

Nordson Corporation

OPERATOR'S CARD

P/N 1605548-01

Encore[®] HD Powder Spray System with Prodigy[®] Color-on-Demand[®]



Figure 1 System Diagram (Two-Gun System Shown)



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

Refer to component operator manuals for more information on safety, setup, operation, troubleshooting, repair and parts.

Quick Start

- 1. Turn on the system air supply.
- 2. Turn on fluidizing air to the feed hoppers and allow the powder to fluidize.
- 3. Turn on system power and the controllers.

Select a Color

1. On the Color Controller Main screen, select **Small Buttons** or **Big Buttons** as desired.

Small buttons display all 28 color buttons on one screen. Big buttons display 14 color buttons per screen.



Figure 2 Color Controller Main Screen

2. If starting with an empty system, or if the system is filled with the wrong color, select a color and **START** a color change.

Changing Colors

Color Change with Screen Only

Point the gun into the booth, or hang it so it is pointing into the booth.

Select a new color and touch the **START** button, or touch the **START** button first then select the new color.

Color Change with the Foot Pedal

Point the gun into the booth, or hang it so it is pointing into the booth.

Press the foot pedal to start the color change, then move to the screen and select a new color.

The factory default purge setting allows 11 seconds after pressing the foot pedal to select the new color, or the system loads the current color instead. The default setting can be adjusted using the Function settings. See your controller manual for details.

CURRENT Ø	START	START w/SUCTION LN	NEXT 😑
SYSTEM PRESSU			
C 1	C 2	С 3	C 4
С5	С6	C 7	C 8
С9	C10	C11	C12
C13	C14	C15 TO 28	
10:49:20 COMPLETE			

Figure 3 Color Controller Color Selection Screen

For color button label instructions, refer to the following pages.

System Warnings

Pressure Warning: If the system pressure falls below 70 psi, the message SYSTEM PRESSURE ALARM appears in red on the screen. You will not be able to start a color change.

Maintenance Warning: When the valve counter exceeds the setpoint, the message WARNING BLADDER MAINTENANCE appears in yellow on the screen. Change the manifold bladders and reset the alarm from the Valve Counter screen.

System Cleaning

Point the gun into the booth, or hang it so it is pointing into the booth. Go to the Main screen, then press **PURGE**, then **CLEAN**, then **START**.

NOTE: If for some reason your system loses air pressure during production, cross-contamination may occur. When air pressure is again available, perform a purge before beginning production.

CURRENT O	START	NEXT DI CLEAN
	CLEAN	
LINE 4B	7:34:12p COMPL	Main

Figure 4 Color Controller Purge Screen

Color Button Labeling

From the Main screen, touch **SETUP**. Use the Button Label screens to enter labels for each color button and for the system.



Figure 5 Color Controller Setup Screen

The first screen has label buttons for colors C1 to C14, plus the label button for the system name. The system name appears in yellow at the bottom left of the Color Buttons screens. Touch the **More** button to go to the button label screen for colors C15–28.

To create a label for a color or the system name, touch the label button. A keyboard screen appears. Enter a 6-character label for the color, or a 12-character label for the system. The labels are retained in memory when the controller is turned off.



Figure 6 Color Controller Button Label Screen

Touch Main to return to the Main screen.

Color Change with Suction Line Purge

NOTE: To perform this procedure the Hopper Purge function must be enabled. Refer to your COD system manual for instructions.

Remove the suction line to be purged from the feed hopper and place the suction line in a waste hopper.

From the Color Selection Controller screen, select the desired color button, then touch **Start w/Suction LN**. The default number of suction line pulses is 12. The pulse range is 1 to 50.

The next screen will ask you to confirm that the correct suction line has been removed from the feed hopper.

Touch the **START** button to begin the suction line purge. The words IN PROCESS will flash on the screen while the system is purging the suction line.

When the purge is complete, the Main screen appears with the word COMPLETE displayed at the bottom.



Figure 7 Color Controller Start w/ Suction LN Screen

Gun Controller Functions and Settings

When power is activated at the pump cabinet, the controller is turned on. To shut off controller power, use the power switch on the pump cabinet.

Use the controller interface to make preset settings, view help codes, monitor system operation, and to configure the controller.

Use the **STANDBY** button shown in Figure 8 to shut off the interface and disable the spray gun during breaks in production. When the controller interface is off, the spray gun cannot be triggered, and the spray gun interface is disabled.



Figure 8 Controller Interface

The **Setpoint** icons light to indicate the configured or selected setpoints.

Setpoints include Select Charge, kV, $\mu\text{A},$ % of Flow and Pattern Air flow rates.

To select a Preset or change a Preset setpoint, press the **Preset Select** button or a **Setpoint** button. The button LED lights to indicate that it is selected.

Use the **Rotary Knob** to change the selected setpoint: clockwise to increase, counter-clockwise to decrease. The setpoints reset to the minimum if increased past their maximum.





Selecting a Setpoint to Change

Changing a Setpoint

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Figure 9 Selecting and Changing Setpoints
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Help Codes

The Help icon in the Function/Help display lights if a problem occurs.

To display the Help codes, press the **Help** button. The controller retains the last 5 codes in memory. Rotate the knob to scroll through the codes. The display blanks if there is no activity for 5 seconds.



To clear the Help codes, scroll through them until **CLr** is displayed, then press the **Enter** button. The Help icon stays lit until the controller clears the codes.

Assist Air Setting, Fast Flow Setting, and Software Versions

The **View** button allows the user access to adjust Assist Air and Fast Flow preset values, and to view software versions.

Press the **View** button consecutively to display, in order, the following functions: Assist Air Setting (AA), Fast Flow Setting (FF), Gun Controller Software Version (GC), Gun Display Module Software Version (Gd), Flow Module Software Version (FL), and Hardware Version for Main Control Board (Hd).

Assist Air Setting

Assist air is the air flow that pushes the powder out of the pump to the gun. This screen allows you to increase or decrease the assist air flow by a percentage of the total flow for each preset, to optimize pump and spray performance.

Assist air can be adjusted from +50% to -50% in 1% increments.

To set the assist air rate:

- 1. Press the View button until AA is displayed.
- 2. Turn the rotary knob to increase or decrease the value.
- 3. Press Enter to save.





Figure 10 Assist Air Settings

Fast Flow Setting

The Fast Flow setting allows you to specify Fast Flow or Normal Flow for each preset. Normal is the default, and is the setting used for most powders. Use a Fast Flow setting when using powders that are hard to fluidize and that may tend to clump.

When set to Normal, the pump cycle rate varies with the powder flow setting. When Fast Flow is enabled, the pump cycles at a continuous fast cycle rate.

NOTE: Fast Flow should be used only when working with difficult powders, as it will decrease the life of the pump pinch valves.

To set the Fast Flow setting:

- 1. Press the **View** button until **FF** is displayed.
- 2. Turn the rotary knob to toggle between **0** for Normal and **F** for Fast Flow.
- 3. Press Enter to save.



Figure 11 Fast Flow Settings

Spray Settings

For the following spray settings, when the gun is not triggered the setpoints are displayed. When the gun is triggered the actual outputs are displayed.



Custom Mode – Preset Setpoints

Figure 12 Custom Mode Displays



Custom Mode – Gun Triggered

Classic Mode

To use Classic mode, the controller must be configured for it. In Classic mode you can choose to control kV (STD) output or μ A (AFC) output, but not both at the same time.

Classic Standard (STD) Mode

Use the Standard mode to set kV. In Standard mode you cannot set $\mu\text{A}.$

- 1. To set the kV setpoint, press the **kV** button. The button LED lights to show that kV is selected.
- 2. Turn the rotary knob to increase or decrease the kV setpoint. The setpoint is automatically saved if it does not change for 3 seconds, or when any button is pressed.





kV Setpoint

STD Mode -Gun Triggered

Figure 13 STD Mode Displays

Classic AFC Mode

Use the AFC mode to set µA output limits. In AFC mode you cannot adjust kV; it is automatically set to 100 kV.

1. To set μA , press the μA button. The button LED lights to show that µA is selected.

Presets

Presets are programmed electrostatic and powder flow setpoints that allow the operator to quickly change spray settings simply by changing the preset number.

The controller can store 20 presets. Presets 1, 2, and 3 are programmed at the factory for the most common applications and can be adjusted as needed. Presets 4-17 can be programmed as needed.

Selecting or Changing a Preset

- 1. Press the Preset button. The button LED lights.
- 2. Turn the rotary knob. The preset number increases from 1 to 20 then resets to 1.
- 3. With the desired preset selected, begin production. All preset electrostatic and powder flow values will be used.
- 4. To change a preset's values, first choose the desired preset by using the rotary knob. Once the preset is selected, change the electrostatic and powder flow settings to the desired values.
- 5. The preset number will begin blinking, indicating a change has been made. To save the new settings, press the Enter button. The preset number will stop blinking, indicating the values have been saved.

6. To begin production without saving the new settings, do not press Enter. The new values will be used for the current job, but the preset will keep the original values for future use.

The setpoints for the selected preset are displayed when the gun is not triggered.



Figure 14 Preset Select

Electrostatic Settings

Electrostatic output can be in Select Charge mode, Custom mode, or Classic mode.

Select Charge[®] Mode

The Select Charge modes are non-adjustable electrostatic settings. The LEDs above the Select Charge mode buttons indicate the selected mode.

The Select Charge modes and factory settings are:

Mode 1	Re-Coat	100 kV, 15 μA
Mode 2	Metallics	50 kV, 50 μA
Mode 3	Deep Recesses	100 kV, 60 μA



Figure 15 Select Charge Mode

NOTE: If the operator tries to adjust kV or μ A values while a Select Charge mode is selected, the controller will switch to Custom or Classic mode.

Custom Mode

Custom mode is the factory default mode. In Custom mode, both kV and µA can be adjusted independently. In Custom mode the STD and AFC icons are not displayed.

1. To set or change kV, press the **kV** button. The button LED lights to show that kV is selected.

- Turn the rotary knob to increase or decrease the kV setpoint. The setpoint is automatically saved if it does not change for 3 seconds, or when any button is pressed.
- 3. To set or change the μ A setpoint, press the μ A button. The button LED lights to indicate that μ A is selected.
- Turn the rotary knob to increase or decrease the μA setpoint. The setpoint is automatically saved if it does not change for 3 seconds, or when any button is pressed.

NOTE: The default μA range is 10–50 μA . The limits of the range can be adjusted.

- When the gun is not triggered the kV and μA setpoints are displayed.
- When the gun is triggered the actual kV and μA outputs are displayed.





Custom Mode – Preset Setpoints

Custom Mode – Gun Triggered



Classic Mode

To use Classic mode, the controller must be configured for it. In Classic mode you can choose to control kV (STD) output or μ A (AFC) output, but not both at the same time.

Classic Standard (STD) Mode

Use the Standard mode to set kV. In Standard mode you cannot set $\mu A.$

- 1. To set the kV setpoint, press the **kV** button. The button LED lights to show that kV is selected.
- Turn the rotary knob to increase or decrease the kV setpoint. The setpoint is automatically saved if it does not change for 3 seconds, or when any button is pressed.





STD Mode – Gun Triggered

Figure 17 STD Mode Displays

Classic AFC Mode

Use the AFC mode to set μA output limits. In AFC mode you cannot adjust kV, it is automatically set to 100 kV.

- 1. To set μA , press the μA button. The button LED lights to show that μA is selected.
- 2. Turn the rotary knob to increase or decrease the μ A setpoint. The setpoint is automatically saved if it does not change for 3 seconds, or when any button is pressed.

The default μA range is 10–50 $\mu A.$ The limits of the range can be adjusted.

For example, the user can set the μA settings from 5, 4, 3.0, 2.9, 2.8, through 0.1.





AFC Mode – µA Setpoint

AFC Mode – Gun Triggered

Figure 18 AFC Mode Displays

Powder Flow Setting

Powder flow rate and pattern air ranges are:

Powder flow rate from 0–100% Pattern air from 0–3.50 in 0.05 increments

To set flow rate or pattern air:

1. Press the **Flow** or **Pattern** button. The green LED on the selected button lights.

2. Turn the knob to increase or decrease the setpoints. The setpoint is automatically saved if it does not change for 3 seconds or when any button is pressed.



Figure 19 Flow Rate and Pattern Setpoints

Purge Operation

HDLV System Purge

Press the **Color Change** button on the controller and then press **Enter** \downarrow .

The Purge Cycle operates as follows:

- 1. **Soft Purge** Assist air is directed through the pump and siphon tubing back to the powder supply (Soft Siphon), then through the pump and delivery tubing to the spray gun (Soft Gun). This clears the pump, tubing, and gun of powder.
- Pulse Purge Purge air is directed in pulses from the pump to the powder supply (Siphon Pulses), then from the pump to the spray gun (Gun Pulses). Pulse On sets the duration of each pulse, Pulse Off sets the time between pulses.

NOTE: Make sure the guns are aimed into the booth before starting a purge.

See functions F26 through F31 for settings.

Color-on-Demand (COD) System Purge

Press the **Color Change** button on the controller and then press **Enter** .

The COD Purge Cycle operates as follows:

1. **Manifold Purge** – The dump valve opens. The pump speeds up to 100% of flow to pump the remaining powder out of the manifolds.

- 2. **Soft Purge** Assist air is directed through the pump and siphon tubing back to the powder supply (Soft Siphon), then through the pump and delivery tubing to the spray gun (Soft Gun). This clears the pump, powder tubing, and gun of powder.
- Pulse Purge Purge air is directed in pulses from the pump to the powder supply (Siphon Pulses), then from the pump to the spray gun (Gun Pulses). Pulse On sets the duration of each pulse, Pulse Off sets the time between pulses.
- 4. **Powder Pre-Load** The new color powder is pumped to the spray gun for the set time at 100% of flow to load the system for production.

The Color Change cycle is started by the operator or by a remote signal to the Color-On-Demand controller. The operator starts the color change by selecting a new color and touching the **Start** button on the touch screen, or by pressing a foot pedal, then selecting a new color before the powder pre-load begins.

Powder type, humidity, tubing length and other variables can change the effectiveness of these settings. You may have to adjust these settings to avoid color cross-contamination and maintain performance.

See functions F26 through F33 for settings.

Configuration

Opening the Function Menu and Selecting Settings

(Nordson Press and hold the **Nordson** button for 5 seconds. The Function/Help display lights to show the function numbers and values. Use the functions to configure the controller for your application.

Use the rotary knob to scroll through the function numbers. To select the displayed function number, press the **Enter** button. The function numbers are in the form F00–00 (function number–value).

Function Number	Function Name
F00	Gun Type
F01	Fluidizing
F02	Display Units
F03	Electrostatic Control
F04	Powder Flow Control
F05	Keypad Lockout
F06	Vibratory Box Delay Off
F07	Maintenance Timer, Gun
F08	Setting Trigger Function
F09	Help Codes
F10	Zero Reset (Flow)
F11	Gun Display Errors
F12	μA Lower Limit
F13	μA Upper Limit
F14	Total Hours
F15	Save/Restore/Reset
F16	Gun Display Brightness
F17	Number of Presets

When the function is selected, the function value blinks. To change the function value, rotate the knob. Press the **Enter** button to save the change and exit the value, so that rotating the knob now scrolls through the function numbers again.





Function 01, Value 00

Figure 20 Displaying and Changing Functions

Function Number	Function Name
F18	Control Type
F19	Pump Type
F20	Gun Number
F21	Maintenance Timer, Pump
F22	Purge
F25	Pattern Air Delay
F26	Soft Siphon
F27	Soft Gun
F28	Pulse ON
F29	Pulse OFF
F30	Siphon Pulses
F31	Gun Pulses
F32	Powder Pre-Load
F33	Manifold Purge
F34	Conveyance Air Constant A
F35	Conveyance Air Constant C
F36	Pattern Air Constant A
F37	Pattern Air Constant C

Table -1 Function Settings

Spray Gun Operation

The spray gun interface and settings trigger allow you to change the preset or the powder flow settings, or purge the gun, without using the controller interface.



Spray Gun Interface

Figure 21 Gun Interface Controls



Spray Trigger Figure 22 Gun Trigger Controls

Changing Presets with the Settings Trigger

- 1. See Figures 21 and 22. Release the spray trigger. Presets cannot be changed while the gun is triggered on.
- 2. Press the **Mode** button until the **Preset Mode** icon is lit. The display shows the current preset number.
- 3. Push the settings trigger up or down until the desired preset number is displayed on the spray gun interface.

NOTE: Unprogrammed preset numbers (presets where all setpoints are zero) are automatically skipped. Refer to your controller manual for preset programming instructions.

4. Press the spray trigger. The system sprays with the new preset.

See controller configuration F08 for more settings.

Changing Powder Flow with the Settings Trigger

- 1. See Figures 21 and 22. Press the **Mode** button until the **Flow Mode** icon is lit.
- 2. Push the settings trigger up or down to change the flow setpoint. This can be done without releasing the spray trigger.

The powder flow immediately changes. The new flow setpoint is displayed on both the spray gun interface and the controller interface.

NOTE: If using **Total Flow** mode, the total air setpoint must be greater than zero or you will not be able to set % Flow Air and the gun will not spray powder. Refer to your controller manual for more information.

Purging the Spray Gun

- 1. See Figures 21 and 22. Point the gun into the booth and release the spray trigger.
- 2. Press the **Purge** button. The purge will continue as long as you press the **Purge** button.

NOTE: If the settings trigger is configured for Purge, then pressing up or down on the settings trigger purges the gun. Refer to *Controller Configuration* in your controller manual for setting trigger configuration.

Purge the gun periodically to keep the powder path inside the spray gun clean. The purge length and frequency required will depend on the application.

NOTE: The purge air only cleans the spray gun powder path. To purge the powder hose, disconnect it from the pump and the gun, place the gun end inside the booth, and blow it out from the pump end with compressed air.

Electrode Air Wash Operation

Electrode air wash air continually washes the spray gun electrode to prevent powder from collecting on it. Electrode air wash air turns on and off automatically when the spray gun is triggered on and off.

Daily Operation

Initial Startup

With the fluidizing and flow air set to zero, and no parts in front of the gun, trigger the gun and record the μ A output. Monitor the μ A output daily, under the same conditions. A significant increase in μ A output indicates a probable short in the gun resistor. A significant decrease indicates a resistor or voltage multiplier requiring service.

Startup

- 1. Turn on the spray booth exhaust fan.
- 2. Turn on the system air supply.
- 3. Make sure the spray gun is not triggered, then turn on controller power. The displays and icons on the controller interface and gun interface should light.

Standby

Use the **Standby** button on the Encore HD controller to shut off the interface and disable the spray gun during breaks in production. When the controller interface is off the spray gun cannot be triggered, and the spray gun interface is disabled.

Maintenance

Clean the spray gun nozzle, gun powder path, pump nozzle and pump throat in an ultrasonic cleaning machine using Oakite[®] BetaSolv or an equivalent emulsion cleaning solution. Rinse with clean water and dry before re-installing. Refer to your controller manual for instructions on adjusting electrode air wash flow.

To turn off controller power, shut system power off at power unit or control panel.

Shutdown

For HDLV system shutdown, complete the following steps:

- 1. Press the **Color Change** button to start cleaning the system of residual powder.
- 2. Purge the spray gun by pressing the **Purge** button on the back of the spray gun until no more powder is blown from the gun.
- 3. Press the **Standby** button to turn off the spray gun and interface.
- 4. Turn off the system air supply and relieve the system air pressure at the pump cabinet.
- 5. If shutting down for the night, or for a longer period of time, shut off the system power.
- 6. Perform the daily maintenance procedures.

Do not immerse the spray gun electrode assembly in the cleaning solution or the rinse water. Remove all O-rings before cleaning. Do not allow the O-rings to come in contact with the cleaning solution.

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