Airflow Management System

Part 108 820A

NORDSON CORPORATION ● AMHERST, OHIO ● USA

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

Address all correspondence to

Nordson Corporation
555 Jackson Street
Amherst, OH 44001

Notice

Trademarks

Table of Contents

Airflow Management System

1. Safety

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.

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.

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.

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.

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

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.

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.

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.

***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.

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

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.

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.

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 standard ohmmeter. Resistance to ground must not exceed one megohm. If arcing occurs, shut down the system immediately.

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.

Disposal

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

2. Description

The Nordson Airflow Management System (AMS) controls the fan speed and delivers constant airflow in the Excel 2000 and Horizon 400 powder recovery systems. The AMS is available in automatic and manual versions.

Manual AMS

See Figure 1. Under manual AMS, the potentiometer is adjusted to achieve the desired face velocity. The frequency drive controls the fan motor and speed.

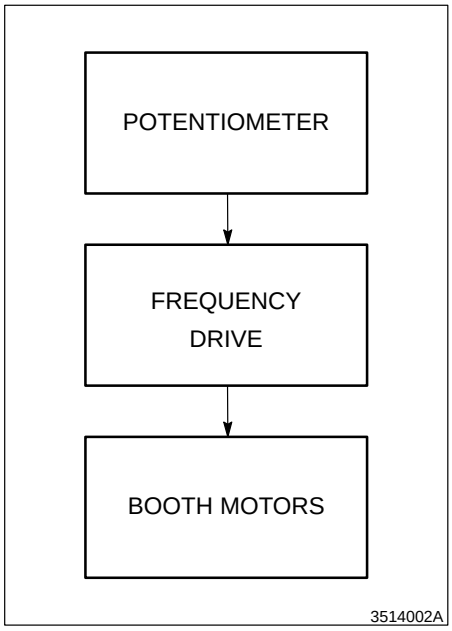

Fig. 1 Manual AMS block diagram

Automatic AMS

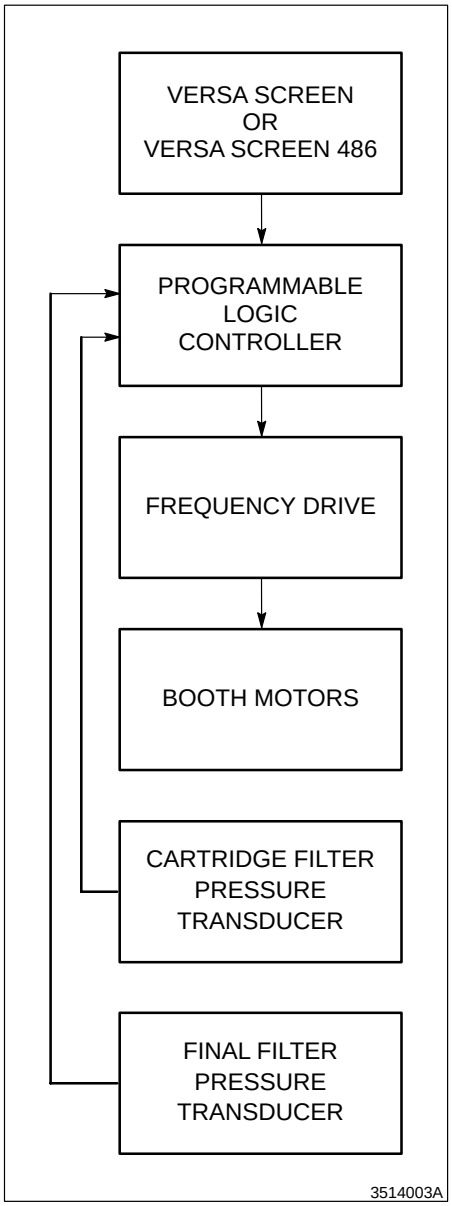

Fig. 2 Automatic AMS block diagram

See Figure 2. Under automatic AMS, the airflow is set at the Versa Screen terminal or a Versa Screen 486 computer. The programmable logic controller (PLC) sends a signal to the frequency drive. The frequency drive adjusts the fan speed to maintain constant airflow as the differential pressure across the cartridge and final filters changes. Pressure transducers sense the pressure at the cartridge and final filters and feed the data back to the PLC.

Pulse-On-Demand

The AMS offers pulse-on-demand as an optional standalone product that you can install separately with the manual systems. The pulse-on-demand option activates the cartridge sequential pulsing circuit when the system exceeds a set pressure differential across the cartridge filters. Cartridge pulsing cleans and extends the life of cartridges. Pulse-on-demand is standard equipment on the Automatic AMS.

3. Installation

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

The parts supplied with the AMS depend on your system and its configuration. Each installation includes three application-specific drawings:

- system electrical connection diagram
- pneumatic schematic
- system electrical schematic diagrams

Manual and Automatic AMS Control

Contact your Nordson controls engineer for hardware and software installation procedures.

Pulse-On-Demand Standalone System

Use these procedures to install the pulse-on-demand option on an Excel 2000 or Horizon 400 system.

Excel 2000 System

1. Refer to the pneumatic schematic. Install the cartridge filter differential pressure switch
   - inside the blowdown timer box,
   - with the cartridge filter differential pressure switch diaphragm in a vertical position.
2. Install a bulkhead fitting in the blowdown timer box.
3. Install a sintered-bronze vent in the blowdown timer box.
4. Install a pneumatic fitting on the cartridge filter differential pressure switch low pressure port.
5. Connect an air line between these parts:
   - cartridge filter differential pressure switch low pressure port fitting
   - bulkhead fitting inside the blowdown timer box
6. Install a tee fitting into the air line between the Magnehelic gage on the fan module support and the fan module pneumatic fitting.

Excel 2000 System (contd.)

7. Connect an air line between these parts:
   - remaining tee fitting port, see step 6
   - the bulkhead fitting outside of the blowdown box
8. Refer to the system electrical connection diagram. Remove the metal jumper from the pressure switch terminals on the blowdown timer board.
9. Connect two wires from the pressure switch terminal of the blowdown timer to these terminals on the cartridge filter differential pressure switch:
   - common
   - norm open

NOTE: Adjust the cartridge pressure differential switch when you operate the system for the first time. Refer to *Operation, Standalone Pulse-On-Demand* in this manual.

Horizon 400 System

1. Refer to the pneumatic schematic. Install the cartridge filter differential pressure switch
   - inside the motor starter panel
   - with the cartridge filter differential pressure switch diaphragm in a vertical position
2. Install a tee fitting in the air line that connects the collector filter gauge to the collector filter bulkhead fitting.
3. Install a pneumatic fitting on the cartridge filter differential pressure switch low pressure port.
4. Refer to the system electrical connection diagram. Remove the metal jumper from the pressure switch terminals on the blowdown timer board.
5. Connect two wires from the pressure switch terminals of the blowdown timer to these terminals on the cartridge filter differential pressure switch:
   - common
   - norm open

NOTE: Adjust the cartridge pressure differential switch when you operate the system for the first time. Refer to *Operation, Standalone Pulse-On-Demand* in this manual.

4. Operation

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

Versa Screen Systems

See Figure 3. Use the Versa Screen operator interface to operate the AMS in the automatic mode.

NOTE: Your screens may be slightly different from those illustrated in this section depending on the software version you have or the combination of features in your system.

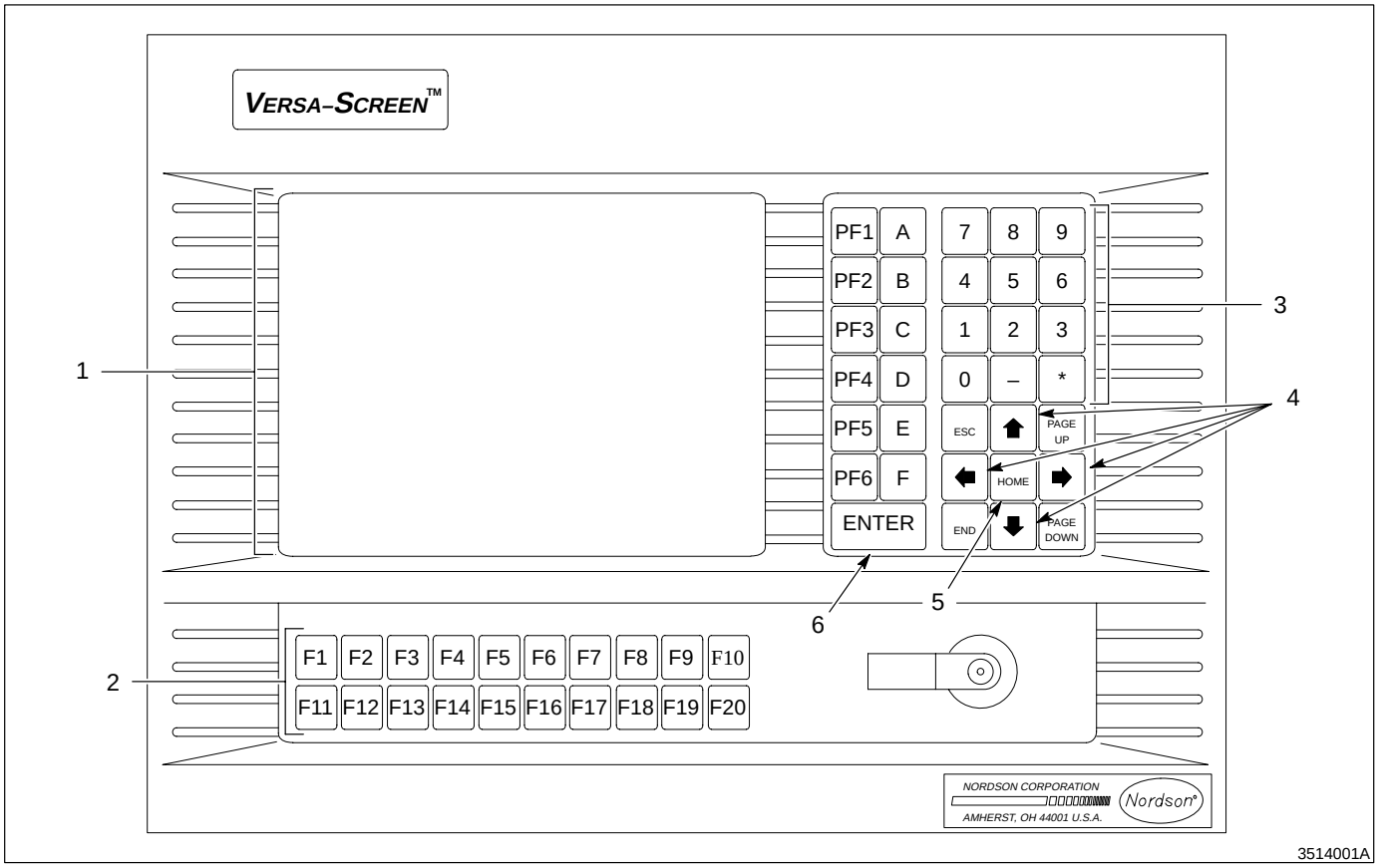

Fig. 3 Versa Screen operator interface

1. Display
2. Function keys
3. Numeric keys
4. Arrow keys
5. Home key
6. Enter key

Setting Up Automatic AMS Control

1. Make sure the system is in the automatic control mode.
2. See Figure 4. Select the BOOTH CONTRL function for booth 1 or booth 2:
   - Press F3 to access the Booth status screen for booth #1.
   - Press F6 to access the Booth status screen for booth #2.

   NOTE: The function key assignments may change with each system.

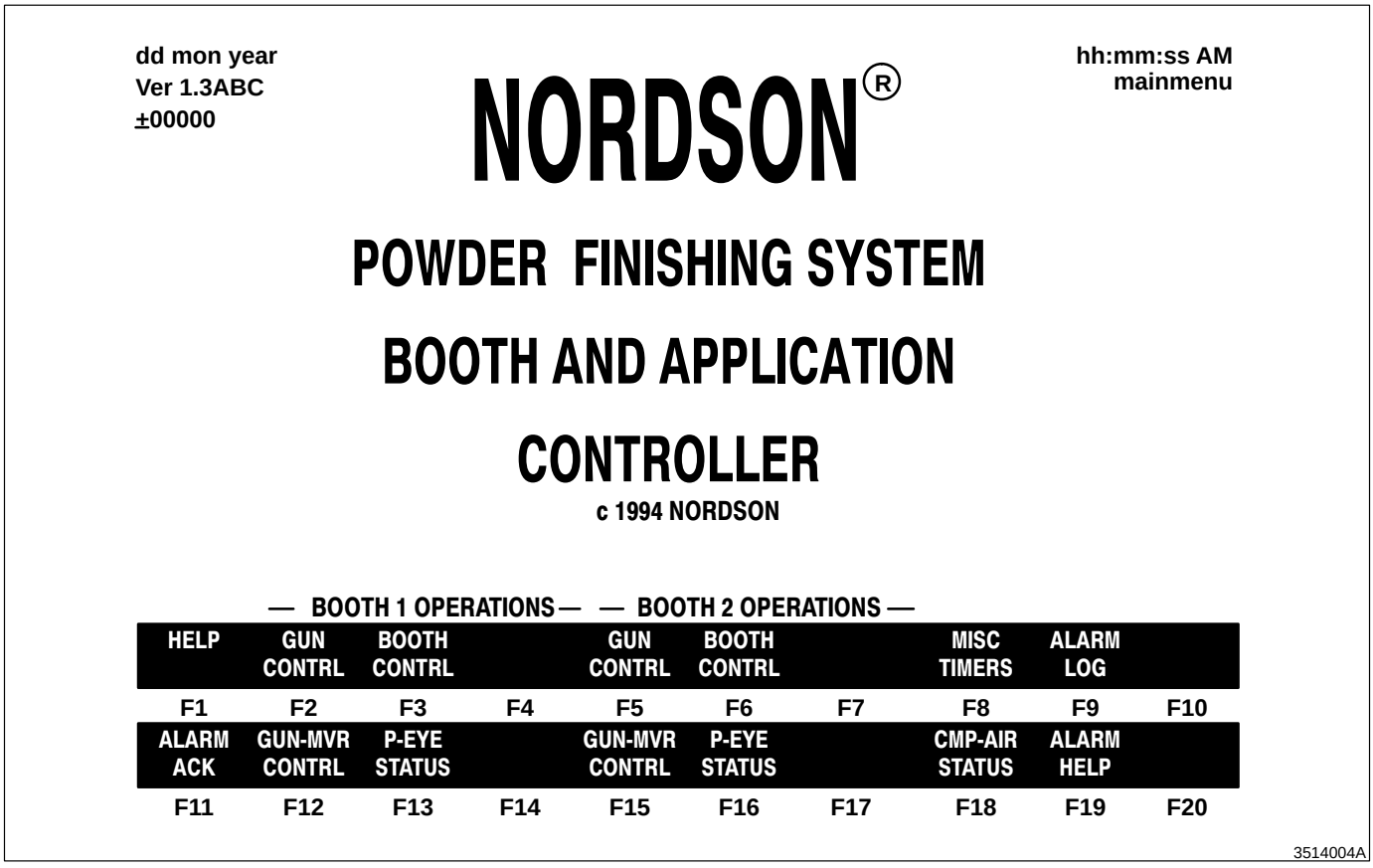

Fig. 4 Versa Screen Main screen

Setting Up Automatic AMS Control *(contd.)*

3. See Figure 5. Press F3 to select MANUAL MOTORS and access the Motor Control screen.

4. See Figure 6. Press the home key until the cursor is at the AIR FLOW CONTROL SETPOINT prompt (1).

   NOTE: The airflow setpoint can range from 1 to 10.

5. Using the numeric keys, enter 5 as a starting point. Press ENTER.

6. Change the AIR FLO MODE to automatic. Press F8 until the AIR FLOW SELECTED MODE (2) toggles to AUTOMATIC AIR FLOW.

7. Press F3 to select EXHSTR START and turn on the motor and fan.

   NOTE: Allow the system to stabilize for 30 seconds after you turn on the fan.

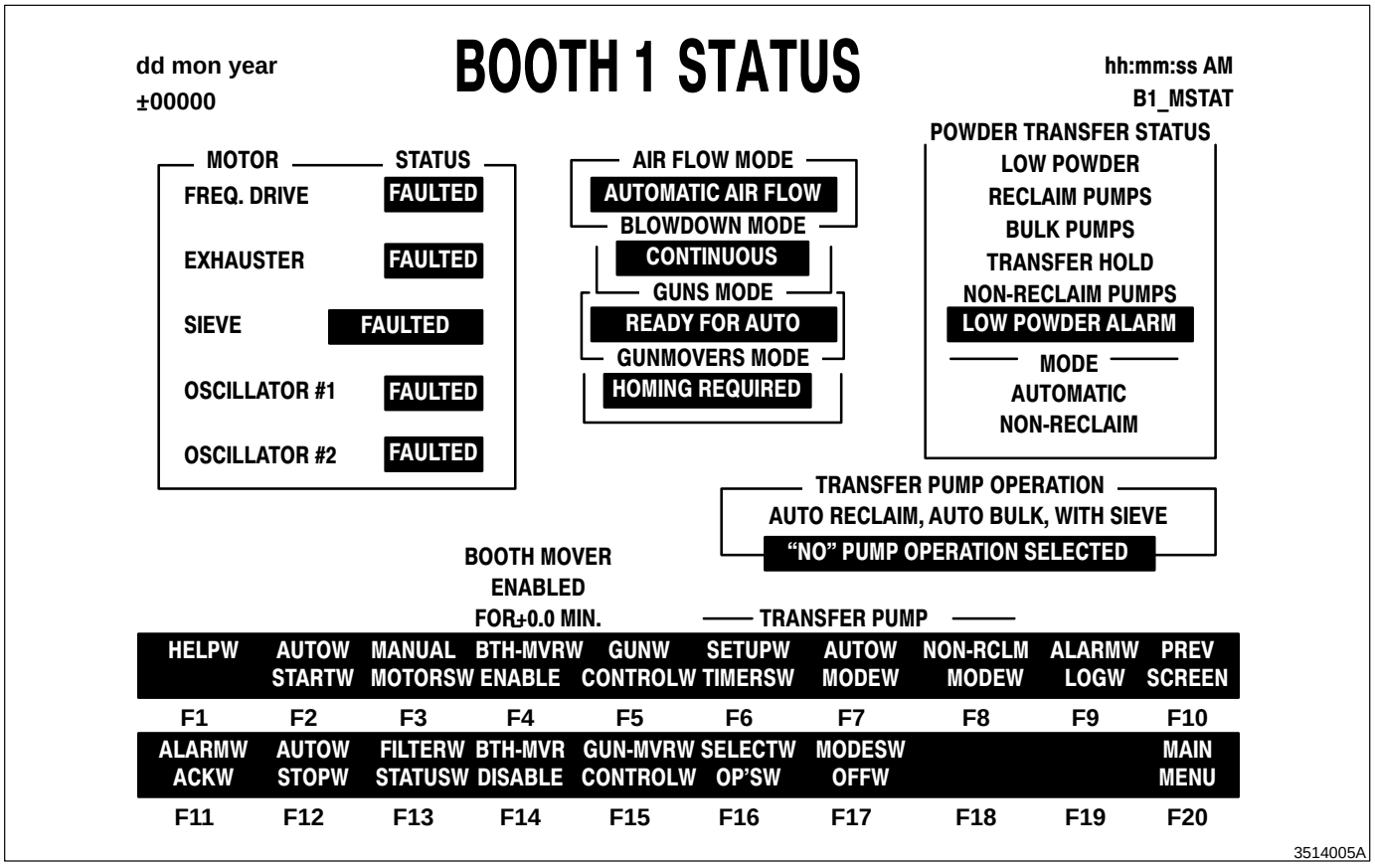

Fig. 5 Versa Screen Booth Status screen

Setting Up Automatic AMS Control (contd.)

8. Measure the booth vestibule face velocity with a Nordson velometer, or an equivalent instrument. Make sure the face velocity is 30.5–36.6 m/min (100–120 ft/min). If the velocity is too
   - high — reduce the airflow setpoint one number at a time
   - low — increase the airflow setpoint one number at a time
9. Evaluate the powder spray pattern and powder containment. Refer to *Evaluating the Powder Spray Pattern* in this manual.
10. Press F20 to select MAIN MENU and return to the main screen.

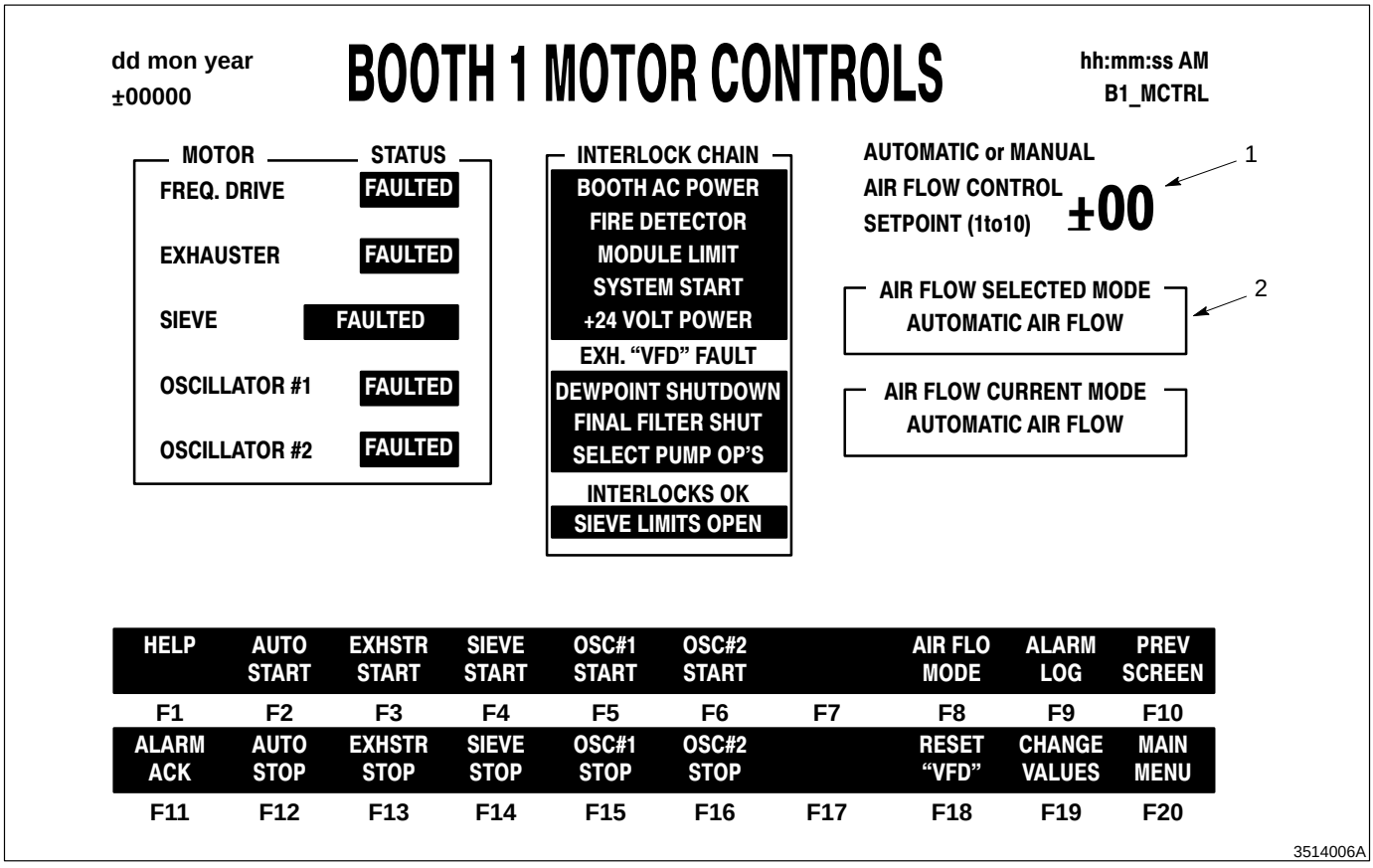

Fig. 6 Versa Screen Motor Status screen

1. AIR FLOW CONTROL SETPOINT prompt
2. AIR FLOW SELECTED MODE indicator

Automatic Pulse-On-Demand

To operate the pulse-on-demand feature, set the upper and lower pressure limits to define when cartridges begin to pulse. Make sure the PULSING MODE is ON DEMAND.

1. From the Booth Status screen, press F13 to select FILTER STATUS.

2. See Figure 7. Press F19 to select CHANGE VALUES and highlight the START POINT cursor.

   a. Using the numeric keys, enter 6 as a starting point.

   b. Press ENTER.

3. Press F19 to select CHANGE VALUES and highlight the STOP SETPOINT cursor.

   a. Using the numeric keys, enter 4 as a starting point.

   b. Press ENTER.

   NOTE: The values (in. wc) are recommended by Nordson for the upper and lower pressure limits. During production, evaluate coating characteristics and change these limits as necessary to obtain the desired results.

4. Select the PULSE MODE. Press F7 until ON DEMAND appears for the PULSING MODE.

5. Press F20 to select MAIN MENU and return to the main screen.

***Automatic Pulse-On-Demand** (contd.)*

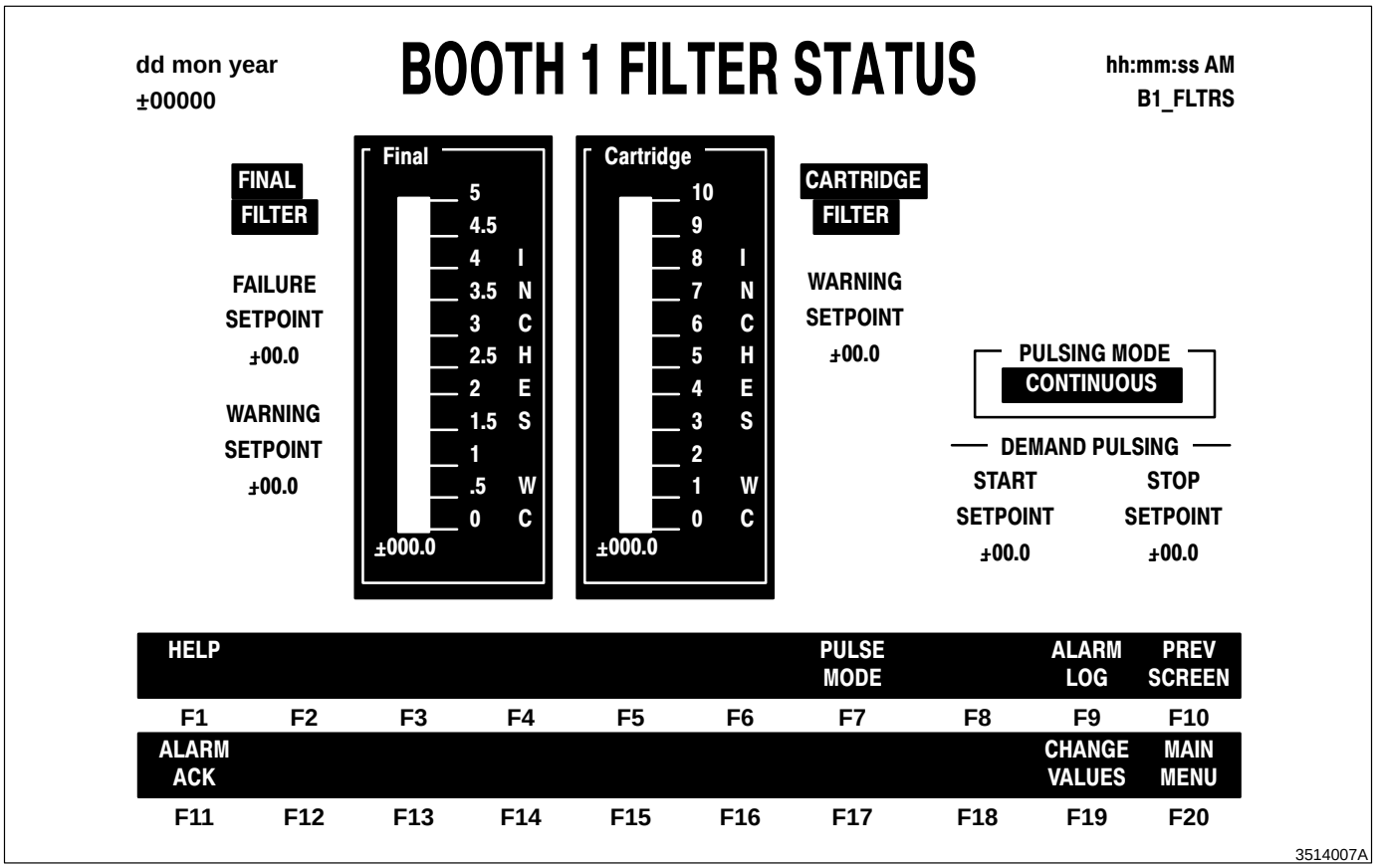

Fig. 7 Versa Screen Filter Status screen

Cleanup

Set the Airflow mode to CLEANUP:

1. See Figure 4. Select BOOTH CONTRL:
   - Press F3 to access the Booth Status screen for booth #1.
   - Press F6 to access the Booth Status screen for booth #2.
2. See Figure 5. Press F3 to select MANUAL MOTORS and access the Motor Control screen.
3. See Figure 6. Change the AIR FLO MODE. Press F8 until the AIR FLOW SELECTED MODE (2) toggles to CLEAN UP.

NOTE: The fan speed increases to its maximum speed. The high face velocity and airflow into the color module maximize powder containment.

4. After cleanup, return the fan speed to AUTOMATIC AIR FLOW:
   a. Change the AIR FLO MODE. Press F8 until the AIR FLOW SELECTED MODE (2) toggles to AUTOMATIC AIR FLOW.
   b. Press F20 to select MAIN MENU and return to the main screen.

Shutdown

1. See Figure 4. From the Main screen, press the BOOTH CONTRL key on the display to access the Booth Status screen.
2. See Figure 5. Press F13 to select EXHSTR STOP and turn off the motor and fan.
3. Press F20 to select MAIN MENU and return to the main screen.

Smart Coat Systems

The Smart Coat system uses a Versa Screen 486 personal computer and pointing device (mouse) for operator input.

NOTE: Your screens may be slightly different from those illustrated in this section depending on the software version you have or the combination of features in your system.

Setting Up Automatic AMS Control

Access the Motor Control Center screen:

1. From the Versa Screen 486 computer screen, select either the BOOTH 1 or BOOTH 2 icon on the upper menu bar.
2. Select Motors. See Figure 8. The Motor Control Center screen appears.

Setting Up Automatic AMS Control (contd.)

3. As a starting point, enter a preset value of 5. Use the mouse to move the slide or press # and enter a numeric value.

4. Change the operating mode to automatic. Toggle MODE under Select Mode until Automatic appears.

5. Select START to start the motor and fan. All motors will start.

   NOTE: Allow the system to stabilize for 30 seconds after you turn on the fan.

6. Measure the booth vestibule face velocity with a Nordson velometer, or an equivalent instrument. Make sure the face velocity is 30.5–36.6 m/min (100–120 ft/min). If the velocity is too

   - high — reduce the airflow preset one number at a time
   - low — increase the airflow preset one number at a time

7. Evaluate the powder spray pattern and powder containment. Refer to *Evaluating the Powder Spray Pattern* in this manual.

8. Return to the Main screen. Select Menu from the upper menu bar.

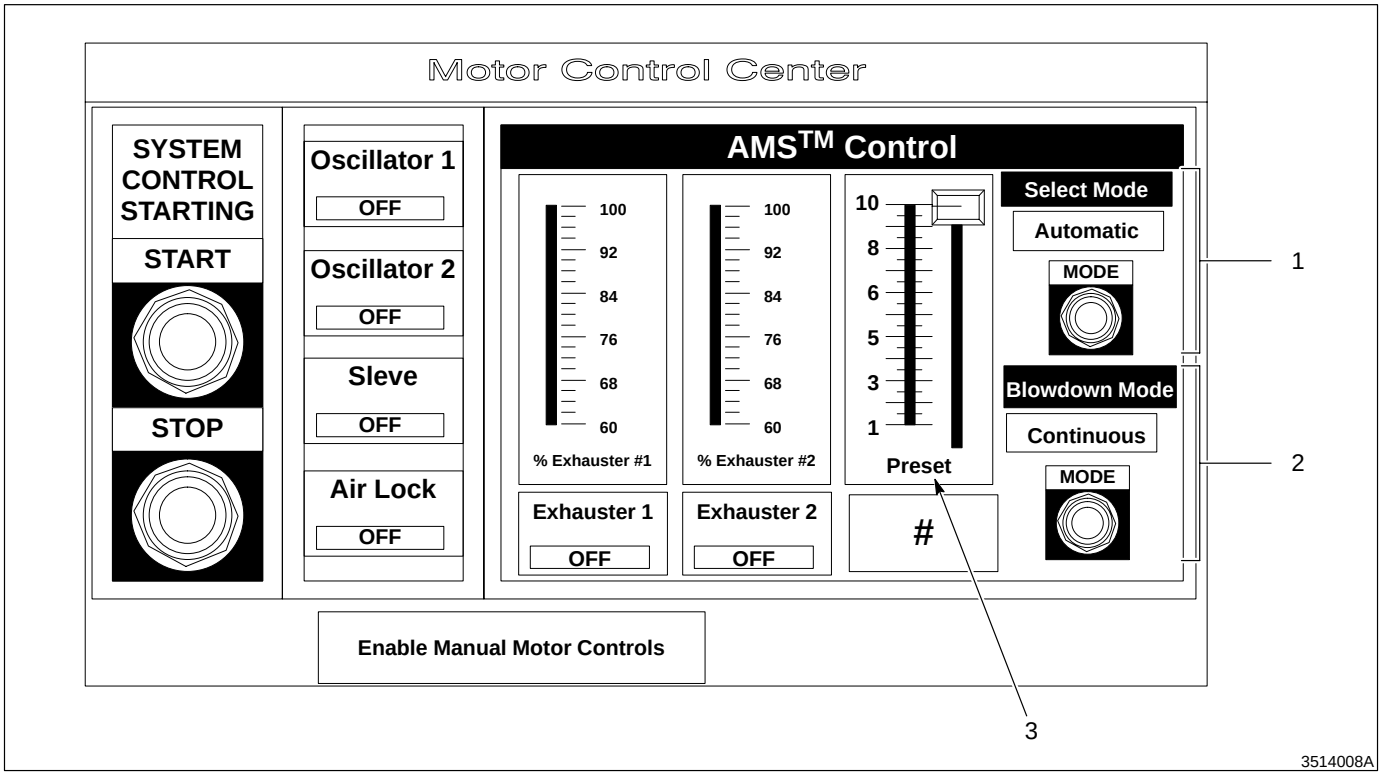

Fig. 8 Smart Coat Motor Control Center screen

1. Select Mode
2. Blowdown Mode
3. Preset

Automatic Pulse-On-Demand

1. Access the Powder Booth Operation screen:

   a. From the Versa Screen 486 computer Main screen, select Booth Status from the upper menu bar.

   b. Select Adjust Setpoints from the Filter Status section.

   c. See Figure 9. The Filter Setpoint Adjustments inset screen appears.

2. Use the left and right arrow icons to set the Cartridge Blowdown Start SP and the Cartridge Blowdown Stop SP. The values recommended by Nordson are:

   - Cartridge Blowdown Start SP 6.0 in.-wc
   - Cartridge Blowdown Stop SP 4.0 in.-wc

3. Select Done.

   NOTE: During production, evaluate coating characteristics and change these limits as necessary to obtain the desired results.

4. Set the Blowdown Mode to On-Demand. Access the Motor Control Center screen:

   a. From the Versa Screen 486 computer Main screen, select Motors from the upper menu bar to

   b. See Figure 8. Toggle Mode in the Blowdown Mode section until On-Demand appears.

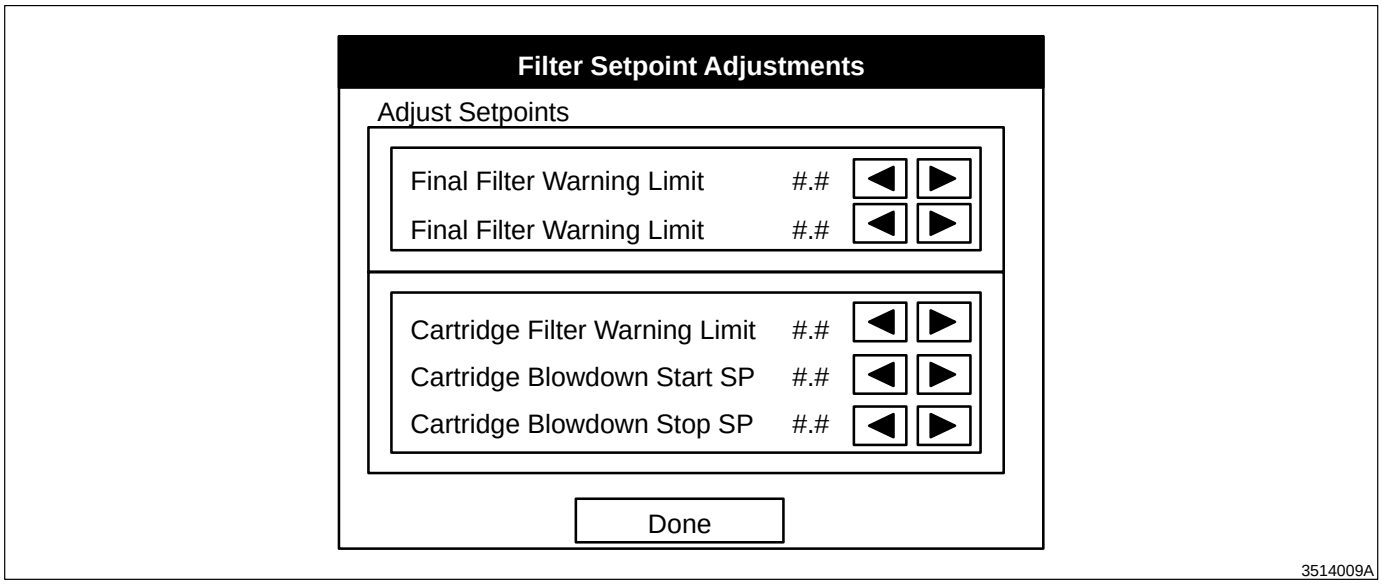

Fig. 9 Smart Coat Filter Setpoint Adjustments screen

Cleanup

1. See Figure 8. From the Motor Control Center screen, toggle Mode under the Select Mode section until Clean Up appears.

   NOTE: The fan speed increases to its maximum speed. The high face velocity and airflow into the color module maximize powder containment.

2. After cleanup, return the fan speed to AUTOMATIC AIR FLOW:

3. Toggle Mode until Automatic appears.

Shutdown

1. Access the Motor Control Center screen.

2. Select STOP.

3. Select Menu from the upper menu bar to return to the Main screen.

Manual AMS Control

See Figure 10.

1. Set the EXHAUSTER SPEED potentiometer (1) to the minimum speed (fully counterclockwise).

2. Press EXHAUSTER START (2) to start the fan motor. Allow the system to stabilize for 30 seconds after you turn on the fan.

3. Measure the booth vestibule face velocity with a Nordson velometer, or an equivalent instrument. If the velocity is not 30.5–36.6 m/min (100–120 ft/min), perform the following:

   a. Use the EXHAUSTER SPEED potentiometer (1) to increase or decrease velocity.

   b. Allow the system to stabilizes for 30 seconds, then measure the face velocity again.

4. Evaluate the powder spray pattern and powder containment. Refer to *Evaluating the Powder Spray Pattern* in this manual.

Manual AMS Control *(contd.)*

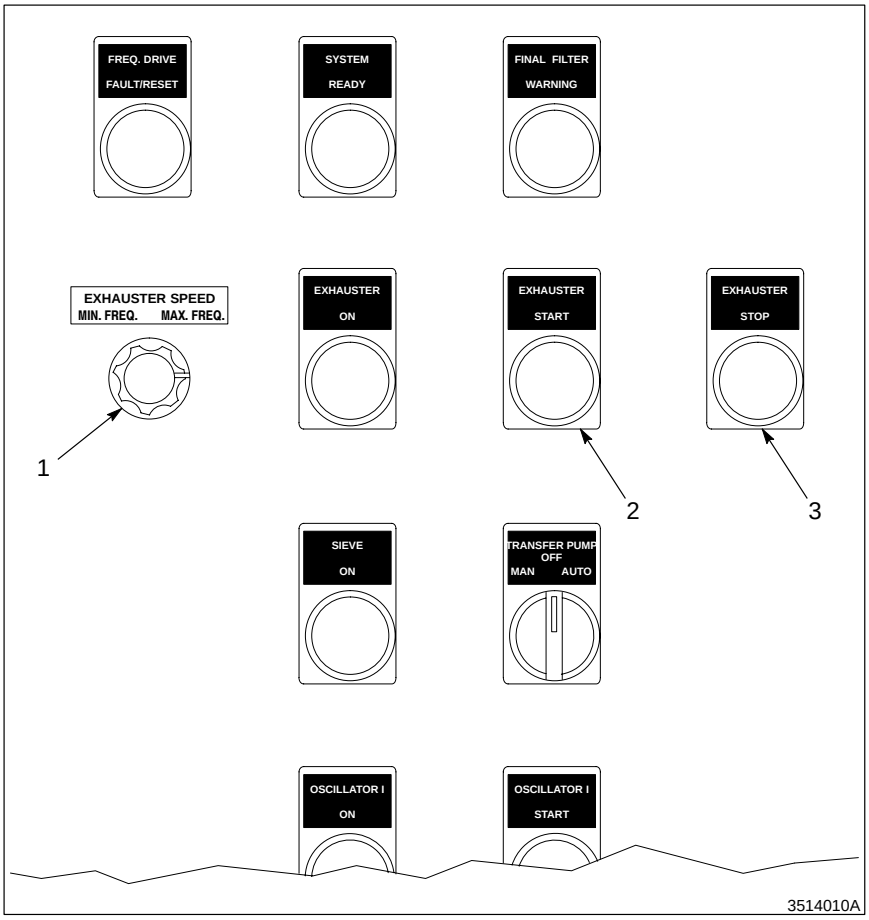

Fig. 10 Control panel for Manual AMS Control

1. EXHAUSTER SPEED, potentiometer
2. EXHAUSTER START button
3. EXHAUSTER STOP button

Cleanup

1. See Figure 10. Increase the fan speed to its maximum by turning the EXHAUSTER SPEED potentiometer (1) fully clockwise.

   NOTE: High face velocity and airflow into the color module maximize powder containment.

2. After cleanup, return the potentiometer to its original setting.

Shutdown

See Figure 10. Press EXHAUSTER STOP (3).

Evaluating the Powder Spray Pattern

1. Hang the parts you that want to spray on the conveyor. Run the parts through the booth while the guns are spraying.

2. If the powder spray pattern pulls away from the guns, the airflow may be set too high. Before reducing the airflow, check the powder containment at each opening. If the

   - powder containment is adequate, reduce the airflow value one number at a time to achieve the proper powder spray

   - powder escapes the booth at any opening, increase the airflow value one number at a time to achieve the proper powder containment

3. Measure the booth vestibule face velocity with a velometer. Note the face velocity for future reference.

   NOTE: As powder collects in the cartridges, the airflow decreases. As the cartridges pulse, the airflow increases. Measure the face velocity periodically during production and adjust the fan speed as necessary.

Standalone Pulse-On-Demand

See Figure 11. For a standalone pulse-on-demand system, adjust the pressure limit on the cartridge filter differential pressure switch when the cartridges reach the desired upper pressure limit for the first time.

NOTE: You cannot make this adjustment until the cartridge fills with enough powder to reach the desired upper pressure limit.

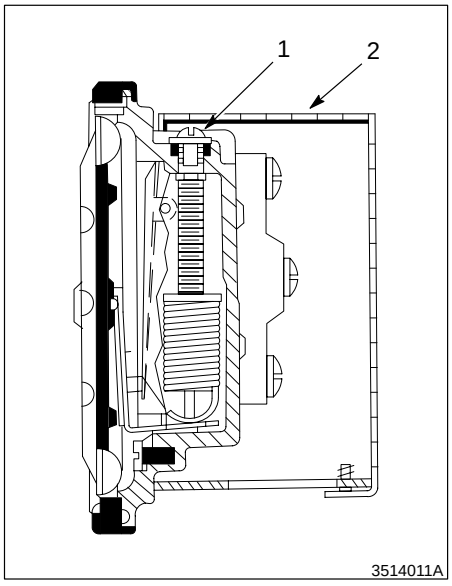

Fig. 11 Filter differential pressure switch

1. Pressure limit adjustment screw
2. Cover

1. Remove the cover (2) to expose the pressure limit adjustment screw (1).

2. Allow the cartridge filter pressure to rise to the desired upper pressure limit. If pulsing starts prior to achieving the limit, turn the pressure limit adjustment screw (1) clockwise until the pulsing stops. Repeat until desired pressure limit is achieved.

3. When the system reaches the desired upper pressure limit, turn the pressure limit adjustment screw (1) counter clockwise until the cartridges begin to pulse.

4. Replace the cover (2).

   NOTE: The pulsing will stop approximately 0.5 in.-wc below the upper pressure set point.

5. Maintenance

The following paragraphs provide maintenance instructions for the AMS.

Daily

Check the face velocity with a velometer at all booth openings. The velocity must be sufficient to contain powder and provide the desired spray pattern.

Weekly

CAUTION: Failed or damaged cartridges will affect AMS performance. Contact Nordson Customer Service, Powder Business Group before you attempt to zero or recalibrate the transducers.

Check the pressure readings from the cartridge and final filter pressure transducers.

- When the fan is off, the pressure readings should be at zero. If they are not, the transducers may need zeroing, recalibrating, or replacing.
- If the pressure readings are near zero when the fan is running, the transducers may need zeroing, recalibrating, or replacing.

Inspect the cartridge and final filters according to the instructions given in either the Excel or Horizon system manuals.

6. Troubleshooting

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

Introduction

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

Automatic Airflow Control

Manual Airflow Control

Standalone Pulse-On-Demand

Troubleshooting the Automatic AMS Control

Problem	Possible Cause	Corrective Action
1. Fan operates at maximum speed	Airflow mode set at cleanup	Set the airflow mode to automatic operation. Refer to the *Operation* section.
	Pressure transducer readings higher than actual setpoint	Replace the overloaded or damaged cartridges. Refer to the Excel or Horizon system manual.
	Electrical or pneumatic connections to transducers are loose or worn.	Inspect and tighten the connections. Refer to the *Installation* section.
	Transducers are out of calibration.	Adjust the zero setpoint or replace the transducers. Refer to the *Repair* section.
	PLC program fault	Contact your Nordson Corporation service representative.
2. Constant airflow not maintained	Airflow mode in manual	Set the airflow mode to automatic operation. Refer to the *Operation* section.
	Cartridges overloaded	Pulse cartridges more frequently by lowering the lower pressure limit. Refer to the *Operation* section. Increase the cartridge pulse pressure. Refer to the *Operation* section. Replace the cartridges or the final filter. Refer to the Excel or Horizon system manual.
	PLC program fault	Contact your Nordson Corporation service representative.

Troubleshooting the Automatic AMS Control (contd.)

Problem	Possible Cause	Corrective Action
3. Fan speed oscillates	Transducer output oscillates	Check the electrical and pneumatic connections between the transducers and the PLC. Repair the loose connections. Refer to the *Installation* section. Contact your Nordson Corporation service representative.
	Frequency drive input or output oscillates	Check the electrical connections between the frequency drive and the PLC. Repair the loose connections. Refer to the *Installation* section. Check the frequency drive to make sure the overload current protection is activated. If the overload current protection is activated, determine and correct the cause of the high current. Refer to the frequency drive manual.
4. Pulse cycling not turning on and off at set pressures	Set pressure limits invalid	Check the pressure limit settings on the Filter Status screen and adjust them if necessary. Refer to the *Operation* section.
	Transducers producing wrong pressure readings	Transducers are out of calibration. Adjust the zero setpoint or replace the transducers. Refer to the *Repair* section.
5. Fan Not Operating	System locked	Unlock the system. Refer to the Excel or Horizon system manual.
	Electrical connections between frequency drive, potentiometer, and fan motor incorrect or shorted.	Check the electrical conditions and correct them if necessary. Refer to the *Installation* section.
	Fuse failure	Replace the fuse.
	Interlock open	Check system interlocks on status screens. System ready light should be on.

Troubleshooting the Manual AMS Control

Problem	Possible Cause	Corrective Action
1. Fan operates at maximum speed	Potentiometer turned fully clockwise	Adjust the knob to give the desired face velocity. Refer to the *Operation* section.
	Electrical connections between frequency drive, potentiometer, and fan motor incorrect or shorted	Check the electrical connections and correct them if necessary. Refer to the *Installation* section.
	Potentiometer defective	Replace the potentiometer.
2. Fan operates at minimum speed	Potentiometer turned fully counterclockwise	Adjust the knob to give the desired face velocity. Refer to the *Operation* section.
	Electrical connections between frequency drive, potentiometer, and fan motor incorrect or open.	Check the electrical connections and correct them if necessary. Refer to the *Installation* section.
	Potentiometer defective	Replace the potentiometer.
3. Fan not operating	System locked	Unlock the system. Refer to the Excel or Horizon system manual.
	Electrical connections between frequency drive, potentiometer, and fan motor incorrect or shorted	Check the electrical connections and correct them if necessary. Refer to the *Installation* section.
	Fuse failure	Replace the fuse.
	Interlock open	Check system interlocks on status screens. System ready light should be on.
4. Fan shuts down intermittently	Frequency drive experiencing overcurrent protections	System voltage is too high. Reduce the system voltage. Refer to the Excel or Horizon system manual.
		Increase the current limit on frequency drive. Refer to the frequency drive manual.
	Mechanical failure of fan	Replace the fan bearings or realign the fan to the inlet cone and grease it. Refer to the Excel or Horizon system manual.

Troubleshooting the Standalone Pulse-On-Demand

Problem	Possible Cause	Corrective Action
1. Pulse cycling not turning on and off at set pressures.	Pressure limits invalid	Check the cartridge filter differential pressure switch setting and adjust if necessary. Refer to the *Operation* section.
	Poor pneumatic connection between transducers, cartridges, and final filter	Check the pneumatic connections and correct if necessary. Refer to the *Installation* section.