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Contact Us
Nordson Corporation welcomes requests for information, comments, and inquiries about its products. General information about Nordson can be found on the Internet using the following address:
Address all correspondence to:
   Nordson Corporation
   Attn: Customer Service
   555 Jackson Street
   Amherst, OH 44001

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Introduction

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

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

Qualified Personnel

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

Intended Use

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

Some examples of unintended use of equipment include

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

Regulations and Approvals

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

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- While operating manual spray guns, make sure you are grounded. Wear electrically conductive gloves or a grounding strap connected to the gun handle or other true earth ground. Do not wear or carry metallic objects such as jewelry or tools.
- If you receive even a slight electrical shock, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.
- Obtain and read 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.
- Make sure the spray area is adequately ventilated.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

High-Pressure Fluids

High-pressure fluids, unless they are safely contained, are extremely hazardous. Always relieve fluid pressure before adjusting or servicing high pressure equipment. A jet of high-pressure fluid can cut like a knife and cause serious bodily injury, amputation, or death. Fluids penetrating the skin can also cause toxic poisoning.

If you suffer a fluid injection injury, seek medical care immediately. If possible, provide a copy of the MSDS for the injected fluid to the health care provider.
The National Spray Equipment Manufacturers Association has created a wallet card that you should carry when you are operating high-pressure spray equipment. These cards are supplied with your equipment. The following is the text of this card:

**WARNING:** Any injury caused by high pressure liquid can be serious. If you are injured or even suspect an injury:

- Go to an emergency room immediately.
- Tell the doctor that you suspect an injection injury.
- Show him this card
- Tell him what kind of material you were spraying

**MEDICAL ALERT—AIRLESS SPRAY WOUNDS:** NOTE TO PHYSICIAN

Injection in the skin is a serious traumatic injury. It is important to treat the injury surgically as soon as possible. Do not delay treatment to research toxicity. Toxicity is a concern with some exotic coatings injected directly into the bloodstream.

Consultation with a plastic surgeon or a reconstructive hand surgeon may be advisable.

The seriousness of the wound depends on where the injury is on the body, whether the substance hit something on its way in and deflected causing more damage, and many other variables including skin microflora residing in the paint or gun which are blasted into the wound. If the injected paint contains acrylic latex and titanium dioxide that damage the tissue’s resistance to infection, bacterial growth will flourish. The treatment that doctors recommend for an injection injury to the hand includes immediate decompression of the closed vascular compartments of the hand to release the underlying tissue distended by the injected paint, judicious wound debridement, and immediate antibiotic treatment.

**Fire Safety**

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment. Use only grounded air and fluid hoses. Check equipment and workpiece grounding devices regularly. Resistance to ground must not exceed one megohm.
- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Do not heat materials to temperatures above those recommended by the manufacturer. Make sure heat monitoring and limiting devices are working properly.
Fire Safety *(contd)*

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

**Halogenated Hydrocarbon Solvent Hazards**

Do not use halogenated hydrocarbon solvents in a pressurized system that contains aluminum components. Under pressure, these solvents can react with aluminum and explode, causing injury, death, or property damage. Halogenated hydrocarbon solvents contain one or more of the following elements:

<table>
<thead>
<tr>
<th>Element</th>
<th>Symbol</th>
<th>Prefix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorine</td>
<td>F</td>
<td>“Fluoro-“</td>
</tr>
<tr>
<td>Chlorine</td>
<td>Cl</td>
<td>“Chloro-“</td>
</tr>
<tr>
<td>Bromine</td>
<td>Br</td>
<td>“Bromo-“</td>
</tr>
<tr>
<td>Iodine</td>
<td>I</td>
<td>“Iodo-“</td>
</tr>
</tbody>
</table>

Check your material MSDS or contact your material supplier for more information. If you must use halogenated hydrocarbon solvents, contact your Nordson representative for information about compatible Nordson components.

**Action in the Event of a Malfunction**

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out system electrical power. Close hydraulic and pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the system.

**Disposal**

Dispose of equipment and materials used in operation and servicing according to local codes.
Section 2
Description

Introduction

See Figure 2-1. The Kinetix automatic gun power supply provides electrostatic control, dc power, and monitoring functions for liquid spray guns.

The power supply provides low-voltage dc to the spray gun voltage multiplier. The multiplier produces the electrostatic voltage used to charge the paint as it is sprayed.

Control Modes

A push-pull rotary switch and potentiometer (kV/AFC switch) allows the operator to choose between two different control modes and to set output levels.

- In the kV mode, voltage output is controlled by the potentiometer setting.
- In the Automatic Feedback Current (AFC) mode, maximum current output is controlled by the potentiometer setting. The AFC mode also provides optimum kV output and electric field strength for coating parts with interior corners and deep recesses at close range or recoating coated and cured parts.
Front Panel Controls

See Figure 2-1 and refer to Table 2-1 for a description of front panel controls and functions.

![Figure 2-1 Front Panel Controls](image)

### Table 2-1 Front Panel Controls

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power switch</td>
<td>Turns on the power supply. If switch S5 on the circuit board is set to continuous, the power switch will activate the spray gun (if the kV potentiometer is turned on). Switch S5 should be set to Trigger.</td>
</tr>
<tr>
<td>2</td>
<td>Power LED (Green)</td>
<td>Lights when the power switch is turned on.</td>
</tr>
<tr>
<td>3</td>
<td>High Voltage LED (Green)</td>
<td>Lights when a trigger signal is sent from the PLC or other external triggering device and indicates that high voltage has been triggered on.</td>
</tr>
<tr>
<td>4</td>
<td>kV LED (Amber)</td>
<td>Lights when the kV/AFC switch is set to kV mode and turned on.</td>
</tr>
<tr>
<td>5</td>
<td>AFC LED (Amber)</td>
<td>Lights when the kV/AFC switch is set in the AFC mode and turned on.</td>
</tr>
<tr>
<td>6</td>
<td>Digital display</td>
<td>Displays the percentage of kV output, µA output, and multiplier polarity (positive or negative) in both kV and AFC modes. The kV/µA switch changes the display from %kV to µA. As parts go by the spray device, both kV and µA output will fluctuate. µA output increases when the spray device is moved closer to a grounded part. The kV output decreases as µA output increases. If the unit is in AFC mode, µA output will not increase past the maximum current set point. Part shape and paint flow rates also affect microampere output.</td>
</tr>
<tr>
<td>7</td>
<td>kV/µA switch</td>
<td>Changes the output display from %kV to µA.</td>
</tr>
<tr>
<td>8</td>
<td>kV/AFC switch/potentiometer</td>
<td>Changes voltage control modes and sets output levels. Pushing the knob in puts the unit in kV mode. Pulling the knob out puts the unit in AFC mode. Turning the switch to position 1 turns on the electrostatic voltage. Rotating the switch clockwise increases the voltage output when in kV or increases the maximum current set point when in AFC mode.</td>
</tr>
</tbody>
</table>
Rear Panel Connections

See Figure 2-2 and refer to Table 2-1 for rear panel connections.

![Rear Panel Controls](1300492A)

Table 2-2 Rear Panel Connections

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>POWER OUTPUT connector</td>
<td>6-pin receptacle for the spray device.</td>
</tr>
<tr>
<td>2</td>
<td>POWER INPUT connector</td>
<td>6-pin receptacle for the power cord.</td>
</tr>
<tr>
<td>3</td>
<td>Cabinet ground stud</td>
<td>Ground wire connection.</td>
</tr>
</tbody>
</table>

Symbols

See Figure 2-3. The Kinetix power supply uses these symbols for the power switch, the ground connection on the rear panel, and above the green high voltage indicator light on the front panel.

![Symbols](1300090A)
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.

Mounting

Use four M6 x 1 fasteners (two each side) to mount the cabinet to a secure location.

Circuit Board

1. See Figure 3-1. Loosen the captive screws (2) and slide the control module (1) out of the cabinet.
2. Unplug the ground wire (3) from the circuit board if necessary.
3. See Figure 3-2. Set up the control unit for your application using the jumper blocks and switches. Refer to Table 3-1 for jumper block and switch settings.
4. See Figure 3-1. Slide the control module into the cabinet and plug in the ground wire.
5. Tighten the captive screws.

Figure 3-1  Removing the Control Module

1. Control module  3. Ground wire
2. Captive screw  4. Circuit board
Figure 3-2  Jumper Block and Switch Settings

1. Power cord receptacle (J1)  
2. Input voltage jumper (J4)  
3. Trigger switch (S5)  
4. Voltage range switch (S4)

Table 3-1  Jumper Block and Switch Settings

<table>
<thead>
<tr>
<th>Jumper Block J4</th>
<th>Top</th>
<th>120/240 Volt nominal input power (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle</td>
<td>110/220 Volt nominal input power (Europe)</td>
<td></td>
</tr>
<tr>
<td>Bottom</td>
<td>100/200 Volt nominal input power (Japan)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switch S4</th>
<th>Top</th>
<th>100/115/120 Vac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>200/230/240 Vac</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switch S5</th>
<th>External trigger. (High voltage is turned on via an external switch.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigger</td>
<td>Internal trigger. (The power switch turns on high voltage if the kV/AFC switch is turned on. This setting should not be used with the Kinetix automatic power supply.)</td>
</tr>
</tbody>
</table>

| Continuous      |                                                                                 |
|-----------------|                                                                                 |
Electrical Connections

**WARNING:** Install a locking disconnect switch or breaker in the service line ahead of the equipment so power can be shut off during installation or repair.

**CAUTION:** Equipment damage may occur if the control unit is connected to any line voltage other than that stated on the ID plate.

Input voltage must be 100-240 Vac nominal, 1 Ø, 50/60 Hz. Switches and jumpers must be set appropriately. The control unit is shipped with an input voltage set to 230 Vac.

1. See Figure 3-3. Connect the power cord to the POWER INPUT receptacle (2) on the rear panel. Connect the unterminated end of the cord according to Table 3-2.

<table>
<thead>
<tr>
<th>Function</th>
<th>Wire Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>L (L1-hot)</td>
<td>Brown</td>
</tr>
<tr>
<td>N (L2-neutral)</td>
<td>Blue</td>
</tr>
<tr>
<td>PE (Ground)</td>
<td>Green/Yellow</td>
</tr>
<tr>
<td>Trigger</td>
<td>White</td>
</tr>
</tbody>
</table>

**NOTE:** Internally, the power cord receptacle wires are connected to a five-position plug that mates with receptacle J1 on the circuit board.

<table>
<thead>
<tr>
<th>J1 Pin Number</th>
<th>Wire Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown</td>
</tr>
<tr>
<td>2</td>
<td>Blue</td>
</tr>
<tr>
<td>3</td>
<td>Green/Yellow</td>
</tr>
<tr>
<td>4</td>
<td>Black (open)</td>
</tr>
<tr>
<td>5</td>
<td>White</td>
</tr>
</tbody>
</table>
**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.

**NOTE:** The Kinetix power supply must be connected to a true earth ground.

2. Connect the ground strap furnished with the control unit to the cabinet ground stud (3). Secure the clamp to an earth ground.

3. Connect the Kinetix spray device cable to the POWER OUTPUT receptacle (1).

![Figure 3-3 Rear Panel Connections](1300492A)

1. POWER OUTPUT receptacle
2. POWER INPUT receptacle
3. Cabinet ground stud
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.

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.

Before operating a Nordson liquid spray system, read the system component manuals and familiarize yourself with the operating characteristics of each component. A thorough understanding of the system operation will help you obtain desired results and diagnose problems.

NOTE: When a spray device is first put into service, set the kV/AFC switch to the kV mode, turn the switch to the maximum setting, and record the μA output with no parts in front of the spray gun. Monitor the 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.
Startup

See Figure 4-1.

1. Turn on the power switch (1). The power LED (2) lights up.
2. Set the kV/AFC switch/potentiometer (6).
   - Push the kV/AFC switch in to put the unit in the kV mode. If the switch is set for the kV mode, rotate it fully clockwise for maximum voltage. The kV LED (4) will light.
   - Pull the kV/AFC switch out to put the unit in the AFC mode. If the switch is set for the AFC mode, rotate it to position 4. This position represents approximately 40 µA. The AFC LED (5) will light.
3. Trigger the spray device. The high voltage LED (3) will light up; indicating that high voltage has been turned on.
4. Coat a part and adjust the kV output or AFC settings to achieve the desired result.

Figure 4-1 Startup Procedures

1. Power switch
2. Power LED
3. High voltage LED
4. kV LED
5. AFC LED
6. kV/AFC switch/potentiometer
Setting Adjustments

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

A high quality finish and maximum transfer efficiency (percentage of paint sprayed that adheres to the part) requires experimentation and experience.

**Electrostatic Voltage**

The electrostatic voltage settings affect overall coating performance. In most applications, the settings should produce a soft spray pattern that directs as much of the paint as possible onto the part with a minimum of overspray. These settings will allow the maximum amount of charged paint to be attracted to the grounded part.

Lowering the electrostatic voltage is a common method for trying to improve the coverage of deep recesses and interior corners of parts. However, lowering the voltage may also reduce your overall transfer efficiency. Paint velocity, direction, and pattern shape can be just as important as electrostatic voltage in coating these areas.

**Using the AFC Mode**

Use the AFC mode with coated parts that have already been cured but require additional recoating and curing, and with coated parts with deep recesses. In this mode, the AFC switch/potentiometer lets you set a feedback current threshold and the voltage is automatically set to the maximum. If the current threshold is reached the voltage is automatically adjusted to maintain the required coverage.

Set the AFC mode at a starting point of position 4 on the kV/AFC switch dial. This corresponds to approximately 40 μA. Adjustments can then be made to optimize performance for different part configurations and application parameters.

When the device-to-part distances changes, the AFC circuitry maintains the optimum combination of voltage and current.

**Shutdown**

See Figure 4-1. Turning the power switch (1) off will also turn off the DC power to the spray device.
Maintenance

Refer to the Repair section for complete disassembly and rebuilding procedures.

NOTE: Significant differences in output may mean that the spray device resistor or multiplier is failing.

1. With no parts in front of the spray device, compare the spray device µA output in kV mode with the output and kV setting recorded at initial startup.

NOTE: Ungrounded or poorly grounded parts will not attract charged paint. This affects transfer efficiency, electrostatic wrap, and the quality of the finish. Ungrounded equipment and parts may also accumulate a charge that could arc and cause a fire or an explosion.

2. Check all ground connections, including part grounds.

3. Check power and cable connections.
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.

### Introduction

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.

<table>
<thead>
<tr>
<th>No.</th>
<th>Problem</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>All LEDs off, no display</td>
<td>5-2</td>
</tr>
<tr>
<td>2.</td>
<td>No power or no high voltage LEDs</td>
<td>5-2</td>
</tr>
<tr>
<td>3.</td>
<td>kV mode LED off, AFC mode LED off, display on</td>
<td>5-2</td>
</tr>
<tr>
<td>4.</td>
<td>Display off, kV mode or AFC mode LED on</td>
<td>5-2</td>
</tr>
<tr>
<td>5.</td>
<td>High voltage LED off, power LED on, kV mode or AFC mode LED on</td>
<td>5-2</td>
</tr>
<tr>
<td>6.</td>
<td>No kV out, kV mode or AFC mode LED on, high voltage LED off, display reads 00</td>
<td>5-3</td>
</tr>
<tr>
<td>7.</td>
<td>No kV out, kV mode or AFC mode LED off, display off, LED on high voltage</td>
<td>5-3</td>
</tr>
<tr>
<td>8.</td>
<td>Low kV output</td>
<td>5-3</td>
</tr>
<tr>
<td>9.</td>
<td>Display reads 0 µA output, device spraying normally</td>
<td>5-3</td>
</tr>
<tr>
<td>10.</td>
<td>Display reads 100% kV, but read 0 µA output, loss of wrap/transfer efficiency</td>
<td>5-4</td>
</tr>
<tr>
<td>11.</td>
<td>Loss of wrap, poor transfer efficiency</td>
<td>5-4</td>
</tr>
<tr>
<td>12.</td>
<td>Poor surface finish, catering, starring, or orange peel</td>
<td>5-4</td>
</tr>
</tbody>
</table>
**Troubleshooting Chart**

**WARNING:** Electrical power must be on to check voltages. Perform these procedures carefully, using insulated tools. Touching energized electrical components could be fatal.

**NOTE:** Component designations, such as SW1 and U3, may be given in troubleshooting procedures. These identify components on the circuit board. Refer to the illustrations at the end of this section when troubleshooting problems involve circuit boards.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All LEDs off, no display</td>
<td>No input power</td>
<td>Make sure power is supplied to the control unit.</td>
</tr>
<tr>
<td></td>
<td>Power switch (S1) off or open</td>
<td>Make sure switch S1 is operating properly.</td>
</tr>
<tr>
<td></td>
<td>Blown F1 fuse, C2 shorted</td>
<td>Correct the overload or short and replace fuse F1. If fuse F1 continues to blow, replace circuit board.</td>
</tr>
<tr>
<td></td>
<td>S4 not set properly</td>
<td>Make sure switch S4 is set correctly.</td>
</tr>
<tr>
<td></td>
<td>J4 jumper loose or missing</td>
<td>Make sure the jumper is located correctly on jumper block J4.</td>
</tr>
<tr>
<td>2. No power or no high voltage LEDs</td>
<td>Regulator U3 failed, no power or high voltage LED</td>
<td>Replace the circuit board.</td>
</tr>
<tr>
<td>3. kV mode LED off, AFC mode LED off, display on</td>
<td>Faulty LED D5 or D7</td>
<td>Replace the circuit board.</td>
</tr>
<tr>
<td></td>
<td>S2 defective</td>
<td>Replace the circuit board.</td>
</tr>
<tr>
<td>4. Display off, kV mode or AFC mode LED on</td>
<td>Q4 faulty</td>
<td>Replace the circuit board.</td>
</tr>
<tr>
<td></td>
<td>U6 defective</td>
<td>Replace the circuit board.</td>
</tr>
<tr>
<td>5. High voltage LED off, power LED on, kV mode or AFC mode LED on</td>
<td>Diode D6 shorted</td>
<td>Replace the circuit board.</td>
</tr>
<tr>
<td></td>
<td>Q1 failed. TP-8 to ground is greater than 1 V</td>
<td>Replace the circuit board.</td>
</tr>
</tbody>
</table>

*Continued...*
<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
</table>
| 6. No kV out, kV mode or AFC mode LED on, high voltage LED off, display reads 00 | No trigger signal, possible cable damage  
Connections at circuit board connector J3 or OUTPUT receptacle bad  
Fuse F2 blown  
U1 or U2 chip defective  
S5 defective | Disconnect the power cable from the control unit. Check for continuity across plug pins 5 and ground. Replace the cable if no continuity is detected.  
Check the connections at J3 connector and the receptacle.  
Check fuse F2 and replace it, if it is blown.  
Replace the U1 chip. If this does not fix the problem, replace the U2 chip. If this still does not fix the problem, replace the circuit board.  
Move S5 to the CONTINUOUS position. Turn on the control unit. If the kV is now available, replace the circuit board. |
| 7. No kV out, kV mode or AFC mode LED off, display off, LED on high voltage | kV/AFC switch (S2) off  
U1, Q2, or U3 defective | Turn the switch and set it to the desired level.  
Replace the U1 chip. If this does not fix the problem, replace the circuit board. |
| 8. Low kV output                                                       | kV/AFC switch (S2) not adjusted properly  
Low input voltage. TP-1 less than 24 Vdc  
U1 chip failed  
Spray device resistor, cable, or multiplier failed | Increase the AFC current set point or the kV output.  
Make sure S4 and J4 are set correctly for the input voltage.  
Check from TP-2 to ground for 21 Vdc with a voltmeter. If this voltage is not present, replace U1 chip.  
Check the resistor and multiplier with a megohmmeter. Check the cable continuity. |
| 9. Display reads 0 µA output, device spraying normally                | Spray device cable feedback circuit open, or loose or dirty cable connection  
Feedback resistor open  
kV/µA switch (S3) failed | Check connections at the J3 connector on the circuit board, the device OUTPUT receptacle, and at the device multiplier. Check the cable continuity. Replace the cable if no continuity is detected.  
Replace the spray device multiplier. Refer to the spray device manual for procedures.  
Replace the circuit board. |

Continued...
## Troubleshooting Chart (contd)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Display reads 100% kV, but read 0 µA output, loss of wrap/transfer efficiency</td>
<td>Loose or dirty device cable connections, or cable damaged</td>
<td>Check the connections at J3, receptacle, and spray device. Check device cable continuity and replace it if necessary.</td>
</tr>
<tr>
<td></td>
<td>Multiplier failed</td>
<td>Replace the multiplier.</td>
</tr>
<tr>
<td>11. Loss of wrap, poor transfer efficiency</td>
<td>Poorly grounded part</td>
<td>Measure the resistance between the part and ground with a standard ohmmeter. Clean the conveyor and part hangers if the resistance is greater than one megohm. For best results, the resistance should be 500 ohms or less.</td>
</tr>
<tr>
<td></td>
<td>Spray device resistor or multiplier failed</td>
<td>Check the device resistor and multiplier with an ohmmeter.</td>
</tr>
<tr>
<td></td>
<td>Moisture in air causing kV to leak to ground</td>
<td>Check the air dryer and filters.</td>
</tr>
<tr>
<td>12. Poor surface finish, catering, starring, or orange peel</td>
<td>Excess surface charge on part</td>
<td>Set kV/AFC switch in the AFC mode, position 4. Adjust for the best combination of surface finish and transfer efficiency. Increase the setting to improve paint transfer efficiency. Decrease the setting to improve surface finish.</td>
</tr>
<tr>
<td></td>
<td>Poorly grounded part</td>
<td>Measure the resistance between the part and ground with a standard ohmmeter. Clean the conveyor and part hangers if the resistance is greater than one megohm. For best results, the resistance should be 500 ohms or less.</td>
</tr>
<tr>
<td></td>
<td>Paint conductivity is too low</td>
<td>Contact the paint manufacturer.</td>
</tr>
</tbody>
</table>
Circuit Board Test Points and Components

Figure 5-1 identifies the location of jumpers (J1 through J4), switches (S1 through S5), fuses (F1 and F2) and test points (TP1 through TP11).

Figure 5-1  Circuit Board Test Points and Components
Wiring Diagram

See Figure 5-2.

Figure 5-2  Wiring Diagram
Electrical Schematic

See Figure 5-3.
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.

Control Module Access

**WARNING:** Disconnect and lock out electrical power before performing the following tasks. Failure to observe this warning could result in personal injury or death.

See Figure 6-1. The control module must be removed from the cabinet to replace or repair internal components.

**Removing the Control Module**

1. Unplug the power cable and disconnect the spray device cable.
2. Loosen the captive screws (1) securing the control module to the cabinet.
3. Slide the control module from the cabinet and disconnect the ground wire (2) from the module.

![Diagram of Control Module](image)

**Figure 6-1** Removing the Control Module from the Cabinet

1. Captive screws
2. Ground wire
3. Circuit board
Installing the Control Module

**NOTE:** Check all electrical connections before installing the module in the cabinet.

1. Connect the ground wire (2) to the module.
2. Make sure the front and rear panel gaskets (not shown) are undamaged and correctly positioned. Slide the control module into the cabinet.
3. Tighten the captive screws (1) securing the control module to the cabinet.
4. Connect the spray device cable to the POWER OUTPUT receptacle and the power cable to the POWER INPUT receptacle as described in the *Installation* section.
5. Connect the cabinet ground wire to a true earth ground.

Circuit Board Replacement

**Removing the Circuit Board**

1. Remove the control module from the cabinet. Refer to *Control Module Access*.
2. Disconnect the plug connectors J1 and J3 on the circuit board. (See Figure 3-2 for connector locations, if necessary).
3. See Figure 6-2. Remove the switch-boot (1) securing the power and kV/µA toggle switches (2) to the front panel (3).
4. Remove the cap (4) and knob (5) from the kV/AFC switch (7).
5. Remove the nut (6) securing the kV/AFC switch to the front panel.
6. Remove the three screws and washers (not shown), securing the circuit board to the control module. Remove the circuit board from the module.
**Installing the Circuit Board**

**CAUTION:** Do not overtighten the screws or you will damage the circuit board.

1. See Figure 6-2. Make sure the O-ring (8) for the kV/AFC switch (7) is in place before installing the circuit board into the module.
2. See Figure 6-1. Install a new circuit board (3) into the module with the three screws and washers (not shown).
3. See Figure 6-2. Secure the kV/AFC switch to the front panel with the nut (6).
4. Place the knob (5) and cap (4) onto the kV/AFC switch (7).
5. Secure the power and kV/µA toggle switches (2) to the front panel with the switch-boot (1).
6. Connect the plug connectors J1 and J3 on the circuit board. (See Figure 3-2 for connector locations, if necessary).
7. Install the control module into the cabinet. Refer to *Installing the Control Module*. 

---

Figure 6-2  Circuit Board Replacement

1. Switch-boot  
2. Toggle switch  
3. Front panel  
4. Cap  
5. Knob  
6. Nut  
7. KV/AFC switch  
8. O-ring
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.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part</th>
<th>Description</th>
<th>Quantity</th>
<th>Note</th>
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<td>Assembly</td>
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<td>1</td>
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<td>• Subassembly</td>
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<td>A</td>
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<tr>
<td>2</td>
<td>000000</td>
<td>• • Part</td>
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</tbody>
</table>
## Kinetix Automatic Gun Power Supply

See Figures 7-1, 7-2, and 7-3.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part</th>
<th>Description</th>
<th>Quantity</th>
<th>Note</th>
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<td>336374</td>
<td>POWER UNIT, Kinetix, automatic, package</td>
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<td>—</td>
<td>336367</td>
<td>MODULE, Kinetix automatic package</td>
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<td>POWER UNIT, Kinetix, automatic</td>
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<td>2</td>
<td>981387</td>
<td>SCREW, captive, M5 x 25 mm, stainless steel</td>
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<tr>
<td>3</td>
<td>983038</td>
<td>WASHER, flat, 0.203 x 0.309 x 0.040 in., nylon</td>
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<tr>
<td>4</td>
<td>297129</td>
<td>PANEL, bezel, IPS10A</td>
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<tr>
<td>5</td>
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<td>GASKET, panel, bezel</td>
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<td>6</td>
<td>940073</td>
<td>O RING, Viton, 0.145 ID x 0.070 in., brass</td>
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<td>7</td>
<td>129583</td>
<td>GASKET, bezel</td>
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<td>8</td>
<td>940121</td>
<td>O RING, Viton, 0.364 ID x 0.070 in., brass</td>
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<td>173121</td>
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<td>173099</td>
<td>KNOB, collet, 21 mm, 1/8 in. shaft</td>
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<td>173100</td>
<td>CAP, knob, flat, 21 mm, with line</td>
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<td>12</td>
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<td>ROD, support</td>
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<td>13</td>
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<td>GASKET, rear panel</td>
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<td>SCREW, pan, slotted, M4 x 8, zinc</td>
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<td>WASHER, lock, M, internal, M4, zinc-plated steel</td>
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<td>18</td>
<td>163443</td>
<td>JUMPER, ground, cable, 15.0 in.</td>
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<td>TAG, ground</td>
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<td>20</td>
<td>271221</td>
<td>LUG, 45°, double, 0.250, 0.438</td>
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<td>21</td>
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<td>22</td>
<td>984702</td>
<td>NUT, hex, M5, brass</td>
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<td>WASHER, lock M, split, M5, zinc-plated steel</td>
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<td>24</td>
<td>933343</td>
<td>CONNECTOR, plug, 5 position</td>
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<td>25</td>
<td>130629</td>
<td>CABLE, power, 5 wire, 6.5 ft, female</td>
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<td>26</td>
<td>185072</td>
<td>EMI SUPPRESSOR, cable clamp, ferrite, 22</td>
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<td>336419</td>
<td>RECEPTACLE, input, male, Kinetix</td>
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<td>28</td>
<td>939122</td>
<td>SEAL, conduit fitting, 1/2 in.</td>
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<td>29</td>
<td>984526</td>
<td>NUT, lock, 1/8-in. conduit</td>
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<td>30</td>
<td>185067</td>
<td>SUPPRESSOR, ferrite, 7 mm diameter</td>
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<td>31</td>
<td>130627</td>
<td>RECEPTACLE, input, 6 wire, female</td>
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<tr>
<td>32</td>
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<td>TERMINAL, push on, 0.250 in., 22-18</td>
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<tr>
<td>33</td>
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<td>TAG ground</td>
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<td>B</td>
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<tr>
<td>34</td>
<td>983021</td>
<td>WASHER, flat, English, 0.203 x 0.406 x 0.040 in., brass</td>
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<tr>
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<td>36</td>
<td>140165</td>
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<td>37</td>
<td>240976</td>
<td>CLAMP, ground with wire</td>
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<tr>
<td>38</td>
<td>939110</td>
<td>STRAP, cable, 0.875 in. diameter</td>
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<td></td>
</tr>
</tbody>
</table>

**NOTE**

A: Use this power supply module as a replacement module.

B: These parts are not included with the Kinetix module, part 336367.

NS: Not Shown
Figure 7-1  Kinetix Automatic Gun Power Supply (1 of 3)
Kinetix Automatic Gun Power Supply (contd)

Figure 7-2  Kinetix Automatic Gun Power Supply (2 of 3)
Figure 7-3  Kinetix Automatic Gun Power Supply (3 of 3)
# Spare Parts

<table>
<thead>
<tr>
<th>Part</th>
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<th>Quantity</th>
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<tbody>
<tr>
<td>939991</td>
<td>FUSE, 50 mA, quick-acting, micro, 250 v</td>
<td>1</td>
</tr>
<tr>
<td>336635</td>
<td>SERVICE KIT, IC, Kinetix (U1, U2 chips)</td>
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</tr>
<tr>
<td>170695</td>
<td>BOOT, switch, waterproof</td>
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</tr>
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</table>

# Kinetix Gun Power Supply Bracket Kit

<table>
<thead>
<tr>
<th>Part</th>
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<tr>
<td>336690</td>
<td>BRACKET KIT, Kinetix power supply</td>
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<tr>
<td>168427</td>
<td>• BRACKET, cabinet, painted</td>
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</tr>
<tr>
<td>129590</td>
<td>• SPACER, cabinet friction</td>
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</tr>
<tr>
<td>983410</td>
<td>• WASHER, flat, M, narrow, M6, zinc-plated steel</td>
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<tr>
<td>129592</td>
<td>• KNOB, clamping, M6 x 12 mm long</td>
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## Section 8

### Specifications

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<thead>
<tr>
<th>Enlosure</th>
<th>Meets IP54 requirements</th>
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<tbody>
<tr>
<td><strong>Electrical</strong></td>
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</tr>
<tr>
<td>Input</td>
<td>120 or 240 Vac ± 10% at 50/60 Hz</td>
</tr>
<tr>
<td>Output</td>
<td>7-21 Vd</td>
</tr>
<tr>
<td>Short circuit output current</td>
<td>0.55 A</td>
</tr>
<tr>
<td><strong>ISA S82.1</strong></td>
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</tr>
<tr>
<td></td>
<td>Pollution Degree 2</td>
</tr>
<tr>
<td></td>
<td>Over Voltage Category 2</td>
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</tbody>
</table>
OBSOLETE
DECLARATION of CONFORMITY

Nordson Corporation
declare under our sole responsibility that the products
Kinetix, automatic liquid electrostatic applicators including control cables used with the Kinetix Automatic Applicator Power Supply
to which this declaration relates complies with the following Directives:
- Machinery Directive 89/37/EEC
- EMC Directive 89/336/EEC
- ATEX Directive 94/9/EC

The conformity is under observance of the following standards or standards documents:
EN292 EN50014 EN50081-1
EN1953 EN50050 EN50082-2
IEC 417L EN50176 EN55011
EN60204 FM7260

Type of protection:
- II 2 G, EEx 0.24 mJ (type A), Ambient temperature: 0 °C to +40 °C

N° of EC type Certificate:
- INERIS 05 ATEX 0069X

N° of notified body (ATEX surveillance)
- 1180

ISO9000 certificate
DNV

Date: 08 Dec 2005

Joseph Schroeder
Engineering Manager
Finishing Product Development

Nordson Corporation • Westlake, Ohio