. universal	1	B
NS	972244	ORIFICE, 0.010 in., 1/8-in. NPT x 1/8-in. NPT, brass	1	B

NOTE A: Refer to *Service Kits* on following pages for contents of kits. Some parts in kits can be ordered separately.

B: These fittings are shipped with the gun. They are installed in the GUN port on the Versa-Spray II control unit.

NS: Not Shown



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Figure 7-2 Versa-Spray II Guns with Air

Service Kits

Service kits are used to replace parts on the Versa-Spray II IPS manual spray guns. Refer to the *Guns Used On* and *Note* columns in the *Spray Gun Part Number Reference Chart* before ordering.

Service Kit Reference Chart – Versa-Spray II IPS Manual Spray Gun

Part	Description	Guns Used On	Note
1014039	POSITIVE MULTIPLIER service kit, 80 kV, with resistor probe	Positive polarity	A
1014038	NEGATIVE MULTIPLIER service kit, 80 kV, with resistor probe	Negative polarity	A
134376	RESISTOR WITH HOLDER service kit	All	B
133716	4-METER CABLE, IPS	All	C
133715	8-METER CABLE, IPS	All	C
163408	12-METER CABLE, IPS	All	C
160103	HANDLE service kit, Versa-Spray	All	
160104	TRIGGER service kit, Versa-Spray	All	
183334	NOZZLE EXTENSION service kit, Versa-Spray II	with air only	
183645	RESISTOR WITH HOLDER service kit, Versa-Spray II (nozzle extension)	with air only	
183646	RESISTOR service kit, nozzle extension, Versa-Spray II	with air only	
<p>NOTE A: Check multiplier polarity before ordering. Compare part number on gun label with part number and description in the <i>Spray Gun Part Number Reference Chart</i>. Gun polarity can be switched by changing multiplier.</p> <p>B: Replaces the multiplier resistor.</p> <p>C: Order cable service kit according to length of cable desired.</p>			

Multiplier Service Kits

Multiplier kits include the resistor, multiplier, and extension. If replacing just the resistor, order the *Resistor Service Kit*.

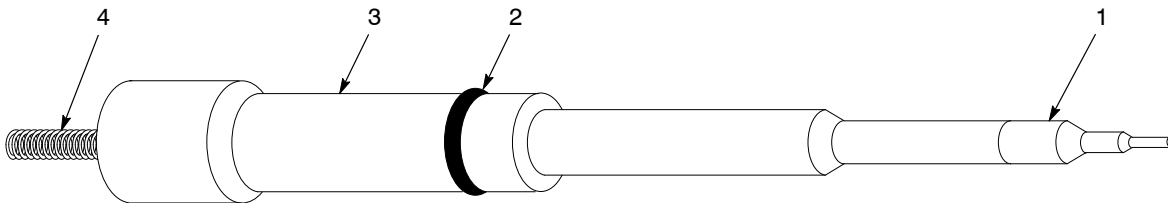
Part	Description	Note
1014038	SERVICE KIT, negative multiplier, 80 kV, with resistor probe	
1014039	SERVICE KIT, positive multiplier, 80 kV, with resistor probe	
125613	• EXTENSION	
134376	• SERVICE KIT, holder, resistor	
-----	• MULTIPLIER, 80 kV, Versa-Spray	

Resistor Service Kit

See Figure 7-3.

Item	Part	Description	Quantity	Note
—	134376	SERVICE KIT, holder, resistor	1	
1	132748	• CONTACT, cable	1	
2	940117	• O-RING, silicone, 0.312 x 0.438 x 0.063 in.	1	
3	-----	• HOLDER, resistor	1	
4	-----	• RESISTOR	1	
NS	245733	• GREASE, dielectric, 3-cc applicator	1	

NS: Not Shown



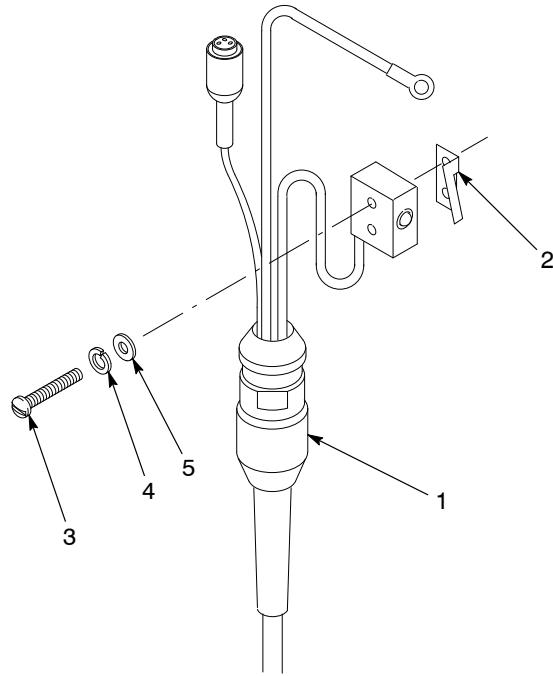
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Figure 7-3 Resistor Service Kit

Cable Service Kits

See Figure 7-4.

Item	Part	Description	Quantity	Note
—	133716	4-METER CABLE service kit, IPS	1	
—	133715	8-METER CABLE service kit, IPS	1	
—	163408	12-METER CABLE service kit, IPS	1	
1	-----	• CABLE	1	
2	132336	• ACTUATOR, switch	1	
3	1070246	• SCREW, pan head, #2-56 x 0.437 in., slotted, zinc	2	
4	983113	• WASHER, lock, e, split, 2, steel, zinc	2	
5	983510	• WASHER, flat, e, 0.094 x 0.188 x 0.025 in., brown	2	



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Figure 7-4 Cable Service Kits

Handle Service Kit

See Figure 7-5.

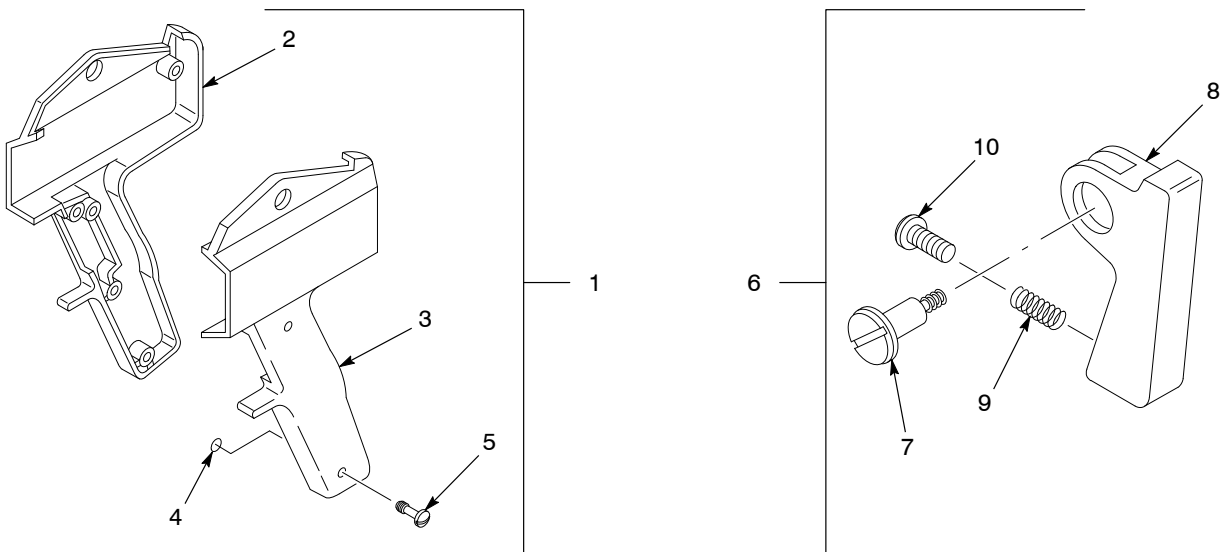
Item	Part	Description	Quantity	Note
1	160103	SERVICE KIT, handle, Versa-Spray	1	A
2	-----	• HANDLE, gun	1	
3	-----	• HANDLE, cover	1	
4	940060	• O-RING, Viton, 0.125 x 0.250 x 0.063 in.	3	
5	981626	• SCREW, captive, slotted, M4 x 12, black	3	

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

Trigger Service Kit

See Figure 7-5.

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



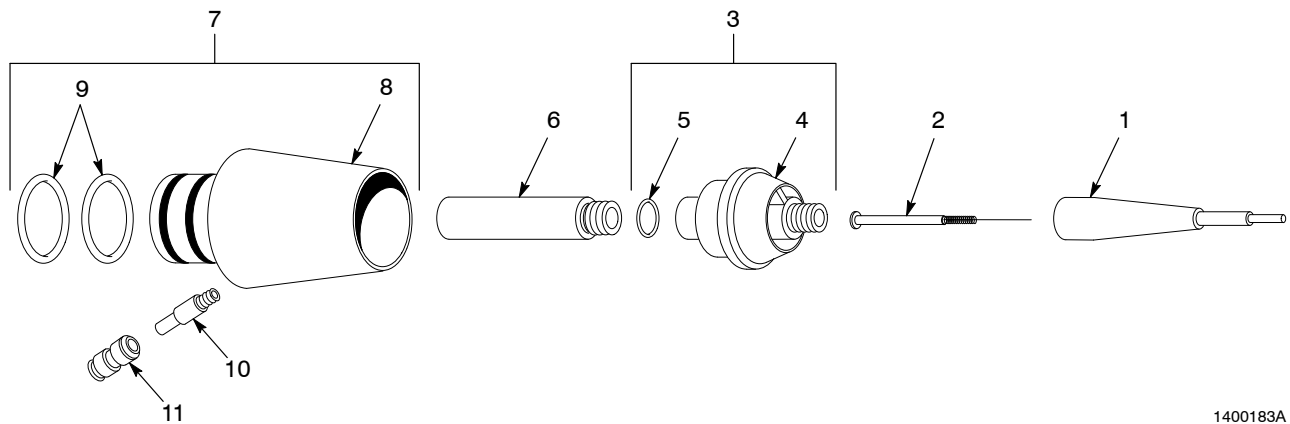
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Figure 7-5 Handle and Trigger Service Kits

Nozzle Extension and Resistor Service Kits

See Figure 7-6.

Item	Part	Description	Quantity	Note
—	183334	KIT, extension, nozzle, Versa-Spray II	1	
1	173182	• HOLDER, resistor, Versa-Spray II	1	
2	169656	• RESISTOR, nozzle extension, Versa-Spray II	1	
3	182255	• KIT, spider, with O-ring, Versa-Spray II	1	
4	-----	• • SPIDER, air inlet, Versa-Spray II	1	
5	940093	• • O-RING, silicone, 0.250 x 0.375 x 0.063 in.	1	
6	173179	• SLEEVE, wear, Versa-Spray II	1	
7	182254	• KIT, adapter, nozzle, Versa-Spray II, with O-ring	1	
8	-----	• • ADAPTER, nozzle, Versa-Spray II	1	
9	941181	• • O-RING, silicone, 0.875 x 1.063 x 0.094 in.	2	
10	173177	• FITTING, M6, straight	1	
11	971790	• UNION, straight, 6 mm, plastic	1	
—	183645	SERVICE KIT, resistor, with holder, Versa-Spray II	1	
1	173182	• HOLDER, resistor, Versa-Spray II	1	
2	169656	• RESISTOR, nozzle extension, Versa-Spray II	1	
—	183646	SERVICE KIT, resistor, nozzle extension, Versa-Spray II	1	
2	169656	• RESISTOR, nozzle extension, Versa-Spray II	1	



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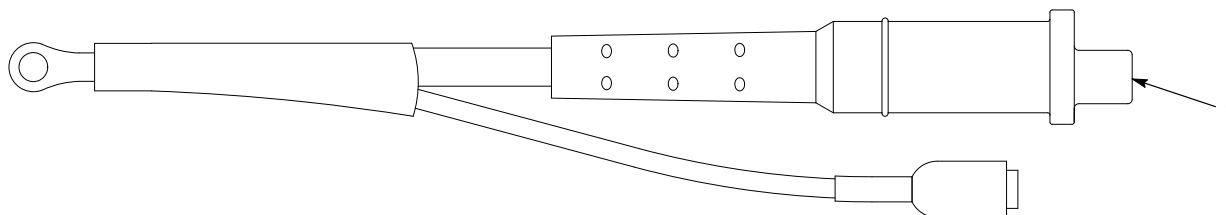
Figure 7-6 Nozzle Extension and Resistor Service Kits

Recommended Spare Parts

Shorting Plug

See Figure 7-7.

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



1400149A

Figure 7-7 Shorting Plug

Powder Feed Hose and Air Tubing

These are bulk part numbers. Order in one-foot increments.

Part	Description	Note
900550	TUBING, Isoprene, 0.469 x 0.208 in.	
900549	TUBING, Isoprene, 0.348 x 0.208 in.	
900742	TUBING, polyurethane, 6 mm	

Section 8

Options

Options Reference Chart

Part	Description	Note
Conical Nozzles		
173139	SHORT NOZZLE, Versa-Spray II, with O-rings	A
145559	32-mm CONICAL NOZZLE service kit, with O-rings, Tivar	A
144760	45-mm CONICAL NOZZLE service kit, with O-rings, Tivar	A
-----	DEFLECTORS, Tivar, in different diameters, with O-rings	A
Tivar Nozzles		
134380	2.5-mm FLAT-SPRAY NOZZLE service kit, with O-rings, Tivar	A
139935	3-mm FLAT-SPRAY NOZZLE service kit, with O-rings, Tivar	A
141044	4-mm FLAT-SPRAY NOZZLE service kit, with O-rings, Tivar	A
139937	6-mm FLAT-SPRAY NOZZLE service kit, with O-rings, Tivar	A
Glass-Filled PTFE Nozzles		
174223	2.5-mm FLAT-SPRAY NOZZLE service kit, with O-rings, glass-filled PTFE (GFT)	A
174225	3-mm FLAT-SPRAY NOZZLE service kit, with O-rings, glass-filled PTFE (GFT)	A
174227	4-mm FLAT-SPRAY NOZZLE service kit, with O-rings, glass-filled PTFE (GFT)	A
174229	6-mm FLAT-SPRAY NOZZLE service kit, with O-rings, glass-filled PTFE (GFT)	A
Cross-Cut and Castle Nozzles		
141013	60° CROSS-CUT NOZZLE service kit, Tivar	A
141014	90° CROSS-CUT NOZZLE service kit, Tivar	A
147495	CASTLE NOZZLE service kit, 0.375 in.	A
Lance Extensions		
233469	150-mm LANCE EXTENSION	B
233468	300-mm LANCE EXTENSION	B
233455	450-mm LANCE EXTENSION	B
Purge Adapter Kits		
157085	SERVICE KIT, handgun, purge (non-metallic powders)	
153832	CONVERSION KIT, handgun, conductive, purge (metallic powders)	
Gun Air Kits		
183328	KIT, manual gun air, Versa-Spray II controls	
183333	KIT, manual gun air, Versa-Spray controls	
Ion Collectors		
189492	KIT, handgun, ion collector	
189493	KIT, 150-mm lance, ion collector	
189494	KIT, 300-mm lance, ion collector	
Miscellaneous Options		
135896	ADAPTER, hose, low flow, with O-ring	
173178	KIT, current limit PCB, deflector, nozzle	
NOTE A: Refer to the <i>Optional Nozzles for Versa-Spray and Versa-Spray II Guns</i> instruction sheet for application, installation, and parts information about the nozzles and deflectors available.		
B: Refer to the <i>150-, 300-, and 450-mm Lance Extensions</i> instruction sheet for installation and parts information for the optional lance extensions.		

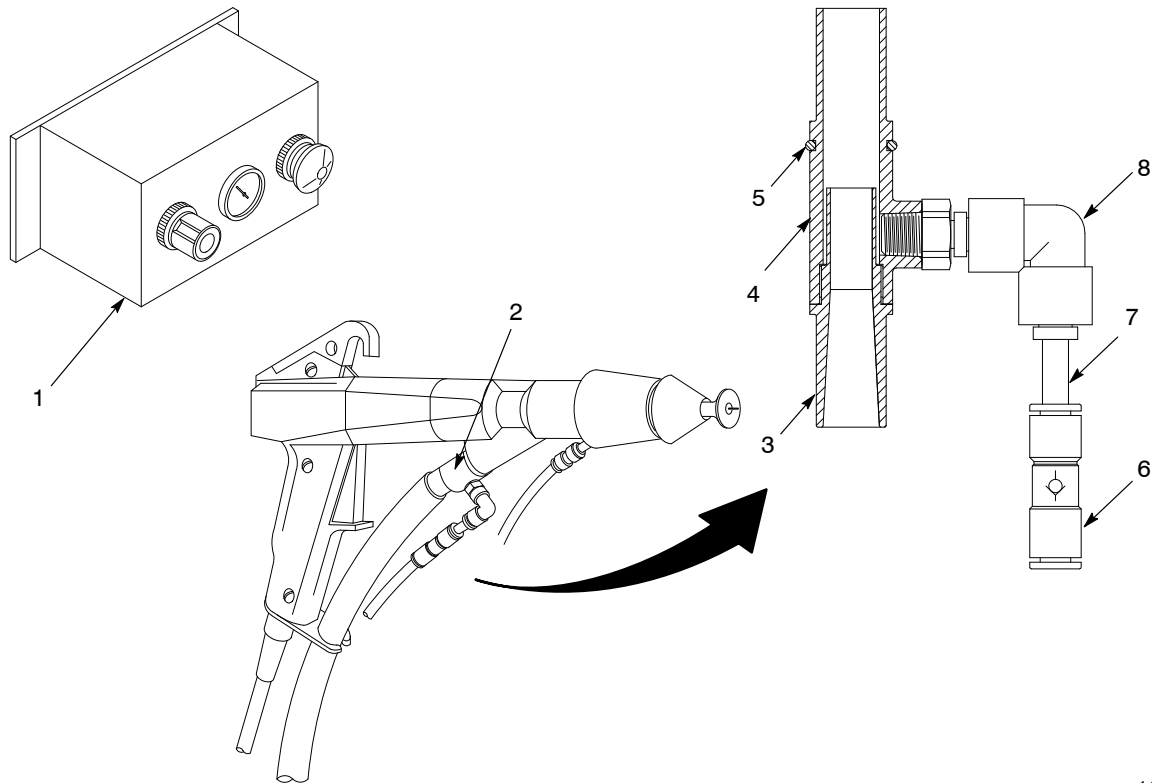
Purge Adapter Kits

Purge Adapter Kit for Non-Metallic Powder Coatings

See Figure 8-1.

Item	Part	Description	Quantity	Note
—	157085	SERVICE KIT, handgun, purge, Versa-Spray, non-conductive	1	
1	153830	• PANEL, control, purge	1	
2	157094	• ADAPTER, purge, Versa-Spray	1	
3	-----	• • ADAPTER, purge, inlet	1	
4	-----	• • ADAPTER, purge, outlet	1	
5	940163	• • O-RING, silicone, 0.625 x 0.750 x 0.062 in.	1	
6	1021472	• • VALVE, check, 6-mm tube x 6-mm tube	1	
7	900586	• • TUBING, polyurethane, 6-mm OD x 4-mm ID, blue	AR	
8	183456	• • FITTING, swivel, elbow, 6-mm tubing x 1/8-in. BPST	1	

AR: As Required



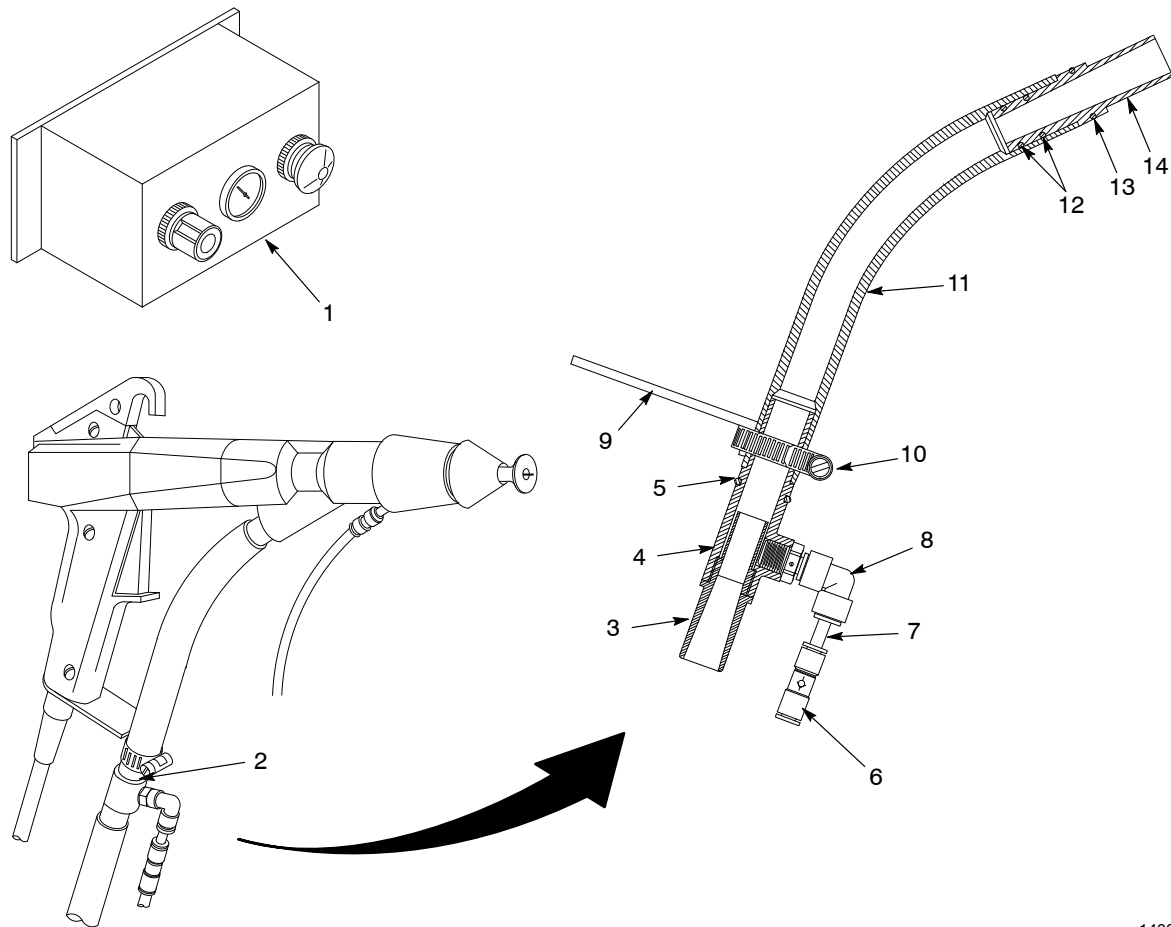
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Figure 8-1 Purge Adapter Kit for Non-Metallic Powder Coatings

Purge Adapter Kit for Metallic Powder Coatings

See Figure 8-2.

Item	Part	Description	Quantity	Note
—	153832	CONVERSION KIT, handgun, purge, Versa-Spray, conductive	1	
1	153830	• PANEL, control, purge	1	
2	157094	• ADAPTER, purge, Versa-Spray	1	
3	-----	• • ADAPTER, purge, inlet	1	
4	-----	• • ADAPTER, purge, outlet	1	
5	940163	• • O-RING, silicone, 0.625 x 0.750 x 0.062 in.	1	
6	1021472	• • VALVE, check, 6-mm tube x 6-mm tube	1	
7	900586	• • TUBING, polyurethane, 6-mm OD x 4-mm ID, blue	AR	
8	183456	• • FITTING, swivel, elbow, 6-mm tubing x 1/8-in. BPST	1	
9	156204	• BRACKET, hose, purge adapter	1	
10	140290	• CLAMP, tubing, worm drive, 0.906–0.500 in.	1	
11	156203	• TUBE, inlet, conductive PTFE	1	
12	940142	• O-RING, silicone, 0.500 x 0.625 x 0.063 in.	2	
13	940163	• O-RING, silicone, 0.625 x 0.750 x 0.063 in.	1	
14	972368	• ADAPTER, conductive, inlet tube	1	
AR: As Required				



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Figure 8-2 Purge Adapter Kit for Metallic Powder Coatings

Gun Air Kits

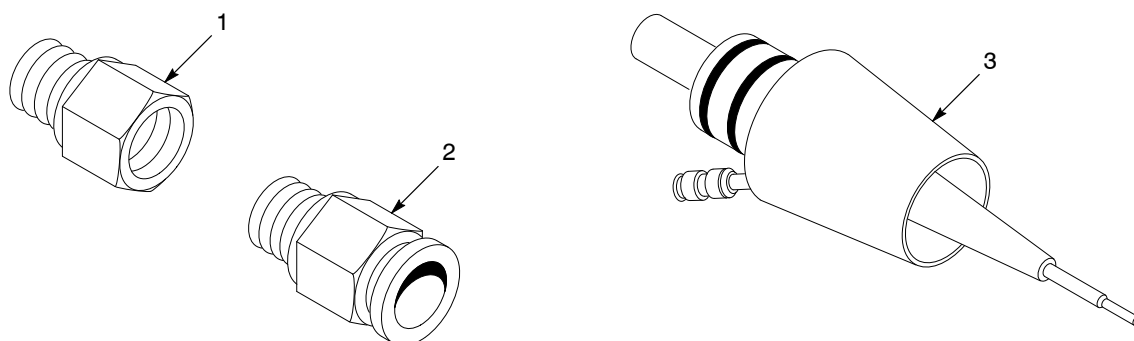
Versa-Spray II Control Unit Gun Air Kit

This kit is used to add gun air to a Versa-Spray or Versa-Spray II manual powder spray gun used with a Versa-Spray II control unit.

See Figure 8-3.

1. Wrap the orifice (restrictor) (1) threads with PTFE tape. Install the orifice in the GUN port in the control unit rear panel.
2. Install the connector (2) into the restrictor.
3. Remove the deflector, nozzle, and wear sleeve from the spray gun. Install the nozzle extension (3) onto the spray gun, then install the nozzle and deflector on the nozzle extension.
4. Install 6-mm air tubing between the connector and the nozzle extension. The tubing should be approximately 0.3 m (1 ft) longer than the gun cable. Tubing must be ordered separately. Refer to *Powder Feed Hose and Air Tubing* in the *Parts* section for the tubing part number.

Item	Part	Description	Quantity	Note
—	183328	KIT, manual gun air, Versa-Spray II controls	1	
1	972244	• ORIFICE, 0.010 in., 1/8-in. NPT x 1/8-in. NPT, brass	1	
2	972141	• CONNECTOR, male, 6-mm tube x 1/8-in BSPT	1	
3	183334	• KIT, extension, nozzle	1	



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Figure 8-3 Versa-Spray II Control Unit Gun Air Kit

Versa-Spray Control Unit Gun Air Kit

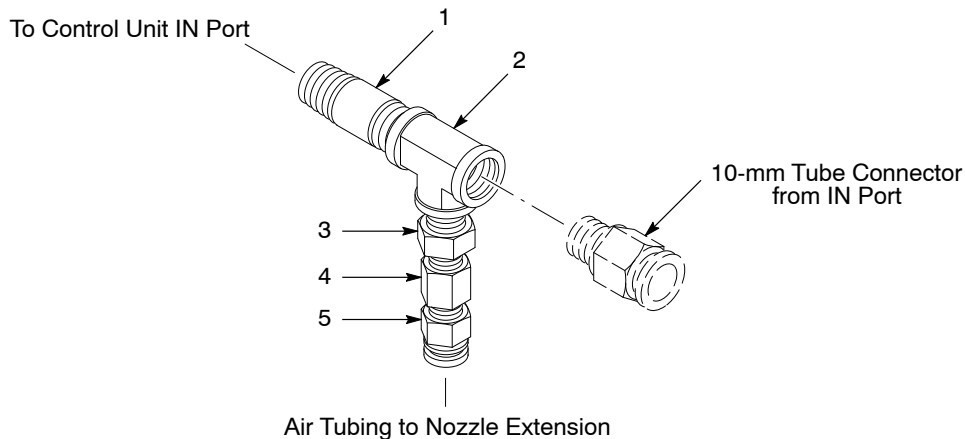
A Versa-Spray II manual powder spray gun with air can be used with a Versa-Spray control unit by installing this kit on the control unit. The kit is shipped fully assembled.

See Figure 8-4.

NOTE: This kit will allow air to flow continuously to the spray gun's nozzle extension until the air supply to the control unit is shut off.

1. Disconnect the supply air tubing from the 10-mm tube connector in the IN port of the control unit. Remove the tube connector.
2. Wrap the nipple (1) threads with PTFE tape and thread the nipple into the IN port. Orient the assembly so the 6-mm connector (5) is pointing down.
3. Wrap the threads of the tube connector removed in step 1 with PTFE tape and install it into the open end of the tee (2).
4. Install 6-mm air tubing between the connector (5) and the nozzle extension. The tubing should be approximately 0.3 m (1 ft) longer than the gun cable. Tubing must be ordered separately. Refer to *Powder Feed Hose and Air Tubing* in the *Parts* section for the tubing part number.
5. Connect the supply air tubing to the 10-mm tube connector installed in step 3.

Item	Part	Description	Quantity	Note
—	183333	KIT, Versa-Spray manual controls gun air	1	
1	973117	• NIPPLE, steel, schedule 40, 1/4, 1.50-in. long	1	
2	973260	• TEE, pipe, hydraulic, 1/4 in., steel, zinc	1	
3	973372	• BUSHING, pipe, hydraulic, 1/4 x 1/8 in., steel, zinc	1	
4	972244	• ORIFICE, 0.010 in., 1/8-in. NPT x 1/8-in. NPT, brass	1	
5	972141	• CONNECTOR, male, 6-mm tube x 1/8-in BSPT	1	



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Figure 8-4 Versa-Spray Control Unit Gun Air Kit

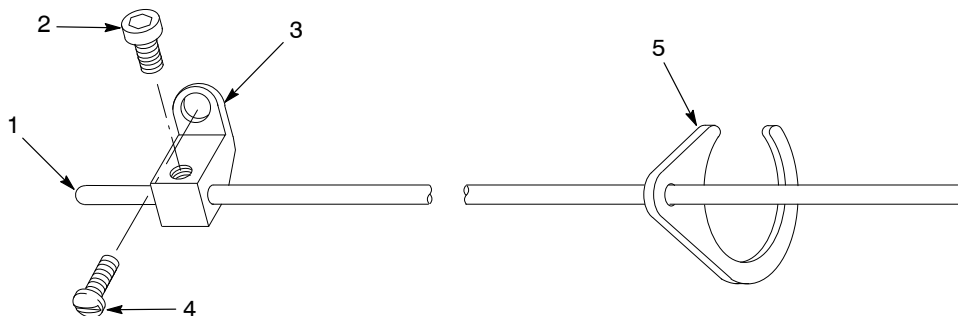
Ion Collector Kits

Installation and adjustment instructions are included with each kit.

See Figure 8-5.

Item	Part	Description	Quantity	Note
—	189492	KIT, hand gun, ion collector, standard	1	
—	189493	KIT, 150-mm lance, ion collector	1	
—	189494	KIT, 300-mm lance, ion collector	1	
1	189482	• ROD, ion collector, 11 in., standard	1	
1	189483	• ROD, ion collector, 15 in., 150-mm lance extension	1	
1	189484	• ROD, ion collector, 21 in., 300-mm lance extension	1	
2	982628	• SCREW, socket, M5 x 10, stainless steel	1	
3	189487	• BRACKET, hand gun, ion collector	1	
4	982069	• SCREW, pan head, M4 x 16	1	
NS	982278	SCREW, set, cup, M5 x 8, black	1	A

NOTE A: Optional, replaces item 2.
NS: Not Shown



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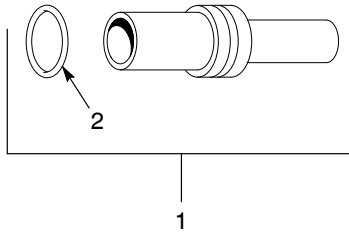
Figure 8-5 Ion Collector Kits

Miscellaneous Options

Low-Flow Hose Adapter

See Figure 8-6.

Item	Part	Description	Quantity	Note
1	135896	ADAPTER, hose, low flow, with O-ring	1	
2	940163	<ul style="list-style-type: none"> O-RING, silicone, 0.625 x 0.750 x 0.063 in. 	1	



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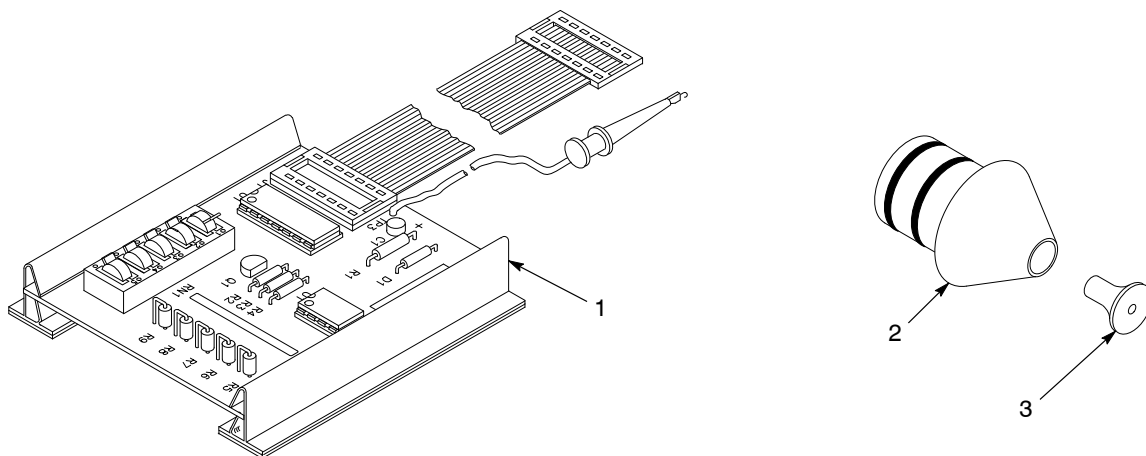
Figure 8-6 Low-Flow Hose Adapter for $\frac{3}{8}$ -in. ID Hose

Versa-Spray Control Unit and Manual Gun Upgrade Kit

This kit is used to upgrade a Versa-Spray control unit and manual powder spray gun. It adds the AFC function to the control unit, and the Versa-Spray II conical nozzle and deflector to the manual powder spray gun.

See Figure 8-7.

Item	Part	Description	Quantity	Note
—	173178	KIT, current limit PCB, deflector, nozzle	1	
1	-----	<ul style="list-style-type: none"> CIRCUIT BOARD, current limit, Versa-Spray, IPS 	1	
2	173139	<ul style="list-style-type: none"> NOZZLE, short, Versa-Spray II, with O-ring 	1	
3	173138	<ul style="list-style-type: none"> DEFLECTOR, 19 mm, Versa-Spray II, with O-ring 	1	
NS	108815	<ul style="list-style-type: none"> INSTRUCTIONS, AFC control kit installation 	1	
NS: Not Shown				



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Figure 8-7 Versa-Spray Control Unit and Manual Gun Upgrade Kit