ColorMax® 2 Powder Coating System with Encore® Feed Center

Customer Product Manual
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Issued 11/23

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

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Change Record

Revision	Date	Change
02	04/15	Replaced part number 1058969 with part number 1606403. Changed screen 8 from 20.00 minutes to 10.00 minutes.
03	05/15	Added slidegate assembly parts.
04	10/15	Replaced part number 1008803 with part number 1607911. Added part number 176299 (12-valve pilot solenoid).
05	03/20	Internal admin change.
06	07/20	Pressure correction.
07	07/20	Added Cyclone Transfer Pan Kit.
08	10/20	Added Regulations Info to Safety Section
09	11/23	Added Additional Regulations Info to Description Section

Section 1
Safety

Introduction

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

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

Qualified Personnel

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

Intended Use

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

Some examples of unintended use of equipment include:

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

Regulations and Approvals

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

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

Personal Safety

To prevent injury follow these instructions.

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

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Ground all conductive equipment. Use only grounded air and fluid hoses. Check equipment and workpiece grounding devices regularly. Resistance to ground must not exceed one megohm.
- Shut down all equipment immediately if you notice static sparking or arcing. Do not restart the equipment until the cause has been identified and corrected.
- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored. Do not heat materials to temperatures above those recommended by the manufacturer. Make sure heat monitoring and limiting devices are working properly.
- Provide adequate ventilation to prevent dangerous concentrations of volatile particles or vapors. Refer to local codes or your material SDS for guidance.
- Do not disconnect live electrical circuits when working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Shut off electrostatic power and ground the charging system before adjusting, cleaning, or repairing electrostatic equipment.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Grounding

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

Grounding inside and around the booth openings must comply with NFPA requirements for Class II, Division 1 or 2 Hazardous Locations. Refer to NFPA 33, NFPA 70 (NEC articles 500, 502, and 516), and NFPA 77, latest conditions.

- All electrically conductive objects in the spray areas shall be electrically connected to ground with a resistance of not more than 1 megohm as measured with an instrument that applies at least 500 volts to the circuit being evaluated.
- Equipment to be grounded includes, but is not limited to, the floor of the spray area, operator platforms, hoppers, photoeye supports, and blow-off nozzles. Personnel working in the spray area must be grounded.
- There is a possible ignition potential from the charged human body. Personnel standing on a painted surface, such as an operator platform, or wearing non-conductive shoes, are not grounded. Personnel must wear shoes with conductive soles or use a ground strap to maintain a connection to ground when working with or around electrostatic equipment.
- Operators must maintain skin-to-handle contact between their hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If gloves must be worn, cut away the palm or fingers, wear electrically conductive gloves, or wear a grounding strap connected to the gun handle or other true earth ground.
- Shut off electrostatic power supplies and ground gun electrodes before making adjustments or cleaning powder spray guns.
- Connect all disconnected equipment, ground cables, and wires after servicing equipment.

Action in the Event of a Malfunction

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

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

Disposal

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

Section 2
Description

Introduction

This manual covers ColorMax® 2 Engineered Powder Coating Systems equipped with Encore® Feed Centers. It includes a description of the major system components and their operation; basic daily operation and general troubleshooting procedures; booth and afterfilter maintenance and repair procedures; and part numbers for normal wear items.

Because powder coating systems are customized to meet customer requirements, your system may have controls and equipment not described in this manual or located in different positions. Your Nordson representative can provide you with additional information and training to supplement this manual.

Because powder coating systems are engineered for the application, Nordson Corporation provides separate manuals for each component or sub-system, such as the feed center, automatic guns, automatic gun controllers, manual spray systems, powder pumps, fire detection systems, and gun movers. Refer to these manuals for more information on the operation and maintenance of these components.

Special Conditions of Use

All Nordson booths are designed and constructed to meet the requirements of NFPA33 (Standard for Spray Application Using Flammable or Combustible Materials) and all electrical work complies with the National Electrical Code (NEC 70) articles 500, 501, 502, and 516. The Booths also have protection systems designed and implemented in accordance with the Standard on Explosion Prevention Systems (NFPA 69) or NFPA 68 (Standard on Explosion Protection by Deflagration Venting).

System Components

Figure 2-1 shows a typical fully equipped ColorMax system.

Item	Component	Function
1	Booth	Consists of canopy and base. Contains the oversprayed powder within the system. Refer to page 2-5 for more information.
2	Reclaim System	Consists of the cyclone assembly, banjo, duct work, and afterfilter (not shown here). The cyclones separate the oversprayed powder from the air flowing through the booth. The reclaimed powder is pumped back to the feed center. Refer to page 2-7 for more information.
3	Encore Feed Center	Consists of an enclosure, sieve, and powder lances and pumps, and purge manifolds. Conditions virgin and reclaimed powder, fluidizes the powder, and pumps it to the spray guns. Refer to page 2-9 for more information.
4	Utility Deck	Provides a platform for the major components of the system, and houses wiring and air hoses and tubing, valves and regulators, powder hoses, and gun cables. Shipped pre-plumbed and wired for quick system installation.
5	Main Electrical Control Panel	Houses the system exhaust fan, along with cartridge filters that separate the waste powder from the air flow, and final filters that clean the air before returning it to spray room. Refer to page 2-15 for more information.
6	Gun Movers and Gun Blow-Off	Optional equipment. The spray guns can be mounted on fixed stands, oscillators, or reciprocators. These devices can be mounted on automatic or manual positioners. Refer to page 2-10 for more information.
7	Powder Application Equipment	Optional equipment. Typically consists of automatic and manual spray guns and controllers. The Nordson iControlR 2 system controls both the automatic spray guns and automatic gun movers (positioners and reciprocators). Refer to the manuals supplied with your system components for information on setup and operation.
Not Shown	Afterfilter	Houses the system exhaust fan, along with cartridge filters that separate the waste powder from the air flow, and final filters that clean the air before returning it to spray room. Refer to page 2-12 for more information.
Not Shown	iControl 2	Controls gun triggering and spraying, and gun movers such as in/out positioners and reciprocators. The system uses signals from conveyor encoders, photo eyes, light curtains, and proximity sensors to identify and track the movement of parts through the spray booth, and to control the spray guns and gun movers. Refer to the operator manual for more information.

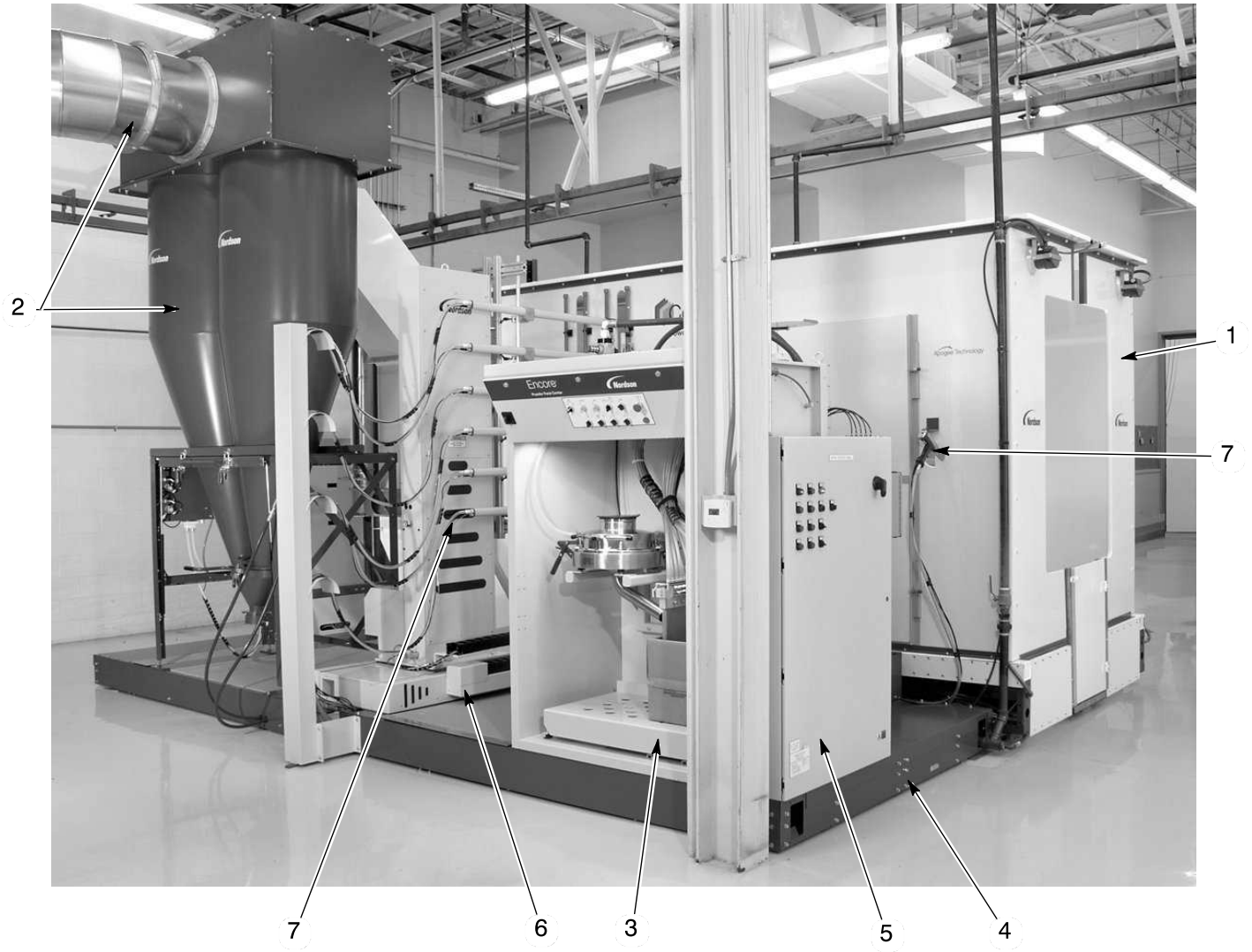


Figure 2-1 ColorMax 2 System Components

Booth

Figure 2-2 shows the exterior and interior components of a typical ColorMax powder spray booth.

Item	Component	Function
1	Conveyor slot and air knife	The conveyor slot allows the part hangers to pass completely through the canopy. Compressed air flowing from the air knife prevents sprayed powder from escaping from the conveyor slot.
2	Fire detector heads	Continuously monitor the interior of the booth. If an electrical spark or flame is detected, the fire detection system shuts down the entire system. The system controller is typically mounted on the side of the main electrical control panel, or close to it.
3	Canopy	Contains the powder within the booth. Can be made from Nordson Apogee panels or polypropylene. The canopy requires periodic conditioning and should not be touched with bare hands to preserve its ability to shed powder.
4	Base	Provides the platform for the canopy and includes the floor duct through which the air flows on its way to the cyclones.
5	Manual spray gun operator doors	Provides access to the booth for the manual spray gun operators.
6	Operator platforms	Provide operators with access to the booth. Manual gun controllers are typically mounted on the platform railings.
7	Booth doors	Provide a way to close off the end of the booth and prevent powder from escaping when blowing off the interior of the booth during color changes and routine cleaning.
8	Vertical riser door	Provides access to the riser that routes the air flowing through the booth into the cyclone for cleaning and inspection.
9	AeroDeck™	Act as dampers to prevent the air flowing into the riser inlet from drawing the powder sprayed by the automatic guns away from the parts moving through the booth. Air is pulsed across the AeroDecks by the air knife running down the center of the decks to keep powder from accumulating on top of them.
10	Floor blow-offs	Blow the powder off the floor and into the floor duct to prevent accumulations. The blow-offs are pulsed in a repetitive pattern, one section at a time, to keep air consumption to a minimum.
11	Gun blow-off manifolds	Distribute the gun blow-off air to the blow-off nozzles.
12	Gun blow-off nozzles	Blow off the exterior of the guns as they are retracted from the booth during the color change sequence. There are 4 nozzles for each gun.

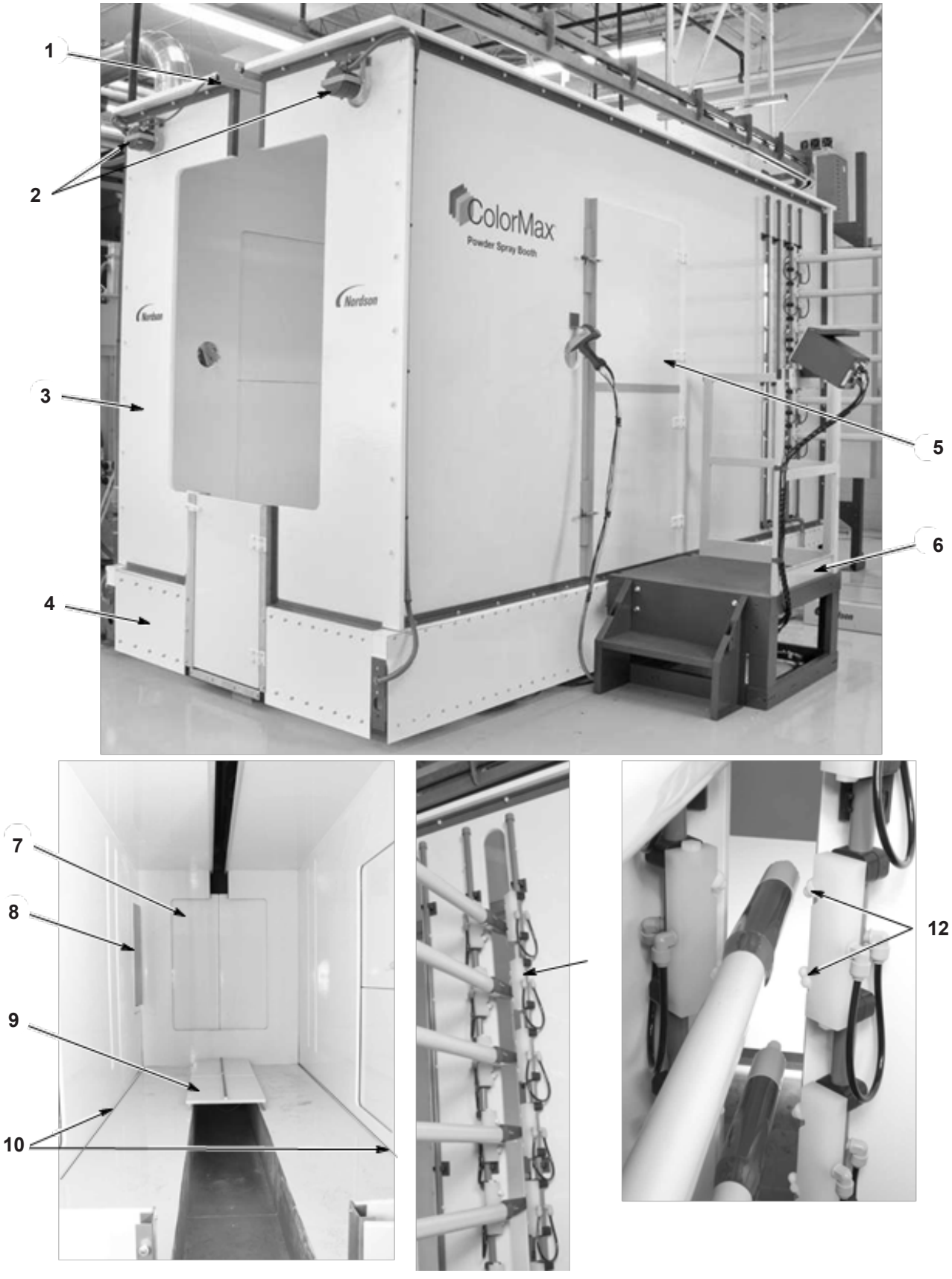


Figure 2-2 Booth Components

Reclaim System

Figure 2-3 shows the components of a typical ColorMax reclaim system.

Item	Component	Function
1	Dual cyclone	Reclaims usable powder from the air flowing through them. Inside the cyclones, the air swirls around and slows so the larger and heavier powder particles fall to the bottom, into the transfer pan. The fine powder dust stays suspended in the air flow and is carried through the ductwork to the afterfilter.
2	Lower section of cyclone	Allows the interior of the cyclones to be cleaned thoroughly during color changes. The lower section is hinged so that it swings up and mates with a cleaning port that is connected to the afterfilter ductwork.
3	Lower section of cyclone	Collects and fluidizes the reclaimed powder so the transfer pump can pump it back to the feed center to be sieved and re-used. It contains a porous membrane that diffuses low pressure compressed air into the powder to fluidize it. The transfer pan is hinged so it can be opened and cleaned thoroughly during color changes.
4	Transfer pump	Pumps the reclaimed powder back to the feed center. The pump is a Nordson High Capacity HDLV® pump with purge capability.
5	Cyclone cleaning port	Mates with the lower cyclone section when it is swung open. The port maintains an air flow through the lower section while the operator cleans the interior. The port duct is connected to the afterfilter duct work so that waste powder flows directly to the afterfilter.
6	Slide gate	Allows air to be pulled through the lower cyclone section and cleaning port when open. Close when not cleaning the lower section.
7	Banjo and afterfilter duct	Conveys air and waste powder to the afterfilter from the cyclone. A pneumatically operated slide gate in the duct closes if a fire is detected in the booth to prevent it from spreading to the afterfilter.

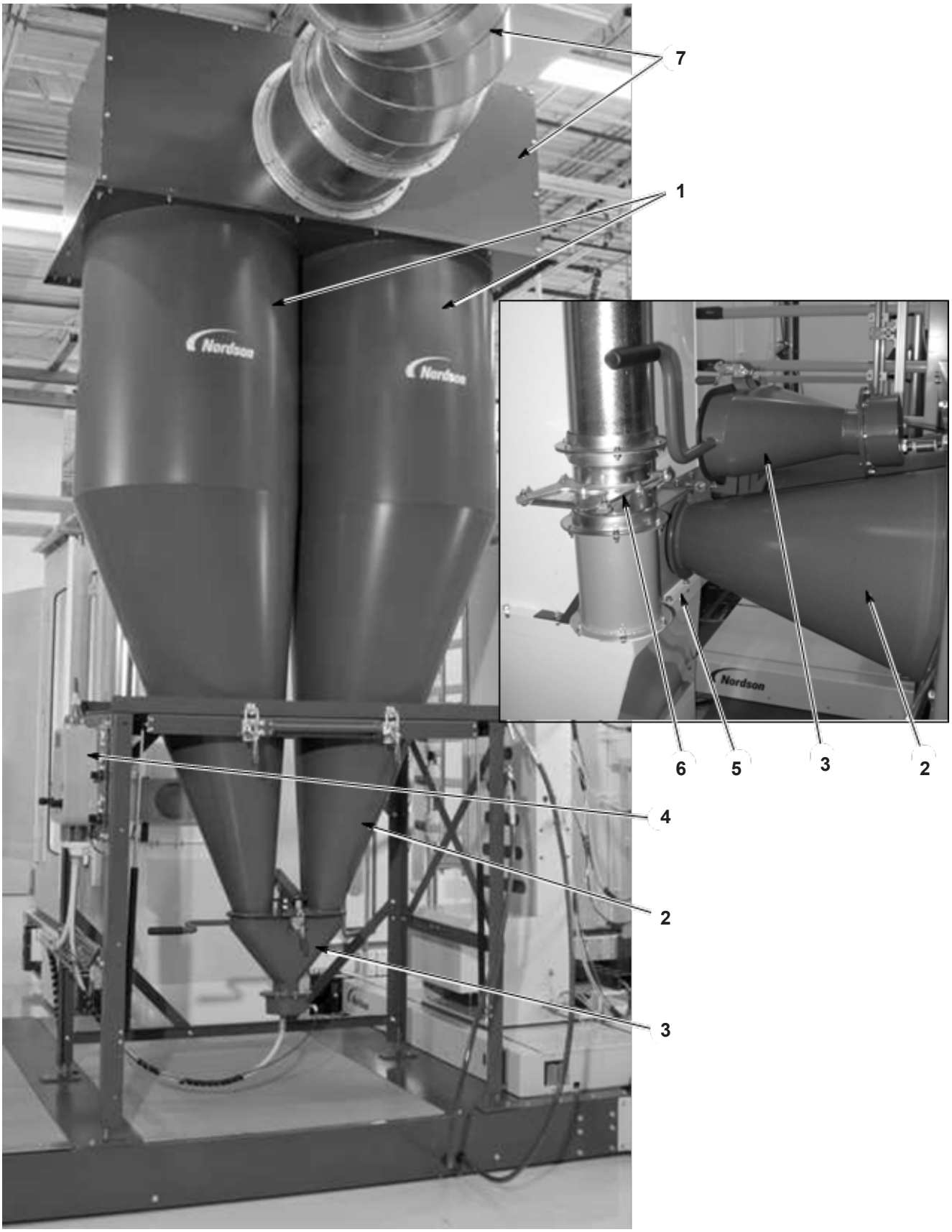


Figure 2-3 Common Reclaim Components

Feed Center

Figure 2-4 shows the components of the Encore Feed Center. Refer to the feed center manual for additional information and parts lists.

Item	Component	Function
1	Operator control panel	Houses electrical and pneumatic controls for the feed center and system.
2	Lance purge regulator	Adjusts the lance purge air pressure.
3	Fluidizing air regulator	Adjusts the fluidizing air for the hopper or lance.
4	Blow gun	Used to blow off the components of the feed center.
5	Level sensors	Detect powder levels in hopper or box. When powder level falls below end of sensor, either an alarm is activated or the virgin powder transfer pump is turned on to add more powder to the system, depending on the system configuration.
6	Powder lances	Function as pickup tubes so that the pumps mounted on top of the lances can draw powder out of the hopper or box and deliver it to the spray guns. The lances are mounted on the lift assembly. The lances shown are equipped with optional fluidizing bars for use with powder boxes and optional hose manifolds.
7	Powder hopper (optional)	Contains and fluidizes the power supply. A porous membrane in the bottom diffuses low pressure compressed air into the powder so that it behaves like a fluid.
8	Vibrating table (vibrator motor is optional)	Supports the powder hopper or box, vibrates to fluidize the powder supply. Normally turned on only when powder boxes are used instead of hoppers.
9	In-line powder pumps	Pump the powder out to the spray guns.
10	Sieve	Vibrates to screen reclaimed and virgin powder before delivering it to the powder hopper or box. Can be fitted with an ultrasonic screen for higher throughput if needed.
11	Lift assembly	Consists of a carriage, vertical slide, and pneumatic cylinder. The lances are mounted on the carriage. The cylinder moves the lances up and down. Proximity switches on the cylinder are positioned to stop the lances at different positions depending on the powder source selected by the operator.
12	Disconnect switch	Turns on and off power to the feed center controls.
Not Shown	Purge manifold and clamping cylinder	Located below the vibrating table. During a color change, the lances are lowered onto the purge manifold, where they are clamped in place before the lance and gun purge starts.
Not Shown	Duct damper	Located on top of the exhaust duct transition. Opened and closed with a pneumatic cylinder. Controlled by a switch on the operator panel. In Auto mode, when a color change is initiated, the damper is automatically opened to contain the powder within the feed center. When the color change is complete, the damper is partially closed since full flow is not required during normal operation. The operator can also open the damper manually as desired.

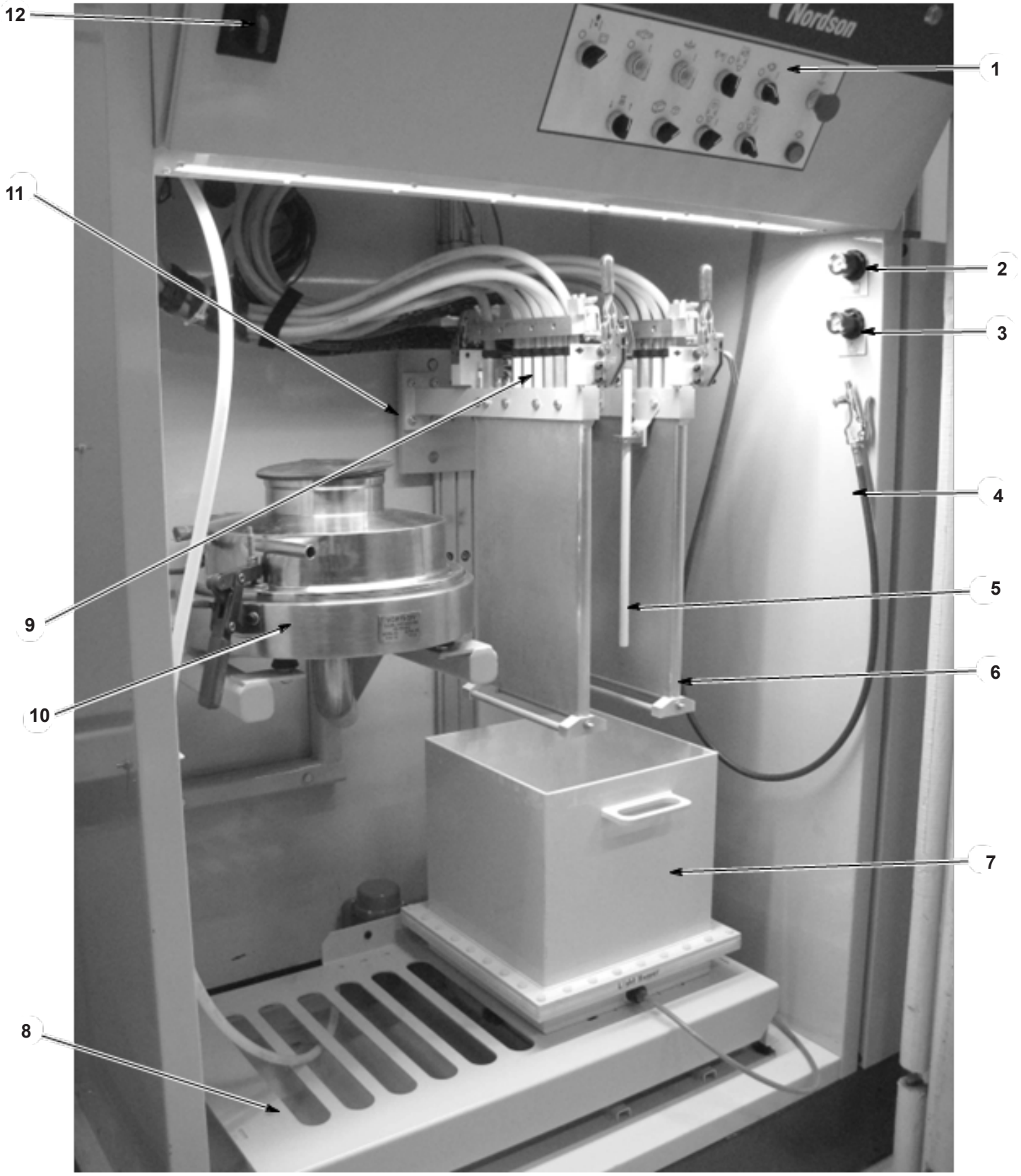


Figure 2-4 Encore Feed Center Components (shown with optional hose manifolds on lances)

Automatic Gun Movers/Gun Blow-Off

NOTE: Gun movers are optional. If they are not used, then the spray guns are mounted on fixed stands.

Component	Description
Positioners	Move the spray guns into or out of the canopy. The positioners can be manually operated or electrically driven automatic devices. Automatic positioner movement is controlled by the Nordson iControl® system or Axis Controller. During production, the positioners maintain the set gun-to-part distance settings, following the contours of the parts. Positioners move the guns horizontally. Applications may require vertical positioners.
Oscillators or Reciprocators	Move the spray guns in repetitive or variable patterns for thorough part coverage; position spray guns between blow-off nozzles during color changes.
Gun Blow-Off System	Blow powder off the spray guns as they are retracted out of the booth during the first part of a color change sequence. The nozzles are supplied with air by manifolds located in the booth base.

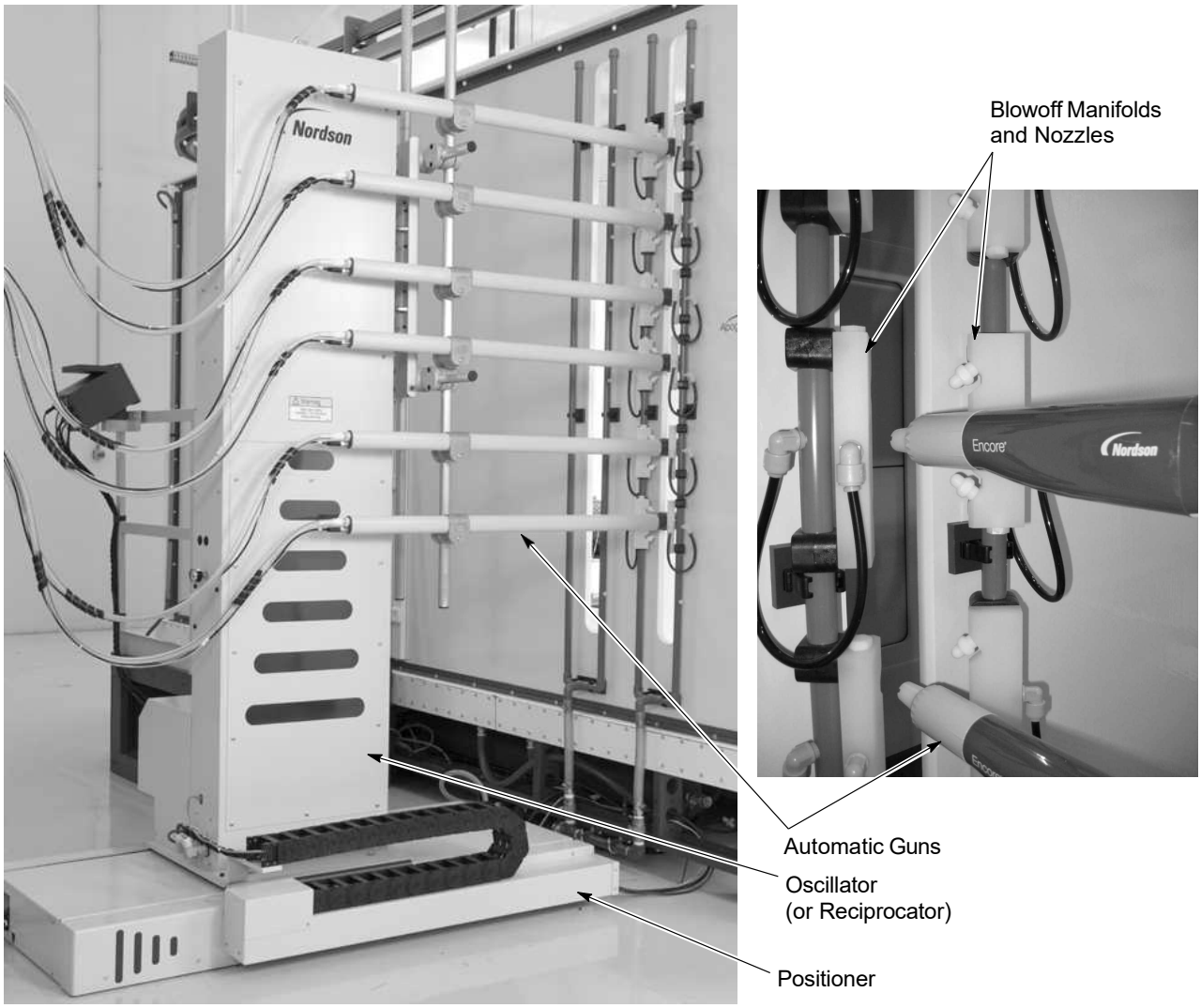


Figure 2-5 View of Positioner and Oscillator with Gun Blow-Off System

Afterfilter

Figure 2-6 shows a typical afterfilter assembly. The afterfilter houses an exhaust fan that draws air through all booth openings to contain sprayed powder within the system and convey the overspray into the cyclone for reclaim and re-use. The powder dust not reclaimed by the cyclones is filtered out of the air by the cartridge filters and final filters in the afterfilter.

Table 2-1 Afterfilter Components

Item	Component	Description
1	Final Filters	Remove any remaining fine powder particles from the air before returning it to the spray room.
2	Fan/Motor Assembly	Creates and maintains the air flow into the booth and feed center, through the cyclones and ducts, into the afterfilter, and back into the spray room.
3	Waste Hoppers	Collect powder particles that are blown off the cartridge filters.
4	Fluidizing Plates	Fluidize the powder in the waste hoppers, allowing the powder to be pumped out of the waste hoppers.
5	Intake Duct	Brings powder-laden air from the cyclones to the afterfilter.
6	Afterfilter Panel	Contains the pulse timer panel, PULSE ON DEMAND switch, and differential pressure switches and gauges. Refer to Afterfilter Panel for more information.
7	Cartridge Filters	Filter powder particles out of the air flow through the filter media and into the fan section.
8	Pulse Valves	Periodically send pulses of air through the cartridge filters to blow off powder collected on the outside of the cartridges.
9	Pulse Air Manifolds	Distributes compressed air to the pulse valves.
10	Pulse Valve Solenoid Boxes	Signal the pulse valves to open based on settings made in the pulse valve timer panel.
NOTE: The afterfilter may have either deflagration vents or an explosion suppression system. Contact your Nordson representative for information about explosion venting or suppression equipment.		

Afterfilter Operation

See Figure 2-6.

Powder is conveyed through the intake duct (5) into the collector section, where powder collects on the external surfaces of the cartridge filters (7). The air passes through the cartridge filters and flows up into the final filter section, through the fan (2) and final filters (1), and back into the spray room.

The pulse valves (8) periodically release large volumes of compressed air into the centers of the cartridge filters, blowing the accumulated powder off the filters. Pulsing is controlled by the pulse valve timer in the afterfilter panel (6), which allows you to set both the time between pulses (delay) and the length (duration) of the pulse.

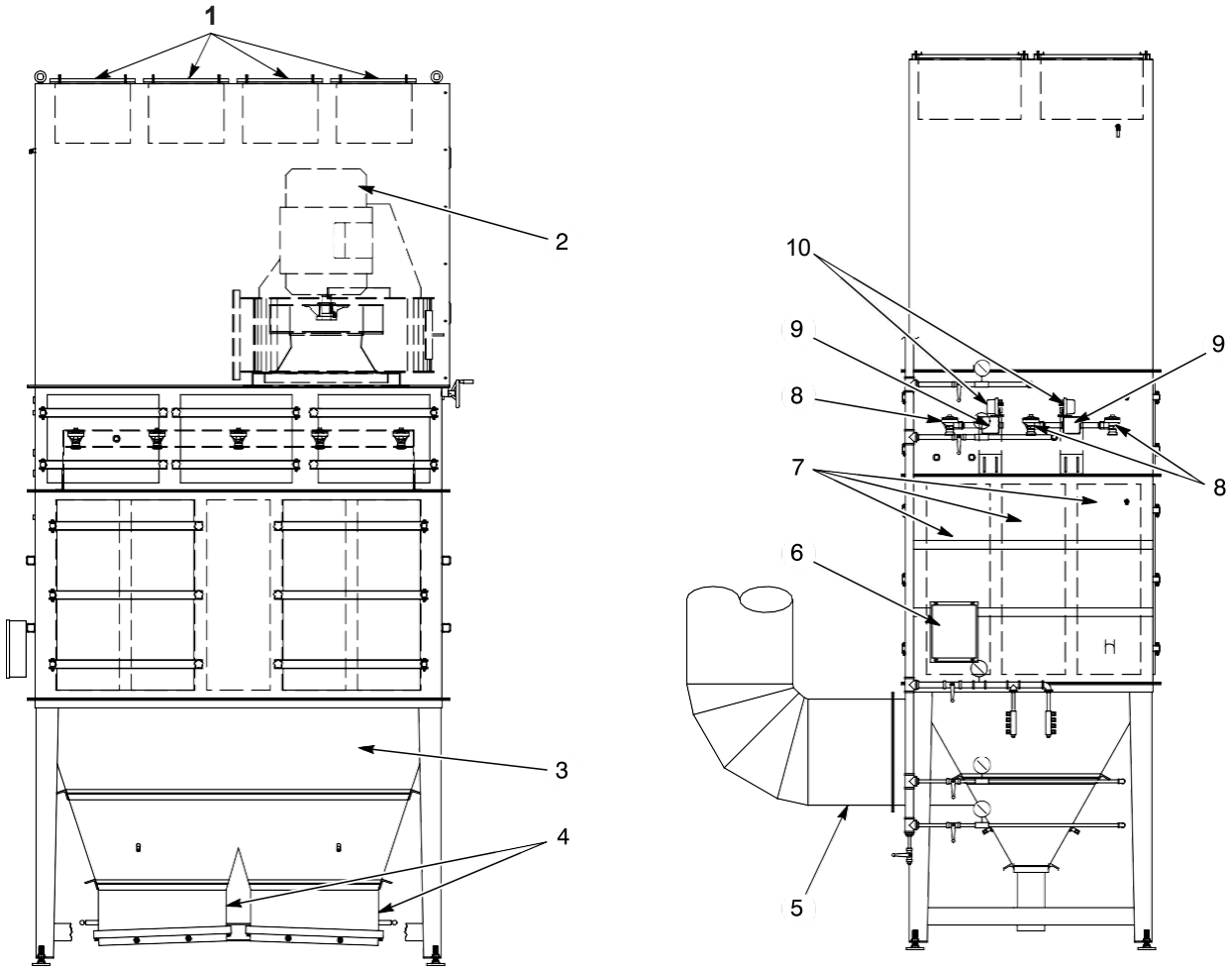


Figure 2-6 Afterfilter Operation—Front and Side Views

The PULSE ON DEMAND switch on the afterfilter panel allows the operator to set cartridge pulsing to be either continuous or on-demand:

- CONTINUOUS: Cartridges are pulsed at operator-specified intervals set at the pulse valve timer.
- ON-DEMAND: Cartridges are pulsed when the cartridge filter differential pressure switch detects a pressure drop across the cartridge filters of 6.5-in. water column (wc). Pulsing stops when the pressure drops below 6.5 in.

The powder blown off the cartridge filters is unusable, primarily because most of the particles are too small to hold an electrostatic charge. The powder falls into the waste hoppers (3) in the bottom of the collector section. The waste hoppers are equipped with fluidizing plates (4), which diffuse air into the powder so that it will flow easily when pumped out of the hoppers by transfer pumps.

The final filter differential pressure switch monitors the pressure drop across the final filters. At 2.5-in. wc, a red warning light on the system control panel lights. At 3-in. wc, the entire system shuts down.

Typically, the afterfilter is equipped with quick-acting explosion and fire suppression systems. These are not shown here.

Control Panels

Refer to the following tables for a description of typical system controls. The contents and locations of the control panels vary depending on the system configuration and options installed.

Encore Venturi Feed Center Control Panel

See Figure 2-7.

Table 2-2 Powder Feed Center Control Panel

Control	Function
1. Damper Selection	Left: Manual mode - Damper is open for high flow. Right: Auto mode - Damper is partially closed during normal operation, open during color change.
2. Bulk Feed Pump	Turns on and off the virgin powder transfer pump. Used when system is equipped with a bulk feed system. When on, the pump is turned on and off automatically as needed to satisfy the level sensor on the lance assembly.
3. Reclaim Powder Transfer Pump	Turns on and off the reclaim powder transfer pump. When on, the pump operates continually.
4. Sieve Control	Turns sieve vibrator motor on and off.
5. Color Change Enable	Starts color change sequence. If operator platform is equipped with an Ancillary Equipment Clean Cycle button, lances are automatically raised out of hopper or box. If not, then starts external gun blow off.
6. Emergency Stop	Shuts down powder coating system.
7. Table Vibrator	Turns table vibrator motor on and off.
8. Purge Selection	Left: Start internal gun purge cycle. Center: Off Right: Start transfer pump purge cycle.
9. Lance Lift	Raises and lowers lance assembly.
10. Powder Source Select	Selects hopper or box, controls where lances stop when lowered into powder.
11. Color Change Indicator Light (Green)	Off: Color change cycle is disabled Blinking: In color change cycle. On: Color change automatic operations complete.

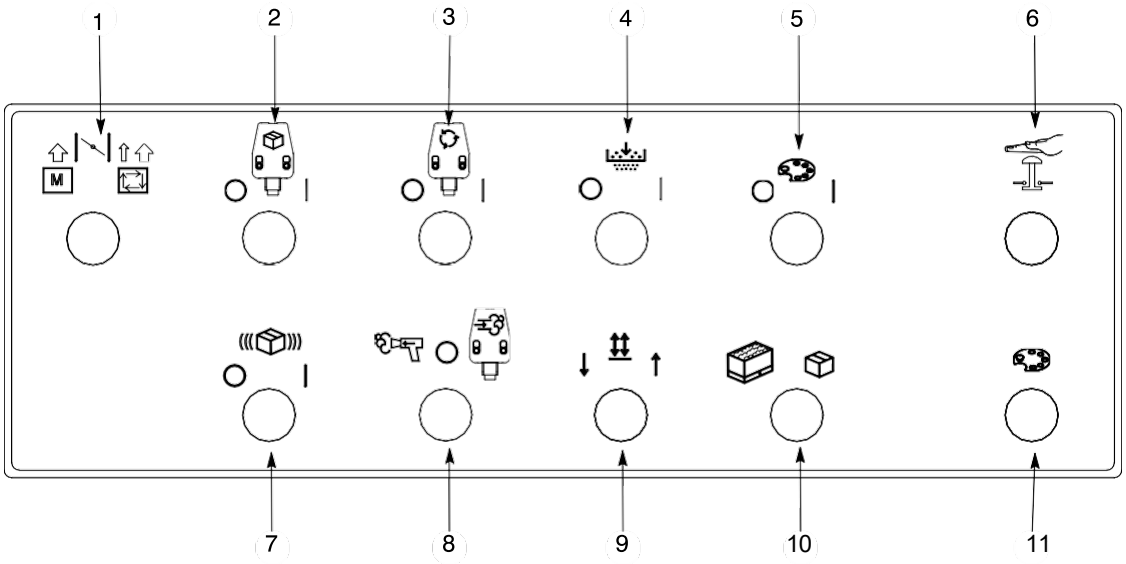


Figure 2-7 Powder Feed Center Controls

Main Electrical Control Panel

See Figure 2-8. Your system control panel may be different.

Table 2-3 Main Electrical Control Panel Functions

Control	Function
12. SYSTEM START	Left: Manual mode - Damper is open for high flow. Right: Auto mode - Damper is partially closed during normal operation, open during color change.
13. SYSTEM STOP	Turns on and off the virgin powder transfer pump. Used when system is equipped with a bulk feed system. When on, the pump is turned on and off automatically as needed to satisfy the level sensor on the lance assembly.
14. SYSTEM READY	Turns on and off the reclaim powder transfer pump. When on, the pump operates continually.
15. AFTERFILTER FAN START	Turns sieve vibrator motor on and off.
16. AFTERFILTER FAN STOP	Starts color change sequence. If operator platform is equipped with an Ancillary Equipment Clean Cycle button, lances are automatically raised out of hopper or box. If not, then starts external gun blow off.
17. FINAL FILTER WARNING	Shuts down powder coating system.
18. FLOOR CLEAN	Turns table vibrator motor on and off.
19. OSCILLATOR #1 START and STOP	Left: Start internal gun purge cycle. Center: Off Right: Start transfer pump purge cycle.
20. OSCILLATOR #2 START and STOP	Raises and lowers lance assembly.
21. OSCILLATOR #1 and 2 SPEED	Selects hopper or box, controls where lances stop when lowered into powder.
22. ANCILLARY EQUIPMENT CLEAN and RESET	Off: Color change cycle is disabled Blinking: In color change cycle. On: Color change automatic operations complete.

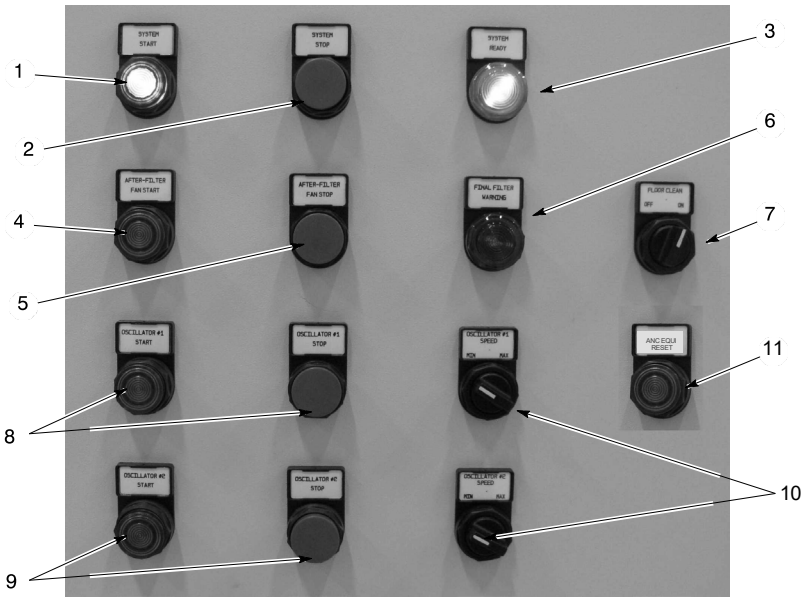


Figure 2-8 Main Electrical Control Panel

Typical System Options

Refer to the manuals shipped with optional equipment for more information, or contact your Nordson Corporation representative.

Table 2-4 Typical System Options

Control	Function
Air Dryer	Removes moisture from the system air supply. Most systems use regenerative-desiccant or refrigerated air dryers.
Spray Gun Oscillators or Reciprocators	Move the spray guns in repetitive vertical patterns for thorough part coverage. Oscillators are typically controlled from the system control panel. Reciprocators are controlled by a Nordson iControl system, Axis controller, or PLC.
Powder Drum Unloaders	Transfer virgin powder from shipping boxes, drums, or bags to the powder feed center.
Fluidizing Hopper	Plastic boxes with fluidizing plates and pans, which diffuse low pressure air into the powder so it can be pumped out of the hoppers and out to the spray guns.
Part Identification and Spray Gun Triggering Systems	Identify and track parts on the conveyor line and control automatic spray gun movement, triggering, pump and gun air, and electrostatic voltage. The Nordson iControl system provides all these functions.

Roll-On/Roll-Off System

Roll-on/roll-off systems move the booth offline for color change, cleaning, and maintenance.

In roll-on/roll-off systems, the entire system, including the cyclone, is mounted on a platform equipped with casters and motor drives. The casters ride on rails installed in the spray room floor. The motor drives move the platform online and offline. The cyclone is disconnected from the afterfilter before the move, then re-connected when the move is completed.

Booth movement is controlled by online and offline end-of-travel limit switches. Operator controls consist of switches on the system control panel or a pendant.

Section 3

Operation

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

Introduction

The PLCs in the powder feed center and the main electrical control panel control the automatic processes in a typical system. The PLCs are typically programmed by your Nordson application engineer to suit your application requirements.

Spray gun triggering and the movement of positioners and reciprocators are typically controlled by a Nordson iControl Integrated Control system. Refer to the iControl manuals for instructions on configuration, programming, and operation.

CAUTION: Before starting up your powder coating system for the first time, perform the Initial Canopy Conditioning procedure in Maintenance. The inside surfaces of the canopy must be clean, free of oils, and dry. A clean canopy prevents powder from sticking, and allows for fast color changes.

Do not touch the inside surfaces of the canopy with bare hands if possible. Wear clean cotton gloves when working in the canopy interior.

NOTE: Before starting your system for the first time, review and adjust if necessary, your feed center PLC function settings, level sensor functions, and air pressure settings. These are described in the Setup section of the feed center manual.

Typical Operating Settings

The settings listed here are approximate. You may need to adjust these settings to obtain the desired results.

Operating Air Pressures

Table 3-5 Typical Operating Air Pressures

Air Pressure	Setting
Input (System)	7 bar (100 psi)
Cartridge Filter Pulse (Afterfilter)	4 bar (60 psi)
Waste Hopper Fluidizing (Afterfilter)	1 bar (15 psi)
AeroWash	5.5 bar (80 psi)
Floor Blow-Off Bleed Air	0.28 bar (4 psi)
Floor Blow-Off Pulse Air	3.4 bar (50 psi)
Purge Air (Feed Center)	6.2 bar (90 psi)
Feed Hopper Fluidizing Air	0.3-0.7 bar (5-10 psi)
Lance Fluidizing Air	0.3-0.7 bar (5-10 psi)

Timer Board Settings

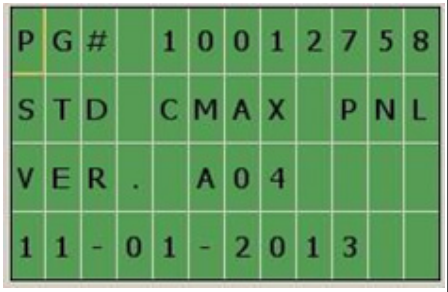
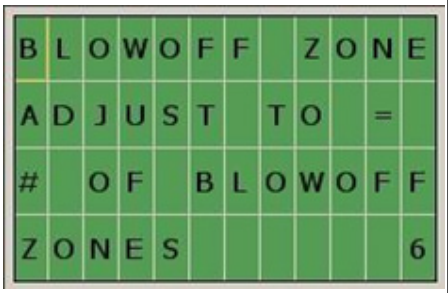
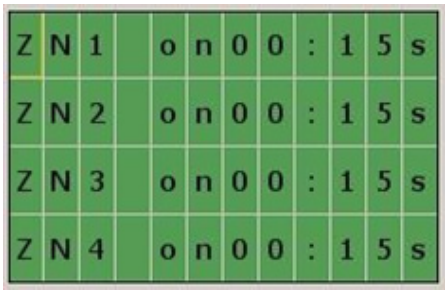
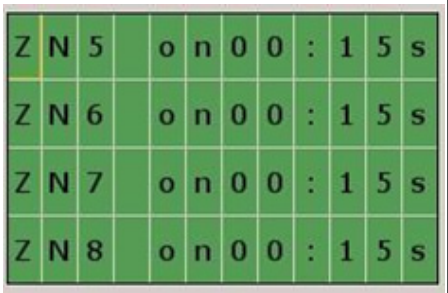
Table 3-6 Typical Timer Board Settings

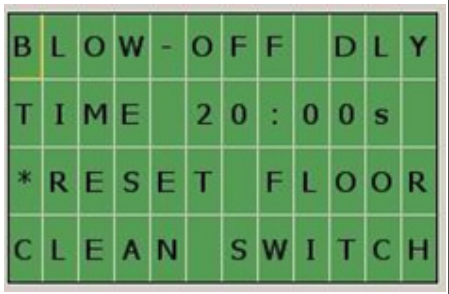
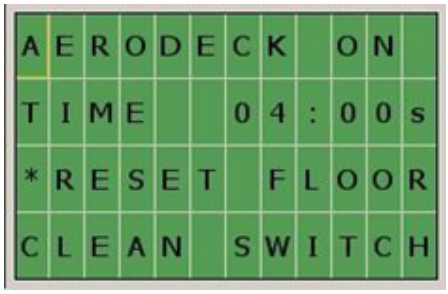
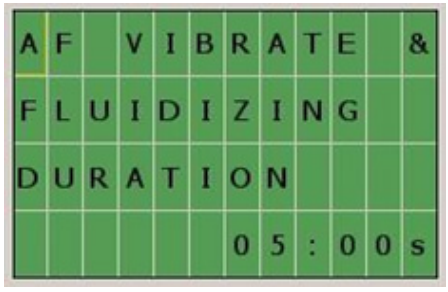
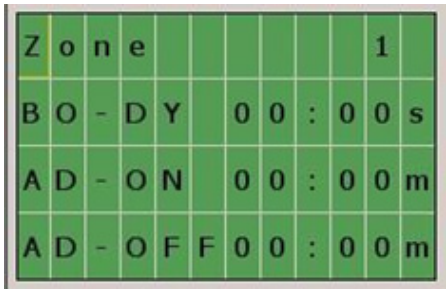
Timer	Setting
Afterfilter Cartridge Filter Pulsing	
On Time (Duration)	0.07 seconds
Off Time (Delay)	10 - 12 seconds

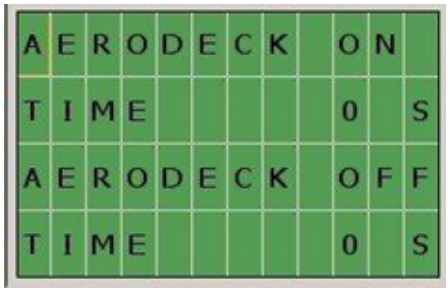
Booth Control Functions

The booth functions are controlled by a PLC inside the main electrical control panel. The following function values are programmed into the controller at the factory and can be adjusted as needed for the application.

Table 3-7 Powder Feed Center Function Settings

Screen	Function	Description	Default
	**SCREEN 1** Welcome Screen	Displays program reference number, program description, program version number and last edit date.	N/A
	**SCREEN 2** Blow-Off Zone	Shows the number of blow off zones in the system. This can be adjusted from 1 to 8.	6
	**SCREEN 3** Blowoff Zone Settings, Zones 1 - 4	Sets the blow-off zone ON time for zones 1 - 4.	0.15 seconds (150ms)
	**SCREEN 4** Blow-Off Zone Settings, Zones 5 - 8	Sets the blow-off zone ON time for zones 5 - 8.	0.15 seconds (150ms)

Screen	Function	Description	Default
	**SCREEN 5** Blow-Off Delay	Sets the delay time between each floor blow-off actuation. **NOTE:** If changed, please turn the FLOOR CLEAN SWITCH on the MECP enclosure door to OFF, then ON to load the new value.	20.00 seconds
	**SCREEN 6** AeroDeck ON Time	The AeroDeck cleaning valve will activate after zones 2, 4, 6, and 8 turn off. The ON time will be timed in accordance with the blow-off delay time stetting. **NOTE:** This value should always be at least 4 seconds less than the delay value in Screen 5.	4.00 seconds
	**SCREEN 7** After Filter Vibrate and Fluidizing Duration	Sets the duration time for the after filter vibrate and fluidizing function.	5.00 seconds
	**SCREEN 8** After Filter Vibrate and Fluidizing Cycle Delay	Sets the delay time for the after filter vibrate and fluidizing cycle.	10:00 minutes
	**SCREEN 9** Status Screen 1	This is a status screen only with no adjustable parameters. The screen displays the next floor blow-off zone, current blow-off delay time remaining, AeroDeck ON time remaining, and AeroDeck OFF time remaining.	N/A

Screen	Function	Description	Default
	**SCREEN 10** Status Screen 2	This is a status screen only with no adjustable parameters. The screen displays the programmed AeroDeck ON time and the calculated OFF time. This screen is updated if the user values from Screen 5 and 6 are changed, and the FLOOR CLEAN selector switch is toggled OFF then ON.	N/A

Changing Function Values

Open the main electrical control panel door to access the PLC.

NOTE: These instructions are also reproduced on a label on the inside of the control panel door.

Figure 3-1 Feed Center PLC Interface

1. Press the **ESC** key to begin search.
2. Find the function screen to be changed by pressing the **UP** (▲) or **DOWN** (▼) arrow keys.
3. While on the selected screen, press and hold the **ESC** key. A cursor will appear.
4. Use the **LEFT** (◀) and **RIGHT** (▶) arrow keys to position the cursor on the value to be changed.
5. Press the **OK** key to highlight the value.
6. Use the **LEFT** (◀) and **RIGHT** (▶) arrow keys to select the correct units (xx:xx) column, and then the **UP** (▲) and **DOWN** (▼) arrow keys to change the value.
7. Press the **OK** key to enter the value.
8. Make additional changes to the same page by moving the cursor as described in steps 4-7.
9. When data changes to the page are complete, press the **ESC** key twice.

Startup

Use the following procedure to start up the system on a daily basis.

NOTE: These procedures assume that the system has been cleaned.

1. Turn the main electrical control panel, feed center, and afterfilter control panel disconnect switches to the ON position.
2. If applicable, move the system into the on-line position. Refer to Booth Moving in this section for more information.
3. Refer to page 2-15. Press the SYSTEM START button on the system control panel. The button lights.

The safety gate (in the duct between the cyclones and the afterfilter) opens. When the gate is fully open and all interlocks are satisfied, the SYSTEM READY indicator lights and the system is ready to start.

4. Press the AFTERFILTER FAN START button on the system control panel. The fan starts and the afterfilter cartridge filters are pulsed automatically.
5. Turn the FLOOR CLEAN switch to the ON position.
6.  Select the powder source (hopper or box) on the feed center control panel.
7. Fill a feed hopper 2/3 full of powder or open a powder box.
8.  Raise the lance assembly and center the powder source under the lances.
9.  Lower the lances into the powder. The lance will stop at a position determined by the powder source selection.
10.  Turn on the vibrator table if the powder source is a box.
11.  Adjust the fluidizing air pressure, using the regulator on the side of the feed center. The powder should be gently boiling without geysering out of the powder source. Allow the powder to fluidize for several minutes before starting production.
12.  Turn on the powder sieve.
13.  Turn on the reclaim transfer pump.
14.  If a bulk unloader is used, turn on the virgin powder transfer pump.

15.  Turn the Damper switch to the Automatic position.

WARNING: Make sure all personnel are clear of the oscillators or reciprocators and spray guns before turning them on. Failure to observe this warning could result in equipment damage and injury to personnel.

16. Turn on the oscillators or reciprocators from the system control panel.
17. Turn on the manual spray gun controllers and the automatic gun controller, if not already on.
18. Make sure the part ID system is powered and working properly.

NOTE: Before spraying powder, wait several minutes for the powder in the feed source to fluidize. When properly fluidized, the powder will be gently boiling. Adjust the fluidizing air pressure as needed.

19. Start the conveyor, hang parts on it, and start production. Refer to your spray gun controller manuals for adjustments to the spray settings.

NOTE: It is important that the inside surface of the canopy is not touched by bare hands. Skin oils and other contaminants will affect the ability of the canopy to shed powder. Operators should wear cotton gloves when working with the canopy.

Ancillary Equipment Clean Function

See Figure 3-1. The Ancillary Equipment Clean and Reset control is located on the non-cyclone side manual platform. This function allows the manual station operator to initiate the first part of the color change cycle, or the ancillary clean mode, without disrupting work flow.

As the last part to be coated passes the automated coating equipment, the non-cyclone side operator can press the **START ANCILLARY EQUIPMENT CLEAN CYCLE** button to initiate this mode. The operator can then complete the task of touching up the final part as the automatic equipment clean cycle is running.

A corresponding indicator and reset button located at the system panel will turn amber as an indication that the mode is activated. This reset button can be pushed at any time during the clean cycle to turn the function off.

See Figure 2-8.

At the conclusion of the ancillary equipment clean cycle, the color change switch located the feed center panel can be turned to the ON position to complete the color change sequence.

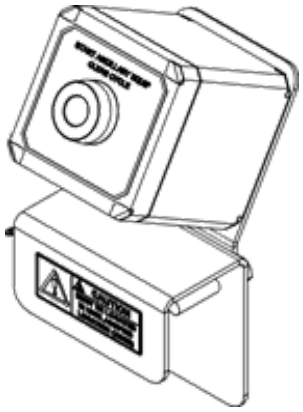


Figure 3-2 Ancillary Equipment Clean Cycle Button Box

Color Change Procedures

Color change procedures vary depending on the type of application equipment and feed center included in the system. To perform a color change most efficiently, it is recommended that two trained operators be present. The operators are responsible for cleaning the following items:

1. **Cyclone side operator:** Powder feed center and cyclones
2. **Non-cyclone side operator:** Interior of booth canopy and cyclones

The two operators' tasks should be performed at the same time unless otherwise noted. Refer to the foldouts included as a supplement to this manual for step-by-step procedures.

Note that the procedures are recommendations only and can be modified as desired.

Powder Level Sensor Operation

The lance assembly lowers as the powder level falls. When the level sensor senses no powder, the sensor activates either a low-powder alarm or starts the bulk feed transfer pump to add virgin powder to the system.

There are two level sensors. The position of one should be set for boxes, the other for hoppers. When the lance is lowered into the powder, it will stop at the position set on the lance cylinder proximity switches for the selected powder source.

The level sensor positions should be set to signal for new powder or a low powder alarm when the powder height is the desired distance above the end of the lances.

Refer to the Encore Powder Feed Center manual for more information.

Booth Moving

Perform this procedure to move the system online or offline.

NOTE: Disregard this procedure if your system is not equipped with a roll-on/roll-off system.

1. From the **Main Menu**, touch the **Booth Move** button.
2. Touch the **Exhauster Stop** button. The afterfilter exhaust fan stops.
3. Touch the **Duct Lifter Open** button. The cyclones disconnect from the afterfilter inlet duct.

4. When **BOOTH MOVER READY** is displayed on the booth moving menu, press the **BOOTH MOVER ENABLE** button on the system control panel. The booth mover buzzer sounds and the pendant button is enabled for three minutes.
5. Visually check the area around the booth for obstructions. Clear the area of all obstructions and personnel.
6. Press the pendant button to move the booth to the desired position. The booth moves as long as the button is held down. The booth stops moving when either you release the button or the booth reaches either the online or offline position.
7. When either **ONLINE READY** or **OFFLINE READY** is displayed on the booth moving menu, touch the **Duct Lifter Close** button. The cyclones connect to the afterfilter inlet duct.
8. When **EXHAUSTER READY** is displayed on the booth moving menu, touch the **Exhauster Start** button. The afterfilter exhaust fan starts.

Shutdown

Use the following procedure to shut down the system.

1. Move the booth offline, if desired. Refer to Booth Moving.
2. Clean the system by performing the color change process, but do not install a new powder source. Refer to the Color Change Procedures section for more information.
3. Press the SYSTEM STOP button. All of the motors in the system turn off.

NOTE: If you are shutting down the system for a short break in production, do not perform step 4.

4. If you will be shutting down the system for maintenance, repair, or an extended period of time, perform these steps:
   a. Press the SYSTEM STOP button on the system control panel.
   b. Turn the disconnect switches on the powder feed center, main electrical control panel, and afterfilter control panels to the OFF position.

Section 4

Maintenance

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

Initial Canopy Conditioning

Perform this procedure on new canopies before initial startup. This procedure removes any oils or other contaminants from the canopy, making the canopy easy to clean and reducing the potential for contamination of reclaimed powder.

Required: Acetone or 80%+ isopropyl alcohol, mild dishwashing detergent, clean water, 5 gallon buckets, pre-washed 100% cotton rags, clean hand sponges and sponge mop.

NOTE: Rags used for cleaning must be washed before use to remove sizing and starches which would be transferred to the canopy surfaces, degrading the ability of the canopy to shed powder.

1. Wipe down entire canopy with acetone or isopropyl alcohol and pre-washed, 100% cotton rags.
2. Fill two clean buckets with water.
3. Put 2-3 drops of mild dish washing detergent into one of the buckets. This will be the soap bucket.
4. Soak and wring out a hand sponge or a sponge mop in the soap bucket. Wipe down the entire inside of the canopy, frequently wringing out the sponge in the rinse bucket and then re-soaping the sponge in the soap bucket. A continuous wet surface is not necessary, so do not be concerned if some surfaces air-dry prior to next step. You must make sure that the soap solution contacts all surfaces.
5. Empty the buckets, rinse them, and repeat steps 1-3, for a total of two wash cycles.
6. Empty the buckets and rinse them. Fill the buckets with clean water and rinse the entire inside of the canopy, frequently wringing out the sponge in the rinse buckets.
7. Repeat step 5 two more times, for a total of three rinse cycles, then allow the canopy to completely dry before spraying powder.

NOTE: It is important that the inside surface of the canopy is not touched by bare hands. Skin oils and other contaminants will affect the ability of the canopy to shed powder during blowoff. Operators should wear cotton gloves when working with the canopy.

Daily Maintenance

Perform these procedures daily to keep your system clean and functioning properly.

System Cleaning

Perform this procedure daily.

WARNING: Wear an approved respirator and safety glasses or goggles when performing maintenance or cleaning operations. Obtain and read Material Safety Data Sheets for each powder used.

1. Perform all procedures in the Color Change section, stopping at loading new powder into the feed center and spraying new powder.
2. After the spray guns are purged and blown clean, wipe down the spray guns with clean cotton cloths. Clean the nozzles and replace any worn parts. Refer to the gun manuals for additional maintenance procedures.
3. Remove any powder residue from the booth using an air-powered vacuum with a soft brush attachment. Wipe down all surfaces with a damp, lint-free cloth (do not use tack cloths).

NOTE: It is important that the inside surface of the canopy is not touched by bare hands. Skin oils and other contaminants will affect the ability of the canopy to shed powder during blowoff. Operators should wear cotton gloves when working with the canopy.

4. Clean the feed center and wipe down the interior with clean cotton cloths.
5. Clean the floor around the booth.

Daily Equipment Maintenance

Table 4-1 Daily Equipment Maintenance

Equipment	Procedure
Flame Detector System	Check the detector sensors every four hours and clean the lenses, if necessary. Make sure air is being supplied to the sensors. Make sure the detector system is operating properly.
Air Dryers	Perform any required maintenance as described in your air dryer manual.
Air Velocity	Measure the air velocity at all booth openings with a velometer. Minimum velocity is 43 m/min (140 fpm).
Compressed Air Supply	Hold a clean, white cloth under the supply line drop leg and open the drop-leg drain valve. Water, oil, or other contaminants will stain the cloth. Eliminate any source of contamination. Drain the filters and separators and check the filter elements. Check all air pressure regulator settings. **NOTE:** The air dryer should remain on at all times to prevent moisture from accumulating in the compressed air system.
Afterfilter Cartridge Filters and Housings	Pulse the cartridge filters to clean them. With the exhaust fan operating, check the cartridge filter differential pressure gauge. It should read between 4- and 6-in. wc. Check the pulse valve timing to make sure that the cartridge filters are being pulsed often enough to prevent clogging. If pulsing the filters does not clean them enough to bring down the pressure, then the filters have reached the end of their lives and must be replaced.

Continued...

Equipment	Procedure
Final Filter Housing and Fan	With the exhaust fan operating, check the final filter differential pressure gauge. It should read between 1- and 2.5-in. w.c. If the differential pressure exceeds 3 w.c., that system will shut down, as the pressure indicates that the final filters are clogged, most likely by the failure of a cartridge filter. If this happens, replace the final filters. Check the cartridge filters and replace any that have failed.
Oscillators, Reciprocators, and In/Out Gun Positioners	Each shift, make sure the oscillators and reciprocators are stroking smoothly and at the proper speed. Make sure the positioners are moving smoothly. Lubricate the gun movers and make repairs and adjustments as necessary. Refer to the gun mover manuals for instructions.
Powder Spray Guns	Clean the spray guns according to the instructions in their manuals.
Powder Pumps	Disassemble and clean the pump blocks, venturi throats and throat holders. Replace worn parts.
Sieve	Remove and clean the screen. Replace the screen if it is damaged. Check the rubber seals. Replace any damaged or worn parts.
Reclaim and Virgin HDLV Transfer Pumps	Inspect the pinch valve body for signs of powder leakage. If you see powder in the pinch valve body or stress cracks in the pinch valves, replace the pinch valves. Refer to the pump manual for long term maintenance and repair procedures.
Afterfilter Transfer Pumps	Disconnect the transfer hoses from the pumps. Blow out the powder from the hoses with compressed air. Remove the transfer pumps from the adapters. Blow out the adapters and pickup tubes. Disassemble the pumps. Clean the parts with a low-pressure air gun and a clean cloth. Replace any worn or damaged parts.
Workpiece, Equipment, and Conveyor Grounds	 **WARNING:** An ungrounded or poorly grounded workpiece, hanger, conveyor, or other equipment can cause electrical arcing. If arcing is observed, shut down the system immediately. Correct the cause before resuming operations. Failure to observe this warning could result in a fire or explosion, causing property damage and possible personal injury or death. Make sure all workpieces are grounded through the hangers and conveyor. The resistance between the workpieces and the hangers, and the hangers and ground, must be less than 1 megohm. Use a megohm meter to check resistances. You will get better transfer efficiency and workpiece coverage at 500 ohms or less. Clean the hangers regularly.

Weekly Maintenance

Table 4-2 Weekly Maintenance

Equipment	Procedure
Booth Enclosure	Clean the booth exterior, all attached equipment, and the spray room. Check the canopy for damage and dirt. Clean as necessary. Refer to the Booth Canopy Conditioning procedure on page 4-5.
Differential Pressure Gauges	Observe and record the differential pressure gauge readings. Cartridge Filters Pressure Drop: 4-12.0-in. wc Final Filters Pressure Drop: 1-2.5-in. wc If the pressure drop across the cartridge filters exceeds 12.0-in. wc, the filters are clogged. If the pressure drop across the final filters exceeds 2.5- in. wc, the final filter warning light on the system control panel will light. At 3-in. wc the system will shut down.
Powder Spray Guns and Cables	Clean the spray guns. Perform electrostatic resistance checks as described in the spray gun and control unit manuals.
Powder Pumps and Feed Hoses	Purge the lance assemblies. Disassemble the pumps and clean the venturi throats and nozzles. Replace any worn or damaged parts. Blow out the feed hoses with compressed air. Replace damaged or clogged hoses.

Monthly Maintenance

Table 4-2 Monthly Equipment Maintenance

Equipment	Procedure
Afterfilter Waste Hoppers	Empty the afterfilter waste hoppers monthly. Refer to Emptying the Afterfilter Waste Hoppers for instructions.
Air Dryer	Check the air dryer operation. Refer to your air dryer manual for maintenance procedures and schedules.
Electrical Connections	Check all terminal blocks and junction boxes for loose wires. Tighten any loose connections and inspect the system wiring. Replace any damaged wires.
Gaskets	Inspect all gaskets and seals for damage. Replace them if they are damaged.
Fan and Roll-On/Roll-Off System Bearings	Every six months, lubricate the fan bearings and all motor bearings with two shots of No. 2 lithium grease from a grease gun.
Roll-On/Roll-Off Wheels	Lubricate the flanged wheel bearings with two shots of white lithium grease every six months.
Equipment Grounds	**WARNING:** Ungrounded or poorly grounded equipment can cause electrical arcing. If arcing is observed, shut down the system immediately. Correct the cause before resuming operations. Failure to observe this warning could result in a fire or explosion, causing property damage and possible personal injury or death. Check all equipment grounds. Repair or replace unconnected or damaged ground cables.

Booth Canopy Conditioning

Perform this procedure every six months or whenever it becomes difficult to blow powder off the canopy surface. Conditioning keeps the canopy easy to clean and reduces the potential for contamination of reclaimed powder.

NOTE: To remove impact-fused powder, perform the initial canopy conditioning procedure on page 4-1.

1. Fill two clean buckets with water.
2. Put 2-3 drops of mild dish washing detergent into one of the buckets. This will be the soap bucket.
3. Soak and wring out a hand sponge or a sponge mop in the soap bucket. Wipe down the entire inside of the canopy, frequently wringing out the sponge in the rinse bucket and then re-soaping the sponge in the soap bucket.
4. Empty the buckets, rinse them, and repeat steps 1-3, for a total of two wash cycles.
5. Empty the buckets and rinse them. Fill the buckets with clean water and rinse the entire inside of the canopy, frequently wringing out the sponge in the rinse buckets.
6. Repeat step 5 two times, for a total of three rinse cycles. Allow the canopy to completely dry before resuming spray operations.

NOTE: It is important that the canopy is not touched by bare hands. Skin oils and other contaminants will affect the ability of the canopy to shed powder during blowoff. Operators should wear cotton gloves when working with the canopy.

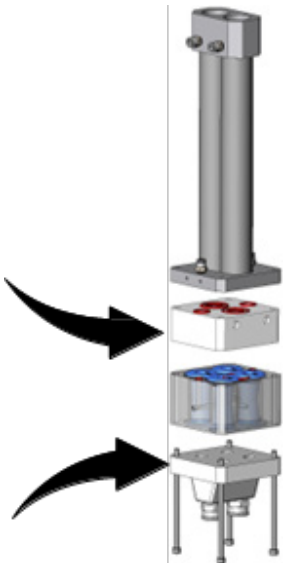
Cyclone Cleaning

Use the cyclone cleaning media listed in Parts to clean the cyclones and remove impact-fused powder. Results may vary depending on the level of impact fusion. Cleaning durations can be reduced or increased to meet system requirements.

1. Disconnect the transfer hose and fluidizing air tubing from the transfer pan at the bottom of the cyclone.
2. Plug all the tubing and hose connectors in the transfer pan.
3. Close the cyclone access doors, if open.
4. With the exhaust fan running, dump 1-2 cups of cyclone cleaning media into the cyclone inlet duct.
5. Let media clean the cyclones for approximately one hour. This duration can be reduced or increased as needed.
6. Shut down the exhaust fan.
7. Open the transfer pan and remove the remaining cyclone cleaning media.
8. Close the transfer pan.
9. Load a new powder color and reclaim to waste for 1-2 minutes to cleanse the system of the cyclone cleaning media residue.

HDLV Transfer Pump and Transfer Pan Maintenance

For more detailed maintenance and repair information, refer to the Prodigy HDLV High-Capacity Pump manual.

<table>
<tr><th>Component</th><th colspan="2">Maintenance Procedure</th></tr>
<tr><td rowspan="2">HDLV Reclaim and Virgin Transfer Pumps</td><td>Daily
Inspect the pinch valve body for signs of powder leakage. If you see powder in the pinch valve body or stress cracks in the pinch valves, replace the pinch valves.</td><td>Pinch Valves Kit 1057265
  </td></tr>
<tr><td>Every Six Months or Each Time You Disassemble the Pump
Disassemble the pump assembly and inspect the lower Y body and upper Y-manifold for signs of wear or impact fusion. Clean these parts in an ultrasonic cleaner if necessary.
NOTE: To reduce downtime, keep a spare upper Y-manifold and lower Y body in stock to install while you are cleaning the other set.</td><td>Upper Y-Manifold Kit 1057269
Lower Y Body Part 1053976
  </td></tr>
<tr><td>Transfer Pan (Cyclone)</td><td colspan="2">Periodically disassemble and clean the transfer pan. Refer to Transfer Pan Cleaning for instructions.
NOTE: Required cleaning frequency depends on several factors, including powder type used, color change frequency, and experience.
Periodically blow off the fluidizing plate and inspect it for signs of air contamination. If the plate is discolored and appears to be contaminated, replace it. Refer to Transfer Pan Cleaning for replacement instructions. Check your air supply and correct any contamination problems.</td></tr>
</table>

Transfer Pan Cleaning

Disassembly

1. See Figure 4-1. Disconnect the fluidizing air tubing (12).
2. Disconnect the 16-mm powder tubing (6) from the bulkhead union (7). Disconnect the bulkhead union from the discharge tube (5).
3. Remove the plenum (3) from the transfer pan (11) by removing the eight bolts (10) and nuts (9).
4. Remove the jam nut (8) and sealing washer (4) from the discharge tube. Use two wrenches: one on the flats of the discharge tube and the other on the jam nut.
5. Lift the fluidizing plate (1) with gasket (2) and discharge tube out of the plenum. Unscrew the discharge tube from the fluidizing plate.
6. Remove the gasket from the fluidizing plate and inspect both parts. If either part is damaged, replace it.

NOTE: If you replace the fluidizing plate, replace the gasket, too.

Cleaning

CAUTION: Remove the plenum and fluidizing plate before cleaning the transfer pan. The solvent used to clean the transfer pan will damage the fluidizing plate and gasket.

Clean any impact-fused powder from the inside of the transfer pan with clean cloths and solvent.

Assembly

CAUTION: Install the discharge tube into the threaded side of the fluidizing plate. (The threaded side is marked with a black dot.) Installing the discharge tube incorrectly may damage the fluidizing plate or discharge tube and cause leakage around the fluidizing plate.

1. Install the discharge tube (5) into the threaded side of the fluidizing plate (1) until the discharge tube is either

- flush with the opposite side of the fluidizing plate,
- or bottoms out against the fluid plate.

Do not over tighten the discharge tube.

2. Install the fluidizing plate, gasket (2), and discharge tube assembly into the plenum (3).
3. Install the sealing washer (4) and jam nut (8) onto the end of the discharge tube. Tighten the jam nut snugly using two wrenches: one on the flats of the discharge tube and the other on the jam nut. Do not over tighten the jam nut.
4. Install the plenum assembly onto the bottom of the transfer pan (11) using the eight bolts (10) and nuts (9).
5. Install the bulkhead union (7) onto the discharge tube and connect the 16-mm powder tubing to the bulkhead union.
6. Connect the fluidizing air tubing (12).

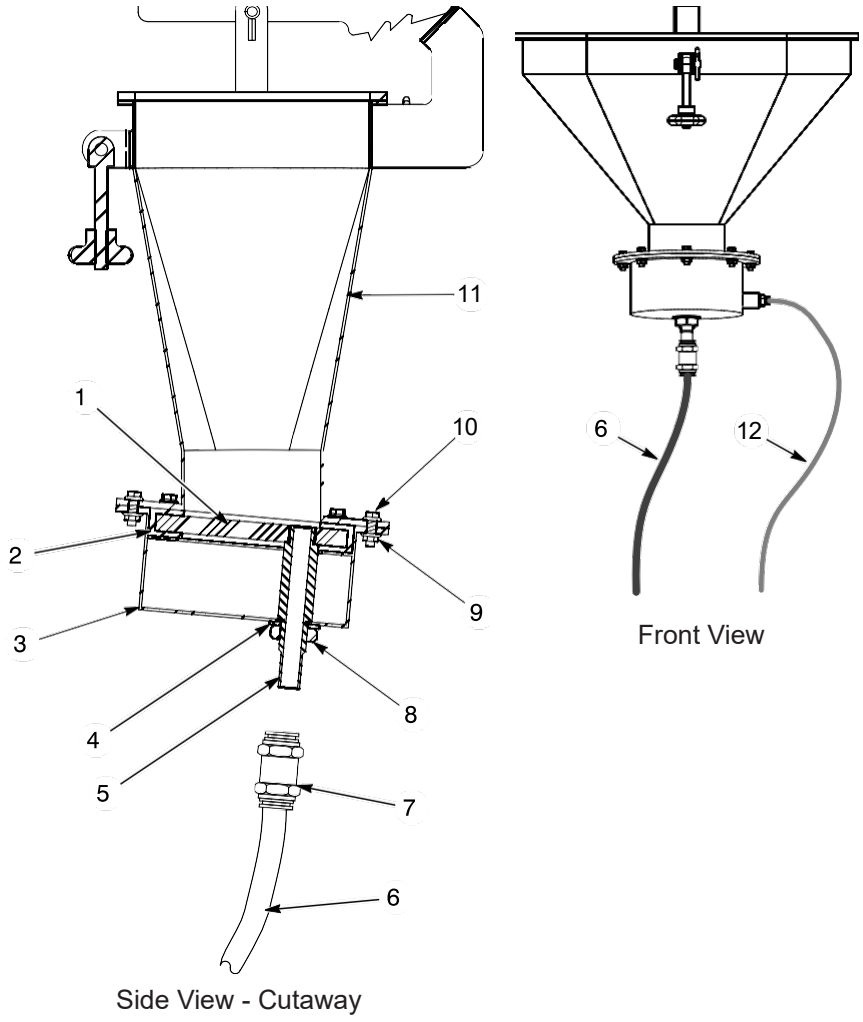
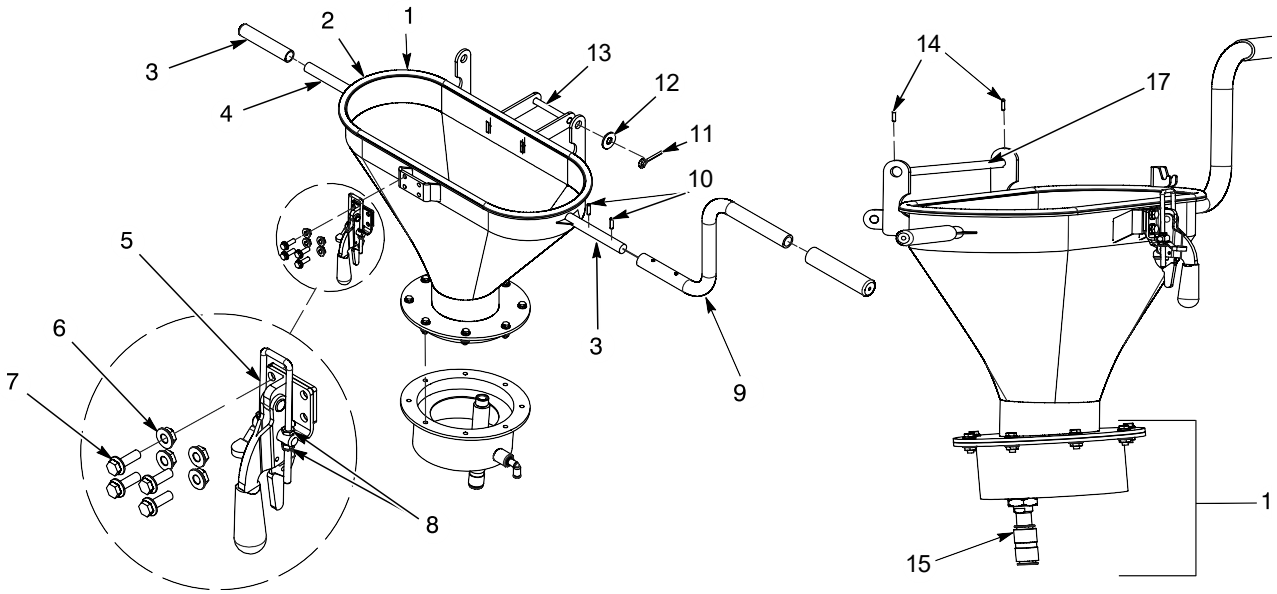


Figure 4-1 Cyclone Transfer Pan

1. Fluidizing plate
2. Gasket
3. Plenum
4. Sealing washer
5. Discharge tube
6. 16-mm transfer line
7. Bulkhead union
8. Jam nut
9. Nuts
10. Bolts
11. Transfer pan
12. Fluidizing air tubing

HDLV Cyclone Transfer Pan Replacement Kit



View 1 View 2

Figure 4-2 Cyclone Transfer Pan

1. Transfer pan
2. Transfer pan gasket
3. Rubber grip
4. Handle shaft
5. Latch assembly
6. Latch nuts
7. Latch bolts
8. Latch adjustment nuts
9. Handle
10. Coil pins
11. Cotter pin
12. Flat washer
13. Hinge rod
14. Set screws
15. Set screws
16. Fluidizing pan assembly
17. Axle shaft

Removing HDLV Cyclone Transfer Pan

See Figure 4-2.

1. Disconnect the bulkhead union (15) from the fluidizing pan assembly (16), noting its orientation relative to the system.

NOTE: Some fluidizing pan assemblies have two bulkhead unions.

2. Unbolt the fluidizing pan assembly (16) from the transfer pan (1). Set aside the eight nuts and bolts for reuse upon assembly.
3. Remove the axle shaft (17) that connects the transfer pan (1) to the lower shell. Set aside the set screws (14), flat washer (12), and cotter pin (11) for reuse upon assembly.
4. Remove the latch assembly (5) and its hardware, saving the latch nuts (5) and latch bolts (7) for reuse on the new transfer pan.

Installing HDLV Cyclone Transfer Pan

See Figure 4-2.

1. The handle (9) will go on either the left or right side of the new transfer pan (1) depending upon the direction of the ColorMax® system.
2. Use a rubber mallet to tap the handle (9) onto the appropriate handle shaft (3) on the transfer pan. Rotate the handle to appear as shown in Figure 4-2.
3. Using a punch, tap two coil pins (10) through the handle (9) into the holes in the handle shaft (4) to secure the handle.
4. Use a rubber mallet to tap rubber grips (3) onto the handle and the unused handle shaft.
5. Install the axle shaft (17), set screws (14), flat washer (12), and cotter pin (11) to attach the new transfer pan to the lower shell.
6. Mount the latch assembly (5) onto the new transfer pan using the latch nuts (6) and latch bolts (7).
7. The set screws (14) are used to raise and lower the hinge rod (13) and must be adjusted during the assembly of the cyclone. Adjust the axle shaft set screws (14) so that each mating surface between the new transfer pan (1) and the lower cyclone extension are parallel and have even contacting surfaces.

NOTE: Ensure the transfer pan gasket (2) is properly seated between the mating surfaces.

8. Once the axle shaft (17) has been adjusted, the axle shaft set screws (14) are used to lock the hinge rod (13) in place.
9. Use the latch adjustment nuts (8) on the clamp adjust for final positioning on the transfer pan.
10. Reinstall fluidizing pan assembly (16) using the original hardware, ensuring that the bulkhead union (15) is toward the back of the transfer pan (1) and aligned with the back of the completed pan assembly.

Emptying the Afterfilter Waste Hoppers

1. See Figure 4-3. Install the waste lid (8) on an empty 55-gallon drum (5).
2. Connect the ground clamp (4) to a true earth ground.
3. Attach 3/4-in. transfer hoses (9) between the transfer pumps (3) and the hose connectors (6) on the waste lid. Use hose clamps on both ends of the transfer hoses.

NOTE: Make sure that all unused hose connectors on the waste lid are plugged.

4. Attach the vent hose (2) to the waste lid vent stub (7). Attach the other end of the vent hose to the after filter vent stub (1).
5. Open the fluidizing air valve on the after filter air manifold. Air pressure turns on simultaneously to the fluidizing bed and fluidizing valves on the waste hopper walls. Allow the powder in the waste hoppers to fluidize for several minutes.
6. After the waste powder is fluidized, open the transfer pump air valve on the after filter manifold.

NOTE: The normal operating air pressure for the transfer pump is 2 bar (30 psi). Increase the transfer pump air pressure if desired.

7. When the transfer pump is not drawing any more powder out of the waste hopper, close the fluidizing and transfer pump air valves.

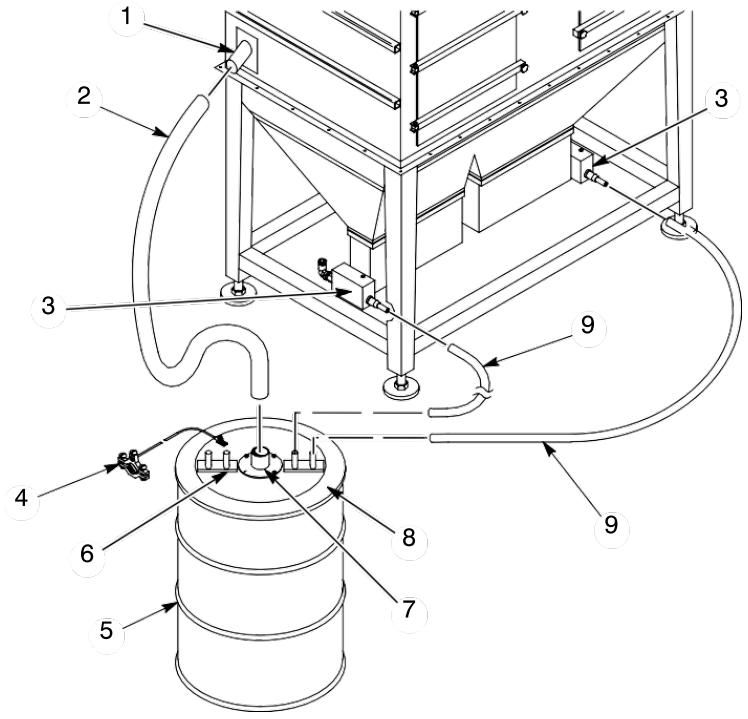


Figure 4-3 Cyclone Transfer Pan

1. After filter vent stub
2. Vent hose
3. Transfer pumps
4. Ground clamp
5. 55-Gallon drum
6. Hose connectors
7. Lid vent stub
8. Waste lid
9. 3/4-in. Transfer hoses

Maintenance Check List

Activity	Color Change	Each Shift	Daily	Weekly	Monthly	Every Six Months
Cleaning						
Fire detector head lenses*		X				
Canopy	X		X			
Final filter compartment	X			X		
Feed and bulk transfer hoses	X	X				
Pump assemblies	X	X				
Spray guns	X	X				
Sieve	X	X				
Bulk transfer pumps	X	X				
Canopy Conditioning**						X
Resistance Checks—Spray Guns and Cables				X		
Visual Checks						
Air supply drop leg			X			
Air dryer drain			X		X	
Cartridge filter differential pressure gauge		X				
Electrical connections					X	
Final filter differential pressure gauge		X				
Fire detector sensors	X	X				
Gaskets					X	
Oscillators, reciprocators and in/out gun positioners		X				
Workpiece clearance***		X				
Workpiece grounding	X	X				
Powder supply levels	X	X				
After filter waste hoppers****					X	

* Clean the fire detector head lenses every 4 hours.

** As required.

*** Continuously monitor the workpiece clearance.

**** Frequency varies depending on application. Check more frequently if spraying to waste often.

Lubrication	Every Six Months
Roll-on/roll-off wheel bearings	X
Roll-on/roll-off wheel bearings	X

Section 5

Troubleshooting

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

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

Common Problems

Use the following tables to correct common problems with the Colormax 2 powder coating system.

Common Problems *(contd)*

Problem	Possible Cause	Corrective Action
1. Spray guns are surging or spitting; powder flow is inadequate or intermittent	Insufficient air volume in feed hose; powder is settling out	Increase the atomizing air pressure and decrease the flow rate air pressure. Refer to the spray gun and control unit manuals for recommended air pressures and ratios.
	Powder in feed source inadequately fluidized; cavities forming in powder below pickup tube ends	Adjust the fluidizing air pressure. The powder should be gently boiling. Refer to problem 5.
	Low powder level in feed source	Add powder to the feed source.
	Powder pump venturi throats worn; pickup tube sucking air at connection to pump mounting arm; pump or pickup tube clogged	Clean the pump and pickup tube. Replace any worn parts. Replace any damaged O-rings.
	Obstruction in powder feed hose	Disconnect the feed hose from the pump. Blow the powder out of the hose with compressed air. Make sure the hose is clear. Eliminate kinks or severe bends in hose. Hose should be no longer than 7.6 m (25 ft) with a maximum 2.7-m (9-ft) vertical rise.
	Obstruction in powder feed hose	Contact your Nordson Corporation representative for a suitable hose material. Contact your powder supplier.
	Obstruction in spray gun	Clean the spray gun.
2. Problems with coating uniformity, edge coverage, film build, wrap, or penetration into recesses	Poor workpiece grounding	Resistance from the workpiece to the ground must be less than 1 megohm. For best results, resistance should not be more than 500 ohms. Clean the workpiece hangers, fixtures, and hooks if necessary. Check the conveyor ground.
	Spray gun placement incorrect	Position the spray guns 254-355 mm (10-14 in.) from the workpieces. Stagger the spray guns 304 mm (12 in.) apart vertically and 381 Mm (15 in.) apart horizontally to avoid fan pattern and electrostatic field overlap. Contact your Nordson Corporation representative for advice.
	Powder pump flow rate and atomizing air pressure incorrect	Refer to the spray gun and control unit manuals for the recommended air pressures and ratios.
	Electrostatic voltage (kV) or AFC setting incorrect for workpieces being coated	Adjust the voltage to 90-100 kV for large flat surfaces and 60-75 kV for recesses. Never set the voltage below 60 kV. Refer to the spray gun and control unit manuals for the recommended voltage, AFC, and air pressure settings and ratios.
	Wrong nozzles being used	Use flat spray nozzles for large, regular-shaped workpieces. Use conical nozzles for deep recesses and most manual touch-ups.
	Powder feed problems	Refer to problem 1.
3. Powder in sieve contaminated	Screen torn	Replace the screen.

Continued...

Problem	Possible Cause	Corrective Action
4. Powder in sieve contaminated	Sieve clamps not tightened, isolators loose or damaged, rubber sleeves damaged	Make sure the sieve clamps are tight. Check the isolators for looseness or damage. Tighten the isolator mounting screws. Check the rubber sleeves for damage, replace if necessary.
5. Powder in feed source not fluidizing, or clouds of powder erupting from surface	Fluidizing air pressure too low or too high	Check the powder in the feed source. Increase the fluidizing air pressure until the powder is gently boiling. Decrease the pressure if clouds of powder are erupting from the surface.
	Moist or oil-contaminated powder	Check the air supply for water or oil. Check the filters, separators, and air dryer.
	Incorrect ratio of reclaimed-to-new powder	Add new powder to the feed source. The powder ration should be no more than 3 parts reclaim-to-1 part new.
	Uneven distribution of powder in feed source	Increase the fluidizing air pressure. Check the powder and the fluidizing plate (if applicable) for contamination.
6. Final filters clogged, powder in fan or final filter housing	Leaking cartridge filter gaskets, or damaged filter media	Make sure the gaskets are sealing correctly. If a 0.4 mm (0.015-in.) feeler gauge slips between the gasket and the sealing surface, tighten the tension nuts to compress the gaskets. Refer to Figure 6-1 Cartridge Filter Replacement in the Repair section for instructions. If the gaskets continue to leak, remove the cartridges. Clean and inspect the gaskets, sealing surfaces, and filter media. Replace the cartridges if the gaskets or filter media are damaged. Replace clogged final filters.
	Leaks in collector housing allowing powder to bypass filters	Locate and seal any leaks with RTV sealant.
7. Final filters clogged, powder in fan or final filter housing	Pulse air pressure inadequate	Increase the pulse air pressure or volume. Decrease the pulse timer delay (off time).
	Powder contaminated	Replace contaminated powder and fix the source of contamination.
	Timer board settings incorrect	Adjust the timer board settings. Refer to the Operation section for typical operating settings.
	Pulse valve or solenoid valves clogged or malfunctioning	Open the pulse valve timer panel. If you do not hear a pulse each time an LED lights, the solenoid valve or the pulse valve connected to that LED may be clogged or failed. Check the wiring to the solenoid valve before opening the solenoid box and replacing the solenoid valve.
	Powder level in afterfilter waste hopper too high	Empty the waste hopper.

Continued...

Problem	Possible Cause	Corrective Action
8. Cartridge filters clogged	Flame detector system sees a flame or spark, or is malfunctioning	Check the inside of the canopy; the detector head aim; and the workpiece and conveyor grounds. Follow the troubleshooting procedures in the flame detector system manual.
	Final filters clogged	Locate the source of powder leakage and correct the problem. Refer to problem 6.
	Final filter pressure switch failed	Replace the pressure switch.
	Safety duct gate not fully open	Make sure that the safety duct gate limit switch is engaged. The gate opens when the SYSTEM START button is pressed. The SYSTEM READY indicator lights when the gate is fully opened.
	Fuse(s) blown	Check the fuses in the system control panel. Replace the blown fuse(s). If the fuses continue to blow, fix the electrical problem.
	Electrical failure	Trace the circuits and correct the problem.
9. Powder escaping from canopy openings	Cartridge filters clogged, exhaust fan draw insufficient to retain powder within enclosure	If the differential pressure gauge shows more than 6-in. wc, refer to problem 7.
	Cross drafts interfering with exhaust fan draw	Check for cross drafts at all canopy openings. Eliminate or divert drafts.
	Workpieces entering booth are too hot	Cool the workpieces before moving them into the booth. The workpiece temperature should not exceed 49 _C (120 _F).
	Powder spray gun output exceeds booth containment capability	Reduce the powder flow and/or the number of the spray guns.
	Canopy openings too large	Close or decrease the size of the openings.
	Workpieces too large for booth	Contact your Nordson Corporation representative.
	Exhaust fan rotation backward	Reverse the rotation of the motor. Refer to the Reversing Motor Direction procedure in this section.
	Air leaks in ducts, duct extensions, or duct seals	Inspect duct joints, extensions, and seals for air leaks. Repair and seal all leaks.

Reversing Motor Direction

Improperly connecting the exhaust fan motor starter causes it to rotate in the wrong direction. If the exhaust fan is rotating in the wrong direction, air is not drawn through the booth and cyclones and the sprayed powder is not be contained within the canopy. Use the following procedure to check and correct fan rotation.

1. Turn ON power at the main electrical control panel.
2. Start and immediately stop the exhaust fan.
3. While the fan is coasting to a stop, observe the direction of fan rotation. The fan should rotate in the direction indicated by the yellow arrow on the fan drive housing. If the rotation is backward, go to the next step.

WARNING: Even with the disconnect switch in the off position, the terminals at the top of the switch are still live. Do not touch them. Failure to observe this warning could result in serious injury or death.

4. Shut off power at the disconnect switch on the main electrical control panel or afterfilter panel. Open the afterfilter panel door and reverse any two wires (L1, L2, or L3) connected to the live side of the fan motor circuit breaker. Close the panel door.
5. Turn the disconnect switches to the ON position. Start the fan and check the rotation direction.

Section 6
Repair

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

WARNING: Parts specified on the Nordson parts list must be used. Substitution of these parts could create a hazardous situation. These parts include but are not limited to the filters.

Introduction

This section covers basic repair procedures for the Colormax powder coating system afterfilter. Repair procedures for the feed center, powder application equipment, and iControl console can be found in their manuals.

Cartridge Filter Replacement

Use the following procedures to replace the cartridge filters in the afterfilter.

NOTE: Two people are required to replace the cartridge filters. One person removes the cartridge filter mounting hardware. The other person removes the old filters and holds the new filters up against the mounting plate.

Filter Removal

1. Shut down the powder coating system. Refer to Shutdown in the Operation section for instructions. Shut off and lock out system electrical power.
2. **Systems with Explosion Suppression Systems Only**: Disable the explosion suppression system. Refer to your explosion suppression system manual for more information.
3. See Figure 6-1. Open the access doors in the blow-down and cartridge filter sections (1, 2).
4. Pull up on the T-handle on the draw rod (8) to hold the cartridge filter (10) against the mounting plate (7).
5. Remove the nut (3), lock washer (4), flat washer (5), and mounting bracket (6) from the draw rod. Save these parts for reuse.
6. Carefully lower the cartridge filter away from the mounting plate and out of the afterfilter. The centering bracket (9) and draw rod will stay in the cartridge filter.
7. Unscrew the draw rod and remove the draw rod and centering bracket from the old cartridge filter.

Filter Installation

See Figure 6-1.

1. Thoroughly clean the sealing surface on the underside of the mounting plate (7). A dirty surface will prevent the cartridge filter gasket from sealing properly and allow powder to leak into the fan section.
2. Remove the new cartridge filter (10) from its carton and inspect it for damage. Do not use damaged cartridge filters.
3. Set the centering bracket (9) into the open end of the new cartridge filter. Slide the draw rod (8) through the centering bracket and screw the draw rod into the bottom of the cartridge filter.
4. Center the cartridge filter under the opening in the mounting plate. Use the draw rod's T-handle to pull up the cartridge filter against the mounting plate.
5. Install the mounting bracket (6) on the draw rod, making sure that the slots in the mounting bracket slip over the T-handle.
6. Install the flat washer (5), lock washer (4), and nut (3) onto the draw rod. Do not tighten the nut at this time.
7. Slip the ends of the mounting bracket into the locating slots around the filter opening in the mounting plate.
8. Tighten the nut until the mounting and centering brackets are touching. This will compress the filter gasket (11) and seal the cartridge against the mounting plate.

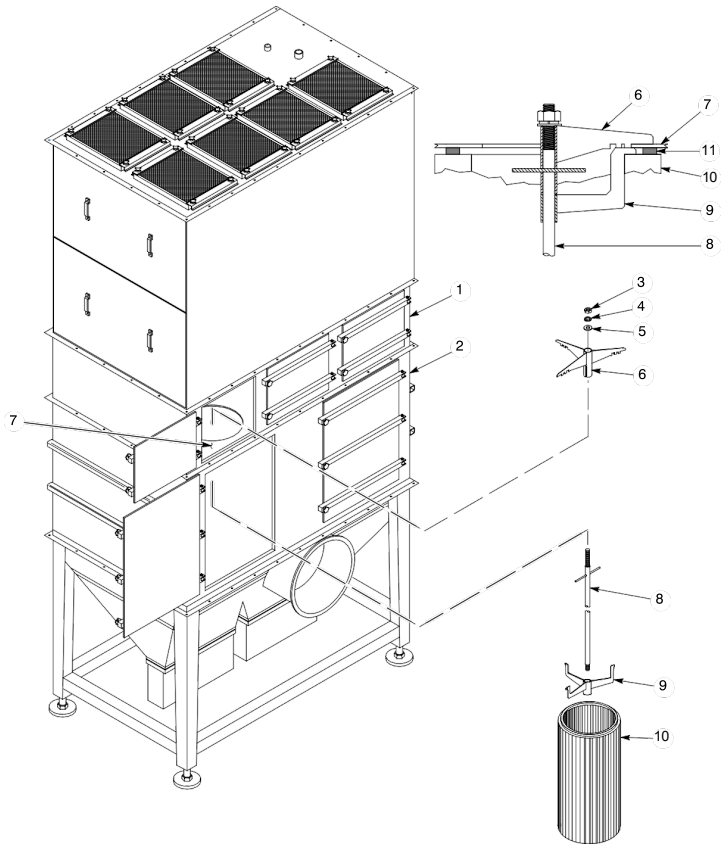


Figure 6-1 Cartridge Filter Replacement

1. Blow-down section
2. Cartridge filter section
3. Hex nut
4. Lock washer
5. Flat washer
6. Mounting bracket
7. Mounting plate
8. Draw rod
9. Centering bracket
10. Cartridge filter
11. Gasket

Seasoning the Cartridge Filters

New cartridge filters must be properly seasoned. If new cartridge filters are not seasoned, their performance and life can be dramatically reduced.

Cartridge filter seasoning is accomplished by introducing virgin powder to the afterfilter through the cyclone inlet duct. Seasoning requires a minimum of 4.5 kg (10 lb) of virgin powder for each cartridge filter in the afterfilter.

For example, the standard 11250 cfm system uses 15 cartridge filters, and therefore requires 67.5 kg (150 lb) of virgin powder for the seasoning procedure.

WARNING: Wear protective clothing, safety goggles, and approved respiratory protection whenever handling powder or performing maintenence or cleaning procedures. Follow the personal protection recommendations included on the Material Safety Data Sheets for each powder used.

1. Press the EXHAUSTER START button and turn the PULSE ON DEMAND switch to the ON-DEMAND position.
2. Measure the initial average air velocity across the booth part openings using a hand-held velometer.
3. Record the cartridge filter and final filter static pressures displayed on the pressure gauges on the system control panel.
4. Disengage the coupling connecting the vacuum conveyor line to the vacuum transfer pan. Open the vacuum transfer pan and the cyclone access doors.
5. Lift the AeroDeck out of its operating position and set it aside. Gradually dump the virgin powder onto the floor in front of the inlet duct opening.
6. Note the cartridge filter static pressure displayed on the pressure gauge. If the pressure is less than 3-in. wc, add more powder until the static pressure reaches 3-in. wc.
7. Close the cyclone access doors and vacuum transfer pan. Connect the vacuum conveyor line coupling to the vacuum transfer pan.
8. Record the average air velocity across the booth part openings using a hand-held velometer.
9. Record the cartridge filter and final filter static pressure displayed on the pressure gauge.

Final Filter Replacement

1. Shut down the powder coating system. Refer to Shutdown in the Operation section for instructions. Shut off and lock out system electrical power.
2. Systems with Explosion Suppression Systems Only: Disable the explosion suppression system. Refer to your explosion suppression system manual for more information.
3. See Figure 6-2. Remove the final filter brackets (2) by removing the clamping knobs (1).
4. Lift the old final filter (3) out of the afterfilter.
5. Inspect the interior of the fan housing (4). If you see large amounts of powder inside of the housing, powder is leaking through the cartridge filters or mounting plate. Fix the leak before starting the system.
6. Remove the new final filter from its carton and inspect it for damage. Do not use damaged final filters.
7. Set the new final filter into the afterfilter.
8. Install the final filter brackets and clamping knobs.
9. Tighten the clamping knobs to compress the final filter evenly on all four side.

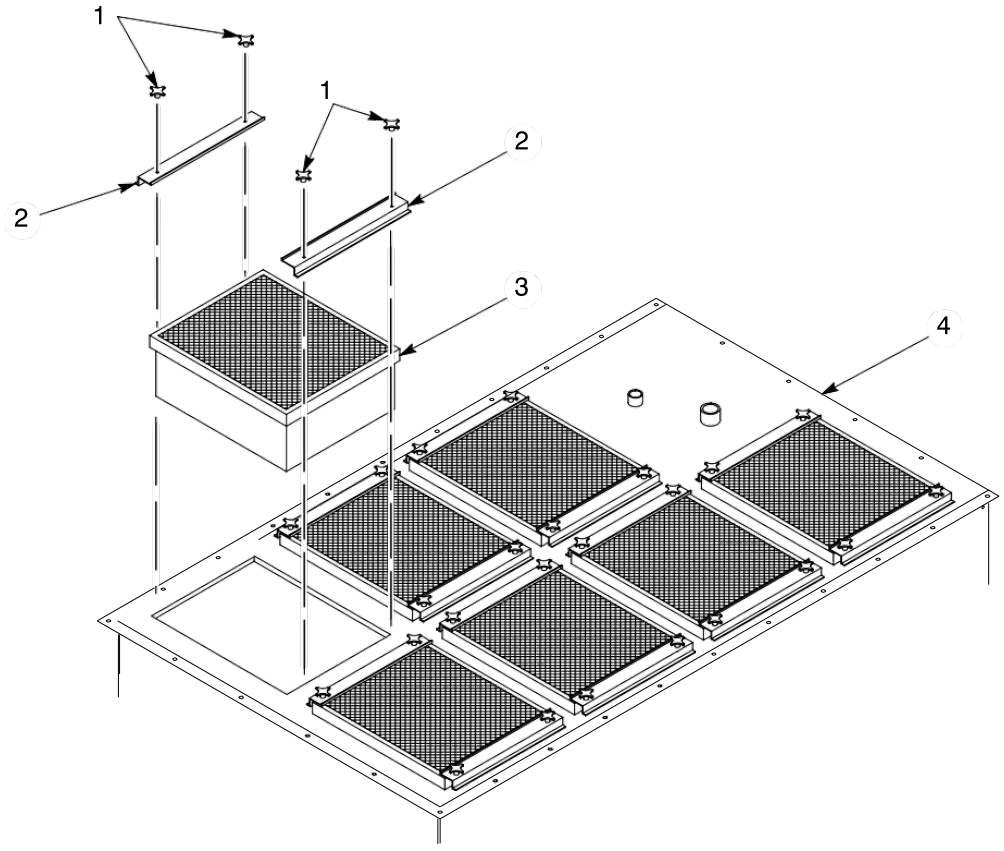


Figure 6-2 Final Filter Replacement

1. Clamping knobs
2. Final filter brackets
3. Final filters
4. Fan housing

Pulse Valve Replacement

Preparation

NOTE: Replace the pulse valves one at a time to avoid confusing which air tubing connects to which pulse valve.

1. Shut down the powder coating system. Refer to Shutdown in the Operation section for instructions.
2. Shut off and lock out system electrical power.
3. **Systems with Explosion Suppression Systems Only**: Disable the explosion suppression system. Refer to your explosion suppression system manual for more information.
4. Open the pulse valve access door.
5. Disconnect the air tubing from the elbow fitting (3) on top of the pulse valve (4).
6. Unscrew the pulse valve from the nipple (2), then unscrew the elbow fitting and nozzle (5) from the pulse valve.
7. Clean the threads of the nipple, elbow fitting, and nozzle. Wrap 2-3 layers of new thread seal tape around the threads.
8. Install the elbow fitting and nozzle onto the new pulse valve.
9. Screw the new pulse valve assembly onto the nipple. Make sure that the pulse valve nozzle points straight down into the cartridge filter.
10. Connect the air tubing to the pulse valve elbow fitting.

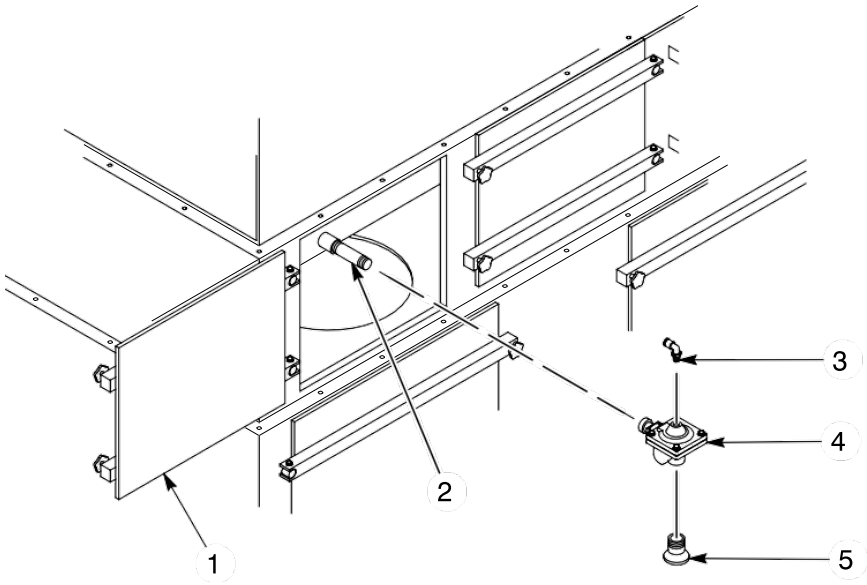


Figure 6-3 Pulse Valve Replacement

1. Access door
2. Nipple
3. Elbow fitting
4. Pulse valve
5. Nozzle

Section 7

Parts

Introduction

To order parts, call the Nordson Industrial Coating Systems Customer Support Center at (800) 433-9319 or your local Nordson representative. Use the illustrations and parts lists to locate and describe parts correctly.

HDLV Cyclone Transfer Pan Kit

Part	Description	Quantity	Note
1617482	KIT, replacement, pan, cyclone, HDLV	1	
- - - - -	• PAN, cyclone, HDLV	1	
1609782	• GASKET, EPDM, flange trim	4	
- - - - -	• HANDLE, grip, transfer pan, ⅞, black	1	
- - - - -	• PIN, coil, medium, 188 x 0.875, steel	2	

Afterfilter Parts

See Figure 7-1.

Part	Part	Description	Quantity	Note
1	------	Bolt, eye, 1.38 ID x 5/8-11 thread x 1.75 in. long	4	
2	156995	Filter, final, 20 x 24 in., internal	See Note	A
3	------	Bracket, filter retaining	14	
4	------	Nut, hex, flanged, serrated, 3/8-16	110	
5	1008635	Fan, assembly, 50 hp	1	
6	1008295	Baffle, plate assembly	1	
7	------	Knob, 3/8-16 through hole	24	
8	244721	Pump, powder, transfer 0.75-in outlet	2	
9	------	Connector, male, 10 mm tube x 1/4 in. NPT	8	
10	1008129	Plate, fluid, base	2	
11	------	Connector, male, elbow, 90_, 10-mm tube x 1/4 in. NPT	4	
12	------	Nut, hex, 5/8-11, UNC 2B	AR	
13	983440	Washer, lock, e, split, 5/8 in., steel, zinc	AR	
14	983090	Washer, flat, e, 0.656 x 1.312 x 0.095 in., zinc plated	AR	
15	174720	Mount, filter, cartridge, Excel	AR	
16	174722	Bracket, filter centering	AR	
17	156996	Filter, 36 in., PowderGrid, center mount	AR	A
18	174723	Rod, filter mount, 36 in., Excel	AR	
19	------	Valve, pilot solenoid, 8	2	B
	176299	Valve, pilot solenoid, 12	2	C
20	174710	Valve, pulse, 1 in. NPT in, 1 in. NPT out	AR	
21	165726	Nozzle, cartridge, pulse	AR	
22	------	Connector, male, elbow, 90_, 6 mm tube x 1/4 in. NPT	4	
23	------	Plug, pipe, 3/8 in. NPTM	2	
24	248105	Manifold, air	2	
25	341848	Valve, fluidizing	4	
26	------	Pad, leveling	4	
NS	1607911	Seal, D-shape, 0.75 x 0.75 in., EDPM, PSA	1	

NOTE: A. Refer to the filters table to determine the correct quantity.

B. Part used for afterfilter CFM 9000 or 11250.

C. Part used for afterfilter CFM 15750.

NS: Not Shown

AR: As Required

Filters

Afterfilter CFM	Cartridge Filter P/N	Quantity Required	Final Filter P/N	Quantity Required
9000	156996	15	156995	7
11250	156996	15	156995	7
15750	156996	21	156995	10

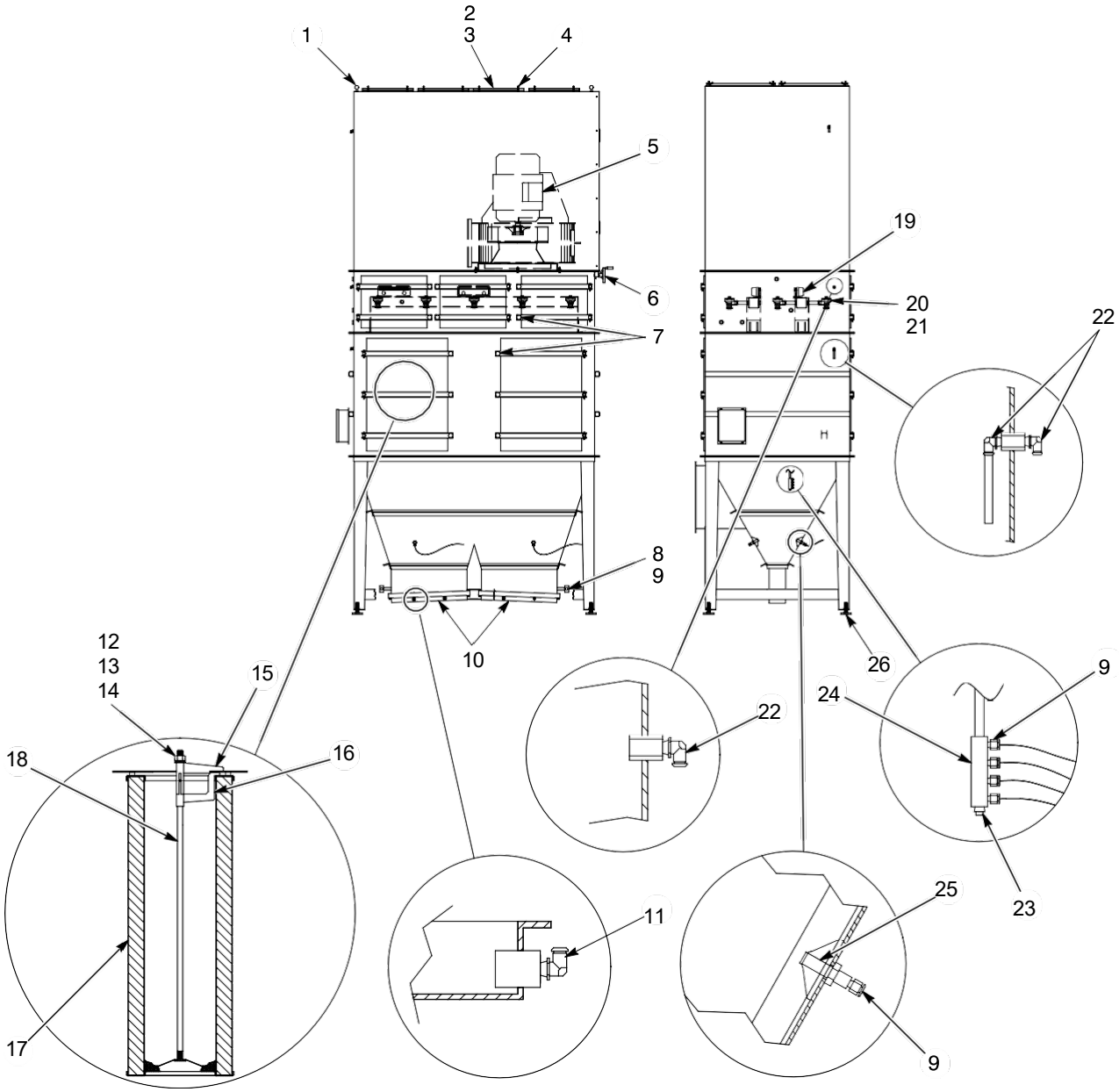


Figure 7-1 Afterfilter Parts

Gun Blow-Off Parts

See Figure 7-2.

NOTE: One gun blow-off kit, part 1602619, is necessary for each spray gun in the system.

Item	Part	Description	Quantity	Note
—	1602619	MANIFOLD ASSEMBLY, nozzle, blow off	1	
1	1602615	• SCREW, pan head, Phillips, M6 x 40 nylon, black	8	
2	1602612	• FITTING, tube, 3/8 in.T x 1/4 in. NPT	4	
3	- - - - -	• TUBE, polyurethane, 3/8 in. OD, black	2	
4	- - - - -	• CLAMP, 1/2 in.	4	
5	- - - - -	• PLUG, pipe, 3/8 in. NPT, nylon	2	
6	1602610	• NOZZLE, blow off gun	4	
7	- - - - -	• MANIFOLD, gun blow off	2	

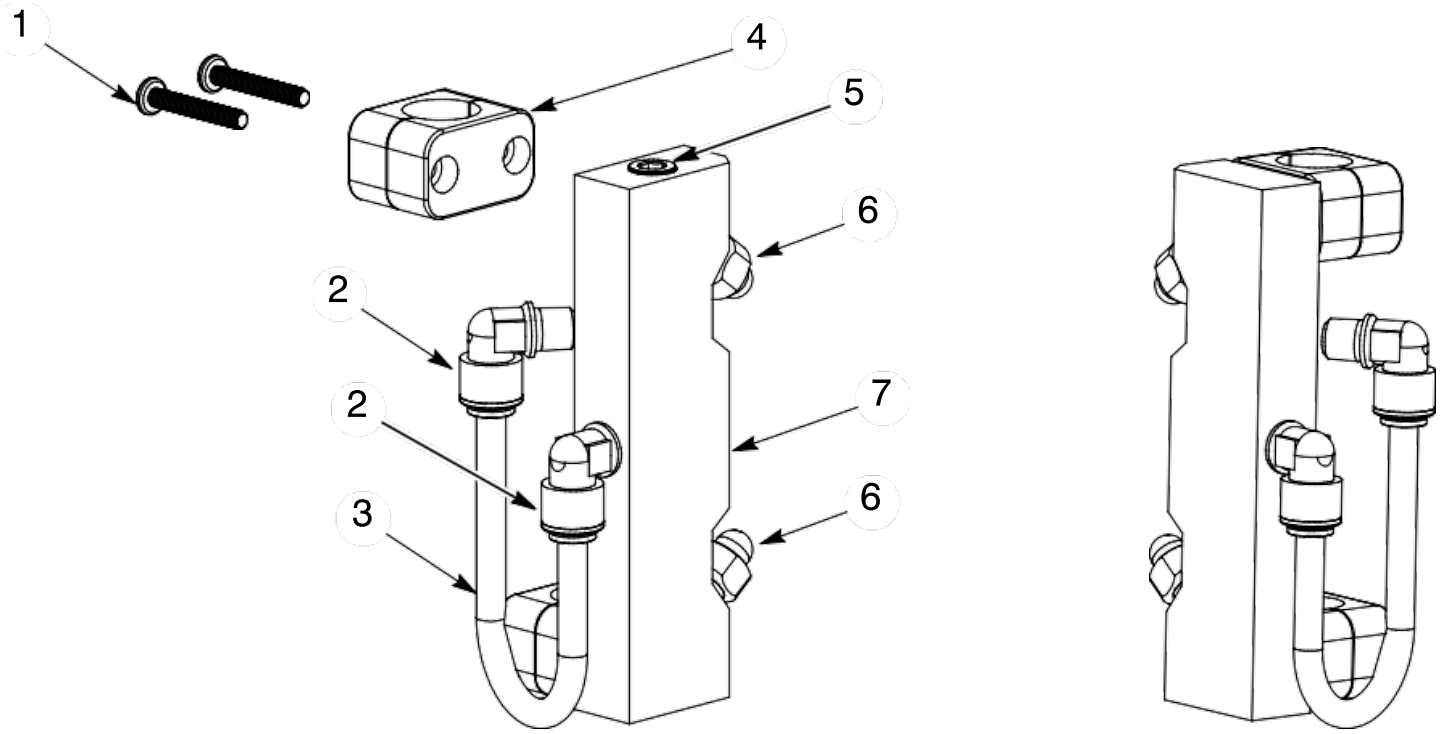


Figure 7-2 Gun Blow Off Manifold Assembly Kit Parts

Miscellaneous Parts

Use the following list to order miscellaneous parts for the system

Part	Description	Note
1018784	Cyclone cleaning media, 50 lb drum	
- - - - -	Gun hose stand, floor mount (4 guns)	
- - - - -	Gun hose stand, roll on/roll off (4 guns)	
- - - - -	Kit, 36 inch, vertical extension, gun stand (adds 2 guns)	

Slidegate Assembly Parts

Seal Kits

See Figure 7-3 for the following parts.

Item	Part	Description	Note
1	1606547	KIT, seal, 16-in slidegate, ColorMax	A
	1606548	KIT, seal, 20-in slidegate, ColorMax	
	1606549	KIT, seal, 24-in slidegate, ColorMax	
	1606550	KIT, seal, 28-in slidegate, ColorMax	
	1606551	KIT, seal, 32-in slidegate, ColorMax	

NOTE: A. This part is used on the new slidegate only. The new slidegate is identified by a yellow schematic label inside the slidegate junction box.

Air Cylinders

See Figure 7-3 for the following parts.

Item	Part	Description	Note
2	1606434	CYLINDER, air, 16-in stroke, slidegate, ColorMax	A
	1606435	CYLINDER, air, 20-in stroke, slidegate, ColorMax	
	1606436	CYLINDER, air, 24-in stroke, slidegate, ColorMax	
	1606437	CYLINDER, air, 28-in stroke, slidegate, ColorMax	
	1606438	CYLINDER, air, 32-in stroke, slidegate, ColorMax	

NOTE: A. This part is used on the new slidegate only. The new slidegate is identified by a yellow schematic label inside the slidegate junction box.

Common Parts

See Figure 7-3 for the following parts.

Item	Part	Description	Note
3	1606445	SWITCH, reed, triac, 110-120 Vac, w/ indicator	A
4	1606447	VALVE, solenoid, ⅜ NPTF ports, 120-V coil	
5	1606697	PIN, clevis, w/ cotter, .5 x 1.5, STL, zinc	

NOTE: A. This part is used on the new slidegate only. The new slidegate is identified by a yellow schematic label inside the slidegate junction box.

Previous Generation Slidegate

Reed Switch

Part	Part	Description	Note
NS	1606771	SWITCH, reed, triac, 110-120 Vac, w/ indicator	A

NOTE:

B. This part was used on the previous generation slidegate only. To differentiate the two, the new slidegate is identified by a yellow schematic label inside the slidegate junction box.

NS: Not Shown

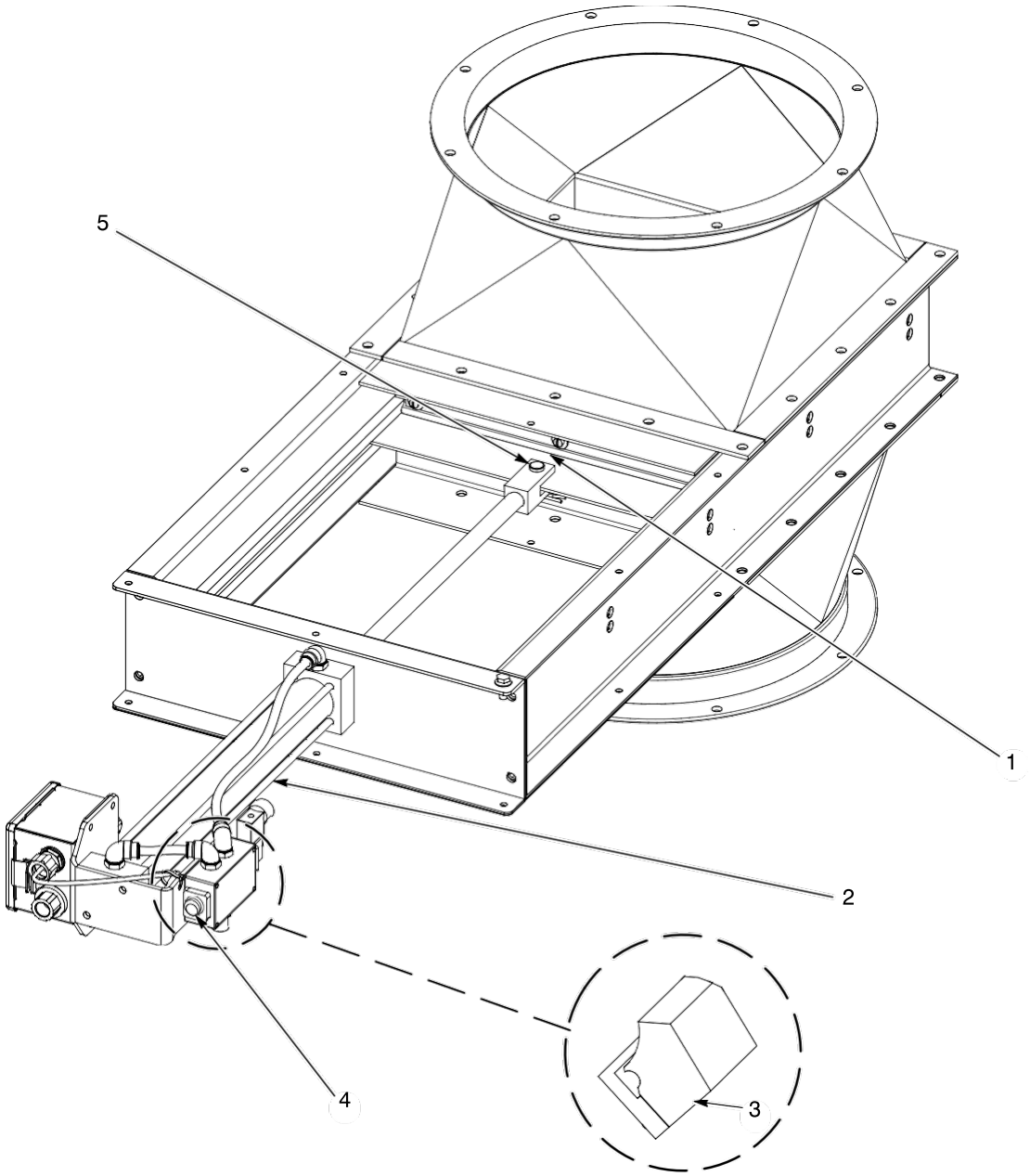


Figure 7-3 Slidegate Assembly

Section 8

System Diagram

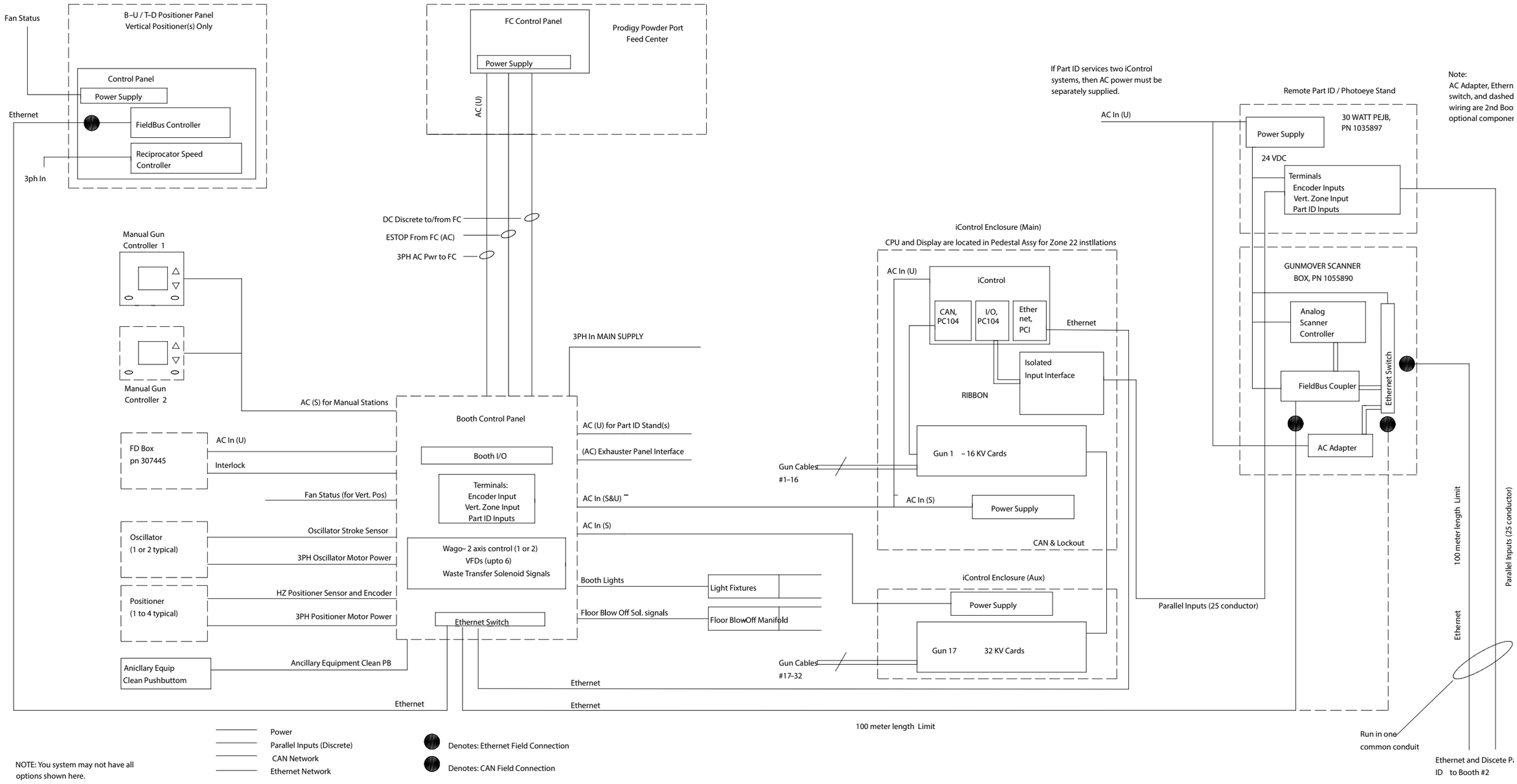


Figure 1 System Layout, ColorMax with Encore Feed Center