

# Encore® HD Pump Control Unit and Power Supply

Customer Product Manual  
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# Table of Contents

<b>Safety</b> .....	<b>1-1</b>
Introduction .....	1-1
Qualified Personnel .....	1-1
Intended Use .....	1-1
Regulations and Approvals .....	1-1
Personal Safety .....	1-2
Fire Safety .....	1-2
Grounding .....	1-3
Action in the Event of a Malfunction .....	1-3
Disposal .....	1-3
<b>Overview</b> .....	<b>2-1</b>
Introduction .....	2-1
Specifications .....	2-2
Pump Control Unit Certification Label .....	2-4
Encore HD Pump .....	2-5
HD Pump Components .....	2-6
Theory of Operation .....	2-8
Pumping .....	2-8
Purging .....	2-10
Stage 1: Soft Purge to Spray Gun .....	2-10
Stage 2: Soft Purge to Feed Source .....	2-10
Stage 3: Hard Purge to Spray Gun and Feed Source .....	2-10
Pump Control Manifold Components .....	2-12
<b>Installation</b> .....	<b>3-1</b>
Wall/Rail Mount Systems .....	3-1
Pump Control Unit Mount .....	3-1
Pump Control Unit Mount (contd) .....	3-2
Interconnect Cable Connection .....	3-3
System Connections .....	3-4
System Diagram .....	3-4
Pump Control Unit Connections .....	3-6
Spray Gun Connections .....	3-7
Spray Gun Cable .....	3-7
Air Tubing and Powder Tube .....	3-8
Bundling Tubing and Cable .....	3-9
Main System Air and Electrical Connections .....	3-10
Main System Air Supply .....	3-10
Standalone, Rail Mount, and Wall Mount System Air Supply .....	3-11
Encore HD Powder Pump Hose .....	3-12
Standard 8-mm OD Poly Tubing .....	3-12
Flexible 8-mm OD Tubing .....	3-12
Pump Adapter Installation .....	3-13
Electrical Connections .....	3-14
System Ground .....	3-14
Mobile Systems .....	3-14
Wall / Rail Mount Systems .....	3-14
<b>Operation</b> .....	<b>4-1</b>
European Union, ATEX, Special Conditions for Safe Use .....	4-1
Maintenance .....	4-2

<b>Troubleshooting</b> .....	<b><a href="#">5-1</a></b>
Pump Troubleshooting.....	<a href="#">5-2</a>
Pump Port Functions.....	<a href="#">5-3</a>
Manifold Troubleshooting.....	<a href="#">5-4</a>
Solenoid and Flow Control Valve Functions.....	<a href="#">5-5</a>
Re-Zero Procedure.....	<a href="#">5-6</a>
Controller Interconnect Cable Test.....	<a href="#">5-6</a>
<b>Repair</b> .....	<b><a href="#">6-1</a></b>
Removing Panel Assembly.....	<a href="#">6-2</a>
Sub-Panel Components.....	<a href="#">6-3</a>
Regulator Adjustment.....	<a href="#">6-3</a>
iFlow Module Repair.....	<a href="#">6-5</a>
Testing iFlow Modules.....	<a href="#">6-5</a>
Conveyance Air Flow.....	<a href="#">6-5</a>
Pattern Air.....	<a href="#">6-5</a>
Solenoid Valve Replacement.....	<a href="#">6-6</a>
Proportional Valve Cleaning.....	<a href="#">6-6</a>
Proportional Valve Replacement.....	<a href="#">6-6</a>
Vibrator Motor Replacement.....	<a href="#">6-8</a>
Fluidizing Tube Replacement.....	<a href="#">6-9</a>
Pump Disassembly.....	<a href="#">6-11</a>
Pump Assembly.....	<a href="#">6-13</a>
Pinch Valve Replacement.....	<a href="#">6-16</a>
Pinch Valve Removal.....	<a href="#">6-16</a>
Pinch Valve Installation.....	<a href="#">6-17</a>
<b>Parts</b> .....	<b><a href="#">7-1</a></b>
Parts.....	<a href="#">7-1</a>
Using the Illustrated Parts List.....	<a href="#">7-1</a>
Pump Control Unit.....	<a href="#">7-2</a>
Panel Assembly.....	<a href="#">7-4</a>
Panel Assembly (contd).....	<a href="#">7-6</a>
iFlow Module.....	<a href="#">7-7</a>
Manifold Assembly.....	<a href="#">7-8</a>
Pump.....	<a href="#">7-10</a>
Spare Parts.....	<a href="#">7-12</a>
Wall/Rail Mount System.....	<a href="#">7-13</a>
Powder Hose and Air Tubing.....	<a href="#">7-13</a>
Miscellaneous Options.....	<a href="#">7-14</a>
<b>Wiring Diagrams</b> .....	<b><a href="#">8-1</a></b>





# Section 1

## Safety

### Introduction

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

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

### Qualified Personnel

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

### Intended Use

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

Some examples of unintended use of equipment include:

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

### Regulations and Approvals

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

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

## Personal Safety

To prevent injury follow these instructions.

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

## Fire Safety

To avoid a fire or explosion, follow these instructions.

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



## Grounding



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

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

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

## Action in the Event of a Malfunction

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

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

## Disposal

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



## Section 2

# Overview

## Introduction

See Figure 2-1. This manual covers the Encore® HD pump control unit, which is used to supply power and to operate Encore HD manual powder spray systems.

The pump control unit comes equipped with a Encore HD powder feed pump. The unit contains the pneumatic circuit, which controls all pump, color change, and vibratory box feed (VBF) functions.

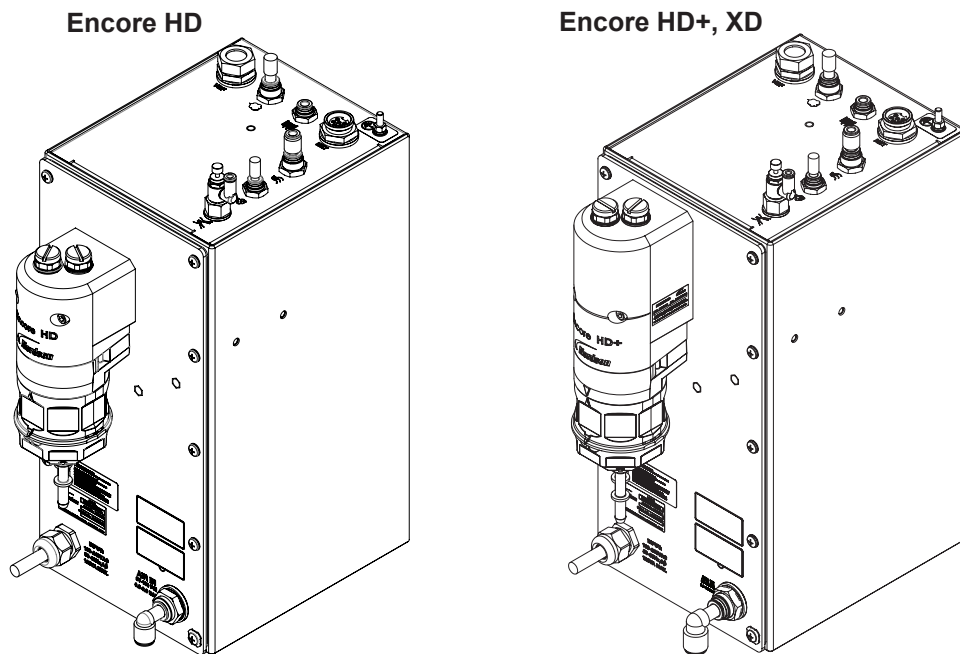


Figure 2-1 Encore HD Pump Control Unit

# Specifications

Model: Encore HD Controller Power Unit	
Input Rating:	100–240 VAC, 50/60 Hz, 125 VA
Output Rating:	24 VDC, 2.5 A
Input Air:	6.0–6.9 bar (87–100 psi), <5 $\mu$ particulates, dew point <10 °C (50 °F)
Max Relative Humidity:	95% non-Condensing
Ambient Temperature Rating:	+15 to +40 °C (59–104 °F)
Hazardous Location Rating for Controls:	Zone 22 or Class II, Division 2
Dust Ingress Protection:	IP6X
Dimensions – See Figure 2-2 and Figure 2-3.	

Model: Encore HD, HD+, XD Pump	
Maximum Output HD:	80 lb/hour (600 g/min.)
Maximum Output HD+, XD:	100 lb/hour (750 g/min.)
<b>Air Consumption</b>	
Conveying Air:	12.5–31 l/min (0.438–1.1 scfm)
Gun Pattern Air	6–57 l/min (0.2–2.0 scfm)
Total Consumption	85–170 l/min (3–6 scfm)
<b>Operating Air Pressures</b>	
Pinch Valves:	37 psi (2.6 bar) Do Not Adjust
Flow Control (to pattern air/pump assist):	85 psi (5.9 bar) Do Not Adjust
Vacuum Generator:	80 psi (5.5 bar) Do Not Adjust
<b>Powder Tubing</b>	
Size:	8 mm OD x 6 mm ID
Length:	Output: 18.3 m (60 ft) Input 1–3 m (3.5–12 ft)
Dimensions – See Figure 2-4.	

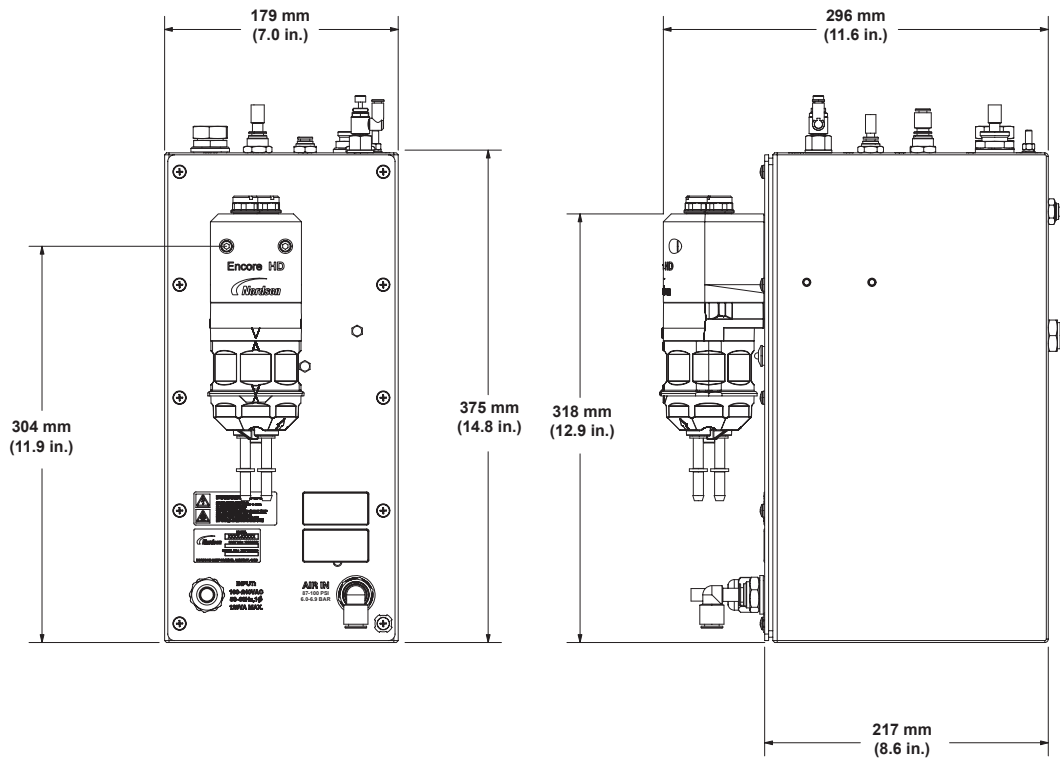


Figure 2-2 Encore HD Controller Power Unit Dimensions

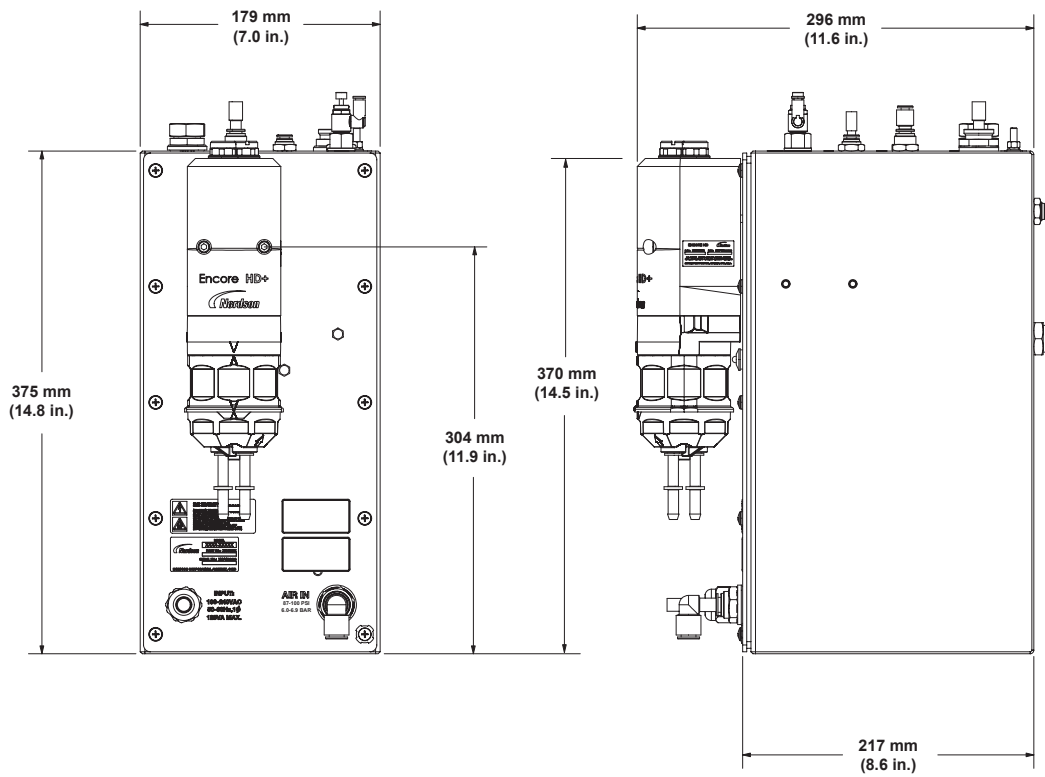
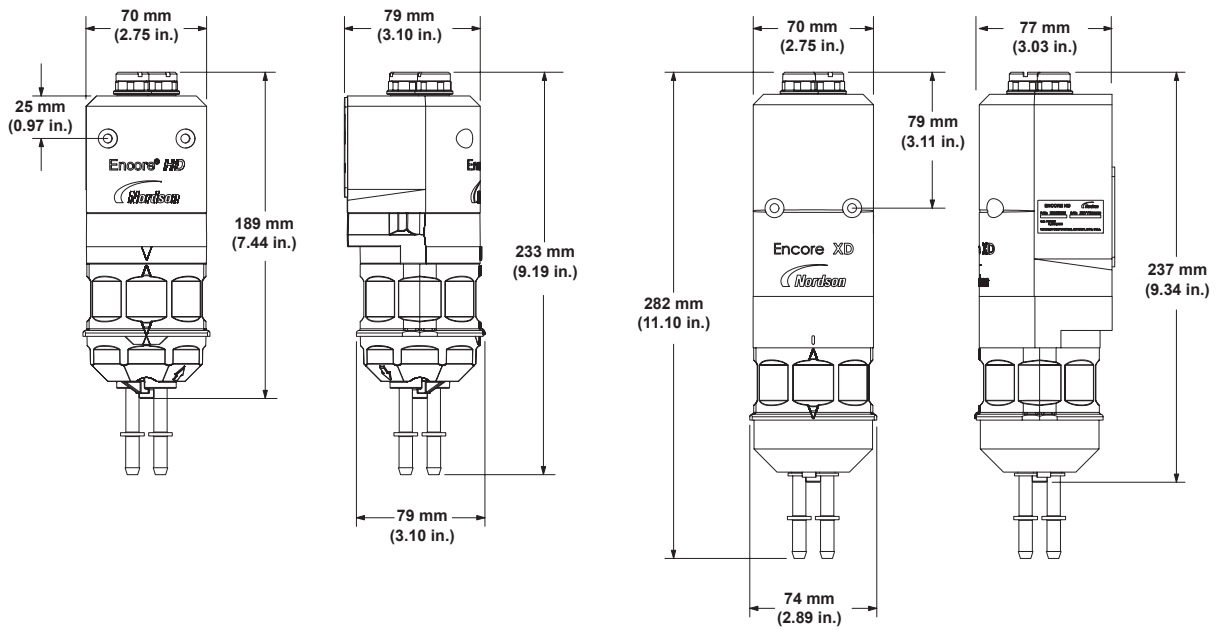


Figure 2-3 Encore HD+, XD Controller Power Unit Dimensions



Encore HD

Encore HD+ and XD  
(HD+ Stamped on Encore HD+)

Figure 2-4 Encore Pump Dimensions

### Pump Control Unit Certification Label



1606121

# Encore HD Pump

See Figure Figure 2-5. The Encore HD (High-Density powder, Low-Velocity air) powder feed pump transports precise amounts of powder from a feed source to a powder spray gun.

The design of the pump and the small diameter powder tubing used allow powder to be purged quickly and thoroughly for fast color changes.

The pump is more efficient than traditional venturi-style pumps in that a very little amount of air is used to operate the pump and carry the powder to the spray gun.

The standard-flow pump is designed to deliver approximately 550 grams/ minute (72 lb/ hour). For applications requiring higher flow rates, install a high flow pump for additional capacity up to 750 grams/minute (100 lb/hour). Refer to *Parts* section for kit part number.

**NOTE:** The total powder output may vary depending on fluidized density and powder specific gravity.

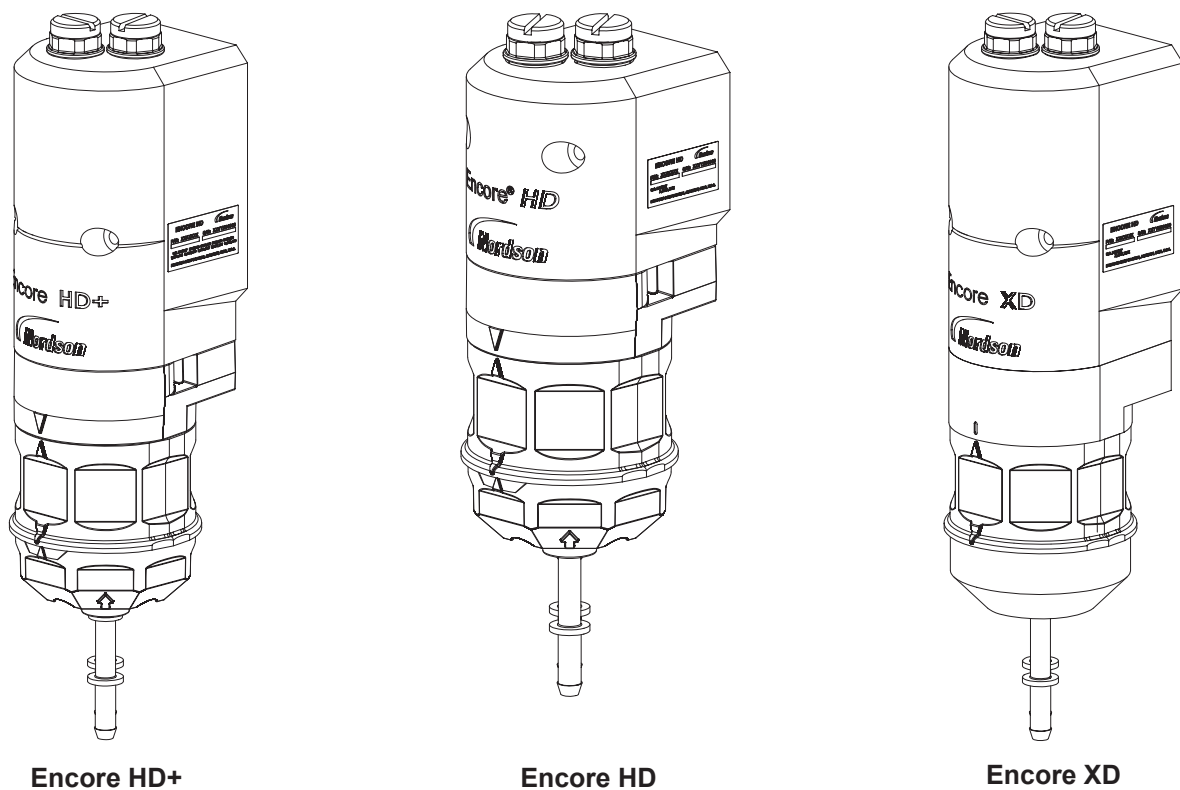


Figure 2-5 Encore HD Pump

## HD Pump Components

See Figure 2-6.

Item	Description	Function
1	Purge Air Fittings and Check Valves	Route high pressure purge air through the pump. Check valves prevent powder contamination of the purge valves.
2	Fluidizing Tubes	Porous cylinders that draw powder into the pump when a vacuum is applied, and force powder out of the pump when air pressure is applied.
3	Purge Manifold	Contains the fluidizing tubes, check valves, and air passages.
4	Upper Y Block	Interface between the pinch valves and the porous tubes; consists of two Y-shaped passages that join the inlet and outlet branches of either half of the pump.
5	Pinch Valves	Open and close to allow powder to be drawn in or dispensed out of the fluidizing tubes.
6	Pinch Valve Body	Houses the pinch valves. Made from clear plastic to easily inspect the pinch valves for wear and tear.
7	Lower Y Block	Connect the inlet and outlet fittings to the pinch valves on either half of the pump.
8	Inlet Fitting	Connects to the tubing leading from the power source
9	Outlet Fitting	Connects to the tubing leading to the powder spray gun



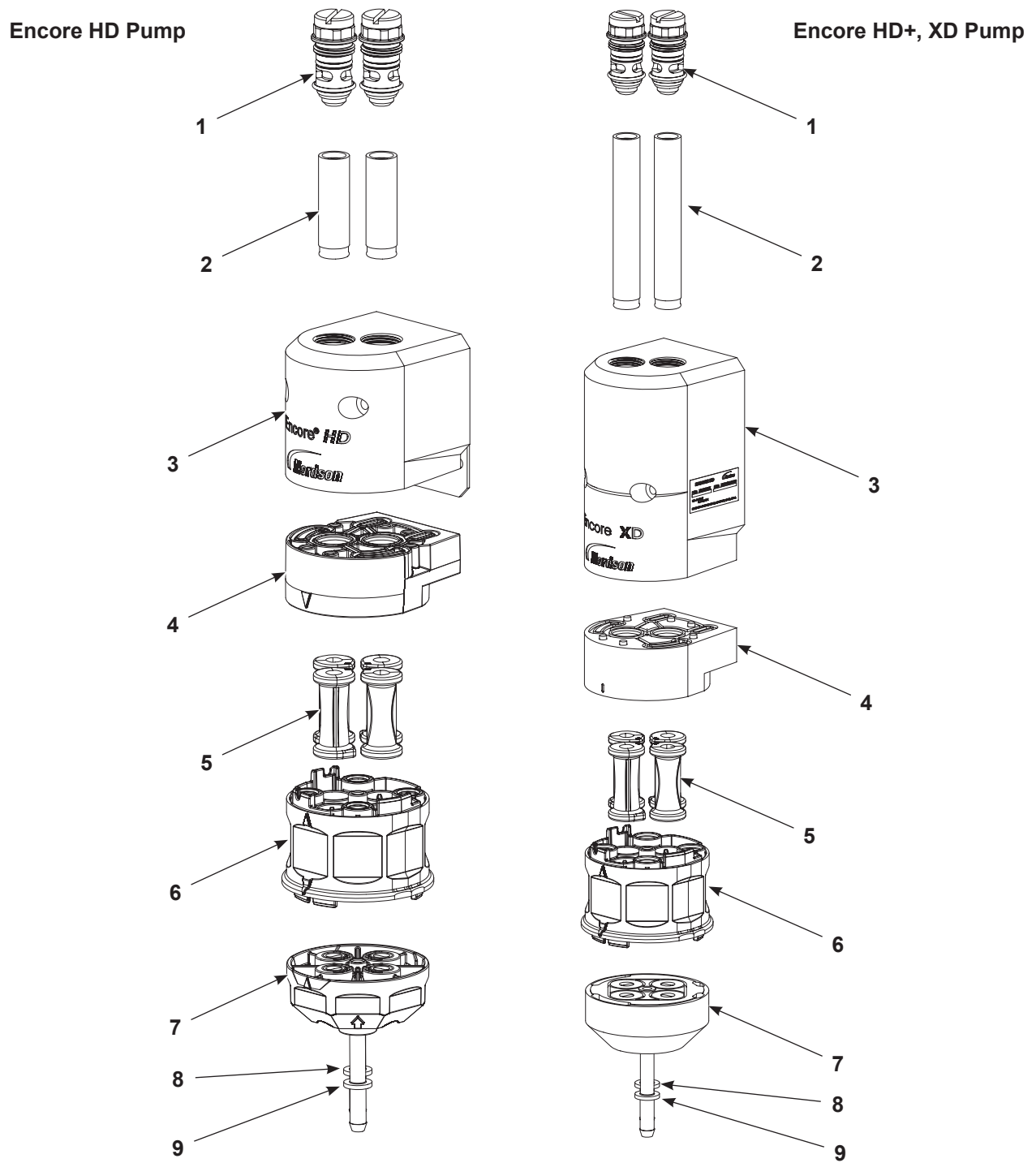


Figure 2-6 Encore Pump Components

## Theory of Operation

### Pumping

The Encore HD pump consists of two halves that function identically. The halves alternately draw powder in and dispense powder out of the pump; while one half is drawing powder in, the other half is dispensing powder out.

#### Left Half Drawing Powder In

See Figure 2-7 View A.

The left suction pinch valve is open, while the left delivery pinch valve is closed. Negative air pressure is applied to the left porous fluidizing tube, which draws powder in the inlet fitting, up the left side of the inlet manifold wear block, through the left suction pinch valve, and into the left fluidizing tube.

After the negative air pressure has been on for the specified time, the fluidizing tube's negative air pressure shuts off and the left suction pinch valve closes.

#### Right Half Dispensing Powder Out

See Figure 2-7 View B.

The right suction pinch valve is closed, while the right delivery pinch valve is open. Positive air pressure is applied to the right porous fluidizing tube, which dispenses the powder out of the fluidizing tube, down the right delivery pinch valve, down the right side of the outlet manifold wear block, out the delivery fitting, and out to the tubing that leads to the powder spray gun.

As the sides complete these processes, they alternate. In the example explained above, the left half would now dispense powder out while the right half would draw powder in.

As each half dispenses powder out, the powder in the tubing blends together, resulting in a consistent flow of powder from the spray gun.

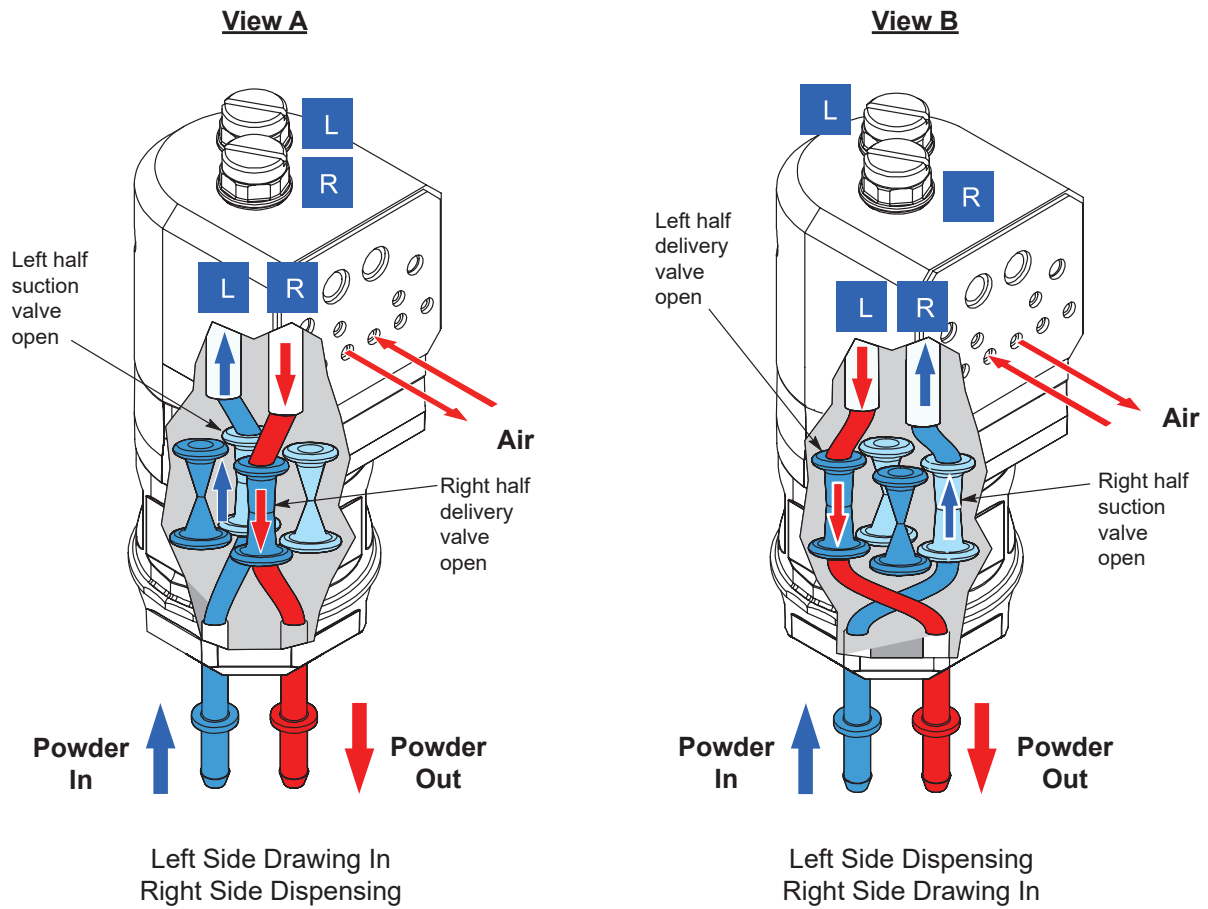


Figure 2-7 Operation of Pump (Shown as rear, right view of the pump)

## Purging

See Figure 2-8. When the operator initiates a color change, the pump goes through a three-stage purge process.

### ***Stage 1: Soft Purge to Spray Gun***

The suction pinch valves close, while the delivery pinch valves remain open. Pump assist air pressure turns on, starting at a low pressure and building up to maximum pump assist pressure. The air dispenses powder out of both fluidizing tubes, through the powder delivery tubing and spray gun and out into the booth.

### ***Stage 2: Soft Purge to Feed Source***

The suction pinch valves are open, while the delivery pinch valves close. Pump assist air pressure turns on, starting at a low pressure and building up to maximum pump assist pressure. The air dispenses powder out of both fluidizing tubes, through the powder suction tubing, and back into the powder feed source.

### ***Stage 3: Hard Purge to Spray Gun and Feed Source***

The delivery pinch valves open. Pump assist air pressure turns on at maximum pressure, while pulses of line air pressure are sent down the purge air fittings at the tops of the fluidizing tubes. The pulses of air remove any powder that remains in the pump, spray gun, and suction and delivery tubing.

After the delivery side is purged, the delivery pinch valves close and the suction pinch valves open. The suction side is purged in the same way as the delivery side.

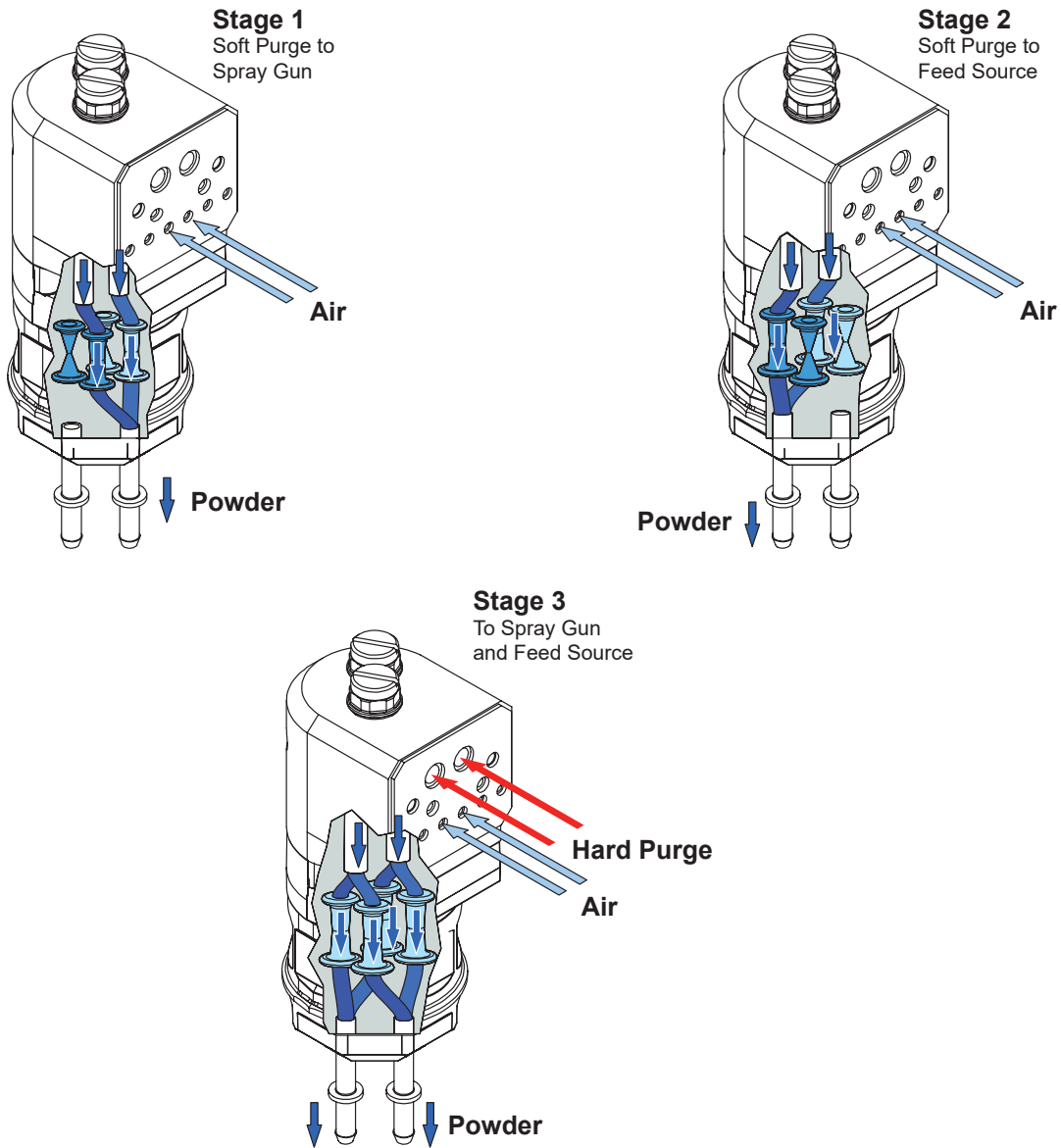


Figure 2-8 Purging Operation

## Pump Control Manifold Components

See Figure 2-9. The Encore High-Density powder, Low-Volume air (HD) powder feed pump transports precise amounts of powder from a feed source to a powder spray gun. The pump control manifold controls the air flow in and out of the pump.

Position	Description	Function	Set Points (psi-static)
1	Right Side Suction Pinch Valve	Open and closes pinch valve	---
2	Right Side Delivery Pinch Valve	Open and closes pinch valve	---
3	Right Side Fluidizing Tube	Alternates negative and positive air pressure to the pump chamber	---
4	Left Side Fluidizing Tube	Alternates negative and positive air pressure to the pump chamber	---
5	Left Side Delivery Pinch Valve	Open and close pinch valve	---
6	Left Side Suction Pinch Valve	Open and close pinch valve	---
7	Vacuum Generator	Works on the venturi principal to generate the negative air pressure required to draw powder into the tubes	---
8	High Pinch Valve	Regulates the high pinch valve pressure	80 psi
9	Low Pinch Valve	Regulates the low pinch valve pressure	37 psi
10	Vacuum Generator Regulator	Regulates the supply from the vacuum generator	80 psi

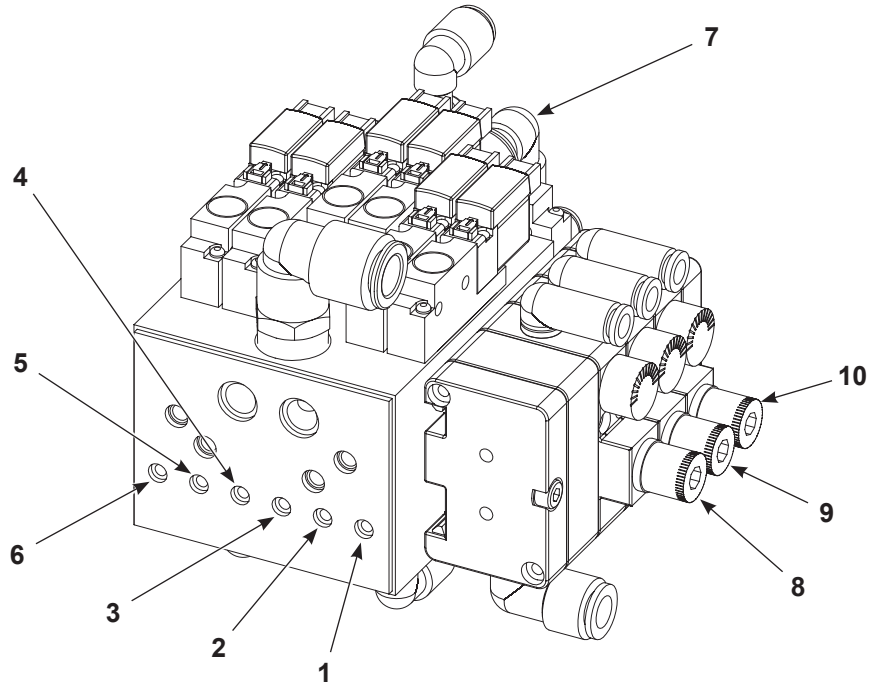


Figure 2-9 Pump Control Manifold

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## Section 3

# Installation

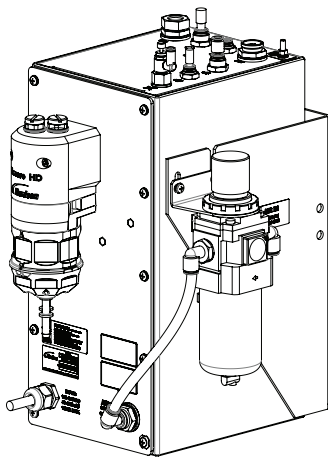


**WARNING:** Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

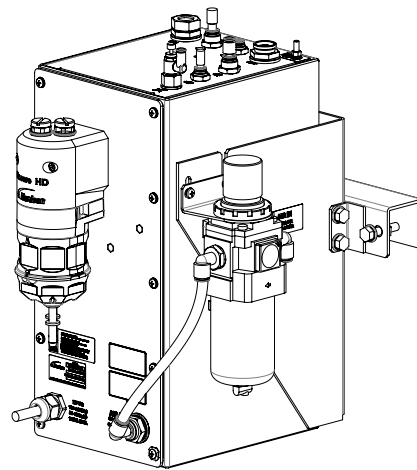
## Wall/Rail Mount Systems

### Pump Control Unit Mount

See Figure 3-1 and Figure 3-2. Using the supplied brackets, the power unit can be mounted to a wall or rail, as desired.



**Wall Mount Configuration**



**Rail Mount Configuration**

Figure 3-1 Controller with Mounting Brackets

## Pump Control Unit Mount (contd)

Fasteners shown are provided with the controller. Make sure to provide clearance for the connections to both the power unit and the interface module.

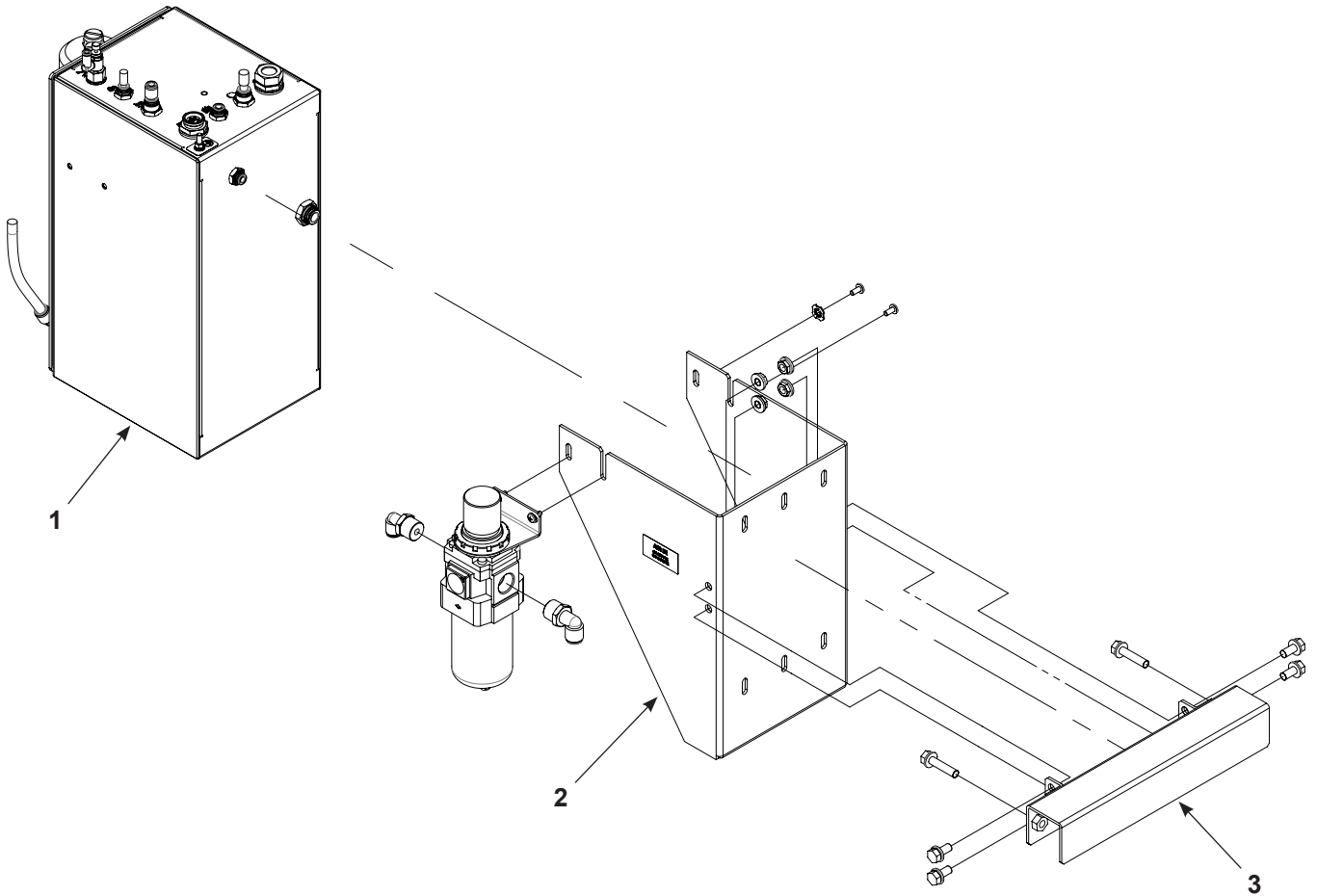


Figure 3-2 Pump Control Unit Wall Mounting Brackets

1. Pump control unit

2. Wall mount bracket

3. Rail mount bracket

## Interconnect Cable Connection

See Figure 3-3. Connect the gray, 3 meter (10 ft) interconnect cable to the net/auxiliary receptacles on Encore HD system controller to the pump control unit.

**NOTE:** The interconnect cable shipped with the system is 3 meters (10 ft) long. If a longer length is desired, you must order additional cables. Two or more cables can be connected as needed.

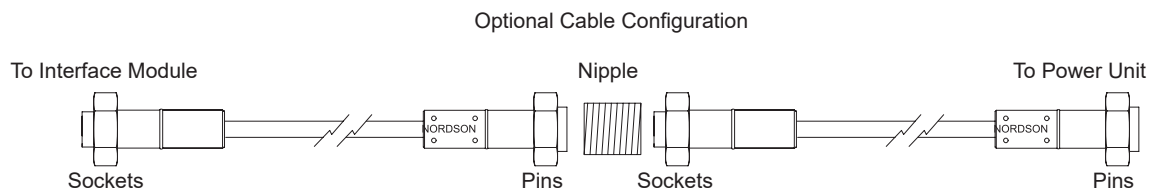
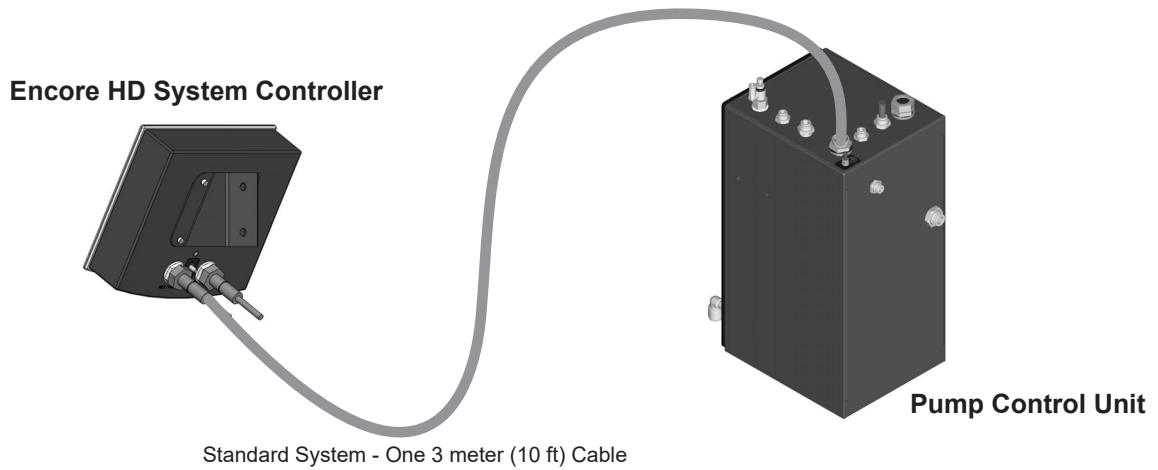


Figure 3-3 Pump Control Unit Interconnect Cable Connections

# System Connections

## System Diagram



**WARNING:** This diagram does not show all system grounds. All conductive equipment in the spray area must be connected to a true earth ground.

For additional information, see the *Wiring Diagrams* section.

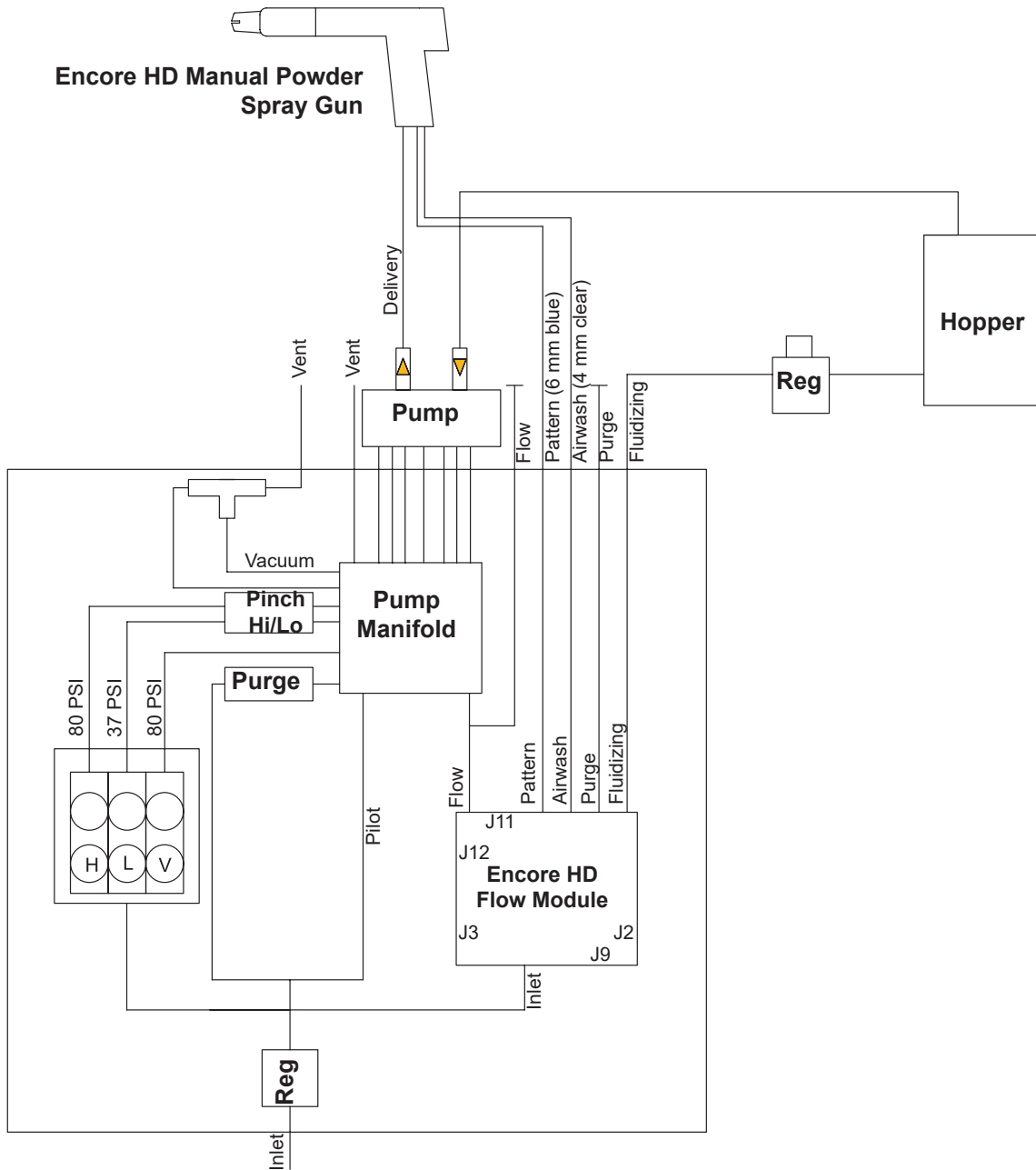


Figure 3-4 Encore HD Pump Control Unit Pneumatic Diagram

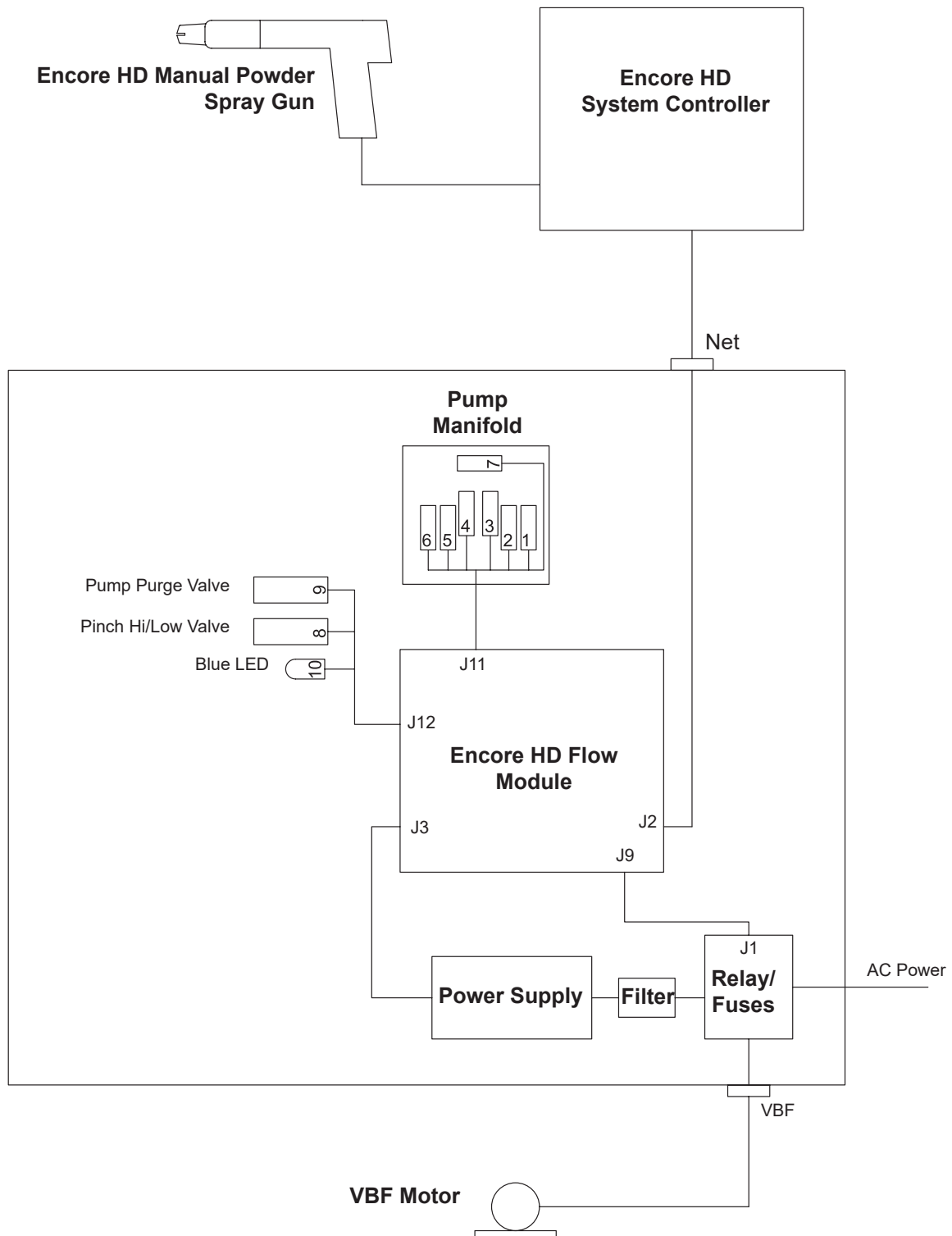


Figure 3-5 Encore HD Pump Control Unit Electrical Diagram

## Pump Control Unit Connections

The Encore HD spray gun is controlled by the system controller and pump control unit connected by a network/power cable.

The pump control unit houses a 24Vdc power supply, circuit board, and iFlow® air controller and valves used to control the Encore HD pump.

The system controller houses the controller interface panel, which contains the displays and controls used to set and adjust electrostatic and flow settings delivered to the spray gun.

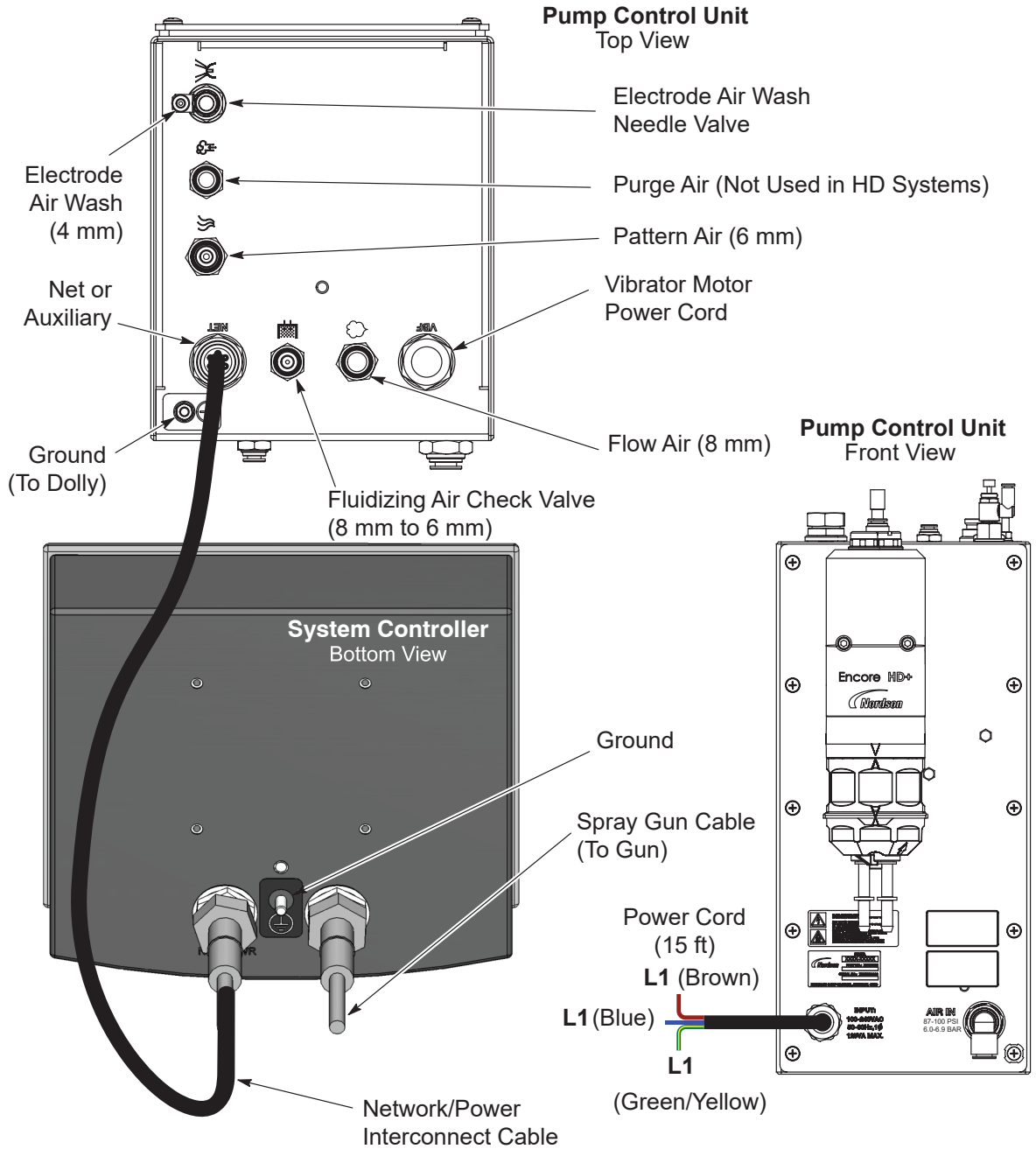


Figure 3-6 Encore HD System Controller Connections

## Spray Gun Connections

Unpack the spray gun. Uncoil the spray gun cable and the included clear 4-mm and blue 6-mm air tubing. Connect the gun cable and air tubing as described in the following procedures.

### Spray Gun Cable

1. Mobile System: See Figure 3-7. Feed the spray gun cable into the back of the dolly tower and up through the top front. This will allow the user to bundle the cable with the pattern and electrode air wash tubing.
2. Connect the cable to the spray system controller receptacle labeled *GUN*. The cable plug and receptacle are keyed.
3. Thread the cable nut onto the receptacle and tighten the nut securely.

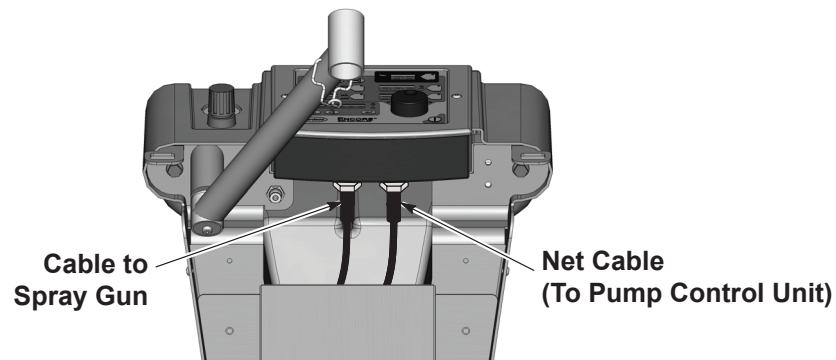


Figure 3-7 Spray Gun Cable Connection to System Controller – Mobile System Shown

## Air Tubing and Powder Tube

**NOTE:** Prior to cutting tubing to length, measure to the same length as the spray gun cable.

See Figure 3-8.

1. Measure and connect the 6-mm blue pattern air tubing to the quick-disconnect fitting in the gun handle. Connect the other end to the pattern air fitting on the pump control unit. Measure and cut the air tubing to required system length.
2. Measure and connect the 4-mm clear electrode air wash tubing to the barbed fitting in the gun handle. Connect the other end to the gun air fitting on the pump control unit. Measure and cut the air tubing to required system length.
3. Push the barbed tube adapter into the end of the powder tube, then plug the adapter into the powder inlet tube in the bottom of the spray gun handle.
4. For hopper pickup tube, install the powder tube onto the barbed adapter. Then insert the adapter into the push-to-connect fitting on the pump adapter on top of the pickup tube assembly.

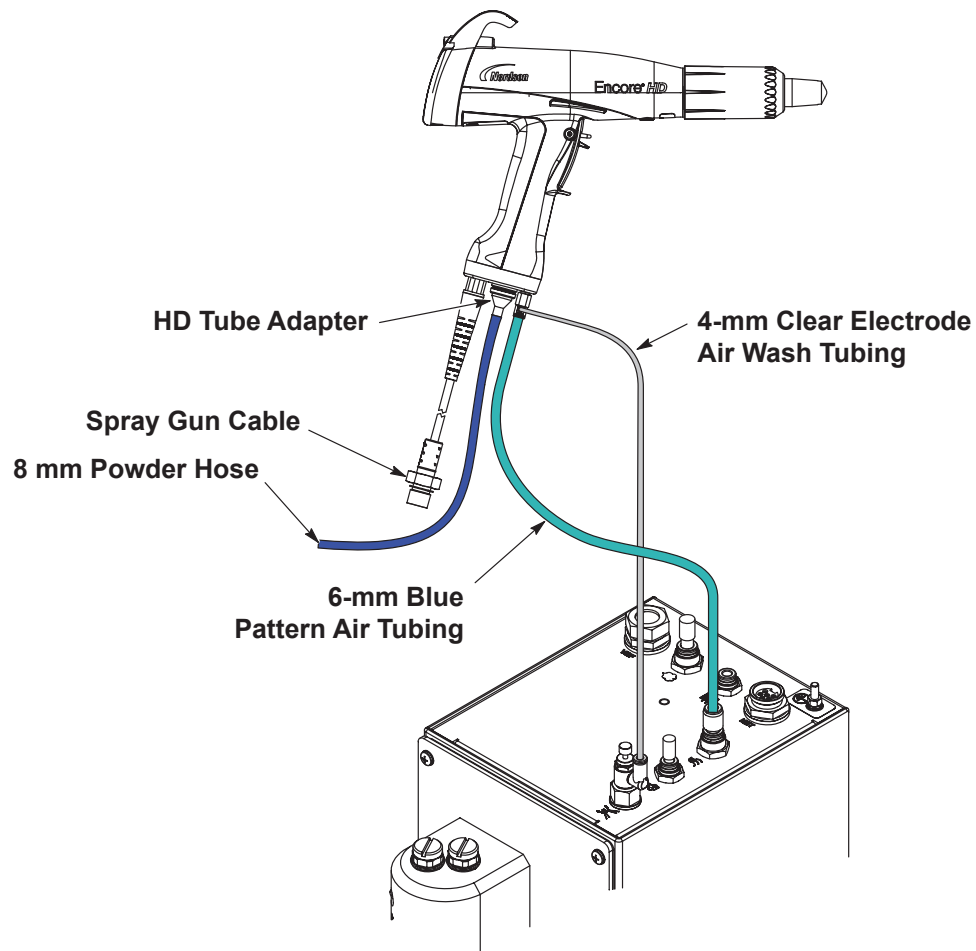


Figure 3-8 Spray Gun Connections



## Bundling Tubing and Cable

See Figure 3-9. Use the sections of black spiral wrap supplied with the system to bundle together the spray gun cable, air tubing, and powder hose.

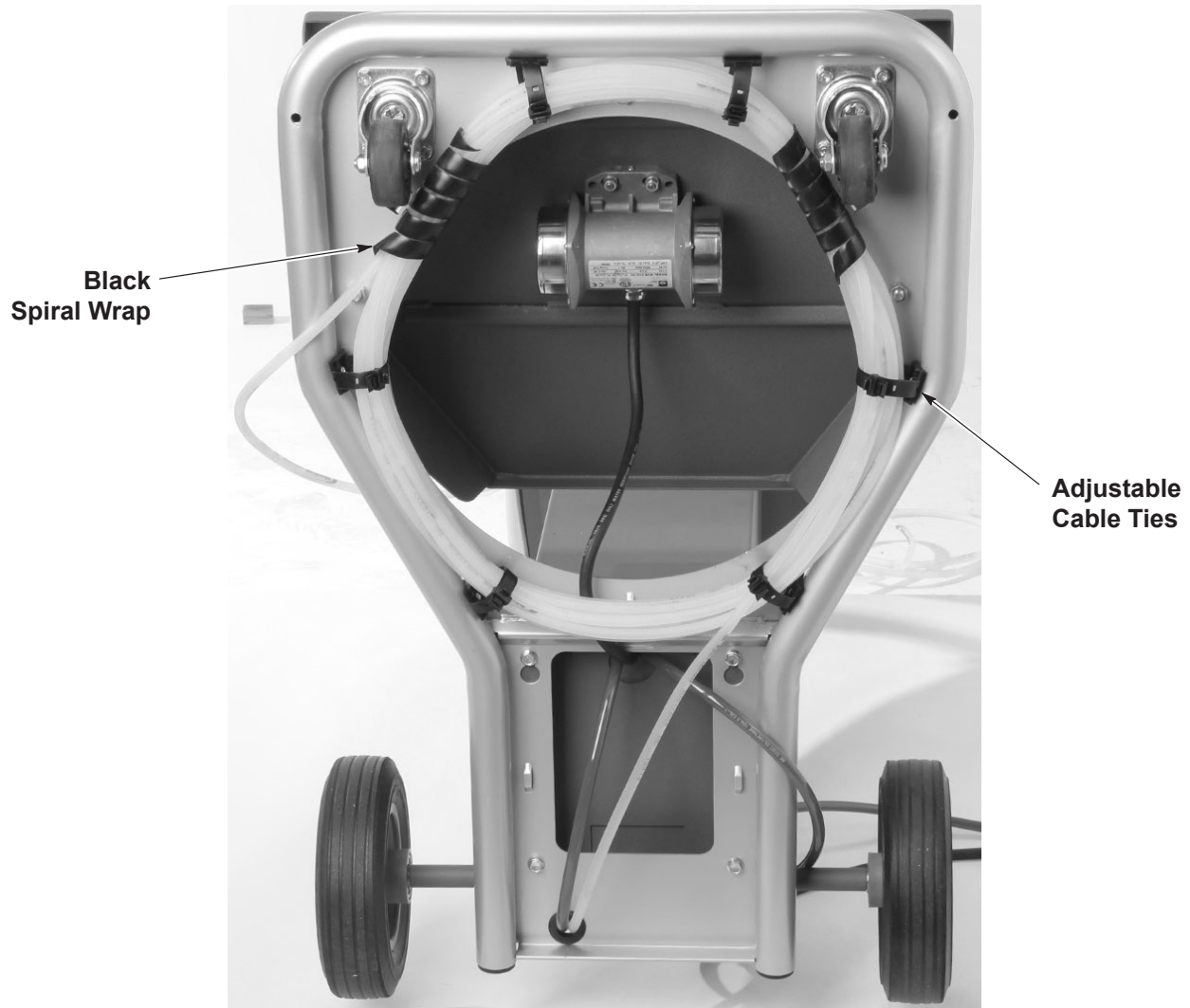


Figure 3-9 Bundling Tubing (Shown with Mobile System)

**NOTE:** See Figure 3-9. The minimum powder hose length is 60 ft.

**For the Mobile Systems:** The tubing is coiled under the dolly platform from the factory. If additional distance from dolly is required, open the tube holders and uncoil to the required length. Close the tube holders, being careful not to over tighten.

Spiral wrap is used to protect the tubing from the swivel castors.

**For Standalone and Rail/Wall systems:** The tubing must be coiled in a 3 ft diameter in a horizontal orientation.

## Main System Air and Electrical Connections

### Main System Air Supply

See Figure 3-10. The air supply pressure should be 6.0–6.9 bar (87–100 psi).

Recommended setpoint for included air filter/regulator is 6.5 bar (95 psi).

**NOTE:** Compressed air should be supplied from an air drop equipped with a self-relieving shutoff valve. The air must be clean and dry. A refrigerant or desiccant-type air drier and air filters are recommended.

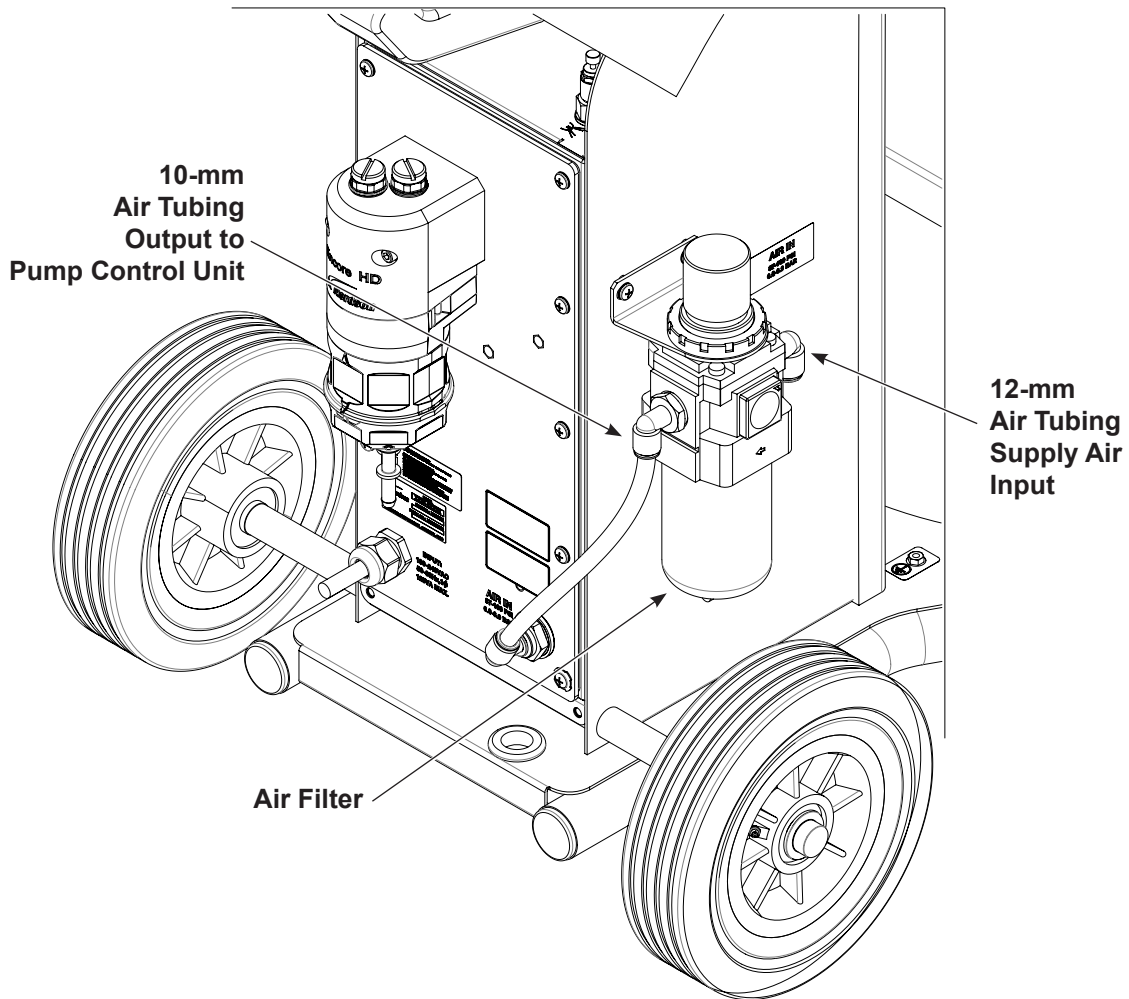


Figure 3-10 System Air Supply Connection (Shown with Mobile System)

## Standalone, Rail Mount, and Wall Mount System Air Supply

See Figure 3-11.

1. Note the orientation of the flow indicator (1) on the top of the filter.

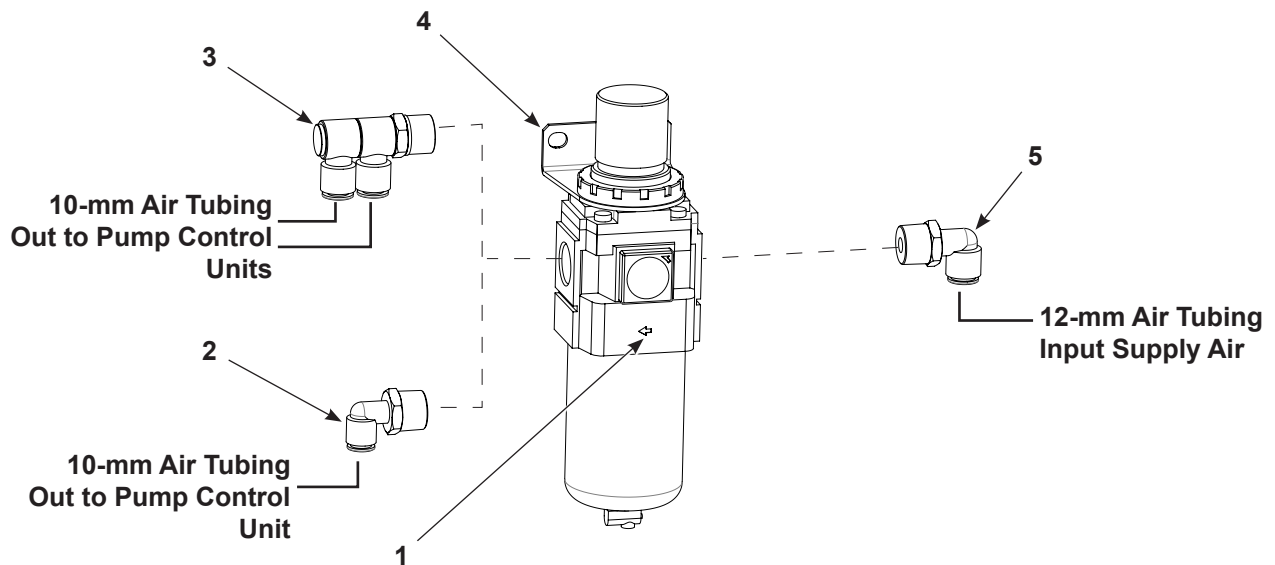


Figure 3-11 Air Filter Installation – Standalone and Rail/Wall Mount Systems

- |                          |                         |                          |
|--------------------------|-------------------------|--------------------------|
| 1. Flow indicator        | 3. 10-mm dual connector | 5. 12-mm elbow connector |
| 2. 10-mm elbow connector | 4. Bracket              |                          |

## Encore HD Powder Pump Hose

See Figure 3-12.

### Standard 8-mm OD Poly Tubing

1. Cut the poly tubing with a tubing cutter. Powder cross-contamination may result if the powder tubing is cut unevenly.
2. Install the poly tubing (3) into the lower Y block (1) and push to internal connector fitting (not shown)

### Flexible 8-mm OD Tubing

1. The barbed adapters used to connect flexible tubing to the pump are shipped with the pump.
2. Install the end of the adapter (2) into the lower Y block (1). Push to internal connect fitting.
3. Push the flexible powder tubing (4) over the barbed ending of the adapter (2).

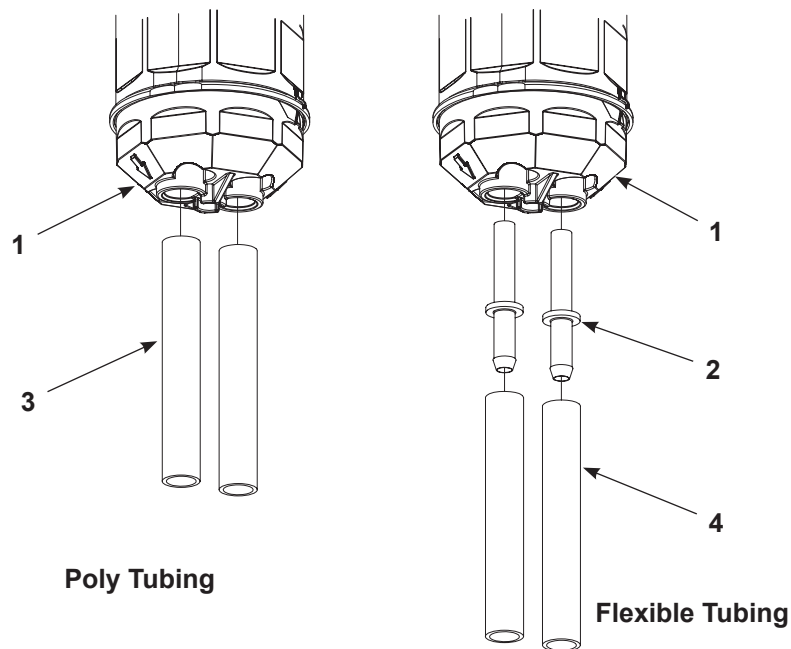


Figure 3-12 Encore HD Pump Tubing Installation

- |                          |                    |
|--------------------------|--------------------|
| 1. Lower Y block         | 3. Poly tubing     |
| 2. Barbed tubing adapter | 4. Flexible tubing |

## Pump Adapter Installation

See Figure 3-13. The pump adapter allows you to connect the Encore HD pump to your powder source. Install the tubing onto the barbed hose adapter. Then, plug the barbed hose adapter into the pump adapter.



Figure 3-13 Pump Mounting with Adapter on HR or NHR Hoppers

## Electrical Connections



**CAUTION:** If you are setting up a vibratory box feeder system, check the system identification plate for the correct voltage. Connecting a system with a 115 Vac vibrator motor to 230 Vac could damage the vibrator motor.

**NOTE:** The spray gun controller is rated for 100–240 Vac at 50/60 Hz, single phase, and is marked as such, but the power supplied to the system must match the vibrator motor rating.

Wire the system power cord to a customer-supplied three-prong plug. Connect the plug to a receptacle that will supply the system with the correct voltage.

Wire Color	Function
Blue	N (neutral)
Brown	L (hot)
Green/Yellow	GND (ground)

## System Ground



**WARNING:** All conductive system components in the spray area must be connected to a true earth ground. Failure to observe this warning could result in an electrostatic discharge strong enough to cause a fire or explosion.

## Mobile Systems

See Figure 3-14. Connect the ground cable attached to the pump control unit ground stud to a true earth ground.

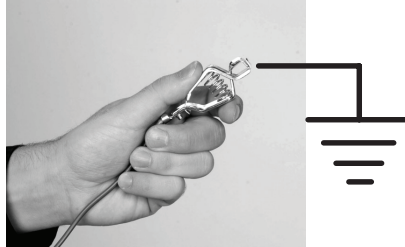


Figure 3-14 System Ground Connection

## Wall / Rail Mount Systems

Use the ESD ground bus bar kit included with the system to connect the power unit ground stud to the grounded spray booth or a true earth ground. Refer to the instructions included with the kit.

## 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.



**WARNING:** This equipment can be dangerous unless it is used accordance with the rules laid down in this manual.



**WARNING:** All electrically conductive equipment in the spray area must be grounded. Ungrounded or poorly grounded equipment can store an electrostatic charge which can give personnel a severe shock or arc and cause a fire or explosion.

## European Union, EX, Special Conditions for Safe Use

1. The Encore XT/HD Interface Control Unit and the Encore HD Controller Power Unit or a Mobile Powder Systems shall only be used over the ambient temperature range of +15°C to +40°C with the Encore HD Powder Electrostatic Manual Applicator or with the Encore HD Select Powder Electrostatic Robot Applicator.
2. Equipment may only be used in areas of low impact risk.
3. Caution should be taken when cleaning external painted and non-metallic surfaces of the controller, interface, applicator, and all accessories. There is a potential for static electricity build up on these components. Follow the manufacturer's instructions to avoid possible electrostatic charging hazards. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in PD CLC/TR 60079-32-1 and IEC TS 60079-32-1.

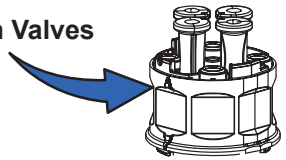
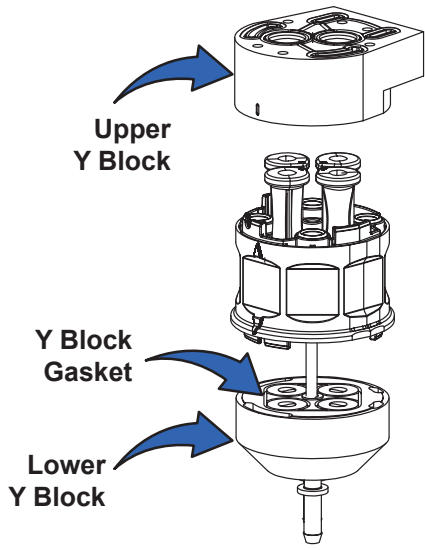
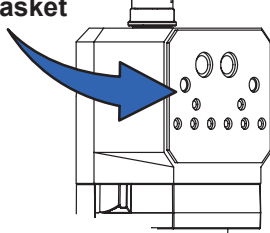
# Maintenance

Perform these maintenance procedures to keep your pump operating at peak efficiency.



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

**NOTE:** You may have to perform these procedures more or less frequently, depending on factors such as operator experience and type of powder used.

Frequency	Part	Procedure
Daily Visual Inspection	<p>Pinch Valves</p> 	<p>Inspect the pinch valve body for signs of powder leakage. If powder is seen in the pinch valve body or there are stress cracks in the pinch valves, replace the pinch valves and filter discs.</p>
Every Six Months or Each Time You Disassemble the Pump	 <p>Upper Y Block</p> <p>Y Block Gasket</p> <p>Lower Y Block</p>	<p><b>NOTE:</b> To reduce downtime, keep a spare upper manifold and set of lower wear blocks in stock to install while the other set is being cleaned.</p> <p>Disassemble the pump and inspect the lower Y block and upper Y block for signs of wear or impact fusion. Clean these parts in an ultrasonic cleaner if necessary.</p> <p><b>NOTE:</b> Replace the Y block gasket each time the pump is disassembled.</p>
	<p>Gasket</p> 	<p>Inspect the gasket for damage. Replace if necessary.</p>



## 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.



**WARNING:** Before making repairs to the controller or spray gun, shut off system power and disconnect the power cord. Shut off the compressed air supply to the system and relieve the system pressure. Failure to observe this warning could result in personal injury.

These troubleshooting procedures cover only the most common problems. If you cannot solve a problem with the information given here, contact Nordson technical support at (800) 433-9319 or your local Nordson representative for help.

# Pump Troubleshooting

Problem	Possible Cause	Corrective Action
<b>1. Reduced powder output (pinch valves are opening and closing)</b>	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.
	Defective check valve	Replace the check valves.
<b>2. Reduced powder output (pinch valves are not opening and closing)</b>	Defective pinch valve	Replace the pinch valves and filter discs.
	Defective pinch solenoid valve	Replace the solenoid valve. Refer to either the pump panel or control manifold manual for more information.
	Defective check valve	Replace the check valves.
<b>3. Reduced powder input (loss of suction from feed source)</b>	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 either the pump panel or control manifold manual for more information.

## Pump Port Functions

Figure 5-1 identifies the functions of the ports on the rear face of the pump.

Position	Function
1	Right Side Suction Pinch Valve
2	Right Side Delivery Pinch Valve
3	Right Side Fluidizing Tube
4	Left Side Fluidizing Tube
5	Left Side Delivery Pinch Valve
6	Left Side Suction Pinch Valve

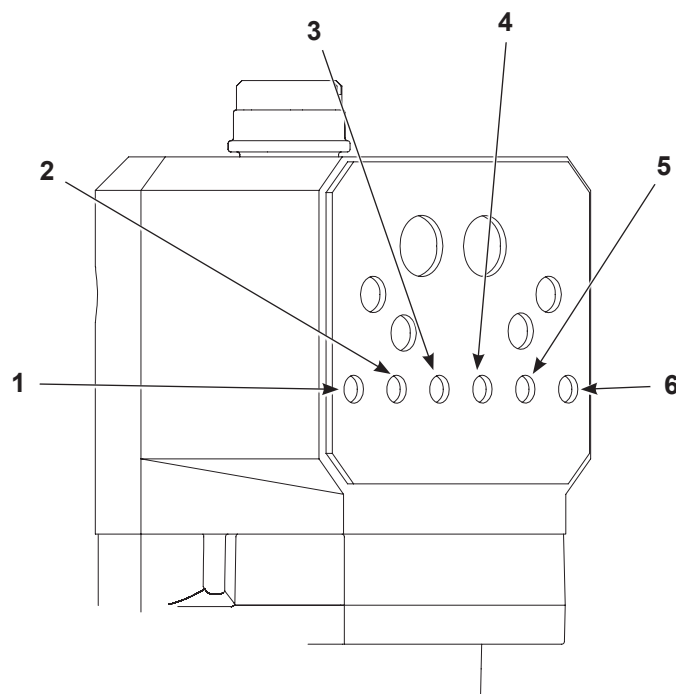


Figure 5-1 Pump Port Functions

# Manifold Troubleshooting

Problem	Possible Cause	Corrective Action
<b>1. Reduced powder output (pinch valves are opening and closing)</b>	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 <i>iFlow Module Repair</i> on page 6-4 for instructions. If the problem persists, replace the pump air flow control valve. Refer to <i>iFlow Module Repair</i> on page 6-4 for instructions.
	Defective pump check valve	Replace the check valves.
<b>2. Reduced powder output (pinch valves are not opening and closing)</b>	Defective pinch valve	Replace the pinch valves and filter discs.
	Defective solenoid valve	Replace the solenoid valve. Refer to <i>Solenoid and Flow Control Valve Functions</i> on page 5-5 to determine which solenoid valve controls the affected pinch valve.
	Defective pump check valve	Replace the check valves.
<b>3. Reduced powder input (loss of suction from feed source)</b>	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 <i>iFlow Module Repair</i> on page 6-4 for instructions. If the problem persists, replace the pump air flow control valve. Refer to <i>iFlow Module Repair</i> on page 6-4 for instructions.
<b>4. Spray gun fan pattern changes</b>	Defective pattern air flow control valve	Clean the pattern air flow control valve. Refer to <i>iFlow Module Repair</i> on page 6-4 for instructions. If the problem persists, replace the pattern air flow control valve. Refer to <i>iFlow Module Repair</i> on page 6-4 for instructions.

## Solenoid and Flow Control Valve Functions

Figure 5-2 identifies the solenoid and flow control valve functions and the corresponding ports on the manifold.

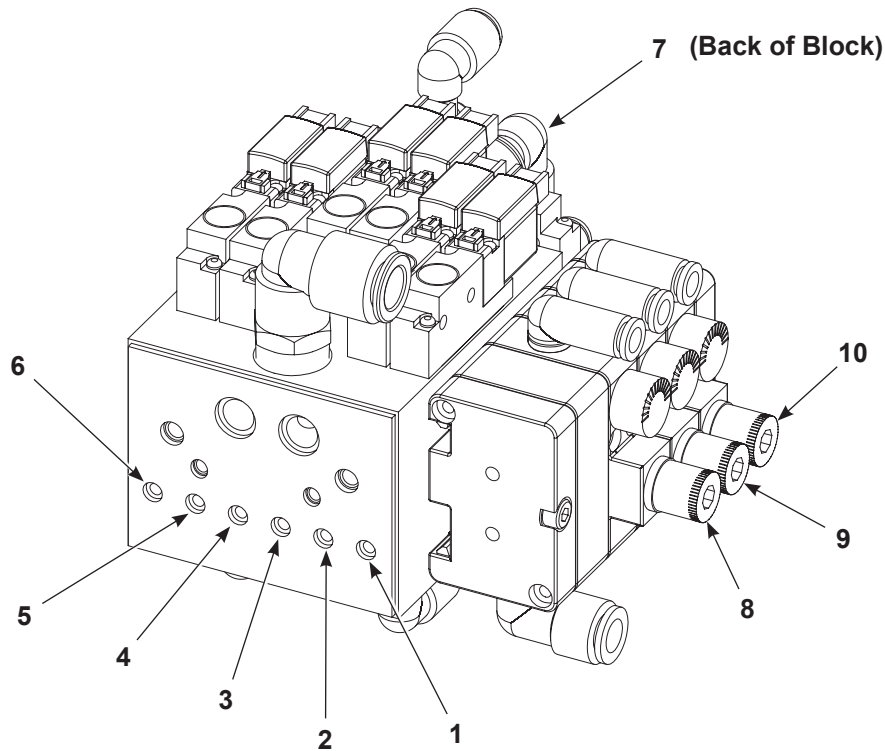


Figure 5-2 Solenoid and Flow Control Valve Functions

Position	Function	Position	Function
1	Right Side Suction Pinch Valve	6	Left Side Suction Pinch Valve
2	Right Side Delivery Pinch Valve	7	Vacuum Generator
3	Right Side Fluidizing Tube	8	High Pinch Valve (80 psi)
4	Left Side Fluidizing Tube	9	Low Pinch Valve (37 psi)
5	Left Side Delivery Tube	10	Vacuum Generator Regulator (80 psi)

## Re-Zero Procedure

Perform this procedure if the system controller interface indicates air flow when the spray gun is not triggered on, or if a Flow Air or Atomizing Air Flow High Help code (H25 or H26) appears. See the system manual for additional information on help codes.

Before performing a re-zero procedure:

- Make sure the air pressure being supplied to the system is higher than the minimum 5.86 bar (85 psi).
  - Make sure no air is leaking through the module output fittings or from around the solenoid valves or proportional valves. Re-zeroing modules with leaks will result in additional errors.
1. At the pump control panel, disconnect the 6 mm pattern air tubing and install 8-mm plugs in the output fittings.
  2. Press the Nordson button for 5 seconds to display the controller functions. F00-00 is displayed.
  3. Rotate the knob until F10-00 is displayed.
  4. Press the **Enter** button, then rotate the knob to display F10-01.
  5. Press the **Enter** button. The system controller will re-zero the flow and pattern air and reset the function display to F10-00.
  6. Remove the plugs from the pattern air output fittings and reconnect the air tubing.

## Controller Interconnect Cable Test

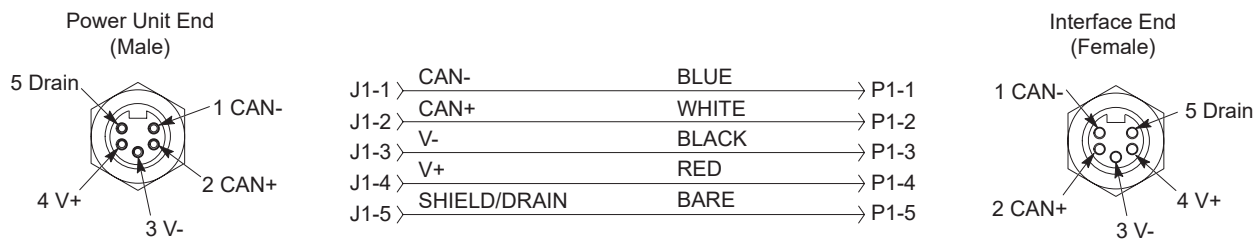


Figure 5-3 Controller Interconnect Cable Wiring

## Section 6

# Repair



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



**WARNING:** Shut off the controller and disconnect the power cord or disconnect and lock out power at a breaker or disconnect ahead of the controller before opening the controller enclosures. Failure to observe this warning could result in a severe electrical shock and personal injury.



**CAUTION:** Electrostatic sensitive device. To avoid damaging the controller circuit boards, wear a grounding wrist strap and use proper grounding techniques when making repairs.

Refer to the *Wiring Diagram* section for the pump control unit electrical schematic and harness connections.

## Removing Panel Assembly

1. Disconnect the main power and air.
2. Remove the ten screws (2) securing the panel assembly (3) to the enclosure (1).
3. Slowly remove panel assembly



**CAUTION:** Handle cable and connectors with care. When reassembling, do not allow cables or air lines to become pinched or twisted at the back of the cabinet wall.

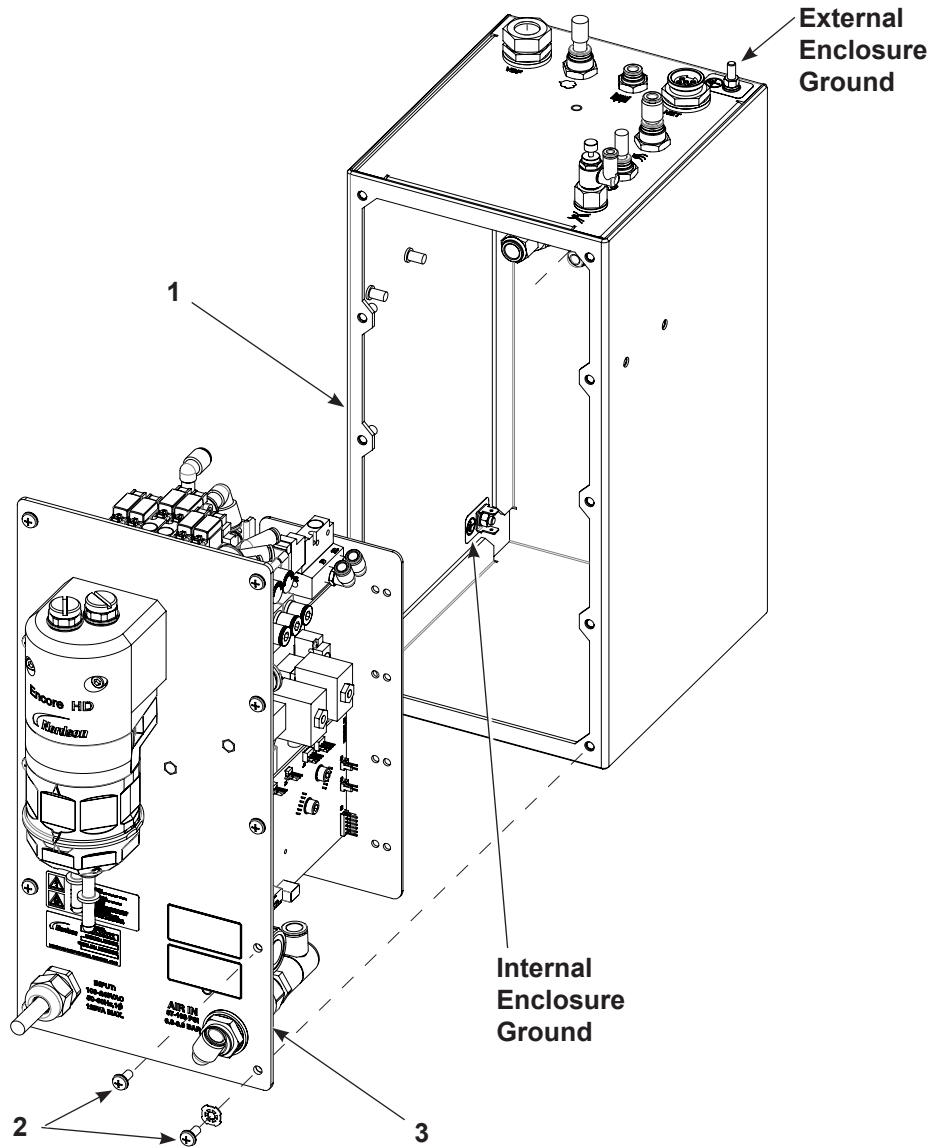


Figure 6-1 Sub-Panel Removal

1. Enclosure

2. Screws

3. Panel assembly



## Sub-Panel Components

Refer to the following when making repairs:

- *Parts* section for parts and service kits.
- *Wiring Diagrams* for wiring diagrams and circuit board connections.
- *Regulator Adjustment* and *iFlow Module Repair* for repair procedures.

## Regulator Adjustment

See Figure 6-2.

Use the iFlow Air Verification Kit and this procedure to adjust the regulator that supplies air to the iFlow module after replacing.

**NOTE:** The plugs and connectors in the regulator ports are not supplied with a replacement regulator. Re-use the plugs and connectors from the old regulator in the replacement regulator.

1. Unplug one of the fittings from the regulator and plug the gauge into the fitting.
2. Set the regulator to 85 psi.
3. Remove the gauge and replace the plug in the regulator fitting.
4. Push the regulator knob to lock the setting.

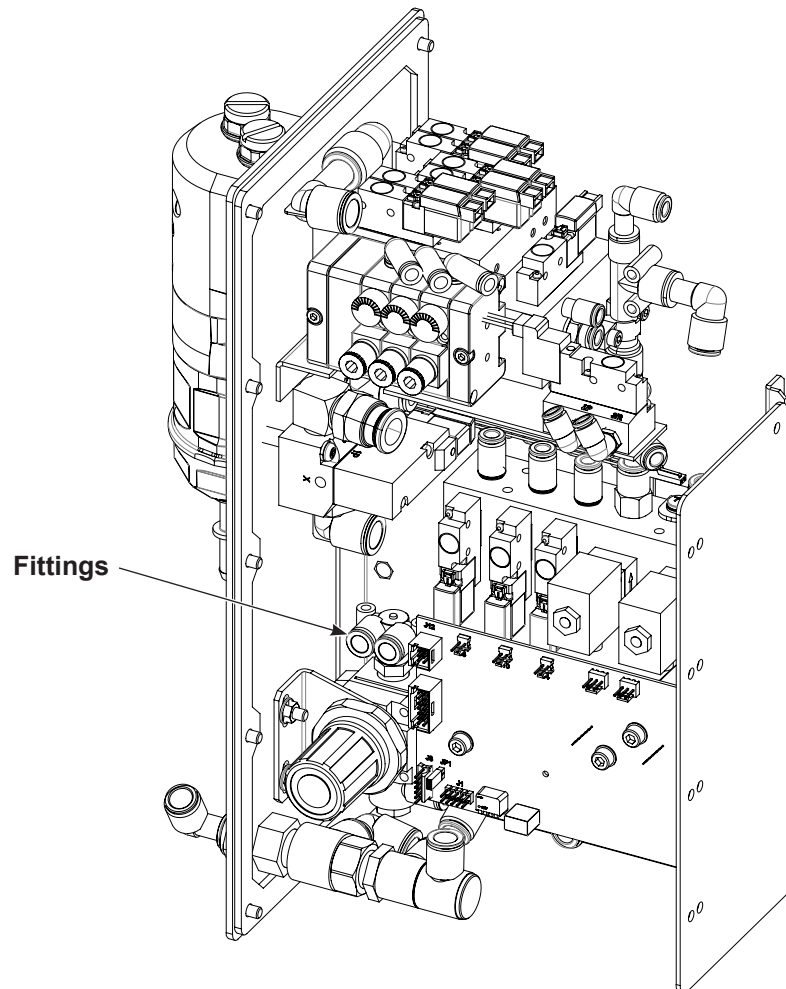


Figure 6-2 Regulator Adjustment

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## iFlow Module Repair

The iFlow module consists of a circuit board and air manifold, on which are mounted two proportional valves, transducers, and four solenoid valves. Repair of the flow module is limited to cleaning or replacing the proportional valves, and replacing the solenoid valves, check valves, and fittings.



**CAUTION:** The module circuit board is an electrostatic sensitive device (ESD). To prevent damage to the board when handling it, wear a grounding wrist strap connected to ground. Handle the board only by its edges.

### Testing iFlow Modules



**CAUTION:** Handle the orifice assembly with care. Rough handling can damage the orifice and affect the manometer reading.

#### *Conveyance Air Flow*

**NOTE:** Perform a color change and verify that all powder is removed from the pump before starting this procedure.

1. Use the flow verification tool (1039881) and connect to the delivery port of the pump with 10 ft of 8 mm tubing.
2. Set the delivery to 100% and set assist air to 00% and trigger the pump ON. The monometer should read 4.0–5.0 psi (0.2–0.3 bar).
3. Increase the assist air to +50% and trigger the pump ON. The monometer should read 7.0–8.0 psi (0.5–0.6 bar).
4. Decrease the assist air to –50% and trigger the pump ON. The monometer should read 1.0–3.0 psi (0.1–0.2 bar).

#### *Pattern Air*

Use the flow verification tool (1039881) with its instructions and connect to the pattern air output.

## Solenoid Valve Replacement

See Figure 6-3. To remove the solenoid valves (13), remove the two screws in the valve body and lift the valve off the manifold.

Make sure the O-rings furnished with the new valves are in place before installing the new valve on the manifold.

## Proportional Valve Cleaning

See Figure 6-3. A dirty air supply can cause the proportional valve (6) to malfunction. Follow these instructions to disassemble and clean the valve.

1. Disconnect the coil (3) wiring from the circuit board (1). Remove the nut (2) and coil from the proportional valve (6).
2. Remove the two long screws (4) and two short screws (5) to remove the proportional valve from the manifold.

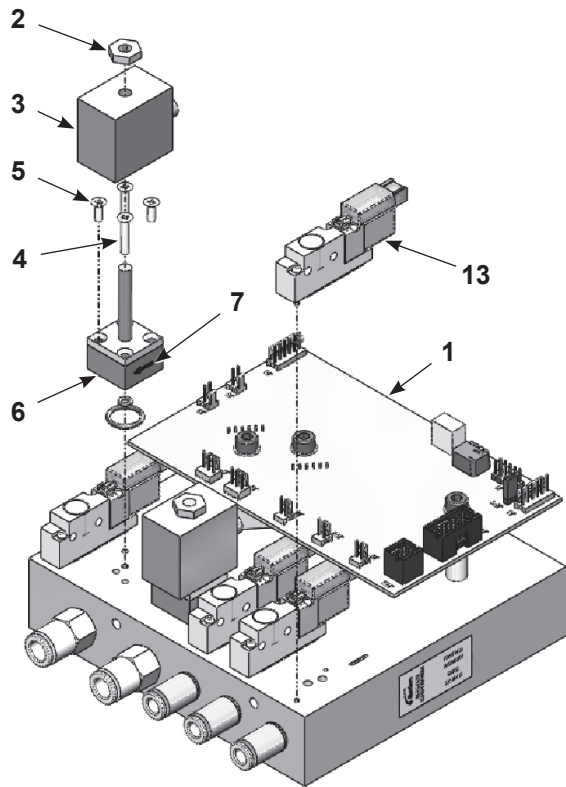


**CAUTION:** The valve parts are very small; be careful not to lose any. Do not mix the springs from one valve with those from another. The valves are calibrated for different springs.

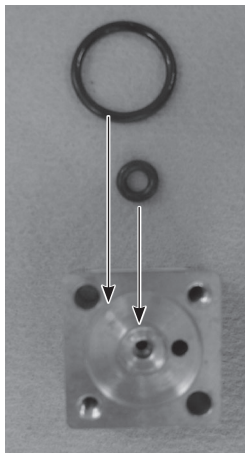
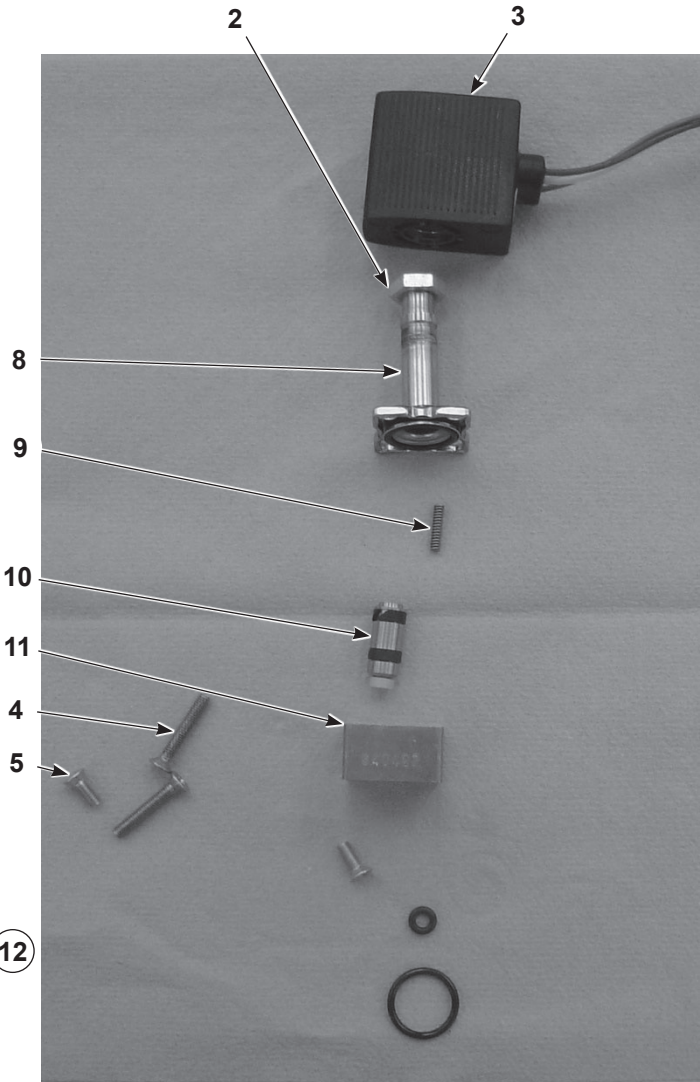
3. Remove the valve stem (8) from the valve body (11).
4. Remove the valve cartridge (10) and spring (9) from the stem.
5. Clean the cartridge seat and seals, and the orifice in the valve body. Use low-pressure compressed air. Do not use sharp metal tools to clean the cartridge or valve body.
6. Install the spring and then the cartridge in the stem, with the plastic seat on the end of the cartridge 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 side of the body points toward the outlet fittings.
9. Install the coil over the valve stem, with the coil wiring pointing toward the circuit board. Secure the coil with the nut and connect the coil wiring to the circuit board.

## Proportional Valve Replacement

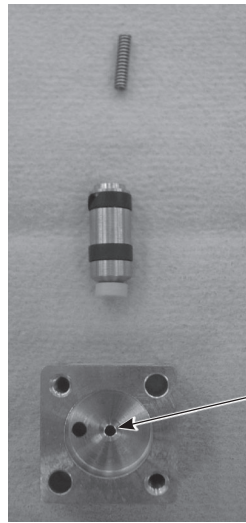
See Figure 6-3. If cleaning the proportional valve does not correct the flow problem then replace the valve. Before installing a new valve, remove the protective cover from the bottom of the valve body. Be careful to not lose the O-rings under the cover.



**Proportional Valve Cleaning**



**Valve Body Bottom**



**Valve Body Top**

Figure 6-3 iFlow Module Repair – Solenoid Valve Replacement and Proportional Valve Cleaning or Replacement

- |  |                            |                     |
|--|----------------------------|---------------------|
| 1. Circuit board                       | 6. Proportional valve (2)  | 10. Cartridge       |
| 2. Nut-coil to proportional valve (2)  | 7. Direction of flow arrow | 11. Valve body      |
| 3. Coil-proportional valve (2)         | 8. Stem                    | 12. Orifice         |
| 4. Long screws-valve to manifold (2)   | 9. Spring                  | 13. Solenoid valves |
| 5. Short screws-valve stem to body (2) |                            |                     |

## Vibrator Motor Replacement

When replacing the vibrator motor, make sure you order the correct motor for your voltage. Check the ID plate on the power unit. Replacement motors include the power cable.

Refer to the *Power Unit Wiring Diagram* in the *Troubleshooting* section of this manual for internal VBF wiring.

## Fluidizing Tube Replacement



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

1. Perform a color change to remove old powder from the pump, then relieve the system air pressure and disconnect the purge air tubing.

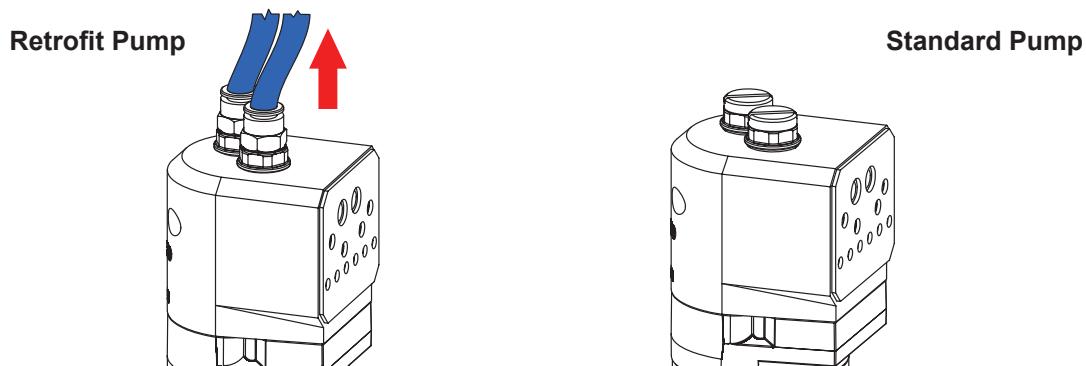


Figure 6-4 Removing the purge air tubing

2. Loosen the fluidizing tube access plug and pull the fluidizing tube straight out of the pump body.

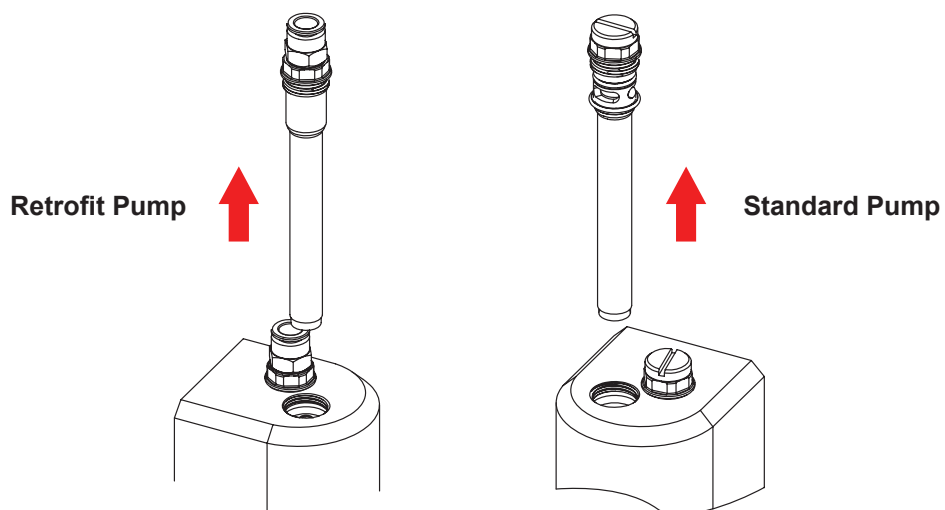


Figure 6-5 Loosening the fluidizing tubes

3. Pull the old fluidizing tube off the access plug, then seat the new fluidizing tube against the red o-ring.

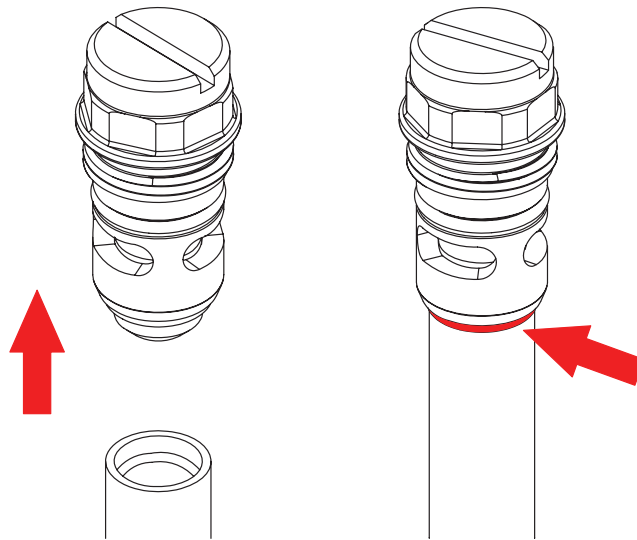


Figure 6-6 Replacing the Access Plugs to the Fluidizing Tubes

4. Install the fluidizing tube assemblies into the pump body. Tighten the access plugs, then reconnect the purge air tubing.

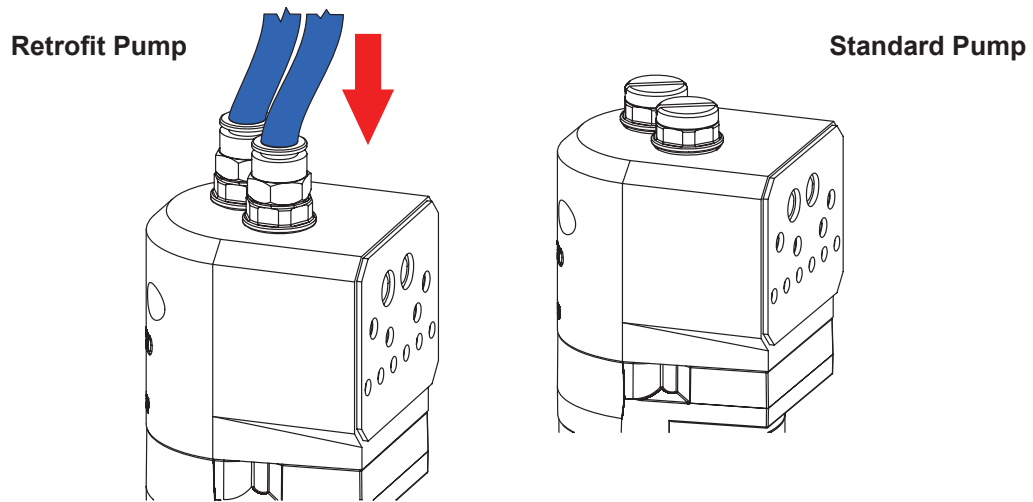


Figure 6-7 Reinstalling the Purge Air Tubing



## Pump Disassembly

To reduce downtime, keep a spare pump in stock to replace a pump that is being repaired. Refer to *Parts* section for ordering information.



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

**NOTE:** Tag all air and powder tubing before disconnecting from the pump.

1. See Figure 6-8. Disconnect the purge air lines (1) from the top of the pump.
2. Disconnect the inlet and outlet powder tubing (2) from the bottom of the pump.
3. Remove the two screws, lock washers, and flat washers (3) securing the pump to the pump panel and move the pump to a clean work surface.
4. See Figure 6-9. Starting with the fluidizing tubes, disassemble the pump as shown. Gaskets that are glued on do not need to be removed unless they are damaged. Discard the Y block gasket (19).

**NOTE:** Refer to *Pinch Valve Replacement* on page 6-16 for instructions on removing the pinch valves from the pinch valve body.

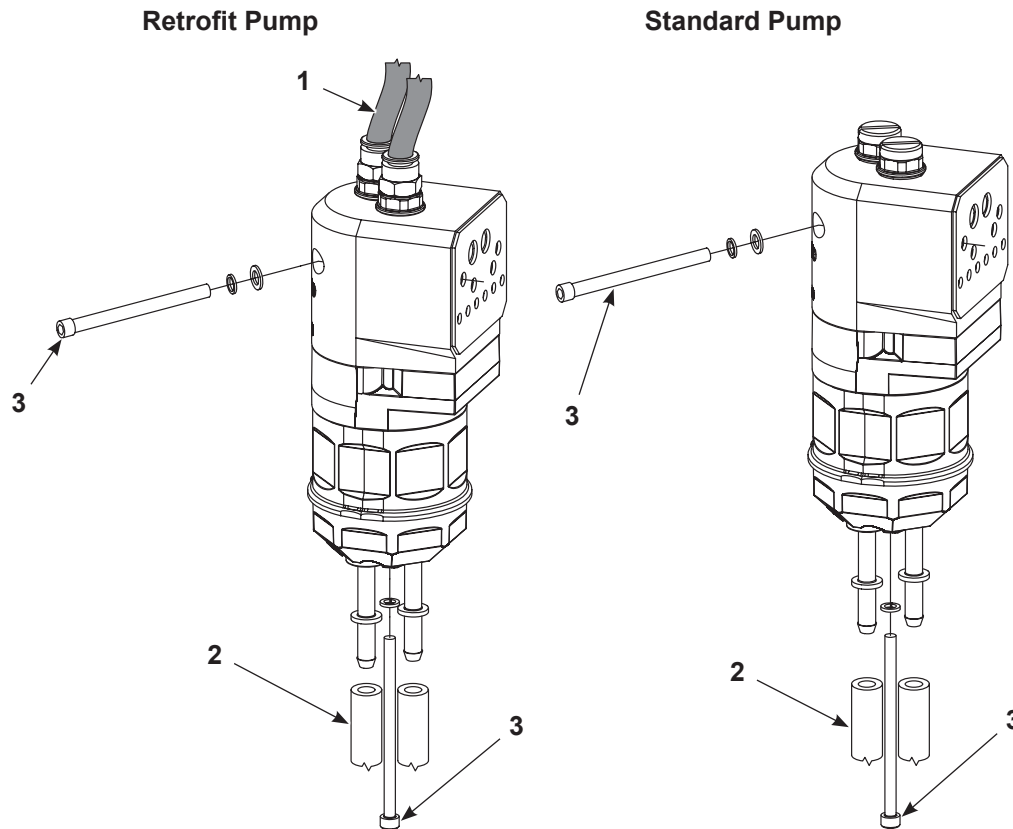


Figure 6-8 Disassembly Preparation

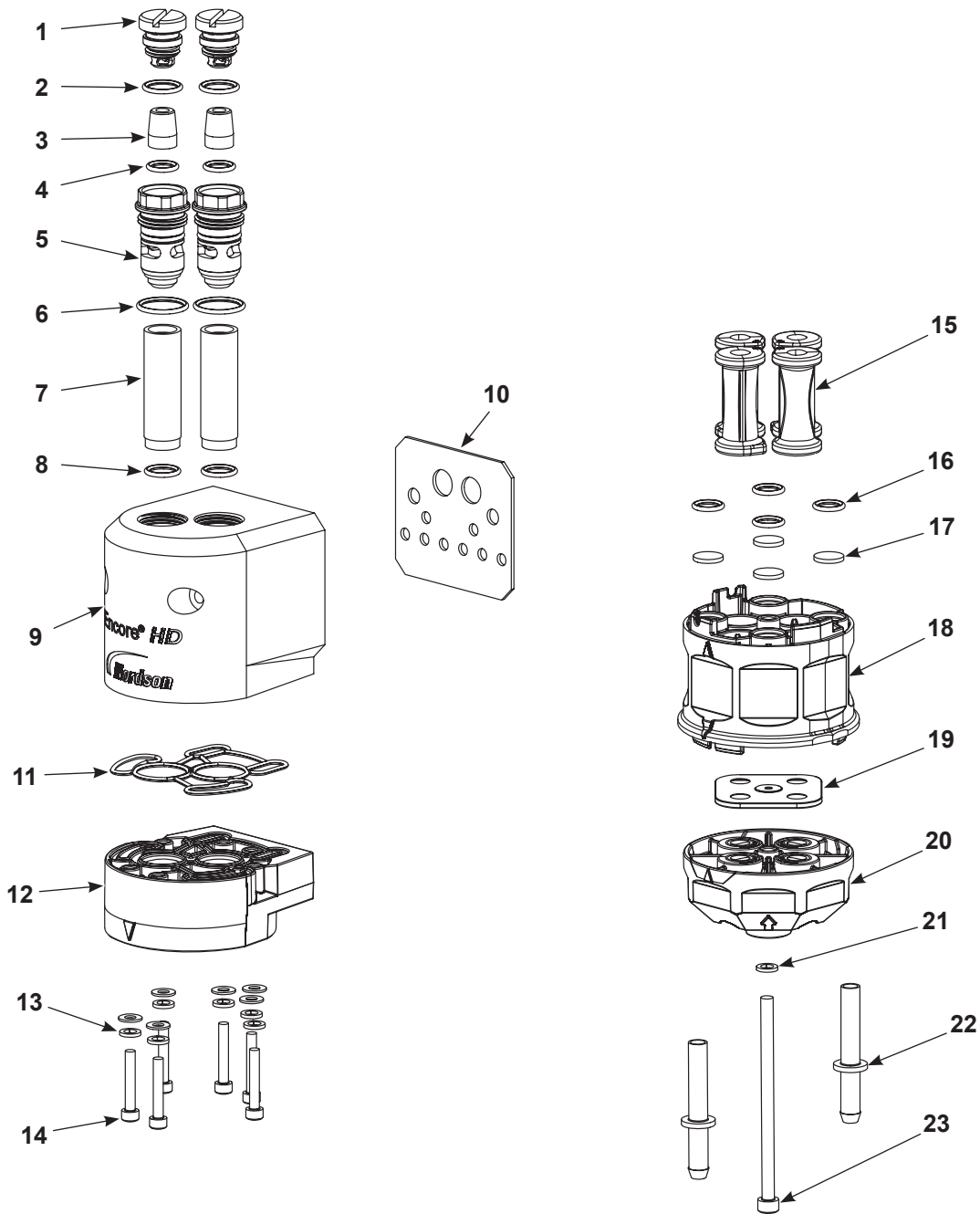


Figure 6-9 Pump Disassembly (Encore HD Shown)

- |                         |                        |                       |
|-------------------------|------------------------|-----------------------|
| 1. Fitting caps (2)     | 9. Purge manifold      | 17. Filter discs (4)  |
| 2. O-rings (2)          | 10. Manifold gasket    | 18. Pinch valve block |
| 3. Check valves (2)     | 11. Block seal         | 19. Y block gasket    |
| 4. O-rings (2)          | 12. Upper Y block      | 20. Lower Y block     |
| 5. Access plugs (2)     | 13. Lock washers (12)  | 21. Lock washer       |
| 6. O-rings (2)          | 14. Screws M5 x 25 (6) | 22. Hose barbs (2)    |
| 7. Fluidizing tubes (2) | 15. Pinch valves (4)   | 23. Screws M5 x 85    |
| 8. O-rings (2)          | 16. O-rings (2)        |                       |

## Pump Assembly



**CAUTION:** Follow the assembly order and specifications shown. Pump damage may occur if you do not carefully follow the assembly instructions.

1. Place the customized O-ring (1) into the upper Y block (2) as shown, then fasten the upper Y block to the purge manifold housing (3) with the provided hardware (4).

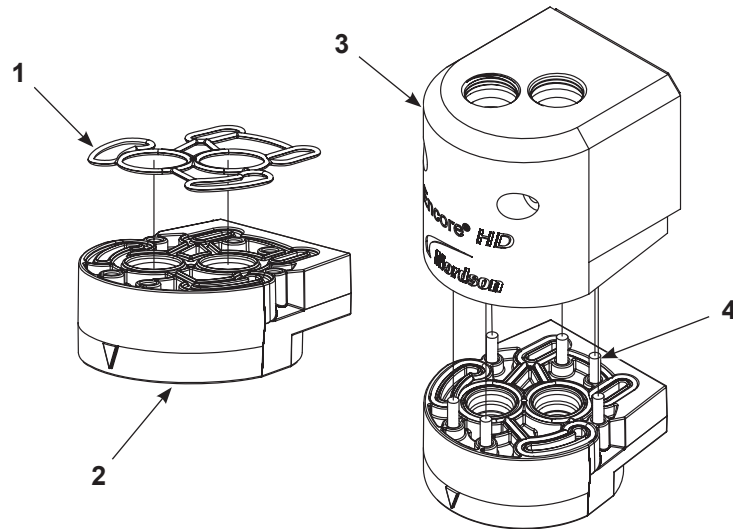


Figure 6-10 Assemble Lower Y Block to Purge Manifold

2. Assemble pinch valves (5), filter discs (6), and O-rings (7) into pinch valve housing (8). Refer to *Pinch Valve Replacement* on page 6-16 for assembly procedure.

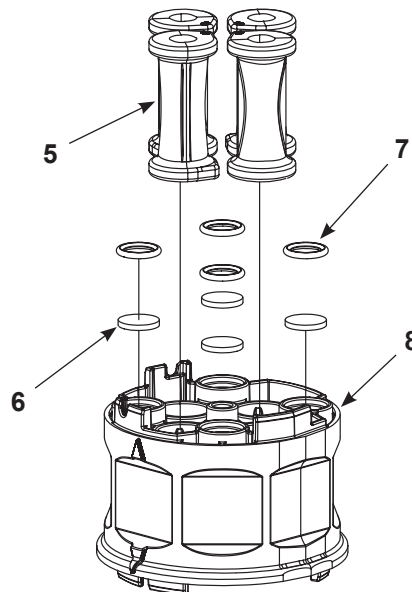


Figure 6-11 Assemble the Pinch Valve Housing

3. Install a new Y block gasket (10) over lower Y block (11), then thread long screw and lock washer (12) through the lower Y block and into the pinch valve housing, upper Y block and purge manifold. Hand tighten the screw.

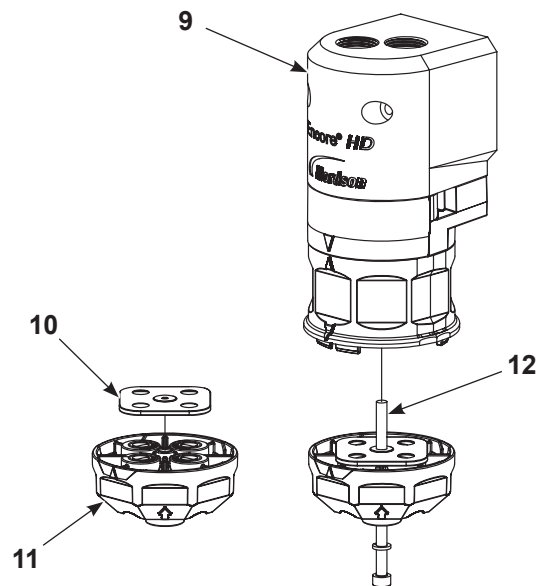


Figure 6-12 Assemble Gasket and Lower Y Block

4. Assemble the check valves (15) O-rings (14) access plugs (16), and fitting caps (13) together before replacing the fluidizing tubes (18). Then, once that is complete, assemble the complete access plugs (17) and additional O-rings onto the fluidizing tubes (18).

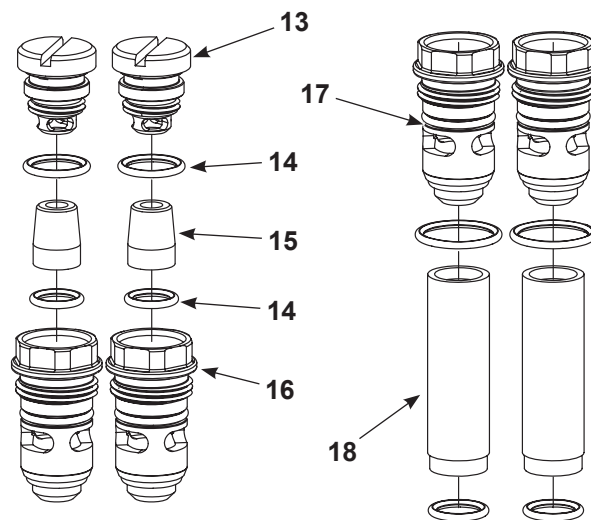


Figure 6-13 Assemble Fittings to Fluidizing Tubes

5. After the pump is assembled, completely tighten the long screw to fit all components together securely.

6. Insert the assembled fluidizing tube (19) into the top of the purge manifold (20). Snug fit tubes to manifold.

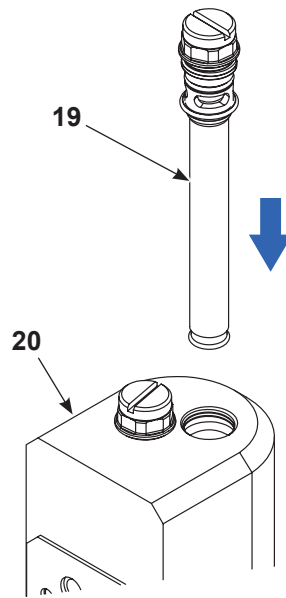


Figure 6-14 Fasten Fluidizing Tubes into Manifold

7. Mount the pump to the cabinet before assembling the feed tubing to the ports in the bottom of the pump. Refer to *Installation* on page 3-12 for more information.

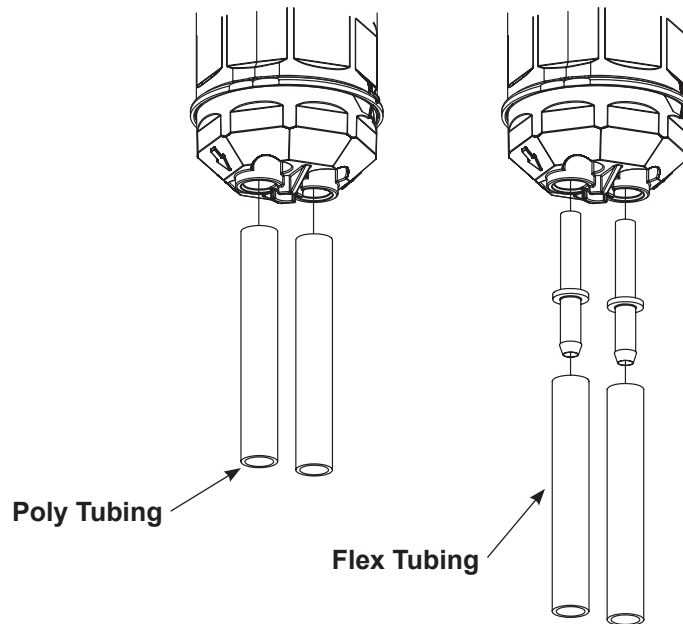


Figure 6-15 Assemble Tubing into Lower Y Block

## Pinch Valve Replacement



**CAUTION:** Before placing the pinch valve body in a vise, pad the jaws. Tighten the vise only enough to hold the valve body firmly. Failure to observe may result in damage to the pinch valve body.

Figure 6-16 shows the top of a pinch valve body.

- The top of the pinch valve body has the word “UP” molded on surface.
- The top side of the valve body has four air passages sealed with filter discs and o-rings.

**NOTE:** Always replace the Y block gasket and the filter discs included in the pinch valve kit when replacing the pinch valves.

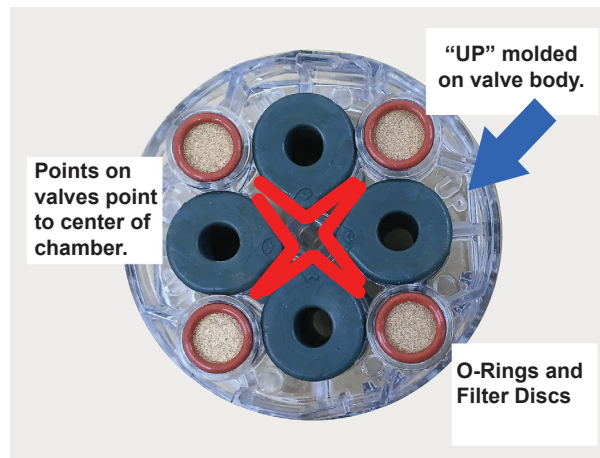


Figure 6-16 Top of Pinch Valve Body

### Pinch Valve Removal

1. Place the pinch valve body in a padded vise.
2. Grasp the bottom flange of a pinch valve with one hand and pull it away from the pinch valve body.
3. Cut the flange off with scissors, then pull the rest of the pinch valve out of the top of the pinch valve body.



Figure 6-17 Pinch Valve Removal

## Pinch Valve Installation

**NOTE:** All pinch valves intended for repeated contact with food must be thoroughly cleansed prior to their first use.

See inset on Figure 6-18 to properly align the pinch valve

1. Insert the insertion tool through one of the valve chambers, then insert the pinch valve into the open end of the insertion tool.

Align the pinch valve point to the center of the pinch valve housing.

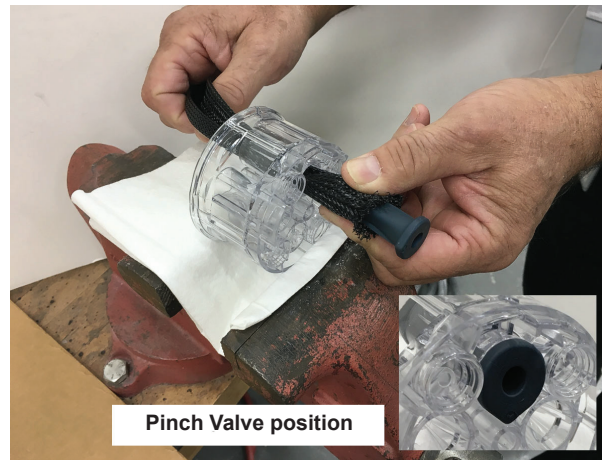


Figure 6-18 Inserting Pinch Valve into Insertion Tool

2. Drag the valve through the chamber and check the alignment of the pinch valve in the housing.

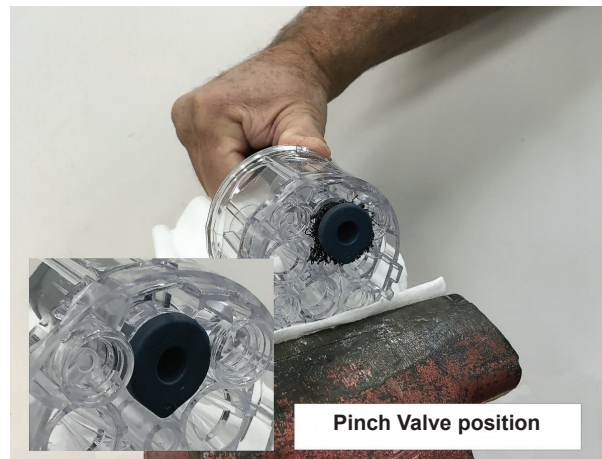


Figure 6-19 Pull Insertion Tube through Chamber

3. Pull on the insertion tool until the end of the pinch valve is inside the valve body. Continue pulling on the insertion tool until the pinch valve pops through the valve body and the tool comes loose.



Figure 6-20 Pulling Pinch Valve into Valve Body

4. Pull the pinch valve bottom flange away to check the alignment of the valve ribs with the square grooves in the valve body. Pull and twist the pinch valve to align the ribs with the grooves as necessary.

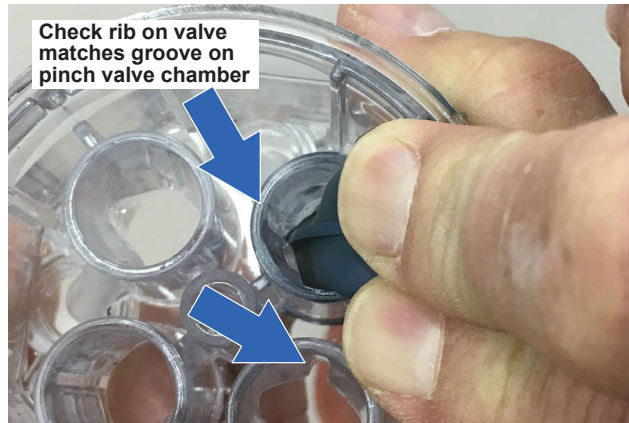


Figure 6-21 Checking Rib and Groove Alignment



## Section 7

# Parts

## Parts

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

### 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	Part	Part	Description	Quantity	Note
—	-----	—	—		—	
1	-----					
2						
<i>Continued...</i>						
NOTE: A.						
B.						
NS: Not Shown						
AR: As Required						

# Pump Control Unit

Refer to Figure 7-1 Pump Control Unit. If ordering a new pump control unit, order the correct voltage.

Item	Part	Description	Quantity	Note
—	1605584	PUMP CONTROL UNIT, 115 V, Encore HD		
—	1605586	PUMP CONTROL UNIT, 230 V, Encore HD		
1	-----	• PANEL, controller, power/pneumatic	1	
2	1045837	• SCREW, pan, recessed, M5 x 12, with internal lock washer bronze	10	
3	1068715	• WASHER, lock, dished, #10	1	
4	1108673	• CONNECTOR, elbow, plug-in, 6 mm T	1	
5	972126	• CONNECTOR, male, elbow, 6 mm T x 1/8 uni	3	
6	1082612	• VALVE, flow control, 4 mm x 1/8 uni	1	
7	984526	• NUT, lock, 1/2 conduit	2	
8	939122	• SEAL, conduit fitting, 1/2, blue	3	
9	1605823	• HARNESS, receptacle out, VBF, controller, Encore HD	1	
10	1023695	• SEAL, bulkhead, 7/8-16 thread	1	
11	972930	• PLUG, push-in, 8 mm T, plastic	1	
12	1603928	• CONNECTOR, male, 8 mm x 1/4 RPT	2	
13	1005067	• UNION, F bulkhead, 8 mm T x 1/4 RPT	2	
14	1605763	• WASHER, sealing, M16, buna-N and steel, zinc	3	
15	955063	• RING, sealing, 1/4	4	
16	309488	• UNION, F bulkhead, 6 mm T x 1/8 RPT	4	
17	984702	• NUT, hex, M5, brass	3	
18	983401	• WASHER, lock, M, split, M5, steel, zinc	3	
19	983021	• WASHER, flat, E, 0.203 x 0.406 x 0.040, bronze	3	
20	240674	• TAG, ground	3	
21	1005068	• UNION, F bulkhead, 10 mm T x 1/4 RPT	1	
22	1604303	• CONNECTOR, male, 10 mm T x 1/4 RPT, with seal	1	
23	972286	• REDUCER, 8 mm stem x 6 mm T	1	
24	1605982	• RECEPTACLE, network, Encore HD controller	1	
25	183804	• PLUG, blanking, 6 mm T	1	
26	933469	• LUG, 90, double, 0.250 x 0.438	1	
NS	939110	• CABLETIE, 3.9 in, 185F/85C, nylon, natural	10	
NS: Not Shown				

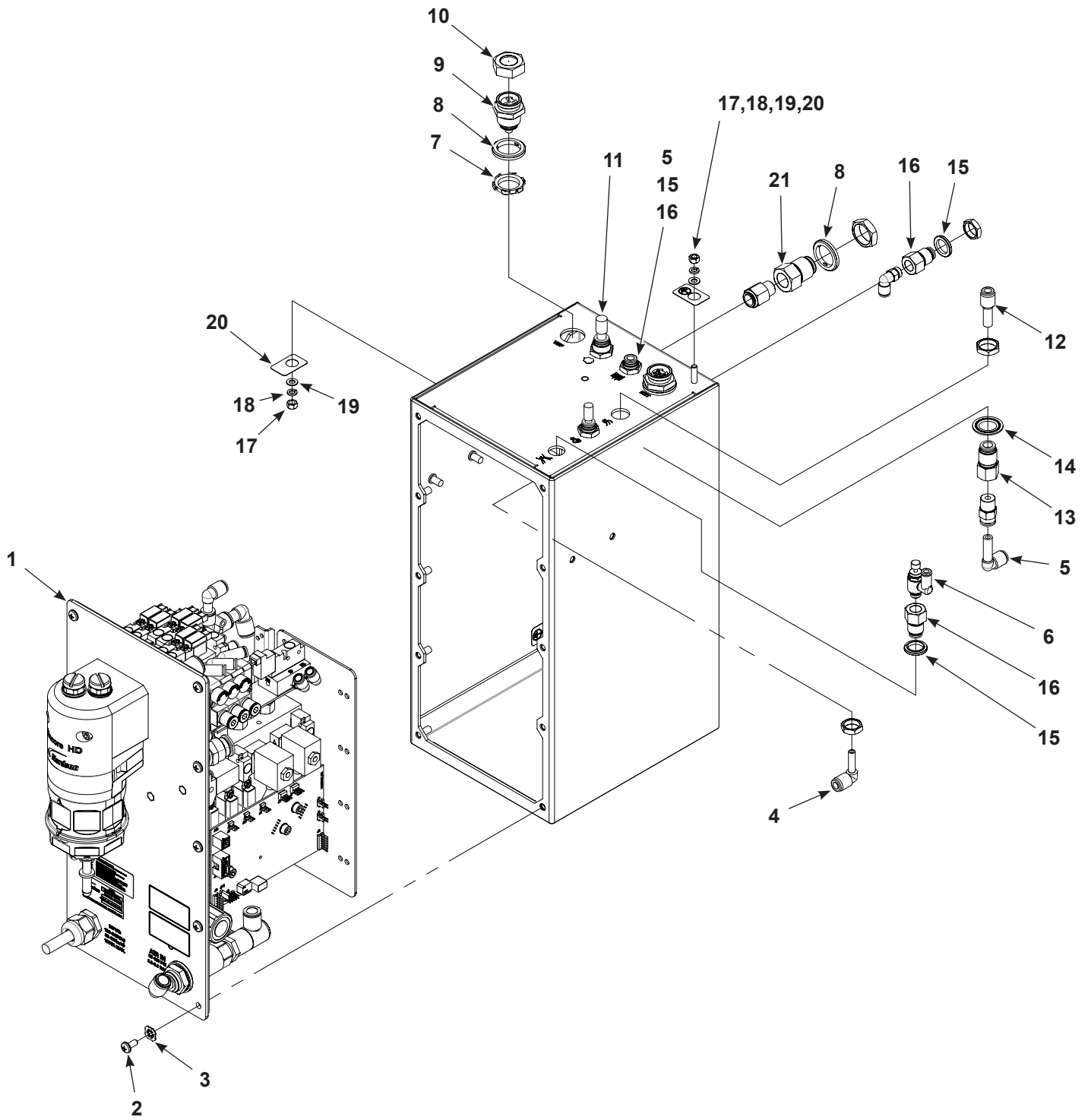


Figure 7-1 Pump Control Unit

## Panel Assembly

See Figure 7-2.

Item	Part	Description	Quantity	Note
—	-----	PANEL, Encore controller power/pneumatic	1	
1	345536	• SCREW, socket, M5 x 80, bl	2	
2	983401	• WASHER, lock, M, split, M5, steel, zinc	2	
3	-----	• PUMP ASSEMBLY, Encore HD	1	A
4	1027585	• VALVE, solenoid, 3-way, sub base	1	
5	1605442	• MODULE, digital air flow, manual system, Encore HD	1	
6	1604082	• VALVE, solenoid, 3-port, 24 vdc, ¼ NPTF	1	
7	1100310	• REGULATOR, 1/8 , 1/4 NPT, 7-125 psi, pneumatic panel	1	
8	1052893	• ELBOW, plug-in, 10 mm T x 10 mm stem, plastic	3	
9	1605376	• HARNESS, blue LED, with housing, Encore HD	1	

NOTE: A. Refer to the Pump section on page 7-6 to order parts.

*Continued...*

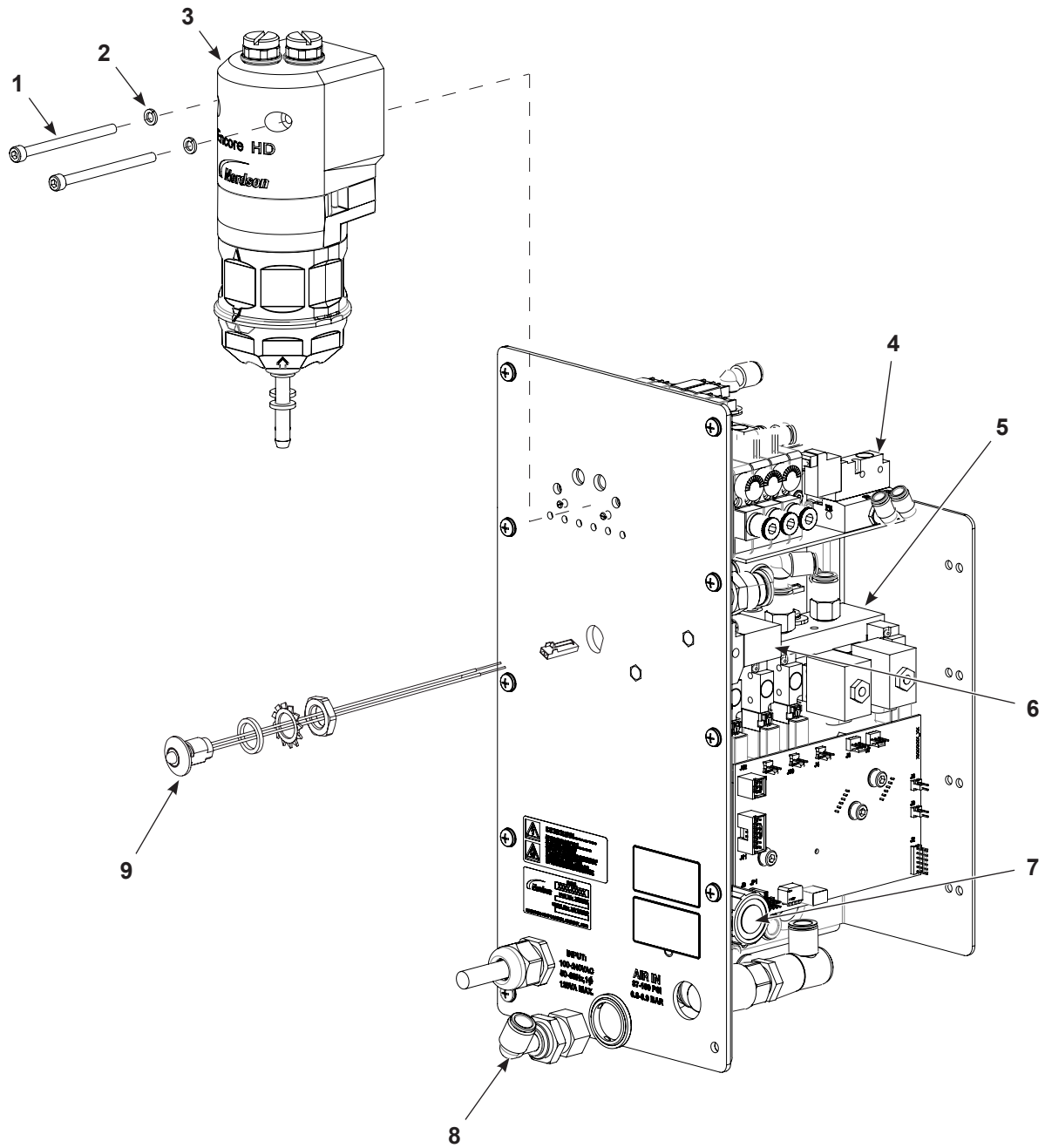


Figure 7-2 Panel Assembly Parts (1 of 2)

## Panel Assembly (contd)

See Figure 7-3.

Item	Part	Description	Quantity	Note
2	983401	• WASHER, lock, M, split, M5, steel, zinc	4	
10	1606835	• PCA, replay board, Encore LT-HD	1	
11	1107695	• POWER SUPPLY, 24 Vdc, 60 W	1	
12	1604518	• CONNECTOR, male, elbow, 6 mm T x 1/8 RPT	3	
14	1604804	• MANIFOLD ASSEMBLY, pump control, Encore HD	1	
15	1605754	• FILTER, line, with terminals, Encore HD	1	
16	984702	• NUT, hex, M5, brass	4	
17	983021	• WASHER, flat, E, 0.203 x 0.406 x 0.040, br	4	
18	240674	• TAG, ground	2	

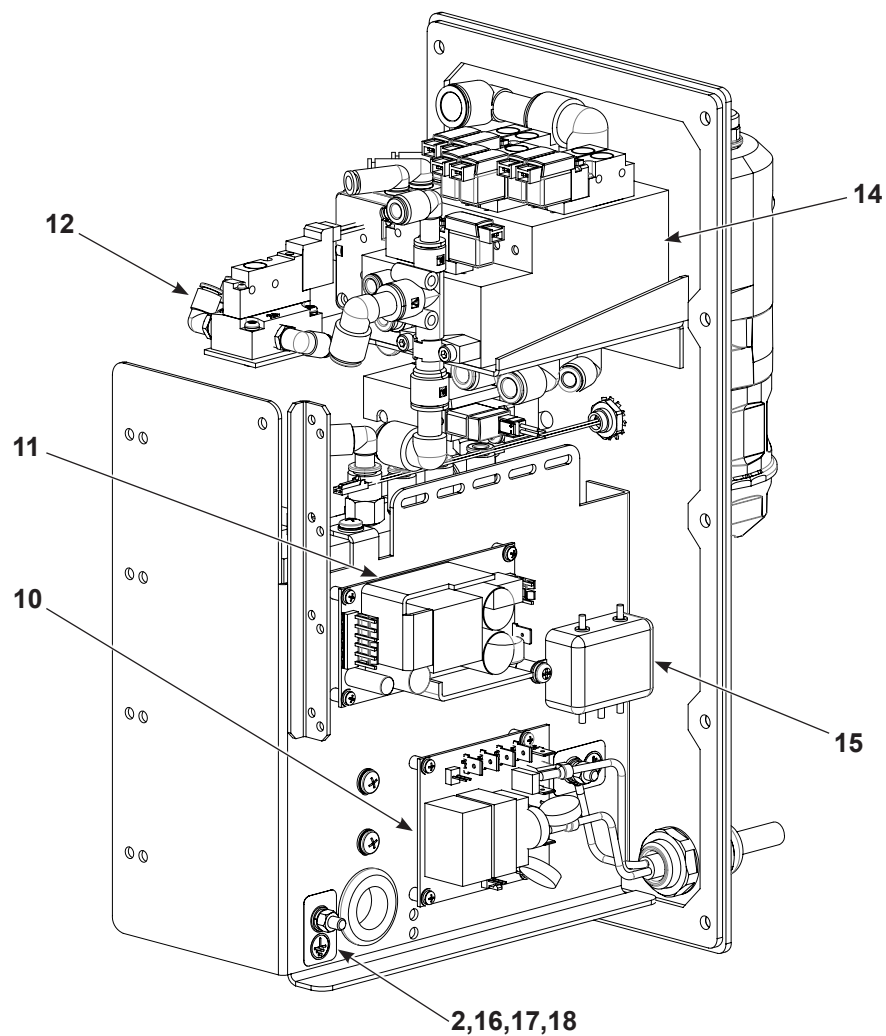


Figure 7-3 Panel Assembly Parts (2 of 2)

# iFlow Module

See Figure 7-4.

Item	Part	Description	Quantity	Note
—	1605443	MODULE, digital airflow, manual system, Encore HD	1	
1	1099288	• VALVE, solenoid, 3-way, w/connector	4	
2	1027547	• VALVE, proportional, solenoid, sub-base	2	
3	-----	• PCA, Encore HD flow node, 1 channel	1	
4	972277	• CONNECTOR, male, elbow, 8 mm T x 1/4 uni	1	
5	972399	• CONNECTOR, male, with/int hex, 6 mm T x 1/8 uni	3	
6	1030873	• VALVE, check, M8 TXR 1/8, M input	2	

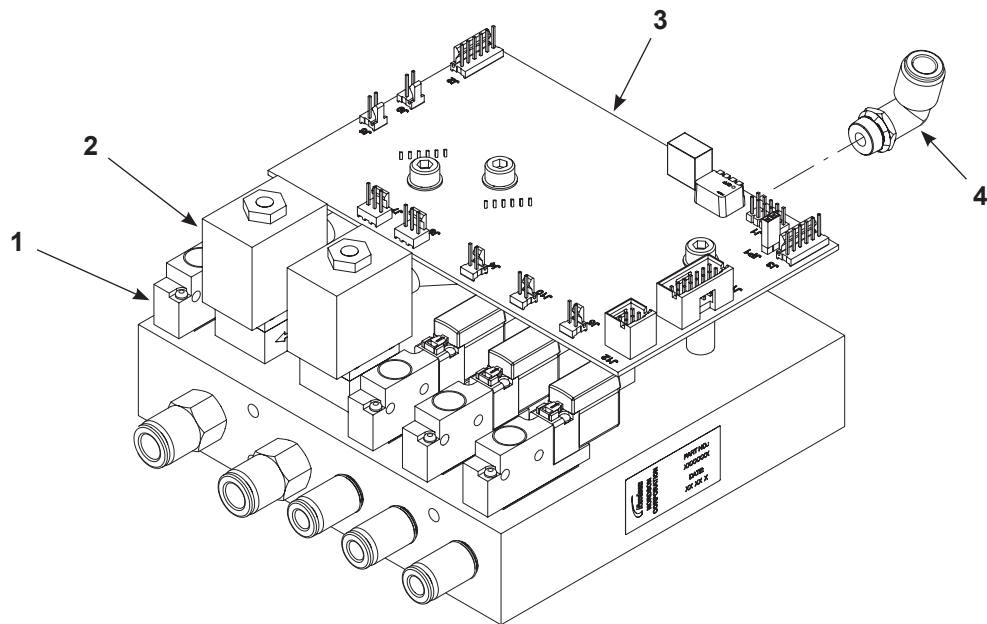


Figure 7-4 iFlow Module Parts

## Manifold Assembly

See Figure 7-5.

Item	Part	Description	Quantity	Note
—	1620531	MANIFOLD ASSEMBLY, pump control, Encore HD		
1	1620533	• GASKET, pump control manifold, Encore HD	1	A
2	972094	• CONNECTOR, male, 90 elbow, 12 mm T x 3/8 UNI	1	
3	1099281	• VALVE, solenoid, 3 port, 24 V, 0.35 W	7	
4	-----	• MANIFOLD, pump control, Encore HD	1	
5	328524	• CONNECTOR, male, with internal hex, 6 mm T x M5	1	
6	1604335	• CONNECTOR, male, 6 mm T x 1/4 RPT, with seal		
7	1603927	• CONNECTOR, male elbow, 8 mm x 1/8 RPT	3	
8	1605530	• CONNECTOR, male, elbow, 6 mm T x 1/8 RPT. with sealant	2	
9	1605567	• MANIFOLD/REGULATOR, compact, in/8 mm, 3 x out/6 mm	1	
10	983136	• WASHER, lock, M, internal, 4 mm, black zinc	2	
11	982453	• SCREW, socket, M4 x 35, black oxide	2	
12	1601413	• ELBOW, plug in, 6 mm T x 8 mm stem, plastic	1	
13	1052920	• PUMP, vacuum generator	1	
14	1601412	• ELBOW, plug in, 8 mm T x 10 mm stem, plastic	1	
15	-----	• SCREW, socket, M4 x 18, zinc	2	
16	1052893	• ELBOW, plug in, 10 mm T x 10 mm stem, plastic	1	
17	1620477	ELBOW, extended, plugin, 12 mm X 12 mm stem, plastic	1	
NOTE: A. When replacing gasket, make sure all residual adhesive has been removed from the manifold.				



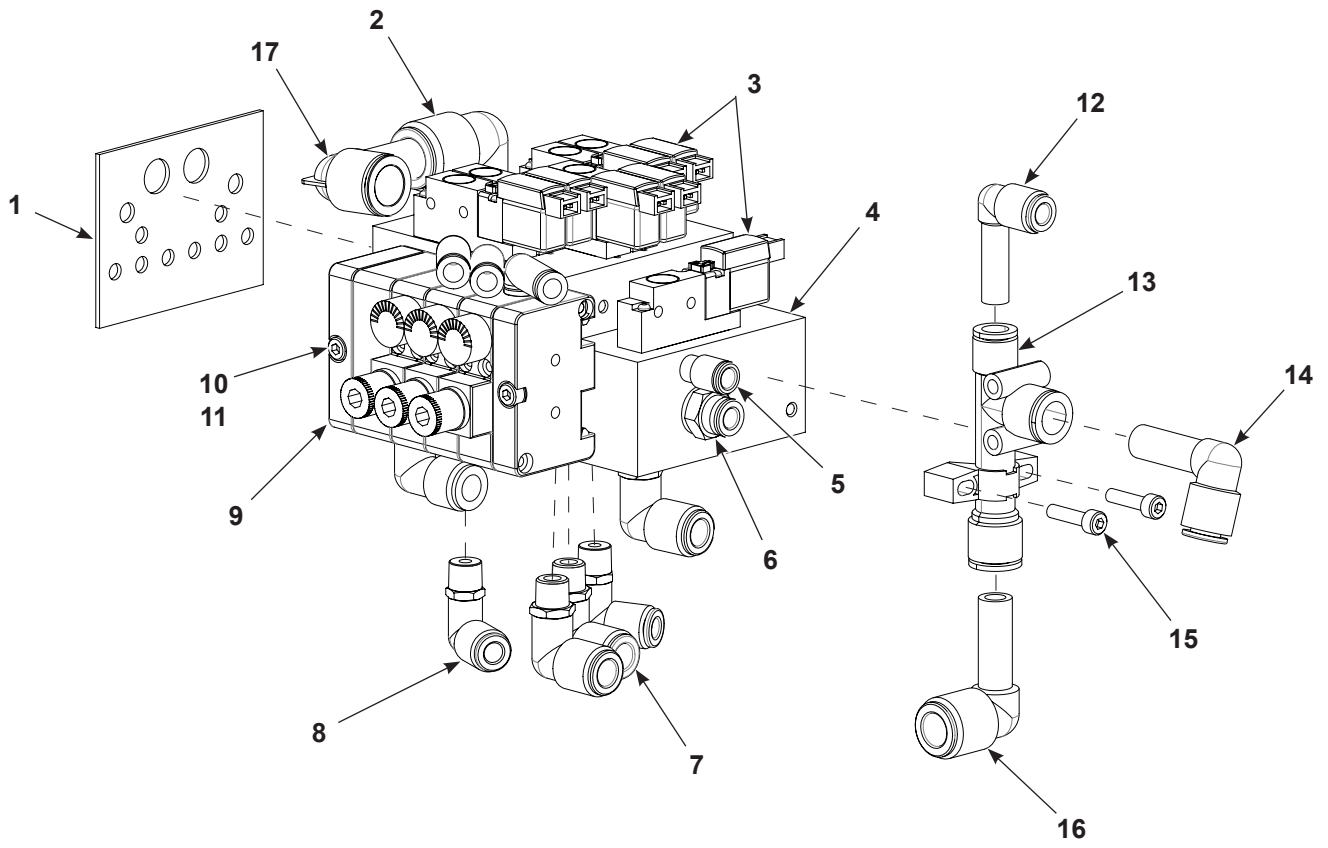


Figure 7-5 Manifold Assembly Parts

# Pump

See Figure 7-6.

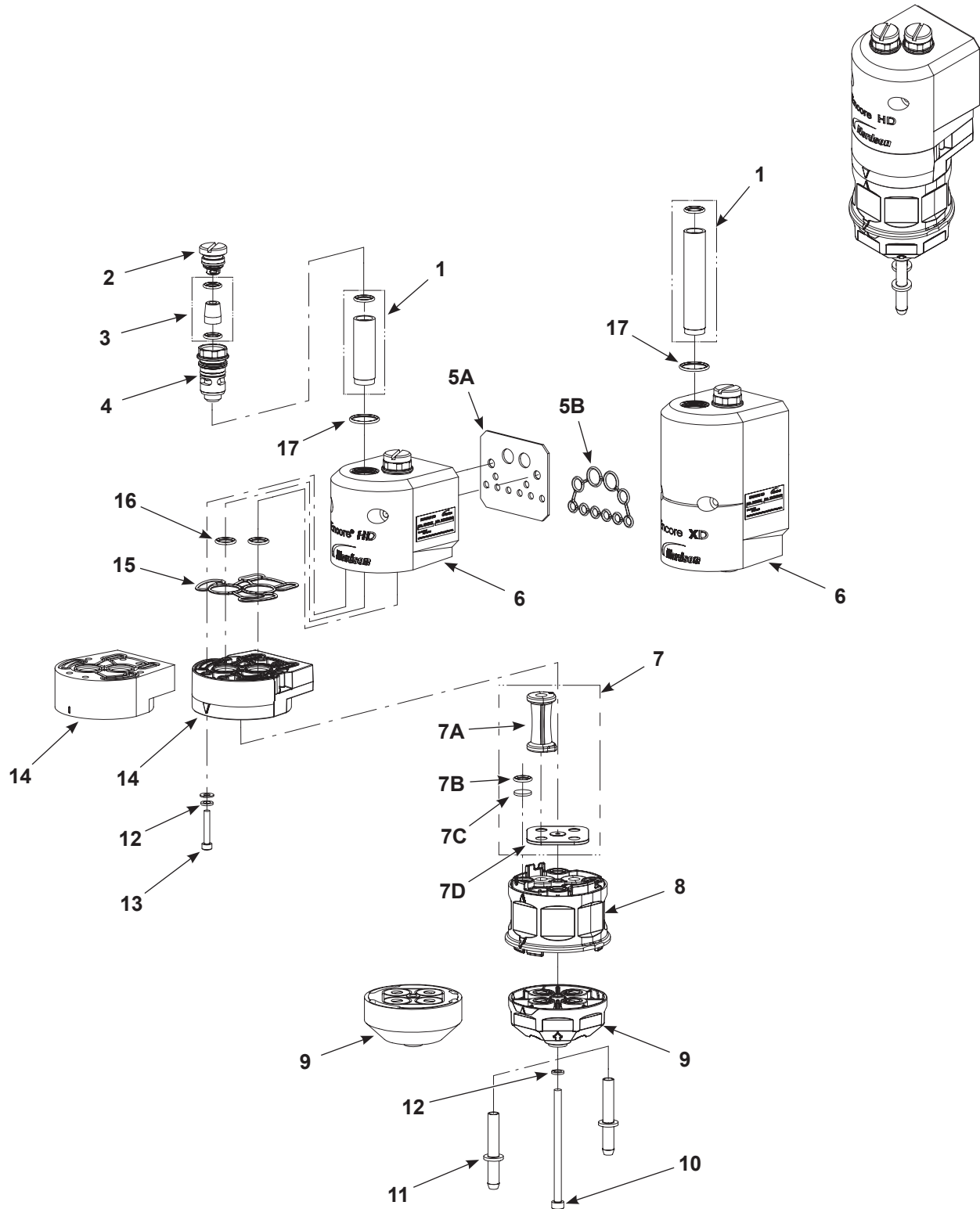


Figure 7-6 Encore HD, HD+ and XD Standard Parts

Item	Part	Part	Part	Description	Quantity	Note
—	1605940			PUMP ASSEMBLY, Encore HD	1	
—		1610978		PUMP ASSEMBLY, Encore HD+	1	
—			1611247	PUMP ASSEMBLY, Encore XD	1	
1	1057258	1093557	1093557	• KIT, fluidizing tube	1	A
2	-----	-----	-----	• PLUG, fluid	—	
3	1605570	1605570	1605570	• KIT, check valve	1	A, B
4	-----	-----	-----	• PLUG, fluid access	—	
5A	-----	1620646	1620646	• GASKET, manifold	2	
5B	1613013	-----	-----	• GASKET, manifold	1	C
6	1604058	1610980	1612222	• MANIFOLD, internal purge	1	
7	1612217	1612217	1612218	• KIT, pinch valve	1	A
7A				• • VALVE, pinch, rib	8	
7B				• • DISC, filter, pump	10	
7C				• • O-RING, silicone, 0.375 x 0.500 x 0.063	8	
7D	1608603	1608603	1608603	• • GASKET, lower Y block	2	D
8	1604060	1604060	1604060	• BLOCK, pinch valve chamber	1	
9	1605568	1605568	1611092	• BLOCK, lower Y	1	
10	1604057	1604057	1604057	• SCREW, socket M5 x 85	1	
11	1078006	1078006	1078006	• TUBE, adapter, barb	2	
12	983401	983401	983401	• WASHER, lock, split M5	6	
13	1040003	1040003	1040003	• SCREW, socket M4 x 25	6	
14	1604059	1604059	1612223	• BLOCK, upper Y	1	
15	1604072	1604072	1604072	• CUSTOM O-RING, upper Y block	1	
16	940126	940126	940126	• O-RING, silicone, 0.375 x 0.500 x 0.063	6	
17	940175	940175	940175	• O-RING, silicone, 0.688 x 0.813 x 0.062	2	

NOTE: A. These parts are available in service kits listed on page 7-12.

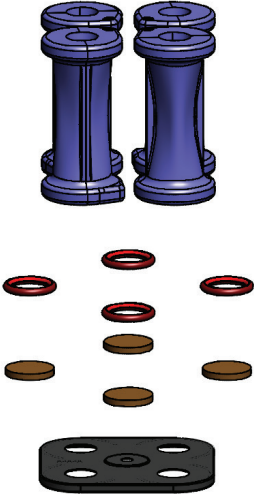
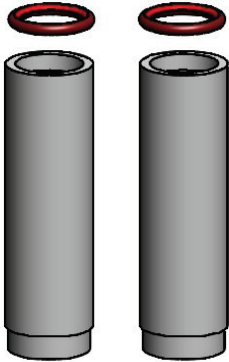
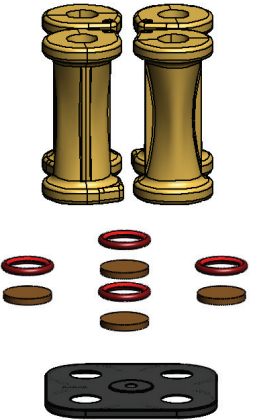
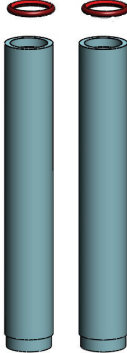

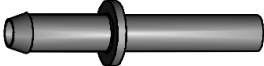

B. If the purge lines enter the top of the pump, use Check Valve Kit 1078161 (Includes 2 check valves).

C. Use gasket 1613013 instead of 1612795 on applications with the Encore HD pump module.

D. Replace the gasket each time the pump is disassembled.

### Spare Parts

Keep one of each of these kits in stock for each pump in the system.

	<p>Blue Pinch Valve Kit Standard Pump <b>1612217</b></p> <p>Includes the following 8 Pinch Valves 8 O-Rings 10 Filter Discs 2 Gaskets</p> <p><b>NOTE:</b> Replace the gasket each time the pump is disassembled.</p>		<p>Fluidizing Tube Kit HD Pump <b>1057258</b></p>
	<p>Amber Pinch Valve Kit Extreme Duty Pump <b>1612218</b></p> <p>Includes the following 8 Pinch Valves 8 O-Rings 10 Filter Discs 2 Gaskets</p>		<p>Fluidizing Tube Kit HD+, XD Pump <b>1093557</b></p>
	<p>Check Valve Service Kit (Retrofit) <b>1078161</b></p>		<p>Barbed Tubing Adapter for Flexible Tubing <b>1078006</b></p>
	<p>Check Valve Service Kit <b>1605570</b></p>		

## Wall/Rail Mount System

Part	Description	Quantity	Note
1620461	REGULATOR, air, with bracket and gage, 8-123 psi, R1/2	1	
1620763	• ELEMENT, filter, air, 5 micron, AW40, SMC	1	
1605531	CONNECTOR, male, elbow, 12 mm T x R1/2	1	
1600607	CONNECTOR Y branch, 10 mm tube x 1/2 in. unithread	1	
972286	REDUCER, 8 mm stem x 6 mm tube	1	A
1067694	KIT, ground bus bar, ESD, 6 position, with hardware	1	
1080718	CABLE, interface/controller, 10 ft.	1	

NOTE: A. Installed in power unit fluidizing air output fitting.

## Powder Hose and Air Tubing

Powder hose and air tubing must be ordered in increments of one foot.

Part	Description	Note
1613849	Powder hose, 6 mm ID x 8 mm OD, polyolefin (by 40 m)	B, F
1613850	Powder hose, 6 mm ID x 8 mm OD, polyolefin (by 160 m)	C, F
1615026	Clear powder hose, 6 mm ID x 8 mm OD, polyurethane (by 60 ft)	G
1606695	Clear powder hose, 6 mm ID x 8 mm OD, polyurethane (by 500 ft)	D, G
900617	Air tubing, polyurethane, 4 mm, clear, electrode air wash	A
900742	Air tubing, polyurethane, 6 mm, blue, pattern air	A
1096789	Air tubing, antistatic, 6/4 mm, black (conductive air tubing), VBF pickup tube to controller	E
900741	Air tubing, polyurethane, 6 mm, black	
900618	Air tubing, polyurethane, 8 mm, blue	A
900619	Air tubing, polyurethane, 8 mm, black	A
900740	Air tubing, polyurethane, 10 mm, blue, main air IN	A
900517	Tubing, poly, spiral cut, 0.62 in. ID, dress out	
301841	Strap, Velcro, w/buckle, 25 x 3 cm, dress out	

NOTE: A. Minimum order quantity is 50 ft.  
 B. Minimum order quantity is 40 m.  
 C. Minimum order is 160 m.  
 D. Minimum order quantity is 500 ft.  
 E. This tubing is used on VBF systems to provide fluidizing air from the bulkhead union to the pickup tube. It is conductive and grounds the pickup tube to the cart body. Do not replace with non-conductive tubing.  
 F. Standard powder hose delivered with system.  
 G. Optional powder hose to use in place of the standard polyolefin.

## Miscellaneous Options

Part	Description	Quantity	Note
1091429	KIT, input air, Encore HD manual systems	1	
972841	• CONNECTOR, male, 10 mm tube x 1/4 in. unithread	1	
971102	• CONNECTOR, male, 10 mm tube x 3/8 in. unithread	1	
973500	• COUPLING, pipe, hydraulic, 1/4 in., steel, zinc	1	
973520	• COUPLING, pipe, hydraulic, 3/8 in., steel, zinc	1	
900740	• TUBING, polyurethane, 10 mm, blue	20 ft	A

NOTE: A. Order replacement tubing in increments of one foot.

*Section 8*  
**Wiring Diagrams**

Description	Part Number
Encore HD Power/PneumaticController Assembly	10013427

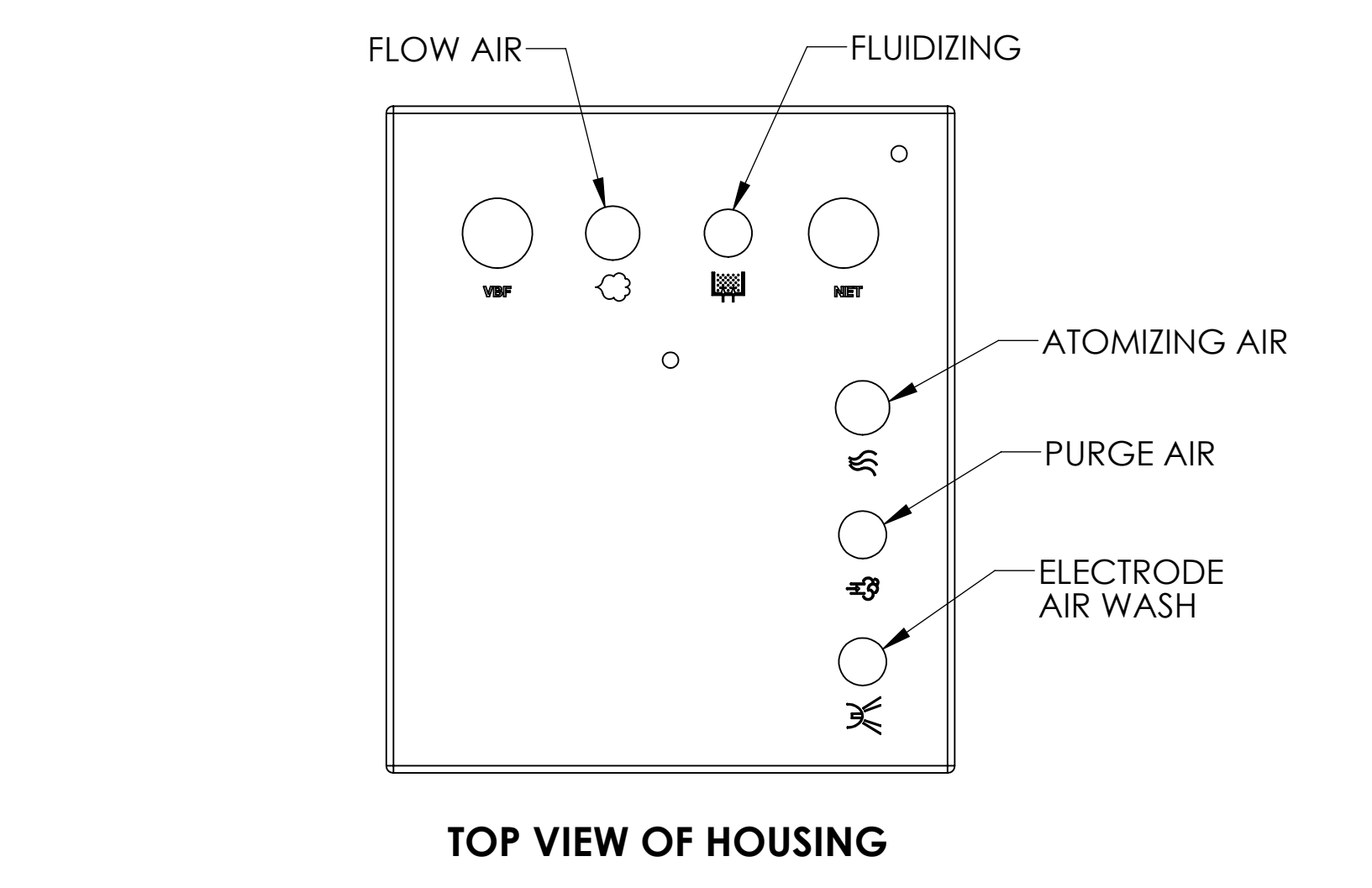
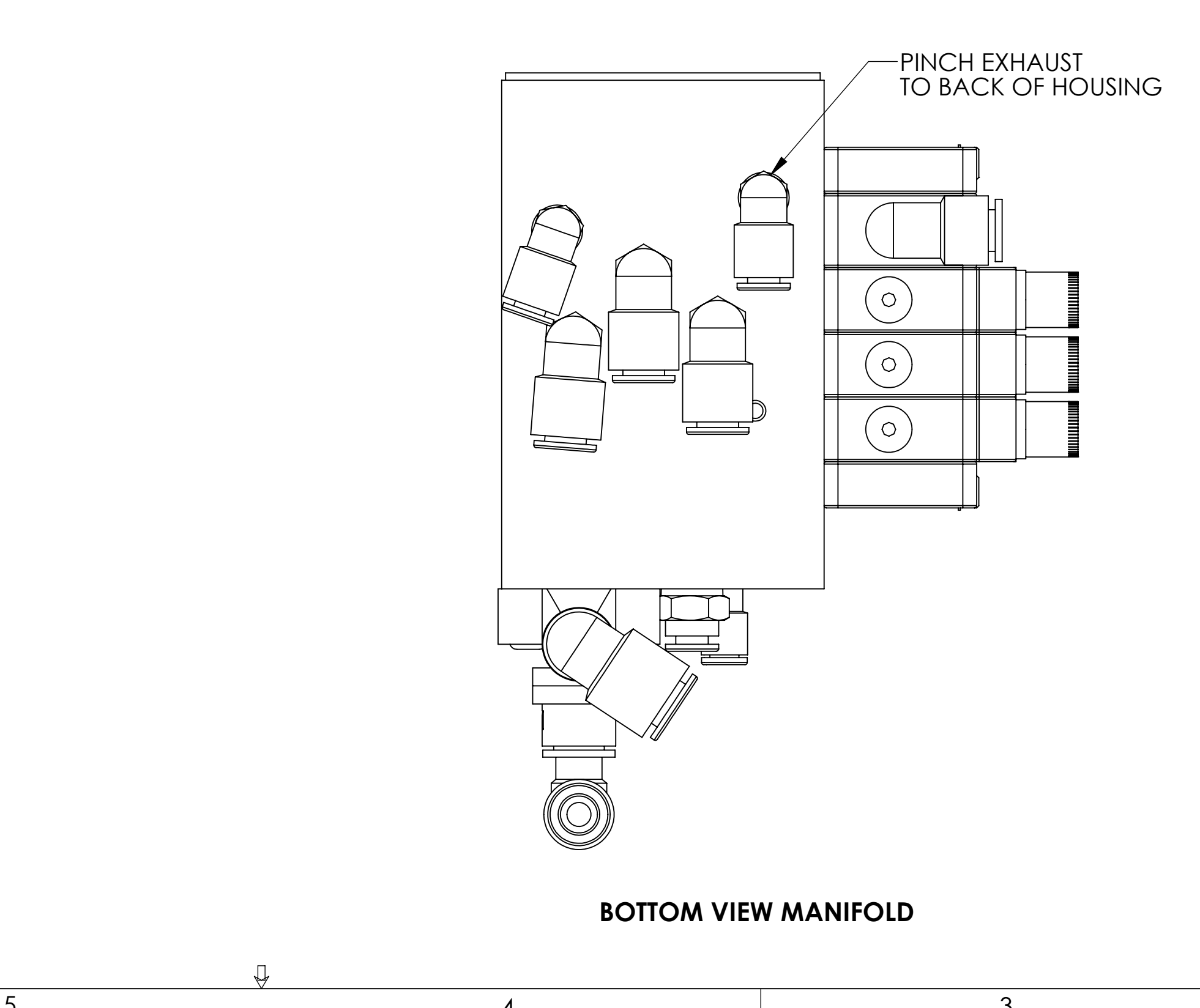
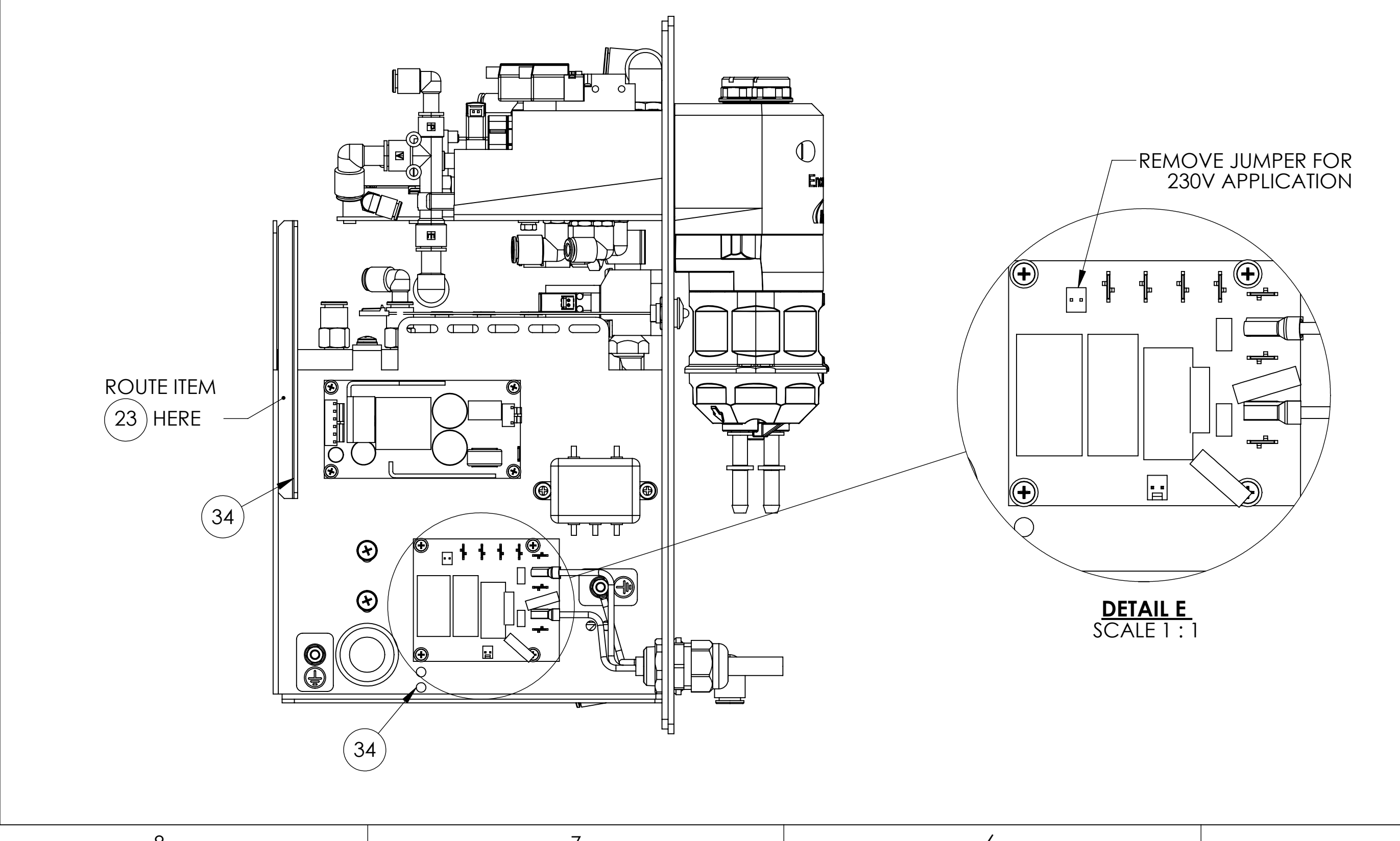
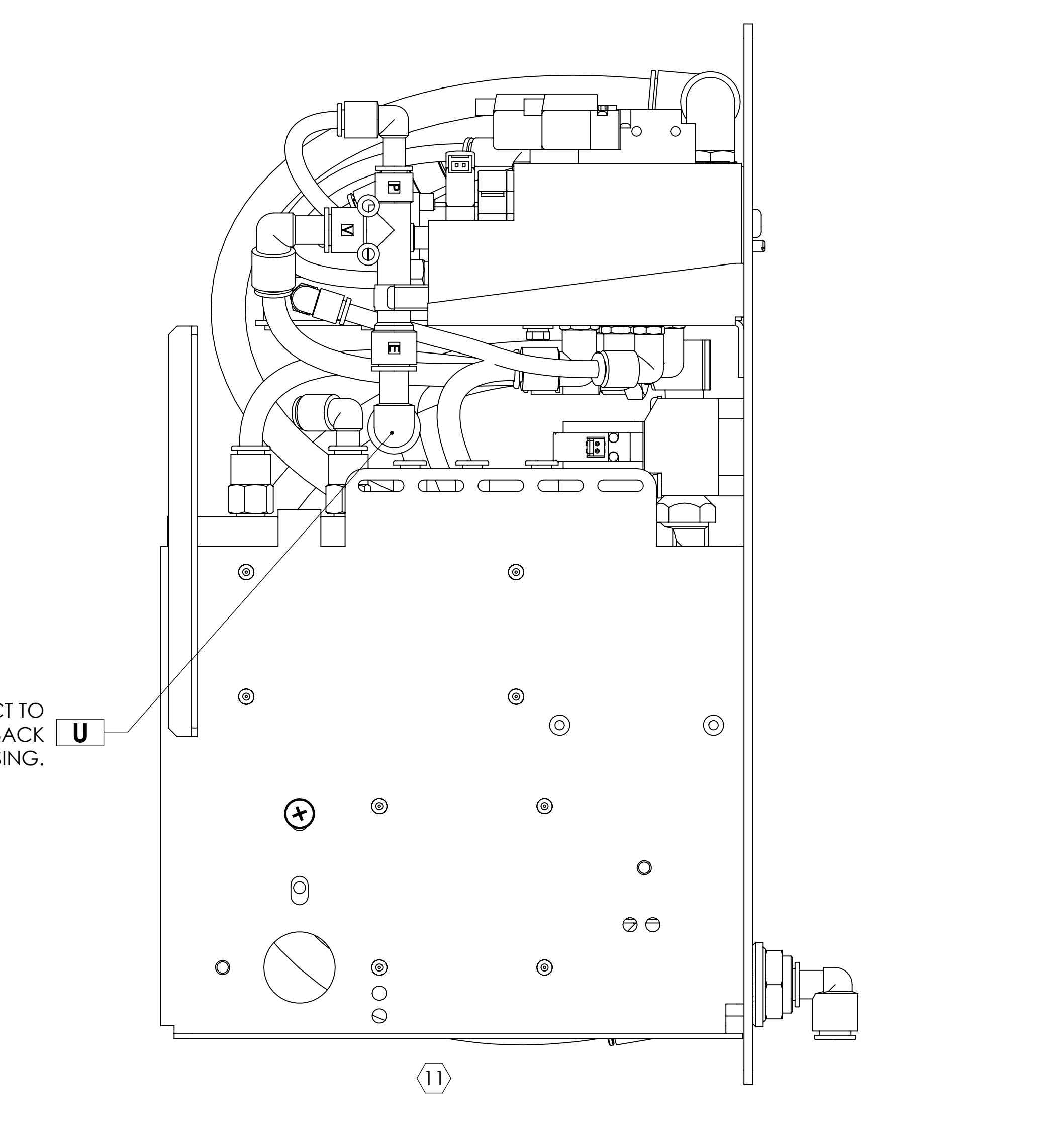
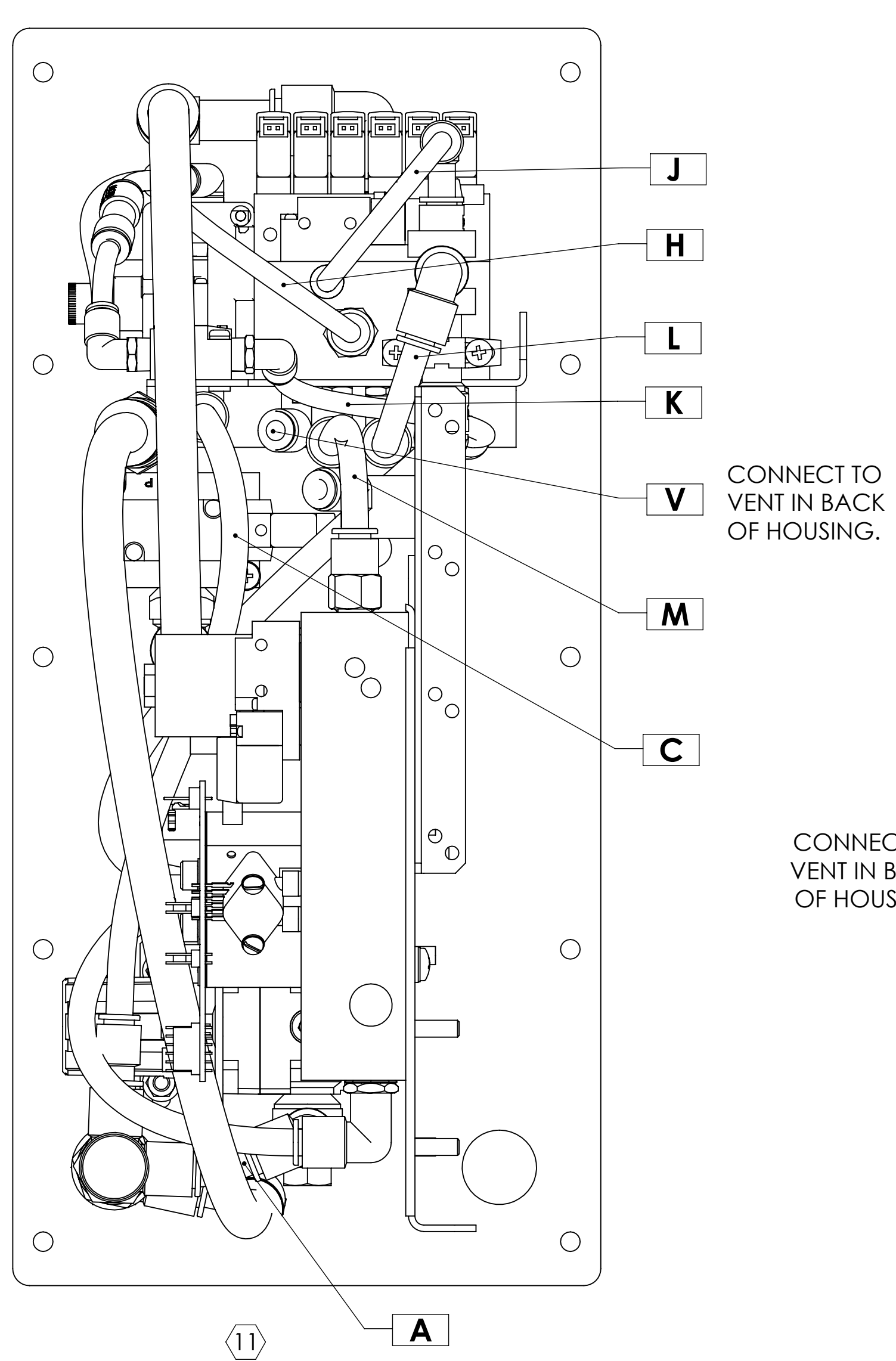
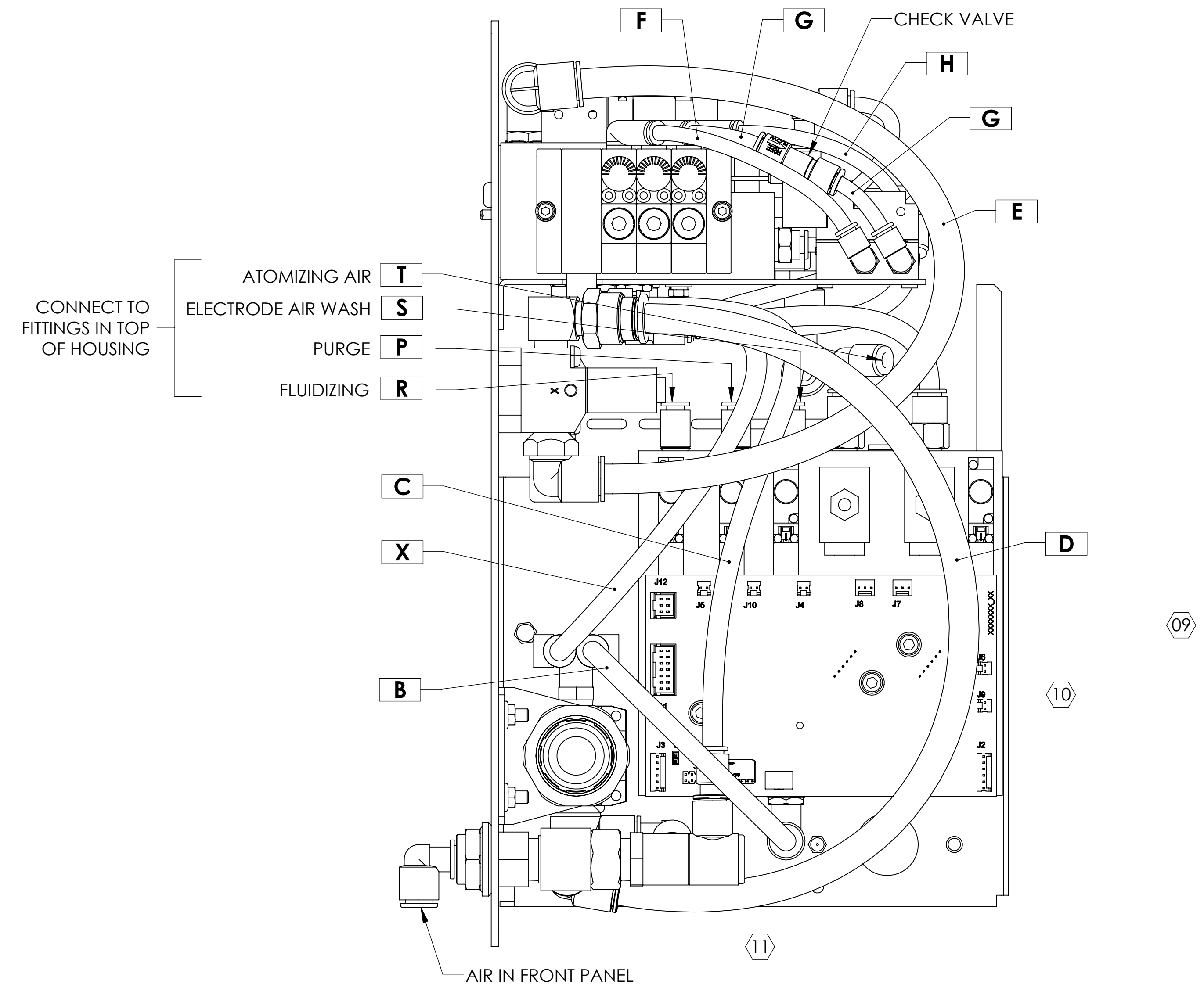




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MATERIAL NO.	10013427	REVISION	11	BY	CHK	RELEASE NO.	DATE
ZONE	REV	DESCRIPTION					
	SEE SHEET 1						



ALL DIMENSIONS IN MM EXCEPT AS NOTED		NORDSON CORPORATION WESTLAKE, OH, U.S.A. 44145	
X20.8 X340.25 X3X40.13		DESCRIPTION REF DWG, PWR/PNEU CTRLR ASSY, ENCORE HD	
MACHINED SURFACES L4		DRAWN BY DC	DATE 12AUG13
RIGID INSIDE/OUTSIDE CORNERS 0.1/0.8		CHECKED BY TMF	APPROVED BY PE603483
THREAD LENGTH DIMENSIONS ARE FULL THREAD		SIZE D	FILE NAME PD16096
INTERPRET DRAWINGS PER ASME Y14.5-2009		MATERIAL NO. 10013427	REVISION 11
PERFECT FORM AT MMC REQUIRED FOR INTERRELATED FEATURES		SCALE 1:2	CADD GENERATED DWG.
THIRD ANGLE PROJECTION		SHEET 2	OF 3



# EU DECLARATION of Conformity

This Declaration is issued under the sole responsibility of the manufacture.

## Product: Encore XT / HD Manual Powder Spray Systems

**Models:** Encore XT Manual, Fixed Mount or Mobile Dolly unit.

Encore Auto Applicator with Encore XT controls for a single gun, automatic systems.

Encore HD Manual, Fixed Mount or Mobile Dolly unit.

Encore Select HD Robot Applicator with Encore HD controls for robot systems.

**Description:** These are electrostatic, powder spray systems, including applicator, control cables and associated controllers. The Encore XT Manual system uses venturi style pump technology for supplying powder to the spray gun. While the Encore HD Manual system uses high density pump technology for supplying powder to the spray gun.

## Applicable Directives:

2006/42/EC - Machinery Directive

2014/30/EU - EMC Directive

2014/34/EU - ATEX Directive

## Standards Used for Compliance:

EN/ISO12100 (2010) ISEN60079-0 (2014) EN61000-6-3 (2007) FM 7260 (2018) EN50050-2 (2013)

EN1953 (2013) EN60079-31 (2014) EN61000-6-2 (2005) EN55011 (2016) EN60204-1 (2018)

## Principles:

This product has been designed & manuf. according to the Directives & standards / norms described above.

## Type of Protection:

- Ambient Temperature: +15°C to +40°C

- Ex tb IIIB T60°C / Ex II 2 D / 2mJ = (Encore XT and HD Applicators)

- Ex tc IIIB T60°C / EX II (2) 3 D = (Controllers)

- Ex II 2 D / 2mJ = (Encore Auto Applicator and Encore Select HD Robot Applicator)

## Certificates:

- FM14ATEX0051X = Encore XT/HD Manual Appl. And Encore Select HD Robot Appl. (Dublin, Ireland)

- FM14ATEX0052X = Controls (Dublin, Ireland)

- FM11ATEX0056X = Encore Automatic Applicator (Dublin, Ireland)

## ATEX Surveillance

- 0598 SGS Fimko Oy (Helsinki, Finland)



Date: 20NOV20

Jeremy Krone

Supervisor Product Development Engineering

Industrial Coating Systems

Amherst, Ohio, USA

## Nordson Authorized Representative in the EU

Contact:

Operations Manager

Industrial Coating Systems

Nordson Deutschland GmbH

Heinrich-Hertz-Straße 42-44

D-40699 Erkrath



# UK DECLARATION of Conformity

This Declaration is issued under the sole responsibility of the manufacture.

## Product: Encore XT / HD Manual Powder Spray Systems

**Models:** Encore XT Manual, Fixed Mount or Mobile Dolly unit.

Encore Auto Applicator with Encore XT controls for a single gun, automatic systems.

Encore HD Manual, Fixed Mount or Mobile Dolly unit.

Encore Select HD Robot Applicator with Encore HD controls for robot systems.

**Description:** These are electrostatic, powder spray systems, including applicator, control cables and associated controllers. The Encore XT Manual system uses venturi style pump technology for supplying powder to the spray gun. While the Encore HD Manual system uses high density pump technology for supplying powder to the spray gun.

## Applicable UK Regulations:

Supply Machinery Safety 2008

Equipment & Protective Systems Intended for use in Potentially Explosive Atmosphere Regulation 2016

Electromagnetic Compatibility Regulation 2016

## Standards Used for Compliance:

EN/ISO12100 (2010) ISEN60079-0 (2014) EN61000-6-3 (2007) FM 7260 (2018) EN50050-2 (2013)  
EN1953 (2013) EN60079-31 (2014) EN61000-6-2 (2005) EN55011 (2009) EN60204-1 (2018)

## Principles:

This product has been designed & manuf. according to the Directives & standards / norms described above.

## Type of Protection:

- Ambient Temperature: +15°C to +40°C
- Ex tb IIIB T60°C / Ex II 2 D / 2mJ = (Encore XT and HD Applicators)
- Ex tc IIIB T60°C / EX II (2) 3 D = (Controllers)
- Ex II 2 D / 2mJ = (Encore Select HD Robot Applicator)

## Certificates:

- FM21UKEX0129X = Encore XT/HD Manual App & Select HD Robot Appl. (Maidenhead, Berkshire, UK)
- FM21UKEX0130X = Controls (Maidenhead, Berkshire, UK)
- FM22UKEX0006X = Encore Automatic Applicator (Maidenhead, Berkshire, UK)

## EX Quality System Certificate

- SGS Baseefa NB 1180 (Buxton, Derbyshire, UK)



**Date:** 22Sept21

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## Nordson Authorized Representative in the UK

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