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

Customer Product Manual
Part 1605396-04
Issued 05/18

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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Notice

Trademarks

Part 1605396-04

Change Record

Revision	Date	Change
04	05/18	Added power supply cover kit to part list.

Table of Contents

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 all 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 (MSDS) 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.

- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Provide adequate ventilation to prevent dangerous concentrations of volatile materials or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits while 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.
- 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 electrical power. Close pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the equipment.

Disposal

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

Section 2
Description

System Components

The Encore HD Powder Spray System with Prodigy Color-on-Demand has been carefully tested, inspected, and packaged prior to shipping. Upon receipt, inspect the shipping materials and components for visible damage. Report any visible damage immediately to the shipper and to your Nordson representative.

The Encore HD Powder Spray System with Prodigy Color-on-Demand consists of the components shown in Figure 2-1.

The system pump stand is shipped bolted to a pallet. The spray guns, controllers, and installation kits are shipped on a separate pallet.

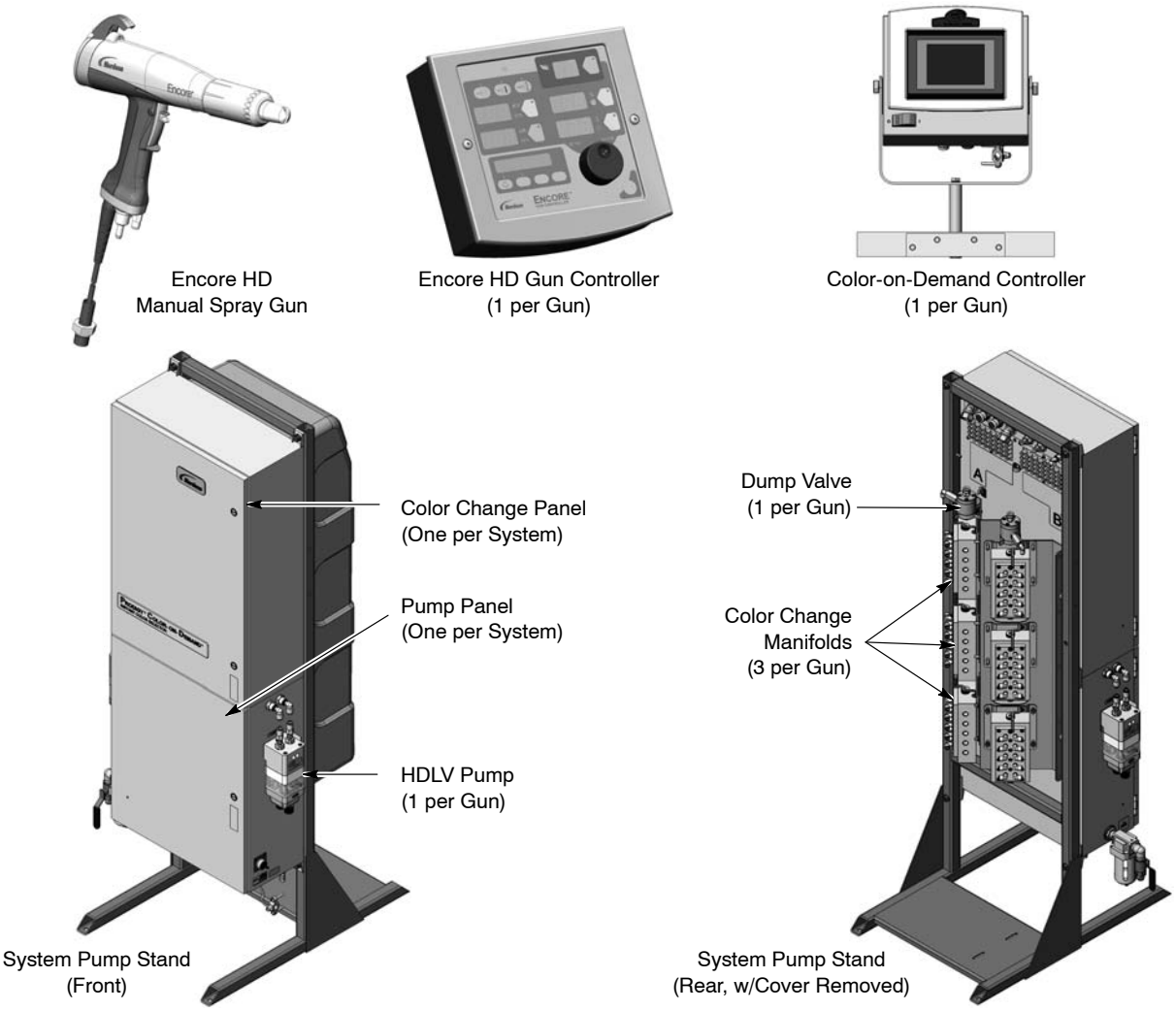


Figure 2-1 System Components

Pump Control Panel

The pump panel is the central electrical and pneumatic enclosure for the Color-on-Demand system. The pump panel houses the Prodigy HDLV® pumps, pump manifolds and control boards, air filter and pneumatic controls, and DC power supply.

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

Manifold Specifications

Output (Maximum)	23.5 kg (52 lb) per hour
Air Consumption	
Conveying Air	21–35 l/min (0.75–1.25 scfm)
Gun Pattern Air	6–57 l/min (0.2–4.0 scfm)
Total Consumption	85–170 l/min (3–6 scfm)
Operating Air Pressures	
Pinch Valves	2.4–2.75 bar (35–40 psi)
Flow Control (to air cap/pump assist)	5.9 bar (85 psi)
Vacuum Generator	3.5 bar (50 psi)

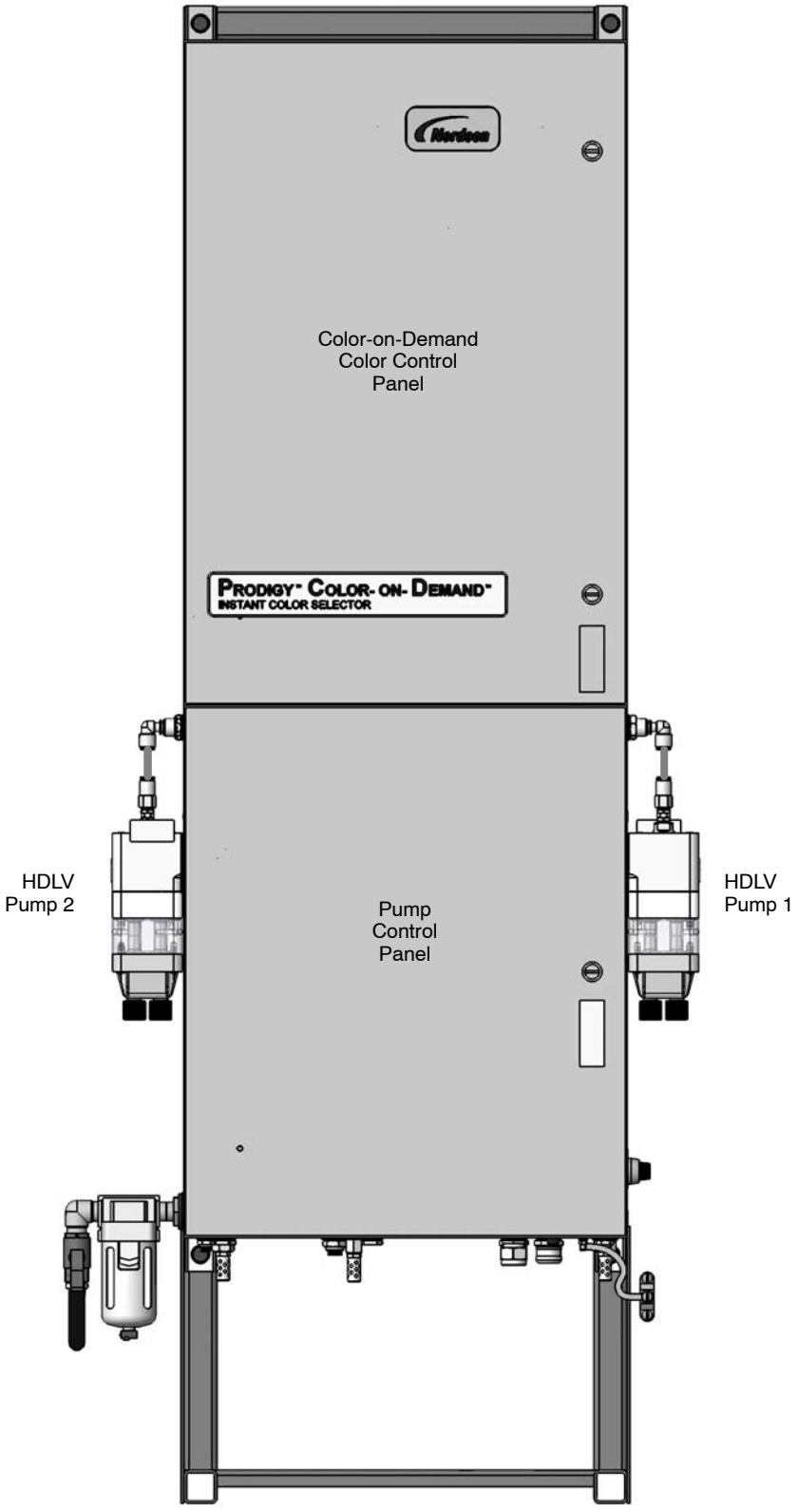


Figure 2-2 Manual Color-on-Demand System Panels

Pump Control Panel Components

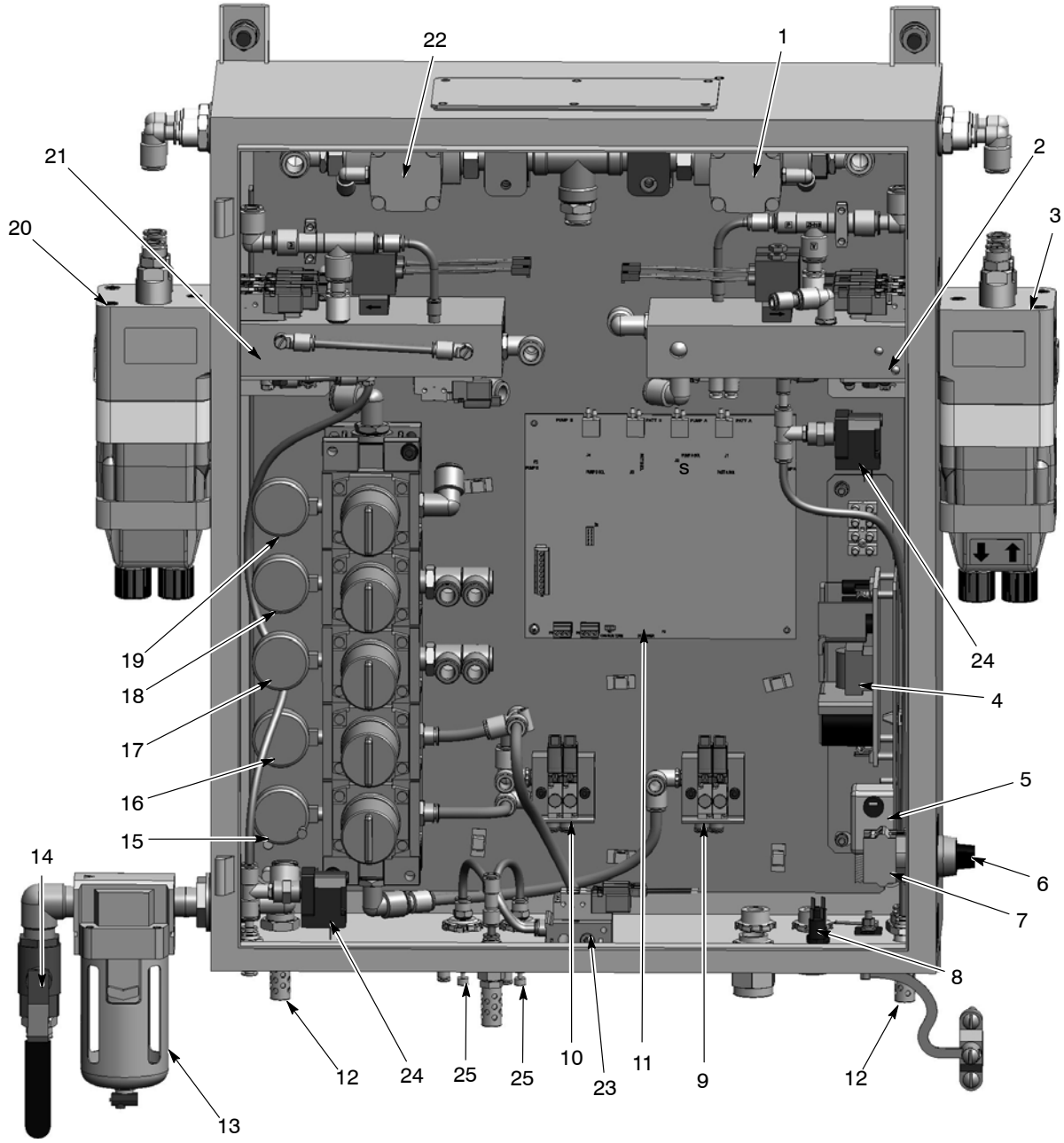


Figure 2-3 Pump Control Panel Components (Dual Pump System Shown)

1. Pump 2 purge valve
2. Pump 1 control manifold
3. Pump 1
4. 24 VDC power supply
5. Line filter
6. Power switch
7. Contact block
8. Fuse, time delay, 3.15 A
9. Purge pilot manifold/solenoids
10. Pinch select manifold/solenoids
11. Pump control board
12. Vacuum generator mufflers
13. Air filter
14. Air supply ball valve
15. Pinch low regulator/gauge
16. Pinch high regulator/gauge
17. Flow control regulator/gauge
18. Vacuum regulator/gauge
19. Purge regulator/gauge
20. Pump 2
21. Pump 2 control manifold
22. Pump 1 purge valve
23. Electrode air wash manifold assembly
24. Pressure switch
25. Flow control valve

NOTE: One pump control board (11) controls one pump. If the system has two pumps, then there are two control boards stacked on top of each other.

For wiring and pneumatic diagrams, refer to the foldouts in the back of this manual.

For pump repair and parts, refer to manual 1081195.

HDLV Pump Manifold Components

The Prodigy High-Density powder, Low-Volume air (HDLV) powder feed pump transports precise amounts of powder from a feed source to a powder spray gun. The pump manifold controls the pump air and vacuum flow. The pump control board controls all manifold functions.

Table 2-1 Manifold Components

Item	Description	Function
1	Solenoid Valves	Control the air flow to the pump during operation. **NOTE:** Refer to *Solenoid and Control Valve Functions* on page 5-3 to identify each valve's specific function.
2	Pattern Air Flow Control Valve	Regulates the air pressure to the spray gun's nozzle, which shapes the powder spray pattern.
3	Pump Air Flow Control Valve	Regulates the positive air pressure to the fluidizing tubes, which dispenses the powder out of the tubes.
4	Vacuum Air Solenoid	Turns the airflow through the vacuum generator on or off.
5	Vacuum Generator	Works on the Venturi principle to generate the negative air pressure required to draw powder into the fluidizing tubes.

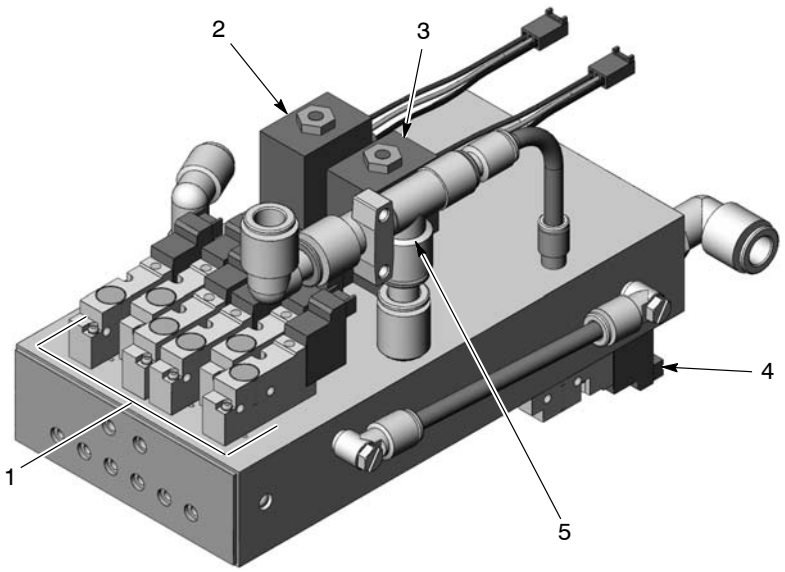


Figure 2-4 Pump Manifold Components

Color-on–Demand Color Control Panel

See Figure 2-5. Air and power are supplied to the color control panel from the pump control panel.

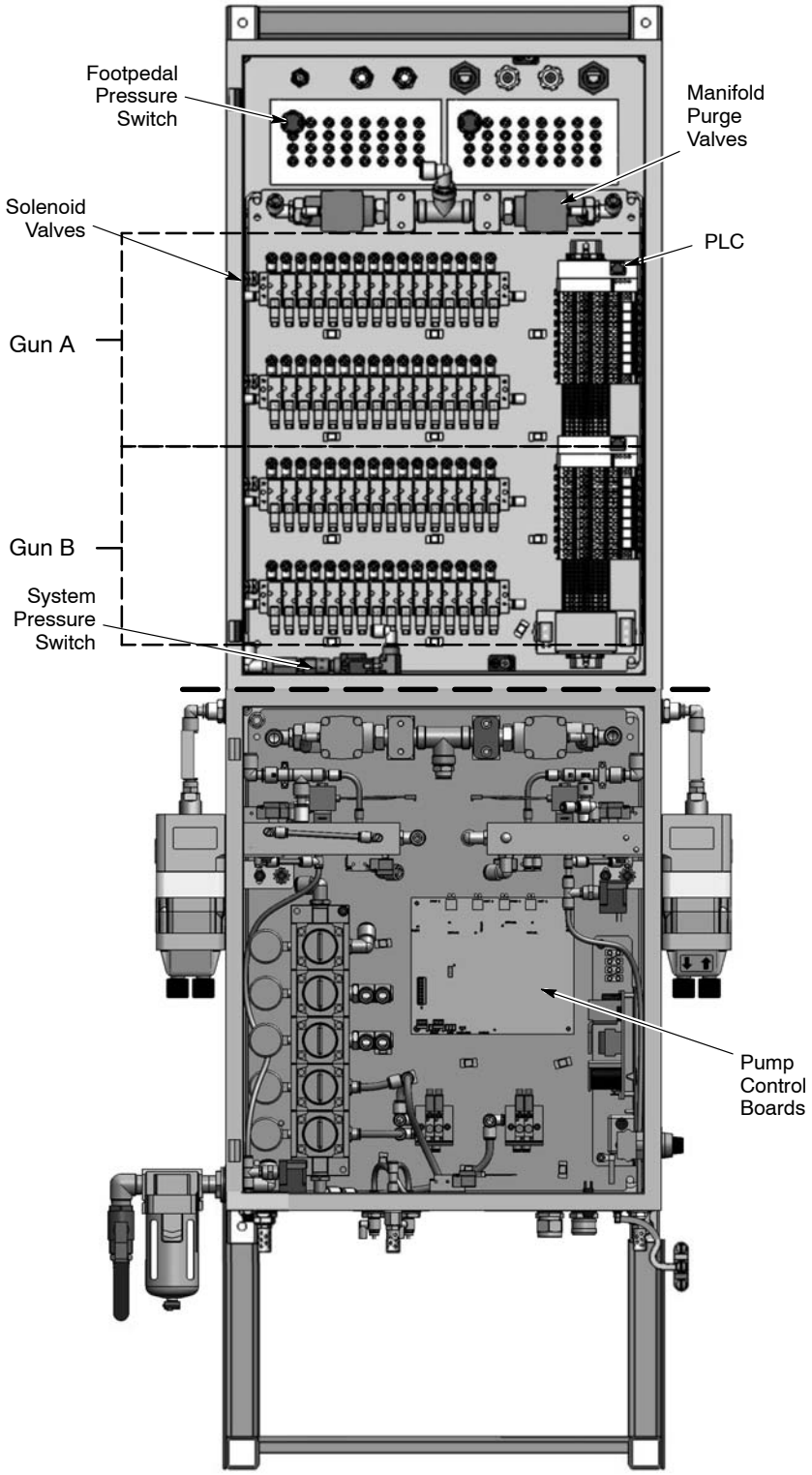


Figure 2-5 System Control Panels (Dual Gun System)

The color control panel houses the PLC and solenoid valves that control the color change system. The PLC also interfaces with the pump control boards in the pump control panel to signal a color change start.

The Color-on-Demand controller provides the operator interface for the color change controls. The controller communicates with the color control panel through an Ethernet cable.

Power is supplied to the COD controller from the color control panel through a separate power cable.

Other major components of the color control panel include the manifold purge valves, which provide manifold purge air during the color change cycle; the system pressure switch, which senses system air pressure and prevents a color change from starting if the air pressure drops below 70 psi; and the foot pedal pressure switches. When the operator steps on the foot pedal, it sends a signal to the pressure switch, which signals the PLC to initiate a color change.

Color Change Manifold

See Figure 2-6. The color change manifold consists of 3 valve blocks with 10 ports in the side of each block and ports at each end. Of the 30 side ports, 28 are powder inlet valves and one is a purge air inlet valve. A separate external dump valve is connected to the top outlet on the top block.

The manifold valve bladders are inflated to close the side ports and deflated to open them. The currently selected powder flows around the valve bladder and out the suction line to the HDLV pump. During a color change, air is exhausted from the Dump 2 valve, allowing them to open so that purge air can push the remaining powder in the suction lines and manifold out through the dump lines to the booth.

Color change cycle settings are made from the Manual Gun Controller interface (**Tools**>**Purge**). These settings determine the pump soft purge, pulse purge, and new color pre-load timing.

Both gun controllers must be set for the “Gun No: 1” network address. Refer to the *Encore HD Manual Powder Spray System Controller* manual (part number1604869) for a description of the color change cycle and settings.

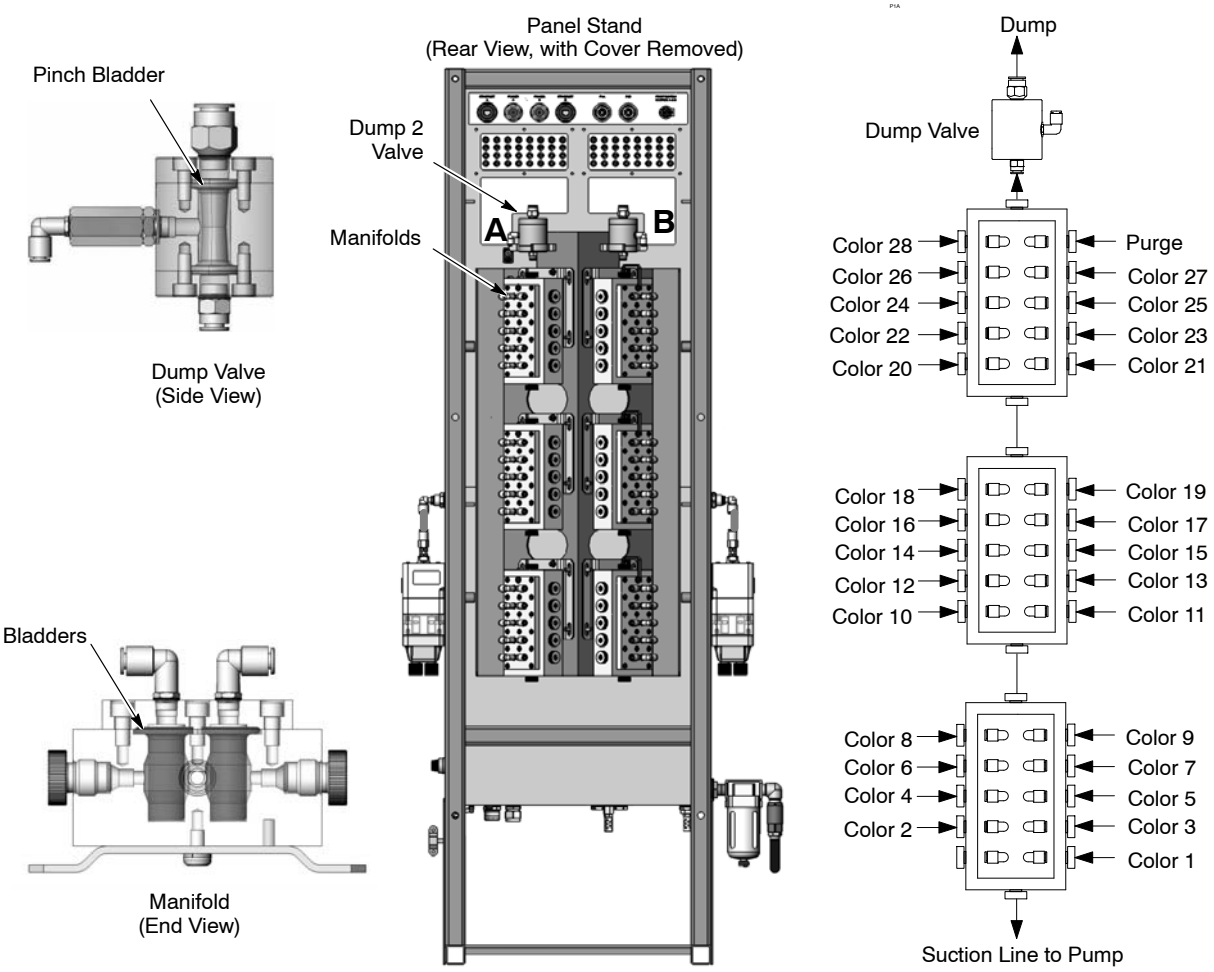


Figure 2-6 Color Change Manifold and Dump Valve

Section 3
Installation

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

Specifications

Electrical	100–240 V, 50/60 Hz, 275 VA max. 1 PH
Air Input Pressure	6.2–7.6 bar (90–110 psi) maximum
Air Flow Requirements	10 CFM during purge; 4–6 CFM during normal operation, depending on powder flow and atomizing air settings.
Weight *	125 kg (275 lbs)
Remote Control Input	24 V, 25 mA max
* Weight of stand with control panels, color change manifolds, and cover.	

System Pump Stand Installation

The System Pump Stand must be located as close to the powder feed hoppers as possible, since the maximum suction tubing length is 3 meters (9 ft, 9 inches) from the manifold inlet ports to the pump adapters on the feed hoppers.

WARNING: The stand weighs 125 kg (275 lbs. Use approved lifting equipment to remove the stand from the shipping pallet and move it to its installation location.

Unbolt the stand from the shipping pallet and secure two nylon lifting straps to the horizontal bar at the top of the stand. Secure the straps to the forks of a forklift or a crane hook. Lift the stand off the pallet and move it to the chosen location.

Bolt the stand securely to the floor with the lag bolts included in the installation kit.

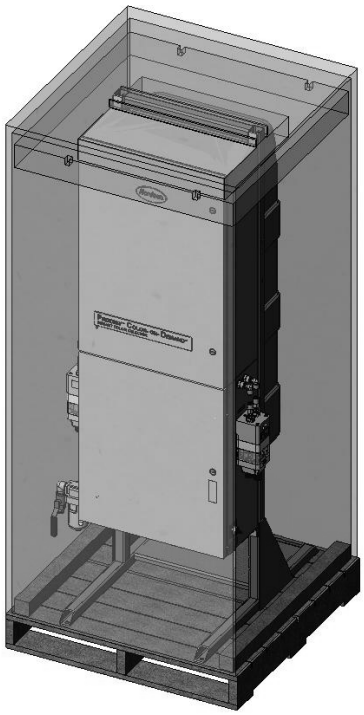


Figure 3-1 Packaged System Pump Stand

Controller Installation

Install the Manual Gun Controller and Color-On-Demand Controller on a wall, panel, or platform rail before making any connections. Both controllers must be accessible to the operator at all times.

NOTE: Both Gun 1 controller and Gun 2 controller must be set for the “Gun No: 1” network address. Refer to the *Encore HD Manual Spray System Controller* manual for more information.

Pump Stand Mounting

The panel stand is shipped with a controller support arm. It can be bolted to the side of the stand with the included M8 x 30 bolts and washers. Use the universal mounting brackets and included fasteners to mount the controllers to the arm; color controller above and gun controller below.

Grounding

Connect the ground strap to the controller ground stud and clamp it to a true earth ground.

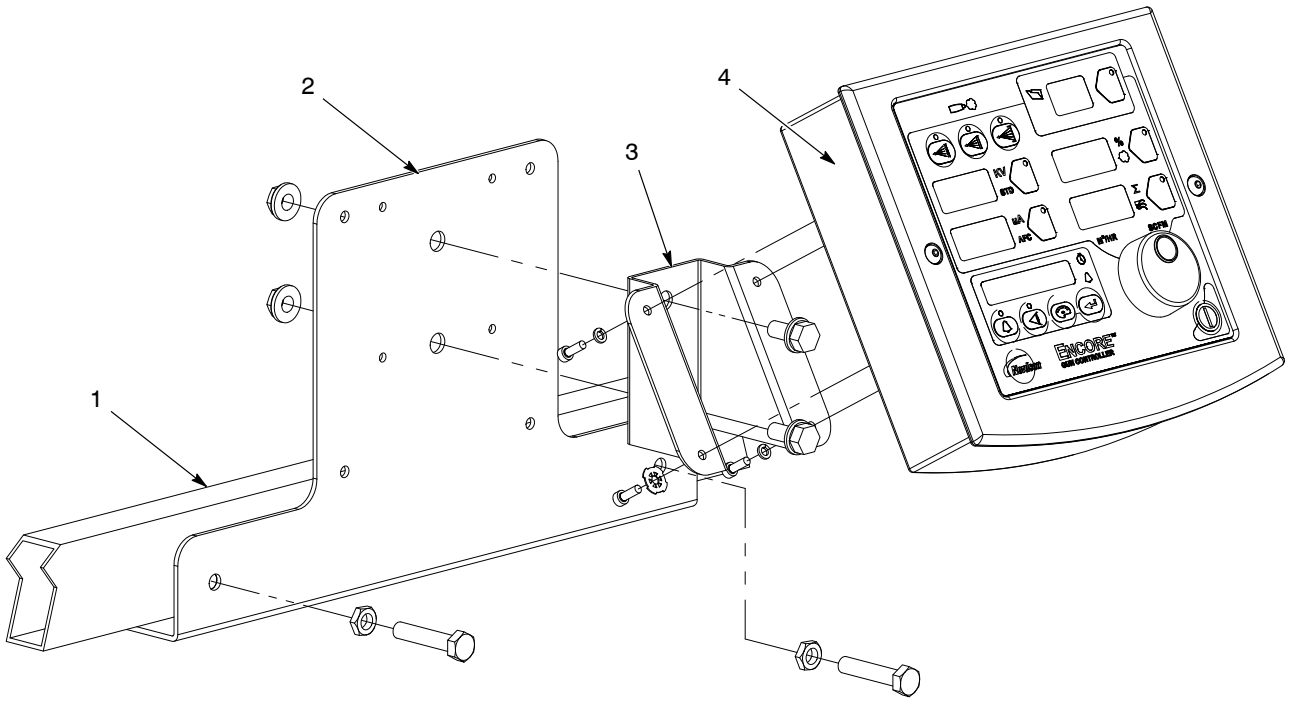


Figure 3-2 Controller Rail Mount Installation

1. Product stand arm
2. Controller rail mount bracket
3. Universal mounting bracket
4. Encore HD controller

Connection Diagram (Rear View of System)

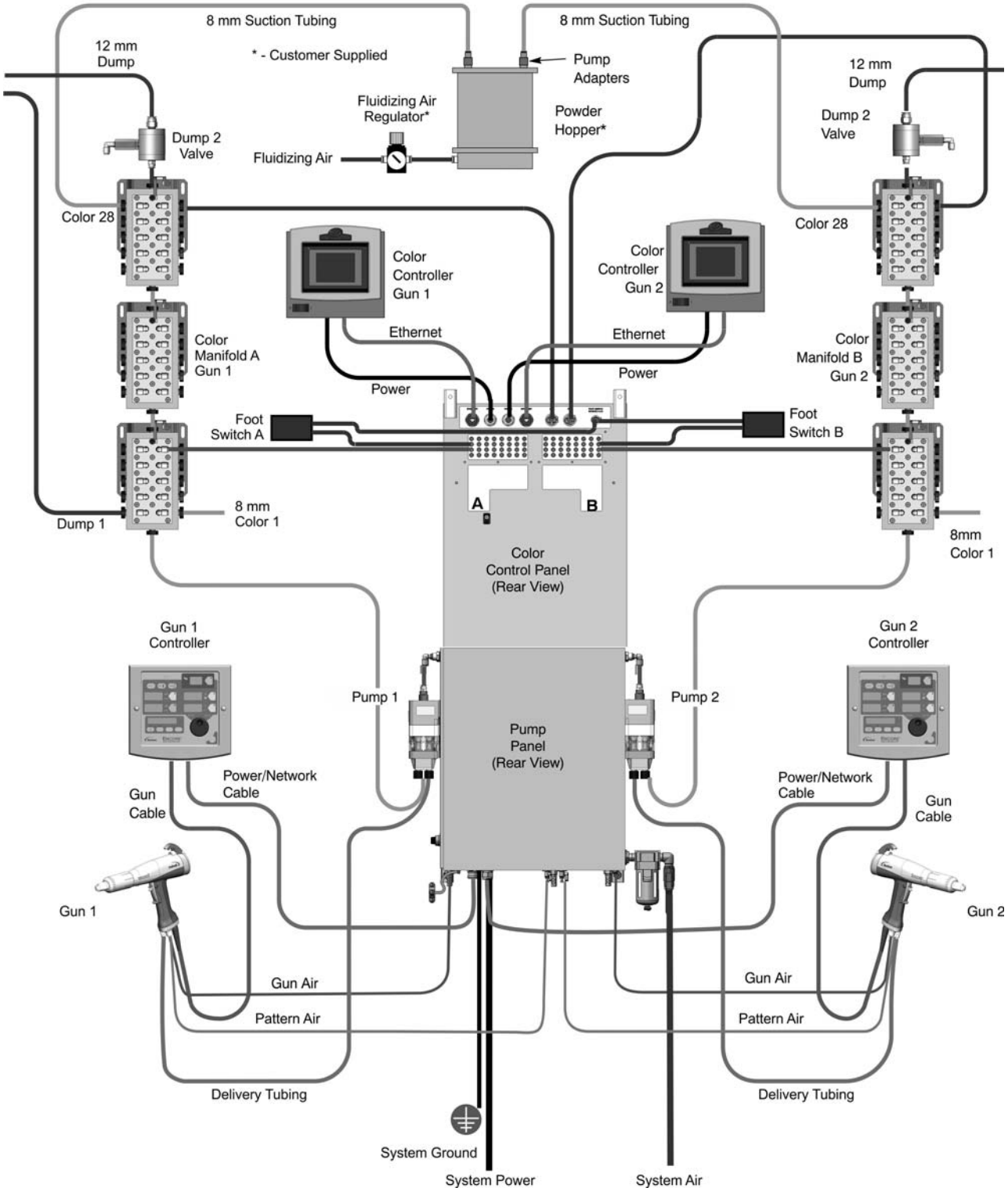


Figure 3-3 System Diagram (Two-Gun System Shown)

System Power, Ground, and Gun Controller Connections

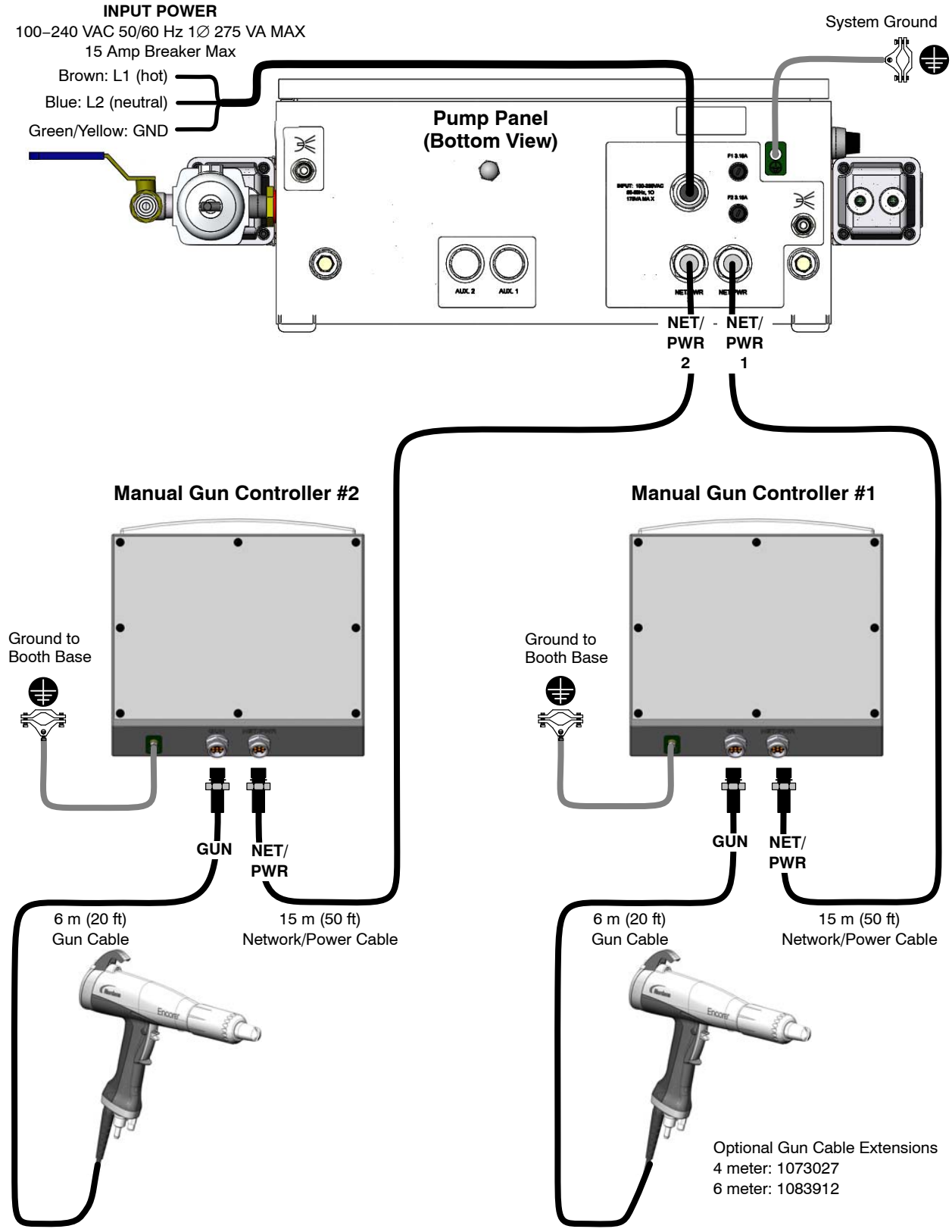


Figure 3-4 System Power, Ground, and Gun Controller Connections

System Air Supply and Gun Air Connections

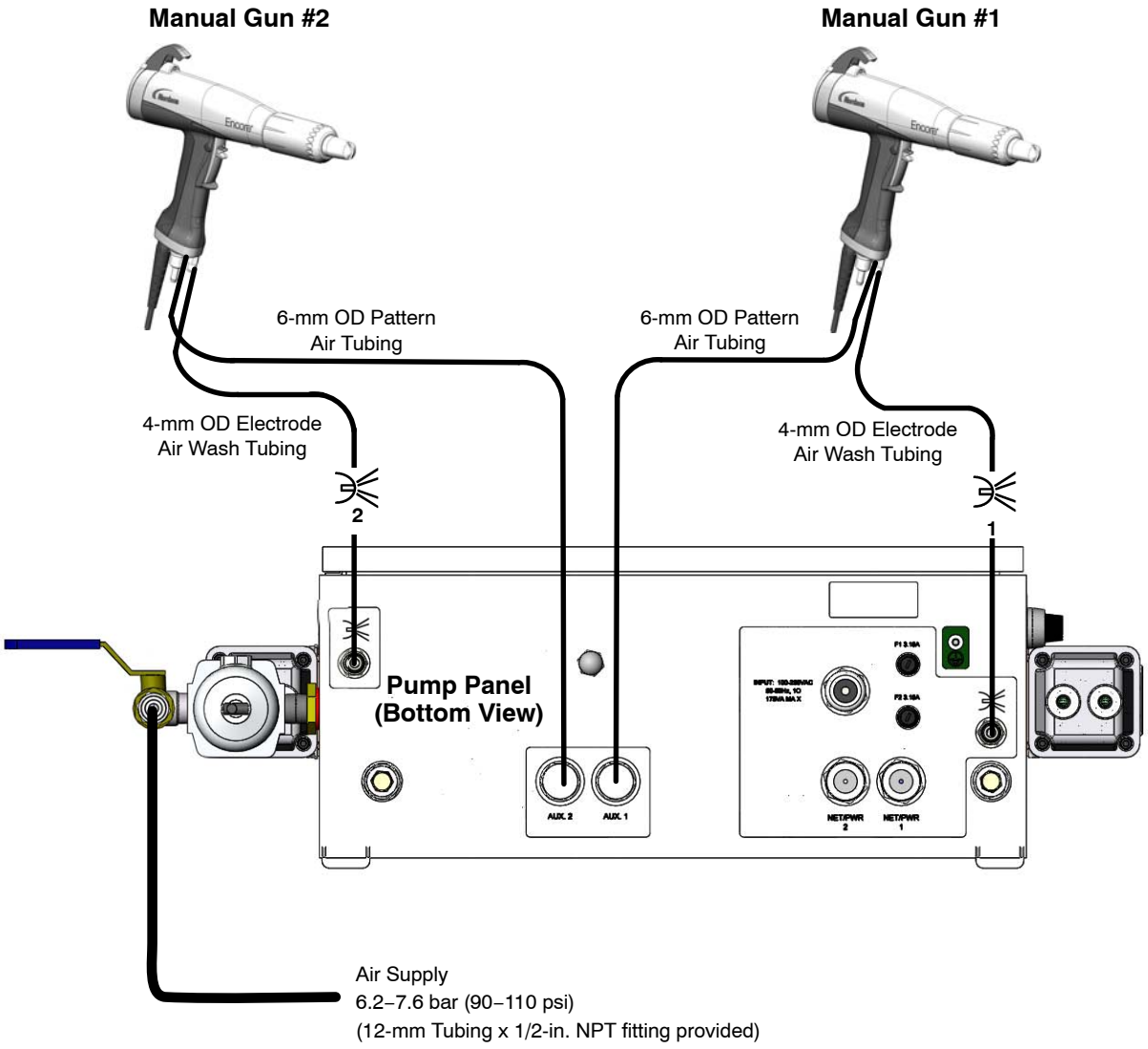


Figure 3-5 System Air Supply and Gun Air Connections

Encore HD Powder Spray Gun Installation

See Figure 3-6 for gun connection illustration. See Figure 3-3 for typical system diagram.

1. Connect the 6-mm pattern air tubing to the quick-disconnect fitting (1) in the gun handle. Connect the other end to the Pattern Air fitting on the power unit or pump panel.
2. Connect the 4-mm clear electrode air wash tubing to the barbed fitting (2) in the gun handle. Connect the other end to the Gun Air fitting on the power unit or pump panel.
3. Seat the O-rings (4) onto the barbed hose adapter (3). Push the barbed end of the hose adapter into the end of the powder hose, then plug the adapter into the powder inlet tube (5) in the bottom of the spray gun handle.
4. Connect the gun cable (6) to the gun connection on the back of the Encore HD controller.
5. Use the sections of black spiral wrap supplied with the system to bundle together the spray gun cable, air tubing, and powder hose.

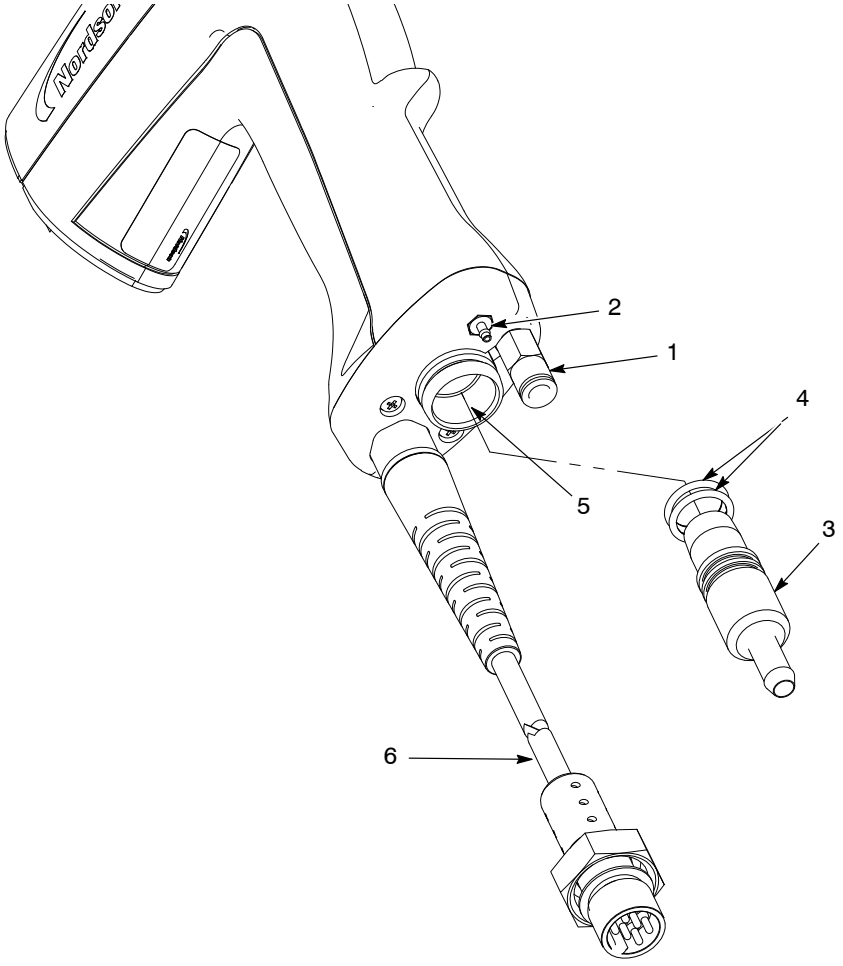


Figure 3-6 Spray Gun Connections

1. Quick disconnect
2. Barbed fitting
3. Hose adapter
4. O-rings
5. Powder inlet tube
6. Gun cable

Color-on-Demand Controller and Foot Switch Connections

1. Connect the power cables to the Color-on-Demand controllers.
2. Cut one of the RJ45 jacks off the 100 ft. long Ethernet cable included in the ship-with kit, leaving a jack on the other end.
3. Remove the back from the controller and plug the Ethernet cable into the socket as shown.
4. Pull the cut end of the cable through the provided 1/2 in. conduit connector and conduit to the color panel and route it inside the panel.
5. Connect the cable leads to the termination module as shown on page 3-10.
6. Connect the conduit to the controller and panel.
7. If you are going to use the foot switches, remove the bottom covers and install the provided connectors. Connect 6-mm tubing from the FOOTSWITCH A & B fitting to the IN fitting on the switch, and from the OUT fitting to the SWA RTN or SWB RTN ports on the tubing manifolds.

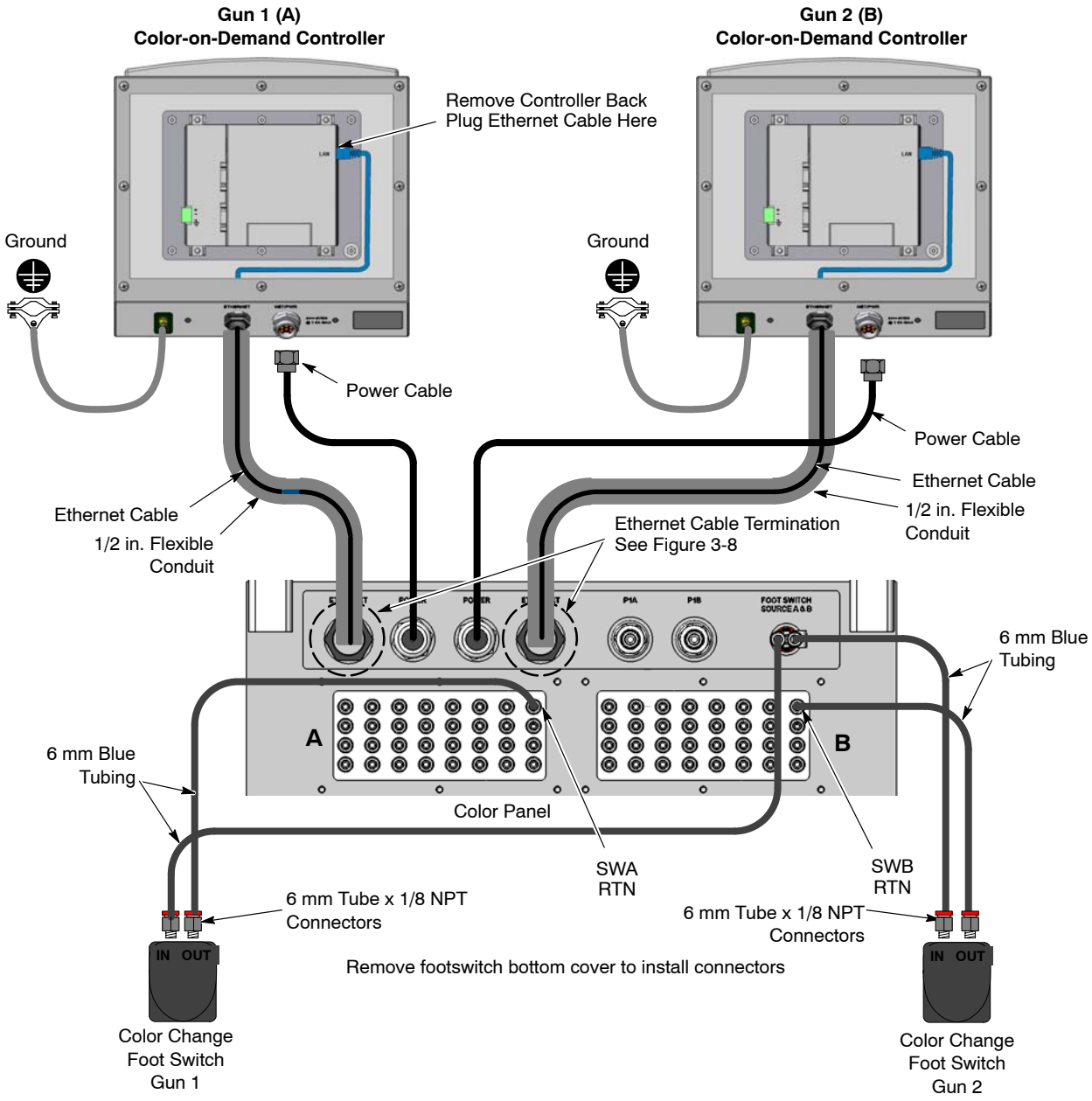


Figure 3-7 Color-on-Demand Controller and Foot Switch Connections

Ethernet Cable Termination

Follow these steps to complete the ethernet cable termination.

1. Cut the RJ45 jack from one end of the Ethernet cable.

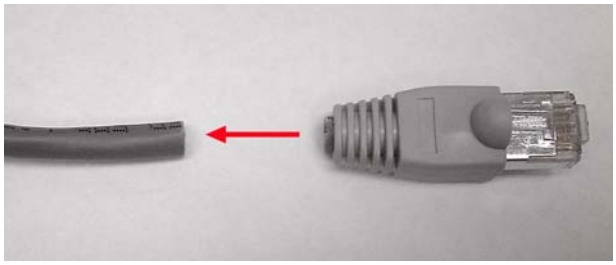


Figure 3-8 Ethernet Cable Termination, Step 1

2. Route the cut end of the Ethernet cable into the color panel.
3. Trim back the cable jacket about eight inches.
4. Cut the foil, clear wrapper, and pull string on the cable.

Figure 3-9 Ethernet Cable Termination, Steps 3–4

5. Trim back the four twisted pair wires to approximately 2.25 inches.

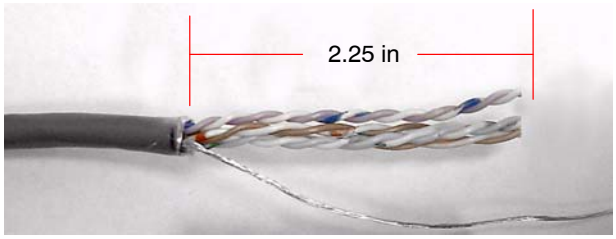


Figure 3-10 Ethernet Cable Termination, Step 5

6. See Figure 3-11. Arrange the twisted pair wires in the module according to the T568-B wiring scheme, with the ends at least 1/4 in. through the terminals. Retain the twists in the wires as close to the terminals as possible. Use a 110 punch-down tool to attach the wires.
7. Trim the ends of the wires as close to the termination module as possible.
8. Install the retention caps on the termination module.
9. Crimp a ground lug to the shield wire.
10. Assemble the ethernet termination case as shown. For rear-connect modules, snap the termination module into the bezel, then install the bezel into the adapter.

Use Type T568B cables.
Use T568-B wiring scheme.

Rear-Connect Module
(End View)

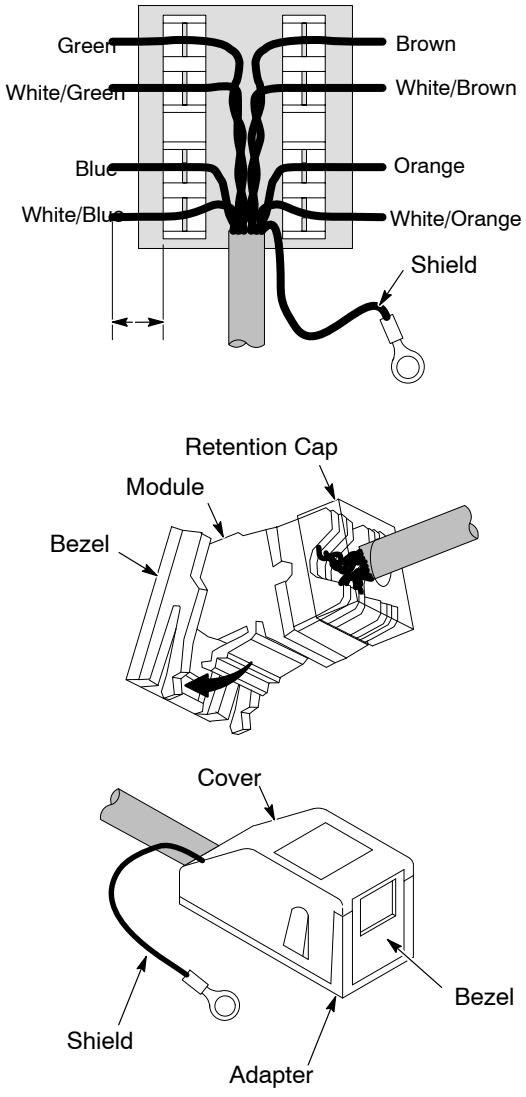


Figure 3-11 Ethernet Cable Connection to Termination Module

11. See Figure 3-12. Install the termination modules under the top side of the enclosure.
12. Connect the 1 meter (3 ft.) long crossover cables from the termination modules to the PLCs.
13. Attach the termination module ground wires to the cabinet ground stud.

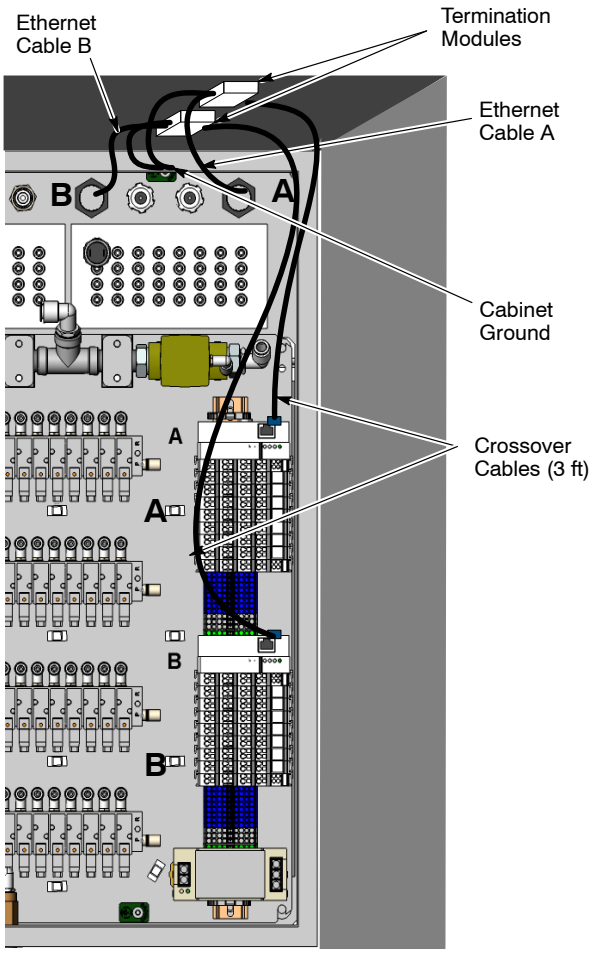


Figure 3-12 Ethernet Cable Termination Inside Color Control Panel

Delivery Tubing Installation

Connect 8-mm clear delivery tubing from the pump outlets to the spray guns. Observe tubing length guidelines, coil excess tubing in loops of at least 1 meter (3 ft) diameter, and lay coil flat on floor.

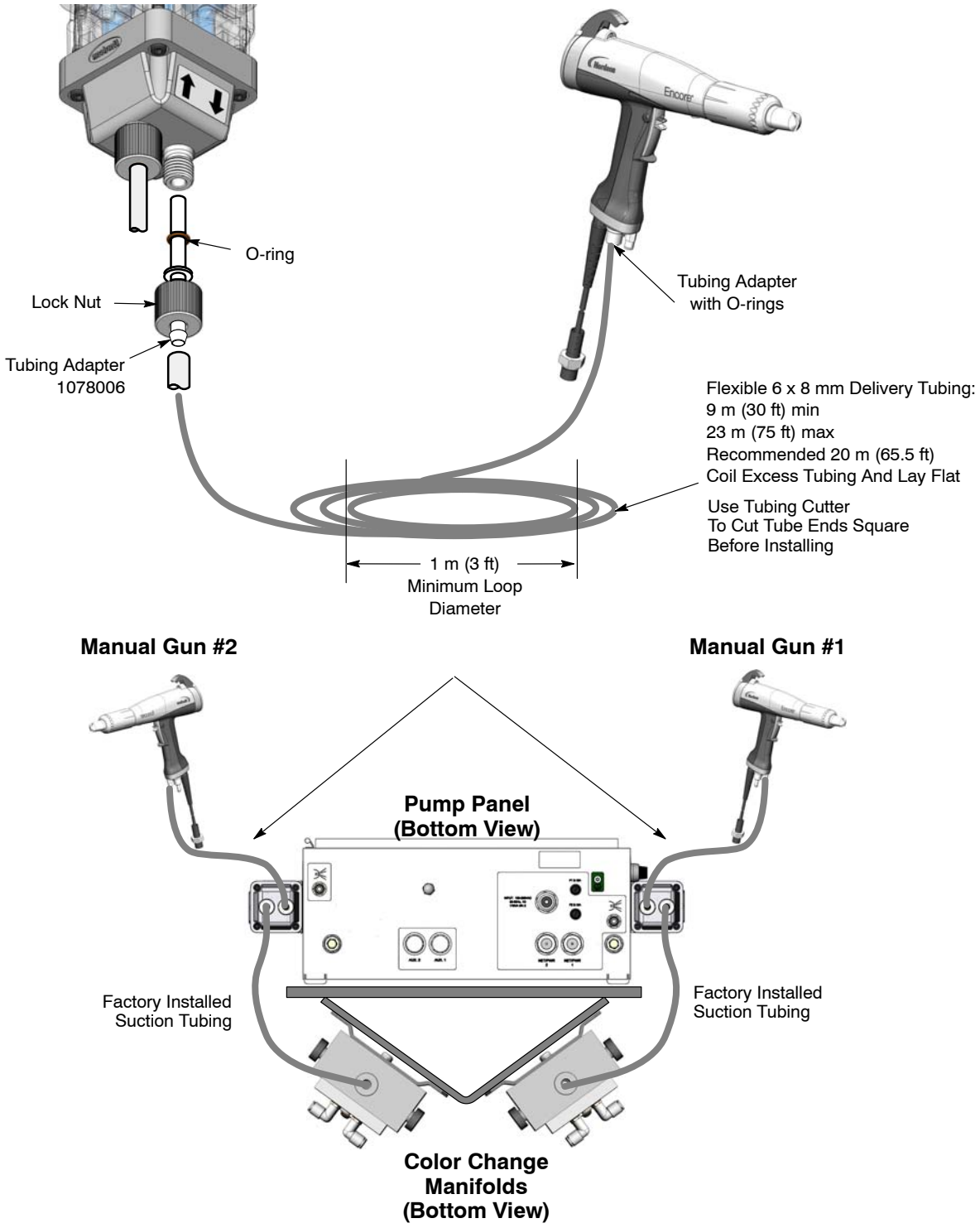


Figure 3-13 Delivery Tubing Installation

Suction and Dump Tubing Installation

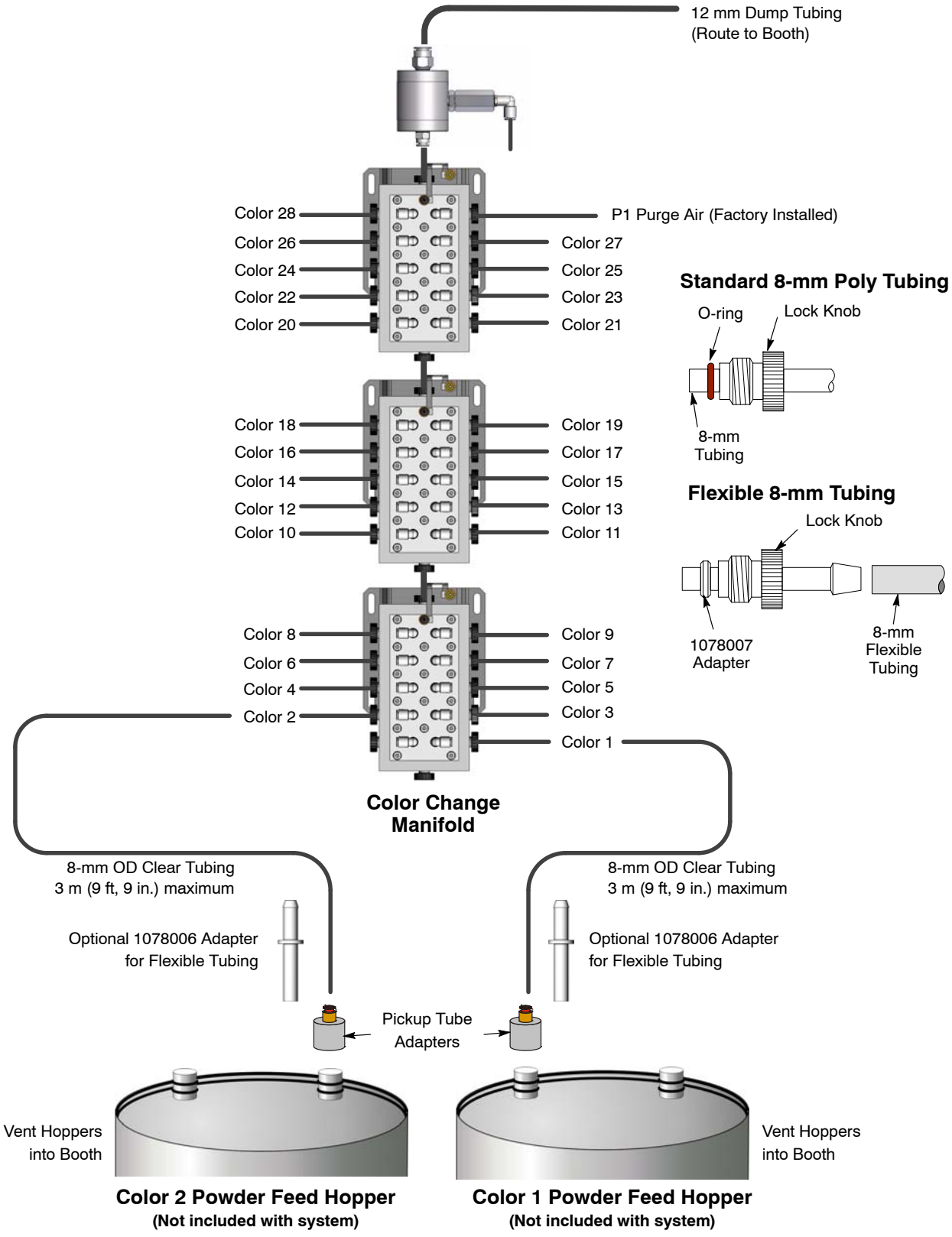
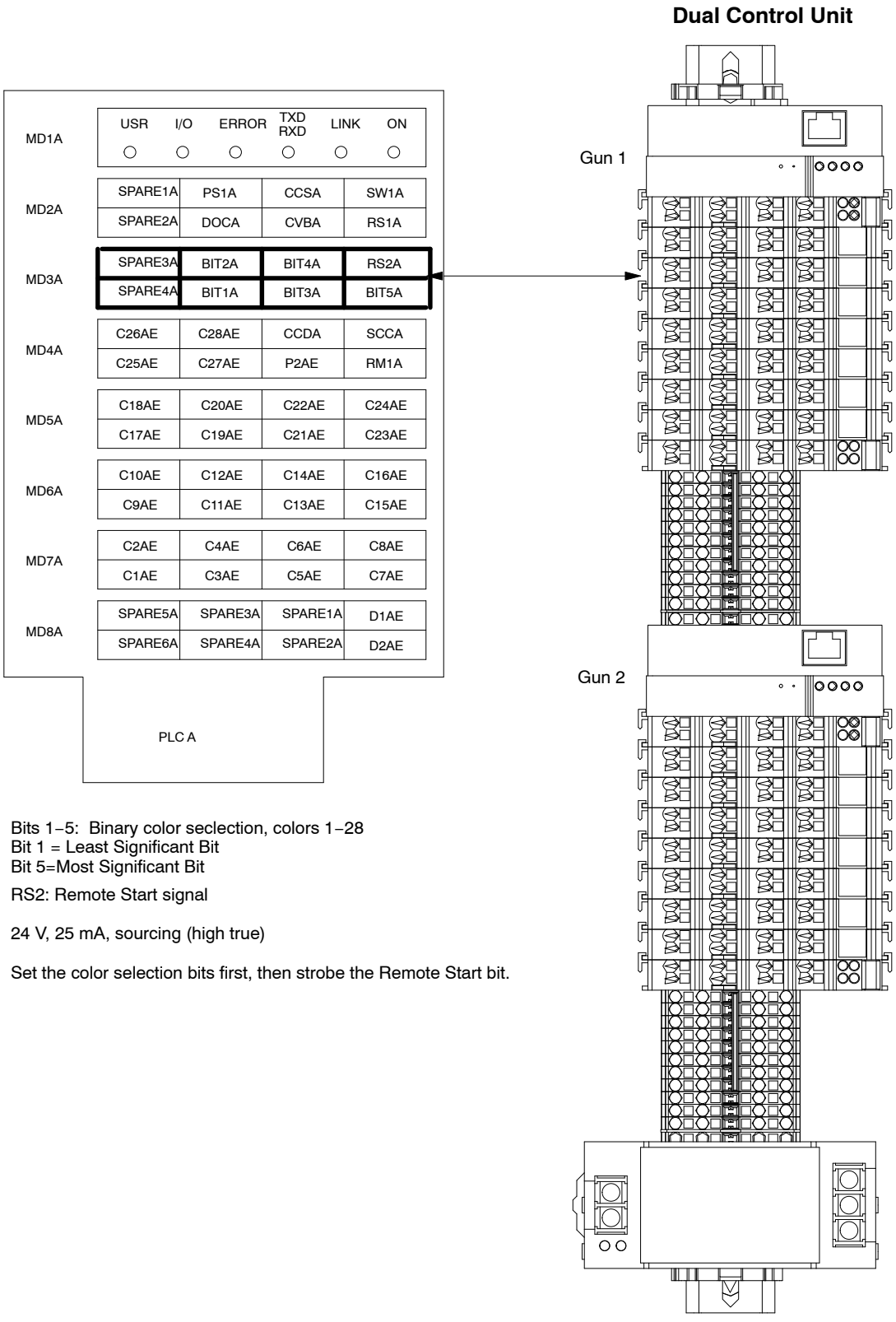


Figure 3-14 Suction and Dump Tubing Installation

Remote Color Selection and Color Change Start Option



Bits 1–5: Binary color seclection, colors 1–28
Bit 1 = Least Significant Bit
Bit 5=Most Significant Bit

RS2: Remote Start signal

24 V, 25 mA, sourcing (high true)

Set the color selection bits first, then strobe the Remote Start bit.

Figure 3-15 Remote Color Selection and Color Change Start Connections

Section 4
Operation

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

Pump Control Panel Setup and Operation

Manifold and Pump Installation

To install a pump and manifold into an existing pump panel:

1. See Figure 4-1. Make sure that the gaskets on the pump (2) and manifold (5) are not damaged. If the gaskets are damaged, replace them.
2. Set the manifold onto the appropriate mounting bracket (4) against the pump panel wall (3). Secure the manifold with the mounting screws (6), but do not tighten the screws.
3. Secure the pump to the pump panel and manifold using the pump mounting screws (1). Tighten the pump mounting screws securely.
4. Tighten the manifold mounting screws securely.
5. Perform the Calibration procedure on page 4-7.

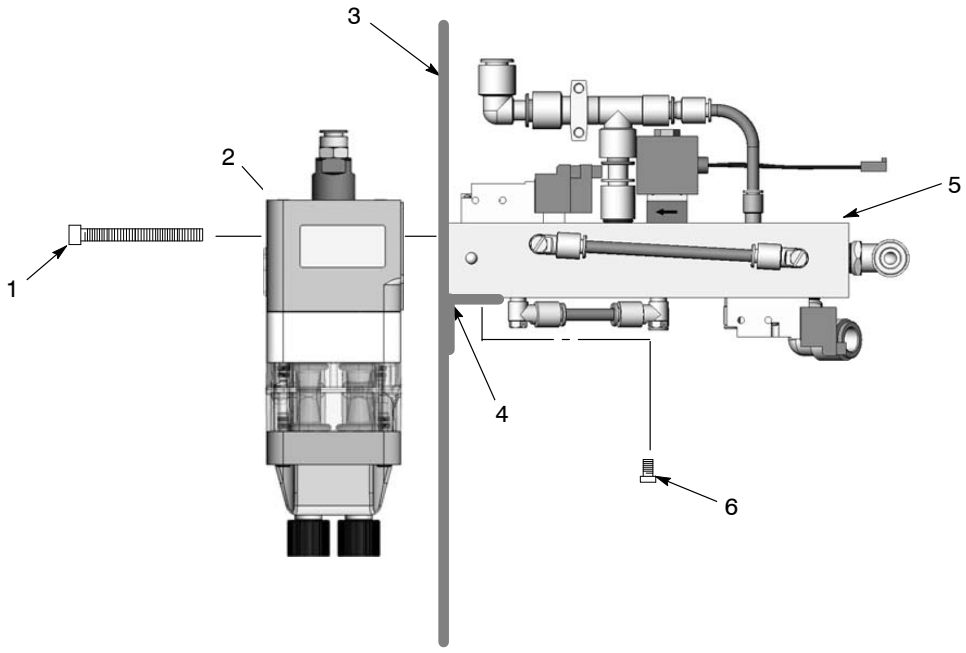


Figure 4-1 Pump and Manifold Installation

1. Mounting screws (2)
2. Pump
3. Pump panel wall
4. Manifold mounting bracket
5. Manifold
6. Manifold mounting screws (2)

Pump Control Board

CAUTION: The circuit board is an electrostatic sensitive device. To prevent damage to the board while handling it, wear a grounding wrist strap connected to the pump panel or other ground.

Electrical and Pneumatic Connections

See Figure 4-2 and the following table for the control board connections. Refer to the circuit drawings in the back of this manual.

Item	Description
XD CR1	Gun Pattern Air Pressure Transducer In/Out
XD CR2	Pump Flow Air Pressure Transducer In/Out
XD CR 3	Not Used
XD CR4	Not Used
J1	Gun Pattern Air Flow Control Valve
J2	Pump Air Flow Control Valve
J3	To Color Control Panel PLC: Dump Output Control (DOC)
J4	To Color Control Panel PLC: Color Valve Back purge (CVB)
J5	JTAG Programming/Debug
P1	Manifold Solenoid I/O Harness
P2	To Color Control Panel PLC: Color Change Status (CCS)
P3	DC Power In
P4	To Color Control Panel PLC: Start Color Change (SCC) Color Change Status (CSS) return P1E (Purge 1 Solenoid) To Pump Control Panel: Purge Pilot Manifold Pinch Select Manifold
P5	CAN Out Connector
P6	CAN In Connector
W1	CAN Network Termination Header

Switches and Indicators

See Figure 4-2 and the following table for the switches and indicators on the control board.

Item	Description
SW1	Node Address Switch
SW2	Console Address/Gun Type Switch
PB1	Test Mode Switch (used for calibration)
PB2	Reset Switch
DS1	Power Indicator
DS2	Fault Indicator

P1 and P2 Pinouts

Pin	P1 Function	P2 Function
1	+24 Vdc	Not Used
2	+24 Vdc	Not Used
3	+24 Vdc	Not Used
4	+24 Vdc	Not Used
5	+24 Vdc	Not Used
6	+24 Vdc	Not Used
7	+24 Vdc	Not Used
8	Delivery 2 – Solenoid 6	Not Used
9	Pressure 2 – Solenoid 5	Not Used
10	Suction 2 – Solenoid 4	Not Used
11	Suction 1 – Solenoid 3	Not Used
12	Pressure 1 – Solenoid 2	Not Used
13	Delivery 1 – Solenoid 1	Pull up resistor for CCS
14	Vacuum – Solenoid 7	Color Change Status (CCS)

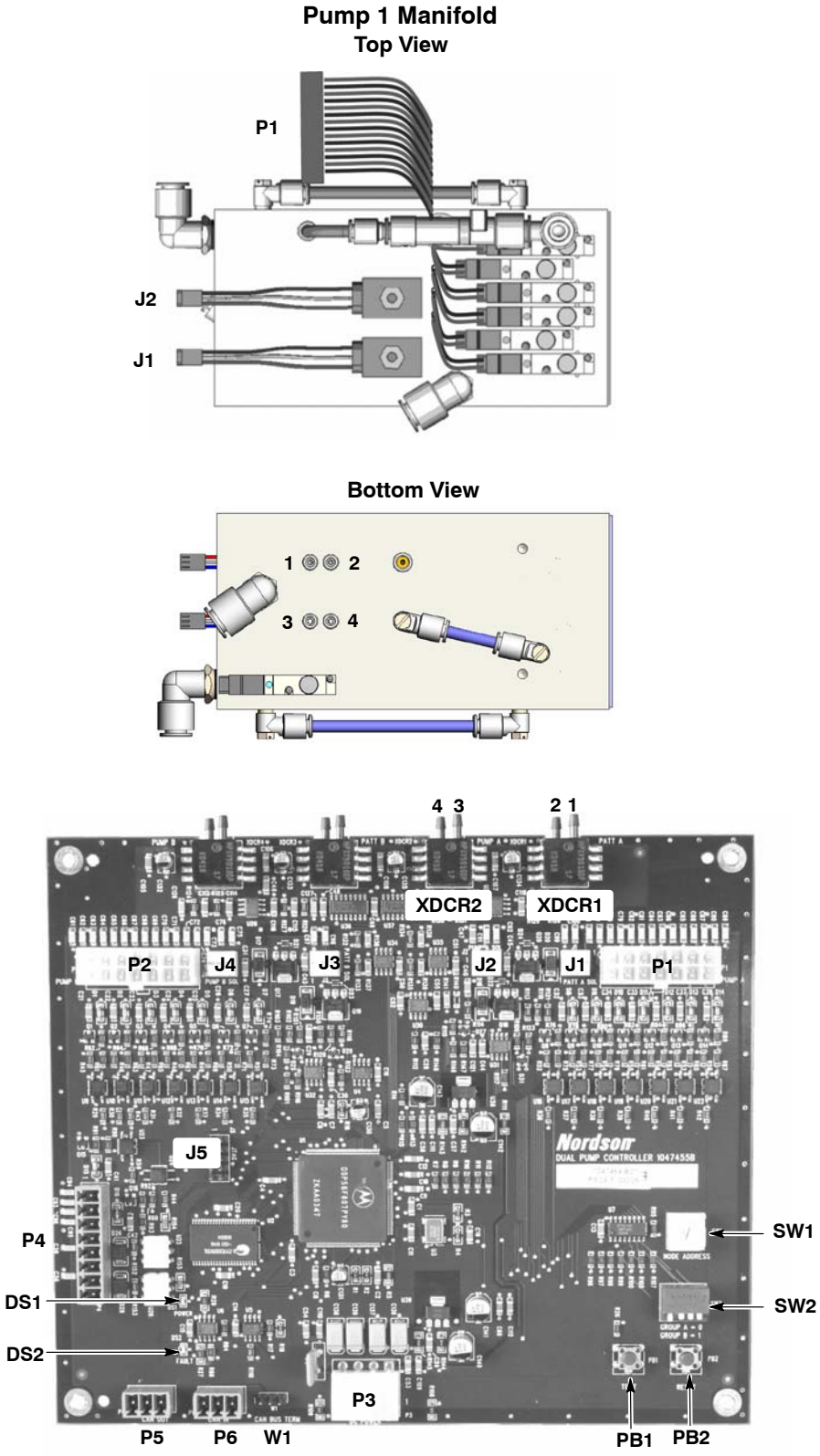


Figure 4-2 Control Board and Manifold Connections

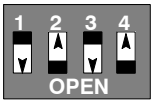
Note: The control board is shipped with air tubing labeled from 4–1 installed in the XDCR fittings. Connect the tubing to the appropriate fittings on the manifolds as illustrated.

Control Board Configuration

See Figure 4-3. Make sure that SW1 and SW2 are set as illustrated for the Color-on-Demand system.

SW1 Position 1

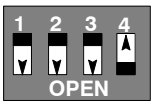
For Color-on-Demand System:



SW2

1 OPEN
2 CLOSED
3 OPEN
4 CLOSED

For Standard Manual Gun System:



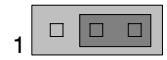
SW2

1 OPEN
2 OPEN
3 OPEN
4 CLOSED

Figure 4-3 SW1 and SW2 Settings

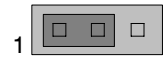
Network Termination

See Figure 4-4. The control board is shipped with a jumper across pins 2 and 3 of the CAN BUS TERM terminals. Move the jumper to pins 1 and 2.



W1
CAN BUS TERM

As Shipped Position
(for Prodigy Standard 2-Gun System)



W1
CAN BUS TERM

Position for Prodigy Color-on-Demand 1 or 2 Gun System

Figure 4-4 CAN BUS TERM Jumper Settings

Configuration Procedure

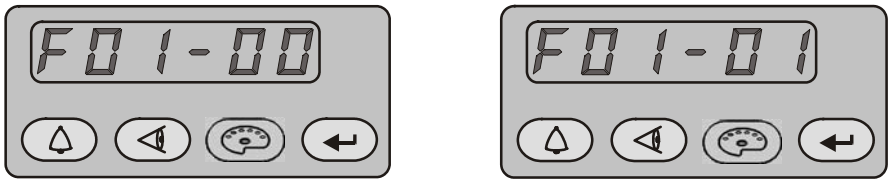
If you replace a control board or manifold, use this procedure to configure the system.

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. See Figure 4-5.

The function numbers are in the form F00–00 (Function Number–Function Value).

To scroll through the function numbers rotate the knob. To select the displayed function number, press the **Enter** button.

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.



Function 01, Value 00 Function 01, Value 01

Figure 4-5 Displaying and Changing Configuration Functions

Use the function controls F-34 through F-37 to set the conveyance air and pattern air calibration values. See Table -2.

Table 4-2 Function Settings

Function Number	Function Name	Function Values	Default HDLV Mode
F34	Conveyance Air Constant A	3.500 to 4.500	4.000
F35	Conveyance Air Constant C	–0.500 to +0.500	0
F36	Pattern Air Constant A	1.500 to 4.500	4.000
F37	Pattern Air Constant C	–0.500 to +0.500	0

See the *Encore HD Manual Powder Spray System Controller* manual for more information on configuration settings.

Air and Powder Tubing Connections

See Figure 4-6 for the air and powder tubing connections for the pump and manifold.

NOTE: Only the XDCR1 and XDCR2 transducers on the control board are used for this application.

Item	Tubing	Function	Item	Tubing	Function
A	10 mm Blue	From Purge Air Source (Line Air Pressure)	**G**	10 mm Blue	Pump Assist/Pattern Air Flow Control 5.9 bar (85 psi)
B	8 mm Clear	Powder Delivery to Spray Gun	**H**	6 mm Blue	Spray Gun Pattern Air Flow Control (to gun)
C	8 mm Clear	Powder Suction from Feed Source	**1 – 2**	4 mm Clear	Pump 1 Pattern Air Pressure Transducer
D	8 mm Clear	Pinch Valve Air Pressure 2.0–2.75 bar (30–40 psi)			
E	10 mm Blue	Vacuum Air Generator Supply 3.45 bar (50 psi)	**3 – 4**	4 mm Clear	Pump 1 Flow Air Pressure Transducer
F	10 mm Blue	Vacuum Generator Vent			

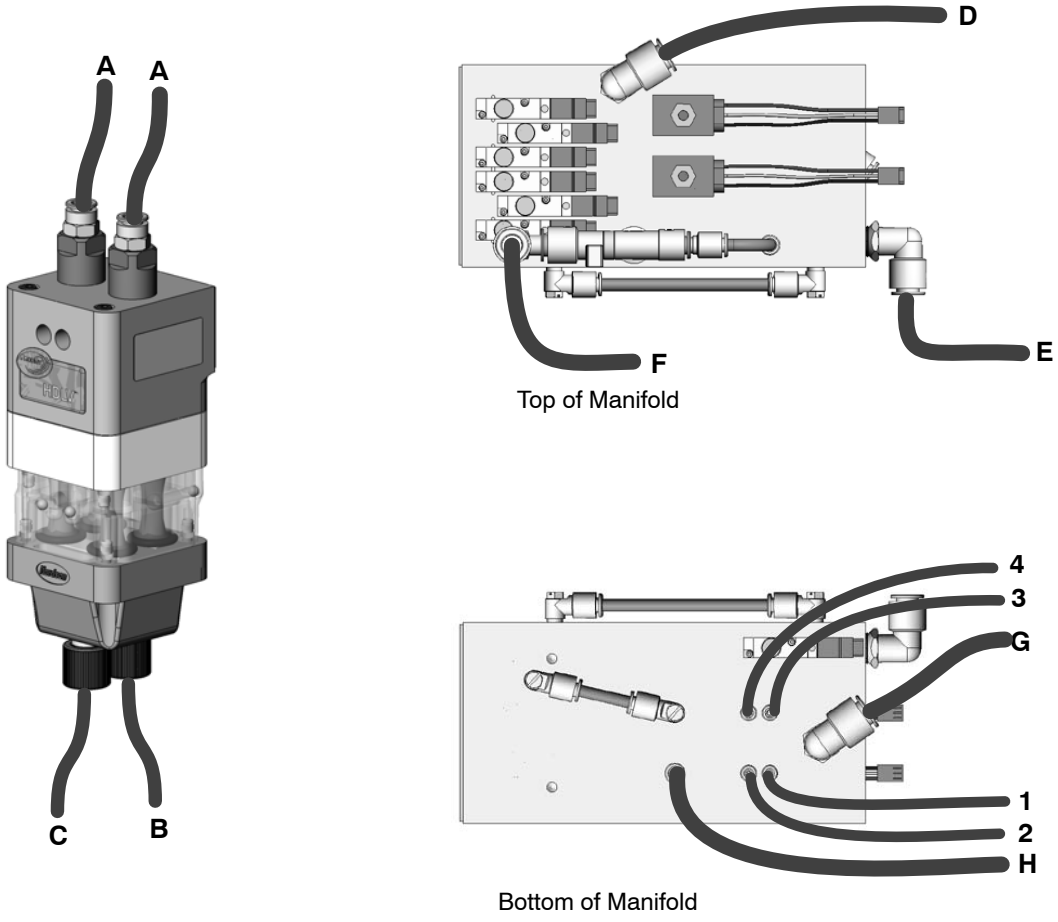


Figure 4-6 Powder and Air Tubing Connections

Operation

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

CAUTION: Do not adjust the regulators inside the pump cabinet. The regulators are factory set and should not be adjusted without guidance from your Nordson representative.

Powder flow rate and pattern air flow is controlled by the gun controller operator interface settings. Refer to the *Operation* section of the controller manual for specific instructions.

The powder flow rate is controlled by specifying a setpoint from 0–100, equivalent to a percent of flow, which corresponds to a predefined pump cycle rate. Increasing the flow rate setting increases the cycle rate; decreasing the flow rate setting decreases the cycle rate.

Spray gun pattern air flow (in either scfm or m^3/hr) is regulated by the pattern air flow control valve on the pump manifold.

The color change cycle, which purges the pump, gun, delivery tubing, and suction lines of powder and loads a new color powder, is controlled by the Purge screen settings on the gun controller.

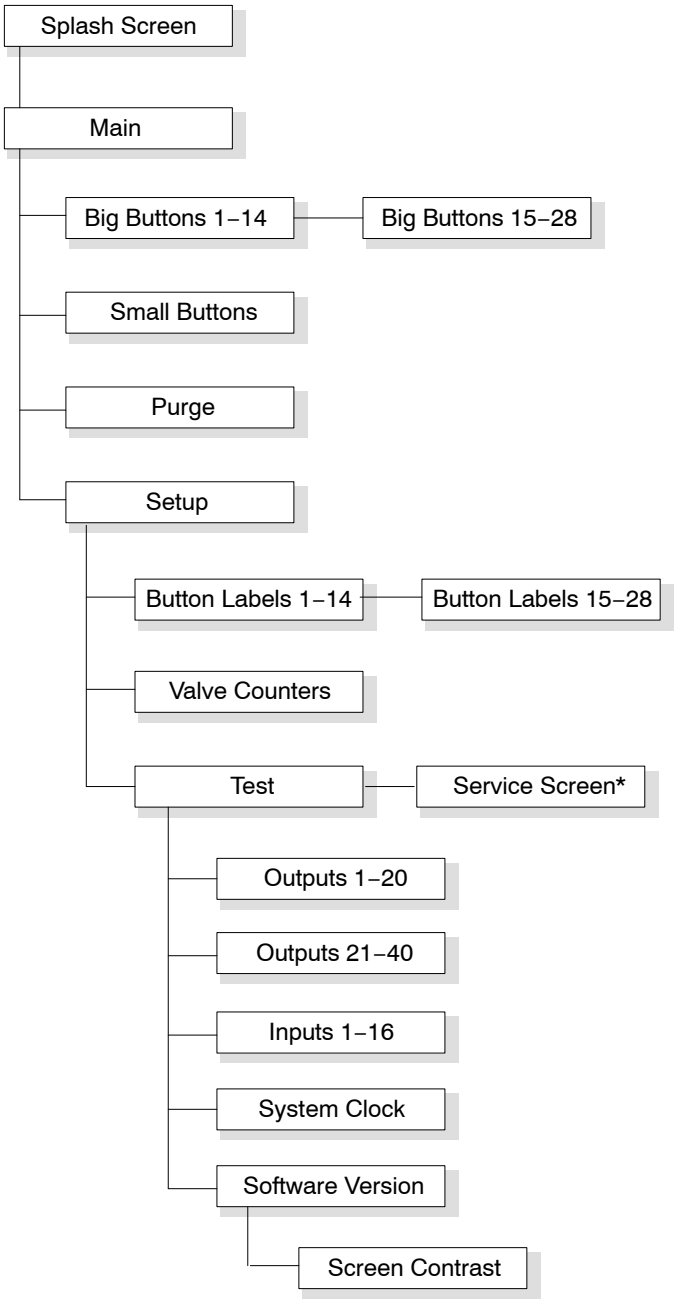
The color change system is controlled by the color control panel PLC and solenoid valves, and the pump control boards.

Colors are selected and color changes are initiated by the operator, using the color controller touch screen and the foot switch, or by a remote signal from a customer process controller.

NOTE: When the fluidizing tubes become clogged with powder, the powder delivery rate will decrease. The gun controller will generate a fault to indicate this condition and notify you that it is time to replace the fluidizing tubes.

Color-on-Demand Controller Setup and Operation

Screen Map



* Service Screen is for use by Nordson CSRs.

Figure 4-7 Color-on-Demand Controller Screen Map

Color Change without Suction Line Purge

When the color controller is turned on, the splash screen appears.

NOTE: Note that the controller power switch only turns on and off the controller. The color change PLC remains powered up until the system power switch is turned off.

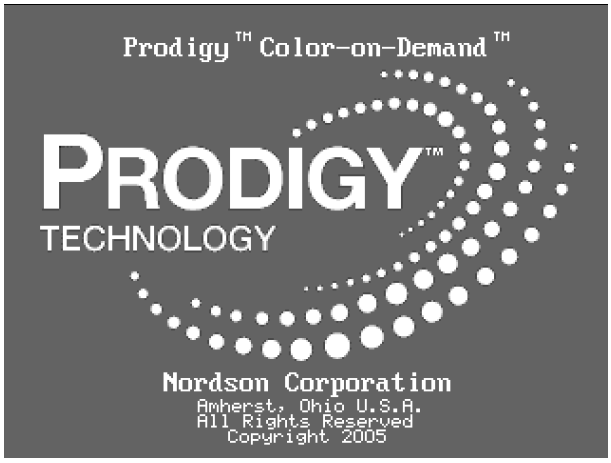


Figure 4-8 Splash Screen

Touch the Splash screen to open the Main screen.

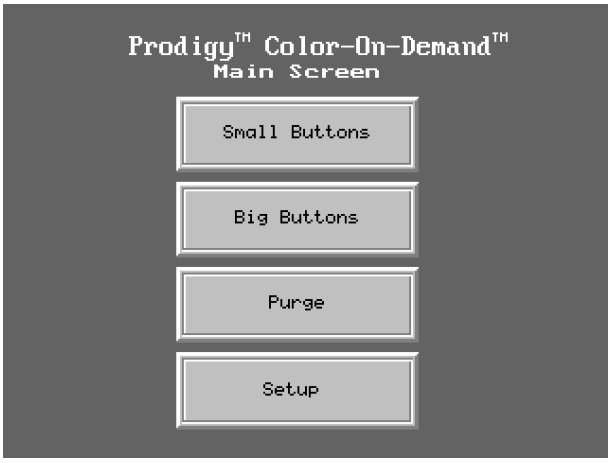


Figure 4-9 Main Screen

Choose the desired button size by touching **Small Buttons** or **Big Buttons**.

The Small Buttons screen has all 28 color buttons on one screen:

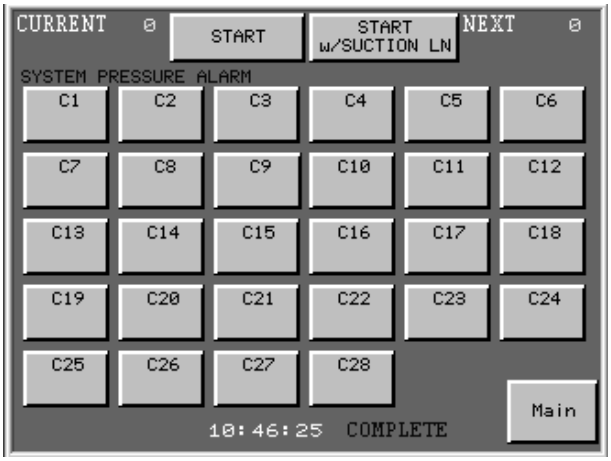


Figure 4-10 Small Buttons Screen

The Big Buttons screens have 14 color buttons on each of two screens:

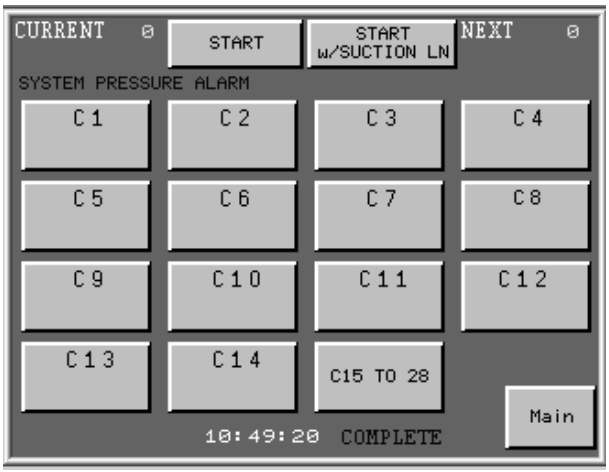


Figure 4-11 Big Buttons Screen

To change colors, touch the desired color button then the **Start** button, or touch the Start button and then select a color, or press the foot pedal then touch the desired color button.

After starting a color change with the foot pedal or Start button, you have approximately 11 seconds (with factory default Purge settings) to select a new color or the system will load the current color again.

When a new color is selected it becomes the Next color while the color in the system is the Current color.

When the color change cycle is complete and the new color is loaded, the Current color and Next color will be the same. COMPLETE appears at the bottom of the screen.

Button Labeling

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

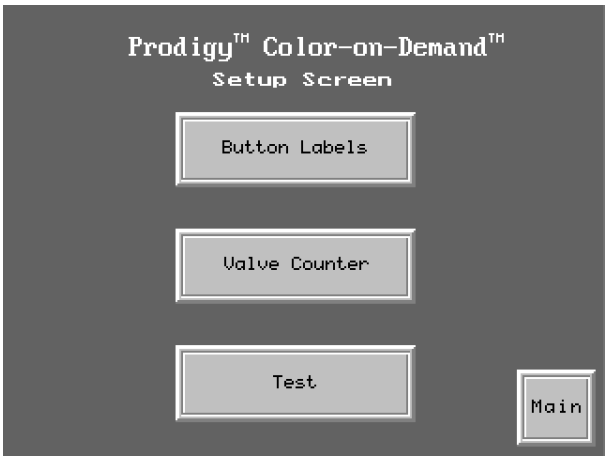


Figure 4-12 Setup Screen

The first screen has label buttons for colors 1 to 14, 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 15–28.

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.

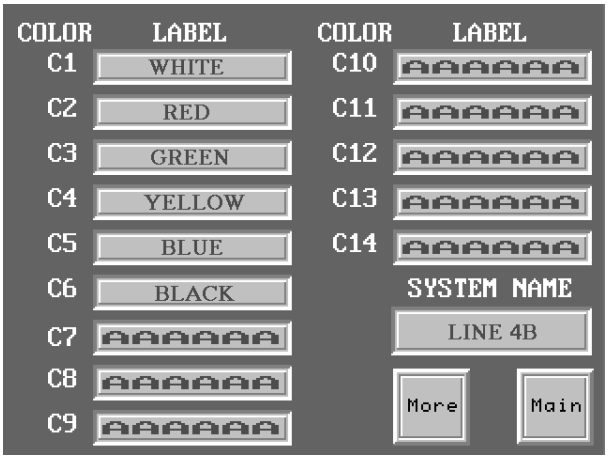


Figure 4-13 Button Label Screen (1 of 2)

Touch **Main** to return to the Main screen.

System Cleaning

Before shutting down the system or removing air pressure from the system, you must clean the system by performing a system purge. You can also use this procedure to clean the system if it loses air pressure while operating.

From the **Main** screen, touch **Purge**. Touch the **Clean** button, then **Start**.

The system performs a color change cycle without loading a new color. COMPLETE appears at the bottom of the screen when the cycle is complete.

Next time the system is started, you must select a color and perform a full color change to load the color.

Figure 4-14 Purge Screen

Color Change with Suction Line Purge

NOTE: To perform this procedure the Hopper Purge function must be enabled. See the Service Screen section on page 5-7 to enable and disable the function.

Remove the suction line to be purged from the feed hopper and place the suction line in a hopper for excess powder disposal (waste).

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

The next screen will offer a reminder to confirm if the 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 screen while system is cleaning the suction line.

When the system is done purging the suction line the screen will revert back to the **Main screen** with the word **Complete** showing at the bottom of the screen.

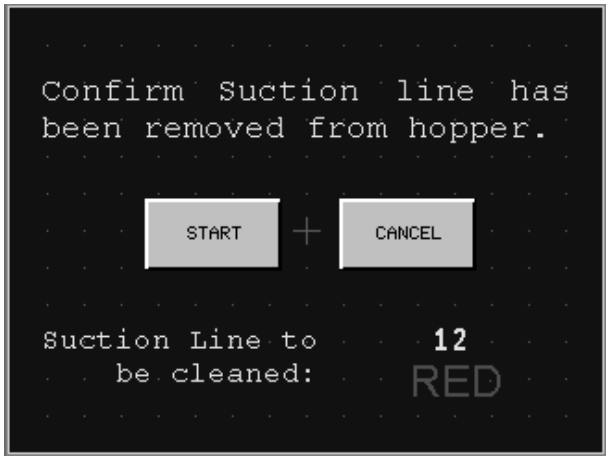


Figure 4-15 Screen display for CURRENT suction line purge

Valve Counters

Use the Valve Counter screen for maintenance. The recommended valve bladder change interval is 30,000 cycles. When this count is reached, you should disassemble the color change manifolds and install new bladders. Replacing the bladders before they fail will prevent color contamination and expensive unscheduled downtime.

Note that the WARNING BLADDER MAINTENANCE message will appear at the set count if enabled from the Service Screen. Refer to page 5-7 for more information on this screen.

Figure 4-16 Valve Counter Screen

System Clock

See Figure 4-17. To set the system clock, go to the **Test** screen, then touch the **Set Clock** button.

Software Version

See Figure 4-17. Go to the **Test** screen, then touch **Software Version**. This screen displays software version information. You may be asked for this information if you call for technical support.

Screen Brightness

After selecting the **Software Version** option, touch the arrow buttons to adjust the brightness of the display screen.

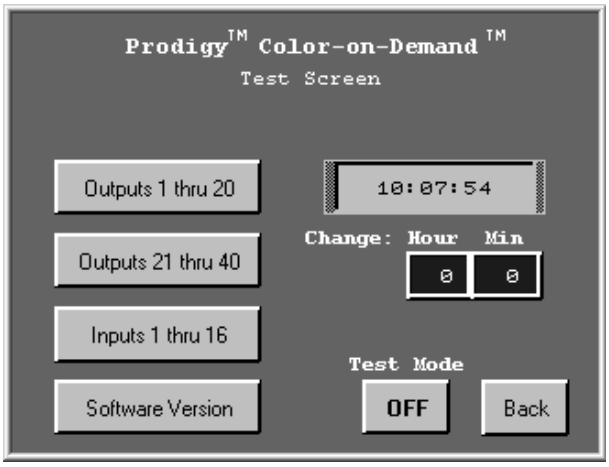


Figure 4-17 Test Screen

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

Pump Control Panel

Problem	Possible Cause	Corrective Action
1. Reduced powder output (pinch valves are opening and closing)	Blockage in the powder tubing to the spray gun	Check the tubing for blockages. Purge the pump and spray gun.
	Defective pump air flow control valve	Clean the pump air flow control valve. Refer to *Flow Control Valve Cleaning* on page 6-2 for instructions. If the problem persists, replace the pump air flow control valve. Refer to *Flow Control Valve Replacement* on page 6-2 for instructions.
	Defective pump check valve	Replace the check valves.
2. Reduced powder output (pinch valves are not opening and closing)	Defective pinch valve	Replace the pinch valves and filter discs.
	Defective solenoid valve	Replace the solenoid valve. Refer to *Solenoid and Flow Control Valve Functions* on page 5-3 to determine which solenoid valve controls the affected pinch valve.
	Defective pump check valve	Replace the check valves.
3. Reduced powder input (loss of suction from feed source)	Blockage in the powder tubing from the feed source	Check the tubing for blockages. Purge the pump and spray gun.
	Loss of vacuum at the vacuum generator	Check the vacuum generator for contamination. Check the pump panel exhaust muffler. If the exhaust muffler appears to be plugged, replace it.
	Defective pump air flow control valve	Clean the pump air flow control valve. Refer to *Flow Control Valve Cleaning* on page 6-2 for instructions. If the problem persists, replace the pump air flow control valve. Refer to *Flow Control Valve Replacement* on page 6-2 for instructions.
4. Spray gun fan pattern changes	Defective pattern air flow control valve	Clean the pattern air flow control valve. Refer to *Flow Control Valve Cleaning* on page 6-2 for instructions. If the problem persists, replace the pattern air flow control valve. Refer to *Flow Control Valve Replacement* on page 6-2 for instructions.

Solenoid and Flow Control Valve Functions

Figure 5-1 identifies the solenoid and flow control valve functions and the corresponding ports on the pump and manifold.

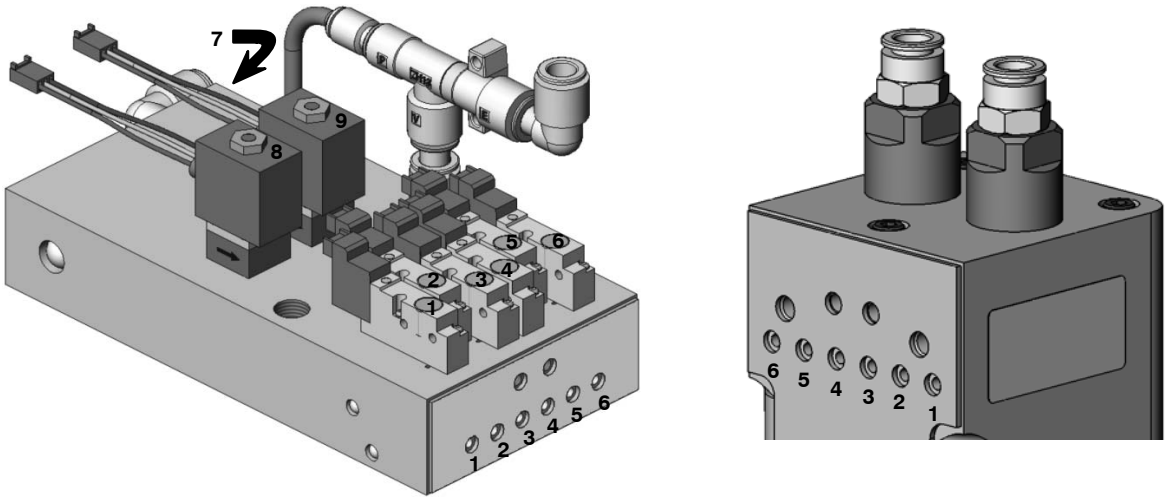


Figure 5-1 Solenoid and Flow Control Valve Functions

Item	Function	Item	Function
1	Left Side Delivery Pinch Valve	**6**	Right Side Delivery Pinch Valve
2	Left Side Fluidizing Tube	**7**	Vacuum Air (on bottom of manifold)
3	Left Side Suction Pinch Valve	**8**	Pump Air Flow Control
4	Right Side Suction Pinch Valve	**9**	Pattern Air Flow Control
5	Right Side Fluidizing Tube		

Color-on-Demand Controller and Control Panel

SYSTEM PRESSURE ALARM: If this message appears on the screens, the system pressure has fallen below 70 psi and color changes cannot be started. Check the system compressed air supply.

For other color change system troubleshooting, use the Output and Input screens along with the color control panel labels. The PLC LEDs, solenoid valves, and air tubing are all coded on the labels so that you can track down any problems. For example, when color 1 is selected for gun1, the LEDs for C1AE on both the PLC and solenoid should light.

Refer also to the diagrams and schematics in the back of this manual.

NOTE: You must turn the Test Mode OFF before you can exit the Test screen.

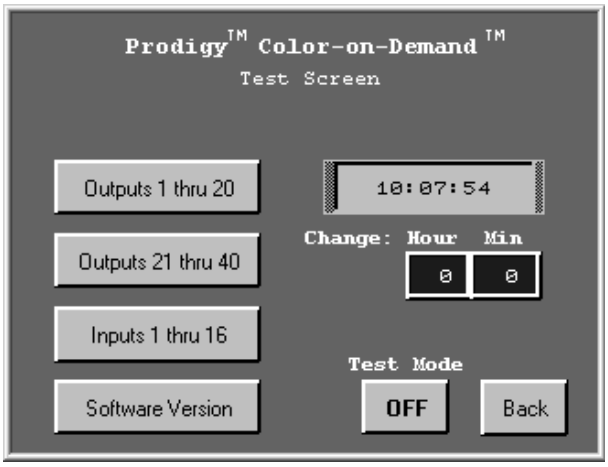


Figure 5-2 Test Screen

NOTE: Before triggering any outputs from the test screens, it is strongly recommended that you do a system purge. Refer to System Cleaning on page 4-14.

On either of the Output screens, touch the Test button to toggle the Test mode ON or OFF, then touch an output button to turn the device on and off.

Inputs

This screen shows the status of the input signals. The LEDs on the top two PLC modules (MD2 and MD3), should light when the inputs are on. Module 2 handles inputs from the system, while module 3 handles a binary 5 bit color selection signal and color change start signal from a remote customer device.

Figure 5-3 Inputs 1–16 Screen

Input Channel	Code	Function
1	SW1	Not Used
2	RS1	Remote Start 1: Signal from foot pedal pressure switch.
3	CCS	Color Change Status signal from pump control board.
4	CVB	Color Valve Back purge signal from pump control board.
5	PS1	Air pressure switch: prevents color change start if air pressure falls below 70 psi.
6	DOC	Dump Output Control signal from pump control board.
7, 8	Spares	
9	RS2	Remote Start 2: 24V remote start signal from customer device to PLC.
10	BIT 5	Binary 5 bit remote color selection inputs for colors 1 – 28 from customer device to PLC: BIT 1 = Least Significant Bit BIT 5 = Most Significant Bit Set the color selection bits first, then strobe RS2.
11	BIT 4	
12	BIT 3	
13	BIT 2	
14	BIT 1	
15, 16	Spares	N/A

Outputs

Touching the Output screen buttons should light the LEDs on the PLC output modules and on the corresponding solenoid valves, and send an air signal to the appropriate valve bladder.

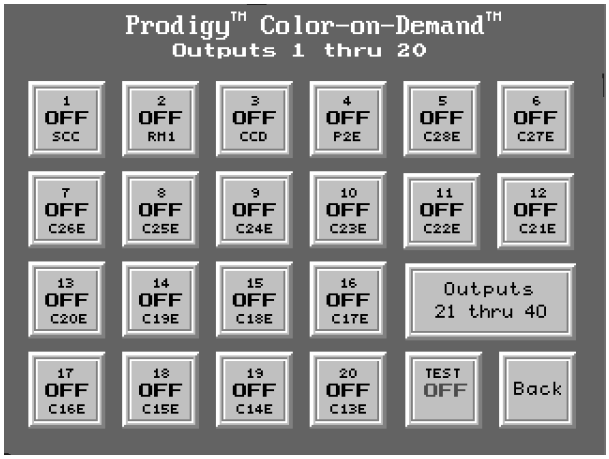


Figure 5-4 Outputs 1–20 Screen

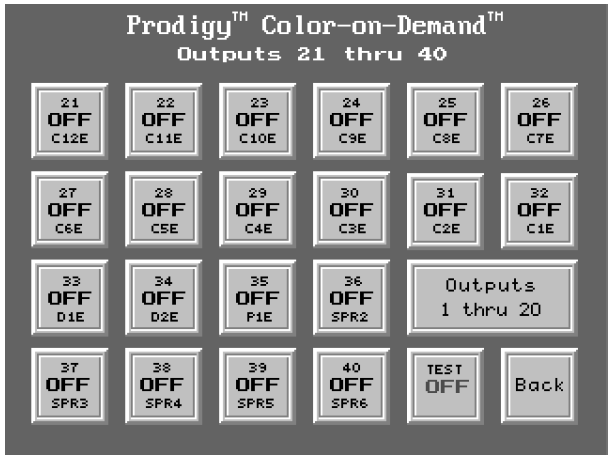


Figure 5-5 Outputs 21–40 Screen

Output Channel	Code	Function
1	SCC	Start Color Change signal to the pump control boards
2	RM1	Remote Monitor 1
3	CCD	Not Used
4	P2E	Purge 2 solenoid: Manifold purge air inlet actuation air
5–32	C28E–C1E	Color 28 to 1 solenoids
33	D1E	Dump 1 solenoid: Manifold dump outlet actuation air
34	D2E	Dump 2 solenoid: Dump valve actuation air
35	P1E	Purge 1 Solenoid
36–40	SPR1–6	Spares

Powder Flow

Lose Flow of one Color: Check for leaks in the siphon tubing from the manifold to the hopper. Check the tubing connections.

Lose Flow of Multiple Colors or All Colors: Check the tubing between the manifold and the dump valve. Check the pinch valve visible inside the dump valve body. If the pinch valve has failed, powder will be visible in the body cavity around the pinch valve.

Service Screen

The Service screen is used by Nordson Customer Service Representatives.

Dump Valve Counter Reset: Resets the counter. Can also be done from the Valve Counter screen.

Dump Valve Counter Preset: Allows the counter to be reset if accidentally reset from the Valve Counter screen.

Warning Count Set: When this value is exceeded by the valve counter, causes the WARNING BLADDER MAINTENANCE message to appear

Total Color Change Counter: Number of color change cycles initiated. Cannot be reset.

Status Arrows: Enables/Disables color change status arrows on operation screens. Default is Off.

Local Start Lockout: Enables/Disables color change start from the controller. Typically enabled when PLC remote color select and start is used.

Hopper Purge Enable: Enables/Disables option to purge the hopper suction line during a color change.

Suction Line Purge Pulses: Number of pulses used to purge the suction line.

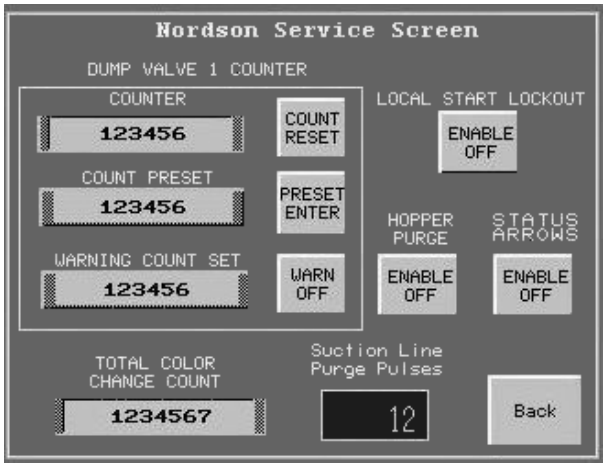


Figure 5-6 Service Screen

Section 6
Repair

Pump Control Panel Repair

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

To reduce downtime, keep a spare manifold in stock to install in place of one being repaired. Refer to *Manifold Parts* on page 7-6 for ordering information.

Repair of the manifold is limited to

- cleaning or replacing the flow control valves
- replacing the solenoid valves

Field replacement of other parts is not possible, due to the need to calibrate the manifold at the factory using equipment not available in the field.

Preparation

NOTE: Tag all air tubing and wiring harnesses before disconnecting them from the manifold.

1. On the color change controller, go to the Purge screen, touch CLEAN and START to perform a system purge.

WARNING: Shut off and lock out system electrical power and relieve system air pressure before performing the following tasks. Failure to relieve air pressure may result in personal injury.

2. Shut off system power and air pressure. Relieve the system air pressure.
3. Tag the pump manifold air tubing, then disconnect the tubing from the manifold.

CAUTION: The circuit board is an electrostatic sensitive device (ESD). To prevent damage to the board while handling it, wear a grounding wrist strap connected to the pump panel or other ground.

4. Tag and disconnect the flow control valve and solenoid valve wiring harnesses from the circuit board below the manifold.
5. Remove the pump from the pump panel.
6. Remove the two screws securing the manifold to the mounting bracket. Take the manifold assembly to a clean work surface.

Flow Control Valve Cleaning

A dirty air supply can cause the flow control valves to malfunction. Follow these instructions to disassemble and clean the flow control valves.

1. See Figure 6-1. Remove the nut (1) and coil (2) from the flow control valve.
2. Remove the two long screws (10) to remove the flow control valve from the manifold.

CAUTION: The valve parts are very small. Be careful not to lose any parts. Do not mix the springs from one valve with those from another. The valves are individually calibrated with the springs installed.

3. Remove the two short screws (3), then remove the valve stem (4) from the valve body (7).
4. Remove the valve cartridge (6) and spring (5) from the stem.
5. Clean the cartridge seat and seals, and the orifice (9) in the valve body. Use low-pressure, compressed air. Do not use sharp metal tools to clean the cartridge or valve body.
6. Install the spring and then the cartridge in the stem, with the plastic seat on the end facing out.
7. Make sure the O-rings furnished with the valve are in place on the bottom of the valve body.
8. Secure the valve body to the manifold with the long screws, making sure the arrow on the valve body points toward the solenoid valves.
9. Install the coil on the stem, with the coil wiring pointing away from the solenoid valves. Secure the coil with the nut.

Flow Control Valve Replacement

If cleaning the flow control valve does not correct the flow problem, replace the flow control valve.

See Figure 6-1. Remove the valve by removing the nut (1), coil (2), and long screws (10).

Before installing a new valve, remove the protective cover from the bottom of the valve body (7). Be careful not to lose the O-rings (8) under the cover.

Solenoid Valve Replacement

See Figure 6-1. To remove the solenoid valves, remove the two screws (11) in the valve body and lift the solenoid valve (12) off the manifold.

Make sure the gasket furnished with the new solenoid valve are in place before installing it on the manifold.

Manifold Installation

Refer to *Installation* on page 4-2 for instructions for installing the manifold and pump into the pump panel.

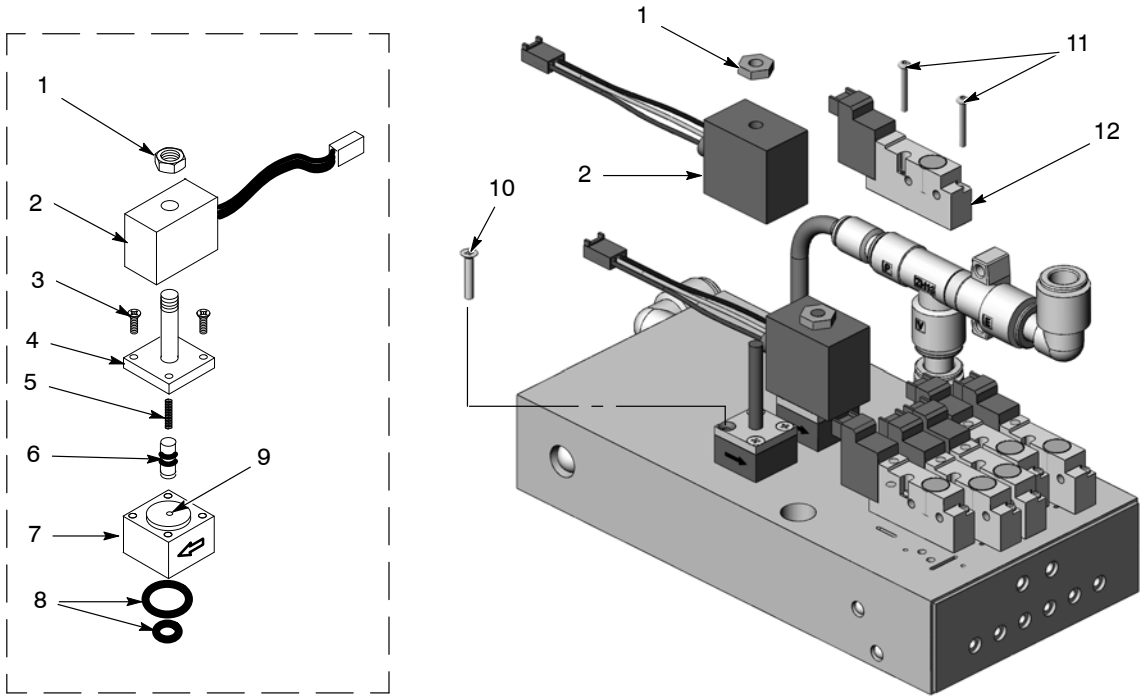


Figure 6-1 Manifold Repair

1. Nut
2. Coil
3. Short screws (2)
4. Valve stem
5. Spring
6. Cartridge
7. Valve body
8. O-rings (2)
9. Orifice
10. Long screws (2)
11. Screws (2)
12. Solenoid valve

Color-on-Demand Controller and Control Panel Repair

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

WARNING: Before making repairs to any component of the system, disconnect and lockout power at the system disconnect. Shut off the system air supply at the ball valve on the pump panel and relieve the system air pressure.

Repair of the Color-on-Demand controller and color control panel is limited to replacement of components. Refer to to the foldouts in the back for pneumatic and electrical diagrams.

Manifold Repair

The color change manifold consists of three identical valve modules connected together with tubing and mounted on a V-shaped panel.

Repair of the manifold modules consists of disassembly, cleaning, and reassembly. The following kits are available for repair:

- Bladder Kit: 10 valve bladders and filter discs
- O-ring Kit: 12 O-rings for tubing connections

Repair Procedure

See Figure 6-2.

1. Disconnect the air tubing from the elbow fittings (1).
2. Unscrew the side lock knobs (8) and pull the powder tubing out of the ports.
3. Unscrew the top and bottom lock knobs.
4. Remove the fasteners securing the module bracket to the panel. Save the fasteners for reuse.
5. Lift the module away from the panel and move it to a clean workbench.
6. Unscrew the nut (5) securing the ground jumper (7) to the bracket stud. Remove the nut, lock washer (6), and flat washer (4).
7. Remove the 16 socket screws (2) securing the cover (17) to the manifold and lift the cover off the manifold.
8. Remove the filter discs, valve bladders, and bladder supports (10, 11, 12) from the manifold.
9. Remove the bladder supports from the valve bladders.
10. Blow out the manifold, cover, and bladder supports. Make sure all traces of powder have been removed.

11. Insert the bladder supports into the new valve bladders, with the hole closest to the end of the support going in first.
12. Insert the new valve bladders into the manifold, with the flat edges on the flanges facing to the center of the manifold.
13. Install the new filter discs on the cover.
14. Install the cover on the manifold and thread the 16 screws in finger tight.
15. Tighten the screws in a crisscross pattern, a turn at a time, until all are tight. Be careful not to overtighten the screws or the manifold threads could be damaged.
16. Secure the ground strap to the module bracket with the flat washer, lock washer, and nut.
17. Install the manifold on the panel.
18. Slide the lock knobs, then the O-rings (9), on the powder tubing.
19. Insert the tubing into the manifold ports until it bottoms out, then screw the lock knobs into the ports until tight.

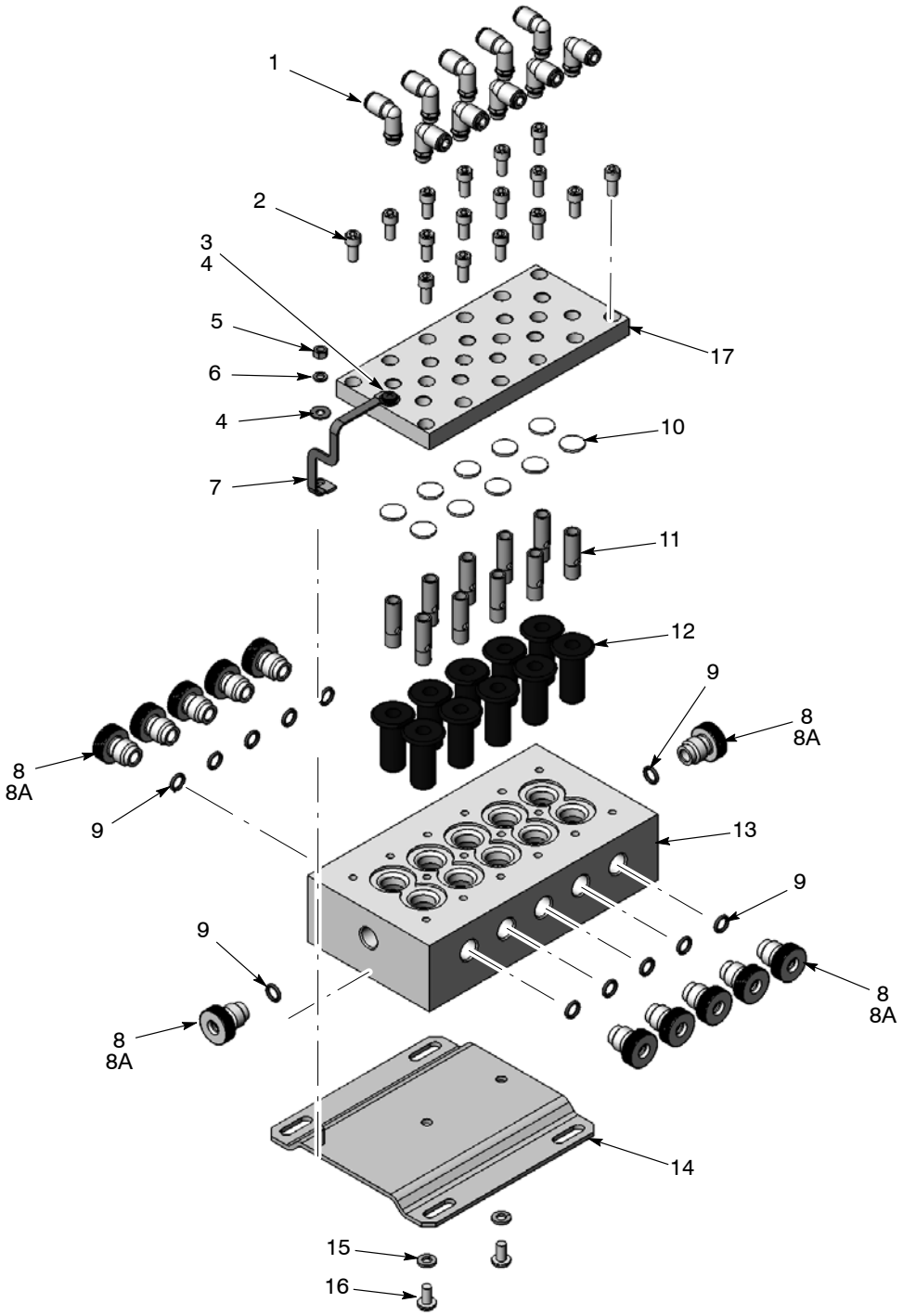


Figure 6-2 Manifold Exploded View

Dump Valve Repair

See Figure 6-3. Use the insertion tool shipped with the HDLV pump pinch valve kit to install the dump valve pinch valve Refer to the HDLV pump manual 1053244 for a detailed pictorial procedure.

1. Remove the 8 socket head screws from the valve caps and remove the caps.
2. Place the valve body in a padded vise.
3. Grasp the large bottom flange of the pinch valve and pull it out of the valve body.
4. Clean the valve body.
5. Install the insertion tool through the valve body. Put the UP end of the new pinch valve in the tool. The UP end of the pinch valve fits into the smaller counterbore in the valve body.
6. Pinch the UP end of the pinch valve through the insertion tool and pull on the other end of the tool until the pinch valve is through the valve body.
7. Install the cap with the 12 mm fitting over the UP end of the pinch valve, and the cap with the 8 mm fitting on the other side, and tighten the screws in a crisscross pattern. Do not overtighten the screws or the valve body threads could be damaged.

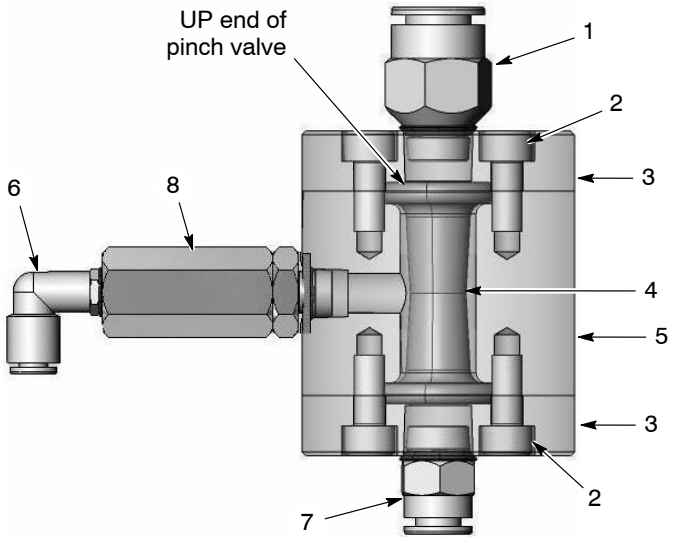


Figure 6-3 Dump Valve Cross-Section View

Section 7
Parts

Introduction

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

Reference Documentation

For additional information related to other components in the system, reference the following documentation:

Document Title	Document Part Number
Encore HD and XT Manual Powder Spray System Controller	1604870
Encore HD Manual Powder Spray Gun	1604869
Prodigy HDLV Pump	1081195
Encore HD Manual Powder Spray System with Prodigy Color-on-Demand Operator Card	1605548

Using the Illustrated Parts List

Numbers in the Item column correspond to numbers that identify parts in illustrations following each parts list. The code NS (not shown) indicates that a listed part is not illustrated. A dash (—) is used when the part number applies to all parts in the illustration.

The number in the Part column is the Nordson Corporation part number. A series of dashes in this column (- - - - - -) means the part cannot be ordered separately.

The Description column gives the part name, as well as its dimensions and other characteristics when appropriate. Indentions show the relationships between assemblies, subassemblies, and parts.

- If you order the assembly, items 1 and 2 will be included.
- If you order item 1, item 2 will be included.
- If you order item 2, you will receive item 2 only.

The number in the Quantity column is the quantity required per unit, assembly, or subassembly. The code AR (As Required) is used if the part number is a bulk item ordered in quantities or if the quantity per assembly depends on the product version or model.

Letters in the Note column refer to notes at the end of each parts list. Notes contain important information about usage and ordering. Special attention should be given to notes.

Item	Part	Description	Quantity	Note
—	0000000	Assembly	1	
1	000000	• Subassembly	2	A
2	000000	• • Part	1	

Single Gun System

Part No.	Description	Quantity
1605368	SYSTEM, Color-on-Demand, manual, single, Encore HD	
1604125	• CONTROL UNIT, interface, Encore XT	1
1603160	• SPRAY GUN ASSY, Encore HD	1
–––––––	• CONTROLLER, COD, single pump, Encore HD	1
1605276	• KIT, ship-with, spray system, Prodigy/Encore HD	1
1067148	• KIT, ship-with, Color-on-Demand, Prodigy	1
1101491	• KIT, controller interface	1

Dual Gun System

Part No.	Description	Quantity
1605369	SYSTEM, Color-on-Demand, manual, dual, Encore HD	
1604125	• CONTROL UNIT, interface, Encore XT	2
1603160	• SPRAY GUN ASSY, Encore HD	2
–––––––	• CONTROLLER, COD, dual pump, Encore HD	1
1605276	• KIT, ship-with, spray system, Prodigy/Encore HD	2
1067148	• KIT, ship-with, Color-on-Demand, Prodigy	2
1101491	• KIT, controller interface	2

Pump Panel Replacement Parts

See Figure 7-1.

Item	Part	Description	Quantity	Note
1	303132	VALVE, $^3/_4$ in. I/O, air operated	AR	A
2	–––––––	MANIFOLD ASSEMBLY, HDLV pump control	AR	A, B, D
3	1081194	PUMP ASSEMBLY, HDLV	AR	A
4	1043906	POWER SUPPLY, 24, 5, 12 VDC, 60 W	1	F
5	334805	FILTER, line, RFI, power, 10A	1	
6	334806	SWITCH, round, 2 position, 90 degree	1	
7	288806	CONTACT BLOCK, 2 N.O. contacts	1	
8	1009090	FUSE, time delay, 215 series, 3.15 A, 5 x 20 mm	2	
9	1099534	VALVE, solenoid, 3 port, 24 V, with adapter	AR	A, E
10	1101498	KIT, PCA replacement, Prodigy pump control	1	B
11	1034396	MUFFLER, exhaust, $^1/_4$ in. NPT male	AR	C
12	1062366	FILTER, air, $^1/_2$ in. NPT	1	
NS	1064136	• FILTER ELEMENT, air, 5 micron, AF40	1	
13	901151	VALVE, ball, $^1/_2$ in. NPT	1	
14	1064964	SWITCH, pressure	AR	
15	1082612	VALVE, flow control, 4mm x 1/8 UNI	AR	
NS	1604832	HARNESS SET, single air wash	AR	
NS	1604833	HARNESS SET, dual air wash	AR	

NOTE A: Quantities for AR items vary depending on number of guns in system.

B: When replacing manifold, perform calibration procedure as described in Manual Gun Controller manual.

C: When replacing board, refer to instruction sheet shipped with kit for switch settings. Also perform calibration procedure as described in Manual Gun Controller manual.

D: For manifold assembly part numbers refer to manual 1081195.

E: If using an old harness with 3 positions, use the supplied adapter. If using a new a harness with 2 positions, then the supplied adapter can be discarded.

F: Power supply cover kit (1611787) available.

AR: As Required

NS: Not Shown

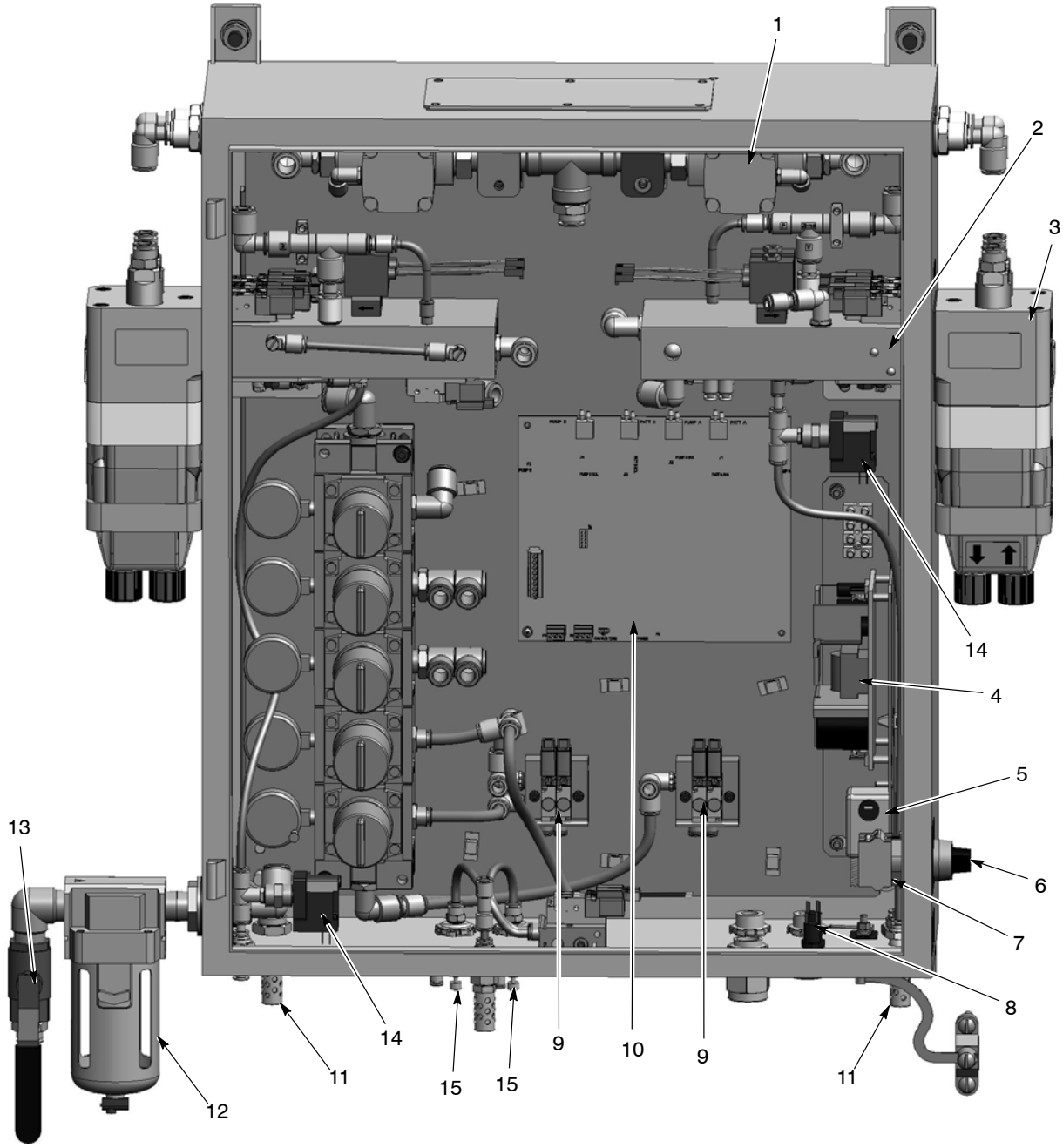


Figure 7-1 Pump Panel Replacement Parts (Dual Pump System Shown)

Manifold Air and Powder Tubing Part Numbers

See Figure 7-2.

Item	Part	Description	Item	Part	Description
A	900740	10 mm Blue polyurethane	**F**	900740	10 mm Blue polyurethane
B	173101	8 mm Clear polyethylene	**G**	900740	10 mm Blue polyurethane
C	173101	8 mm Clear polyethylene	**H**	900742	6 mm Blue polyurethane
D	173101	8 mm Clear polyethylene	**1, 8**	900617	4 mm Clear polyurethane
E	900740	10 mm Blue polyurethane			

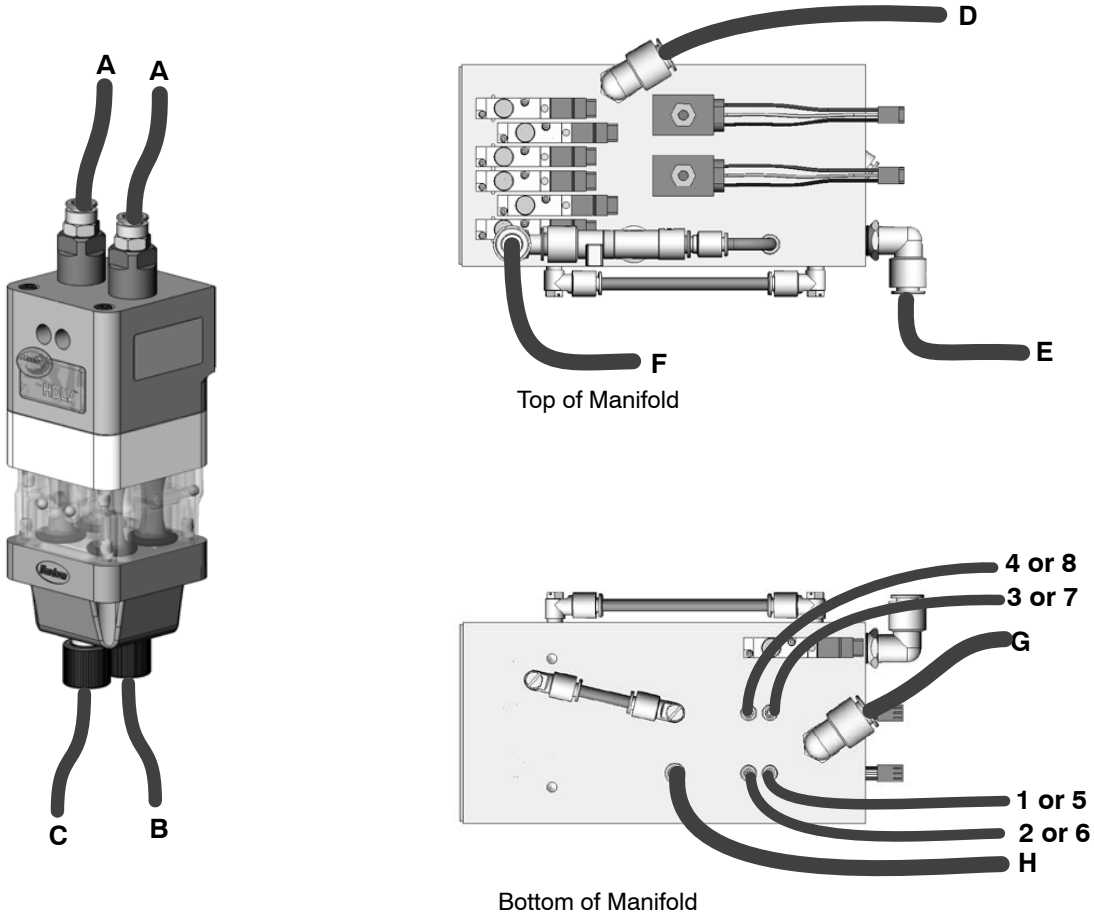


Figure 7-2 Air and Powder Tubing Part Numbers

Color-on-Demand Controller and Control Panel Parts

Controller Kit Parts

See Figure 7-3.

Item	Part	Description	Quantity	Note
—	1101491	KIT, controller interface, Prodigy color change III	1	
1	1101488	• CONTROLLER interface, Prodigy color change III	1	A
2	129592	• KNOB, clamping, M6 x 12 mm long	2	
3	129590	• SPACER, cabinet, friction	2	
4	982649	• SCREW, hex, machine, M10 x 22 mm	1	
5	983405	• WASHER, lock, split, M10, steel, zinc	1	
6	288828	• KIT, bracket, mounting, rail	1	
7	982500	• SCREW, hex, machine, M8 x 16 mm	1	
8	984707	• NUT, hex, M8, steel, zinc	1	
9	240976	• CLAMP, ground w/wire	1	
10	- - - - - -	• BRACKET, base, manual control interface	1	
11	- - - - - -	• BRACKET, post, Prodigy, manual control	1	
12	- - - - - -	• BRACKET, mounting, U, Prodigy, manual control	1	
NOTE A: See Figure 7-3 and accompanying parts list for serviceable parts.				

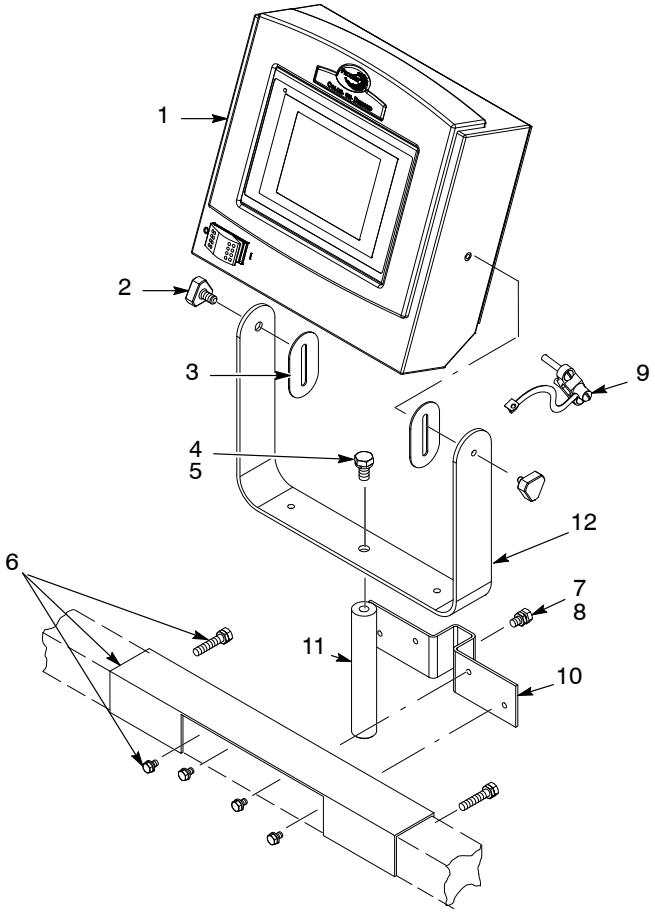


Figure 7-3 Controller Kit Parts

Controller Parts

See Figure 7-4.

Item	Part	Description	Quantity	Note
—	1101488	CONTROLLER, interface, Prodigy color change III	1	
1	1101458	• TERMINAL, display, COD Generation III	1	A
2	322404	• SWITCH, rocker, DPST, dust-tight	1	
3	939122	• SEAL, conduit fitting, 1/2 in., blue	2	
4	984526	• NUT, lock, 1/2 in. conduit	2	
5	324343	• CONNECTOR, conduit, straight, 1/2 in.	1	
6	984702	• NUT, hex, M5, brass	4	
7	983401	• WASHER, lock, split, M5, steel, zinc	4	
8	983021	• WASHER, flat, 0.203 x 0.406 x 0.040 in., brass	1	
9	240674	• TAG, ground	4	
10	271221	• LUG, 45, double, 0.250, 0.438 in.	2	
NOTE A: Use Retrofit Kit 1101490 to replace the Cimrex 69 display terminal with the Proface AGP3300 display terminal.				

Retrofit Kit

See Figure 7-4.

Item	Part	Description	Quantity	Note
—	1101490	KIT, retrofit, display, COD Generation III	1	
1	1101458	• TERMINAL, display, COD Generation III	1	
11	- - - - - -	• PLATE, adapter with studs	1	
12	- - - - - -	• GASKET, adapter plate	1	
13	- - - - - -	• PLATE, adapter	1	
14	983102	• WASHER, lock, SPT, #6, steel, zinc, 14451–CA	4	
15	984101	• NUT, hex, machine, #6–32, steel, zinc, 14441–CA	4	

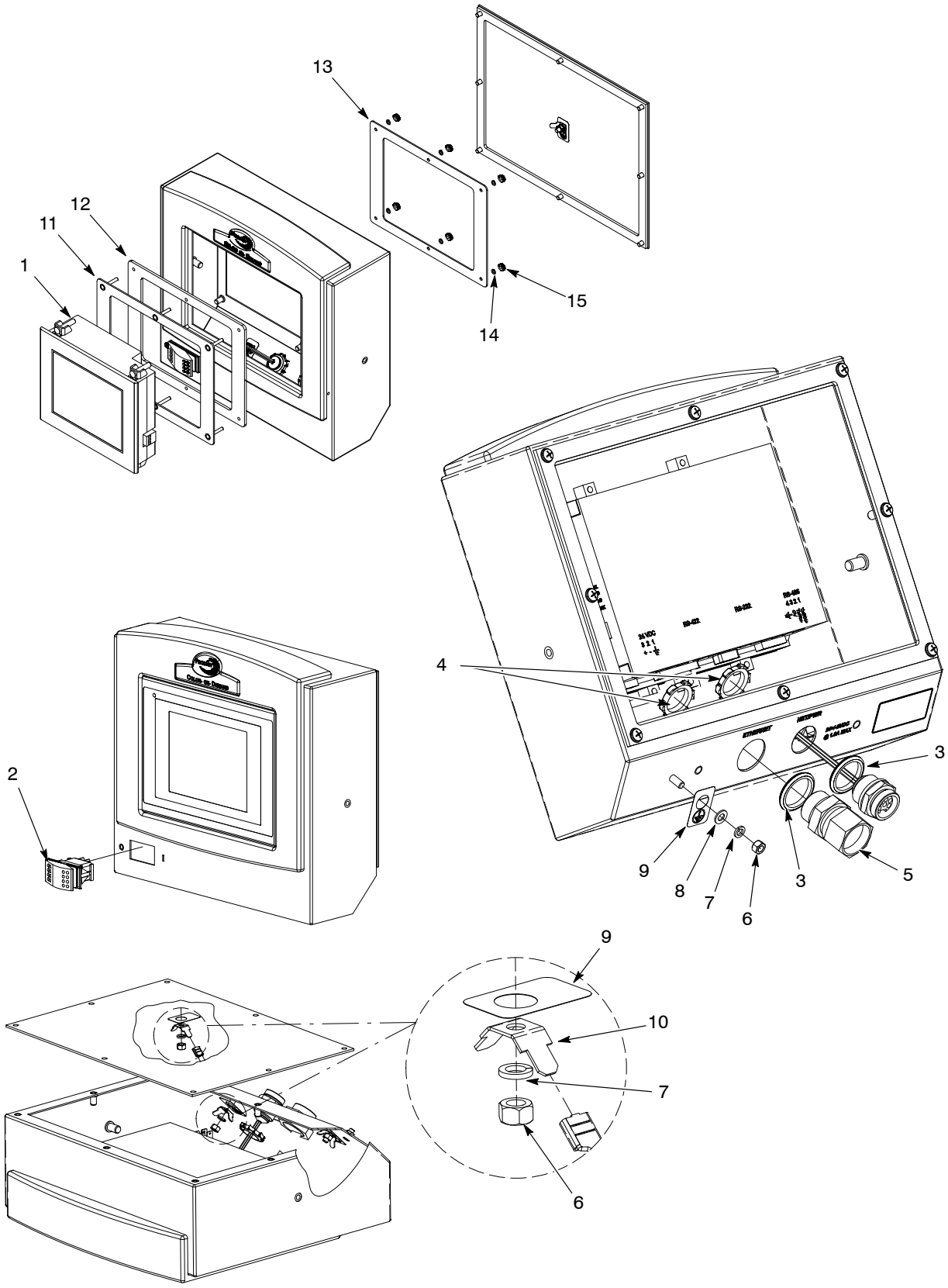


Figure 7-4 Controller Parts

Color Change Control Panel Parts

See Figure 7-5.

Item	Part	Description	Quantity	Note
—	- - - - - -	CONTROLLER, Prodigy, single or dual color changer	1	
1	1101489	• CONTROL UNIT, dual pump color changer, PLC	1	A
2	1101459	• CONTROL UNIT, single pump color changer, PLC	1	A
3	303132	• VALVE, 3/4 in. NPT, air operated	AR	B
4	1095074	• SWITCH, pressure, N.O., 30 psi	AR	B
5	1068324	• VALVE, solenoid, 3 port, 24V, N.O., w/o leads	AR	C
6	1068325	• VALVE, solenoid, 3 port, 24V, N.C., w/o leads	AR	C
NS	173101	• TUBING, polyethylene, 8 mm x 6 mm, natural	AR	D
NS	900742	• TUBING, polyurethane, 6/4 mm, blue	AR	D
NS	900618	• TUBING, polyurethane, 8 mm OD, blue	AR	D
NS	900740	• TUBING, polyurethane, 10 mm OD, blue	AR	D
NS	226690	• TUBING, polyurethane, 12 mm OD, blue	AR	D

NOTE A: Select appropriate control unit for your system. Parts breakdown on following pages.
G: One required per gun.
H: 31 N.O. valves and 1 N.C. valve required per gun.
I: Order in increments of one foot.
AR: As Required
NS: Not Shown

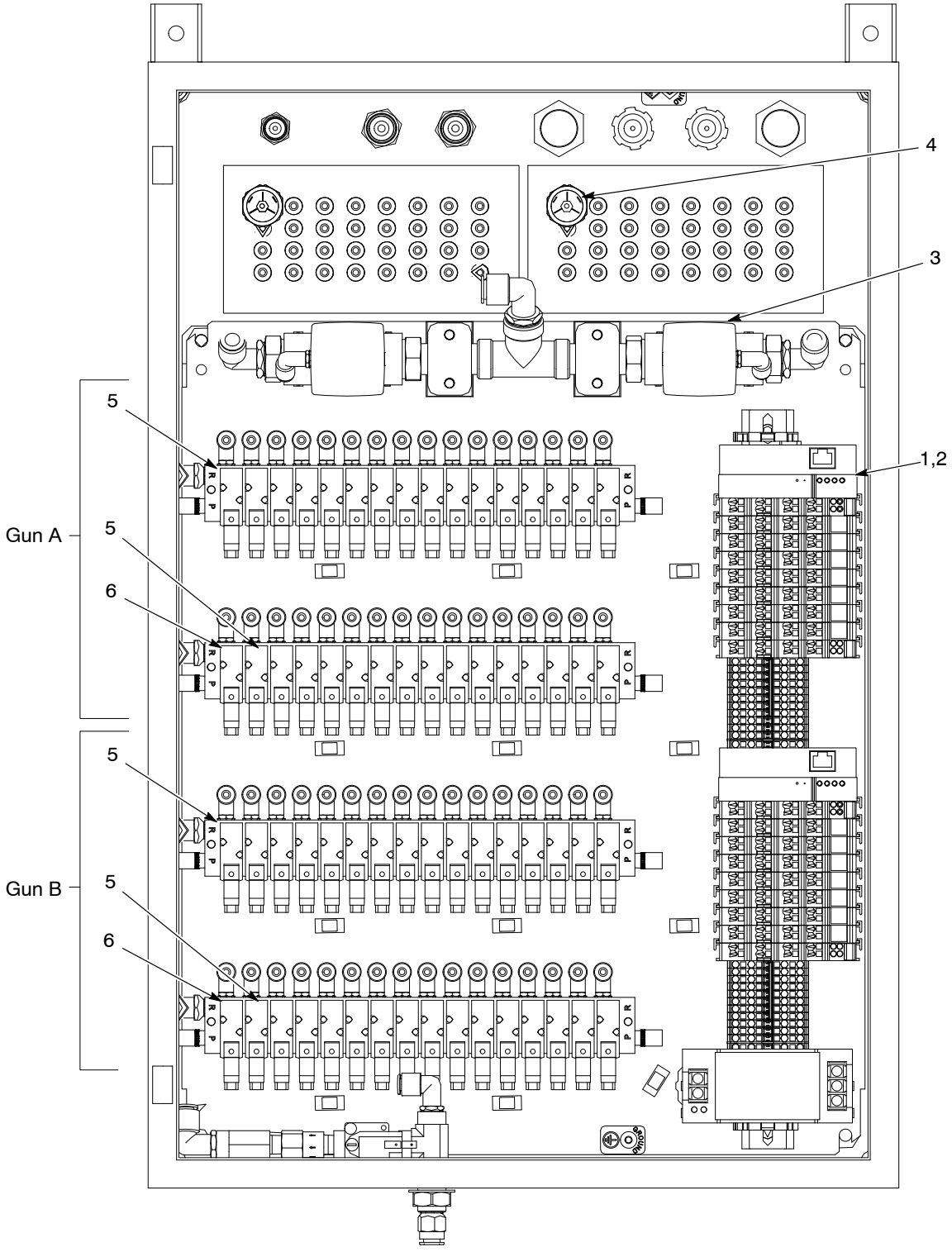


Figure 7-5 Color Control Panel Parts

Control Unit (PLC) Parts

See Figure 7-6.

Item	Part	Description	Quantity	Note
–	1101489	CONTROL UNIT, dual pump color changer, PLC	1	
–	1101459	CONTROL UNIT, single pump color changer, PLC	1	
1	1105978	• CONTROLLER, programmed, COD, Gen III	AR	A, D
2	1064193	• MODULE, 8-channel digital input, Wago, 750-430	AR	B, D
3	1064195	• MODULE, 8-channel digital output, Wago, 750-530	AR	C, D
4	1064191	• MODULE, end, carrier, Wago, 750-600	1	
5	1064192	• POWER SUPPLY, 90W, 24Vdc, 3.75 amps, DIN rail	1	D

NOTE A: Two required for dual control unit, one for single.
B: Four required for dual control unit, two for single.
C: Ten required for dual control unit, five for single.
D: Installation by a qualified Nordson service representative is recommended for these parts.
AR: As Required
NS: Not Shown

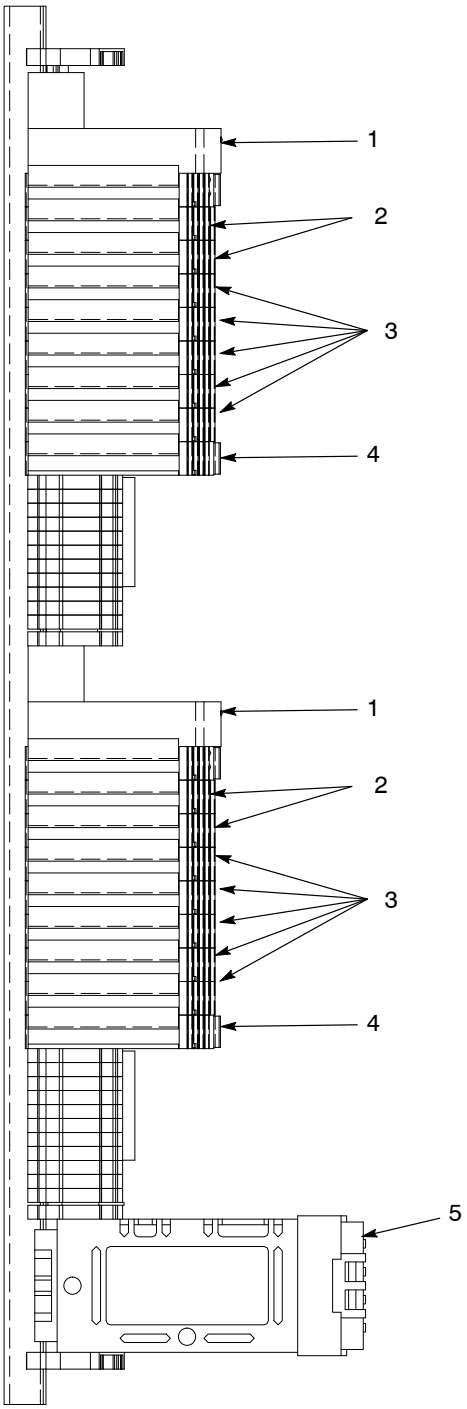


Figure 7-6 Control Unit (PLC) Parts

Ship-With Kit Parts

Part	Description	Quantity	Note
1067148	KIT, ship-with, Color-on-Demand system	1	
1072866	• CABLE, Ethernet CAT5E, 50 ft	1	
248375	• CONDUIT, flexible, bulk, 1/2 in. (50 ft)	AR	A
1058224	• CONNECTOR, Ethernet, RJ45-to-IDC, CAT5	1	
1078555	• BOX, surface mount, Ethernet	1	
226690	• TUBING, polyurethane, 12/8 mm, blue (50 ft)	AR	A
1064948	• SWITCH, foot, air, 3-way, 100 psi	AR	
900742	• TUBING, polyurethane, 6/4 mm, blue (100 ft)	AR	A
1065711	• CABLE, Ethernet crossover, CAT5E, RJ45, 3 ft	1	
------	• UNION, reducer, 12 mm tube x 8 mm tube	1	
972141	• CONNECTOR, male, 6 mm tube x 1/8 in. unithread	2	
911110	• UNION, bulkhead, 12 mm tube x 12 mm tube	2	
933071	• TERMINAL, ringtong, ins, 22–18, 10	1	

NOTE A: Order replacements in increments of one foot.

AR: As Required

Color Change Manifold Parts

See Figure 7-7.

Item	Part	Description	Quantity	Note
–	1094892	MANIFOLD, module, Color-on-Demand, assembly		
1	972126	• CONNECTOR, male, elbow, 6 mm tube x 1/8 in. unithread	10	
2	981225	• SCREW, socket head, 1/4–20 x 0.625 in.	16	
3	1045837	• SCREW, pan head, M5 x 12, w/lockwasher	1	
4	983021	• WASHER, flat, 0.203 x 0.406 x 0.040, brass	2	
5	984702	• NUT, hex, M5, brass	1	
6	983401	• WASHER, lock, split, M5, steel, zinc	1	
7	246458	• JUMPER, ground, 4 in.	1	
8	1047934	• KNOB, lock, powder tube	12	
8A	940117	• O-RING, silicone, .312 x .438 x .063 in.	12	C
9	945115	• O-RING, Viton, 8.00 x 2.00	12	A
10	1080408	• DISC, filter, Prodigy HDLV pump	10	B
11	- - - - - -	• SUPPORT, Color-on-Demand bladder	10	
12	- - - - - -	• VALVE BLADDER, color changer, 0.12 W, , Color-on-Demand	10	B
13	- - - - - -	• MANIFOLD, color changer, Color-on-Demand	1	
14	- - - - - -	• BRACKET, Prodigy color changer	1	
15	983409	• WASHER, lock, split, M6, steel, zinc	2	
16	982499	• SCREW, pan head, slotted, M6 x 12, zinc	2	
17	- - - - - -	• COVER, manifold, color changer, Color-on-Demand	1	

NOTE A: Available in packages of 12, order 1065983 KIT, Color-on-Demand, O-Ring, 12 pack.

B: Available in packages of 10 bladders and 10 filter discs, order 1065982, KIT, Color-on-Demand, bladder, 10 pack.

C: Internal O-ring for lock knob.

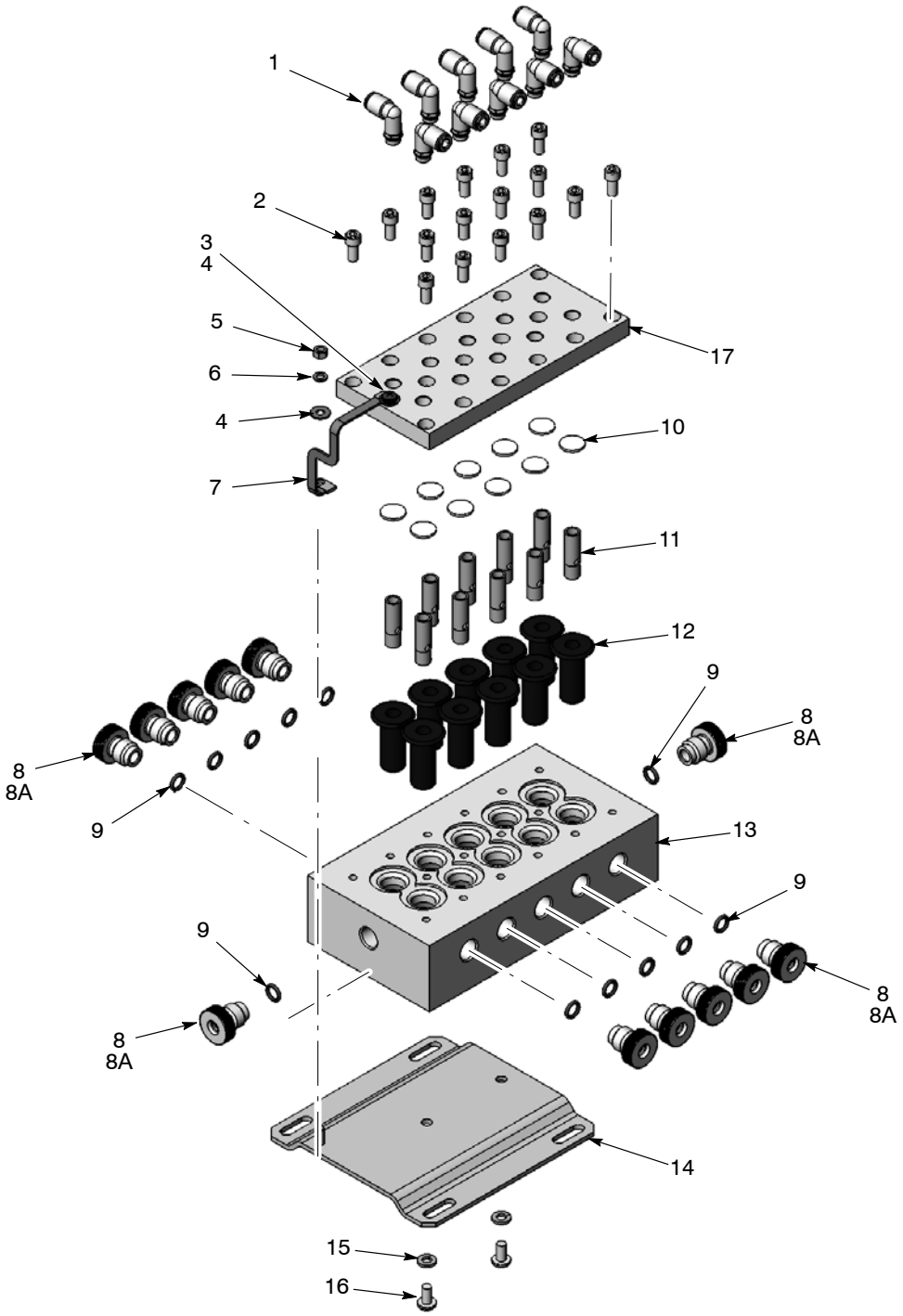


Figure 7-7 Color Change Manifold Parts

Dump Valve Parts

See Figure 7-8.

Item	Part	Description	Quantity	Note
–	1074720	VALVE, dump, Color-on-Demand	1	
1	971104	• CONNECTOR, male, 12 mm x 1/4 in. unithread	1	
2	1064886	• SCREW, socket head, M6 x 14, zinc	8	
3	- - - - - -	• CAP, dump valve, Color-on-Demand	2	
4	1066626	• VALVE, pinch, HDLV pump	1	A
5	1074028	• BODY, dump valve, Color-on-Demand	1	
6	972126	• CONNECTOR, male, elbow, 6 mm x 1/8 in. unithread	1	
7	971121	• CONNECTOR, male, 8 mm x 1/4 in. unithread	1	
8	1075460	FILTER, inline, $^1/_8$-in. NPT	1	
NOTE A: To replace, order 1066626 KIT, dump valve, pinch valve, 4 pack. Use insertion tool shipped with pump pinch valve kit to install.				

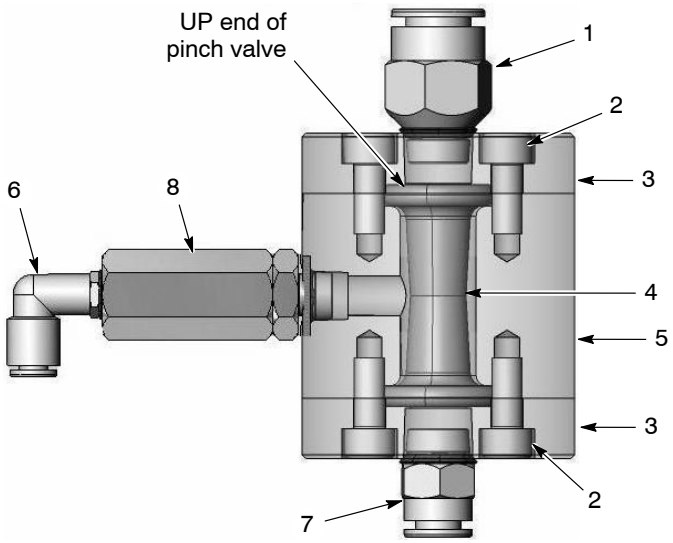
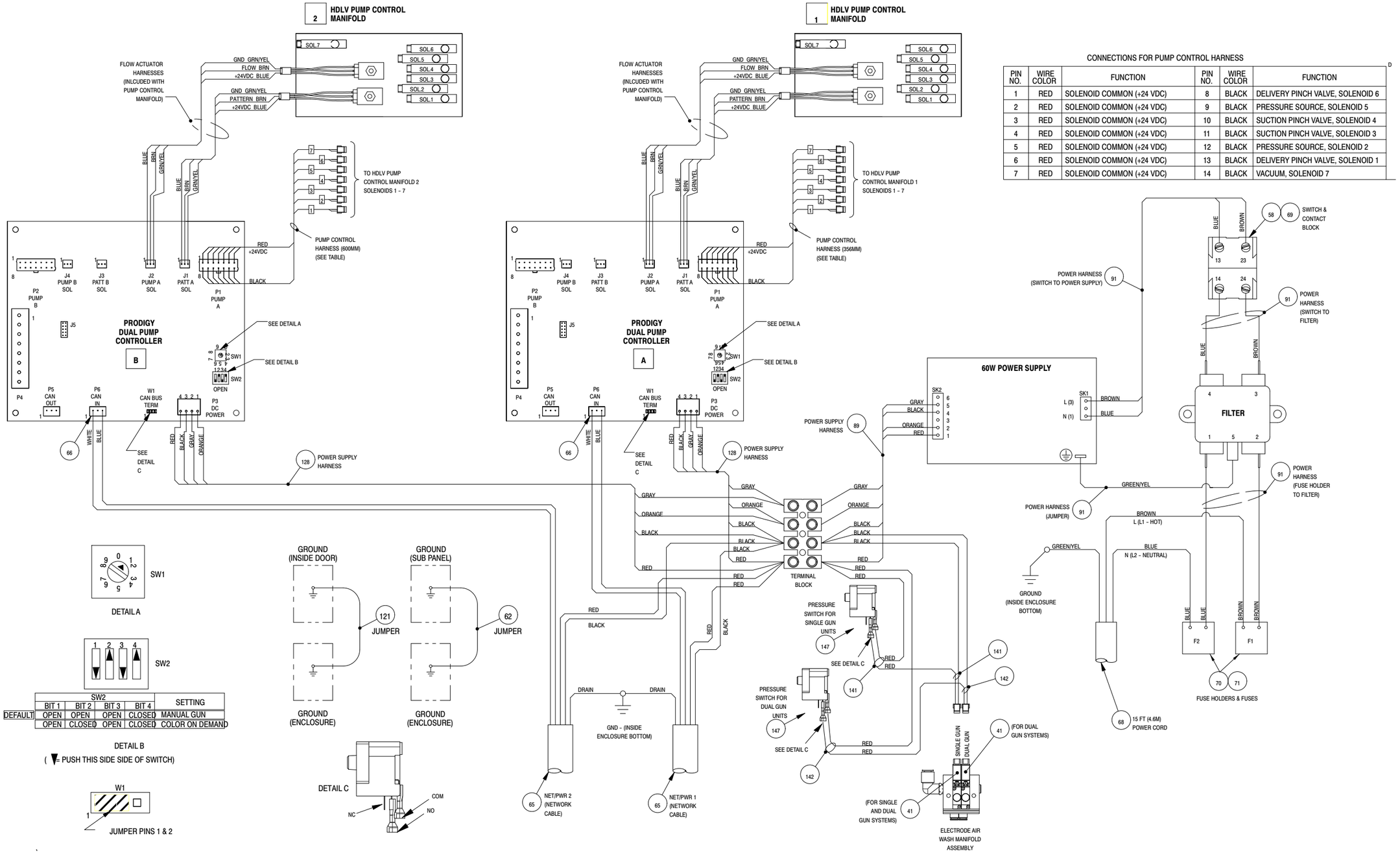


Figure 7-8 Dump Valve Parts

Section 8
System Diagrams

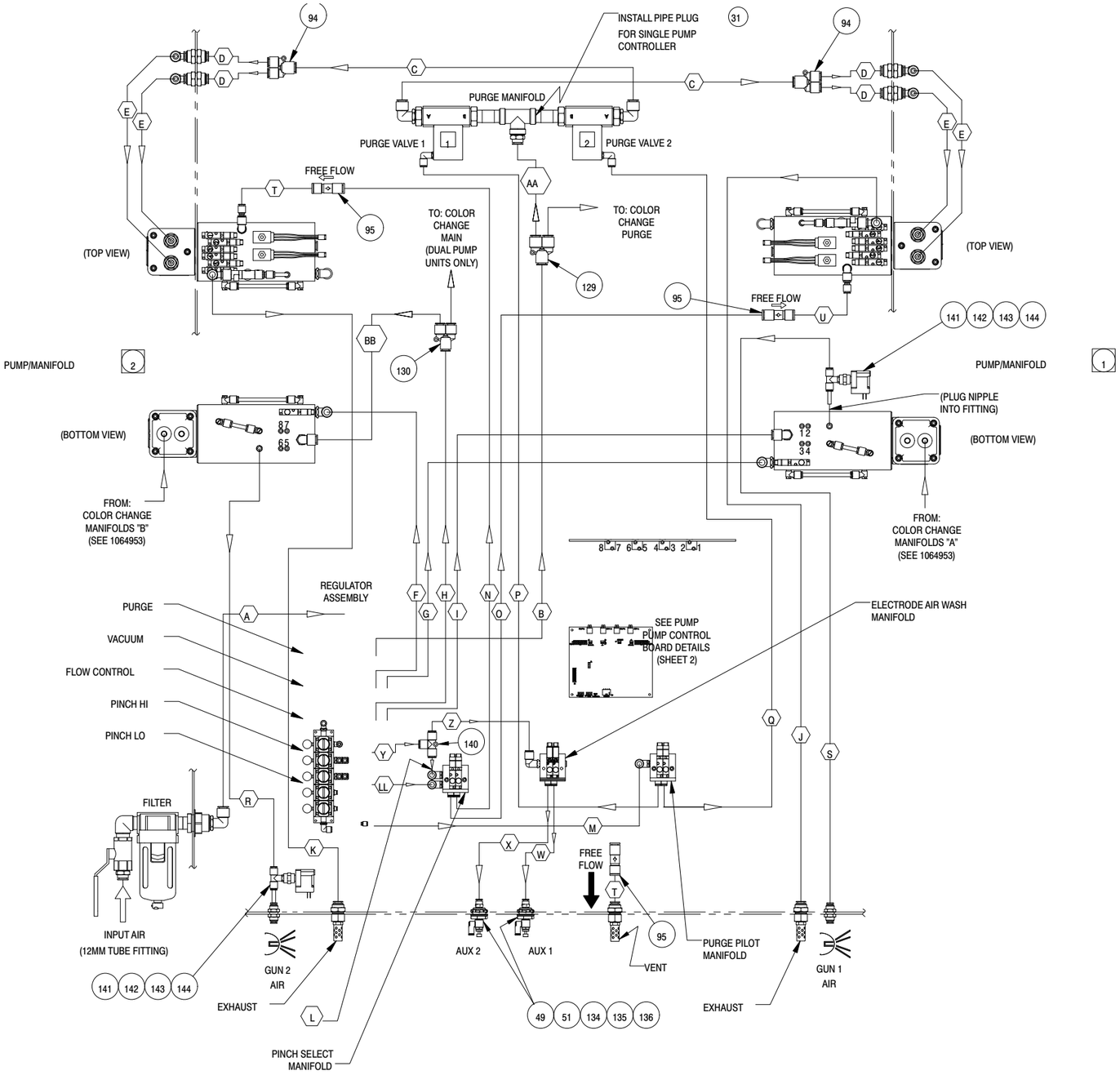


SW2				
	BIT 1	BIT 2	BIT 3	BIT 4	SETTING
DEFAULT	OPEN	OPEN	OPEN	CLOSED	MANUAL GUN
	OPEN	CLOSED	OPEN	CLOSED	COLOR ON DEMAND

CONNECTIONS FOR PUMP CONTROL HARNESS

PIN NO.	WIRE COLOR	FUNCTION	PIN NO.	WIRE COLOR	FUNCTION
1	RED	SOLENOID COMMON (+24 VDC)	8	BLACK	DELIVERY PINCH VALVE, SOLENOID 6
2	RED	SOLENOID COMMON (+24 VDC)	9	BLACK	PRESSURE SOURCE, SOLENOID 5
3	RED	SOLENOID COMMON (+24 VDC)	10	BLACK	SUCTION PINCH VALVE, SOLENOID 4
4	RED	SOLENOID COMMON (+24 VDC)	11	BLACK	SUCTION PINCH VALVE, SOLENOID 3
5	RED	SOLENOID COMMON (+24 VDC)	12	BLACK	PRESSURE SOURCE, SOLENOID 2
6	RED	SOLENOID COMMON (+24 VDC)	13	BLACK	DELIVERY PINCH VALVE, SOLENOID 1
7	RED	SOLENOID COMMON (+24 VDC)	14	BLACK	VACUUM, SOLENOID 7

Figure *8-1 Pump Control Panel Wiring Diagram*



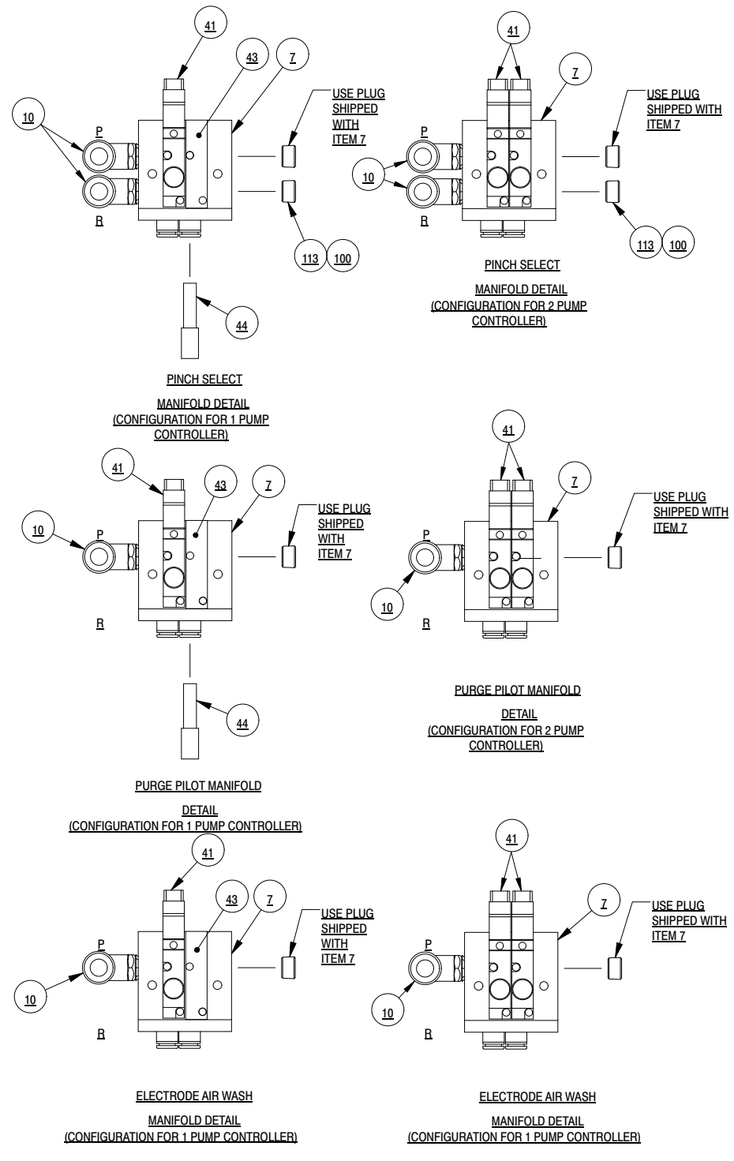
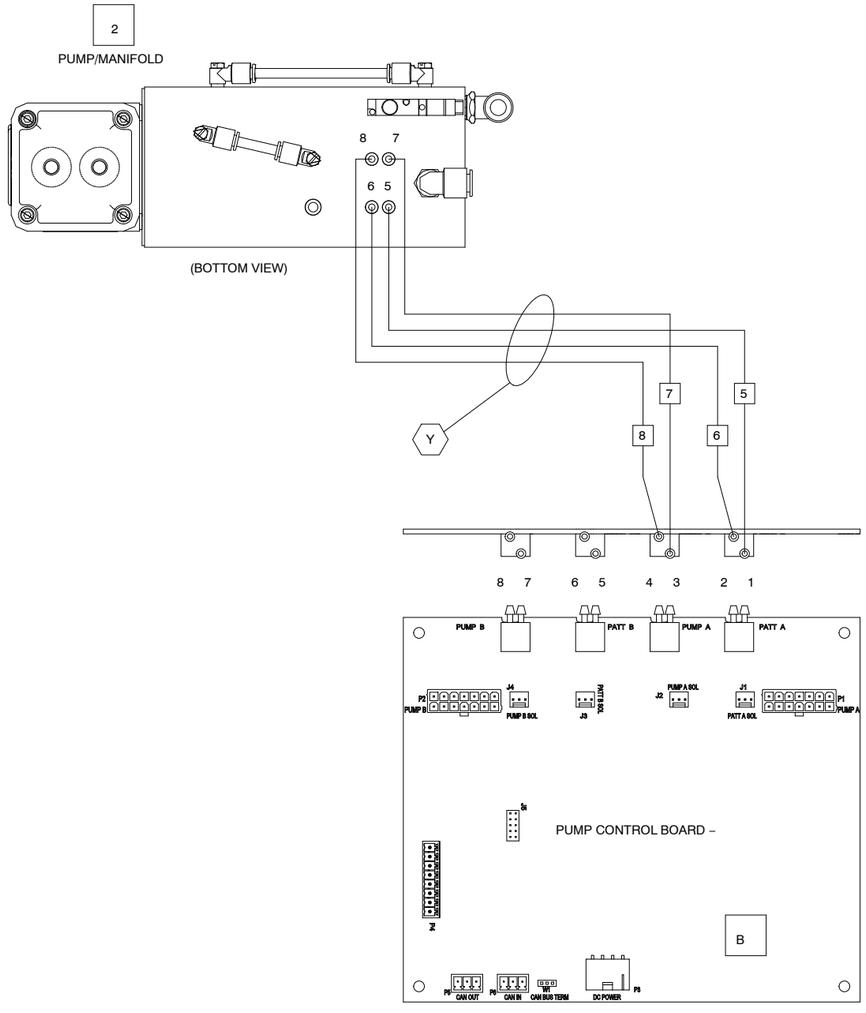
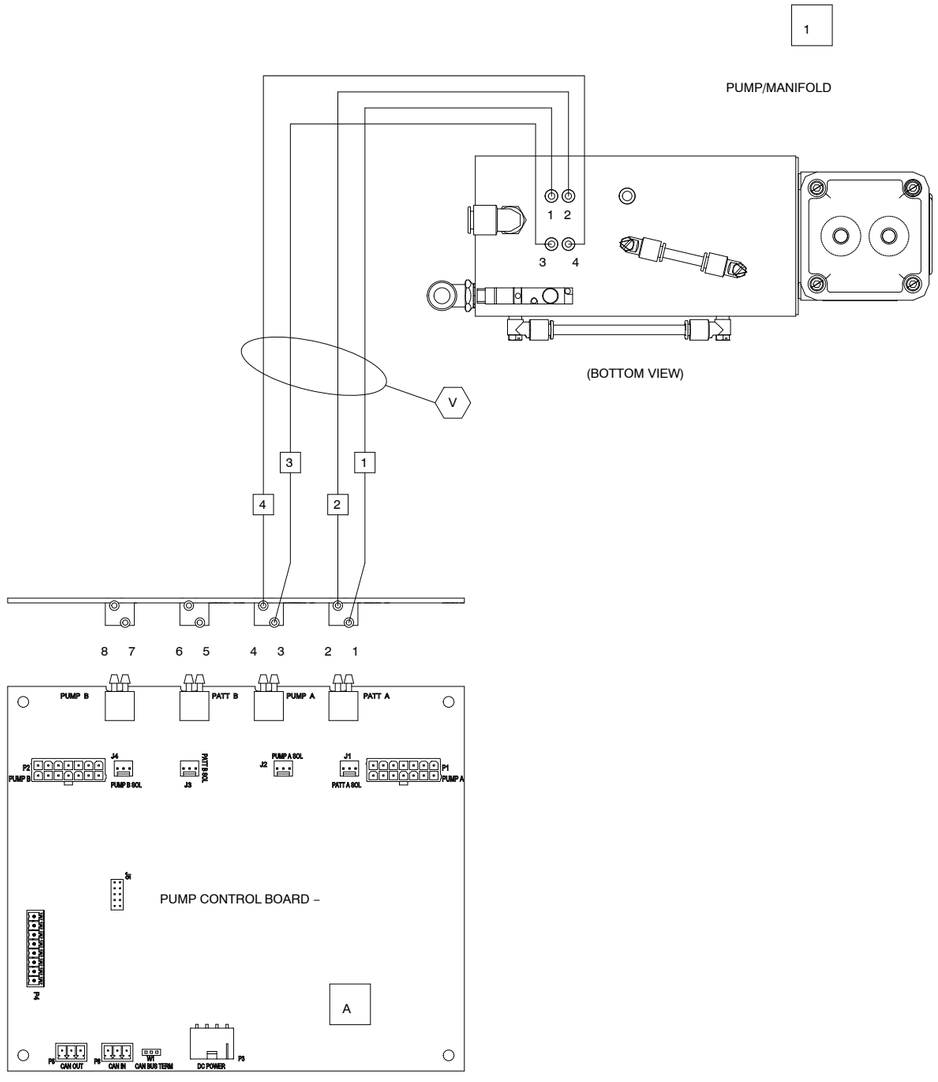


Figure *8-2 Pump Control Panel Pneumatic Diagram (Sheet 1 of 2)*



PUMP CONTROL

BOARD "B" DETAIL



PUMP CONTROL

BOARD "A" DETAIL

Figure *8-3 Pump Control Panel Pneumatic Diagram (Sheet 2 of 2)*

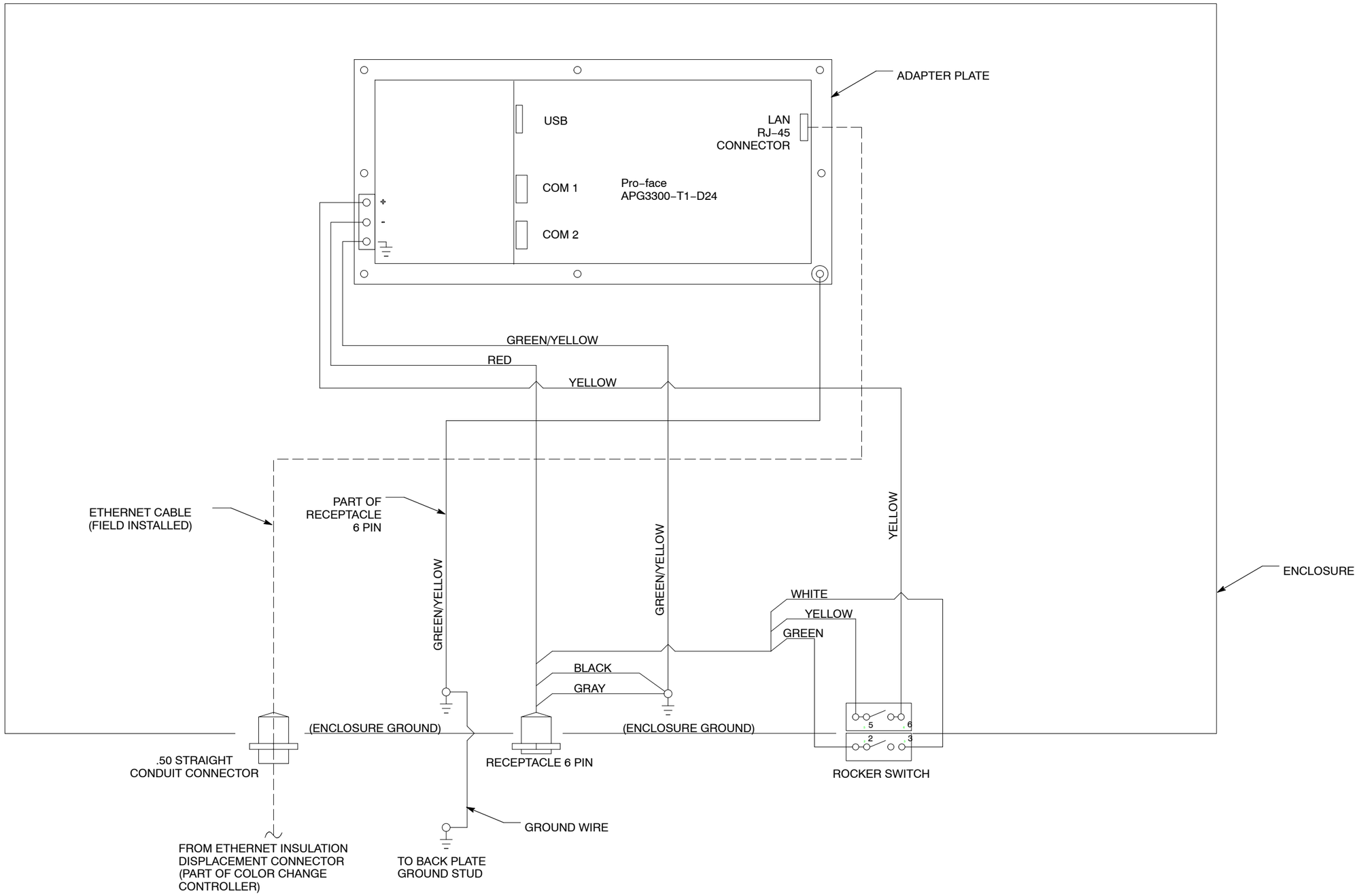


Figure *8-4 Color-on-Demand Controller Wiring Diagram*

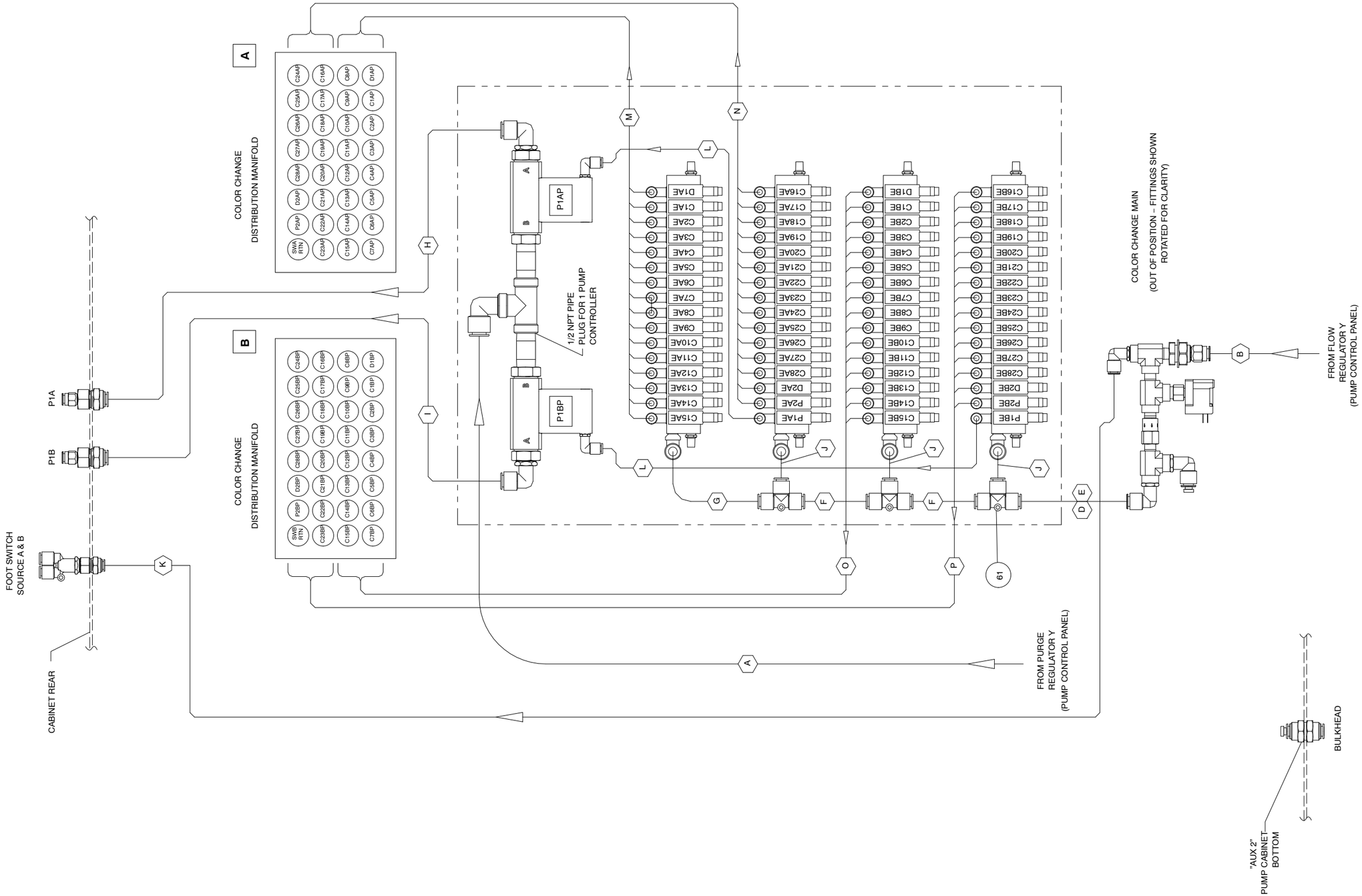


Figure *8-5 Color Change Control Panel Internal Pneumatic Diagram (Dual Unit Shown)*

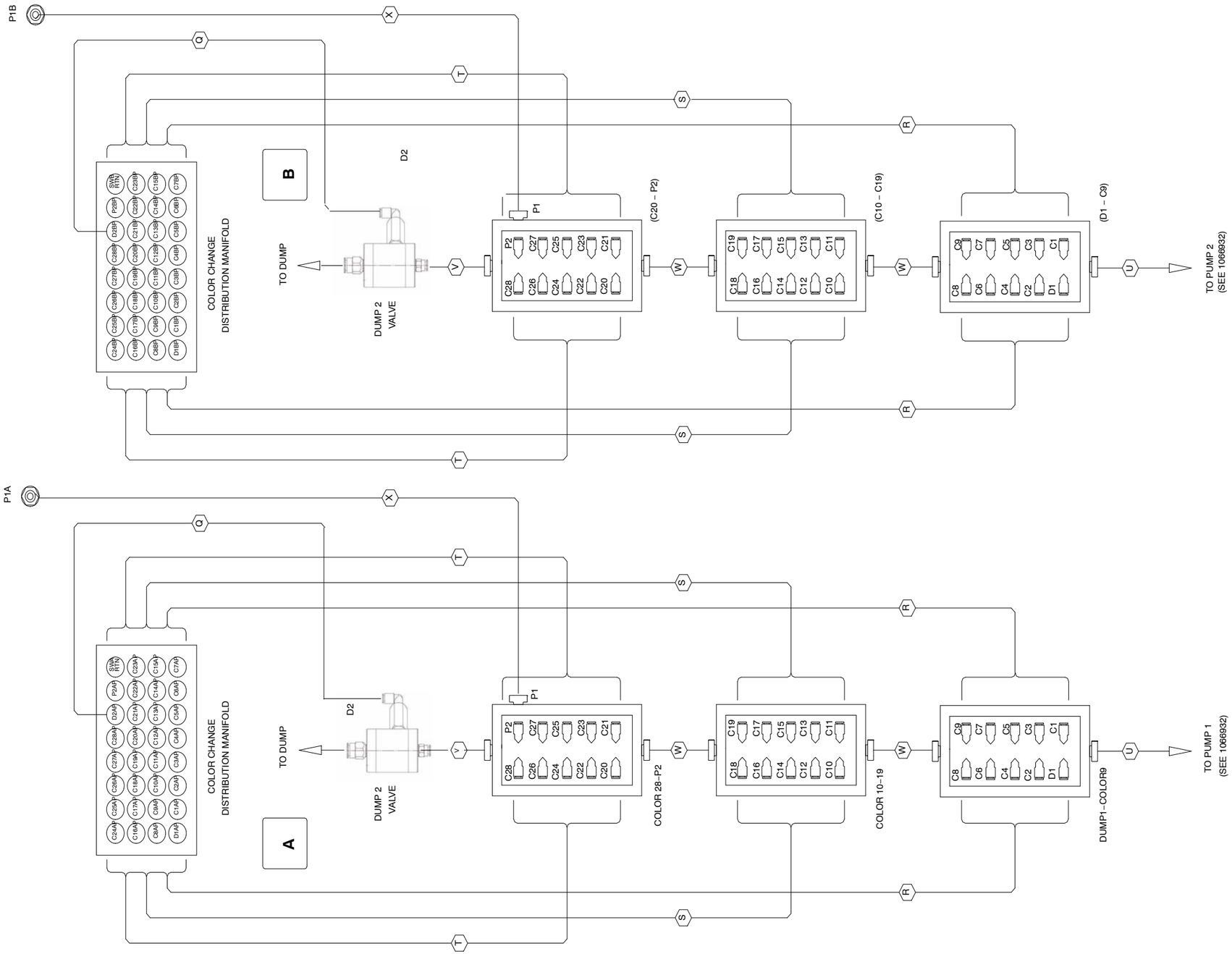


Figure *8-6 Color Change Control Panel External Pneumatic Diagram (Dual Unit Shown)*

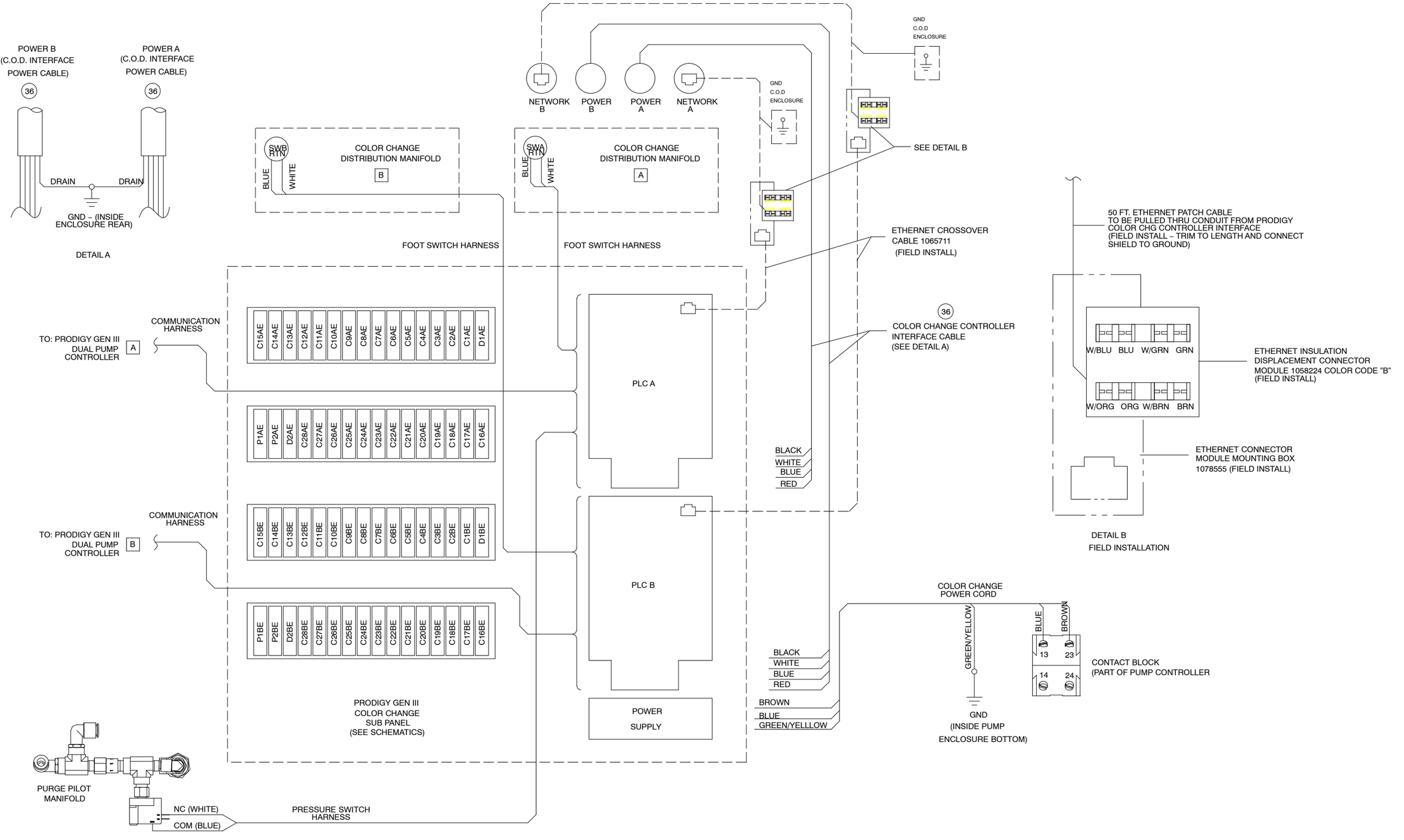


Figure *8-7 Color Change System Wiring Diagram (Dual Unit, Sheet 1 of 2)*

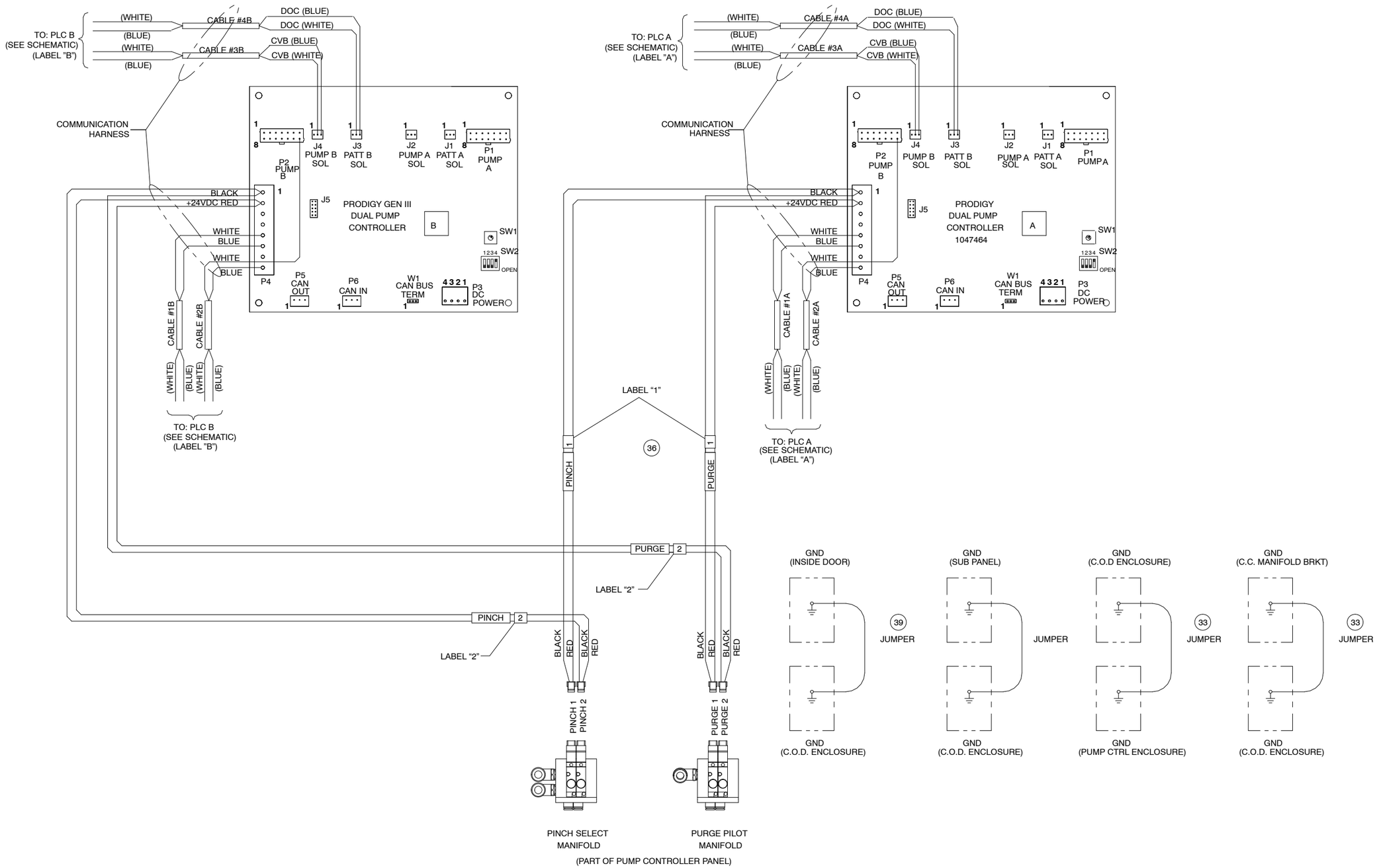


Figure *8-8 Color Change System Wiring Diagram (Dual Unit, Sheet 2 of 2)*

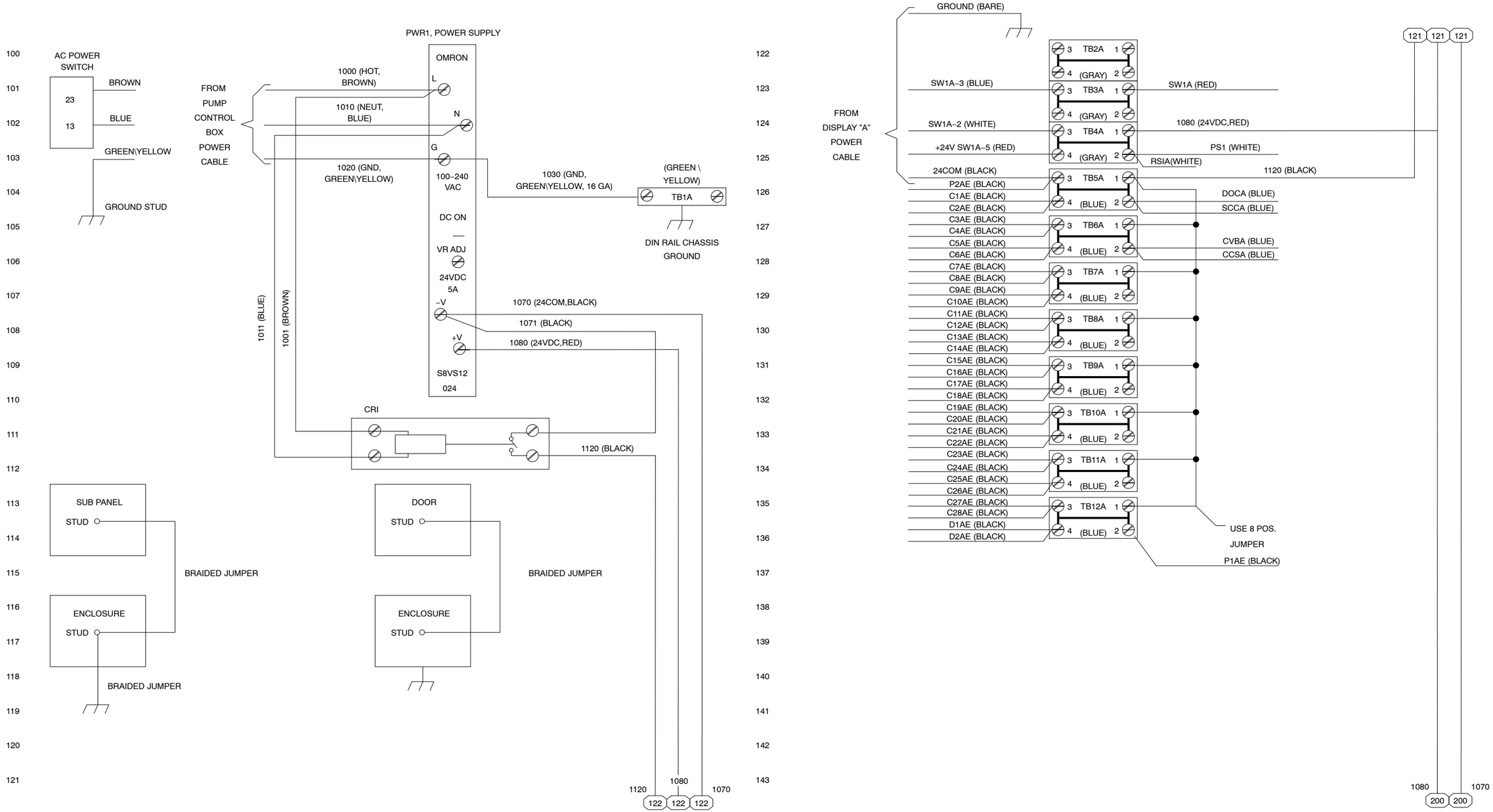
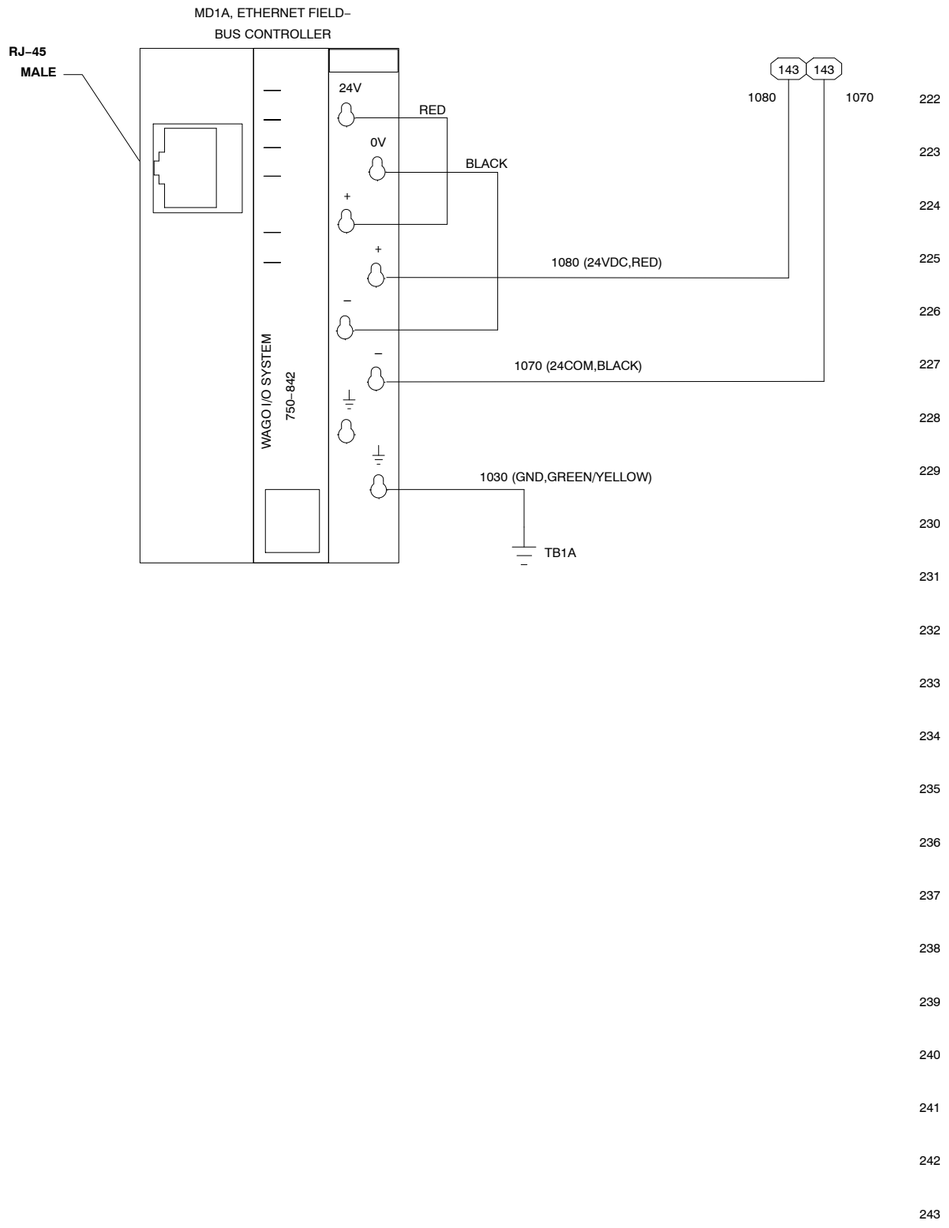
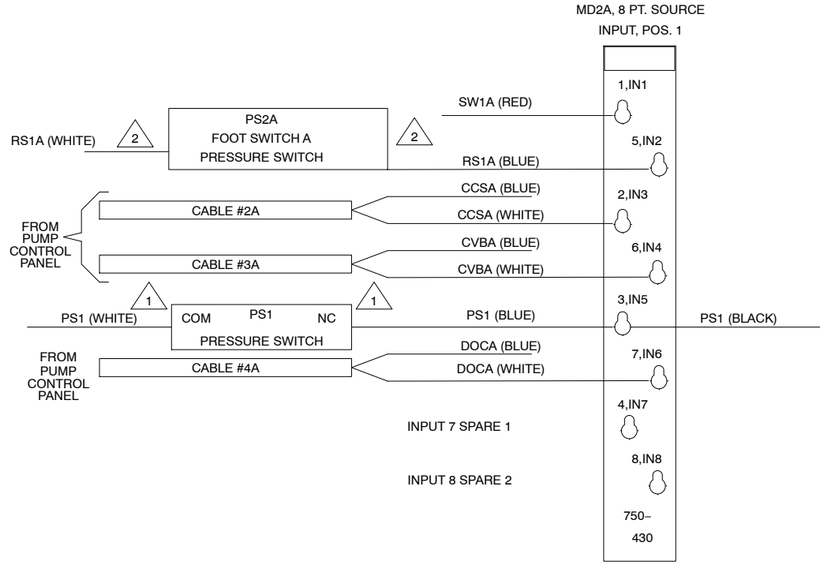


Figure *8-9 Color-on-Demand Control Panel Schematic (Dual Unit, Sheet 1 of 10)*





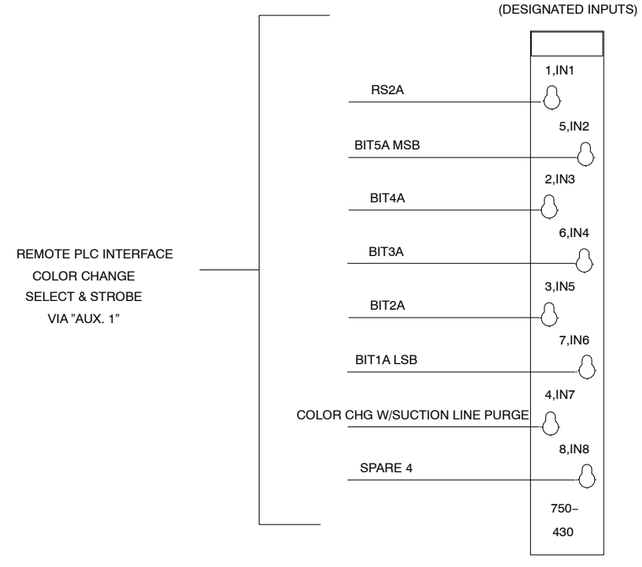
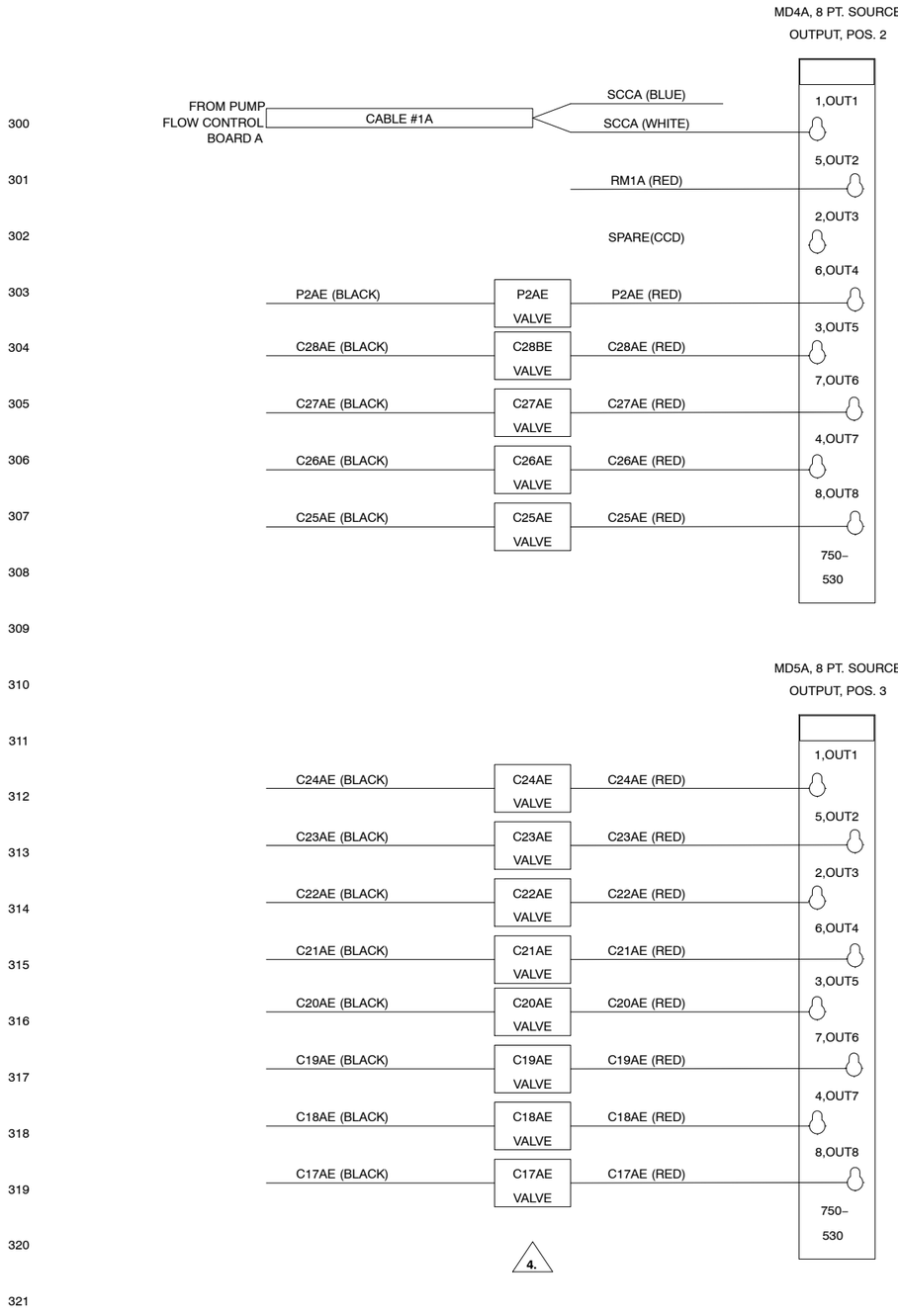


Figure *8-10 Color-on-Demand Control Panel Schematic (Dual Unit, Sheet 2 of 10)*



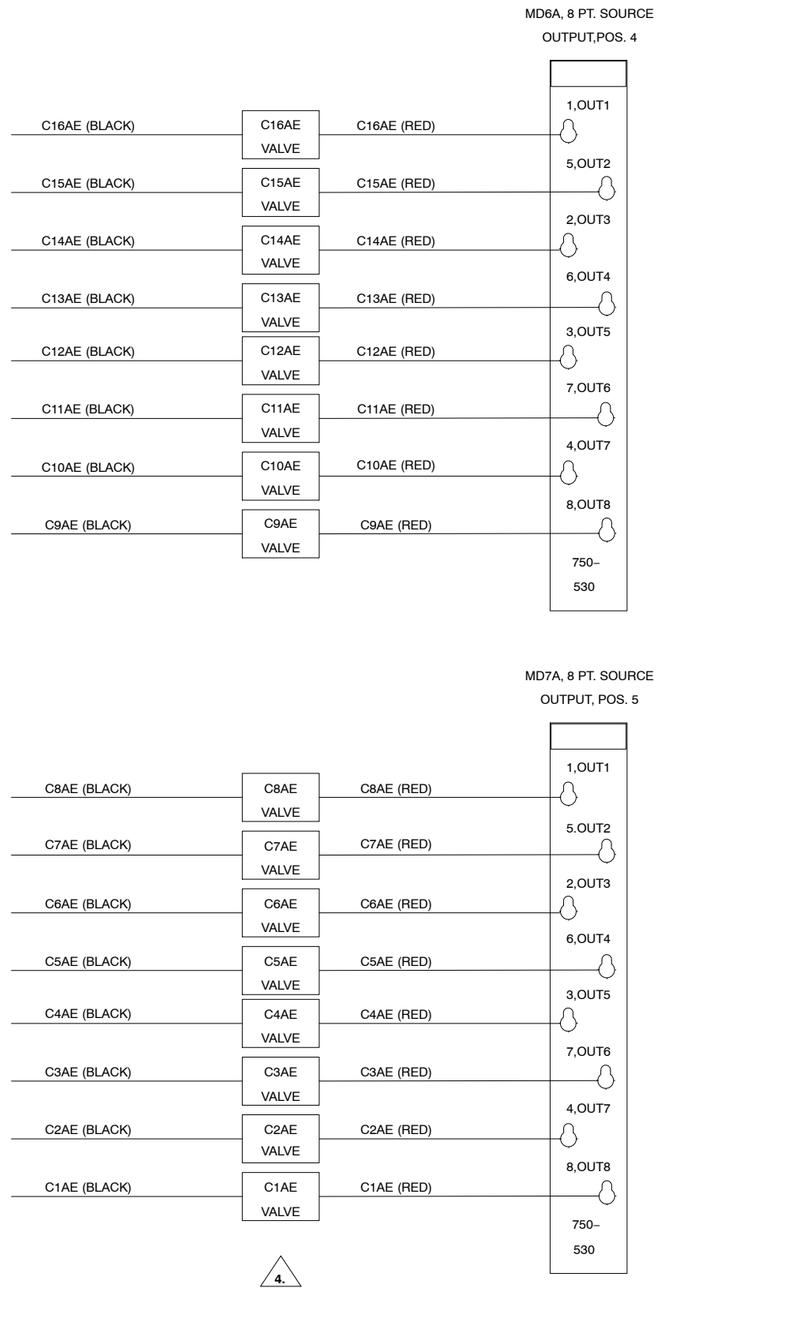


Figure *8-11 Color-on-Demand Control Panel Schematic (Dual Unit, Sheet 3 of 10)*

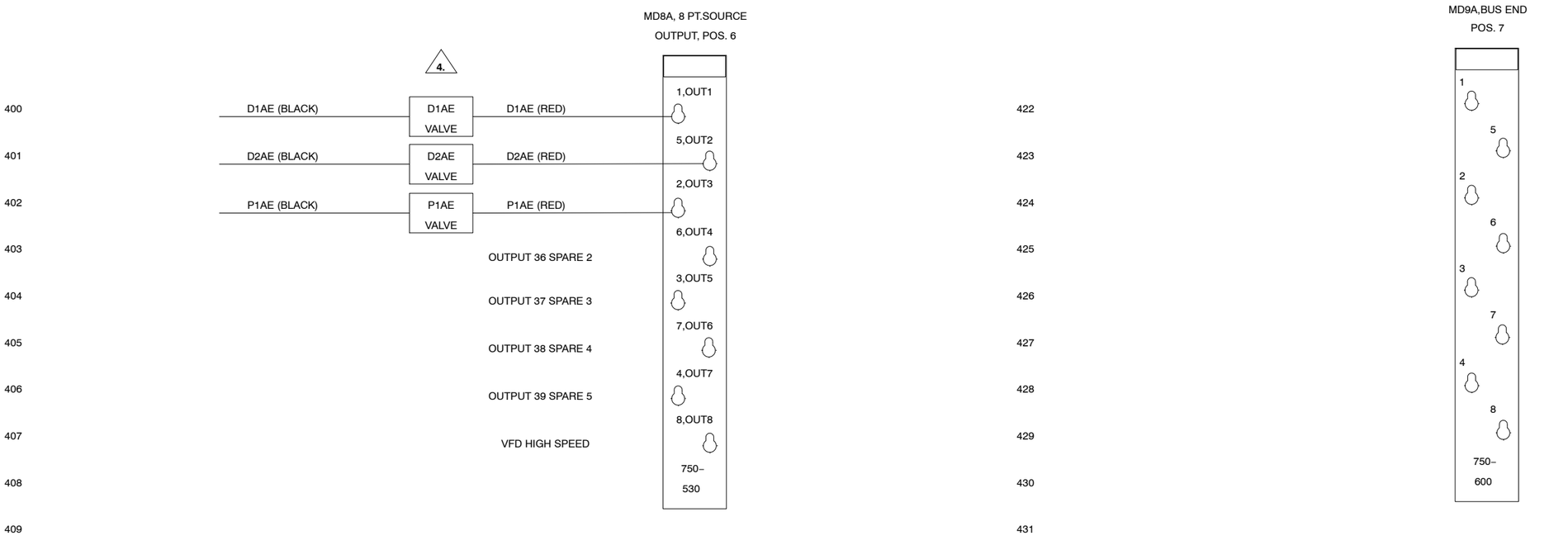


Figure *8-12 Color-on-Demand Control Panel Schematic (Dual Unit, Sheet 4 of 10)*

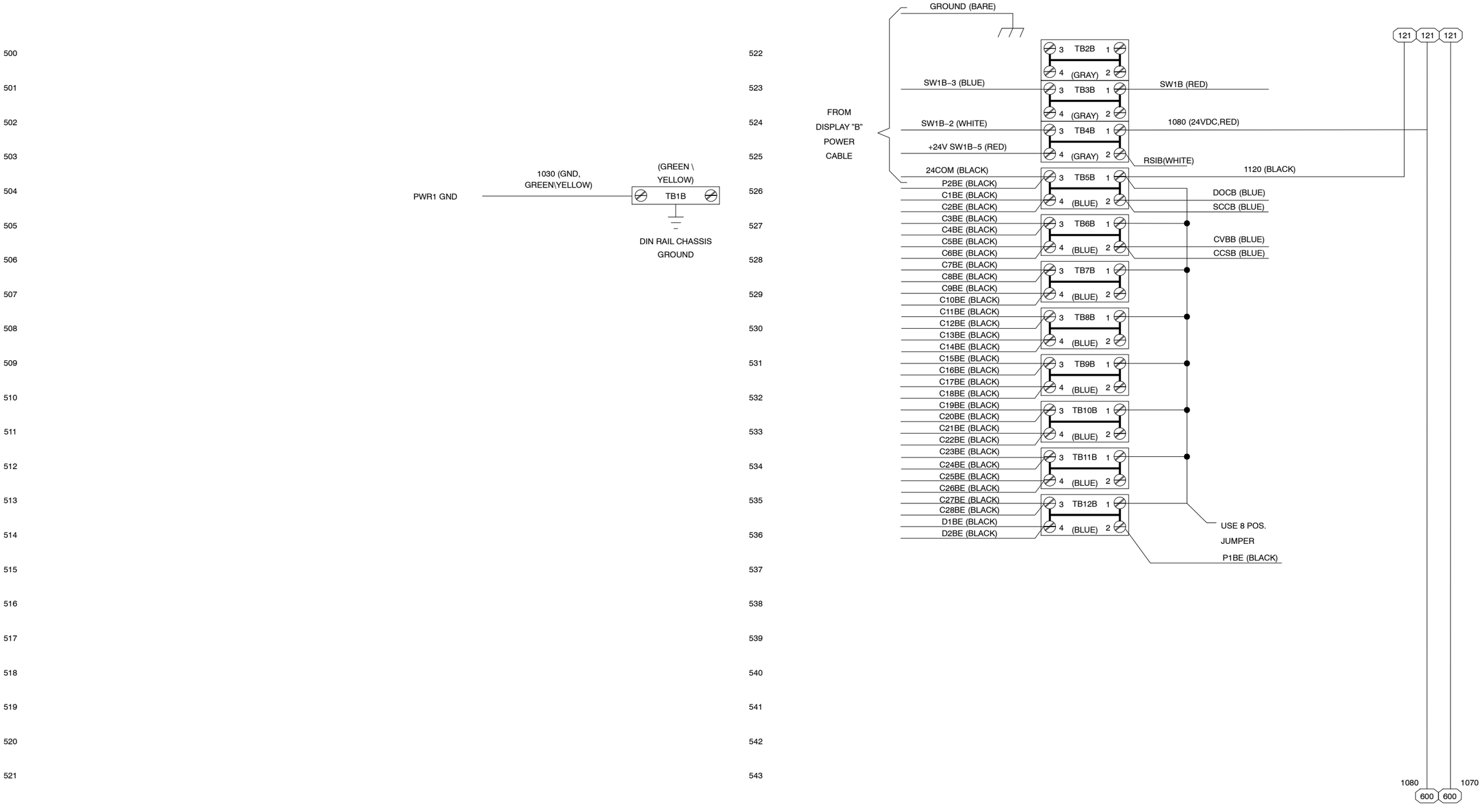


Figure *8-13 Color-on-Demand Control Panel Schematic (Dual Unit, Sheet 5 of 10)*

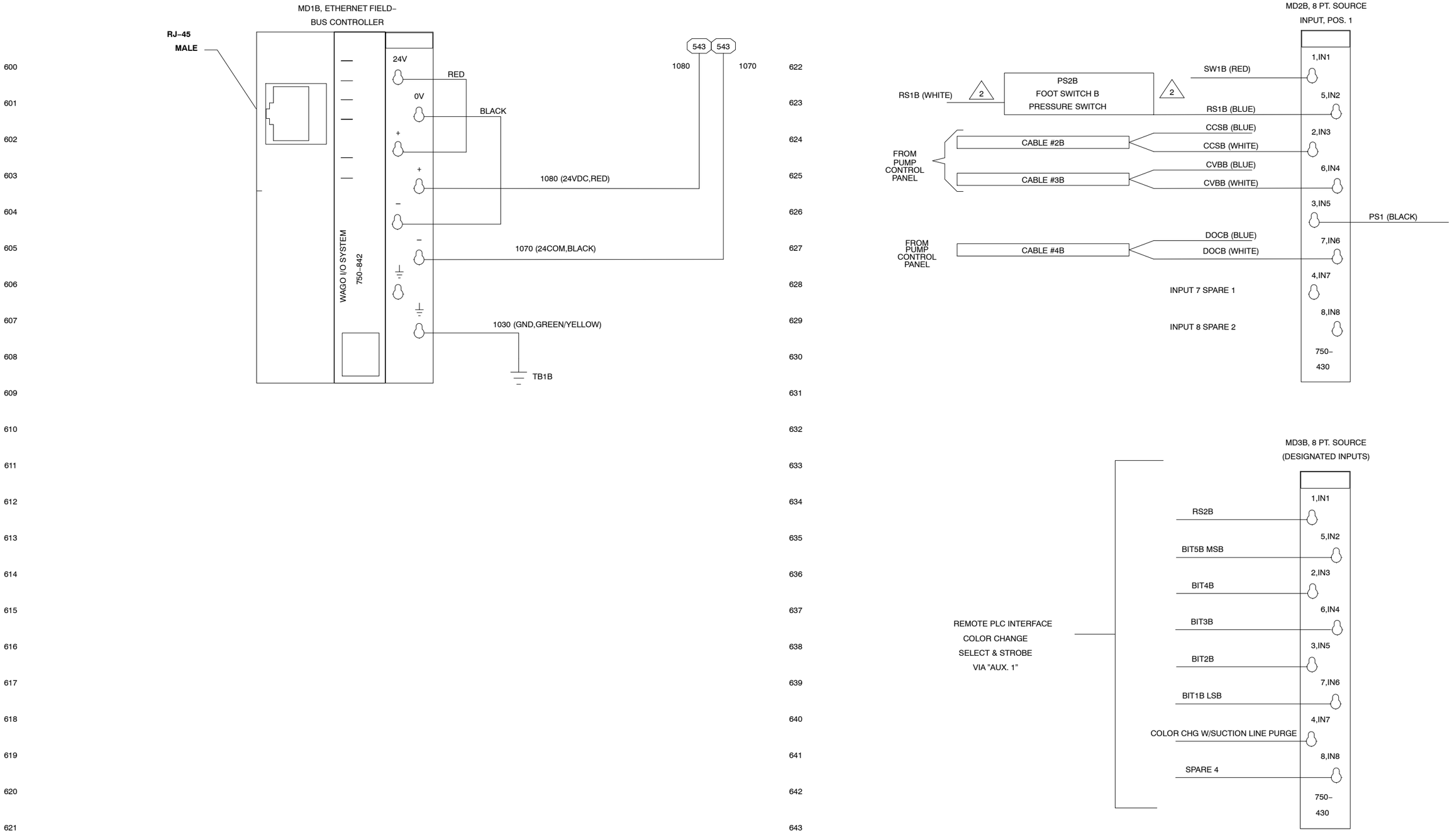
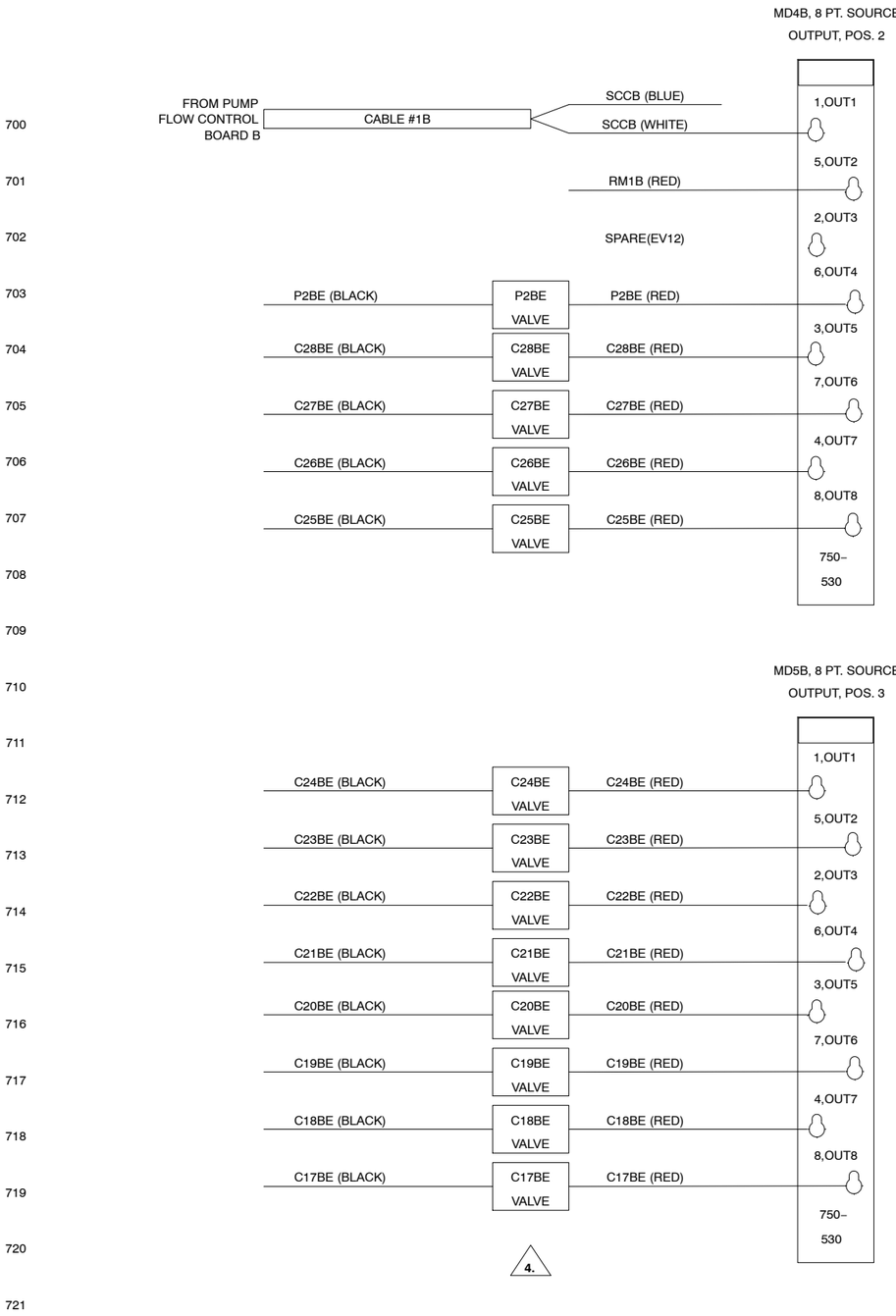


Figure *8-14 Color-on-Demand Control Panel Schematic (Dual Unit, Sheet 6 of 10)*



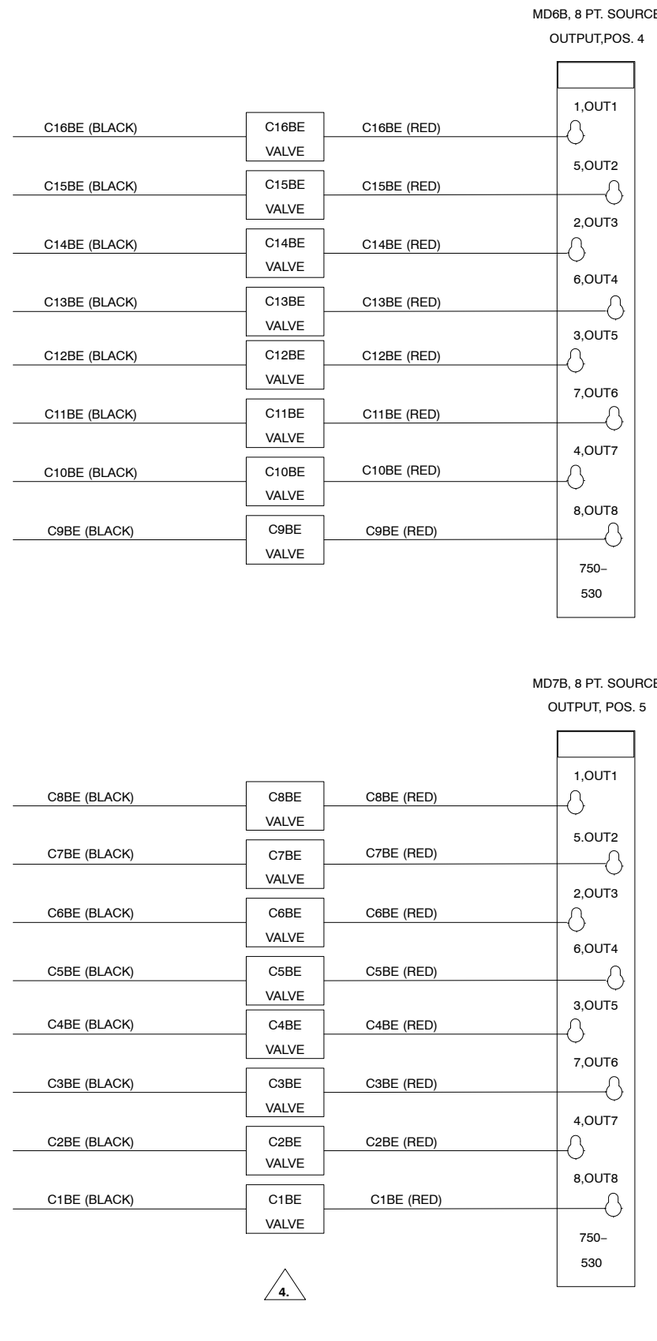
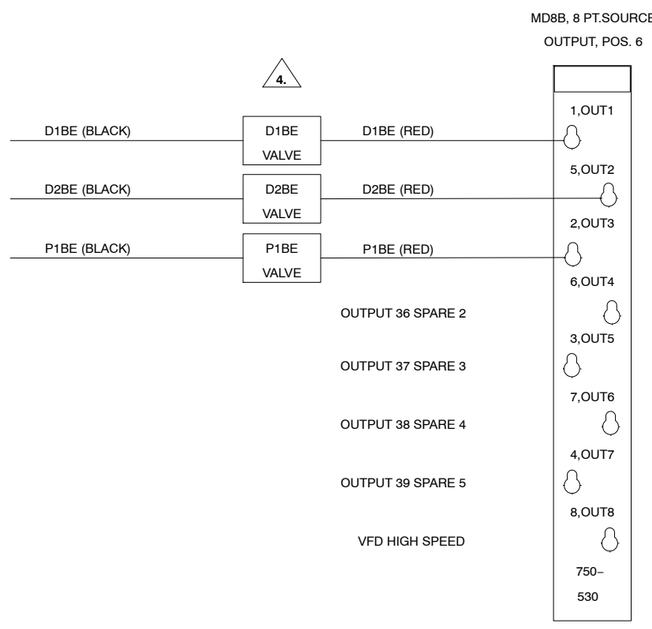


Figure *8-15 Color-on-Demand Control Panel Schematic (Dual Unit, Sheet 7 of 10)*



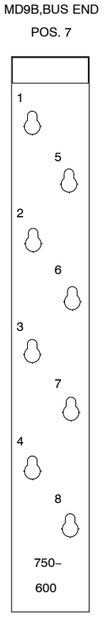


Figure *8-16 Color-on-Demand Control Panel Schematic (Dual Unit, Sheet 8 of 10)*

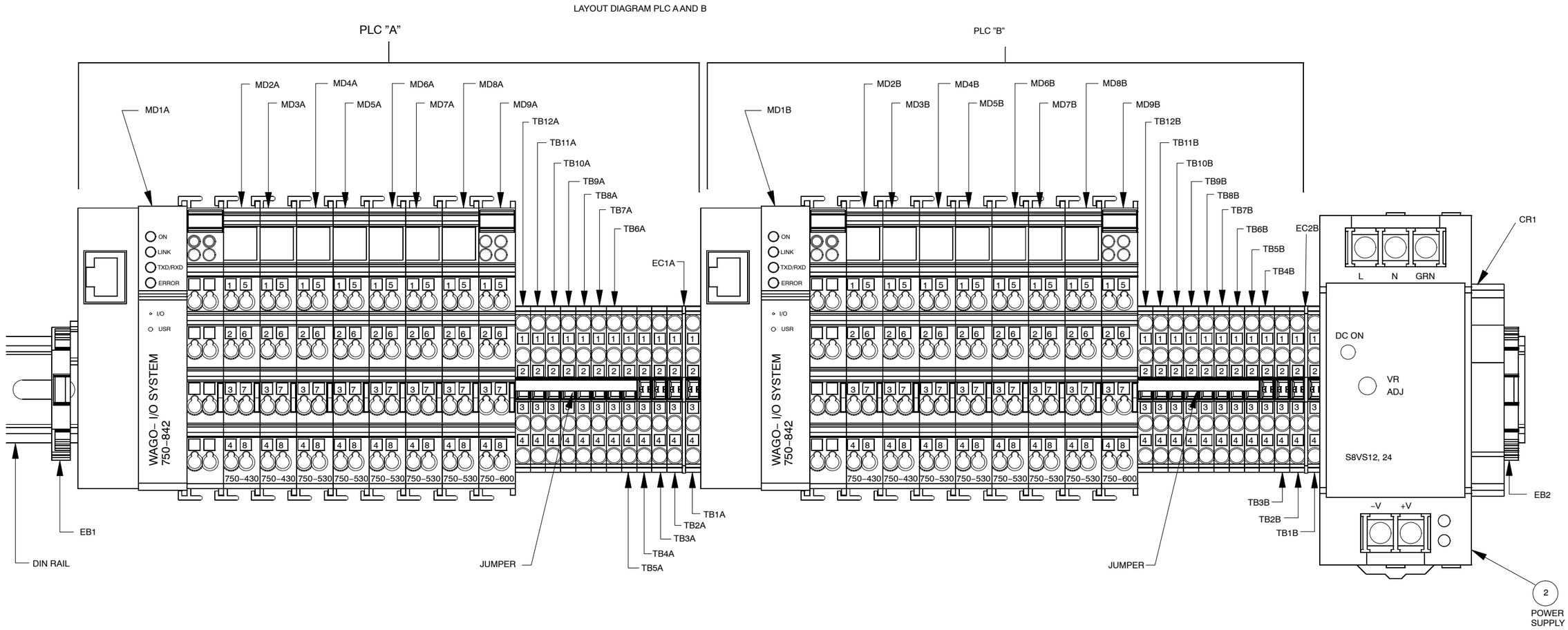


Figure *8-17 Color-on-Demand Control Panel Schematic (Dual Unit, Sheet 9 of 10)*

LAYOUT DIAGRAM PLC A AND B

COLOR–ON–DEMAND CONTROLS PLC LABELS

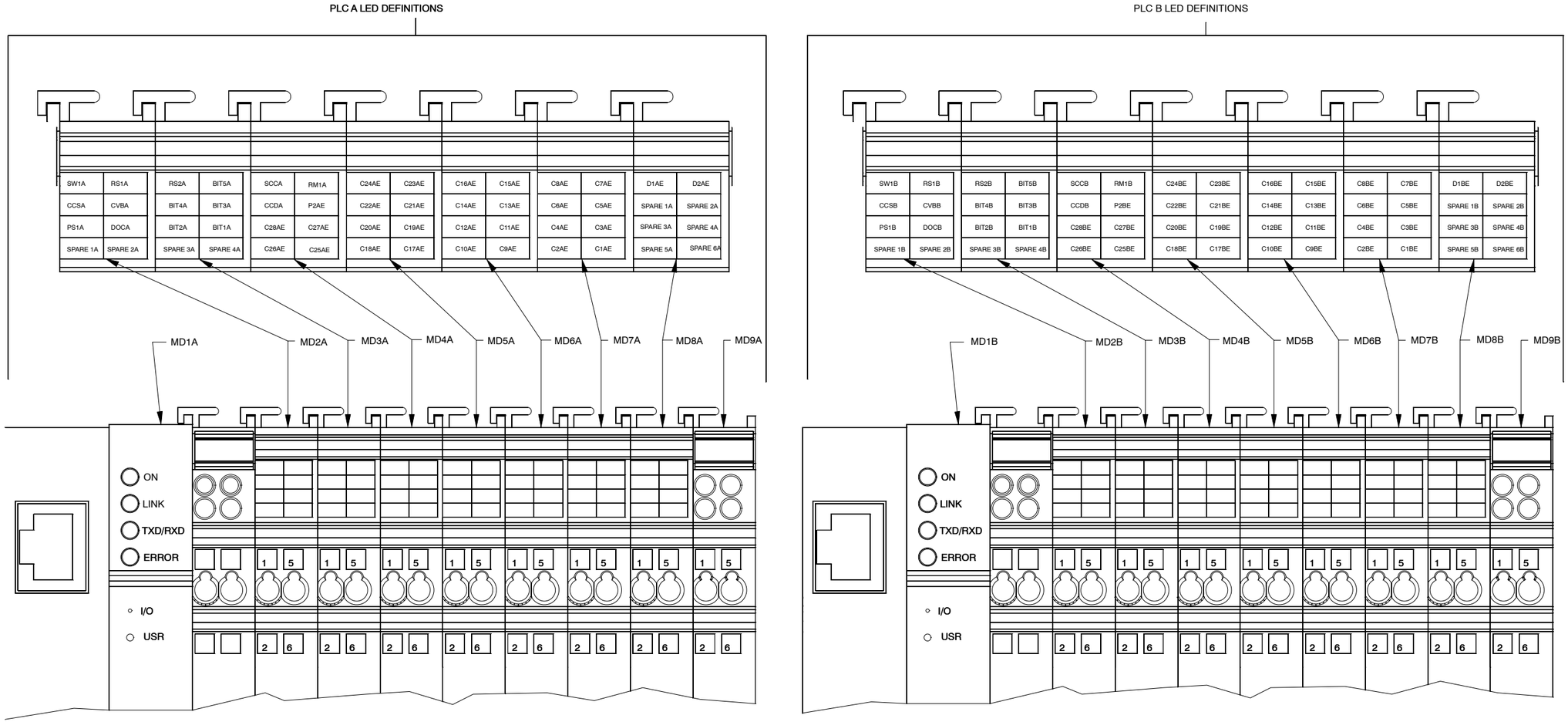


Figure *8-18 Color-on-Demand Control Panel Schematic (Dual Unit, Sheet 10 of 10)*

EU DECLARATION of CONFORMITY

Product: HDLV

Models: Prodigy Color-on-Demand, HDLV Manual Pump Cabinet and Controls

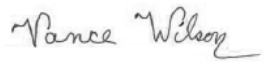
Description: One or two manual gun powder pump systems used for delivering powder to the spray gun with quick color selection and change-over.

Applicable Directives:
2006/42/EC – Machinery Directive
2014/35/EU – Low-Voltage Directive
2014/30/EU – Electromagnetic Compatibility Directive

Standards Used for Compliance:

EN/ISO12100	EN55011	NFPA79
EN60204	EN61000-6-2	
	EN61000-6-3	

Principles:
This product has been manufactured according to good engineering practice.
The product specified conforms to the directive and standards described above.



Date: 28Mar2018

Vance Wilson
Engineering Development
Industrial Coating Systems
Amherst, Ohio, USA

Nordson Authorized Representative in the EU
Contact: Operations Manager
Industrial Coating Systems
Nordson Deutschland GmbH
Heinrich-Hertz-StraBe 42-44
D-40699 Erkrath

EU DECLARATION of Conformity

Product: Prodigy HDLV High Density Powder Pump

Models: Prodigy HDLV Pump

Description: This is a low density air / high density powder pump used for supplying of powder coating material to the applicator. The pump is labeled for use in a Zone 22 area.

Applicable Directives:
2006/42/EC - Machinery Directive
2014/34/EU - ATEX Directive

Standards Used for Compliance:
EN1127-1 EN/ISO12100 EN/ISO80079-36 EN/ISO80079-37

Principles:
This product has been designed & manufactured according to the directives & standards / norms described above.

Markings and Certs:
Flammable Atmosphere Marking: Ex h IIIC T40ºC Dc
Tech File: Notified Body #0518, Sira, UK
DNV ISO9001
ATEX Quality Notification – Baseefa (2001) Ltd (UK)

Vance Wilson

Date: 12Feb2018

Vance Wilson
Engineering Development
Industrial Coating Systems
Amherst, Ohio, USA

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