NHC-4 Powder Coating System

Part 108 063A

NORDSON CORPORATION • AMHERST, OHIO • USA

Nordson Corporation welcomes requests for information, comments and inquiries about its products.

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Notice

Trademarks

Nordson's Support System

Customer Support

For more than 25 years, Nordson has offered unparalleled field service to its customers before, during, and after a sale. Nordson representatives will work with you to decide the best system for the application. Nordson will be there to help you during start up, training your employees to maintain and run your equipment, and we're only a phone call away at any time thereafter.

Parts and Accessories

Besides standard replacement parts, many accessories are available to help improve productivity and reduce downtime. Contact your Nordson representative for further information.

System Engineering

Custom design and modifications to standard equipment are available through Nordson's Finishing Systems Group. Your representative will have complete details.

RBX

Nordson has developed a "Rebuilt Exchange" program which an save you up to 50% of the cost of a new component while also eliminating downtime and costly in-plant repairs. Old, worn-out units, hoses, and guns may be traded for rebuilt Nordson equipment which has the same warranty as new equipment.

Package of Values

Specification assistance to post-installation troubleshooting, Nordson's package of values is designed to keep you productive and profitable. We provide:

- carefully engineered, high quality products;
- strong service support;
- backing of a financially and technically strong, well-established company; and
- field service representatives who believe in delivering to our customers the benefits for which you have paid—all of which is backed by a corporate commitment to deliver the product specified.

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Section 1
Safety Summary

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Safety
Powder Spray Systems

1. Introduction

This section contains general safety instructions for using your Nordson equipment. Task- and equipment-specific warnings are included in other sections of this manual where appropriate. Note all warnings and follow all instructions carefully. Failure to do so may result in personal injury, death, or property damage.

To use this equipment safely,

- read and become familiar with the general safety instructions provided in this section of the manual before installing, operating, maintaining, or repairing this equipment.
- read and carefully follow the instructions given throughout this manual for performing specific tasks and working with specific equipment.
- store this manual within easy reach of personnel installing, operating, maintaining, or repairing this equipment.
- follow all applicable safety procedures required by your company, industry standards, and government or other regulatory agencies. Refer to the National Fire Protection Association (NFPA) standard 33 and to federal, state, regulatory agency, and local codes for rules and regulations covering installation and operation of powder spray systems.
- obtain and read Material Safety Data Sheets (MSDS) for all materials used.

2. Safety Symbols

Become familiar with the safety symbols presented in this section. These symbols will alert you to safety hazards and conditions that may result in personal injury, death, or property and equipment damage.

WARNING: Failure to observe this warning may result in personal injury, death, or equipment damage.

2. Safety Symbols (contd.)

WARNING: Risk of electrical shock. Failure to observe this warning may result in personal injury, death, or equipment damage.

WARNING: Disconnect equipment from line voltage. Failure to observe this warning may result in personal injury, death, or equipment damage.

WARNING: Risk of explosion or fire. Fire, open flames, and smoking prohibited.

WARNING: Wear protective clothing, safety goggles, and approved respiratory protection. Failure to observe may result in serious injury.

WARNING: System or material pressurized. Relieve pressure. Failure to observe this warning may result in serious injury or death.

CAUTION: Failure to observe may result in equipment damage.

3. Qualified Personnel

"Qualified personnel" is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations, and have been trained to safely install, operate, maintain, and repair the equipment. It is the responsibility of the company operating the equipment to see that its personnel meet these requirements.

4. Intended Use

WARNING: Use of this equipment in ways other than described in this manual may result in personal injury, death, or property and equipment damage. Use this equipment only as described in this manual.

Nordson Corporation cannot be responsible for injuries or damages resulting from nonstandard, unintended applications of its equipment. This equipment is designed and intended only for the purpose described in this manual. Uses not described in this manual are considered unintended uses and may result in serious personal injury, death, or property damage. Unintended uses may result from taking the following actions:

- making changes to equipment that have not been recommended or described in this manual or using parts that are not genuine Nordson replacement parts.
- failing to make sure that auxiliary equipment complies with approval agency requirements, local codes, and all applicable safety standards
- using materials or auxiliary equipment that are inappropriate or incompatible with your Nordson equipment
- allowing unqualified personnel to perform any task

5. Installation

Read the installation section of all system component manuals before installing your equipment. A thorough understanding of system components and their requirements will help you install the system safely and efficiently.

- Allow only qualified personnel to install Nordson and auxiliary equipment.
- Use only approved equipment. Using unapproved equipment in an approved system may void agency approvals.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Follow all instructions for installing components and accessories.
- Install all electrical, pneumatic, gas, and hydraulic connections to local code.

5. Installation (contd.)

- Install locking, manual, shutoff valves in the air supply lines to the system. This allows you to relieve air pressure and lock out the pneumatic system before undertaking maintenance and repairs.
- Install a locking disconnect switch or breaker in the service line ahead of any electrical equipment.
- Use only electrical wire of sufficient gauge and insulation to handle the rated current demand. All wiring must meet local codes.
- Ground all electrically conductive equipment within 10 feet (3 meters) of the spray area. Ungrounded conductive equipment can store a static charge which could ignite a fire or cause an explosion if a hot spark is discharged.
- Route electrical wiring, electrostatic cables, and air hoses and tubing along a protected path. Make sure they will not be damaged by moving equipment. Do not bend electrostatic cables around a radius of less than 6 in. (152 mm).
- Install safety interlocks and approved, fast-acting fire detection systems. These shut down the spray system if the booth exhaust fan fails, a fire is detected, or other emergency situation develops.
- Make sure the spray area floor is conductive to ground and that the operator's platform is grounded.
- Use only designated lifting points or lugs to lift and move heavy equipment. Always balance and block loads when lifting to prevent shifting. Lifting devices must be inspected, certified, and rated for a greater weight than the equipment being lifted.
- Protect components from damage, wear, and harsh environmental conditions.
- Allow ample room for maintenance, material supply container drop-off and loading, panel accessibility, and cover removal.
- If safety devices must be removed for installation, install them immediately after the work is completed and check them for proper functioning.

6. Operation

Only qualified personnel, physically capable of operating the equipment and with no impairments to their judgement or reaction times, should operate this equipment.

Read all component manuals before operating a powder spray system. A thorough understanding of all components and their operation will help you operate the system safely and efficiently.

- Use this equipment only in the environments for which it is rated. Do not operate this equipment in humid, flammable, or explosive environments unless it has been rated for safe operation in these environments.

- Before starting this equipment, check all safety interlocks, fire-detection systems, and protective devices such as panels and covers. Make sure all devices are fully functional. Do not operate the system if these devices are not working properly. Do not deactivate or bypass automatic safety interlocks or locked-out electrical disconnects or pneumatic valves.

- Know where EMERGENCY STOP buttons, shutoff valves, and fire extinguishers are located. Make sure they work. If a component malfunctions, shut down and lock out the equipment immediately.

- Before operating, make sure all conductive equipment in the spray area is connected to a true earth ground.

- Never operate equipment with a known malfunction or leak.

- Do not attempt to operate electrical equipment if standing water is present.

- Never touch exposed electrical connections on equipment while the power is ON.

- Do not operate the equipment at pressures higher than the rated maximum working pressure of any component in the system.

- Know the pinch points, temperatures, and pressures for all equipment that you are working with. Recognize potential hazards associated with these and exercise appropriate caution.

- Wear shoes with conductive soles, such as leather, or use grounding straps to maintain a connection to ground when working with or around electrostatic equipment.

6. Operation (contd.)

- Do not wear or carry metallic objects (jewelry or tools) while working with or around electrostatic equipment. Ungrounded metal can store a static charge and cause harmful shocks.
- Maintain skin-to-metal contact between your hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If wearing gloves, cut away the palm or fingers.
- Keep parts of the body or loose clothing away from moving equipment or parts. Remove personal jewelry and cover or tie back long hair.
- Wear National Institute of Occupational Safety and Health (NIOSH) approved respirators, safety glasses or goggles, and gloves, and while handling powder containers, filling hoppers, operating spray equipment, and performing maintenance or cleaning tasks. Avoid getting powder coatings on your skin.
- Never point manual guns at yourself or other persons.
- Do not smoke in the spray area. A lit cigarette could ignite a fire or cause an explosion.
- If you notice electrical arcing in a spray area, shut down the system immediately. An arc can cause a fire or explosion.
- Shut off electrostatic power supplies and ground gun electrodes before making adjustments to powder spray guns.
- Shut off moving equipment before taking measurements or inspecting workpieces.
- Wash exposed skin frequently with soap and water, especially before eating or drinking. Do not use solvents to remove coating materials from your skin.
- Do not use high-pressure compressed air to blow powder off your skin or clothes. High-pressure compressed air can be injected under the skin and cause serious injury or death. Treat all high-pressure fittings and hoses as if they could leak and cause injury.

7. Less-obvious Dangers

Operators should also be aware of less-obvious dangers in the workplace that often cannot be completely eliminated:

- exposed surfaces on the equipment which may be hot or have sharp edges and cannot be practically safeguarded
- electrical equipment which may remain energized for a period of time after the equipment has been shut off
- vapors and materials which may cause allergic reactions or other health problems
- automatic hydraulic, pneumatic, or mechanical equipment or parts that may move without warning
- unguarded, moving mechanical assemblies

8. Action in the Event of a System or Component Malfunction

Do not operate a system that contains malfunctioning components. If a component malfunctions, turn the system OFF immediately.

- Disconnect and lock out electrical power. Close and lock out hydraulic and pneumatic shutoff valves and relieve pressures.
- Allow only qualified personnel to make repairs. Repair or replace the malfunctioning component.

9. Maintenance and Repair

Allow only qualified personnel to perform maintenance, troubleshooting, and repair tasks.

- Always wear appropriate protective devices and use safety devices when working on this equipment.
- Follow the recommended maintenance procedures in your equipment manuals.
- Do not service or adjust any equipment unless another person trained in first aid and CPR is present.
- Use only genuine Nordson replacement parts. Using unapproved parts or making unapproved modifications to equipment may void agency approvals and create safety hazards.

9. Maintenance and Repair (contd.)

- Disconnect, lock out, and tag electrical power at a disconnect or breaker in the service line ahead of electrical equipment before servicing.
- Do not attempt to service electrical equipment if there is standing water present. Do not service electrical equipment in a high-humidity environment.
- Use tools with insulated handles when working with electrical equipment.
- Do not attempt to service a moving piece of equipment. Shut off the equipment and lock out power. Secure equipment to prevent uncontrolled movement.
- Relieve air pressures before servicing equipment. Follow the specific instructions in this manual.
- Make sure that the room where you are working is sufficiently ventilated.
- If a "power on" test is required, perform the test carefully and then shut off and lock out power as soon as the test is over.
- Connect all disconnected equipment ground cables and wires after servicing the equipment. Ground all conductive equipment.
- Service lines connected to panel disconnect switches may still be energized unless they are disconnected. Make sure the power is off before servicing. Wait 5 minutes for capacitors to discharge after shutting off the electrical power.
- Turn off the electrostatic power supply and ground the gun electrode before adjusting or cleaning.
- Keep high-voltage connection points clean and insulated with dielectric grease or oil.
- Check all ground connections periodically with a megohm meter. Resistance to ground must not exceed one megohm. If arcing occurs, shut down the system immediately.

9. Maintenance and Repair *(contd.)*

- Check interlock systems periodically to ensure their effectiveness.

WARNING: Operating faulty electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make resistance checks part of your periodic maintenance program.

- Do not store flammable materials in the spray area or room. Keep containers of flammable materials far enough away from spray booths to prevent their inclusion in a booth fire. If a fire or explosion occurs, flammable materials in the area will increase the chances and the extent of personal injuries and property damage.

- Practice good housekeeping procedures. Do not allow dust or powder coatings to accumulate in the spray area or booth or on electrical equipment. Read this information carefully and follow instructions.

10. Disposal

Dispose of equipment and materials used in operation and cleaning according to your local regulations.

Section 2
Equipment Familiarization

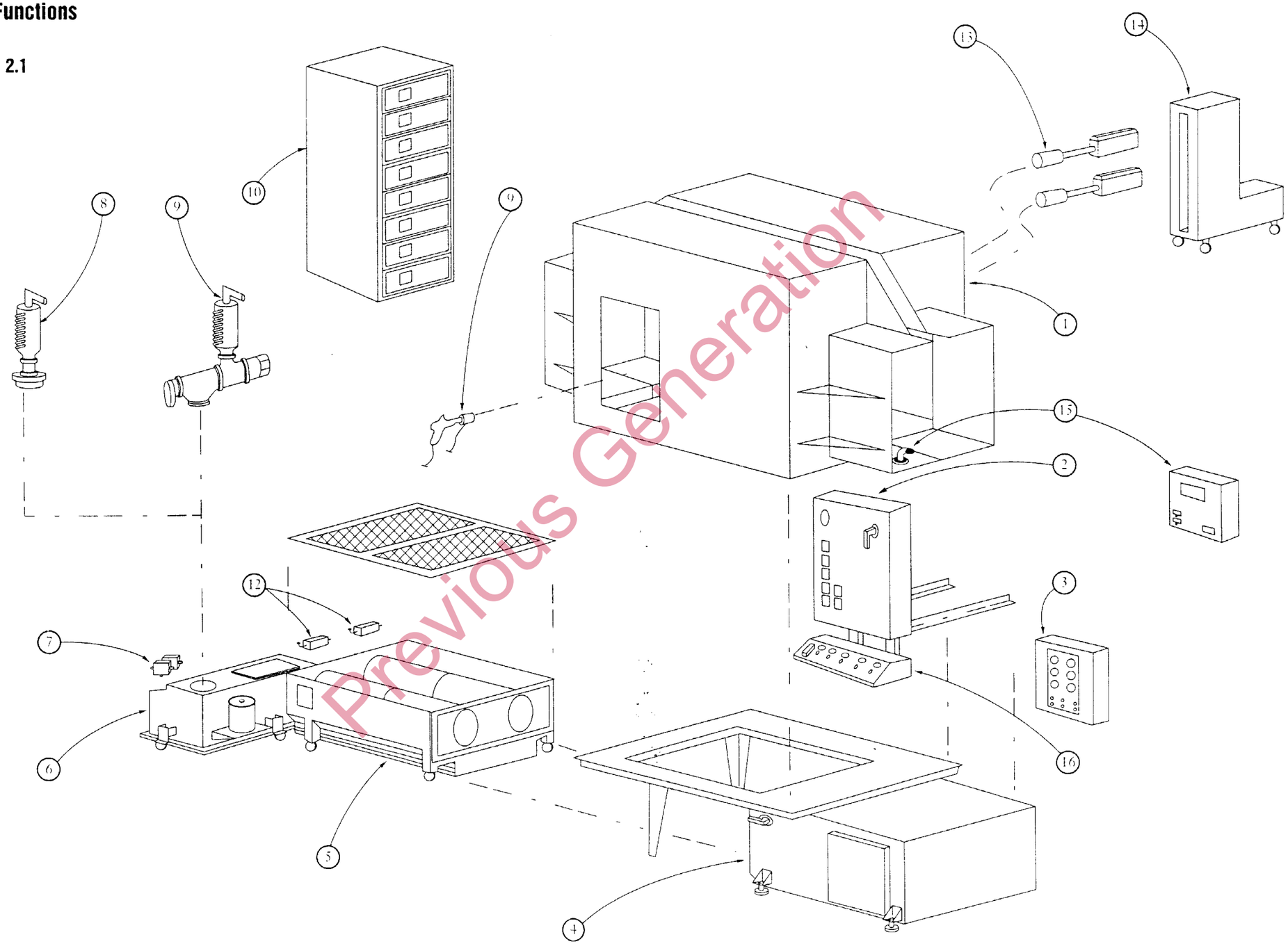
The Nordson® NHC–4 Powder Coating System is a working assemblage of pre-engineered modular components tailored to each application.

The system is a closed-loop powder delivery and recovery arrangement wherein the sprayed powder materials are contained thereby precluding the need for external exhaust of effluent.

Basic Components and Functions

Figure 2.1

Refer to page 3 for detailed information corresponding to this drawing.



Basic Components and Functions, cont.

Reference Figure 2.1 on opposite page.

Nordson® NHC-4 System Familiarization

Figure 2.1 is an exploded view of the Nordson® NHC-4 Powder Coating System which will assist the user in identifying the primary, and optional, components and their relative positions.

System components shown, include:

1. **Booth Enclosure (canopy)**
2. **Electrical Control Panel**
3. **Manual Gun Control Console**
4. **Booth Base**
5. **Collector Module**
6. **Feed Hopper**
7. **Powder Pumps**
8. **Vibratory Screener**
9. **Rotary Screener**
10. **Automatic Gun Control Console**
11. **Manual Powder Gun**
12. **Transfer Pump**
13. **Automatic Powder Gun**
14. **Gun Mover (oscillator)**
15. **Fire Protection System**
16. **Pneumatic Control Panel**

Basic Components and Functions, cont.

Powder Delivery Equipment

For the preparation and application of powder to part.

1. **Feed Hopper**—with level control. Stores and conditions the powder.
2. **Venturi-type Pumps**—draws powder from feed hopper and conveys it through hoses to guns.
3. **Guns**—electrostatically charges powder particles and spray directs them towards target part.

Powder Recovery and Recycle Equipment

For containment of powder during spraying; for collection of overspray; for recycling of powder to feed hopper.

1. **Collector Module**—with four cartridge filters. Accumulates oversprayed powder which is transfered via pumps back to feed hopper.
2. **Booth Enclosure**—engineered to each individual application. Parts are spray coated as they pass through the booth enclosure—the enclosure confines the powder.
3. **Booth Base**—complete with recirculating fan and motor; collector module attachment; high efficiency final air filters—returns clean air to room.

Control Equipment

For the safe and optimum operation of system and component parts.

1. **Gun Control Consoles**—regulates individually supplied powder feed to the guns and provides individual control of electrostatic kilovoltage.
2. **Pneumatic Control Panel**—provides regulation of hopper and collector powder fluidization, the recycle transfer pumps, and other pneumatic functions.
3. **Electrical Panel**—for system power and control distribution, motor starters, safety interlocks, operating push buttons, and indicating lights.
4. **Fire Detection and Control Equipment**—for automatic guns. Safety feature provided to shut down all powder flow, recirculating fan, electrical power and compressed air within .5 seconds after detection of spark.

Basic Components and Functions, cont.

Available options may include those listed as well as other components. Please contact your Nordson representative for further information.

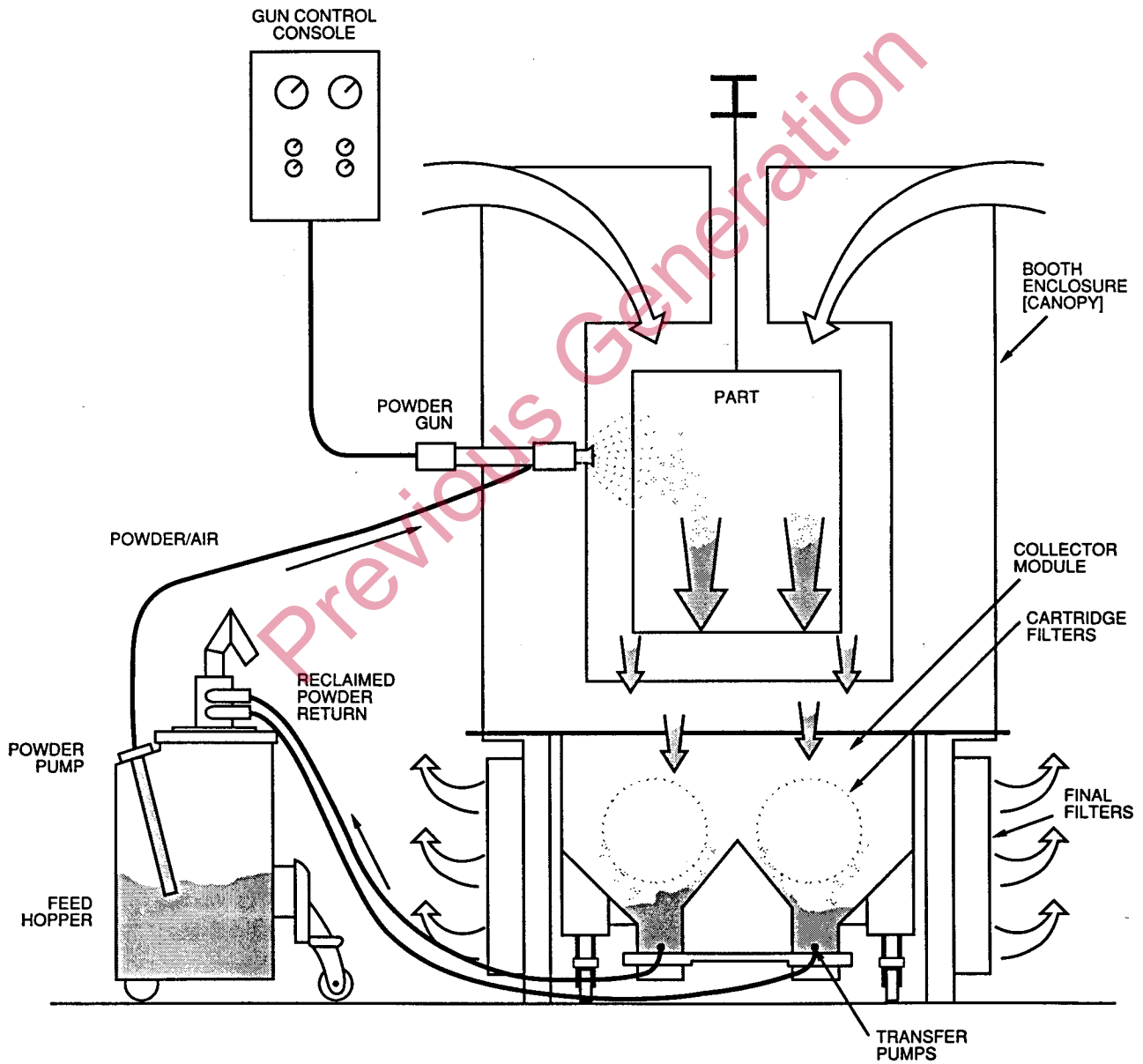
Optional Components

1. **Collector Modules**—one or more for additional powder colors.
2. **Feed Hoppers**—one or more for additional powder colors.
3. **Vibratory- or Electrically-driven Rotary Powder Screeners (Sieves)**—mounted on feed hoppers. To screen out undesirable particulates from recycled powder.
4. **Gun Movers**—oscillators or reciprocators. For automatic gun movement.
5. **Regenerative or Refrigerant Compressed Air Dryer**

System Operation

Figure 2.2

Refer to page 5 for detailed information corresponding to this drawing.



System Operation, cont.

Reference Figure 2.2 on opposite page.

Nordson® NHC-4 Powder Coating System Operation

Powder, fluidized in the feed hopper, is entrained in a clean, dry air stream by hopper-mounted pumps. The powder/air mixture is conveyed through flexible hoses to the spray guns where the powder particles receive an electrostatic charge as they are directed toward the grounded parts moving through the booth enclosure.

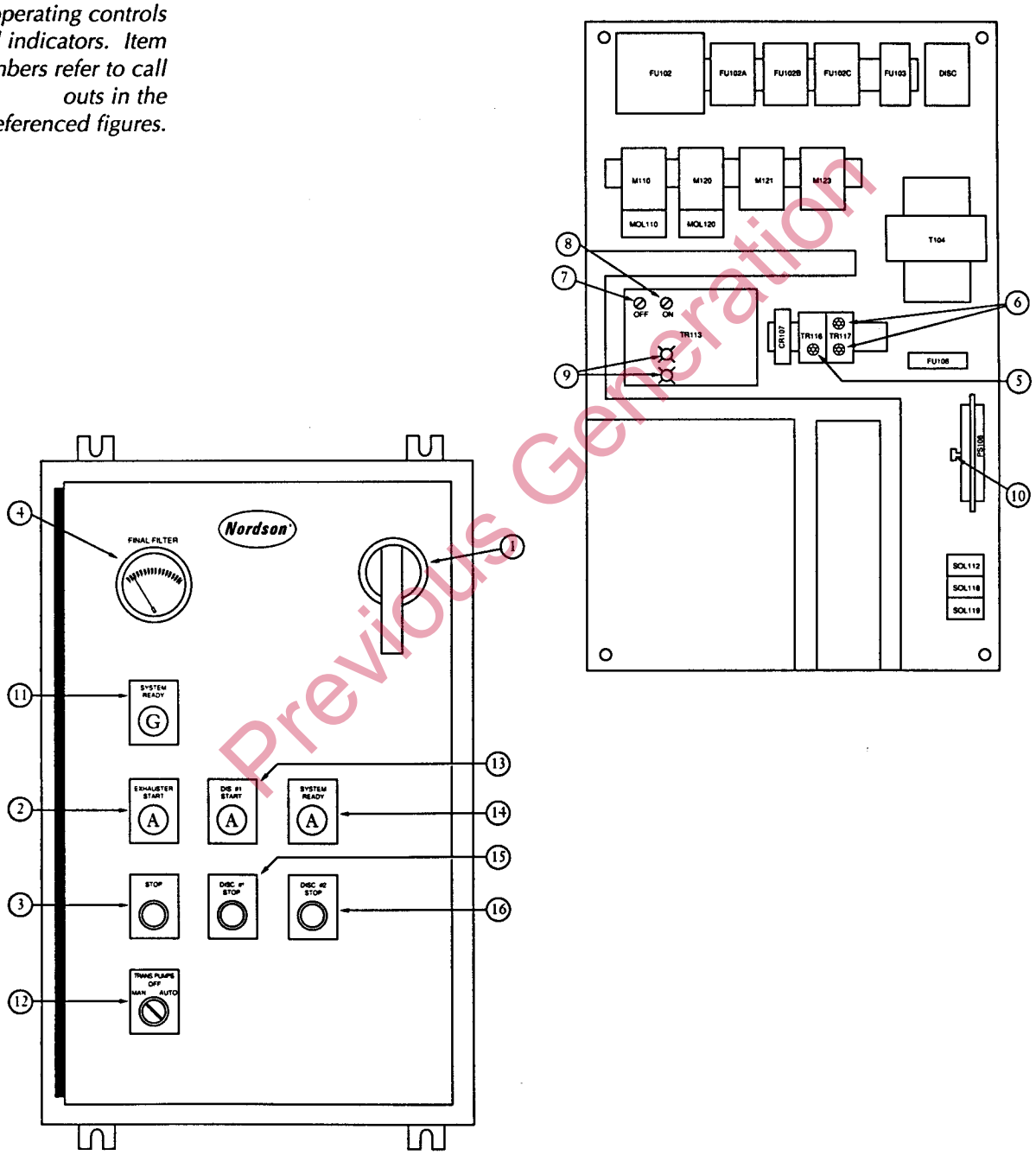
Powder, not deposited on the parts, is carried by the booth circulating air downward into the collector module where it is collected on the cartridge filters. The circulating air, now free of powder, is drawn into the base-mounted fan and discharged through high-efficiency filters back into the room.

Collected powder is air-pulse blown from the cartridge filters, falling to the bottom of the collector module. This recovered powder, fluidized in the collector module, is transfer-pumped through flexible hoses (normally through a screening device) back into the feed hopper where it blends with the virgin powder.

Operating Controls and Indicators

The chart on the opposit page explains the operating controls and indicators. Item numbers refer to call outs in the referenced figures.

Figure 2.3



Operating Controls and Indicators, cont.

Electrical Control Panel

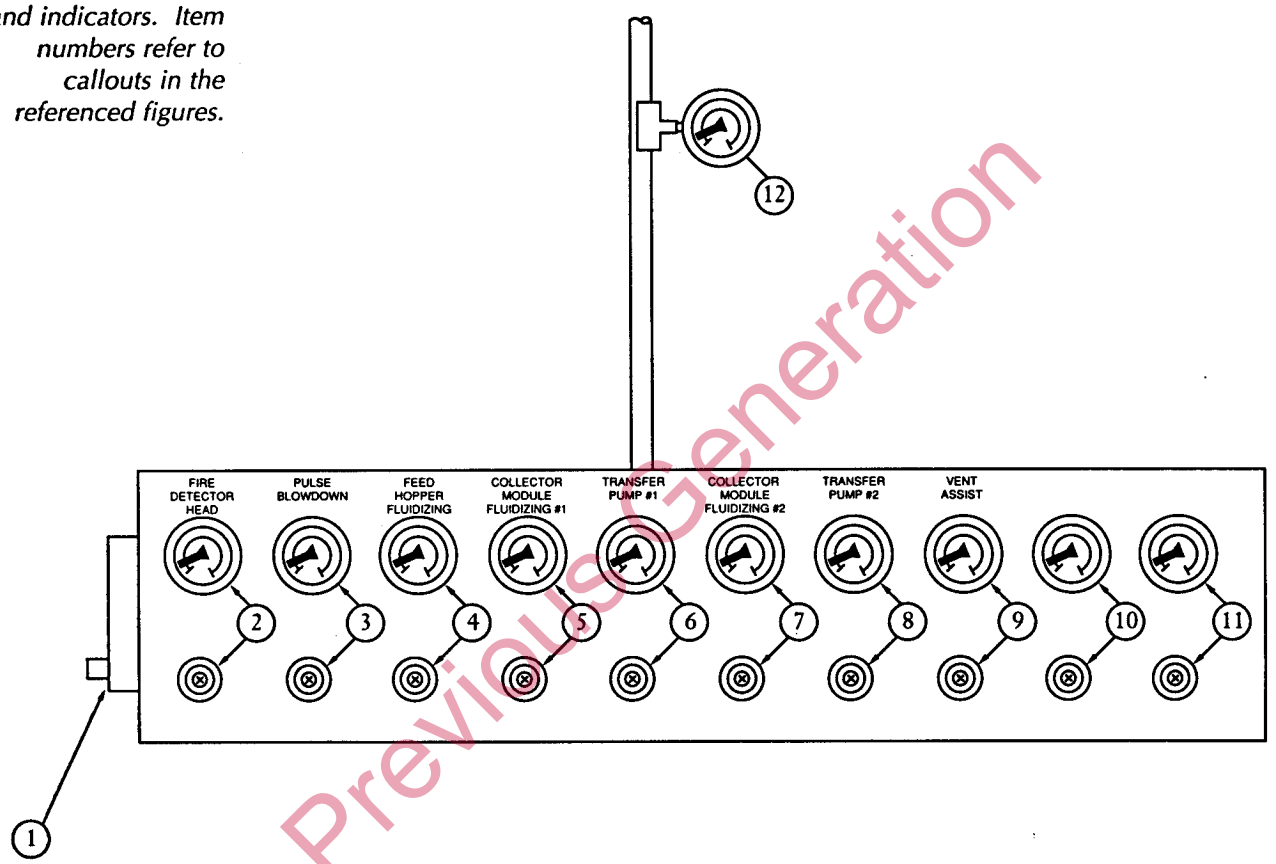
See Figure 2.3 opposite page.

Item	Description of Purpose or Function
1. **Main Disconnect Switch**	Removes or applies primary voltage service for the system, (230/460/575V).
2. **Exhauster Start Push Button/ Light**	Starts circulating fan. Lights "amber" when fan is ON and energizes system electrical and pneumatic controls.
3. **Exhauster Stop Push Button**	Stops fan. De-energizes system electrical and pneumatic controls. "Amber" light goes out.
4. **Pressure Gauge**	Indicates in inches of water (w.c.) pressure drop across the final filters.
5. **Adjustable Time Delay Relay** (TR116)	Activates transfer pumps on collector module. Delays action of level control to minimize frequency of pump "ON/OFF chatter."
6. **Dual Adjustable Time Delay Relay** (TR117)	Sets transfer pump(s) ON time. Automatically switches level control back and forth between two transfer pumps.
7. **Pulse Valve(s) Timer "OFF" Time** (Adj. 1.5–30. secs.)	Sets time between air pulses for cartridge filter blowdown.
8. **Pulse Valve(s) Timer "ON" Time** (Adj. 0.05–.5 secs.)	Sets duration of air pulses for cartridge filter blowdown.
9. **RED LED's** (Pulse Time Board)	Indicates which air pulse valve is activated. Can be used when trouble-shooting cartridge filters to isolate powder leakage.
10. **Pressure Switch Adjusting Screw**	Changes sensitivity to pressure drop across final filters.
11. **"SYSTEM READY" Light** (Green)	Indicates that all system or safety interlocks are in place.
12. **Selector Switch, 3–Position (MAN–OFF–AUTO)**	Selects powder transfer pump operation: "OFF" — no transfer "MAN" — continuous transfer (non-reclaim) "AUTO" — cycling transfer with level sensor control
13. **Oscillator #1 Start Push Button/ Light**	Starts electrically-driven Oscillator #1. Lights amber when operating.
14. **Oscillator #2 Start Push Button/ Light**	Starts electrically-driven Oscillator #2. Lights amber when operating.
15. **Oscillator #1 Stop Push Button**	Stops oscillator #1.
16. **Oscillator #2 Stop Push Button**	Stops oscillator #2.

Operating Controls and Indicators, cont.

The chart on the opposit page explains the operating controls and indicators. Item numbers refer to callouts in the referenced figures.

Figure 2.4



Operating Controls and Indicators, cont.

Pneumatic Control Panel

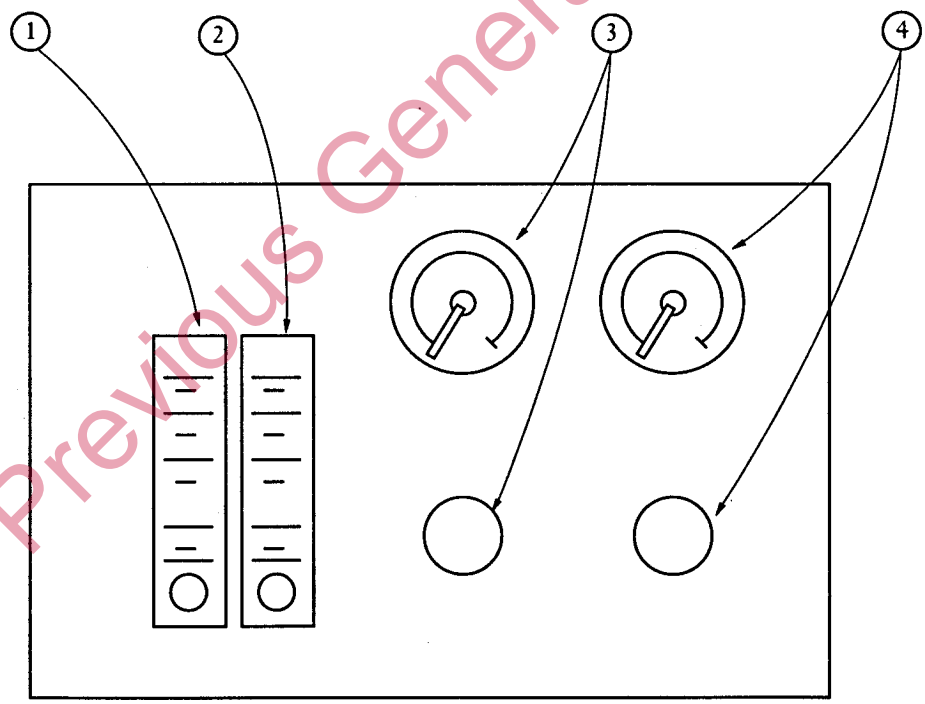
See Figure 2.4 opposite page.

Item	Description of Purpose or Function
1. **Flowmeter—Fire Detector Head (UV)**	Sets and indicates air flow (SCFM) delivered to fire detector head for clearing lens.
2. **Pressure Regulator and Gauge—Fire Detector Head (UV)**	Regulates and indicates air pressure delivered to fire detector head for cleaning lens.
3. **Pressure Regulator and Gauge—Pulse Blowdown**	Regulates and indicates air pressure to cartridge filter blowdown valves.
4. **Pressure Regulator and Gauge Feed—Hopper Fluidizing**	Regulates and indicates air pressure delivered to feed hopper plenum.
5. **Pressure Regulator and Gauge—Collector Module Fluidizing #1**	Regulates and indicates air pressure delivered to plenum #1 of collector module.
6. **Pressure Regulator and Gauge—Transfer Pump #1**	Regulates and indicates air pressure delivered to collector module transfer pump #1 to increase or decrease powder transfer rate.
7. **Pressure Regulator and Gauge—Collector Module Fluidizing #2**	Regulates and indicates air pressure delivered to plenum #2 of collector module.
8. **Pressure Regulator and Gauge—Transfer Pump #2**	Regulates and indicates air pressure delivered to collector module transfer pump #2 to increase or decrease powder transfer rate.
9. **Pressure Regulator and Gauge—Vent Assist**	Regulates and indicates pressure delivered to "vent assist" on collector module to increase or decrease exhaust flow from feed hopper cyclone.
10. **Spare Regulator and Gauge**	Used for optional components—labelled when used.
11. **Spare Regulator and Gauge**	Used for optional components—labelled when used.
12. **Primary Air Pressure Gauge**	Indicates incoming air pressure.

Operating Controls and Indicators, cont.

The chart on the opposit page explains the operating controls and indicators. Item numbers refer to call outs in the referenced figures.

Figure 2.5



Operating Controls and Indicators, cont.

Pneumatic (Rotary Screener) Control Panel*

See Figure 2.5 opposite page.

Item	Description of Purpose or Function
1. **Flowmeter (0–200 SCFH)**	Controls volume flow of air to cover end air purge seal.
2. **Flowmeter (0–200 SCFH)**	Controls volume of air flow to drive end air purge seal.
3. **Air Pressure Regulator and Gauge**	Regulates air pressure to air surge seals.
4. **Air Pressure Regulator and Gauge**	Regulates air pressure to vent-assist on collector module.

**Used with AZO only.*

General

Suggested Review of Drawings

In addition to the "Controls and Indicators," the user will want to review the following drawings to become familiar with the location of components and connection points:

Operating Environment

The Nordson® NHC-4 Powder Coating System will give the user the best performance when operated in a proper environment and within design conditions. The user should plan to locate the system in an area which maintains:

temperature range of 70–80°F; and

humidity range of 45–55% RH.

Temperature and humidity ranges exceeding the above indicates the need for climate conditioning of the installation area.

General, cont.

NOTE: Special design conditions may exist for certain applications.

Normal Design Conditions for the NHC-4 Include:

1. **End Opening Silhouettes**—allowing 6" clearance around all four sides of largest part.

2. **Part Hanger Keyhole Slot**—18" in height.

3. **Cross Drafts**—not exceeding 60 FPM.

4. **Average Face Velocity**—100 FPM (minimum) through all openings in the booth enclosure.

5. **Entering Part Temperature**—not exceeding 120°F.

6. **Total Area of Booth Enclosure**—canopy openings not to exceed 20 square feet.

7. **Powder**—Nordson® Powder Coating Systems are designed to operate with commercially available powders.

   NOTE: The characteristics and properties of a powder coating material can affect system operation. Powder coatings generally have an average particle size of 25–35 microns with no more than 10% of the total being less than 10 microns. When the percentage of fines (particles less than 10 microns) reaches 10% of the total, blinding or plugging of the filter media can occur.

8. **Cartridge Filters**—4 cartridges filters are provided with each system.

   NOTE: Cartridge filters are considered a wear item and a consumable element when operating a powder coating system. Life expectancy of a cartridge filter depends on many variables including: type of coating material; particle size distribution; humidity and temperature in the spray area; number of hours of operation; dew point and cleanliness of the compressed air used to clean the cartridges; and the pressure and frequency of reverse air cleaning.

9. **Compressed Air**—supplied at 80 to 100 psi with a maximum of 38°F pressure dewpoint from a dedicated air dryer.

Prior to installation of your NHC-4, the user should verify the above environment and operating conditions. Please check with your Nordson representative if conditions exceed these guidelines.

General, cont.

Utilities Provided By User

1. **Primary Electrical Service**—(230/460/575V) should include a fused disconnect switch with lock-out capability.

2. **Compressed Air Piping to the System**—should be a minimum of 1" NPT. Supply pressure must be 80–100 psi. Air must be clean and dry.

System Manuals

Before attempting to install components which make up the NHC-4 system, the user should become familiar with the contents of this manual. Identifying the components in the "Parts List" in Section 8; reviewing the "Operating Controls and Indicators" in Section 2, the "Pneumatic Diagrams—Figure 6.2," and the "Electrical Schematic—Figure 6.1" ***is necessary for installation, start up, and troubleshooting.***

The user should also carefully review other drawings and manuals supplied as a part of this manual. These will typically include:

1. **Booth Enclosure (Canopy) Drawing**

2. **System Layout Drawing**

3. **Powder Gun and Control Console Manuals**

4. **Electrostatic Cable Manuals**

5. **Gun Mover (Oscillators and Reciprocators) Manual**

6. **Air Dryer Manual**

7. **Fire Protection Manual**

8. **Rotary Screener Manual**

Refer to the checklist in "Section 10—Optional Parts and Equipment" to identify included manuals and drawings.

Section 3
Installation Procedures

Installation of the Nordson® NHC-4 Powder Coating System should be carried out in accordance with local, state and national codes—including NFPA Bulletin 33.

The following installation procedures are provided as guidelines to assist the user in effecting a timely and least-costly completion.

Safety • Unloading • Preparation

Observe these safety precautions during and after installation of the Nordson® NHC-4 Powder Coating System.

Safety Precautions

WARNING The Nordson® NHC-4 Powder Coating System contains energized electrical components that could be fatal. Disconnect and lock out input electrical power to the system ***before*** removing any panels or performing maintenance procedures.

WARNING Wear a filter-type respirator whenever handling powder containers, filling hoppers, operating spray equipment, or performing maintenance or cleaning operations. ***Always wear safety glasses.***

WARNING Wash skin frequently with soap and water, especially before eating or drinking. Do not use solvents to remove powder from skin. Do not use high pressure compressed air to blow powder off skin or clothes. (Compressed air injected under skin can cause serious injury or death.)

CAUTION Gloves should be worn whenever handling powder to minimize skin reaction. Obtain and read "Material Data Safety Sheets" for all powders used.

WARNING Do not allow unqualified personnel to service electrical equipment.

WARNING Do not operate equipment at a pneumatic pressure higher than the rated maximum working pressure of any component in the system. Manual shut off valves should be installed in the air supply lines to pneumatic equipment so that pressure can be relieved before undertaking maintenance or repairs.

WARNING Never touch exposed electrical connections or equipment while the power is ON.

CAUTION Lift equipment using only designated lifting points and lugs. Do not attempt to lift using covers, doors, panels, cable or hose connections. Always balance load when lifting. Never put stress on flat sheet panels.

WARNING Remove all jewelry (rings, watches, etc.) before operating or servicing equipment.

WARNING Work on a rubber mat (if possible) to service equipment. Do not attempt to service equipment when standing water is present. Avoid servicing electrical equipment in a high humidity environment.

Safety • Unloading • Preparation, cont.

WARNING Do not perform internal service or adjustment on any equipment unless another person, capable of rendering first-aid or CPR, is present.

WARNING Whenever undertaking maintenance or repairs on equipment, make sure that all moving equipment (robots, reciprocators, conveyors, etc.) that could endanger service personnel are shut down and locked out.

WARNING Connect all ground wires and straps when installation is complete.

Unloading, Unpacking, and Storage

NOTE: Equipment stored outside and/ or not protected from inclement weather, can cause damage and may void the warranty.

The Nordson® NHC-4 will be shipped partially assembled, wired, and piped—usually via truck. The user is cautioned to use care in unloading components and assemblies to avoid damage to the equipment. Typically, it will be necessary to utilize fork trucks (or other rigging equipment) to unload the equipment from the carrier.

A shipment packing list will be found taped inside the booth enclosure on the base pan. It will identify quantity and numbers of skids, numbered boxes (such as M-1, M-2, etc.), and parts contained in each box. When the shipment is unloaded, an inventory of skids and boxes (only) should be made comparing actual count against the packing list. Please report discrepancies to your Nordson representative immediately.

All equipment should be removed to an **indoor** storage area at or adjacent to the installation site. **UNPACKING AND UNCRATING SHOULD BE DELAYED UNTIL YOUR NORDSON REPRESENTATIVE ARRIVES AND CAN OVERSEE THIS ACTIVITY.**

Inspection

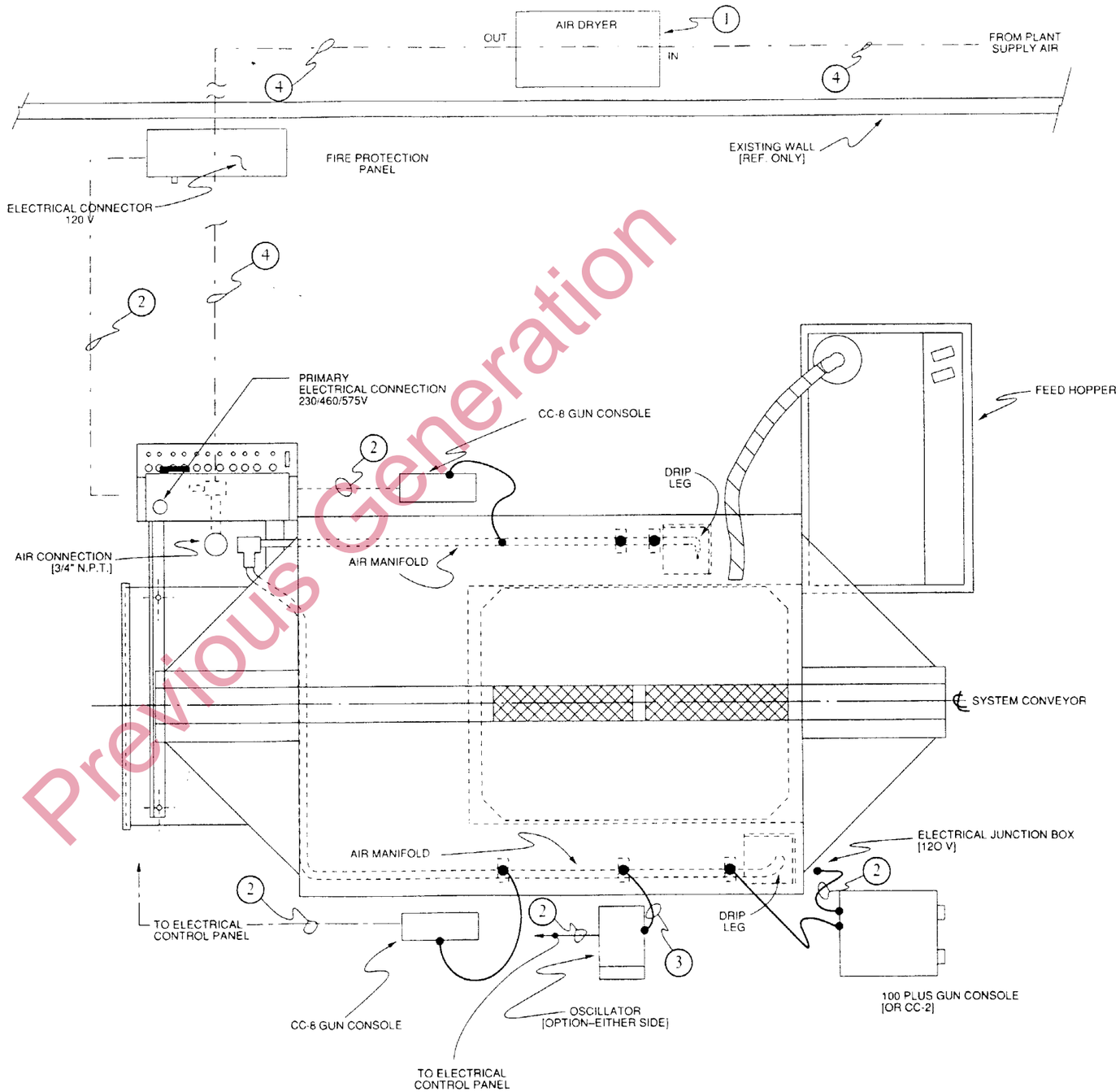
NOTE: Upon his arrival, your Nordson representative will guide you in the final unpacking of crates and boxes; examination of components for damage; and completion of an inventory.

1. Upon unloading from the carrier, inspect the components and assemblies for obvious damage such as: scratches, dents, tears, or other physical damage; corrosion, or other water damage; and/or loose fasteners.
2. Remove end cover from booth base. Inspect fan compartment for hidden damage.
3. Inspect pulse blowdown valve compartment for hidden damage.
4. Report any observed damages to the carrier. Retain a copy of this report for your Nordson representative. Take pictures of any damage. *SEE NOTE.*

Safety • Unloading • Preparation, cont.

Figure 3.1

Refer to Appendix for possible alternative layouts.



Location and Connections

1. Recommended dryer should be located in an adjacent room and/or not greater than 20 feet from the booth.
2. Field electrical connections made by purchaser.
3. No connection is made if the drive is electrical.
4. Field piping by purchaser.

Safety • Unloading • Preparation, cont.

Tools

The availability of proper hand and/or power tools will expedite and enhance installation of the Nordson® NHC-4 Powder Coating System and its components. Following is a list of required and recommended tools:

- ❑ C-clamps (and/or welder's clamps)
- ❑ Caulking Gun
- ❑ Chalk Line
- ❑ Electrical Multi-meter
- ❑ Electrical Tools
- ❑ Pipe Wrenches
- ❑ Pliers (including vise-grip)
- ❑ Plumb-bob and Line
- ❑ Portable Air or Electric Drills/ Wrenches
- ❑ Razor Knife
- ❑ Screw Driver Sets (straight blade and Phillip's head)
- ❑ Spirit Levels (minimum 3 ft.)
- ❑ Torque Wrench (up to 30 inch-pounds)
- ❑ Tubing Cutter
- ❑ Wrench Sets (including socket, open-end, Allen, and adjustable)

Foundation/Floor

The Nordson® NHC-4 system does not normally require any special foundations, however, a smooth and level concrete floor (1/8" in 3') will minimize time and effort associated with installation of the booth base and all other components of the system.

Location and Connections

Figure 3.1 (opposite page) shows the relationship of components, pneumatic connection points, and electrical service connections for the typical NHC-4 system. Please check "Section 10—Optional Compnents and Equipment" for possible alternative layouts specific to your system.

Main System Assembly Procedures

Booth Base

The booth base consists of two structures: a) a fan section which encloses the fan, motor, and blowdown valves; b) a base pan for the booth enclosure. Both are normally bolted together and shipped in one piece.

1. Bolt base pan to fan section (if received in two parts) using 5/16 – 18 x 3/4" cap screws.

2. Locate and mark center line of booth base assembly at floor level on end of fan section and on leg end of base pan.

3. Locate (on the floor) the center line of conveyor using plumb-bobs from existing conveyor, or by using the layout and conveyor drawings. Snap a chalk line on the floor to mark the center line.

*NOTE: 4 leveling pads (Item 14, Figure 8.1) must be raised off the floor prior to aligning the base. **Do not** attempt to move base with leveling pads in contact with the floor.*

4. Position and align booth base assembly over the chalk line and/or under plumb-bobs. Match center line markers established in Item 2 above.

5. Level the booth base assembly, using spirit levels, from side-to-side and end-to-end, to ± 1/16", or better.

6. Leveling of the fan section will be accomplished by raising or lowering the 4 threaded swivel pads located in the 4 corner brackets (Item 14, Figure 8.1). Leveling pads are shipped inverted. Remove and assemble with pads on bottom—before leveling the base.

7. Leveling of the legs of the base will be accomplished by inserting shims under the pads of the 2 legs. Note that the two legs must be fixed with offset clips which are lag-screwed to the floor ***ONLY*** upon completion of all installation procedures and final alignment of booth assembly.

NOTE: Proper positioning of blowdown valves is critical to powder recovery—therefore, Procedure 8 must be completed.

8. Verify (and correct if necessary) the position of 2 air pulse blowdown valves (Item 21, Figure 8.1). Valve nozzles center-to-center distance must be 17". Center of nozzles to side walls should be 10-7/8". Twist valve(s) to correct. Verify that the distance from the end of the nozzle to the outside edge of the compartment is 17". To correct, loosen 2 bolts on air manifold brackets, (Item 37, Figure 8.1). Check level of valve nozzle—if necessary, shim under square manifold. Adjust to proper distance and re-tighten bolts.

Main System Assembly Procedures, cont.

Booth Enclosure (Canopy)

The booth enclosure may be shipped as a series of flanged panels of sheet polypropylene, sheet steel, or a combination of both, i.e., roof panels of polypropylene, side walls of sheet steel.

1. Locate and become familiar with Nordson supplied booth enclosure drawing(s).

2. Lay out the panels in a clean area, taking care to avoid scratching or other damage. Identify the match marks, i.e., the panels will assemble "A" to "A," "B" to "B," etc.

3. Locate and identify fasteners (bolts) to be used in the assembly of the enclosure. Fasteners will be used as follows:

   a. Nylon cap screws and nuts (5/16-18 x 1-1/4") for polypropylene to polypropylene panels.

   b. Nylon flat head screws and nuts (5/16-18 x 1-1/4") for polypropylene baffles to polypropylene panels. (Flat head screws fit countersunk holes.)

   c. Steel cap screws (5/16-18 x 1-1/4") nuts and washers for polypropylene panels to steel, or steel to steel. Always use steel washers against polypropylene panels under the screw head.

   d. C-section clamping channels, with 2 steel cap screws, for joining booth enclosure flanges to base angle.

*NOTE: The availability and use of C-clamps, vise-grip pliers or welder's clamps will expedite assembly of the booth enclosure. **Do not** allow flanges to be stressed. Use bracing and **do not** over-tighten bolts.*

4. Locate vertical side wall panels and gun opening baffles. Install baffles in gun openings and tighten fasteners to 15 inch-pounds.

5. Assemble side wall panels with cap screws and nuts. Finger tighten.

6. Place side wall panel assemblies on booth base angle and temporarily clamp in place. Brace side walls to relieve stress on bottom flanges.

7. Locate four (4) vertical end panels (each with half vestibules) and place on end base angle. Temporarily clamp in place and brace. Assemble to side wall panels and fasten with cap screws and nuts. Finger tighten.

8. Locate and assemble two (2) roof panels with conveyor slot baffles. Tighten fasteners to 15 inch-pounds.

9. Assemble roof panels, with baffles, to side wall and end vestibule panels using cap screws and bolts. Finger tighten.

Main System Assembly Procedures, cont.

Booth Enclosure (Canopy), cont.

10. Remove bracing.

11. Verify that bottom gussets of half vestibules butt together and drill 3/8" diameter holes through both gussets. Draw gussets tightly together using steel cap screws, washers, and bolts.

12. Drill several 3/8" diameter holes between steel bolt locations. Insert nylon cap screws and nuts. Tighten to 15 inch-pounds. (The number of bolts used will vary with the length and depth of the gussets.)

13. Remove steel cap screws, nuts, and washers. Replace with nylon bolts. Tighten to 15 inch-pounds. (This step will not be required for steel enclosures.)

14. Remove temporary clamps holding bottom flange of booth enclosure to base.

15. Carefully align booth enclosure on base angle so that "interior of enclosure" is flush with, or evenly spaced around, the "interior perimeter" of the base angle. Temporarily re-clamp.

16. Locate C-section clamping channels (approximately 6" long) and evenly distribute around exterior of enclosure bottom flange and base angle. Cap screws engage bottom of base angle.

17. Securely tighten cap screws of C-section clamping channels while maintaining the alignment achieved in Step 15 above.

18. Measure roof conveyor slot and adjust, if necessary, to provide a width of approximately 5-1/2".

19. Tighten all panel fasteners to 15 inch-pounds while maintaining "interior joints" as flush as possible.

20. Using (GE) RTV silicone sealant (provided), run a smooth bead around "interior perimeter" of booth enclosure/base joint. Check for sealant under square structural tube at outboard end of collector module. Apply sealant if necessary. Allow sealant to cure for approximately 24 hours before disturbing joints.

NOTE: *Your Nordson representative will heat-gun weld all remaining "interior joints" prior to start up.* ***Do not*** *spray powder until joints are sealed.*

Main System Assembly Procedures, cont.

Collector Module

The collector module will be shipped assembled including 4 cartridge filters. The user is cautioned to remove, carefully inspect and re-install the cartridge filters to assure that no damage has occurred and that shipping has not disturbed seals.

1. Remove 4 cartridge filters in strict accordance with procedures in "Section 7—Disassembly and Repair."

NOTE: Do not use damaged filters—replace with good filters.

2. Thoroughly inspect each cartridge for damage including:

   a. Nicks or cuts in red rubber gaskets.

   b. Bent or dented steel end caps.

   c. Dents in screens which have gouged pleated filter media.

   d. Tears, separations, or holes in pleated filter media.

3. Re-install 4 cartridge filters in strict accordance with procedures in "Section 7—Disassembly and Repair."

NOTE: Over-tightening of bolts may damage or break the fluidizing plate.

4. Check-tighten fluidizing plate C-section clamp cap screws (Item 16, Figure 8.2) to 25 inch-pounds maximum using a torque wrench.

5. Install 2 powder transfer pumps (Item 14, Figure 8.2) on the lower outboard end of the collector module. (See "Section 7—Disassembly and Repair.")

6. Connect flexible tubing between fittings on collector module and quick-disconnect plate by referring to the Pneumatic Diagram, "Section 6—Troubleshooting," Figure 6.2.

7. Roll collector module aside to temporary storage with quick disconnect plate in storage bracket (Item 23, Figure 8.2).

Main System Assembly Procedures, cont.

Feed Hopper

The feed hopper will be shipped assembled, but without powder pumps or connecting tubing with disconnect plate.

NOTE: Over-tightening of bolts may damage or break the fluidizing plate.

1. Check-tighten fluidizing plate C-section clamping cap screws (Items 7 and 9, Figure 8.3) to 25 inch-pounds maximum.

2. Locate, assemble, and install 100 PLUS powder pumps (Item 14, Figure 8.3). One pump for each manual or automatic powder gun is included. Follow installation procedures in Manual 32-8, noting that the NHC-4 feed hopper will have mounting kits and powder suction (pick up) tubes already installed on hopper. Referring to Figure 4 in Manual 32-8: inspect O–rings [Ref. 3] on adapter [Ref. 1]. Replace if damaged. Take care when pressing pump down over O–rings to avoid causing damage.

3. Locate and install cyclone on top of rotary screener if removed for shipping. (See Figure 8.5.)

4. Locate and install vent plate on collector module (Item 12, Figure 8.2), if it has been removed for shipping.

5. Connect flexible plastic tubing between fittings on feed hopper and quick disconnect plate by referring to Pneumatic Diagram in Section 6, Figure 6.2.

6. Roll feed hopper aside to temporary storage with tubing and quick disconnect plate tied to top.

Main System Assembly Procedures, cont.

Used on systems with automatic and powder guns.

Fire Protection and Control System

Refer to Detronics Manual for Model 801 Ultraviolet Fire Protection System (or alternate manual provided in "Section 10—Optional Parts and Equipment") for the installation and start up procedures.

1. Position the swivel-type detector mounting brackets according to the booth enclosure (canopy) drawings.
2. Drill matching 1/4" diameter holes in canopy vestibule. Bolt bracket in place.
3. Attach detectors to bracket.
4. Locate and mount red control panel as close to booth enclosure as possible.
5. Connect clean, dry air to detector heads using 1/4" flexible tubing in accordance with Pneumatic Diagram (Figure 6.2, Section 6.)
6. Complete 120 volt, single-phase, electrical wiring and ground connections. See "Electrical Installation" in this section.
7. Position detector heads (by loosening the swivel hex lock nut) to give maximum field of view of interior of the booth enclosure as described in the manual. (Two or more heads may be used to provide optimum viewing.) Tighten swivel hex lock nut.

Main System Assembly Procedures, cont.

Gun Control Consoles

Gun control consoles, 100 PLUS, CC8 or CC2 should be positioned as close to the booth as possible to accommodate the available length of high voltage (console to gun) cables and to minimize lengths of flexible tubing from console to pumps. Refer to the following manuals for installation procedures:

The 100 PLUS (floor mounted) or CC2 consoles are most conveniently located at the collector end of the NHC-4 system adjacent to the vestibule opposite the feed hopper with the control side (or front) positioned to allow the operator to view the automatic guns when adjusting the settings.

The CC8 is designed for wall or stand mounting and should be located conveniently to the operator(s). This location should accommodate the cable length supplied and minimize tubing lengths to the gun and pump. If an operator platform is included, the CC8 is usually mounted thereon, using the bracket provided.

A booth, base-supported, CC8 stand (Figure 8.10) is used where there is no operator platform. It is clamped to the booth base square tubing at a convenient position.

1. Position the 100 PLUS or CC2 (or mount the CC8) gun control console(s).

2. Connect air hose(s) provided from manifold along side of the booth base to the inlet port of the console(s) by referring to console manuals and system pneumatic diagram.

3. Complete electrical wiring connections. (See "Electric Installation" in this section.)

Powder Guns • Mounts • Gun Movers

Powder Guns

The Nordson® NHC-4 Powder Coating System may use manual (hand) or automatic powder guns or both. **DO NOT** attach cables or powder feed tubing to guns at this stage of the installation. Refer to the following manuals in "Section 10—Optional Parts and Equipment" when installing the guns:

Manual (Hand) Guns NPE-2M 31-4, 31-0

Automatic Guns NPE-2A 31-3, 31-0

Automatic Guns 100 PLUS 31-11, 31-12

Fixed Mounts

1. Locate fixed gun mounts (Figure 8.9).
2. Position clamping/support brackets on the square mechanical tube of base pan at the gun openings of booth enclosure. (U-shaped bracket fits up from bottom of square tubing with vertical rod-clamp outboard.)
3. Insert vertical tube (rod) in clamp. Tighten bolts.
4. Position gun mounting bars and clamps on vertical tube (rod). See Figure 2, Manual 31-11, 100 PLUS Powder Gun or the drawings provided.
5. Reposition clamping/support bracket to center guns in the opening.

Gun Movers (Oscillators • Reciprocators)

The NHC-4 system with automatic powder guns may incorporate one or more vertical gun movers, The user should first identify the type of gun mover and become familiar with the respective instructional manual and drawings provided in "Section 10—Optional Parts and Equpment."

1. Locate and align oscillator at gun opening(s) allowing for offset of gun mounts.

Powder Guns • Mounts • Gun Movers, cont.

Gun Movers (Oscillators • Reciprocators), cont.

2. Mount and position gun mounts and guns as in Item 4 above.

3. Reposition oscillator so that guns are centered in the opening.

4. Bolt or lag oscillator to floor if required.

5. Connect compressed air to oscillator according to system pneumatic diagram and respective manual.

6. Complete electrical wiring connections as required. (See "Electrical Installation" in this section, and electrical schematic [Figure 6.1].)

Air Dryer

NOTE: User's compressed air supply (80 psi minimum) should be clean and dry. The system must **never** *be operated without a dedicated air dryer or with air that is not free of particulate matter, aerosols, oil, condensate, etc., or with a pressure dewpoint higher than 38°F.*

Either one of two types of compressed air dryers may be supplied with the NHC-4 system—refrigerant or regenerative. Each is a packaged assembly ready for connection to user's compressed air supply (and electric service in the case of the refrigerant-type). Install as follows:

1. Locate the manufacturer's instruction manual included in "Section 10—Optional Parts and Equipment" and become familiar with installation and operation.

2. Position the dryer according to the layout drawings or, if not specified, within 20 feet of the booth. (See Figure 2.5.)

3. Bolt or lag dryer to floor if necessary.

4. Install 1" black piping to dryer inlet from user's "valved" compressed air supply.

5. Install and connect pipe from dryer outlet to connection above electrical control panel. (Refer to Pneumatic Diagram [Figure 6.2].)

Electrical Installation

All electrical wiring should be completed in accordance with national, state and local codes, and should be performed by qualified electricians only.

System Wiring

WARNING The Nordson® NHC-4 system incorporates electrical wiring and devices which, when activated, can cause personal injury or death.

1. Install 30 amp electrical service from plant source (230/460/575 volts, 3-phase, 60 Hz) to vicinity of system. Terminate with fused disconnect switch and lock out.

2. Locate and review schematic electrical wiring drawing (Figure 6.1) in Section 6.

3. Provide stranded wire of the proper size and insulation to the following recommendations:

   Red ..... AC Control

   White ..... Common

   Blue ..... DC

   Black ..... Power

   Green (or Green with Yellow stripe) ..... Ground

   Yellow ..... Outside Source (interlocks)

   Shielded 3-conductor Cable ..... UV Detector

4. Provide and use wire number labels (markers) consistent with wiring schematic.

5. Install "earth ground" to all components of the NHC-4 system including:

   - ❑ Booth base;
   - ❑ Gun consoles;
   - ❑ Oscillators;
   - ❑ Feed hopper and cyclone;
   - ❑ Collector module;
   - ❑ Fire protection control panel and detectors; and
   - ❑ All other system components which are not directly grounded to the above.

Verify each ground connection by the use of an ohmmeter. (Paint, steel scale, or corrosion, can prevent proper grounding; remove to bare metal.)

Electrical Installation, cont.

System Wiring, cont.

6. Install wiring interconnections between system components in accordance with wiring schematic and reconnect any wiring removed for shipping purposes. Code approved practices require use of metal conduit and liquid-tight flexible conduit. Interconnections will include, but may not be limited to:

   a. Primary (230/460/575 volt, 3-phase, 60 Hz) service from lock out disconnect to the master control panel.

   b. 120 volt, single-phase, from dedicated and protected plant source to the fire protection (red) panel.

   c. Fire protection panel to detector(s) head(s). See notes on "UV Flame Detection" schematic in the manual. This requires a shielded cable and ground strap.

   d. Master control panel to the fire protection panel.

   e. Conveyor interlock to fire protection panel and to the gun consoles.

   f. Master control panel to gun console(s).

7. Verify, by continuity, all wiring and connections. Correct as necessary. Tighten all terminals—including those factory-wired.

DO NOT apply power to the system until all installation and assembly is complete and checked-out.

Completing the Installation

Final System Assembly

NOTE: Do not move base while it is resting on the leveling pads.

1. Check and adjust alignment of booth base with conveyor center line. Re-level if necessary.

2. Inspect sponge gaskets on the collector module. Replace if damaged.

NOTE: System will operate only if proximity switch is activated.

3. Position proximity switch (Item 19, Figure 8.1) at the mouth opening of the pulse blowdown compartment to bring target face 53/64" maximum outside of the compartment. Tighten locknuts. The switch is not positioned prior to shipment to prevent damage; it must be properly positioned because the collector module can only activate the switch when it is sealed against the gasket.

4. Roll in and position collector module. Align with the sides of the fan section—*taking care not to damage the flexible tubing.*

5. Level collector by raising or lowering adjustable (caster) legs (Item 17, Figure 8.2), 4 bolts per leg in the slotted holes. Maintain 3/4" between top of the module and the bottom of the base pan. The module must clear the base pan for subsequent removal.

6. Connect 1 clamping strap (Item 26, Figure 8.1). Do not tighten.

7. Connect other clamping strap and snug up.

8. Snug up first clamping strap. Tighten both clamping straps to compress the sponge gasket.

9. Inspect the magnetized seal skirt (Item 21, Figure 8.2) for holes or other damage. Replace if damaged. Separate velcro joint and note the position of the four corners of the skirt.

10. Lay out the skirt on top of the collector module grating with the smooth side facing inward and the corners positioned. Smooth the skirt into contact with the base pan frame and top frame of the collector module and rejoin the velcro. Be sure that the top edge of the skirt does not extend above base pan.

11. Connect and bolt up the collector module quick disconnect plate to the base plate (Item 4, Figure 8.1).

Completing the Installation, cont.

Final System Assembly, cont.

NOTE: The rectangular vent hole with the sponge gasketing will mate with the hole in the collector module.

12. Roll the feed hopper to the approximate position at the end of the collector module. Inspect gasket (Item 10, Figure 8.2) and replace if damaged.

13. Shift hopper to right just enough to clear 2 clamping guides, shift toward the collector module, and then shift to the left and the seat. Take precautions to ensure that the gasket is kept clear of the collector module.

14. Level hopper by adjusting the caster brackets (Item 13, Figure 8.3), 4 bolts in the slotted holes.

15. Tighten 2 thumbscrews (Item 11, Figure 8.2 and Item 12, Figure 8.3) on 2 clamping guides to compress the vent gasket.

16. Connect and bolt hopper quick disconnect plate to base plate (Item 4, Figure 8.1).

17. Connect 2" flexible vent hose between the hopper cyclone and the vent connection (Item 12, Figure 8.2) on the side of the collector module. Tighten the hose clamps.

18. Plug in power cords to the receptacles on base leg—if equipped with a rotary electric screener.

19. Attach electrical grounding straps between collector module and base leg, and between the feed hopper and base leg.

20. If "non-reclaim," round, portable HRS feed hoppers are to be used. (Refer to Steps 23–30 of Color Changes in "Section 4—Operating Instructions.")

21. Insert the level control sensor (Item 42, Figure 8.1) into the plastic well on the side of the feed hopper. Lock in place.

22. Complete any other (air and air/powder) flexible tubing connections. Assure that all cut ends are clean, square cuts. The use of properly sized tubing cutters will speed this process. Tubing must be clean and dry. Follow the pneumatic diagram (Figure 6.2) quick disconnect layout (Figure 8.6), gun console(s) and gun manuals. Connections may include:

    a. Transfer pumps on the collector module to the cyclone on feed hoppers (2 lines). Insert plugs provided in unused cyclone inlet tubes.

Completing the Installation, cont.

Final System Assembly, cont.

b. Gun consoles to the pumps on feed hoppers—2 lines per pump.

c. Booth base to control panel.

d. Removable quick-disconnect plate to feed hopper.

e. Removable quick-disconnect plate to collector module.

f. Factory installed connections removed for shipment.

23. Connect high voltage cables between gun consoles and guns in strict accordance with gun and cable manuals.

Final Inspection

Thoroughly inspect all parts of the system to insure that all equipment is properly installed in accordance with instructions in all applicable manuals. DO NOT start up the equipment until this inspection is complete.

It is recommended that the user DO NOT PROCEED WITH START UP until your Nordson representative has checked out the system installation and has completed the training of your personnel.

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Section 4
Operating Instructions

Before the user commences the safe operation of the Nordson® NHC-4 Powder Coating System, it is necessary to review safety precautions, new equipment start up, routine operating procedures, and the process of changing colors.

Do not attempt to operate the NHC-4 Powder Coating System before your Nordson representative has completed the instruction and training of your personnel and you have read "Section 2—Equipment Familiarization."

Safe Operating Guidelines

Observe these general safety guidelines when operating the Nordson® NHC-4 Powder Coating System.

Safety Precautions

WARNING The Nordson® NHC-4 system contains energized electrical components with potentials that could be fatal. Only qualified personnel should operate this equipment.

WARNING Never point a powder gun at anyone—including yourself.

WARNING Never spray powder anywhere except into the spray booth with the fan, filters, and flame detection system fully operational.

WARNING Never operate equipment at pneumatic pressures higher than the maximum rating of the components.

WARNING Never operate the equipment if it is not properly "earth-grounded." If sparking is noticed between the gun and workpiece, or between the workpiece and any other object, ***shut down the system immediately to prevent possible fire. Do not restart the system until the fault has been corrected.***

WARNING Wear a filter-type respirator whenever handling powder containers, filling hoppers, operating spray equipment, or performing maintenance or cleaning operations. ***Always wear safety glasses.***

WARNING Wash skin frequently with soap and water—especially before eating and drinking. Do not use solvents to remove powder from skin. Do not use high pressure compressed air to blow powder off skin or clothing. (Compressed air injected under skin can cause serious injury or death.)

CAUTION Gloves should be worn whenever handling powder to minimize skin reaction. Obtain and read "Material Safety Data Sheets" for all powder used.

WARNING Lock out and tag external power sources at a disconnect switch or breaker in the service line ahead of electrical equipment ***before*** servicing.

WARNING If using a hand gun, operator must maintain skin-to-metal contact between his hand and the gun handle to prevent shocks and spark hazards. If the operator must wear gloves, cut away palm or fingers.

Safe Operating Guidelines, cont.

WARNING Do not make gun adjustments without turning OFF the high voltage output at the power unit or master control console. Turn OFF power and ground the tip before cleaning or changing nozzles on a gun. When a hand gun is not in use, hang the gun so that the nozzle is within 4" (100mm) of a grounded connector.

WARNING Never touch exposed electrical connections or equipment while the power is on.

WARNING Do not operate equipment with covers, panels, or safety guards removed.

CAUTION Lift equipment using only designated lifting points or lugs. Do not attempt to lift using covers, doors, panels, cable or hose connections. Always balance the load when lifting. Never put stress on flat sheet panels.

WARNING Remove all jewelry (rings, watches, etc.) before operating or servicing this equipment.

WARNING Do not attempt to service any part of this equipment when standing water is present. Work on a rubber mat, if possible. Avoid servicing electrical equipment in a high humidity environment.

WARNING Do not perform internal service or adjustment on any equipment unless another person capable of rendering first aid and CPR is present.

WARNING Do not smoke in the spray area.

WARNING Wear shoes with conductive soles (such as leather) to maintain a connection to ground and to prevent shocks. If rubber-soled shoes are worn, it is necessary to use grounding straps to prevent potentially harmful shocks. The spray area floor must be conductive to ground and the operator's platform, if used, must also be grounded.

New Equipment Start Up

Pre-start Up Procedures

The following procedures describe the necessary steps to initially bring a new Nordson® NHC-4 Powder Coating System to the pre-production trial state.

WARNING This equipment contains electrical potentials that are dangerous and can be fatal. Disconnect and lock out primary electrical source.

WARNING Turn OFF and lock out conveyor system and, if so equipped, oscillators, reciprocators or gun movers.

WARNING Turn OFF electrostatic power at all individual power units.

NPE CC8 ..... 33-2, Key 11, Figure 7 Input Switch

100 PLUS ..... 33-4, Item 8, Figure 10

CAUTION Turn OFF incoming compressed air supply to the system.

Initial Start Up

NOTE: The following procedure is based on the assumption that installation is complete and that all electrical and compressed air interconnections are verified as being correct.

1. Remove end cover (Item 6, Figure 8.1) of the base compartment to observe the fan, motor, and V-belt drive.
2. Remove the 2 final filters (Item 34, Figure 8.1).
3. Open door of electrical control cabinet.
4. Verify continuity and size of all fuses.
5. Replace any blown fuses.
6. Set pulse valve timer (TR113):

   OFF Time—15 secs. ..... Item 7, Figure 2.4

   ON Time—.07 secs. ..... Item 2, Figure 2.4

New Equipment Start Up, cont.

7. Set transfer pump time delay relays TR116 and TR117 (Items 5 and 6, Figure 2.4).

   Time delay to pump start (TR116) .....60 seconds

   Pump ON time (TR117) .....20 seconds—both knobs

8. Close the electrical control cabinet door.

9. Turn on electrical supply (230/460/575 volt, 3-phase, 60 Hz) at the service source and on the cabinet door.

10. Jog fan motor by depressing "Exhauster Start" push button/light, and then by depressing "Stop" push button.

11. Observe direction of fan rotation with respect to the yellow arrow. If direction is o.k., proceed to Step 16 in this section. If the rotation is backward, proceed to Step 12. (Rotation of fan shaft is clockwise when viewed from the sheave or pulley end.) If you are equipped with a "rotary screener" or "AZO," observe the direction of fan rotation at the motor end. Motor shaft should be rotating "clockwise." If the rotation is backward, proceed to Step 14.

12. Open door of the electrical control cabinet.

13. Change fan rotation by reversing any 2 wires of (230/460 volt) L1, L2, or L3, coming into the fan motor starter M110 (Figure 8.7). Proceed to Step 16.

14. Change rotary screener rotation by reversing any 2 wires (230/460 volt) coming into the motor starter M120 (Figure 8.7).

15. Close door of electrical cabinet.

16. Replace end cover of fan compartment.

17. Restore electrical power.

18. Set all air pressure regulators to "0" by turning handles fully counter-clockwise.

19. Turn ON compressed air supply to the system.

20. Adjust primary service air regulator (user-supplied) to 80 psi.

New Equipment Start Up, cont.

NOTE: If the system utilizes automatic powder guns—a fire protection or "UV" system must be included.

21. Adjust UV detector pressure regulator (Item 5, Figure 2.3) to 12 psi and the flowmeter (Item 6, Figure 2.3) to 60 SCFH.

22. Adjust vent assist pressure regulator (Item 10, Figure 2.3) to 40 psi.

23. Season "new" cartridges by using the procedures listed in "New Cartridge Seasoning" immediately following this section.

*NOTE: At this point in new system start up, user **MUST season new cartridges**—this procedure may require 2 to 8 hours to complete and should not be hurried.*

New Cartridge Seasoning

CAUTION The following steps describe procedures for seasoning "new" cartridge filters. These steps ***must*** be followed whenever "new" cartridges are installed. Failure to properly season new cartridges can result in early clogging of filter media and loss of use.

1. Open seasoning slide damper on the side of the fan section (Item 2, Figure 8.1). Insure that the final filters are removed.

2. Start fan. Take initial readings of the face velocity in the entrance and exit vestibules with a hand-held velometer. Record readings.

3. Load virgin powder into the feed hopper.

4. Turn ON and adjust feed hopper fluidizing air regulator (Item 4, Figure 2.3) to approximately 8 psi. Allow adequate time for the powder to become uniformly fluid-like while looking for slight bubbling at the surface. Adjust regulators to achieve adequate fluidization without geysering (erupting clouds of powder) or having a "dead bed." Refer to "Section 6—Troubleshooting."

5. Remove powder feed hoses from powder guns and point hose ends into booth enclosure—making sure that hoses are not pointed directly at cartridge filters. Lightly fasten hoses to enclosure so that they are restrained, but not crimped.

6. Turn ON power at the gun control consoles. DO NOT turn on electrostatic power to guns. Power switches are located as follows:

   NPE CC8 ..... 33-2, Key 12, Figure 7 Output Switch

   100 PLUS Console ..... 33-4, Item 1, Figure 10; and 33-5, Item 1, Figure 2

New Equipment Start Up, cont.

7. Start a light flow of powder through the feed hoses by adjusting the flow rate and atomizing the air regulators on each console (CC8 and/or 100 PLUS). Suggested initial pressure settings are 20 psi for atomizing air and 20 psi for the flow rate. Raise or lower both pressures to establish a light flow.

8. Turn ON and adjust 2 collector module (fluidizing) air regulators (Item 5 and 7, Figure 2.3) to 10 psi. Allow powder to accumulate to a few inches depth. Readjust the regulator to give a slight bubbling of powder surface while noting that fluidization will only be seen in two narrow bands beneath the cartridges.

9. Start screeners (sieves).

   a. Vibratory—Adjust the air regulator (Figure 2.3) to 50 psi to start the pneumatic vibrator motor if the system is equipped with a vibratory screener. Raise or lower regulator pressure as necessary to "just maintain" the flow of powder through the screen into the feed hopper.

   b. Rotary—If the feed hopper is equipped with a rotary electric screener (AZO), refer to and follow the instructions given in the AZO cyclone screener manual located in the Appendix section of this manual.

   Turn ON and adjust AZO regulator (Item 3, Figure 2.6) to 25 psi and flowmeters (Items 1 and 2, Figure 2.6) to 100 SCFH. Set vent assist pressure (Item 4, Figure 2.6) to 40 psi (if used).

10. Turn ON and adjust 2 powder transfer pump air regulators (Items 6 and 8, Figure 2.3) to 15 psi. (Observe that only one pump is active at any given time. Time delay relays, TR116 and TR117, establish this normal sequence of pumps.)

11. Take continuing readings with a hand-held velometer until the face velocity through the openings reaches 1/2 of the initial values recorded in Step 2.

12. Adjust pulse valve air pressure regulator (Item 3, Figure 2.3) to 25 psi on the gauge. Pulsed blowdown of the cartridges will become audible about every 15 seconds.

13. Continue to take velometer readings until the face velocity through openings again reaches 1/2 of the recorded initial values.

14. Adjust pulse valve air pressure regulator to 40 psi.

New Equipment Start Up, cont.

New Cartridge Seasoning, cont.

15. Repeat Step 13.

16. Adjust pulse valve air pressure regulator to 55 psi. Start closing valve (Item 28, Figure 8.1) until the pressure gauge (Item 27, Figure 8.1) falls to 20 psi during a pulse. (This will prevent starving the powder pumps of air during pulses.)

17. Close seasoning slide damper. Face velocity should rise to 100 FPM or greater and remain steady.

18. Check for any powder leaks by observing if traces of powder are spitting out or by stopping fan (and powder flow) and by looking for any accumulation on the fan blades.

NOTE: Correct any powder leaks before proceeding further. Refer to "Section 6—Troubleshooting" for corrective measures.

19. Replace the 2 final filters if no leaks are apparent.

20. Using a velometer, verify that the full velocity at openings is 100 FPM or greater. If the face velocity is below requirement, contact your Nordson representative immediately.

21. Turn off all flow of powder through hoses.

22. Reconnect powder feed hoses to all guns.

At this point in the start up procedure, the user should have the Nordson representative work directly with him to complete settings of guns, pressures, electrostatic voltages, and for the initial powder coating trials.

Gun Activation

Manual Guns

The following steps cover the procedures for activating and spraying powder through the Nordson® hand guns, NPE-2M.

WARNING Review all "Safety Precautions" at the beginning of this section.

1. Thoroughly review the Electrostatic Powder Spray Hand Gun, the Control Console Model NPE-CC8, the 31-4, and the 33-2 manuals to assure that all components are properly installed and to become familiar with operating instructions.

2. Verify that the NPE-2M hand guns are positioned to spray powder only into the booth enclosure and that the high voltage output switch on the CC8 is OFF.

3. Restore electrical power and compressed air to the system. Verify that the booth circulating fan is operating and that powder in the feed hopper and collector module are properly fluidized.

4. Proceed with "Operation" section in the 33-2 manual (CC8 Console) and "Steps 1 through 8." Observe all safety precautions therein.

5. Power up conveyor (by others) and move parts into the booth enclosure.

6. Test spray items to be coated.

7. For troubleshooting, refer to manual 33-2 and "Section 6—Troubleshooting."

Gun Activation, cont.

Automatic Guns

The following steps cover the procedure for activating and spraying powder through the Nordson®100 PLUS Automatic Guns.

WARNING Review all "Safety Precautions" at the beginning of this section.

WARNING Before operating automatic powder guns, make sure that the flame protection system is fully operational.

1. Thoroughly review the 31-11 manual, 100 PLUS Series II Automatic Electrostatic Powder Spray Gun; the 33-4 manual, 100 PLUS Electrostatic Power Unit; and the 33-5 manual, 100 PLUS Master Control Unit, to ensure that all components are properly installed and to become familiar with operating instructions.

2. Verify that the 100 PLUS Automatic Guns are positioned to spray powder only into the booth enclosure and that all high voltage switches are turned OFF.

3. Restore electrical power and compressed air to the system. Verify that the booth circulating fan is operating and that powder in the feed hopper and collector module are properly fluidized.

4. Power up conveyor (by others) and move parts into booth enclosures.

5. Proceed with "Operating Instructions" in the 33-4 and 33-5 manuals. Observe all safety precautions therein.

5. Test spray items to be coated.

6. Refer to "Section 6—Troubleshooting Guide," in this manual and the 31-11 Automatic 100 PLUS, Series II Gun manuals as required.

7. Record all final air pressure and KV settings and post in a visible area on your system for continued reference.

NOTE: When the NPE-2A Automatic Guns and NPE-CC2 Control Consoles are used, refer to the 31-3 and 33-3 manuals, respectively. Follow the instructions in these manuals.

Daily Start Up and Shutdown Procedures

Shutdown

1. Allow powder from collector module to pump back into feed hopper, if possible.
2. Turn OFF power at console CC8, CC2, and/or 100 PLUS master control unit.
3. Turn OFF booth fan "exhauster stop." Turn disconnect switch handle to "OFF."
4. Perform daily preventative maintenance procedures as listed in "Section 5—Preventive Maintenance."

Daily Start Up

1. Perform daily preventive maintenance procedures as listed in "Section 5—Preventive Maintenance."
2. Turn disconnect switch handle to "ON."
3. Turn ON fan.
4. Turn ON power at CC8, CC2 and/or 100 PLUS master control unit console.
5. Adjust all air pressure and KV settings, as necessary, and/or as recorded.
6. Verify operation of flame protection system.

Changing Powder Color

Cleaning of the booth enclosure is necessary to remove all residue from those parts of the system that will be exposed to the next color.

Booth Enclosure and Gun Cleaning

Observe the following safety precautions while cleaning the booth and guns.

WARNING Wear shoes with conductive soles, e.g., leather. Rubber soles are not conductive. The wood or floor covering must be grounded, e.g., a wood platform would not provide a ground.

CAUTION Gloves should be worn when handling powder.

WARNING Wear a filter-type respirator while exposed to dusty conditions.

WARNING Remove powder from skin with soap and water. Washing in solvents can cause reaction with components in the powder resulting in allergies and skin disorders. Wash hands before eating and smoking. Do not use compressed air to blow powder off hands or clothing. This practice may result in damage to eardrums or eyes. Compressed air injected under skin may cause serious injury or death.

1. Turn ON fan (EXHAUSTER START).
2. Turn OFF all electrical power at gun consoles CC8, CC2, and/or 100 PLUS.
3. Clean guns in accordance with gun manuals in "Section 10—Optional Parts and Equipment."
4. Clean entire interior of booth enclosure using a rubber (or non–conductive or –sparking) squeegee, drawing all powder toward the collector module opening. (The collector module is not normally cleaned for color changes.)
5. Remove the remaining powder residue using an air-powered vacuum equipped with a soft brush. Follow-up by wiping down the booth with a damp cloth. After removal of the collector module, a second cleaning of the base pan may be required.
6. Turn OFF fan (STOP).

Changing Powder Color, cont.

Color Change • Non-reclaim

1. Turn OFF all electrical power and compressed air supply to the Nordson® NHC-4 Powder Coating System.

WARNING Bleed off **ALL** air pressure from the entire system. Removal of quick-disconnects or hoses while under pressure could result in serious injury.

NOTE: Steps 2 through 9 are necessary only for reclaim to non-reclaim color change.

2. Unbolt and remove quick-disconnect plate (with tubing) for the feed hopper (Item 39, Figure 8.1).

3. Store and tie tubing (with the quick-disconnect plate) on the feed hopper. Make sure that tubing clears the floor.

4. Remove ground strap.

5. Unplug rotary electric screener—if so equipped. (2 plugs are used: 230/460/575 volt and 120 volt.)

6. Remove flexible vent hose from the side of the collector module and 2 powder transfer hoses at transfer pumps. Store with the feed hopper.

7. Unlock and remove level control sensor (Item 42, Figure 8.1) from the side of the feed hopper. Store the sensor behind leg on base.

8. Loosen 4 thumbscrews on the feed hopper clamping guides and back out about 1/4" to disengage the vent gasket between the feed hopper and the collector module.

9. Pull feed hopper away from the collector module, roll the feed hopper to the right to clear clamping guides. Move to temporary storage.

10. Unbolt and remove collector module quick disconnect plate (Item 40, Figure 8.1) with tubing. Store quick disconnect on bracket (Item 23, Figure 8.2).

11. Carefully remove magnetized fabric gasketing skirt (Item 21, Figure 8.2) joining the base pan and collector module. Separation of velcro joint will aid removal. Store with collector module for re-use.

12. Release ratchets and disconnect 2 clamping straps holding collector module to fan section (Item 26. Figure 8.1).

Changing Powder Color, cont.

Color Change • Non-reclaim, cont.

13. Roll collector module straight out end—taking care to keep hoses and tubing with quick-disconnect plate clear of legs and module. Move to temporary storage. Place storage cover (Item 26, Figure 8.2) over collector module.

14. Inspect fan and blowdown valve cavity for accumulation of powder. Vacuum out cavity if necessary.

NOTE: The presence of excessive amounts of powder indicates cartridge filter leakage. Take corrective action by referring to "Section 6—Troubleshooting" before proceeding further.

15. Inspect gaskets of new (alternate color) collector module—replace if necessary.

16. Roll in and position new collector module. Take care not to damage tubing.

17. Level module if necessary. Maintain 3/4" between top of the module and the base of pan. (Module must clear the base pan for subsequent removal.)

18. Connect 1 clamping strap. DO NOT tighten.

19. Connect another clamping strap and snug up.

20. Snug up first clamping strap. Tighten both clamping straps to compress the mouth gasket, and to activate the proximity switch.

21. Inspect the new (alternate color) magnetized gasketing skirt for holes or other damage. Replace if damaged. Separate velcro joint and note position of 4 corners of the skirt.

22. Lay out skirt on the top of the collector module grating with the smooth side facing inward and the corners positioned. Smooth the skirt into contact with the base pan frame and top frame of the collector module. Rejoin the velcro.

NOTE: Be sure that the top edge of the skirt does not extend above the base pan.

23. Connect and bolt up the collector module quick disconnect plate.

24. Position HRS (non-reclaim) portable feed hopper(s), with powder pumps mounted, adjacent to the booth enclosure.

25. Connect and bolt up feed hopper quick disconnect plate, with tubing, to the base plate.

Changing Powder Color, cont.

Color Change • Non-reclaim, cont.

26. Connect the tubing between guns and powder pumps and between powder pumps and the gun console CC8, CC2, and/or 100 PLUS.

27. Connect flexible vent from feed hopper(s) to vent connection on the side of the collector module. Use "Y" connections if more than one feed hopper is used.

28. Install drum lid and cyclone assembly on top of (user-supplied) 55 gallon drum.

29. Connect 2 hoses between the transfer pumps on the collector module and the cyclone on the drum lid. Plug unused cyclone inlets.

30. Clean powder guns. Install (alternate color) powder feed tubing between pumps and guns.

31. Install all ground connections.

Color Change • Reclaim

NOTE: If the cartridge filters in the collector module have not been previously seasoned, proceed immediately to, and complete, the "Section 4—Cartridge Seasoning" procedures.

1. Follow Steps 1 through 23 for non-reclaimed color change.

2. Roll in and position new alternate color feed hopper with powder gun pumps, tubing and quick disconnect plate—following in reverse order and action Steps 2 through 8 listed under "Non-reclaim Color Change."

3. Clean powder guns. Install (alternate color) powder feed tubing between pumps and guns.

4. Connect all ground straps.

Coating With A New Color

Preparation

Before commencing spray operations, complete the color equipment changes necessary in the "Non-reclaim" or "Reclaim" sections listed above.

1. Restore electrical power and compressed air to the Nordson® NHC-4 Powder Coating System.
2. Start fan.
3. Fill feed hopper(s) with powder.
4. Verify all functions and settings for air and electrostatic voltage. (Different colors or powders may require adjustment of these settings for optimum coating results.)
5. Color change is complete. Part spraying can begin.

System Settings

	Initial Set-up	Final Set-up	Subsequent Settings
Primary Air Pressure (plant supply)	80 psi		
Collector Module			
#1 Fluidizing	10 psi		
#2 Fluidizing	10 psi		
#1 Transfer Pump	25 psi		
#2 Transfer Pump	25 psi		
Feed Hopper • Reclaim			
Fluidizing	8 psi		
Vent Assist	40 psi		
Feed Hopper • Non-reclaim			
#1 Fluidizing	8 psi		
#2 Fluidizing	8 psi		
#3 Fluidizing	8 psi		
Vent Assist	40 psi		
Pulse Manifold			
At Panel	55 psi		
After Gate Valve	20 psi		
UV Detector			
Pressure	12 psi		
Flow	60 SCFH		
Rotary Screener			
#1 Flow	100 SCFH		
#2 Flow	100 SCFH		
#3 Pressure	25 psi		
#4 Pressure (vent assist)	40 psi		
Vibratory Screener			
Pressure	50 psi		
Pulse Timer			
OFF Time	15.00 secs.		
ON Time	.07 secs.		
Transfer Pump Timers			
TR116 Delay-to-start	60 secs.		
TR117 ON time—2 settings	20 secs.		
Filter Pressure Drop Max. Readings			
Cartridge Filters	4.5 (in. w.c.)		
Final Filters	3.0 (in. w.c.)		

System Settings, cont.

	Initial Set-up	Final Set-up	Subsequent Settings
Guns			
#1 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#2 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#3 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#4 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#5 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		
#6 Flow Rate	30 psi		
Atomizing	20 psi		
KV	90/100		

Section 5
Preventive Maintenance

Nordson Corporation's recommended preventive maintenance guidelines are designed to achieve the best performance and the longest life of the Nordson® NHC-4 Powder Coating System.

These procedures are organized according to the recommended frequency of performance, i.e., daily, weekly, and periodically (those procedures depending upon varying factors—such as operating conditions and the environment).

Regular and thorough maintenance provides better and more cost-effective operation.

Safe Operating Guidelines

Observe these general safety guidelines when operating the Nordson® NHC-4 Powder Coating System.

Safety Precautions

WARNING Wear a filter-type respirator whenever handling powder containers, filling hoppers, operating spray equipment, or performing maintenance or cleaning operations. ***Always wear safety glasses.***

WARNING Wash skin frequently with soap and water—especially before eating and drinking. Do not use solvents to remove powder from skin. Do not use high pressure compressed air to blow powder off skin or clothes. Compressed air injected under skin can cause serious injury or death.

CAUTION Gloves should be worn whenever handling powder to minimize skin reactions. Obtain and read "Material Data Safety Sheets" for all powders used.

WARNING Do not allow unqualified personnel to service electrical equipment.

WARNING Lock out and tag external power sources at a disconnect switch or breaker in the service line ahead of the electrical equipment before servicing the equipment.

WARNING Do not operate equipment at a pneumatic pressure higher than the rated maximum working pressure of any component in the system. Manual shut-off valves should be installed in the air supply lines to pneumatic equipment so that pressure can be relieved before undertaking maintenance or repairs.

WARNING Never touch exposed electrical connections or equipment while the power is ON.

WARNING Do not operate equipment with covers, panels, or safety guards removed.

WARNING Lift equipment using only designated lifting points or lugs. Do not attempt to lift using covers, doors, panels, cable or hose connections. Always balance load when lifting. Never put stress on flat sheet metal panels.

WARNING Remove all jewelry (rings, watches, etc.) before operating or servicing equipment.

Safe Operating Guidelines, cont.

WARNING Do not attempt to service equipment when standing water is present. Work on a rubber mat, if possible. Avoid servicing electrical equipment in a high humidity environment.

WARNING Do not perform internal service or adjustment on any equipment unless another person capable of rendering first-aid and CPR is present.

WARNING Whenever undertaking maintenance, or repairs on equipment, make sure that all moving equipment (robots, reciprocators, conveyors, etc.) that could endanger service personnel are shut down and locked out.

WARNING Reconnect all ground wires and straps when repair is complete.

WARNING Do not smoke in the spray area.

WARNING Wear shoes with conductive soles (such as leather) to maintain a connection to ground and prevent shocks. Grounding straps must be used if rubber-soled shoes are worn to prevent potentially harmful shocks. The spray area floor must be conductive to ground. The operator's platform, if used, must be grounded.

WARNING Personnel in the spray area must not wear or carry metallic objects on their person. Ungrounded metal can store a static charge and cause harmful shocks.

WARNING Do not make gun adjustments without turning OFF the high voltage output at the power unit or master control console. Ground tip of gun before changing or cleaning nozzles.

WARNING If using a hand gun—operator must maintain skin-to-metal contact between hand and gun to prevent shocks and spark hazards. If wearing gloves—cut away palm or fingers.

WARNING Turn OFF power and ground tip of gun before cleaning or changing nozzles. When hand gun is not in use, hang so that nozzle is within 4" (100mm) of a grounded conductor.

Daily Maintenance

Booth Enclosure

With the fan ON, clean the booth interior with a rubber squeegee (or other grounded, non-sparking device) pulling the powder to the collector module opening. Wipe down with damp cloths.

Vibratory Screener (Sieve)

Remove the screen basket from the interior of the feed hopper and vacuum out contaminants. Inspect screen and replace if damaged; reconnect ground clip.

Rotary Screener (AZO)

Refer to AZO manual in "Section 10—Optional Parts and Equipment." Empty contaminants from 5 gallon pail on a daily basis and (with a soft brush) clean out any contaminants from the inside to the screen. Replace the screen if damaged.

Transfer Pumps

Remove pumps from the collector module while using a small container to catch the powder. Remove the discharge hose (to the cyclone) and blow out with a safety-type compressed air gun. Disassemble pump and clean all parts with an air gun and a soft, clean cloth. Replace worn or damaged parts.

Booth Base

NOTE: If significant powder has accumulated in either compartment, the cartridge filters may be leaking. Correct by referring to "Section 6—Troubleshooting."

1. Open and inspect the fan/motor/drive compartment. Vacuum out any powder.

2. Inspect pulse valve compartment. Vacuum out any powder.

Powder Guns

Clean guns in accordance with appropriate manuals (such as 31-11 and 31-4) in the "Section 10—Optional Parts and Equipment." Check voltage to each gun.

Daily Maintenance, cont.

Powder Pumps

Clean pumps in accordance with the 32-8 manual for 100 PLUS Powder Pumps.

Fire Protection System (UV)

Clean lens every 4 hours. Verify that detector is operating. Check flowmeter for signs of oil or water each day. Correct problem if it occurs.

Compressed Air

NOTE: Dryer should remain ON at all times to prevent moisture from accumulating in the system components.

Open drip leg. Using a clean, white cloth, check for water, oil, or other contaminants. Correct as necessary. Check and correct all regulator settings.

Gun Movers (Oscillators and Reciprocators)

On each shift, check for smooth stroking and proper speed. Correct and adjust if necessary.

Cyclones • Vent Hoses

Vacuum out cyclones and blow out vent hoses.

Air Dryers

Clean and drain filters. See "Dryer Manual" in "Section 10—Optional Parts and Equipment."

Part Clearance

Continually check clearance of parts through the booth. Part sizes may change causing damage to booth and guns.

Grounding

Continually check for grounding of parts to hangers. Clean/strip hangers regularly.

Weekly Maintenance

Booth Enclosure

Thoroughly clean the booth interior and surrounding area while the fan is ON. Squeegee all powder to collector module. Vacuum using a soft brush. Wipe down with damp, lint-free cloths.

Guns • Pumps • Hoses

Clean all parts per manuals. Replace worn parts.

Magnetized Gasket (Skirt)

Remove, clean, and inspect for damage (rips, tears, etc.). Replace if damaged.

Feed Hopper

Remove all powder, squeegee, and vacuum clean.

Collector Module

Remove all powder and vacuum clean. **DO NOT VACUUM CARTRIDGES.** Remove and clean the transfer pumps. Inspect cartridge filters for damage and replace if necessary. Season new cartridges.

Periodic Maintenance

Electrical Connections

Tighten electrical connections and inspect for loose or broken wires.

Guns and Cables

Check gun resistor and electrostatic cable resistance with a megohm meter on a regular basis.

Dryer

Check the operation of the air dryer. Refer to manual in "Section 10—Optional Parts and Equipment."

Gaskets

Inspect all foam-type gaskets for damage. Replace using contact (rubber) cement.

V-belts

Every 6 months, check tension of V-belt drive. Belt deflection should be no more than 1/2".

Bearings

Every 6 months, grease-lubricate the 2 fan shaft bearings and 2 motor bearings.

a. Shaft bearings .....2 shots of polyurea or lithium grease

b. Motor bearings .....2 shots of polyurea or lithium grease.

Rotary Screener

Every 3 months, lubricate lip seals of the rotary screener (AZO) per the manual in the "Section 10—Optional Parts and Equipment."

Periodic Maintenance, cont.

Filter Gauges

1. Observe and record readings of gauge on electrical panel and gauge on booth base. Readings should not exceed:

   a. Across cartridge filters ..... 4.5" w.c.

   b. Across final filters ..... 3.0" w.c.

   Readings in excess of the above indicate clogging of the filters. Correct problem and replace with new filters. (See "Section 6—Troubleshooting.")

Powder Tubing

Check all flexible tubing carrying powder. Blow out tubing ONLY when it is disconnected from guns and pumps. Where powder may have "impact-fused" inside the tubing—replace tubing.

Maintenance Check List

Activity	Each Shift	Daily	Weekly	6 Mos.	Color Change
Cleaning					
Booth Enclosure		❑	❑		❑
Collector Module			❑		
Cyclone		❑			
Fan/Pulse Valve Compart.			❑		❑
Gun Pumps		❑	❑		
Guns	❑		❑		❑
Part Grounding	❑				❑
Rotary Screener		❑			
Transfer Pumps		❑			
UV Lens *	❑				❑
Vent Hoses		❑			
Vibratory Screener	❑				
Visual Checks					
Air Drip Leg		❑			
Air Dryer Drain		❑			
Cartridge Filter Gauge	❑				
Electrical Connections			❑		
Final Filter Gauge	❑				
Gaskets			❑		
Gun Movers	❑				
Gun Resistors and Cable Resistance			❑		
Magnetic Skirt			❑		
Part Clearance**	❑				
Powder Levels	❑				❑
UV Detector Lens	❑				❑
V-belts				❑	

Maintenance Check List, cont.

Activity	Each Shift	Daily	Weekly	6 Mos.	Color Change
Lubrication					
Fan Bearings				❑	
Motor Bearings				❑	
Rotary Screener ***				❑	

* Every 4 hours.
** Continuously.
*** Every 3 months.

Section 6
Troubleshooting

Troubleshooting guides are provided in chart form to assist the user in finding possible causes of abnormal conditions and provide suggested corrective measures.

Obvious causes of conditions (such as broken wires, disconnected tubes, etc.) are not included in this guide.

Call your Nordson representative if difficulty arises in using a troubleshooting procedure, or if a condition is encountered which has not been discussed.

How To Use

This section is compiled in chart form to assist you in finding a probable cause to an abnormal condition. Where repair or replacement of components is necessary, refer to "Section 7—Disassembly and Repair," and "Section 8—Parts Lists."

Charts*

Charts are broken down into the following: Page

NOTE: In addition to the troubleshooting guides in this section, review the equivalent sections in the appropriate manuals located in the "Section 10—Optional Parts and Equipment."

Obvious causes of conditions (such as broken wires, disconnected tubes, etc.) are not included in this guide.

If any difficulty should arise using this guide, or a condition is encountered which has not been covered, please contact your Nordson representative for assistance. He will be glad to help you.

*Included in this section are Figures 6.2, Pneumatic Diagram; and 6.1, Electrical Schematic.

Condition-A

Powder feed to gun(s) is resulting in:
- *Inadequate flow*
- *Surging*
- *Intermittent Flow*
- *Spitting*

Probable Cause	Suggested Correction
1. Unsuitable fluidization of feed hopper.	a. Adjust (increase or decrease) fluidizing pressure. b. Proceed to "Improper Fluidization Guide."
2. Low powder level in feed hopper.	a. Refer to "Powder Not Transferring Guide."
3. Powder gun pump.	a. Inspect or clean venturi nozzles. Replace if worn. b. Inspect or clean venturi throat. Replace if worn. c. Verify sealing of pick-up tube O–rings. d. Clear obstructions from pick-up tube or hoses. Look for large contaminants floating in powder bed near inlet.
4. Obstruction in tube to gun.	a. Remove feed tube at gun. Look for smooth powder out-flow. Remove tube at pump and blow out. b. Eliminate kinks, severe bends, pinching, or any cause of impact fusion. c. Reduce length of hose to 25' maximum and vertical rise of 9' maximum.

Condition-A, cont.

Powder feed to gun(s) is resulting in:
- *Inadequate flow*
- *Surging*
- *Intermittent Flow*
- *Spitting*

Probable Cause	Suggested Correction
5. Severe tribo-charging in feed tube to gun.	a. Contact Nordson representative for alternate tubing material. b. Review problem with powder supplier.
6. Obstruction in gun (flat spray).	a. See "Gun Manual." Clean nozzle, electrode, and internal passages. b. Replace worn parts.
7. Obstruction in gun (conical spray).	a. See "Gun Manual." Clean nozzle, electrode, and internal passages. b. Verify that gap between deflector and nozzle is approximately 1/8" all around. c. Replace worn parts.
8. Flow rate or atomizing pressure.	a. Adjust settings in accordance with "Gun Control Manuals."
9. Low electrostatic voltage (KV).	a. Increase and check KV at gun with KV meter.

Condition-B

Powder coating of parts:
- *Uniformity*
- *Edge Coverage*
- *Film Build*
- *Wrap Around*
- *Penetration into recesses or corners (Faraday Cage Effect)*

Probable Cause	Suggested Correction
1. Poor ground (less than 1 megohm to ground).	a. Clean hangers, fixtures, and hooks. b. Assure conveyor grounding.
2. Gun placement.	a. Position guns 10 – 14" from part. b. Stagger guns 12" vertically and 18" horizontally to avoid overlap of spray fan pattern and electrostatic fields. c. Contact Nordson representative and/or powder supplier.
3. Gun pump pressure settings.	a. Change flow rate pressure for more or less powder. b. Change atomizing pressure to alter spray fan pattern and distribution of powder.
4. Electrostatic voltage.	a. Adjust KV settings to: 90 – 100 KV for a large flat surface; 60 – 75 KV for recesses. (Never set below 60 KV.)
5. Gun nozzle selection.	a. Normally use flat spray for large regular-shaped parts. b. Conical spray for deep recesses and most hand touch-up.
6. Powder feed.	a. See "Powder Feed to Guns."

Condition-C

Powder not transferring from collector module to feed hopper.

Probable Causes	Suggested Correction
1. Ball valve at transfer pump OFF.	a. Turn ON valve.
2. Transfer pump air pressure too low.	a. Increase pressure.
3. Transfer pump clogged.	a. Clean pump.
4. Transfer pump worn.	a. Replace worn parts.
5. Transfer hose clogged.	a. Clean out hose.
6. Screener sieves clogged.	a. Clean out sieves. b. Increase vibrator pressure.
7. Cyclone plugged.	a. Clean out inlet ports. b. Clean inside of cyclone.
8. Excessive cyclone venting.	a. Reduce vent-assist air pressure.
9. Feed hopper level control system.	a. Decrease time delay to transfer pump start. b. Increase transfer pump "ON Time." c. Adjust sensitivity of level control sensor. d. Replace level sensor.
10. Powder "rat-holing" in collector module.	a. Increase fluidizing pressure.
11. Damp or contaminated powder.	a. See "Improper Fluidization Guide, Probable Cause No. 2."

Condition-D

Improper Fluidization (geysering or dead-bed):
- *Collector Module*
- *Feed Hopper*

Probable Causes	Suggested Correction
1. Powder level not maintained 6" to 8" in collector module, or at level sensor in feed hopper.	a. Add powder. b. Powder not transferring—see "Condition C."
2. Moist or contaminated powder.	a. Check incoming air for water, oil, etc., at drip legs. Correct problem. b. Check for contaminants dripping from the conveyor. c. Replace powder.
3. Fluidizing pressure too HIGH/ LOW.	a. Adjust pressure(s) for slight percolation at surface.
4. Plugged/worn transfer pumps or hose. (Geysering in collector module.)	a. Verify ball valve is ON. b. Clean pumps. Replace. c. Clean hose.
5. Fluidizing plate(s).	a. Inspect for air leakage around flanges of plate. Correct if detected. b. Observe pressure on feed hopper for sharp increase or decrease in pressure. Replace plate. c. If no gauge, inspect plate for severe scratches, cracks, polished surface, or discolorization. Replace plate.

Condition-D, cont.

	Probable Causes	Suggested Correction
Improper Fluidization (geysering or dead–bed): • *Collector Module* • *Feed Hopper*	6. Blend of reclaim and virgin powder.	a. Complete "Daily Maintenance" of booth enclosure. b. Increase or decrease rate of powder transfer from collector module to feed hopper.
	7. Non-uniform distribution of powder in bed, i.e., stratification.	a. Increase fluidizing pressure. b. Refer to No. 2 above. c. Refer to No. 5 above.

Condition-E

Final Filters:
• Clogged
• Powder in fan compartment

Probable Cause	Suggested Correction
1. Leaking cartridge filter gaskets.	a. Remove cartridges, clean gaskets, and reinstall.
2. Damaged cartridge filter gaskets.	a. Replace cartridges. (Season "new" cartridges.)
3. Leak (crack or hole) in mouth area of collector module around the cartridge opening.	a. Locate and seal any crack or hole with RTV sealant.

Condition-F

Cartridge Filters:
• Clogged
(Observe pressure gauge)

Probable Cause	Suggested Correction
1. Inadequate pulse blowdown.	a. Increase pulse pressure. b. Decrease "OFF TIME" of pulse timers.
2. Powder too fine or contaminated.	a. Reduce ratio of reclaim-to-virgin powder. b. Check particle size of powder. c. Replace contaminated powder.
3. Blow down valves out of position.	a. Position valves according to installation procedures.
4. Cartridge seasoning inadequate.	a. Replace cartridges. (Season "new" cartridges.)

Condition-G

System:
- *Shuts Down*
- *Won't Start*

Probable Cause	Suggested Correction
1. Fire Detection System.	a. Follow troubleshooting procedures in UV manual. b. Check grounding of parts.
2. Final filters clogged.	a. Locate source of powder leakage and correct problem. (See "Final Filters Clogged."
3. Collector module not activating the proximity switch.	a. Tighten collector clamping straps. b. Reposition switch. c. Replace switch.
4. Final filter pressure switch (PS108) failed.	a. Replace switch.
5. Fuse(s) blown.	a. Replace fuse(s).
6. Electrical failure.	a. Trace circuits and correct problem.

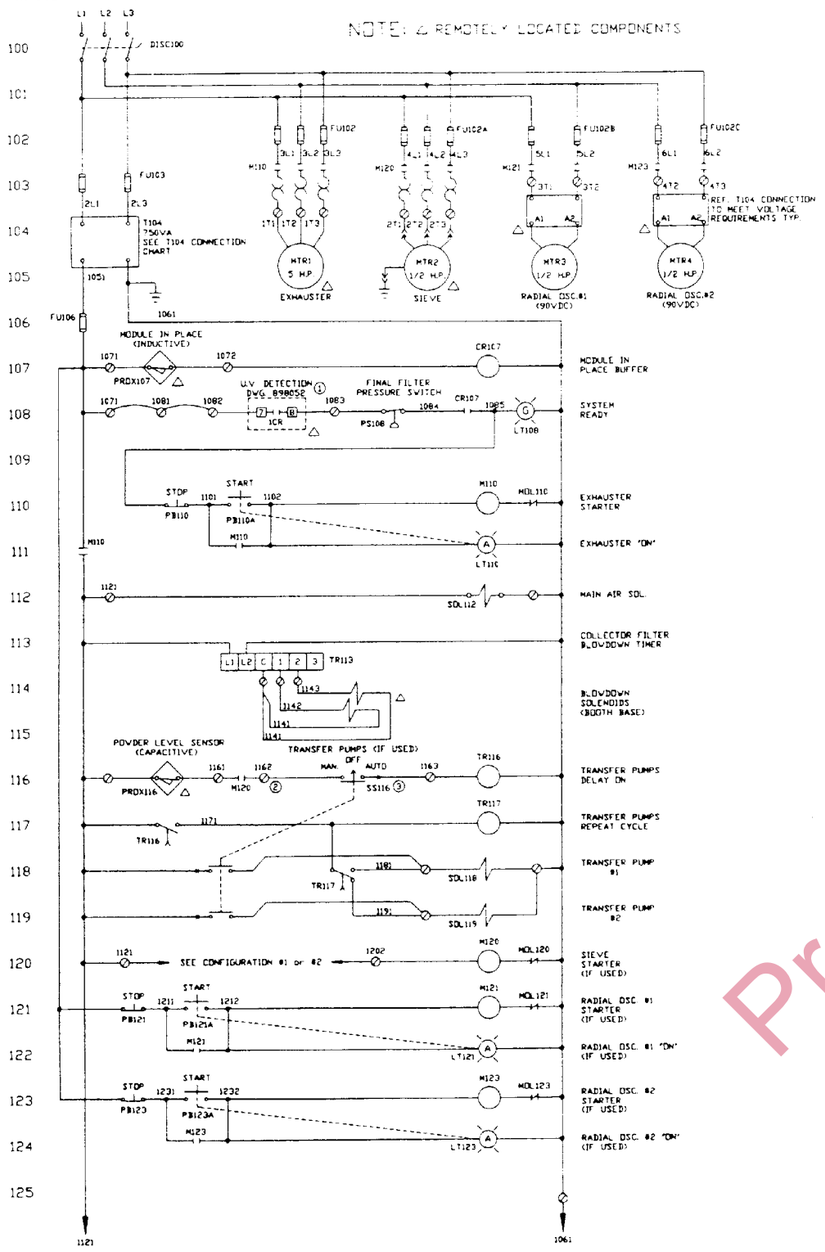
Condition-H

Powder:
• Escaping from booth openings

Probable Cause	Suggested Correction
1. Cartridge filters clogged.	a. Observe cartridge pressure drop gauge. If gauge exceeds 4-1/2" w.c., proceed to "Cartridge Filters Clogged."
2. Cross drafts.	a. Check air conditioning system intake/discharge or other sources.
3. Entering parts are too hot.	a. Cool parts before entering the booth.
4. Powder flow exceeds design criteria.	a. Reduce powder flow and/or number of guns.
5. Booth openings exceed design criteria.	a. Close off or decrease size of openings.
6. Seasoning slide damper open or restrictor plate not removed.	a. Close damper or remove restrictor plate.
7. Parts larger than design specifications.	a. Contact Nordson representative.
8. Guns too close to vestibules or openings.	a. Reposition guns.
9. Fan rotation backwards.	a. Reverse rotation of motor.
10. Air leaks around collector module.	a. Tighten strap clamps between the module and fan section to compress gasket. b. Inspect gasket. Replace if damaged. c. Inspect magnetic seal skirt (down draft booths) between base pan and module. Assure integrity of seal. Replace if damaged.

TO USERS XXXV,3PH,60Hz SUPPLY

NOTE: ⚠ REMOTELY LOCATED COMPONENTS

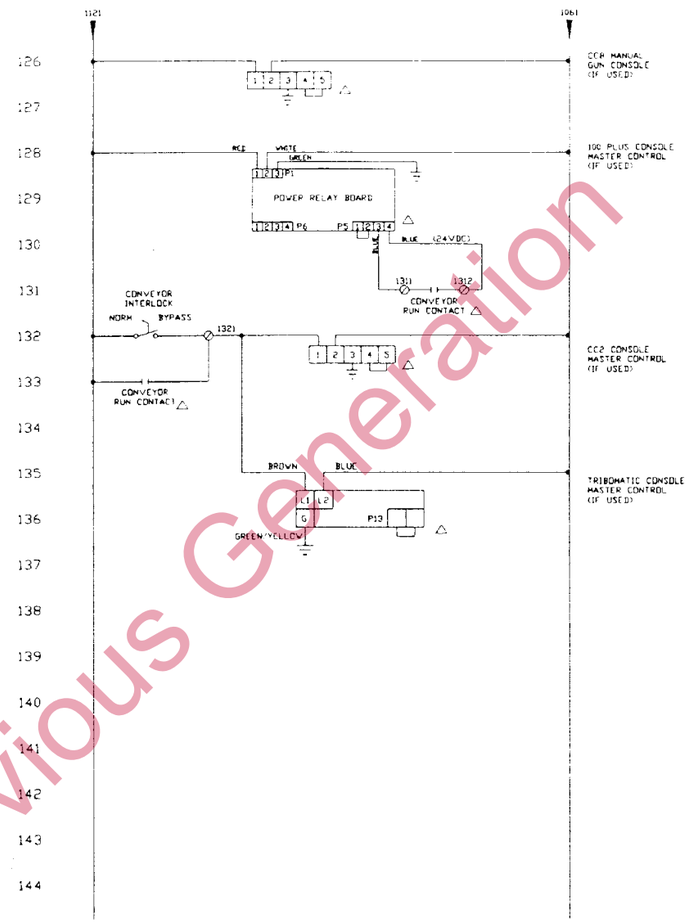


NOTE:

① CONNECT U.V. DETECTION POWER (L1, L2, GND) TO TERMINALS (107, 1061, GND) RESPECTIVELY WHEN DETECTION IS INTERLOCKING (7, 8) A SINGLE CONTROL PANEL. IF MULTIPLE PANELS, THEN U.V. DETECTION POWER SHALL ORIGINATE FROM A SEPARATE DEDICATED SOURCE (120VAC, 1 AMP). ADD JUMPER (1082 to 1083) WHEN U.V. DETECTION IS NOT REQUIRED.

② ADD JUMPER (1161 to 1162) WHEN SIEVE EQUIPMENT IS NOT INSTALLED

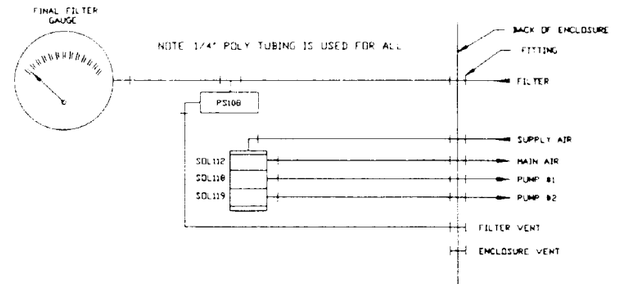
③ ADD JUMPER (1162 to 1163) WHEN TRANSFER PUMP SELECTOR IS NOT INSTALLED



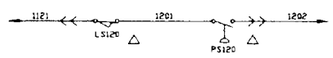
NOTE: ALL PHASES OF INSTALLATION MUST COMPLY WITH ALL FEDERAL, STATE, AND LOCAL CODES. ALL WORK THAT IS LOCATED IN CLASS 2, DIVISIONS 1 AND 2 HAZARDOUS LOCATIONS MUST COMPLY WITH NFPA CODE 33, SPRAY APPLICATION 1985 AND NFPA CODE 70, ESPECIALLY ARTICLES 500, 502, AND 516, LASTEST EDITIONS.

PNEUMATIC SCHEMATIC

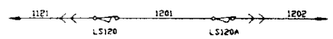
FITTINGS THROUGH BACK OF ENCLOSURE



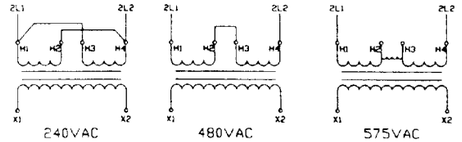
CONFIGURATION 1 : NORDSON ROTARY SCREENER (SIEVE)



CONFIGURATION 2 : AZO ROTARY SCREENER (SIEVE)



T104 CONNECTIONS:



				NORDSON CORPORATION	
				THE FINISHING SYSTEMS GROUP AMHERST, OHIO 44001 U.S.A.	
				TITLE: MASTER CONTROL PANEL NHC-4	
				CUSTOMER	
				DWG BY: KPH DATE	SCALE: INCHES NTS CENTIMETERS
CHG LET	REVISIONS	DATE	BY	CK.	SHEET 1 OF 2
					DWG. NO. 898951-01

3/4 BALL VALVE
80 TO 100 P.S.I. AIR SUPPLY
3/4 TEE
3/4 SCH 40 PIPE
2" x 2" MANIFOLD W/ 3/4 COUPLINGS
3/4 FLEX HOSE
DRIP LEG (2)
1/4 POLY LABELED #900509
TO FAN SECTION FINAL FILTER DRESS
0-160 P.S.I. PRESSURE GAUGE
LABEL
3/4 TO 1/2 REDUCER
1/2 NIPPLE CLOSE
EXHAUST
1/2 SCH 40 PIPE
MASTER CONTROL PANEL
MAC VALVE 35A-SAC-DAAA-1BA
1/2 SCH 40 PIPE
10 PORT MANIFOLD
1/2 O.D. FLEX TYPE
1/4 O.D. TUBING (SOL 1&2 MAIN AIR) PV1
1/4 O.D. TUBING FLEX TYPE (SOL 1&2 PUMP #1) PV2
1/4 O.D. TUBING FLEX TYPE (SOL 1&9 PUMP #2) PV3
SMC (2) VX 4GU13-33S
1/4 O.D. TUBING #900509
1/4 O.D. TUBING FLEX TYPE
1/4 O.D. TUBING FLEX TYPE
1/2 O.D. TUBING FLEX TYPE
COLLECTOR MODULE HOPPER #1
COLLECTOR MODULE HOPPER #2
MANIFOLD GAUGE
HOPPER
PNEUMATIC PANEL
1/2 O.D. TUBING FLEX TYPE
SPLIT RING DISCONNECT PART #898939
SHOW TUBE LOCATIONS STAMPED
1/2 O.D. TUBING #900513
1/2 O.D. TUBING #900513

NOTE: CIRCLED NUMBERS INDICATE TUBING NO. USED

AA CCB-1.2 X
3/8" O.D. TUBING
(2) 1/4 POLY TUBES GUN PUMPS
BB CC2/100+ CONTROL CONSOLE
3/4 FLEX HOSE ASSY. P/N-802060
(E) 1/4 POLY TUBES TO GUN PUMPS

PLAN VIEW
NHC-4
FAN SECTION
CANOPY
PULSE MANIFOLD
0-100 GUAGE
MANIFOLD GAUGE

9 OPTION: AZO
NOTE: VENT ASSIST REG./GAUGE INCL.
10 VENT ASSIST
10 OPTION: VIBRATOR SIEVE
NOTE: USE WITH VENT ASSIST (6)
11 NORDSON ROTARY SIEVE OPTION
NOTE: USE W/VENT ASSIST (6)
12 SPARE
CC OPTION: DIEMCO PNEUM. RECIP.
1/2 FLEX HOSE
CC

SYMBOLS

A		MANUALLY OPER. ON-OFF BALL VALVE
B		PRESS. SWITCH PS10B
C	EXH. IN	3-WAY NORMALLY CLOSED SOL. ACTUATED VALVE (MANUAL OPTION)
D		2-WAY NORMALLY CLOSED REMOTE SUPPLY PILOT PRESSURE
E		AIR LINE PRESS REGULATOR #901444 ADJUST. RELEVING
F		PRESS GAUGE 0-30 P.S.I. #901240
G		METERING VALVE (GATE VALVE)
H		PRESS. GAUGE 0-100 P.S.I. #901228
J		FLOW METER #246570
K		PRESS. GAUGE 0-160 P.S.I. #

ENGLISH

ITEM NO.	PART NO.	DESCRIPTION	QTY.

NORDSON CORPORATION
TITLE PNEUMATIC DIAGRAM - NHC-4
CUSTOMER FIG - 6.2
DRAWN B.N. DATE 10-17-89
SCALE NONES CENTIMETERS
SHEET OF
DWG NO 898951-2
REV. REVISIONS DATE BY CK
2-23-89 B.N. D.P.

Section 7
Disassembly and Repair

This section contains instructions for repair and replacement of various parts of the Nordson® NHC-4 Powder Coating System. Instructions describe the process of taking components apart, repair or replacement of key parts, and putting the assemblies together again.

Those sub-assemblies which are discussed in standard manuals provided in the "Section 10—Optional Parts and Equipment" are not covered here. Refer to the "Checklist" in that section for a listing of provided manuals.

Safe Operating Guidelines

NOTE: Instructions in this section are cross-referenced, wherever it may be helpful, to the illustrated parts lists in "Section 8—Parts Lists."

Safety Precautions

Observe the following precautions when working on the Nordson® NHC-4 Powder Coating System.

WARNING This system contains energized electrical components that could be fatal. Disconnect and lock out input electrical power to the system before removing any panels or performing maintenance procedures.

WARNING Wear a filter-type respirator whenever handling powder containers, filling hoppers, operating spray equipment, or performing maintenance or cleaning operations. ***Always wear safety glasses.***

WARNING Wash skin frequently with soap and water—especially before eating or drinking. Do not use solvents to remove powder from skin. Do not use high pressure compressed air to blow powder off skin or clothes. Compressed air injected under skin can cause serious injury or death.

CAUTION Gloves should be worn whenever handling powder to minimize skin reactions. Obtain and read "Material Safety Data Sheets" for all powders used.

WARNING Do not allow unqualified personnel to service electrical equipment.

WARNING Do not operate equipment at a pneumatic pressure higher than the rated maximum working pressure of any component in the system. Manual shut-off valves should be installed in the air supply lines to pneumatic equipment so that pressure can be relieved before undertaking maintenance or repairs.

WARNING Never touch exposed electrical connections or equipment while power is ON.

CAUTION Lift equipment using only designated lifting points or lugs. Do not attempt to lift using covers, doors, panels, or cable or hose connections. Always balance load when lifting and never put stress on flat sheet metal parts.

WARNING Remove all jewelry (rings, watches, etc.) before operating or servicing equipment.

Safe Operating Guidelines, cont.

WARNING Do not attempt to service equipment when standing water is present. Work on a rubber mat, if possible. Avoid servicing electrical equipment in a high humidity environment.

WARNING Do not perform internal service or adjustment on any equipment unless another person, who is capable of rendering first-aid and CPR, is present.

WARNING Whenever undertaking maintenance or repairs on equipment, make sure that all moving equipment (robots, reciprocators, conveyors, etc.) that could endanger service personnel are shut down and locked out.

WARNING Reconnect all ground wires and straps when repair is complete.

Cartridge Filters

Removal and Replacement

Reference Figure 8.2 (collector module).

The following steps cover the removal of spent cartridge filters and their replacement with 4 new filters.

CAUTION Shut off and lock out all compressed air supplies to the system.

NOTE: "New" cartridges must always be seasoned in accordance with the procedures in "Section 4—New Equipment Start Up."

1. Bleed off all air pressure from the system.
2. Unbolt and remove 2 quick disconnect plates (with tubing) at booth base leg.
3. Remove feed hopper in accordance with "Section 3—Installation Procedures." Roll aside.
4. Remove collector module from beneath the booth base in accordance with "Section 3—Installation Procedures." Roll aside to suitable working area. (If necessary—remove excess powder from the module so that the cartridge filter support rods are above the powder level.
5. Remove protective expanded metal grating (Item 2) from the top of the collector module.
6. Back out 2 end plate torque screws (Item 8) to relieve all pressure on the cartridges and allow clearance for removal.
7. Unscrew 2 cap screws (Item 19) with washers on the tension rods (Item 5) on the closed end. Save for reuse.
8. Unscrew bolts with washers on opposite end—while holding the retaining rods. Save rods, screws, and washers for reuse. Cartridges will now lay on 2 support rods.
9. Push cartridges (Items 3 and 4) toward the closed end of the module and remove. Remove the 2 cartridges at the open end of the module first.
10. Carefully pry out end plate (Item 6) from 2 closed end cartridges (Item 4). Clean off any RTV (silicone) from end plates.
11. Locate 4 new cartridge filters: 2 with open ends; 2 with one closed end.

Cartridge Filters, cont.

NOTE: Do not use any cartridge filters other than those approved by Nordson. The use of cartridges not specifically designed to Nordson standards could seriously affect the operation and performance of your NHC-4 Powder Coating System.

12. Remove cartridges from cartons and carefully inspect each for damage—see "Section 3—Installation." DO NOT install any damaged cartridges.

13. Apply a few short beads of RTV (silicone) around the recessed diameter of the concave, closed ends, of the 2 cartridges (Item 4). Place a clean end cap (Item 6) in the closed end recess of each cartridge. The RTV will hold the plate in place for re-assembly after it is allowed to cure for about 60 minutes.

14. Install the two closed end cartridges, with the end plate, in the collector module. Make sure they are resting on the support rods. Push the cartridges to the end so that the plate engages the torque screw. Note that the end plate is counter-bored for the torque screw.

15. Install the 2 open end cartridges with the bare steel end engaging the rubber gaskets of the previously installed cartridges (Step 14). The gaskets of these open end cartridges will compress against the collector module front wall plate with the two large round openings.

16. Install 2 retaining rods previous removed in Steps 7 and 8. Use the cap screws and washers previously removed. Tighten cap screws.

NOTE: Tightening in excess of this torque limit will cause destruction of the cartridge.

17. Tighten 2 torque screws (Item 8) to 7 foot-pounds, maximum, using a torque wrench. Inspect the cartridges for alignment and adequate engagement of gaskets.

18. Replace the protective expanded metal grating removed in Step 5.

Final Filters

Reference Figure 8.1 (booth base).

Follow these procedures if it becomes necessary to gain visual access to the interior or to replace the final filters.

Replacement

WARNING The interior of the fan section contains moving parts which can cause serious personal injury. Never put hands inside when power is available to the fan.

1. Turn OFF fan.
2. Remove screws from 6 Z-brackets (Item 35). (The Z-brackets are located 2 on the top, 4 on the sides.) Loosen 2 bottom Z-bracket screws. Set aside the 6 Z–brackets for reuse.
3. Carefully remove the filter taking care not to damage the gasket. Replace damaged gaskets.
4. Locate new final filter(s) and remove from carton.
5. Carefully inspect for damage. Do not use damaged filters.
6. Insert filter into position so that it is resting on the bottom of two z-brackets.
7. Install 2 top and 4 side Z-brackets with screws.
8. Verify proper positioning of the filter on the gasket.
9. Tighten 8 Z-bracket screws just enough to slightly compress the gasket.
10. Restart fan.

Transfer Pump

Reference Figure 8.11

Clean or Repair

The following procedures should be used to clean or repair the pumps.

WARNING Remove all compressed air from the system by turning off the incoming air and bleeding off all pressure.

1. Remove powder from the collector module, or provide a container to catch powder.
2. Remove both incoming air tubing and outgoing powder/air hose from pump.
3. Gently work pump body from fitting welded to collector module. Care should be taken that the internal O-ring (Item 6) is not damaged.
4. Gently work out venturi throat (Item 1) and air nozzle (Item 4).
5. Unscrew the elbow (Item 5).
6. Clean all parts using a safety-type air gun, and a clean, soft, and lint-free cloth.
7. Inspect all parts for wear or damage. Replace worn or damaged parts.
8. Reassemble pump. Mount on the collector module and reconnect tubing.

NOTE: Do not use any lubricant on O-rings.

Collector Module Fluidizing Plates

Reference Figure 8.2.

Replacement

Replacement of fluidizing plates will be a rare and unusual occurrence either resulting from physical equipment damage or contamination of the air, powder, etc. If replacement is necessary, it is very important that these instructions be carefully followed.

CAUTION Wear protective clothing, safety goggles, and a dust respirator.

1. Remove the collector module to a suitable work area. Refer to the procedures relating to color change and installation in "Sections 3 and 4."
2. Remove all powder from the module. Thoroughly vacuum clean module.
3. Remove cartridge filters in accordance with the procedures in this section.
4. Remove all flexible tubing connected to the module.
5. Remove vent (Item 12).
6. Remove transfer pumps (Item 14).

CAUTION Use proper equipment when handling large, heavy structures.

7. Turn over the collector module so that the bottom or "plenum" is now on top.

CAUTION When turning over the module, pivot the module on either of its long sides. Do not attempt to work on module when on its side or end.

8. Loosen cap screws from the clamping channels (Item 16 and 22). Back out cap screws about 1/4–3/8" to clear the gaskets. Remove channels with screws and save for reuse.
9. Remove plenum (Item 18) from the module. Thoroughly clean the plenum. If water or oil is evident, correct the problem before proceeding.
10. Remove damaged fluidizing plate (Item 15) with gasket.
11. Discard fluidizing plate and gasket.

Collector Module Fluidizing Plates, cont.

Replacement, cont.

12. Locate "new" fluidizing plate with gasket—verify fit to plenum and module opening.

13. Clean all surfaces of the fluidizing plate using a dry brush and lint-free cloth.

14. Position fluidizing plate, with gasket, on hopper opening and carefully align with the flanges on four sides. Position plenum on top of the fluidizing plate and align on four sides.

15. Install clamping channels over the plate, gasket, and flanges.

16. Tighten the clamping cap screws in a crisscrossing pattern to prevent flange distortion and plate damage. Use a torque wrench and tighten to 25 inch-pounds.

17. Turn over collector module to normal position on casters using the proper handling equipment.

18. Inspect cartridge filters for damage. (If cartridge filters are old—replace with new cartridges.)

19. Install cartridges in accordance with procedures in this section.

20. Replace protective grating, vent, transfer pumps, fittings, and tubing.

21. Reinstall collector module in system.

Note: *If you have installed "new" cartridges, they must be seasoned. Do not operate the system before seasoning new cartridges.*

See "Section 4—Operating Instructions."

Feed Hopper

Reference Figures 8.3, 8.4, and 8.5.

Disassembly and Repair

Disassembly and repair of the feed hopper subassembly is broken down into 4 sections. The first 3 sections (rotary screener, vibratory screener, and powder pumps) are necessary to prepare the assembly for the final section—replacement of the fluidizing plate.

CAUTION Before proceeding with any of the following disassembly or repair functions:

1. Shut down and lock out all electrical power.
2. Turn OFF and bleed-down system air pressure.
3. Remove all flexible hoses and tubing.
4. Unplug electrical connections.
5. Remove the feed hopper to a suitable work area.
6. Thoroughly clean out all powder from the hopper and screener.
7. Use proper equipment when handling large, heavy structures.

Reference Figure 8.5.

Rotary Screener Equipped

1. Unbolt and remove cyclone and vent hose from the top of the rotary screener.
2. Remove bolts from the hopper cover (Item 19).
3. Remove bolts (Item 3) which fasten screener to cover.
4. Lift and set screener aside.
5. Disassemble and clean cyclone prior to reassembly.
6. Follow instructions in the screener manual for further disassembly and repair.
7. Replace all caps in unused inlet tubes of cyclone.

Feed Hopper, cont.

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Feed Hopper, cont.

Refer to the 32-8 Manual.

Powder Pumps

1. Gently work the pump housing off the hopper-mounted adapter (Ref. No. 1, Figure 4). Do not damage O-rings.
2. Remove powder feed tube (Ref. No. 6) inside the hopper.
3. Remove retainer plate (Ref. No. 8) from inside the hopper and disassemble pump retainer (Ref. No. 7) and pickup tube (Ref. No. 8).
4. Clean all parts of the pump. Inspect all O-rings. Replace if necessary.
5. Reassemble pump for later mounting on the hopper.
6. Repeat Steps 1 through 5 for all pumps.

Fluidizing Plate

Reference Figure 8.3.

***NOTE:** The screener, pump assemblies, and cover must be removed prior to replacement of the fluidizing plate.*

1. Remove all powder and vacuum interior.
2. Turn over feed hopper so that the bottom, or plenum, is now on top.
3. Follow Steps 8 through 16 in "Collector Module Fluidizing Plates Replacement" (page 7.8) in this section.
4. Turn the feed hopper back over to the normal position on casters.
5. Reassemble pumps, screener, and cover. Reconnect flexible tubing and vent hose.
6. Reinstall the feed hopper into the system.

Blowdown Pulse Valve(s)

Access and Replacement

Reference Figure 8.1.

The 2 pulse valves are located in the fan section of the booth base. Access to the valves is through a large opening underneath the booth base pan.

1. Verify that electrical power and compressed air are shut down and locked out. Bleed off all air pressure from the system.
2. Remove feed hopper and collector module.
3. Disconnect rubber hose (Item 15) at square manifold (Item 18).
4. Remove bolts (Item 37) from the adjustable mounting brackets and lay square manifold, along with pulse valves, on floor.

NOTE: Removal of the proximity switch (Item 19) will permit better access. If this switch is removed, reinstall according to instructions in "Section 3—Installation" to assure proper operation.

5. Remove flexible electrical conduit from the back of the pulse valve (Item 21). Remove the solenoid cover on back of valve.
6. Remove 2 wires from the screw terminals on the solenoid.
7. Unscrew the pulse valve from the pipe nipple on the manifold. *(Repeat for the second pulse valve—if required.)*
8. Using Teflon® paste or tape, thread on new valve(s) to pipe nipple(s). Position and tighten the valve, pointing it toward the collector module opening, so that the final valve positioning will tighten on the threads.
9. Reconnect the 2 wires on the solenoid. Replace cover and flexible conduit.
10. Position manifold with valves. Bolt to adjustable brackets. Do not tighten bolts.
11. Adjust the manifold IN or OUT to give 17" from the end of the nozzles to the fan section opening. Tighten the bolts.
12. Position and tighten valves on the pipe nipples for 17" center-to-center of nozzles, and 10-5/8" from the nozzles centers to the side walls.
13. Reconnect the rubber hose to the manifold.
14. Reinstall the proximity switch (if removed), and verify the switching action.

Fan • Motor • V-belt Drive

Reference Figure 8.1.

***NOTE:** Access to the fan and drive is accomplished by removing the end cover (Item 36) of the fan section of booth base.*

V-belt Drive

1. Locate the motor sliding base hex-head adjusting screw at the left of, and beneath, the motor.
2. Turn the screw until the V-belts (Item 8) are loose enough to be rolled off the sheaves (or pulleys).
3. If the V-belts are to be replaced—use only properly sized, matched belts. Roll the belts onto the sheaves, making sure that the V-sections are seated in the appropriate grooves.
4. Turn the sliding base adjusting screw until the belts are tightened. Depress belts midway between the sheaves; when properly tightened, the belts should not depress more than 1/4 to 1/2".

Motor

1. Remove V-belts as above.
2. Remove 4 nuts holding the motor feet to the sliding base.
3. Pull motor from its compartment.
4. Remove the flexible conduit and disconnect the 3 wires from the motor leads.
5. Remove the taper-lock sheave (Item 7) from the motor by loosening the 3 cap screws. Save the sheave and key for reuse.
6. Replace the motor and V-belt drive by using Steps 1 – 5 in reverse. Tighten the belts as in replacement of V-belts above.
7. Restore electrical power and verify fan rotation (reference "Section 4—Operating Instructions").

Fan • Motor • V-belt Drive, cont.

Fan Removal

Reference Figure 8.1.

***NOTE:** Access to the fan and drive is accomplished by removing the end cover (Item 36) of the fan section of booth base.*

1. Remove V-belts and motor as above.

2. Remove the 4 bolts (Item 37) attaching the fan assembly to the booth base structure. Remove the 2 bottom bolts. Block under the assembly. Remove the 2 top bolts.

3. Pull the assembly straight out end of the compartment. Do not damage the inlet cone (Item 22) or the fan wheel (Item 23).

4. The fan wheel is removed from the shaft be loosening 2 square head set screws and then pulling it off the end of the shaft. (Save the key for reuse—the fan must be keyed to the shaft upon reassembly.)

***NOTE:** When reassembled, the motor and shaft sheaves should be aligned with a straight edge.*

5. Bearing (Item 11) or shaft (Item 13) replacement requires that the shaft locking collar(s) set screws be loosened and the shaft pulled from the bearings toward the sheave (or pulley) end. Once the shaft is removed, the taper-lock sheave must be removed if the shaft is to be replaced. Place a new sheave on the old shaft (or the old sheave on a new shaft) in the position as removed.

6. To replace the bearings: remove the 4 bolts from the bearing and frame. Save the locking collar(s) for reuse. Use specified bearings only.

7. Reassembly is accomplished by following these steps in reverse.

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Section 8
NHC-4 Powder Coating System Parts Lists

Illustrated parts lists for the Nordson® NHC-4 Powder Coating System.

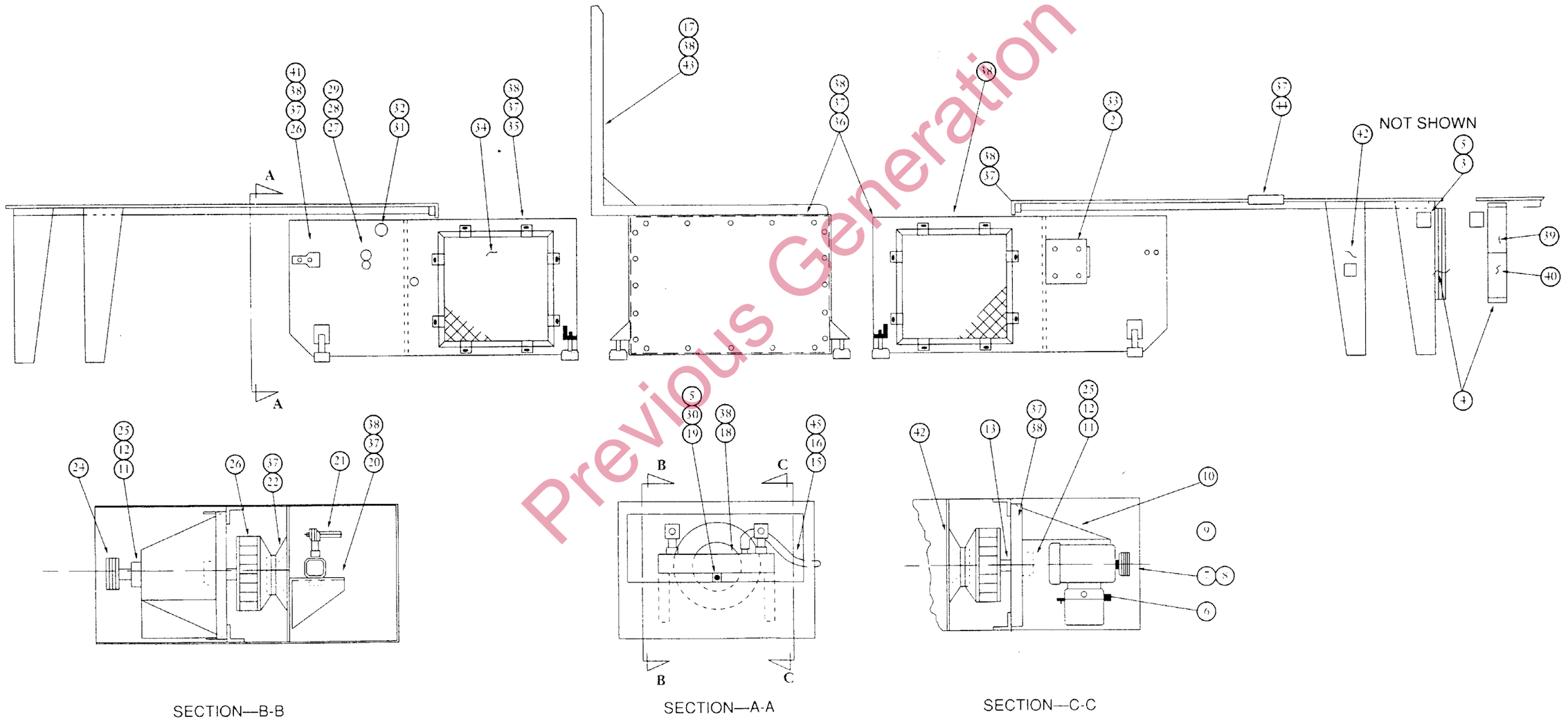
Various assembly components are shown and referenced by item number where appropriate.

Item numbers can be identified by studying the appropriate illustration.

Booth Base

Part numbers can be located by using their corresponding item numbers.

Figure 8.1



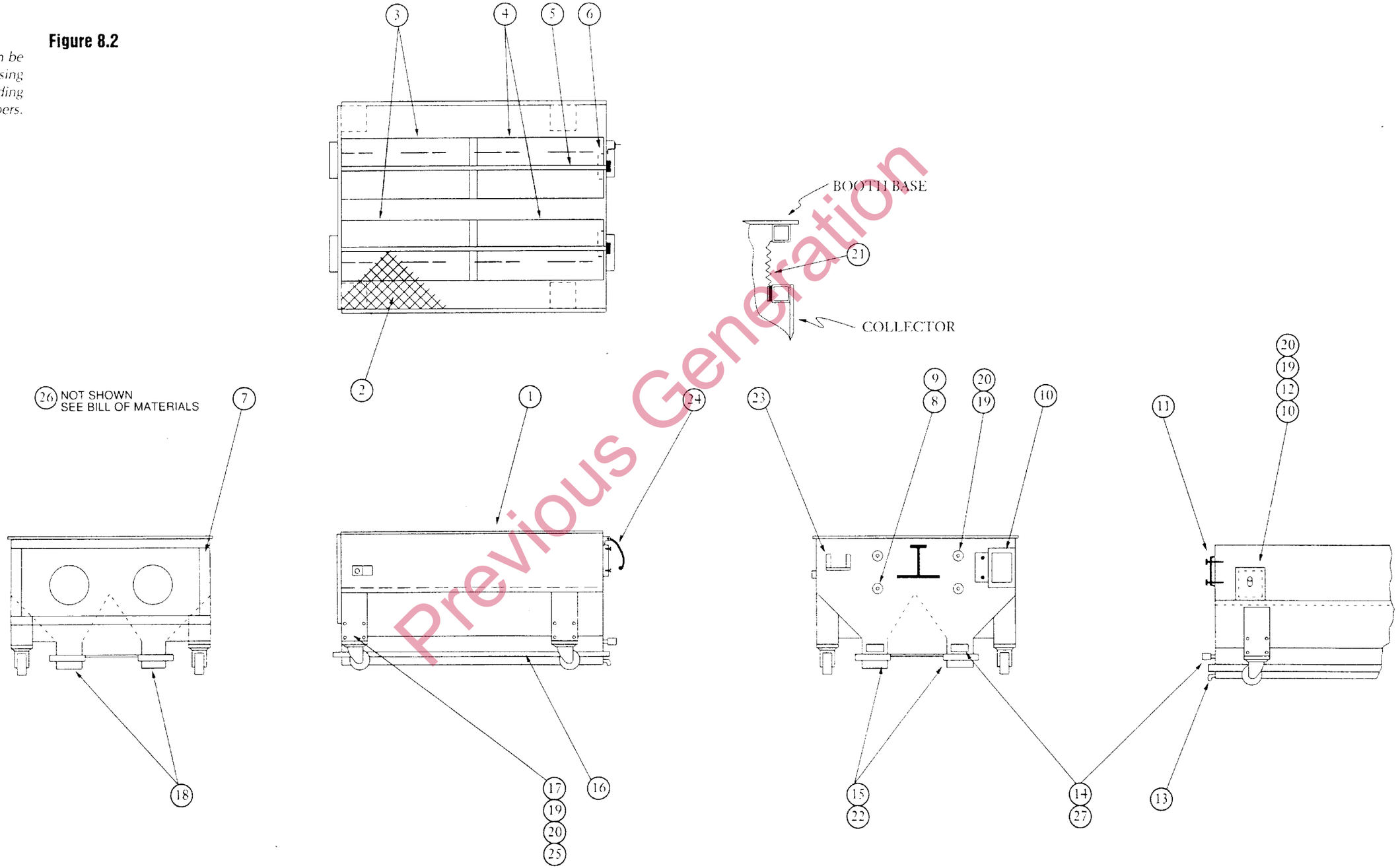
Booth Base Parts List

Item #	Part #	Description	Qty.
1.		Booth Base NHC-4	Ref.
2.		Slide Damper	1
3.		Junction Box, electrical	1
4.		Base Plate, quick-disconnect	1
5.		Cap Screw, 1/4–20 x 1	8
6.		Sliding Base, motor	1
7.		Sheave, 4.8 P.D., 2 grove, 1-1/8 I.D.	1
8.		V-belt, B-38, matched	2
9.		Motor, 5 hp, 3450 RPM, frame 184T	1
10.		Frame, fan/motor support	1
11.		Bearing, ball, 1-15/16 I.D.	2
12.		Collar, locking, 1-15/16 I.D.	2
13.		Shaft, fan, 1-15/16 x 25-1/2	1
14.		Pad, leveling	4
15.		Hose, rubber, 1/2 I.D.	4 ft.
16.		Clamp, hose	2
17.		Cap Screw, 5/16 – 18 x 1	4
18.		Manifold, blowdown	1
19.		Sensor, proximity, microswitch	1
20.		Bracket, manifold mount	1
21.		Valve, blowdown, 120 volt, CA25TDS	2
22.		Cone, fan inlet, aluminum	
23.		Fan wheel, stl., airfoil #13-1/2	1
24.		Sheave, 5.4 P.D., 2 groove, 1-15/16 I.D.	1
25.		Cap Screw, 1/2 x 1-1/4	8
26.		Strap Clamp, ratchet with C-hook	2
27.	901228	Gauge, 0-100 psi, 1/4 NPT	1
28.		Valve, gate, 3/4 NPT	1
29.		Elbow, 1/2 tube x 1/4 NPT	1
30.		Bracket, mounting, proximity sensor	1
31.		Gauge, minihelic, 0-10 inches w.c.	1
32.	900534	Tubing, 1/4 O.D.	1 ft.
33.		Thumbscrew, 1/4-20 x 3/4	4
34.		Filter, final, 2' x 2' x 2.19 inch	2
35.		Z-bracket, filter clamp	16
36.		End Cover, fan compartment	1
37.		Cap Screw, 5/16 – 18 x 3/4	58
38.		Washer, steel, 5/16	54
39.		Plate, quick disconnect—feed hopper	1
40.		Plate, quick disconnect—collector	1
41.		Nut, 5/16 – 18	8
42.	601367	Sensor, level, feed hopper	1
43.		Mount, control panels	1
44.		C-clamps, booth enclosure to base	16
45.		Fitting, 1/2" I.D. hose x 1/2 NPT, barbed	2

Collector Module

Figure 8.2

Part numbers can be located by using their corresponding item numbers.



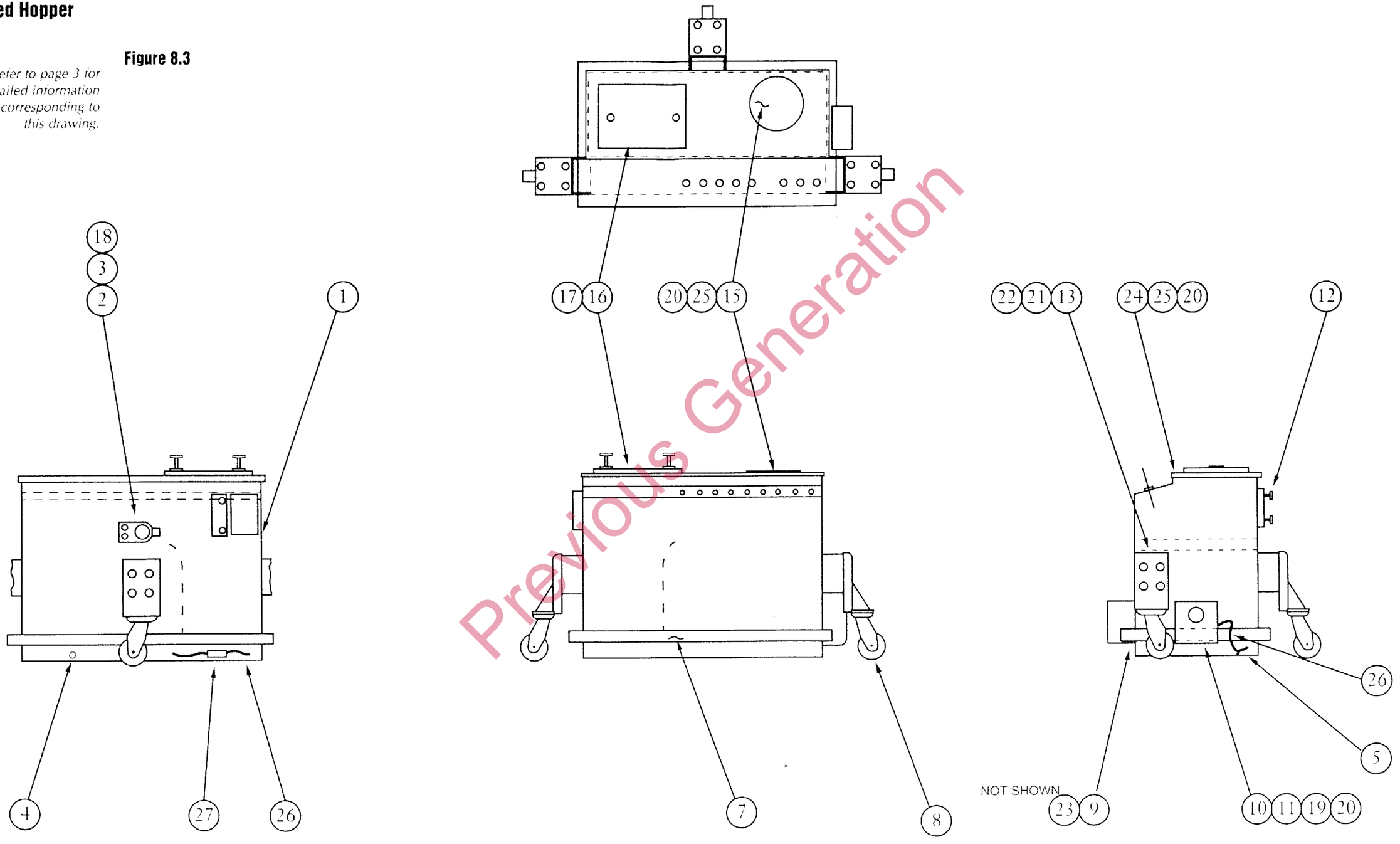
Collector Module Parts List

Item #	Part #	Description	Qty.
1.		Tank, collector	1
2.		Grating, removable	1
3.	101413	Cartridge Filter, open 2 ends	2
4.	101414	Cartridge Filter, closed, 1 end	2
5.		Rod, tension	2
6.		End Plate, cartridge	2
7.		Gasket, mouth, 1" x 2"	10 ft.
8.		Torque Screw, 1/2-13 x 3	2
9.		Nut, 1/2-13	2
10.		Gasket, vent, 1/8 x 1	6 ft.
11.		Thumbscrew, 1/4-20 x 1	2
12.		Vent, collector module	1
13.		Elbow, 1/2" tube x 1/2 NPT	2
14.	244721	Pump, transfer	2
15.		Plate, fluidizing w/ gasket	2
16.		Clamp, c-section, w/screws - 57"	4
17.		Bracket, caster, adj.	4
18.		Plenum, collector module	2
19.		Cap Screw, 5/16–18 x 3/4	20
20.		Washer, 5/16	24
21.		Skirt, seal magnetic	1
22.		Clamp, c-section, w/screws – 7"	4
23.		Bracket, quick disconnect	1
24.		Handle	1
25.		Casters, swivel, 4" med., hvy duty	4
26.	101440	Storage Cover	1
27.	900551	Hose, transfer, 3/4 I.D.	15 ft.

Feed Hopper

Figure 8.3

Refer to page 3 for detailed information corresponding to this drawing.



Feed Hopper Parts List

Item #	Part #	Description	Qty.
1.		Tank, feed hopper	1
2.		Bracket, mounting, level sensor	1
3.		Kit, mounting, level sensor	1
4.		Elbow, 90°, 1/2 O.D. tube x 1//2 NPT	1
5.		Elbow, 90°, 1/4 O.D., tube x 1/4 NPT	1
6.		Plenum, feed hopper	1
7.		Clamp, C-section, w/screws—39"	2
8.		Caster, swivel, 4", med. hvy duty	3
9.		Clamp, C-section, w/screws, 20-3/4"	2
10.		Bracket, gauge	1
11.		Gauge, minihelic, 0-10 inches w.c.	1
12.		Thumbscrew, 1/4 – 20 x 1	2
13.		Bracket, caster, adj.	3
14.		Powder Pump	Ref
15.		Plate, cover, sieve opening	Ref
16.		Lid, removable	1
17.		Clamp, lid	2
18.		Screw, 1/4 – 20 x 1/2	3
19.		Cap Screw, 5/16 – 18 x 1	2
20.		Washer, 5/16	26
21.		Cap Screw, 3/8 – 16 x 1	24
22.		Washer, 3/8	24
23.		Plate, fluidizing, w/gasket	1
24.		Cover, feed hopper	1
25.		Cap Screw, 5/16 – 18 x 3/4	24
26.	900509	Tubing, 1/4 O.D.	2 ft.
27.		Tee, 1/2 O.D. tubing x 1/2 NPT	1
28.		Plug, pump hole	As Req'd

Vibratory Sieve Assembly

Figure 8.4

Part numbers can be located by using their corresponding item numbers.

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Vibratory Sieve Assembly Parts List

Item #	Part #	Description	Qty.

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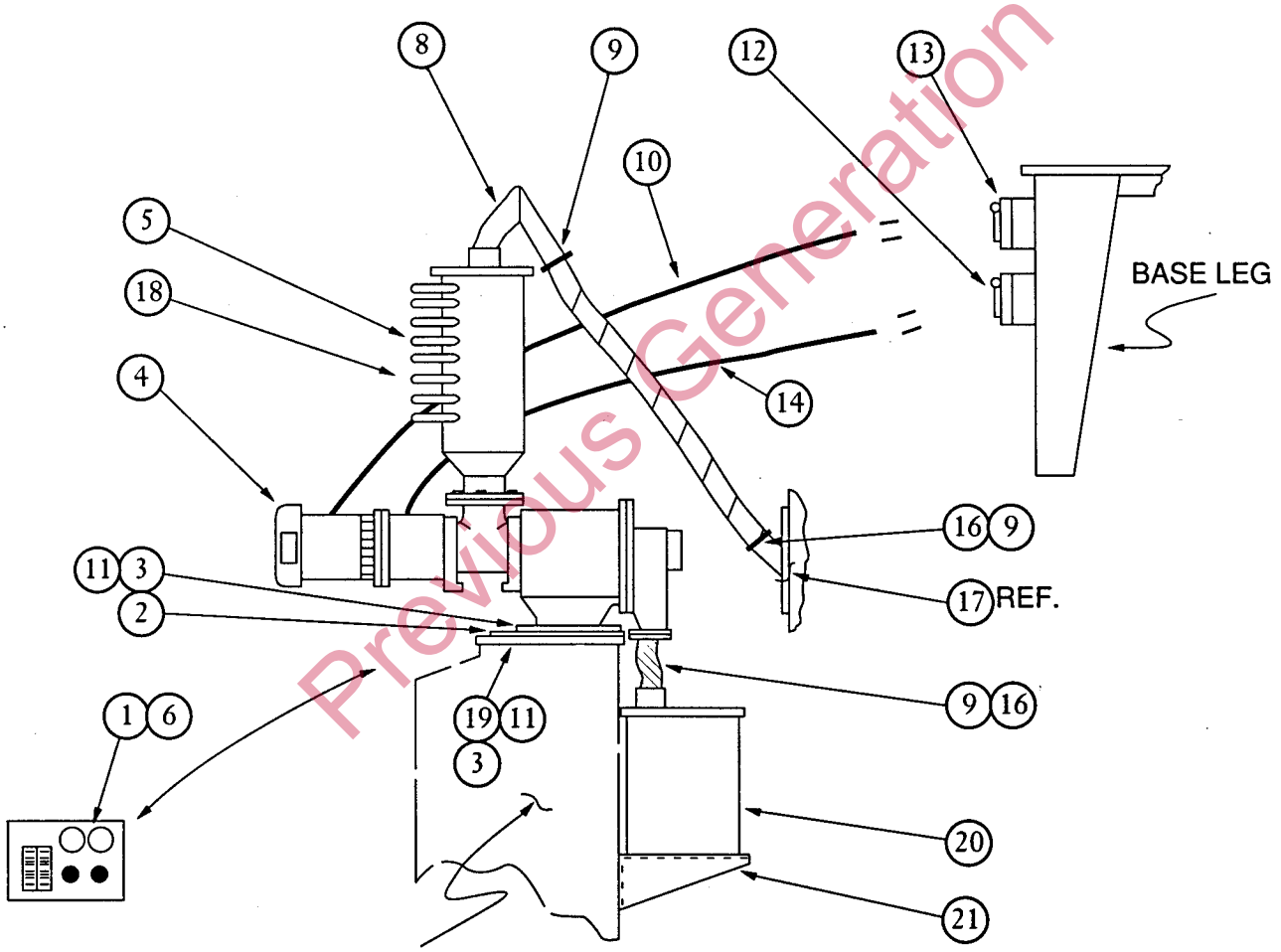
Rotary Screener

Figure 8.5

Part numbers can be located by using their corresponding item numbers.



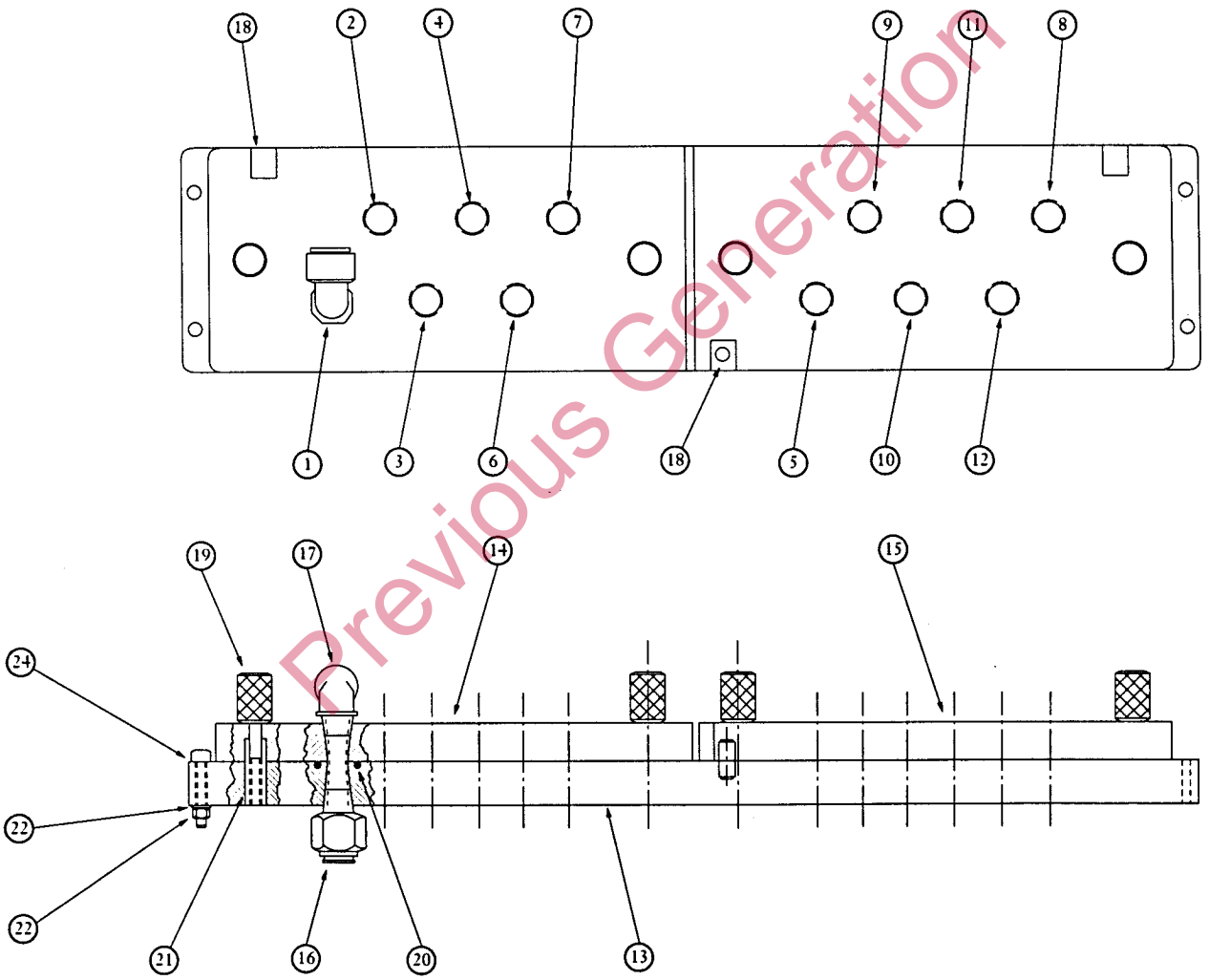
Rotary Screener Parts List

Item #	Part #	Description	Qty.
1.		Flow Meter Assembly	1
2.		Gasket, neoprene	1
3.		Cap Screw, 5/16 –18 x 3/4	26
4.		AZO Cyclone Screener, E-240	1
5.		Rotary Sieve Cyclone Kit	1
6.	900534	Tubing, 1/4 O.D.	6'
7.		Not Shown	0
8.		Upper Vent Tube	1
9.	970966	Clamp, hose	3
10.		Cord Set, 230/460//575 volt	1
11.		Washer, 5/16	24
12.		Receptacle, 120 volt	1
13.		Receptacle, 230/460/575 volt	1
14.		Cord Set, 120 volt	1
15.		Not Shown	0
16.	242402	Hose, flexible, 2" O.D.	10 ft.
17.		Vent, collector module	Ref.
18.	900754	Cap, cyclone part	9
19.		Cover, hopper	1
20.		Pail and lid, 5 gallon	1
21.		Shelf, pail	1

Quick Disconnect Plate

Figure 8.6

Part numbers can be located by using their corresponding item numbers.



Quick Disconnect Plate Parts List

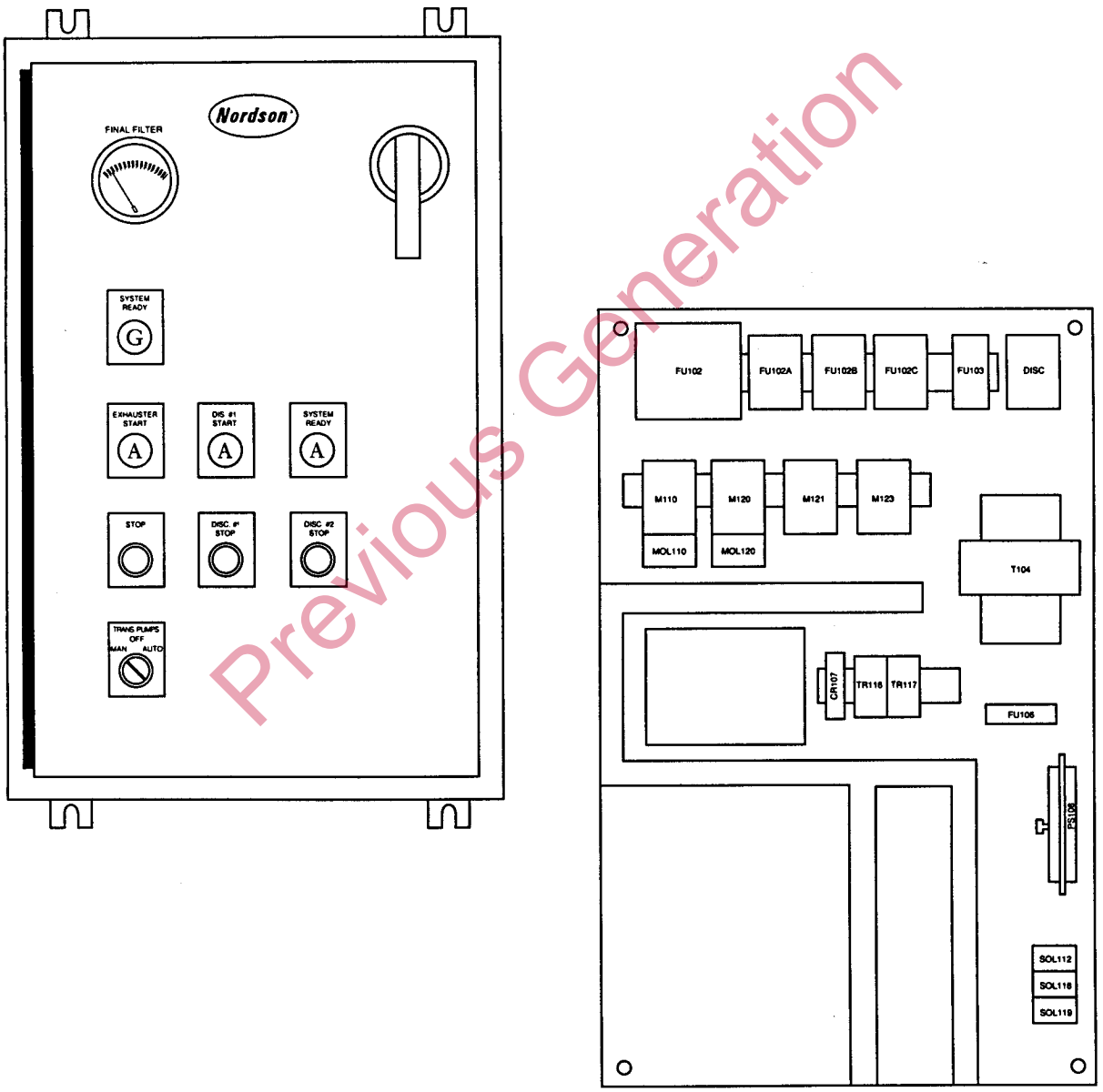
Item #	Part #	Description	Qty.
Flexible Tubing* Connections:			
1.		Collector Module, fluidizing #1	—
2.		Transfer Pump #1	—
3.		Collector Module, fluidizing #2	—
4.		Transfer Pump #2	—
5.		Feed Hopper, fluidizing	—
6.		Vent Assist	—
7.		Spare (not used)	—
8.		Spare (not used)	—
9.		Rotary screener (AZO)	—
10.		Vibratory Screener	—
11.		Rotary Screener	—
12.		Spare (not used)	—
Parts:			
13.		Base Plate, fixed	1
14.		Plate, removable, collector module	1
15.		Plate, removable, feed hopper	1
16.		Connector Straight, 1/4 NPT x 1/2" tube	9
17.		Connector 90° Elbow, 1/4 NPT x 1/2" tube	9
18.		Dowel, locating	2
19.		Thumbscrew	4
20.	941143	O-ring, silicone	12
21.		Threaded Insert, 1/4-28 x 7/16	4
22.		Nut, 1/4 – 20	4
23.		Lock Washer, 1/4"	4
24.		Cap Screw, socket head, 1//4 – 20 x 1-1/2	4

**Reference "Pneumatic Diagram, Figure 6.2," tubing lines 1 through 12.*

Electrical Control Panel

Figure 8.7

Part numbers can be located by using their corresponding item numbers.



Electrical Control Panel Parts List

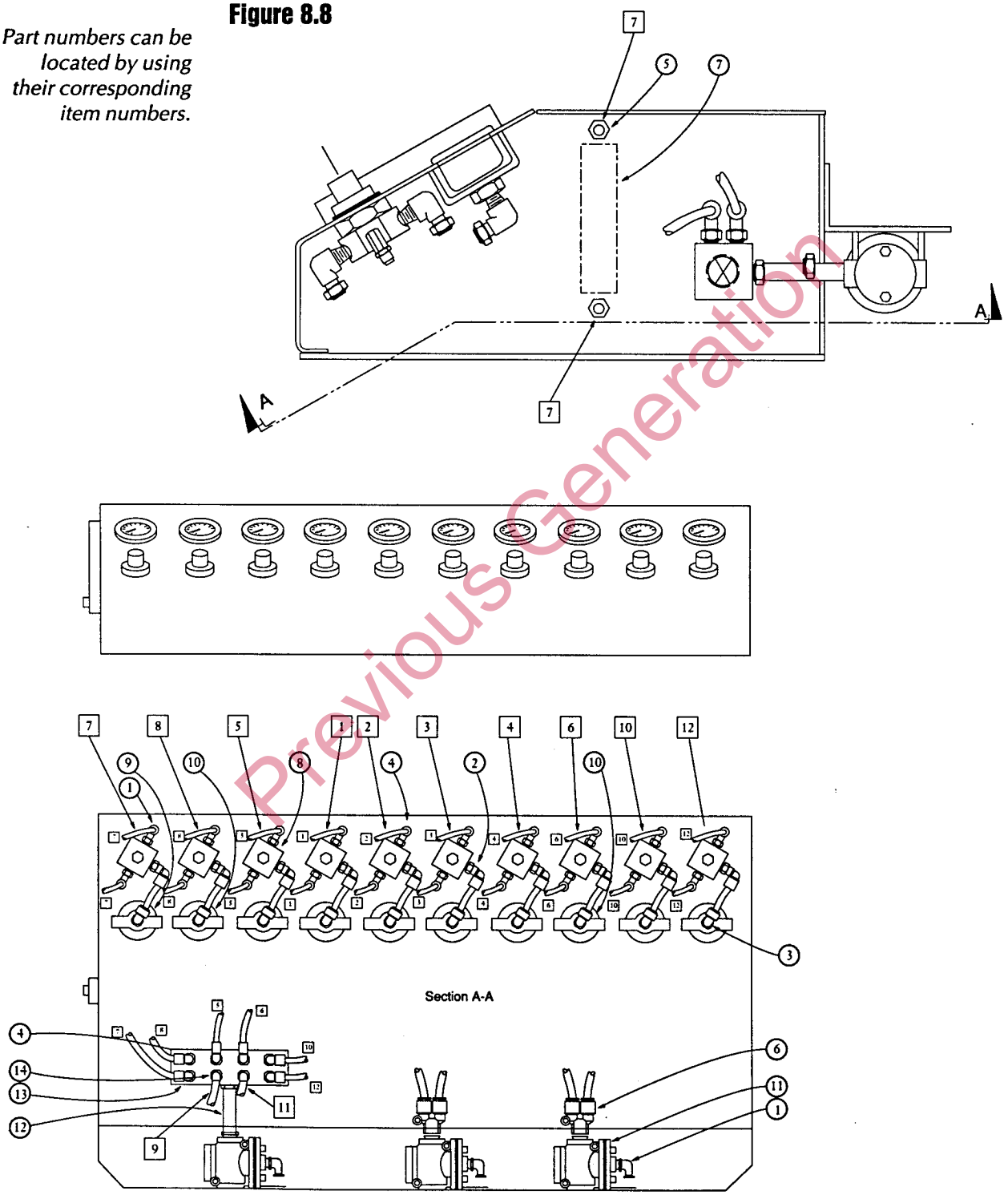
Item	Qty.	Description	Part No.	Manufacturer
	1	Enclosure	A36240LP	Hoffman
	1	Panel	A36P24	Hoffman
Disc	1	Disconnect Switch	DETLNF60	Stromberg
	1	Handle	DETLZX47	Stromberg
M1100	1	Motor Starter	CR4CCA	GE
MOL110	1	Overload Relay	*See Chart*	GE
M120, 121,123	AR	Motor Starter	CR4CCAA	GE
MOL120	1	Overload Relay	*See Chart*	GE
	1	Aux. Contact	CR4XA10B	GE
FU102A	1	Fuse Block	L60030C3	Littlefuse
FU102	1	Fuse Block	60308J	Gould
FU103, 102B, 102C	AR	Fuse Block	L60030C2C	Littlefuse
FU106	1	Fuse Block	L60030MIC	Littlefuse
FU102A	3	Fuses	*See Chart*	Littlefuse
FU102B, 102C	AR	Fuses	*See Chart*	Littlefuse
FU102	3	Fuses	*See Chart*	Buss
FU103	2	Fuses	*See Chart*	Littlefuse
FU106	1	Fuse	FLM6	Littlefuse
T104	1	Transformer	9T58B51	GE
CR107	1	Relay*	RV2S	IDEC
CR107	1	Socket	SY2S-05	IDEC
TR116	1	Time Delay Relay	5X829E	Dayton
TR117	1	Repeat Cycle Relay	1A368E	Dayton
TR116,117	2	Socket	5X852E	Dayton
PS108	1	Pressure Switch	AFSDAO	Cleve. Controls
SOL112, 118, 119	3	Solenoids	35ASACDAAAIBA	MAC
	1	End Kit	M35001-01	MAC
TR113	1	Blowdown Timer	DNCT2003A10	NCC
	1	Final Filter Gauge	2-5005	Dwyer
LT108	1	Pilot Light	CR304ALG3A2G	GE
PB110A, LT110, PB121A, and LT121, PB123A, LT123	AR	Exhauster "ON"	CR304ABT11AE32	GE
PB110, 121, 123	AR	Push Button	CR304ABGO1AR	GE
TB	AR	Terminal Blocks	14921	AB
	3	Male Connectors	KQHO7-34S	SMC
	1	Male Elbow	KQLO7-35S	SMC
	1	Branch Tee	KQTO7-35S	SMC
	6	Bulkhead Union	KQEO7-00	SMC
	2	Bulkhead Connector	KQEO7-35S	SMC
	1	Vent		
	1	Male Elbow	KQLO7-34S	SMC
	1	Selector Switch (3-pos.)	CR304ASG34B22	GE

**If 575V, use GE Part No. 9T58B71.*

Pneumatic Control Panel

Part numbers can be located by using their corresponding item numbers.

Figure 8.8



Pneumatic Control Panel Parts List

Item #	Part #	Description	Qty.
Parts:			
1.		Elbow, 90°, 1//4 tube x 1/4 NPT, male	4
2.		Elbow, 90°, 1/4 tube x 1/8 NPT, male	10
3.	971621	Elbow 90°, 1/4 tube x 1/8 NPT, female	10
4.	972192	Elbow, 90°, 1/2 tube x 1/4 NNPT, male	25
5.		Connector, 1/4 tube x 1/8 NPT, male	2
6.		Branch Y, 1/2 tube x 1/2 NPT, male	2
7.	246,570	Flow Meter, 0-200SCFH	1
8.	901444	Pressure Regulator	10
9.	901240	Gauge, Pressure, 0-30 psi	8
10.	901228	Gauge, Pressure, 0-100 psi	2
11.	901074	Valve, pilot, 2-way	3
12.		Pipe Nipple, 1/2 NPT x 3	1
13.		Manifold, 10 port	1
14.		Connector, 1//2 tube x 1/4 NPT, male	2
15.		Tubing, flexible, 1/4 O.D.	18 ft.
16.		Tubing, flexible, 1/2 O.D.	8 ft.
17.		Valve Ball, 3/4 NPT (not shown)	1
18.		Gauge, pressure, 0-160 psi (not shown)	1

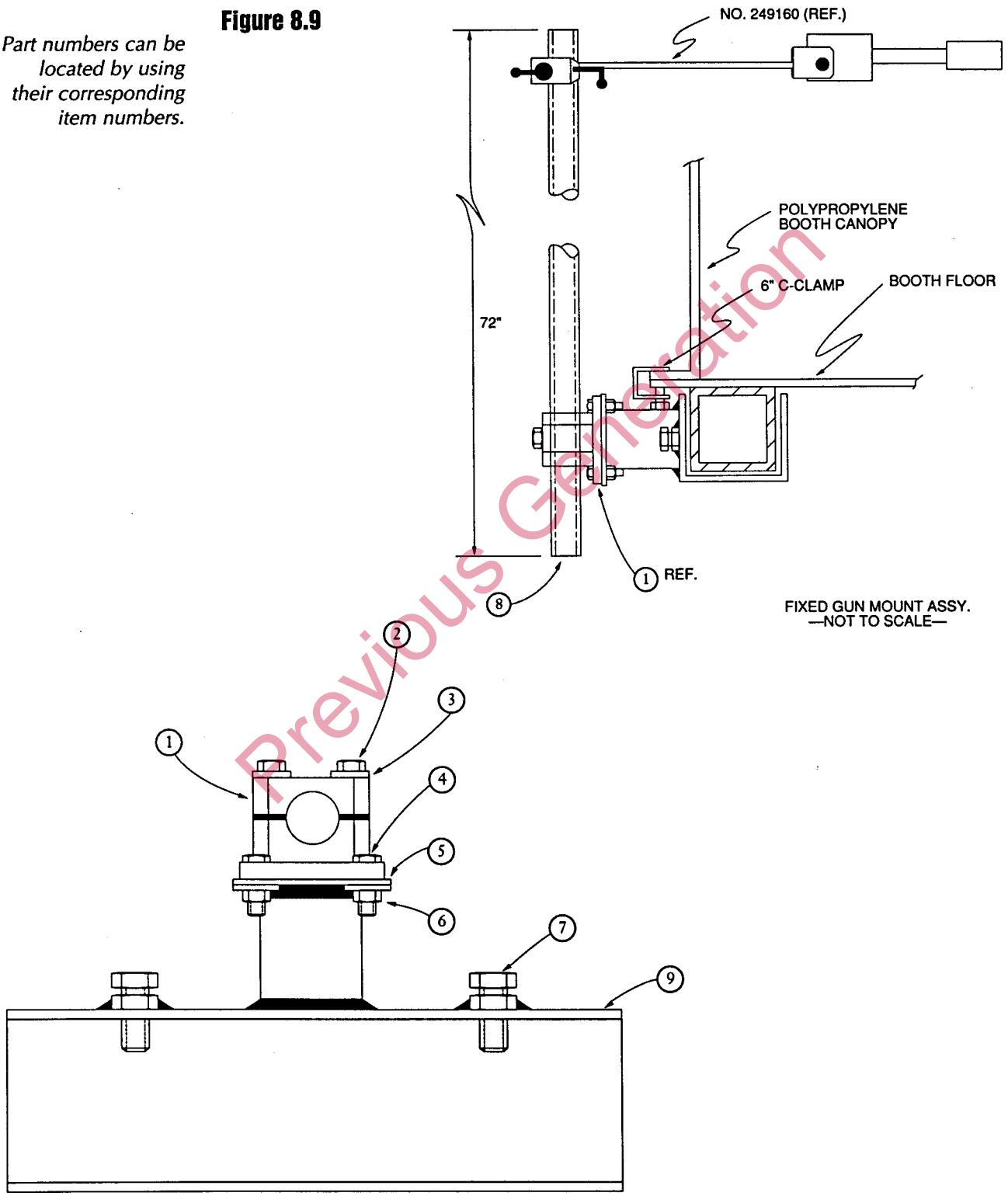
☐ *1/2" O.D. Flexible Tubing Connections (ref. "Pneumatic Diagram, Figure 6.2"):

1.	Collector Module, fluidizing #1
2.	Transfer Pump #1
3.	Collector Module, fluidizing #2
4.	Transfer Pump #2
5.	Feed Hopper, fluidizing
6.	Vent Assist
7.	Fire Detector Head
8.	Pulse Blowdown
9.	Rotary Screener (AZO)—optional
10.	Vibratory Screener—optional
11.	Rotary Screener—optional
12.	Spare

Fixed Gun Mount

Part numbers can be located by using their corresponding item numbers.

Figure 8.9



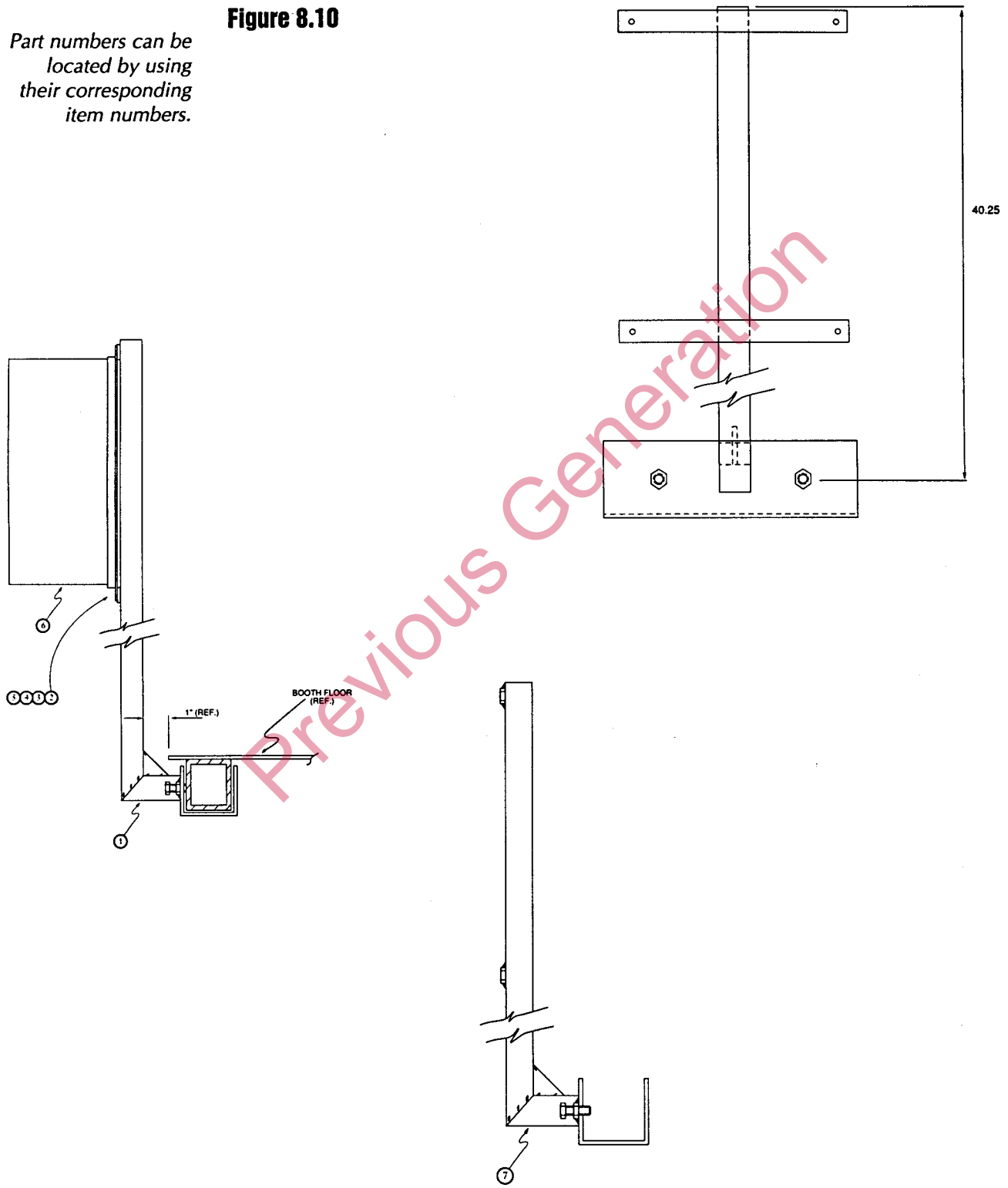
Fixed Gun Mount Parts List

Item #	Part #	Description	Qty.
1.		Clamp, gun bar	1
2.		Cap Screw, 5/16–18 x 2	2
3.		Washer, 5/16	2
4.		Cap Screw, 1/4–20 x 1	4
5.		Washer, 1/4	4
6.		Nut, 1//4–20	4
7.		Cap Screw, 1/2–13 x 1-1/4	2
8.		Tubing, 1" dia. x 1/8 THK, alum.	1
9.		Bracket, gun mount	1

Base Mount—CC8 Console

Figure 8.10

Part numbers can be located by using their corresponding item numbers.



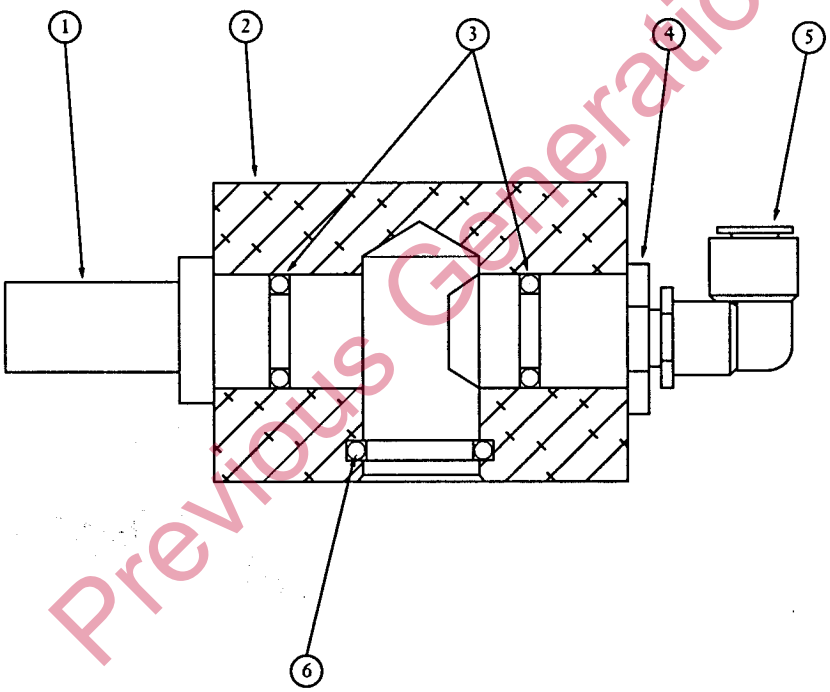
Base Mount—CC8 Console Parts List

Item #	Part #	Description	Qty.
1.		Cap Screw, 1/2–13 x 1-1/4	2
2.		Cap Screw, 1/4-20 x 1	4
3.		Washer, 1/4	4
4.		Lock Washer, 1/4	4
5.		Nut, 1/4-20	4
6.		NPE CC-8 Control Console	Ref
7.		Mounting Frame	1

Pump • Powder Transfer

Figure 8.11

Part numbers can be located by using their corresponding item numbers.



Pump • Powder Transfer Parts List

Item No.	Part No.	Description	Qty.
—	244721	Pump, powder transfer	Ref.
1.	244642	Throat Venturi	1
2.	244641	Pump, body	1
3.	942101	O-ring, silicone	2
4.	244643	Nozzle, air	1
5.	972192	Elbow, conn. 1/4 NPT x 1/2" O.D. tube	1
6.	942143	O-ring, silicone	1

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Section 9
Specification Summary

Because of possible technological or quality improvements, equipment specifications are subject to change without notice.

Equipment Specifications

Because of possible technological or quality improvements, equipment specifications are subject to change without notice.

Physical Dimensions

Booth Enclosure

Width ..... 5'0"

Length ..... 7'0"

Height ..... Part height + 2'6"

Overall System

Width ..... 7'8"

Length ..... 12'9"

Circulating Fan

5 hp AC, TEFC, 3450 rpm, with V-belt drive

Number of Guns

Manual (hand) 2

Automatic 6

Manual and Automatic ..... 2 and 4

Equipment Specifications, cont.

Average Compressed Air

Consumption with 6 guns:

Minimum ..... 100 SCFM

Maximum ..... 200 SCFM

Working pressure ..... 80 to 100 PSI

Electrical Data

Approximate System Current, with 6 guns and rotary screener, without oscillator.

18 amps 230V-3Ø-60HZ

9 amps 460V-3Ø-60HZ

7 amps 575V-3Ø-60HZ

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Section 10
Optional Parts and Equipment

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Customer _____

Date _____

System No. _____

The following details all drawings and manuals which are included with your Nordson® NHC-4 Powder Coating System.

☒	31-0-1	Electrostatic System Installation and Trouble Shooting
☐	31-3	NPE-2A Automatic Gun
☐	31-4	NPE-2M Manual Gun
☐	31-11	100 PLUS, Series II Gun
☐	31-12	100 PLUS, Series II Cable, Installation and Troubleshooting
☐	32-6	HR3 Hopper
☐	32-8	100 PLUS, Pump
☐	33-2	NPE-CC8, Control Console
☐	33-3	NPE-CC2, Control Console
☐	33-4	100 PLUS, Electrostatic Power Unit
☐	33-5	100 PLUS, Master Control Unit
☐	34-13	Pneumatic 5-function Box
☐	34-15	Lance Extension
☐	34-16	Flat Spray Nozzle
☐	34-17	UV Flow Meter
☒	35-0	Powder System Safety and Maintenance Manual
☐	36-51	Air Volume Control
☐	37-1	Tribomatic Powder Spray Gun and Diffuser
☐	37-2	Tribomatic Powder Spray System Control Console
☐	37-3	Tribomatic Hopper and Powder Pump
☐	37-6	Tribomatic Powder Spray Handgun

☐	37-7	Tribomatic Powder Pump
☐	37-8	Tribomatic 19-inch Control Module
☐	37-9	Tribomatic Master Control Module and Powder Spray System

Other Equipment

☐	E240	Rotary Screener (AZO)
☐	801	Detector Electronics
☐		Deimco Reciprocator
☐		Nutro Oscillator
☐	LSM 1700	Endress & Hauser Level Control
☒		Efector Proximity Switch and/or Level Control
☐	34-21	Rotary Screener—Nordson
☐		_____
☐		_____
☐		_____

Special Drawings

☐	_____	Booth Enclosure (canopy)
☐	_____	System Layout
☐	_____	Utility Drops
☐	_____	Electrical Schematic
☐	_____	Pneumatic Diagram
☐	_____	_____
☐	_____	_____
☐	_____	_____