Encore® HD/XD Pump Control Unit and Power Supply

Customer Product Manual

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

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Change Record

Revision	Date	Change
01	10/15	New release
02	03/16	Updated gaskets.
04	1/18	Updated for new Encore HD pump information.
05	11/18	Replacing part number 1606690 with 1615026
06	6/19	Update part lists for pump control, panel assembly, manifold assembly, pump, spare parts, powder hose and air tubing.
07	2/21	Updated safety information
08	5/21	Updated specification, filter/regulator, and pneumatic fittings and tube routings.
09	01/22	Updated approvals and reference text.
10	04/24	Removed pump specific content from manual to consolidate in the pump manual.
11	11/24	Updated the manufacturer address, certification label, and DOCs

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/XD 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/XD powder feed pump. The unit contains the pneumatic circuit, which controls all pump, color change, and vibratory box feed (VBF) functions.

Encore HD **Encore XD**

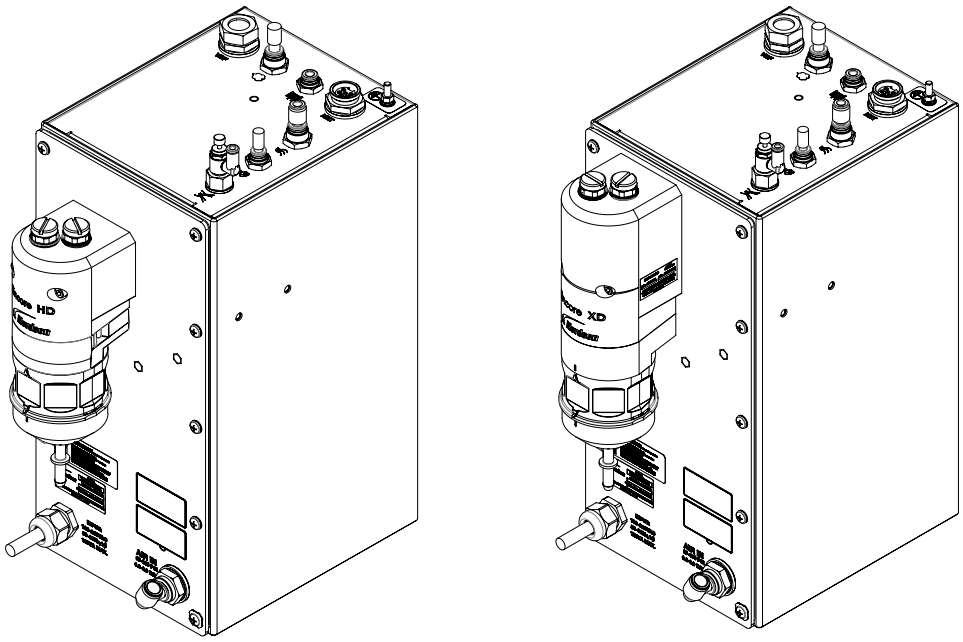

Figure 2-1 Encore HD/XD Pump Control Unit

Specifications

Model: Encore HD/XD 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), <5µ 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.	

NOTE: For pump information, refer to the pump manual.

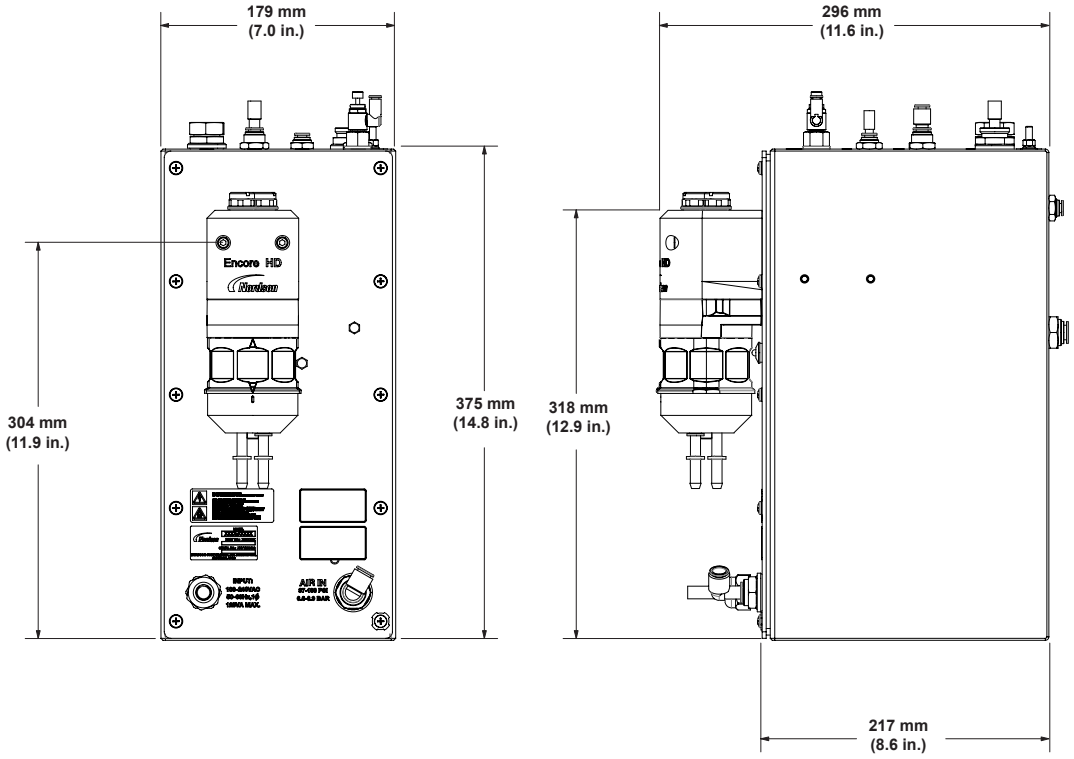

Figure 2-2 Encore HD Controller Power Unit Dimensions

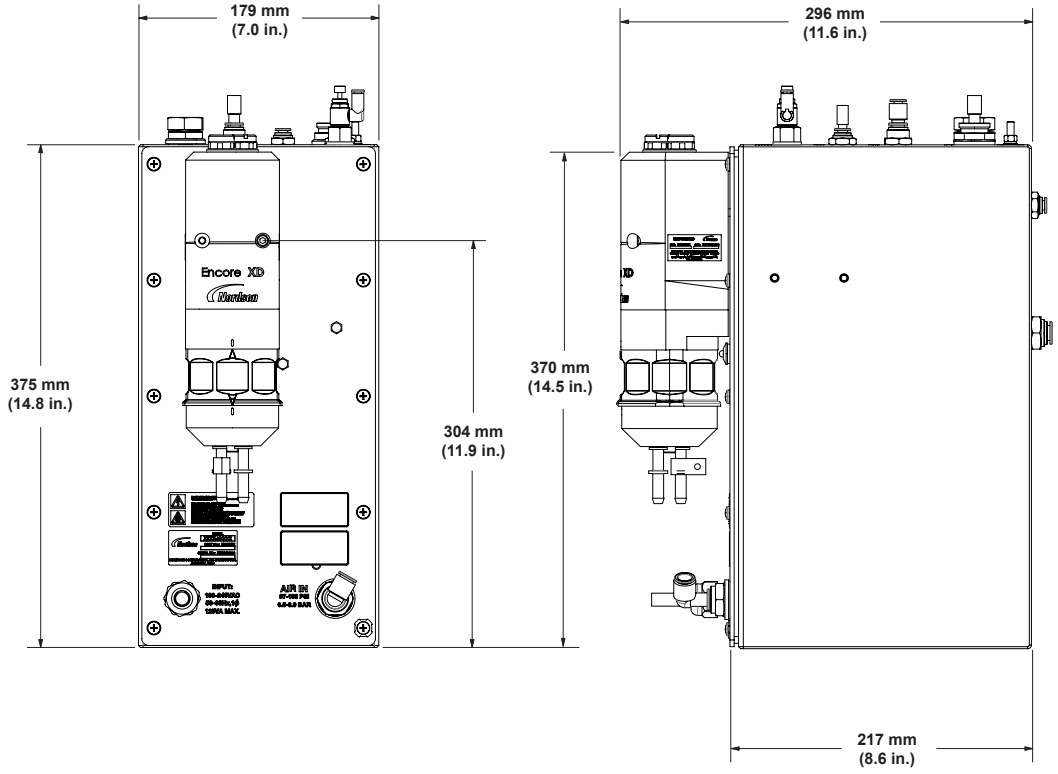

Figure 2-3 Encore XD Controller Power Unit Dimensions

Pump Control Unit Certification Label

1606121

Pump Control Manifold Components

See Figure 2-4. 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

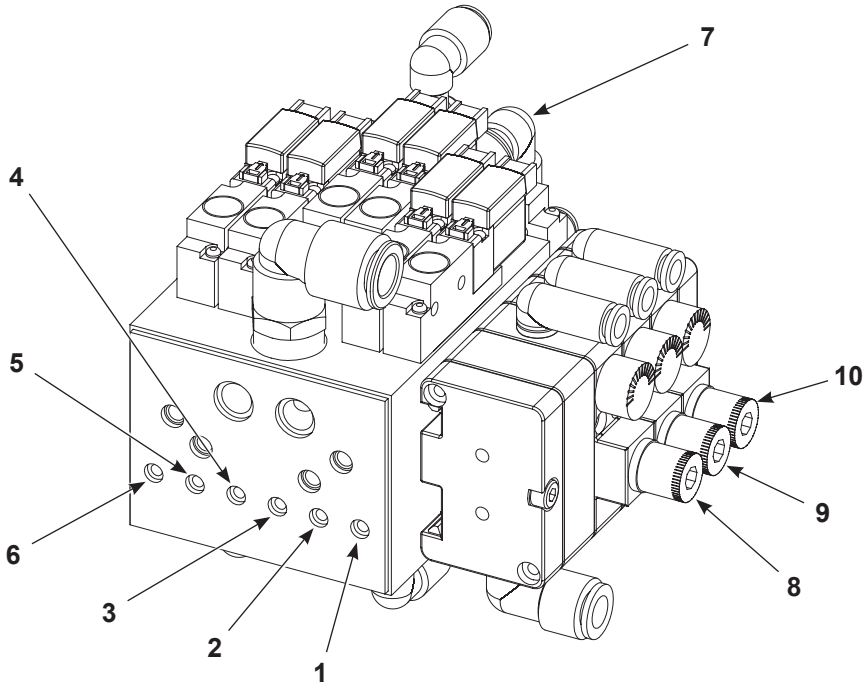

Figure 2-4 Pump Control Manifold

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Section 3

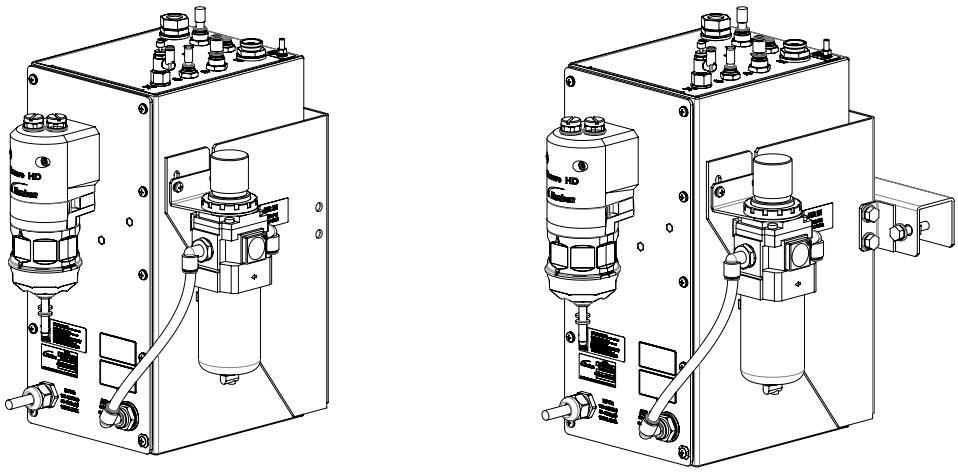
Installation

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.

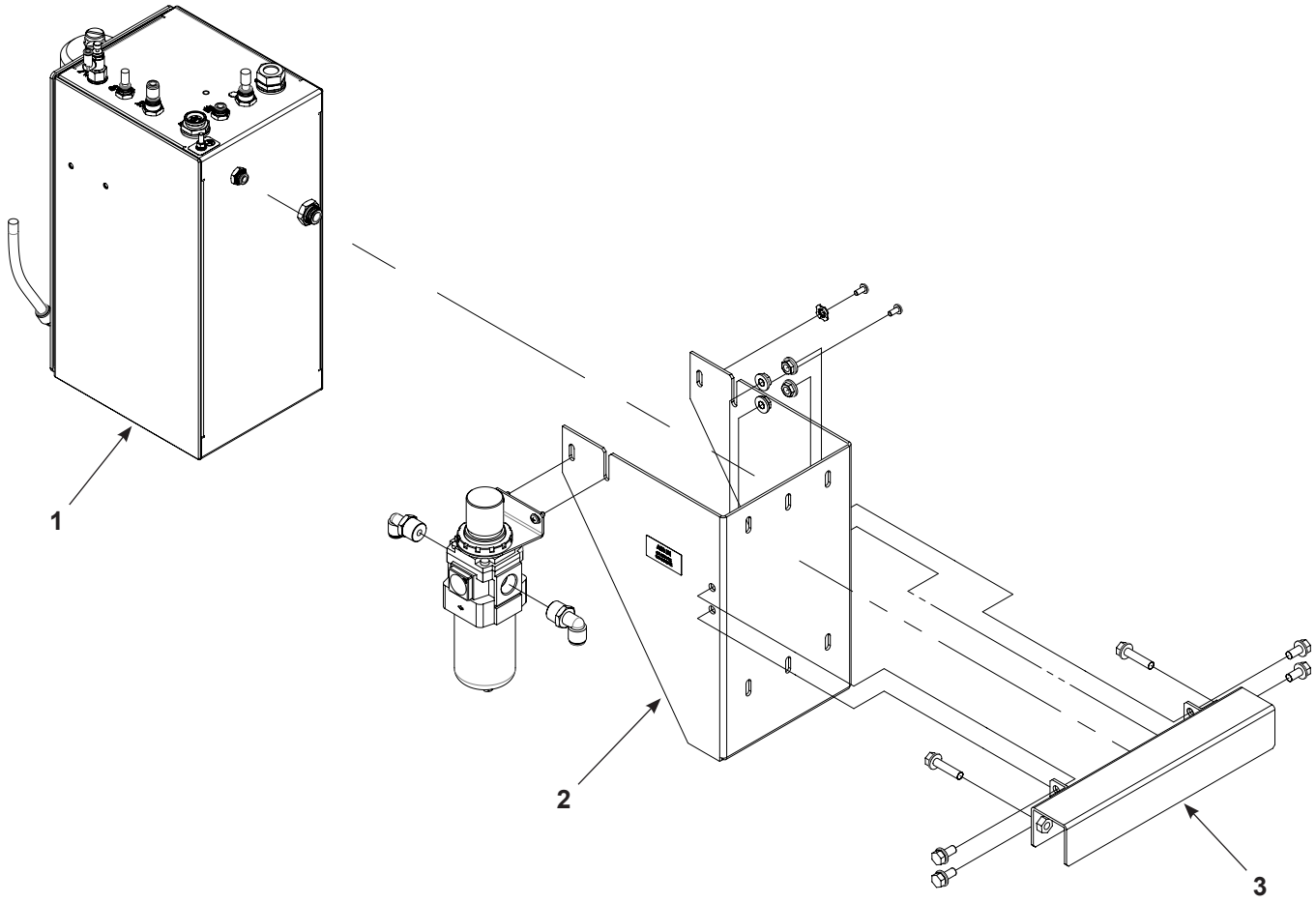


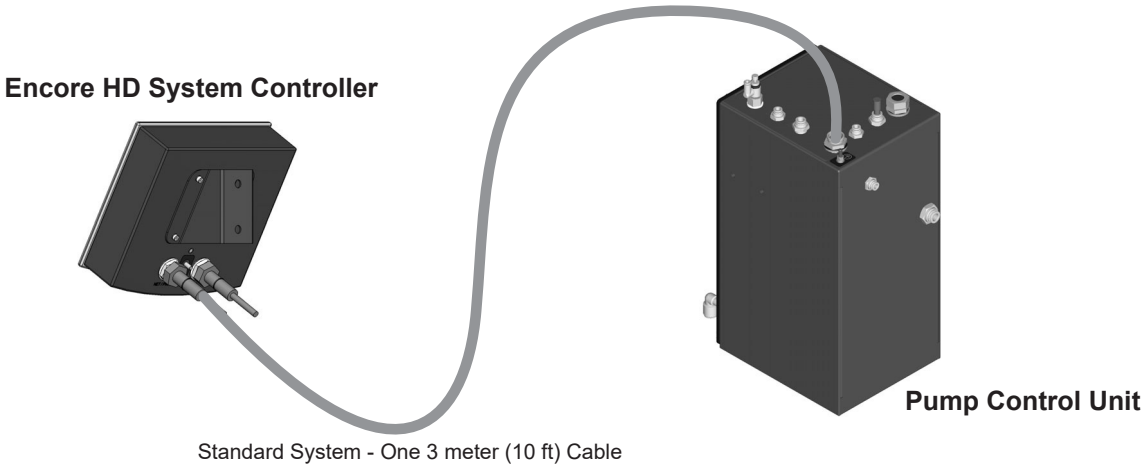
Figure 3-2 Pump Control Unit Wall Mounting Brackets

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/XD 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.



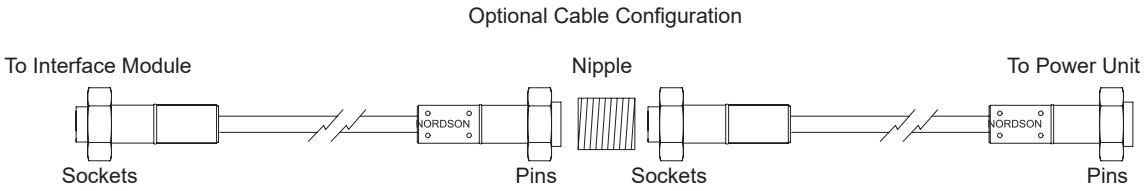


Figure 3-3 Pump Control Unit Interconnect Cable Connections

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.

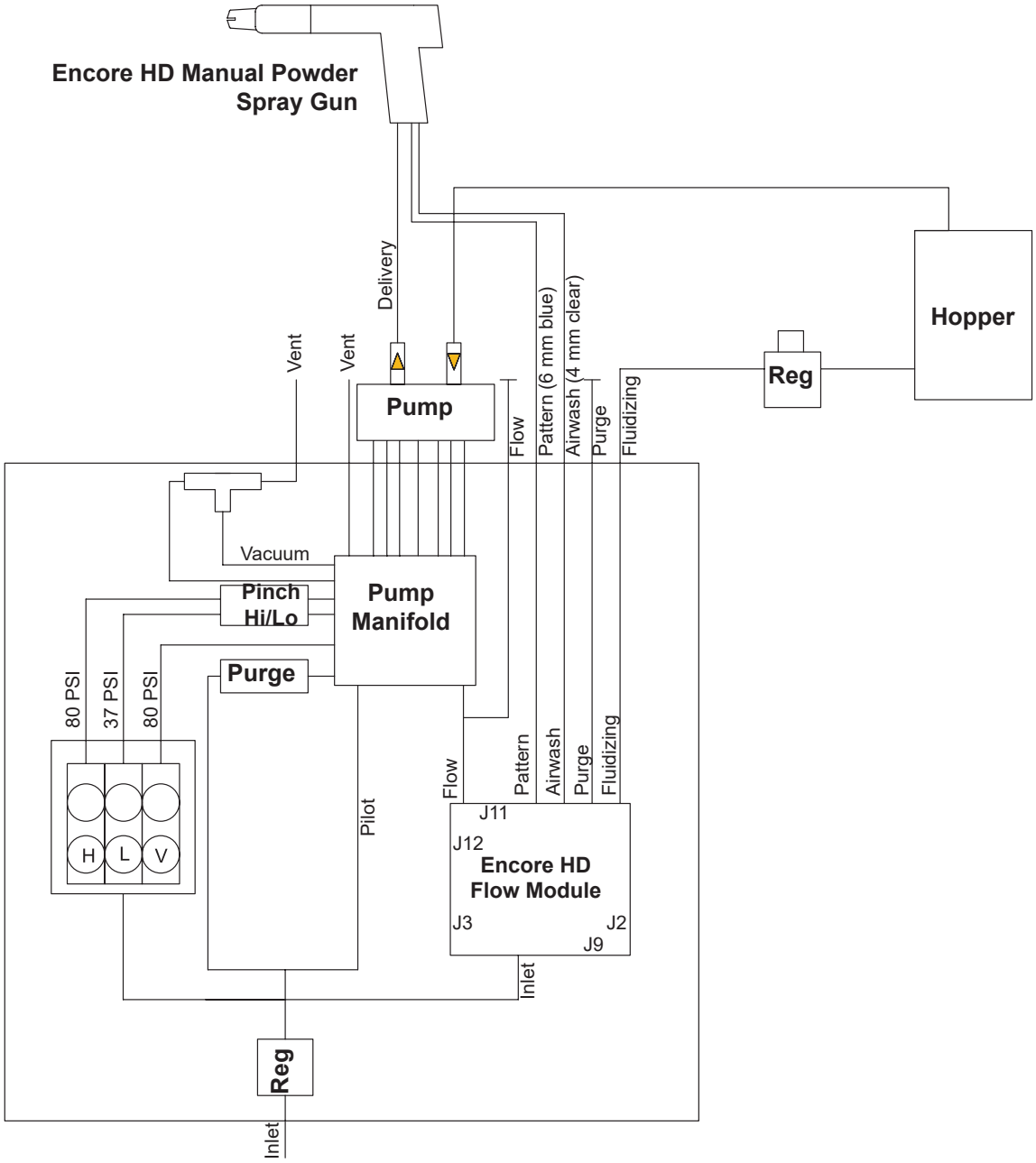


Figure 3-4 Encore HD/XD Pump Control Unit Pneumatic Diagram

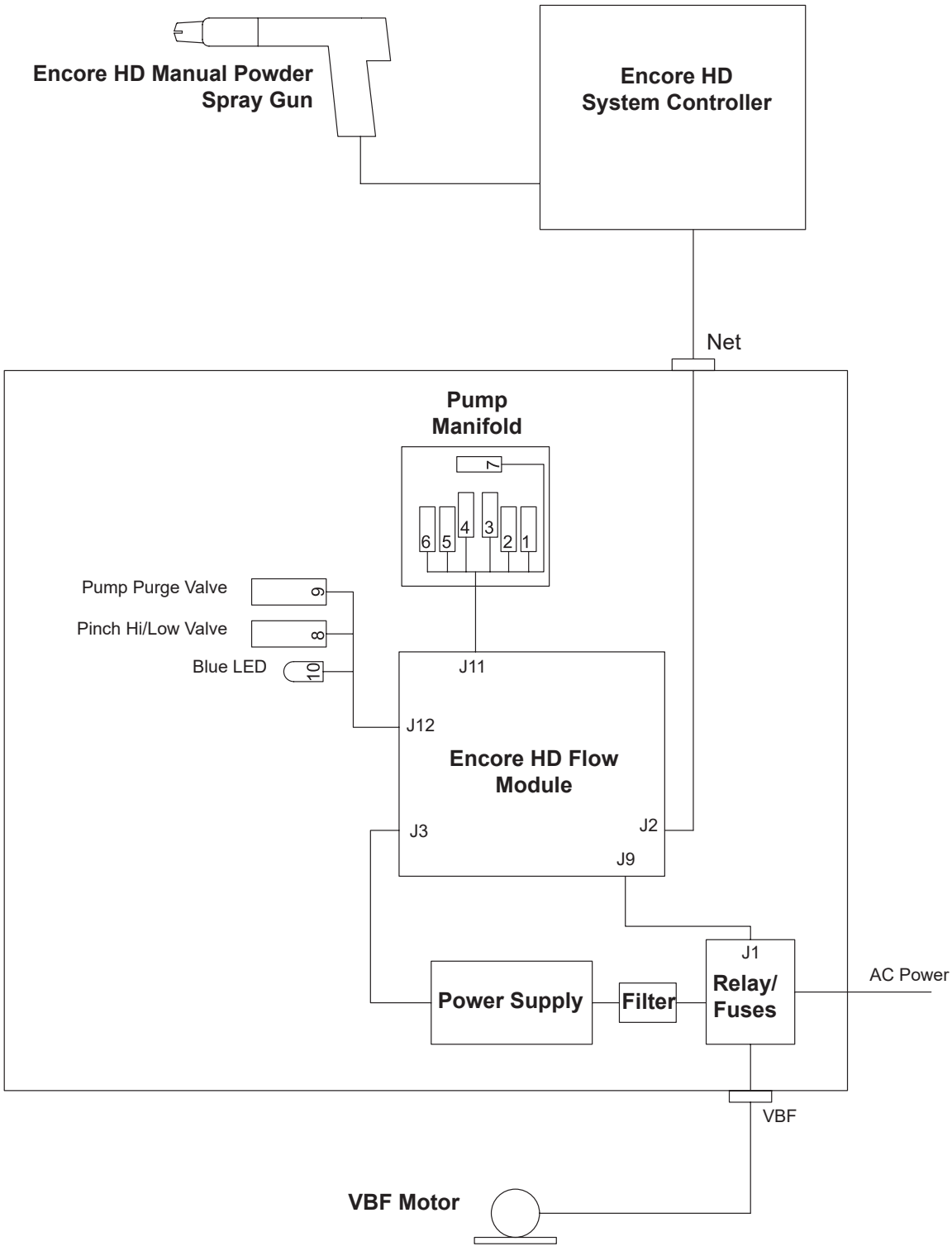


Figure 3-5 Encore HD/XD Pump Control Unit Electrical Diagram

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/XD 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.

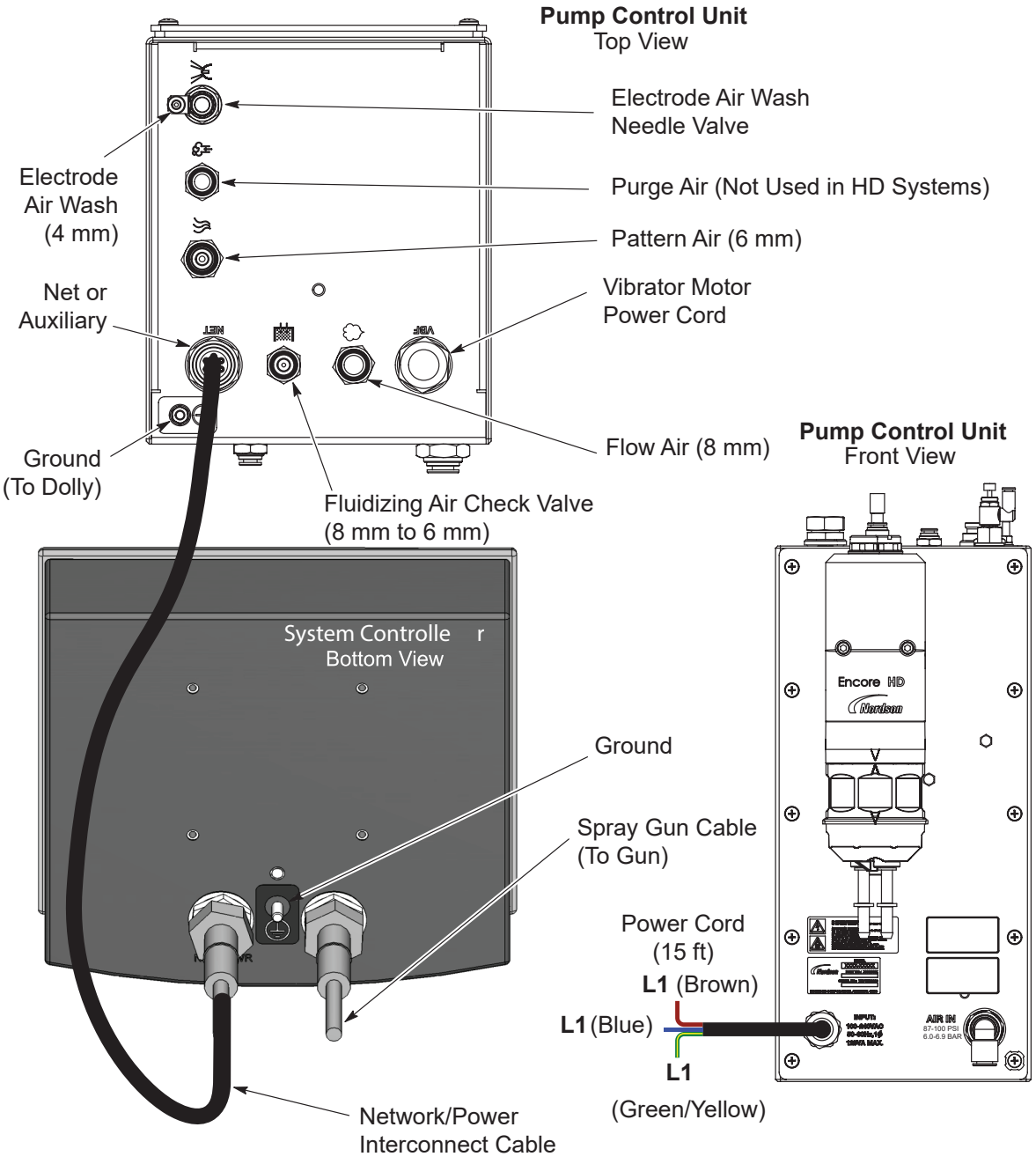


Figure 3-6 Encore HD System Controller Connections

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.

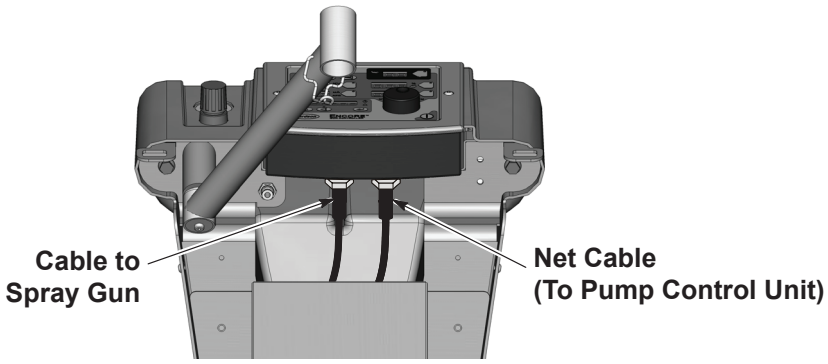


Figure 3-7 Spray Gun Cable Connection to System Controller − Mobile System Shown

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.

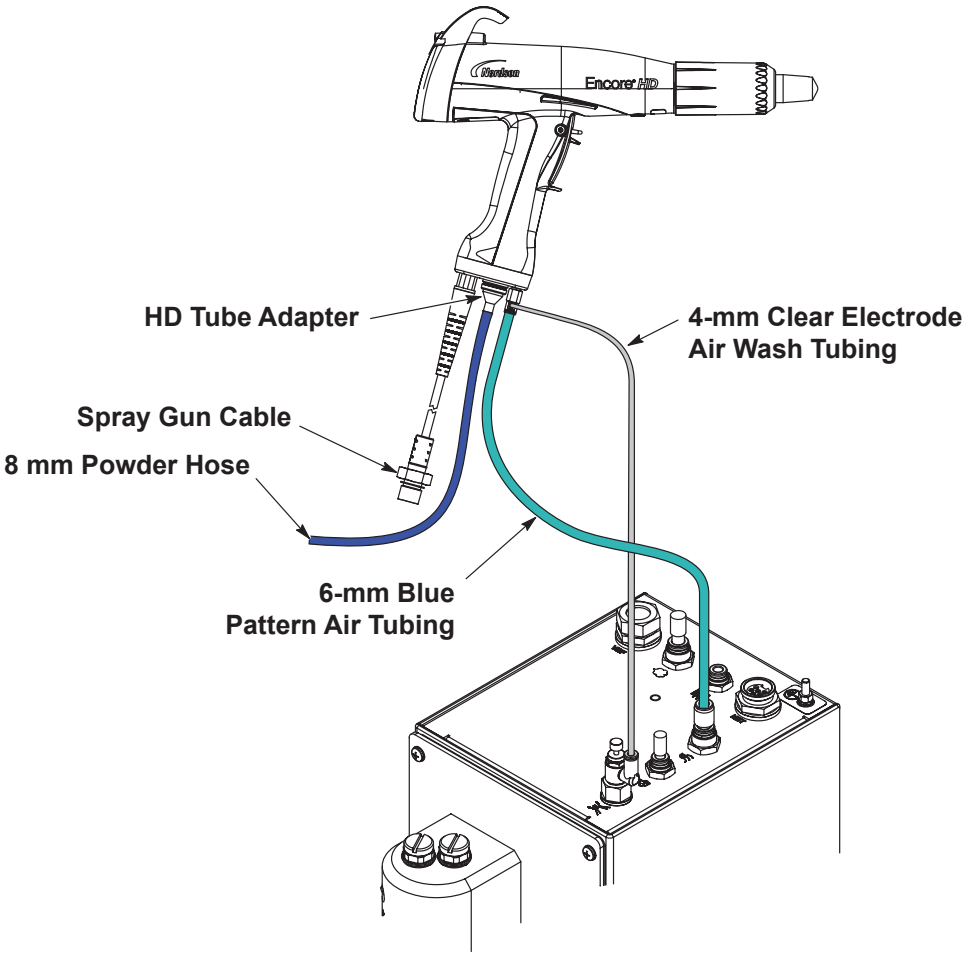


Figure 3-8 Spray Gun Connections

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.

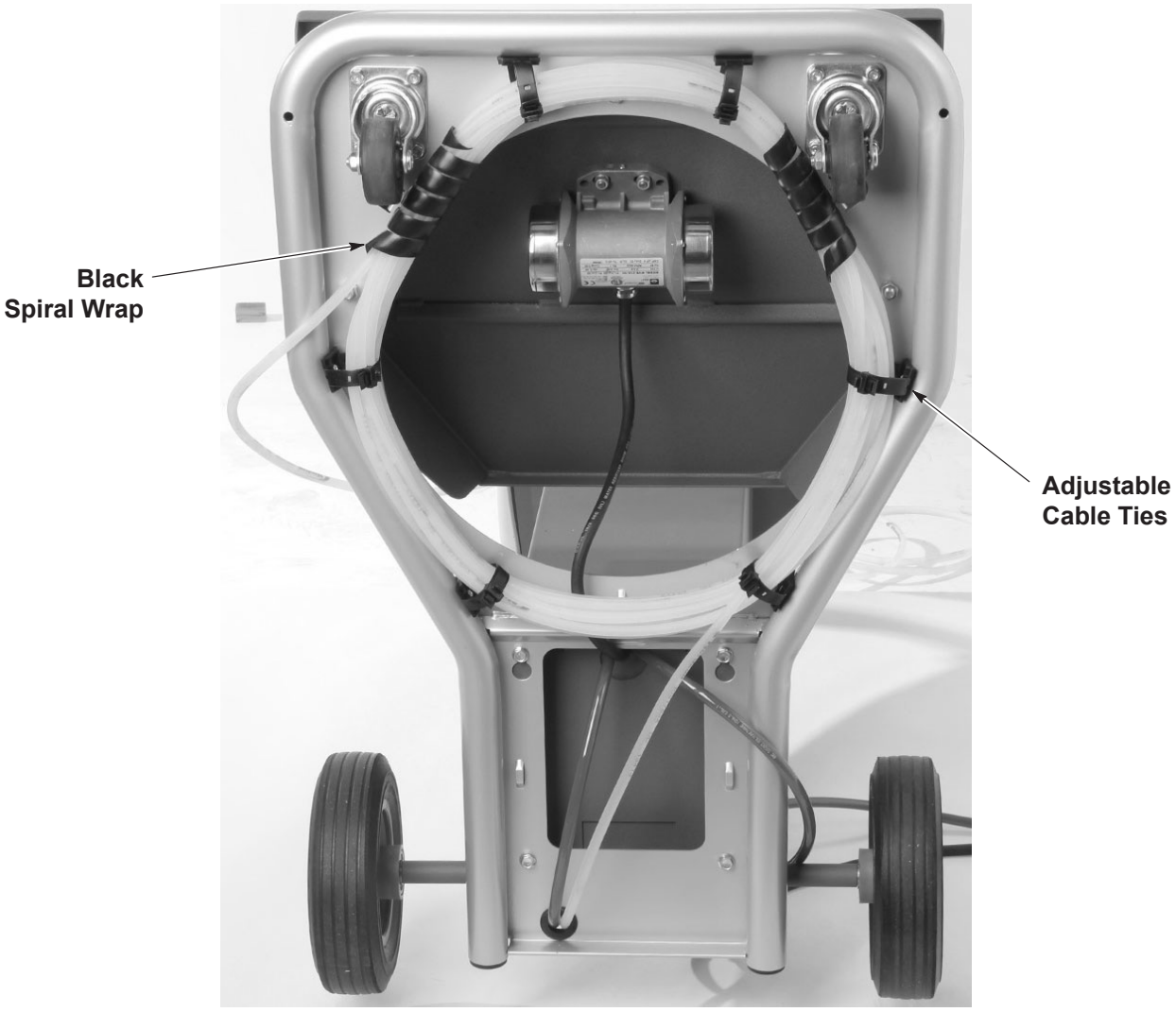


Figure 3-9 Bundling Tubing (Shown with Mobile System)

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.

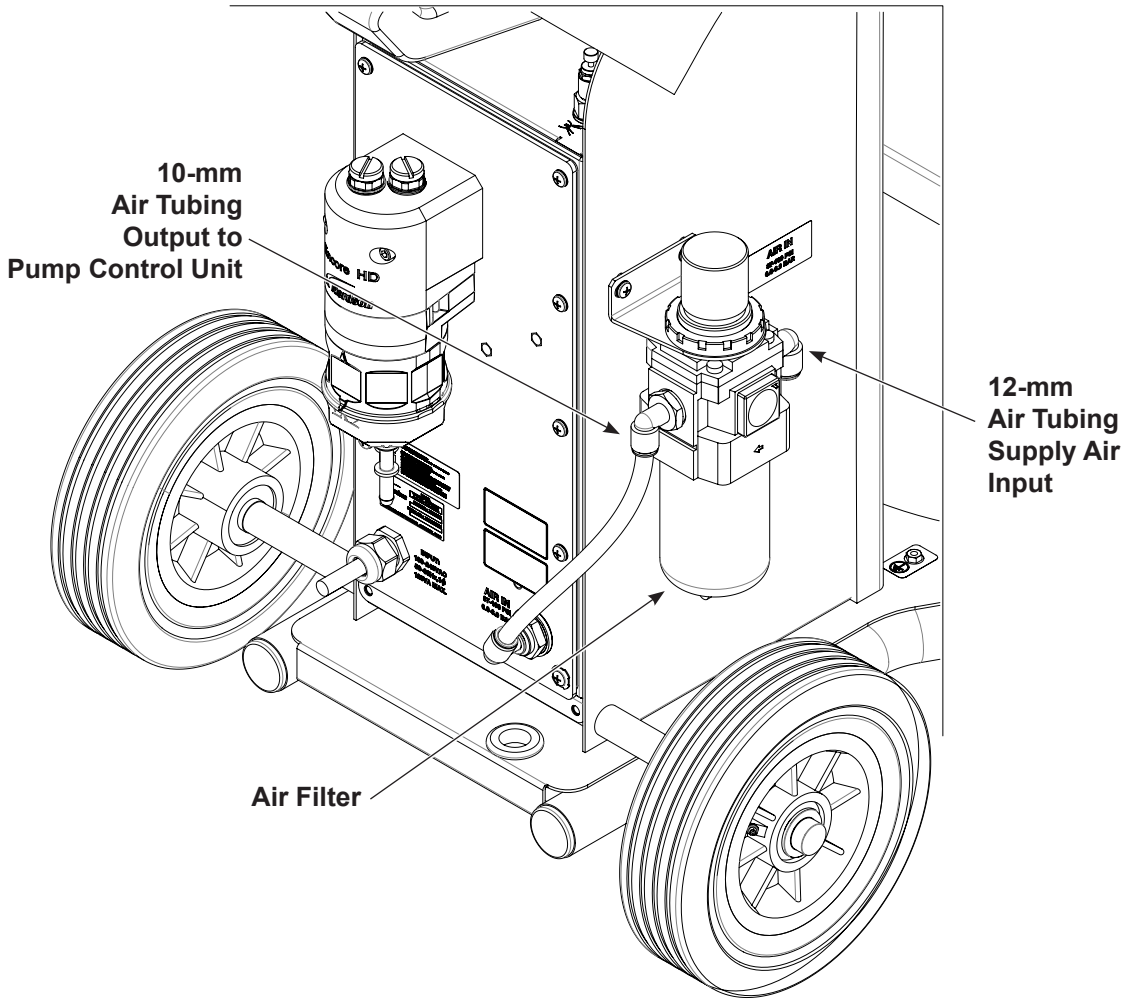


Figure 3-10 System Air Supply Connection (Shown with Mobile System)

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.

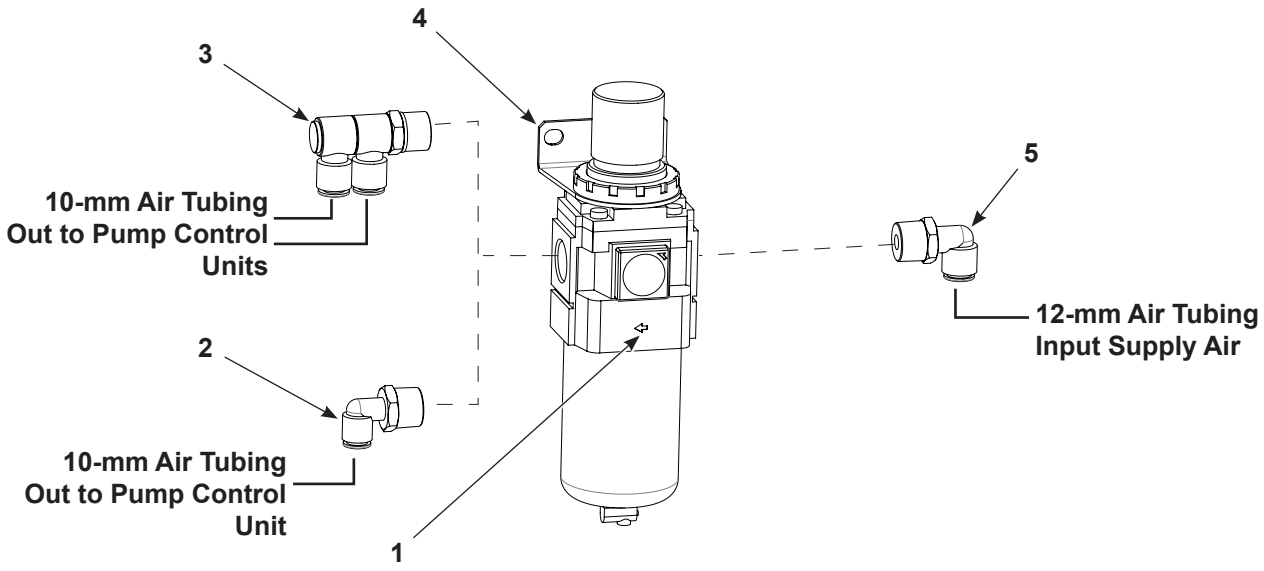


Figure 3-11 Air Filter Installation − Standalone and Rail/Wall Mount Systems

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

Powder Pump Hose

See Figure 3-12.

Standard 8-mm OD Poly (Semi-Rigid) Tubing

1. Cut the semi-rigid tubing with a tubing cutter. Powder cross-contamination may result if the powder tubing is cut unevenly.
2. Install the semi-rigid 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).

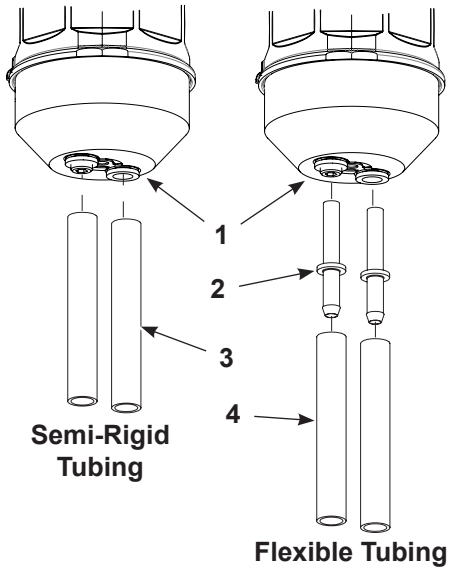


Figure 3-12 Pump Tubing Installation

1. Lower Y block
2. Barbed tubing adapter
3. Semi-rigid tubing
4. Flexible tubing

Pump Adapter Installation

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

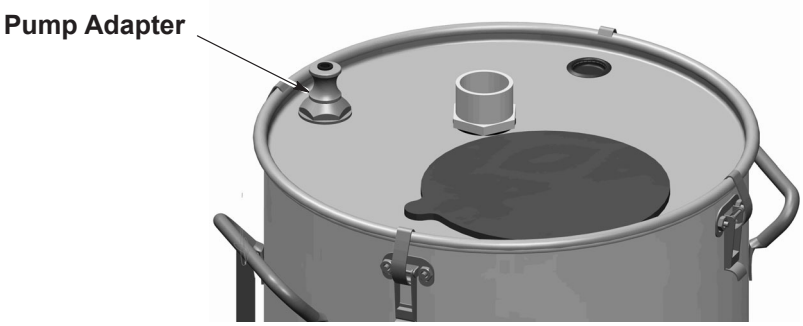


Figure 3-13 Pump Mounting with Adapter on HR or NHR Hoppers

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.

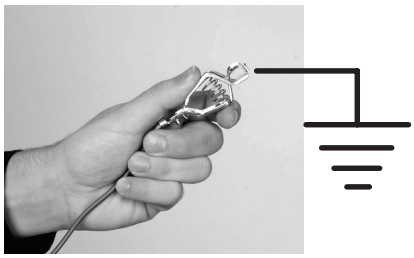


Figure 3-14 System Ground Connection

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.

NOTE: For pump information, refer to the pump manual.

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.

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.

NOTE: For pump information, refer to the pump manual.

Manifold Troubleshooting

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 *iFlow Module Repair* in the *Repair* section for instructions. If the problem persists, replace the pump air flow control valve. Refer to *iFlow Module Repair* in *Repair* section 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* in the *Troubleshooting* section 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 i*iFlow Module Repair* in *Repair* section for instructions. If the problem persists, replace the pump air flow control valve. Refer to *iFlow Module Repair* in *Repair* section for instructions.
4. Spray gun fan pattern changes	Defective pattern air flow control valve	Clean the pattern air flow control valve. Refer to *iFlow Module Repair* in *Repair* section for instructions. If the problem persists, replace the pattern air flow control valve. Refer to *iFlow Module Repair* in *Repair* section 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 manifold.

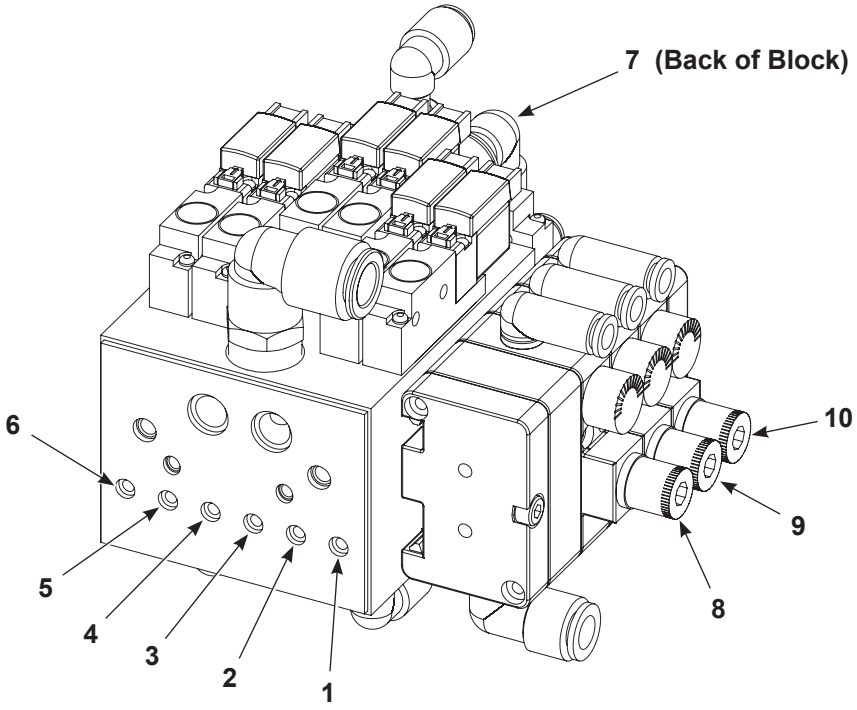


Figure 5-1 Solenoid and Flow Control Valve Functions

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

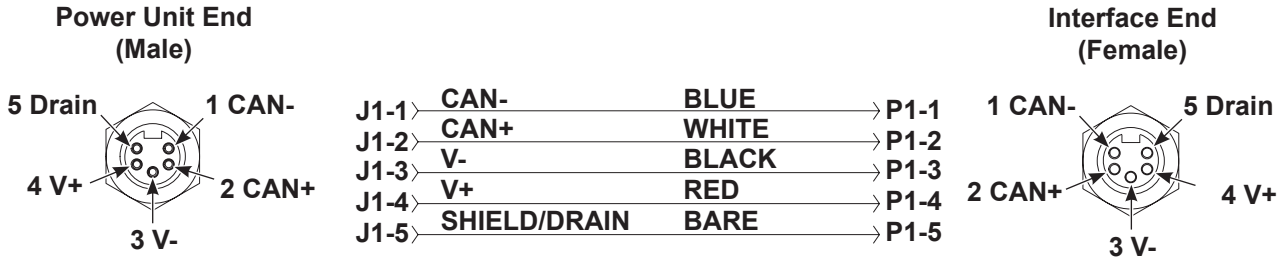


Figure 5-2 Controller Interconnect Cable Wiring

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.

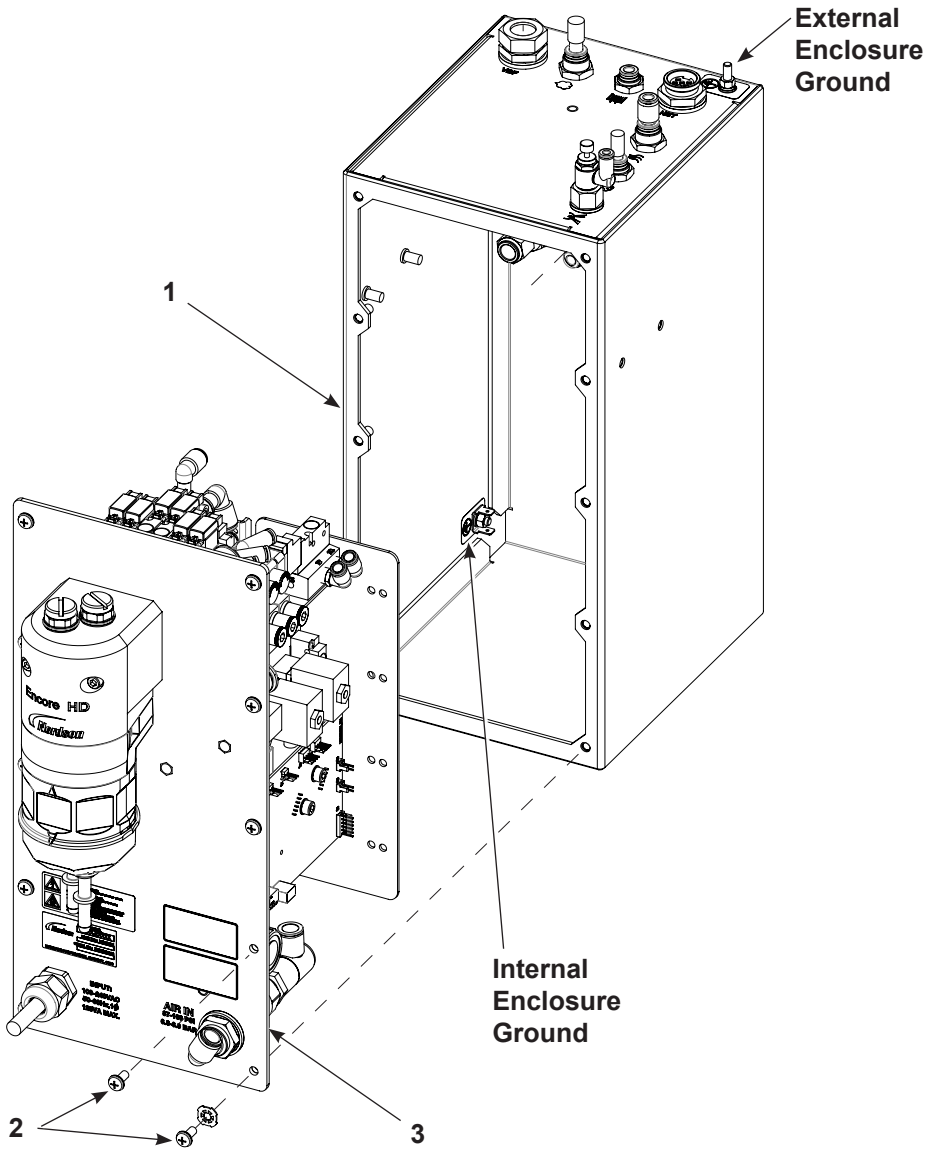


Figure 6-1 Sub-Panel Removal

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.

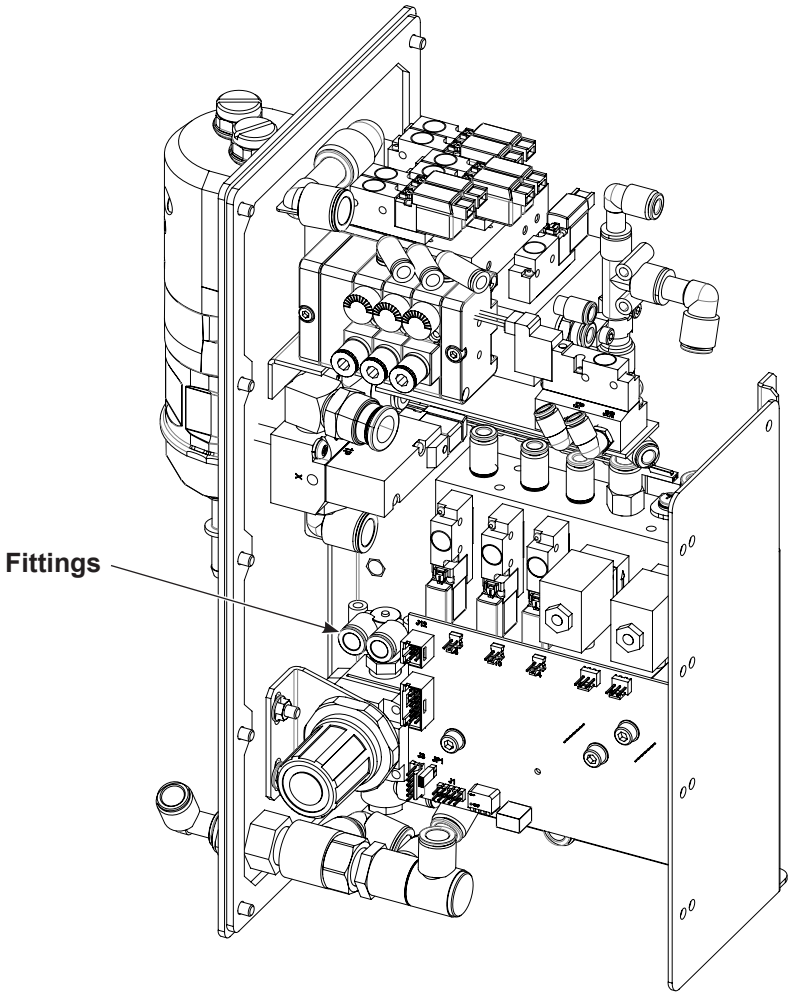


Figure 6-2 Regulator Adjustment

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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.

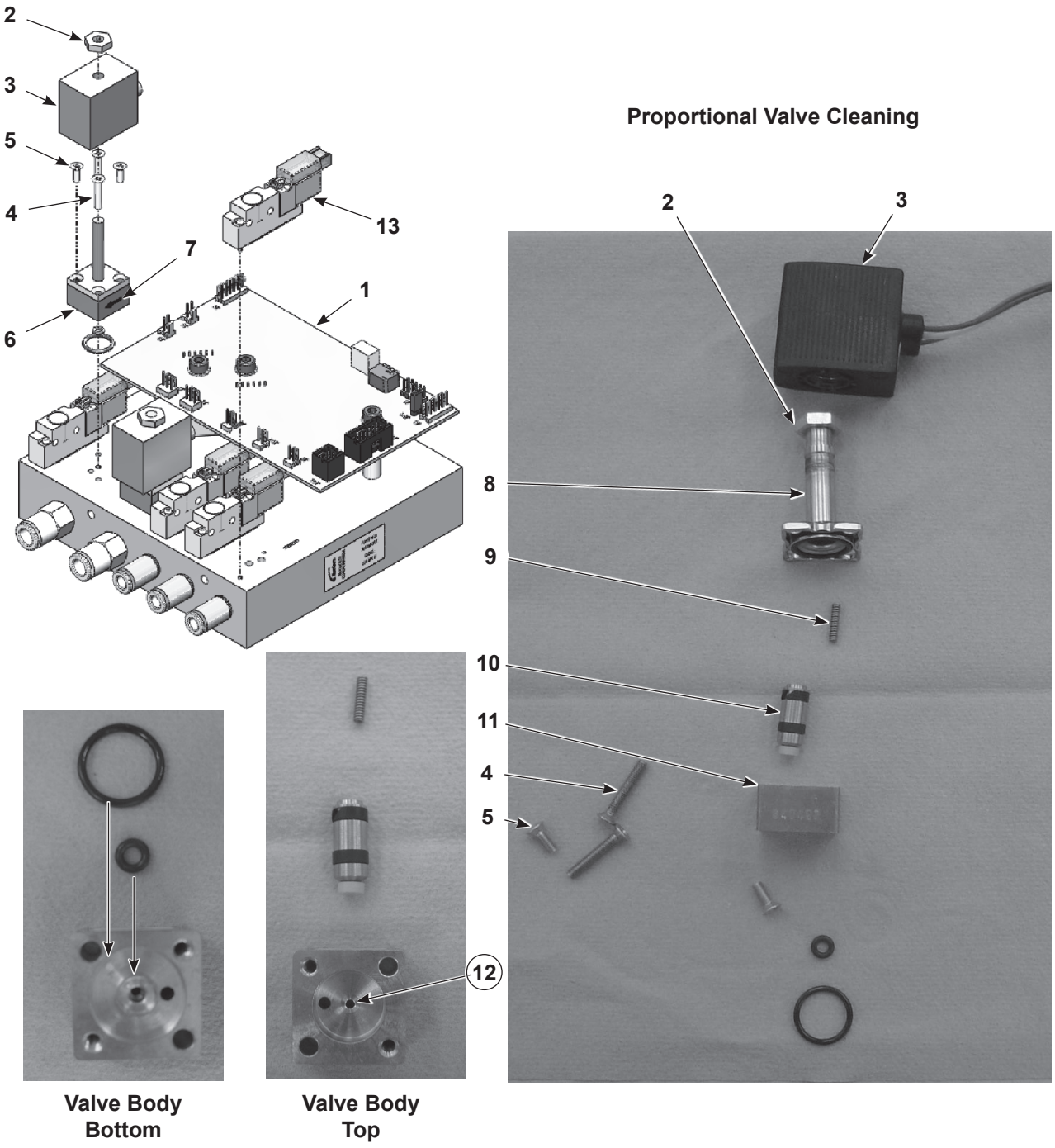


Figure 6-3 iFlow Module Repair − Solenoid Valve Replacement and Proportional Valve Cleaning or Replacement

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

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.

Pump

NOTE: For pump information, refer to the pump manual.

Section 7
Parts

Parts

To order parts, call the Nordson Industrial Coating Solutions 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						

Continued...

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, ½, 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				

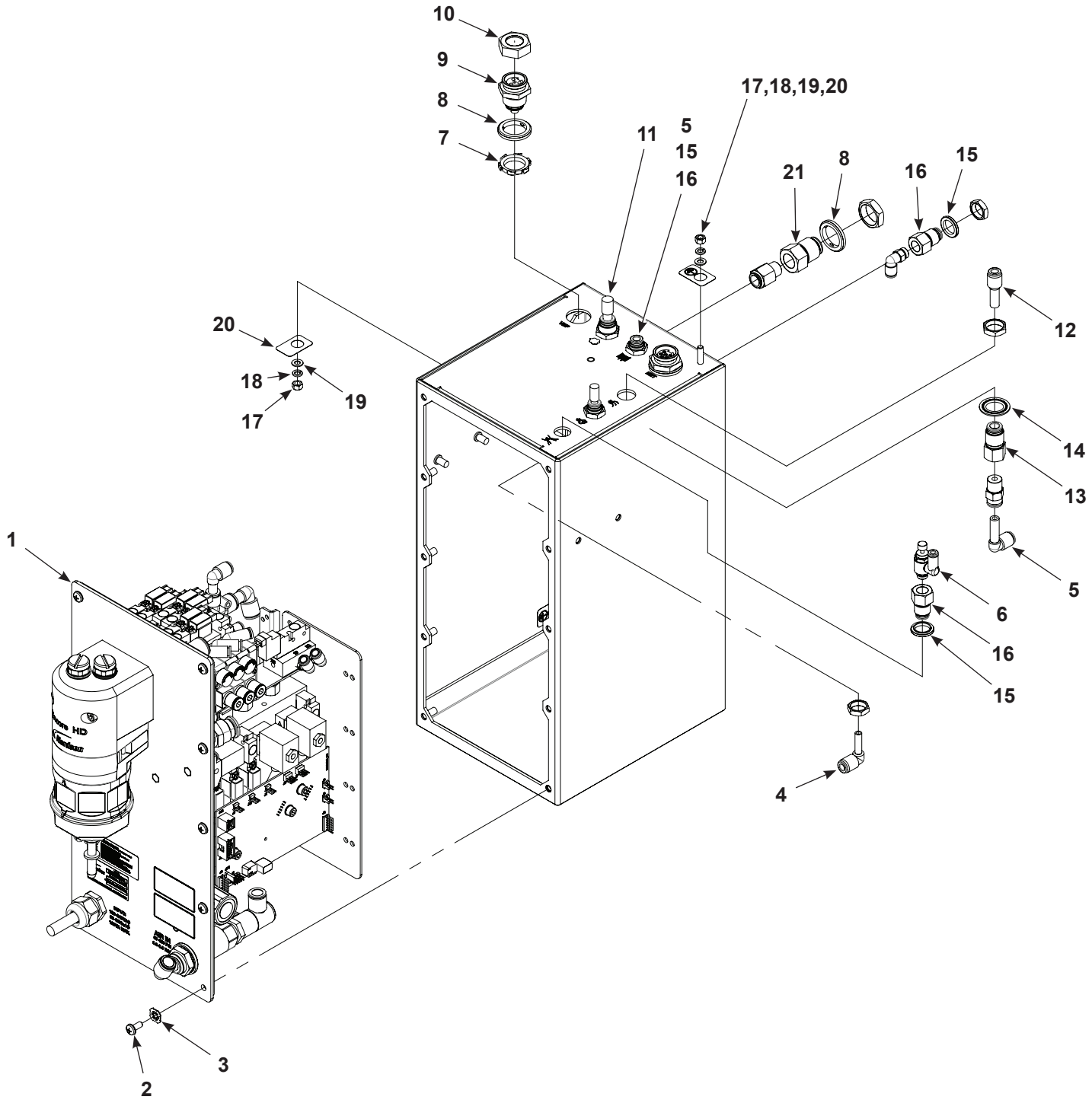


Figure 7-1 Pump Control Unit

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	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 manual to order parts.				

Continued...

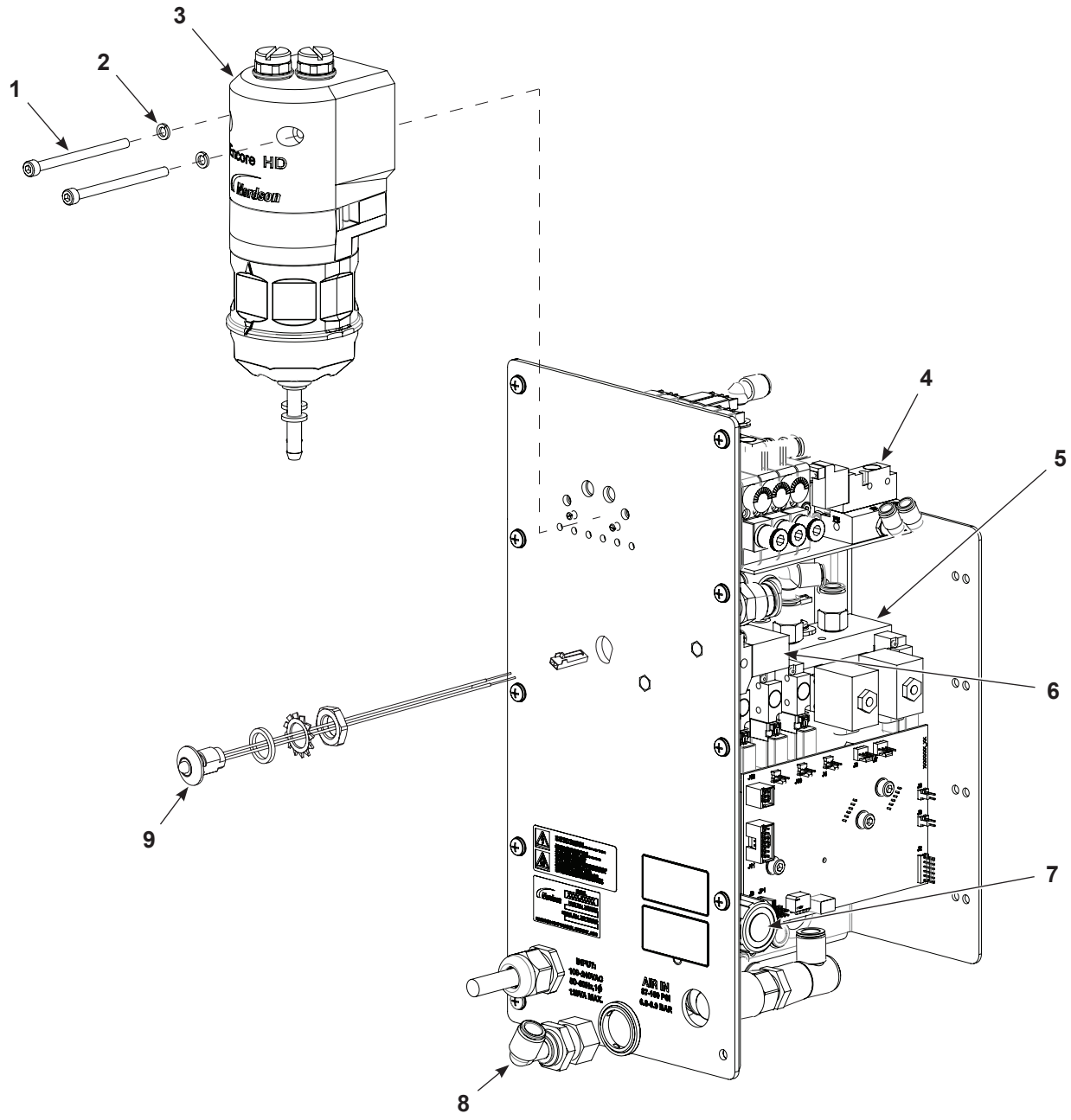


Figure 7-2 Panel Assembly Parts (1 of 2)

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	

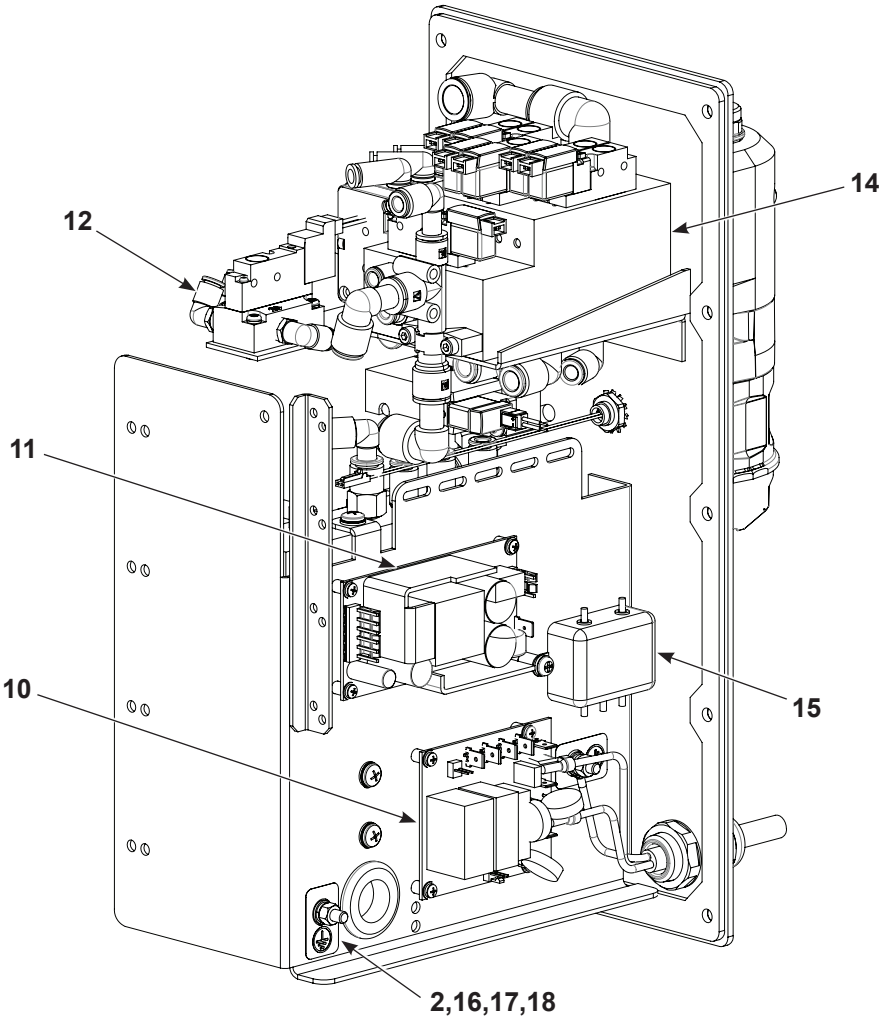


Figure 7-3 Panel Assembly Parts (2 of 2)

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	

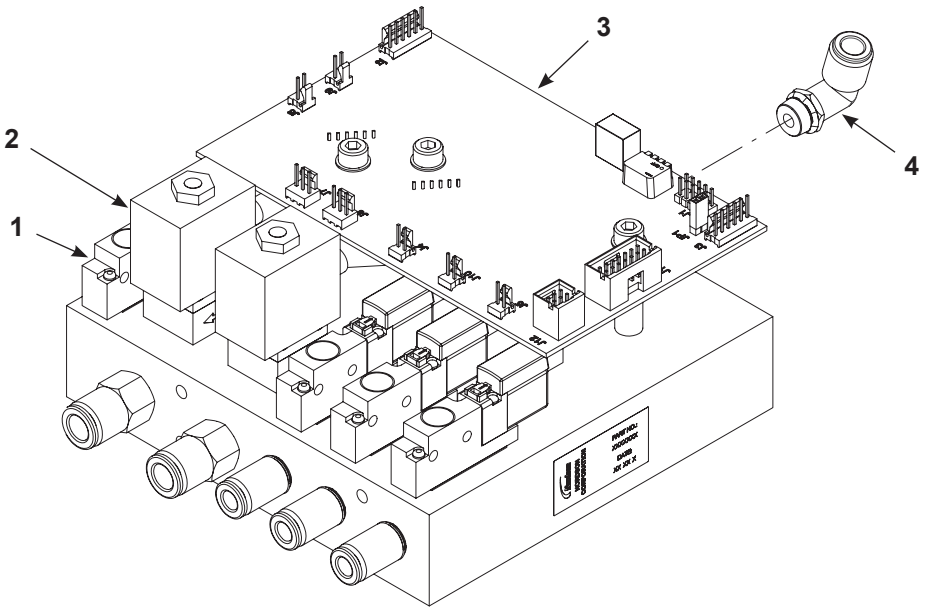


Figure 7-4 iFlow Module Parts

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.				

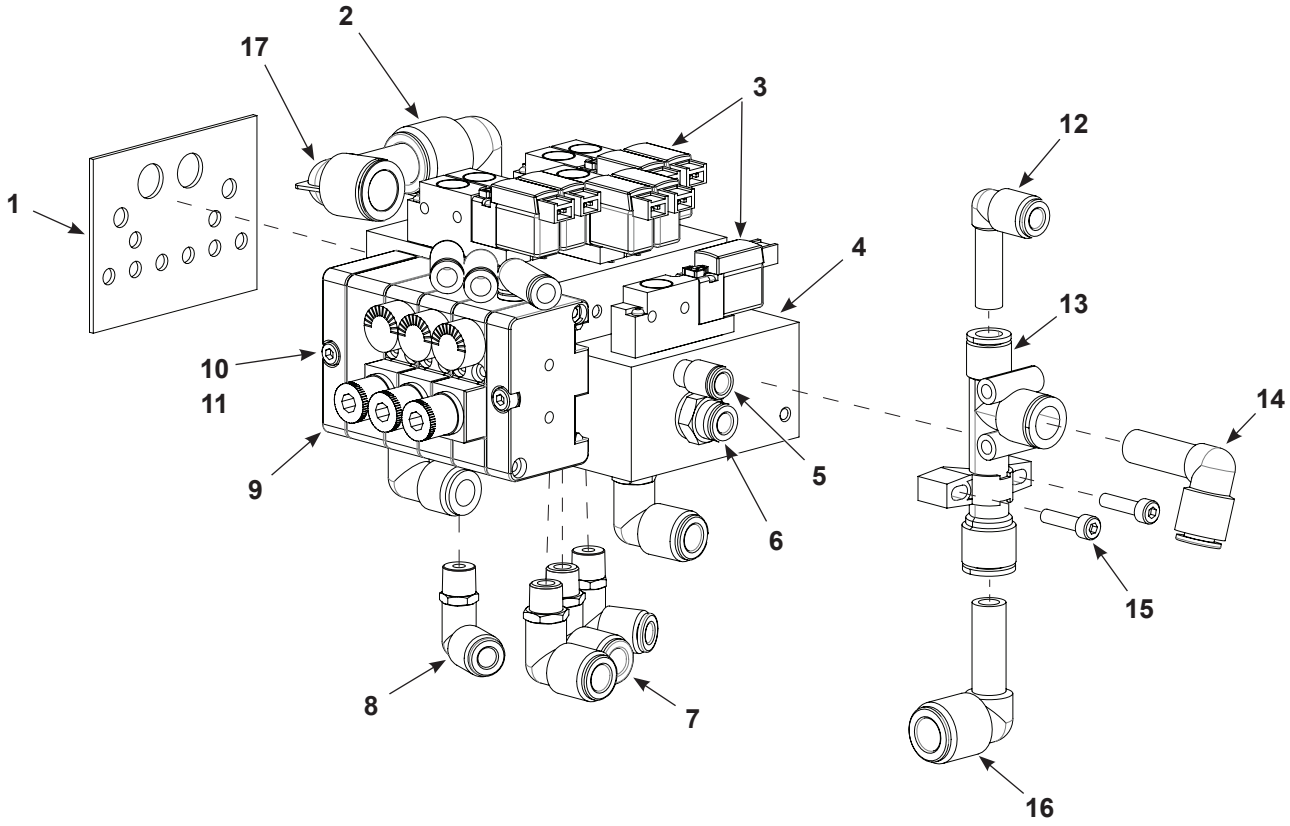


Figure 7-5 Manifold Assembly Parts

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	Quantity	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.			

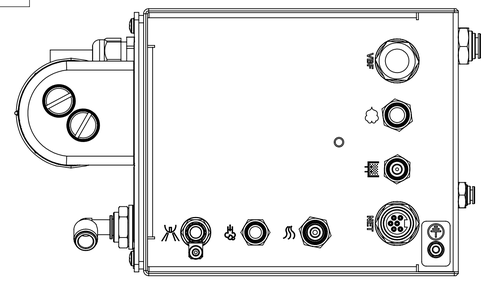
Section 8
Wiring Diagrams

Description	Part Number
Encore HD Power/PneumaticController Assembly	10013427

MATERIAL NO. 10013427 | REVISION 14

REVISIONS

ZONE	REV.	DESCRIPTION	BY	CHK	ECO NO.	DATE
	00	PROPOSAL				
	02	01) WAS PD16096, 02) ADDED SHEETS 3 & 4	MB			15APR14
	03	03) ADDED SHEET 5 & MOVED PINCH MANIFOLD	MB			
	05	04) REMOVED PANEL ASSY; 05) RELEASED	MB	TMF	PE-603483	13AUG15
	06	06) CHANGED MODEL NAMES AND NUMBERS IN TABLE	NHY	TMF	PE-604849	14JUN16
	07	07) ADDED ITEMS 35 & 36, REVISED QTY OF ITEM 30; REVISED EXPLODED VIEW (SHEET 1) TO CLARIFY ASSY; REVISDED GROUND PATH IN WIRING DIAGRAM (SHEET 3)	DC	DLU	PE-605175	08FRB17
	08	08) SHT 1: ADDED ENCORE HD+ OPTIONS TO TABLE A, HI POT TEST VOLTAGE WAS 1350V	EW	BF	PE-605057	21NOV17
	09	09) REMV'D FITTING AND TUBING PICTORALLY (SHEET 1)	MHH	DLU	PE-101300	15JAN20
	10	10) SHT 2: LABEL WAS 'W'	MHH	DLU	PE-103306	02JUL20
	11	REVISED TUBE ROUTING VIEWS (SHEET 2)	TAL	JR	PE-103623	08JAN21
	12	REMOVED PART NUMBERS 1606977 & 1606978 FROM TABLE A	DG	FM	PE-104601	01OCT21
	13	REMOVED PART NUMBER 1611086 FROM TABLE A, ADDED LABEL VIEW NOTE ON VBF VOLTAGE FOR ROUTING, REVISE TABLE A COLUMN 3	DS	EJ	PE-105206	20JUN22
	14	UPDATED DRAWING VIEW TO REFLECT CHANGE TO P/N 1620629	TC	AO	PE-105298	07JUL22
		ADDED NOTE TO VBF VOLTAGE LABEL FOR INCREASED CLARITY				



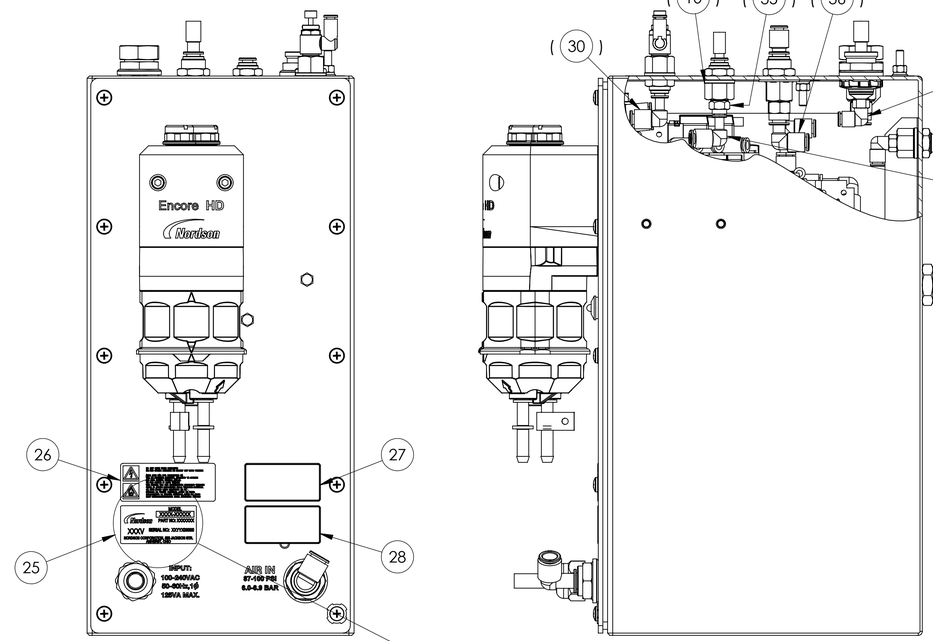
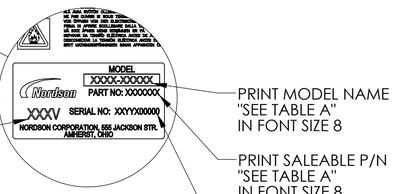


TABLE A		
MODEL NAME	PN	VBF VOLTAGE
ENCORE HD	1605584	115V
ENCORE HD	1605586	230V
08 ENCORE HD+	1611089	230V

13 PRINT VBF VOLTAGE "SEE TABLE A" IN FONT SIZE 14

14 IF NOT IN TABLE A, OMIT VOLTAGE

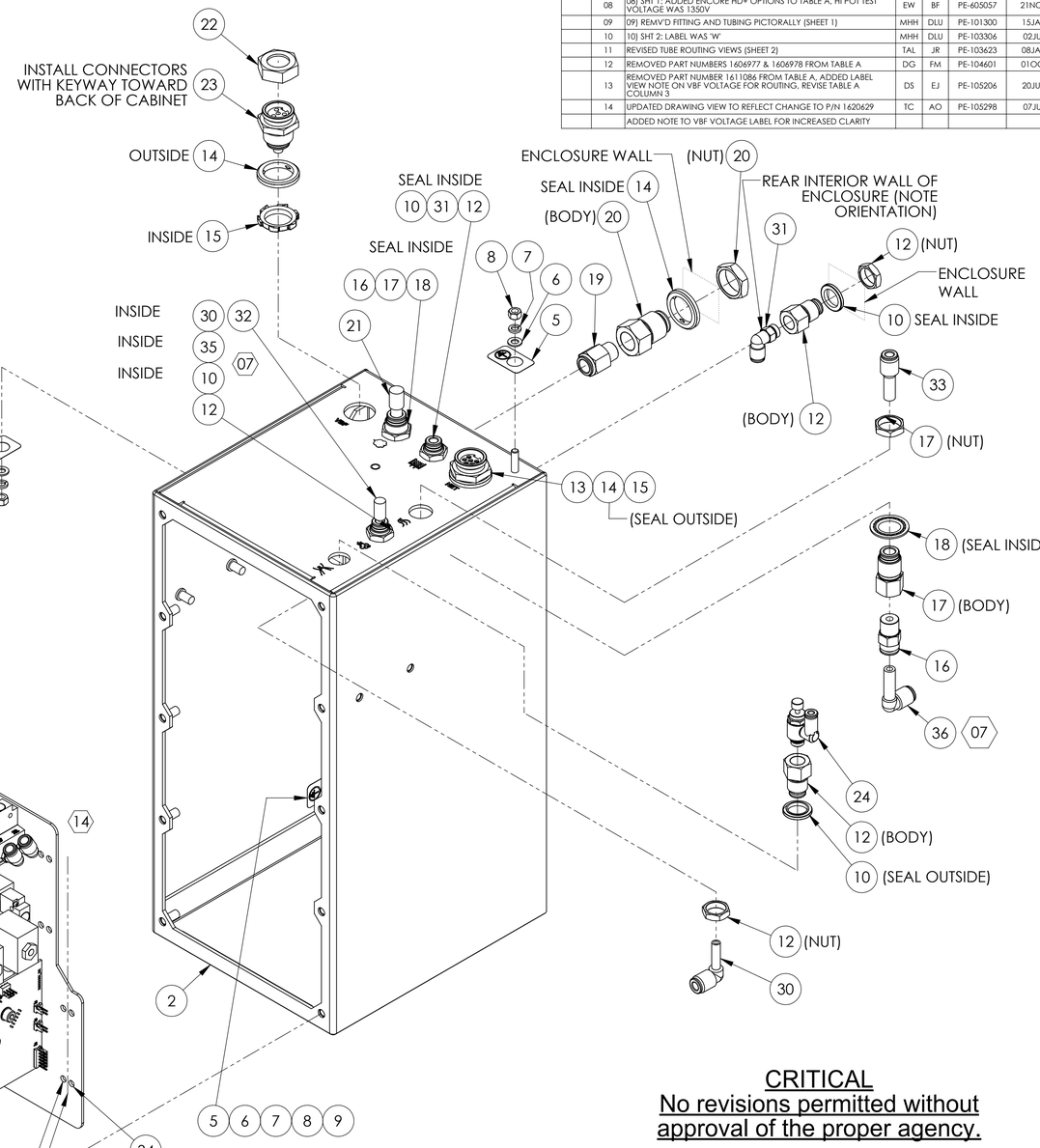


PRINT MODEL NAME "SEE TABLE A" IN FONT SIZE 8

PRINT SALEABLE P/N "SEE TABLE A" IN FONT SIZE 8

PRINT SERIAL NUMBER PER ENG. STD. 28.4 IN FONT SIZE 8

DETAIL D
SCALE 1 : 1



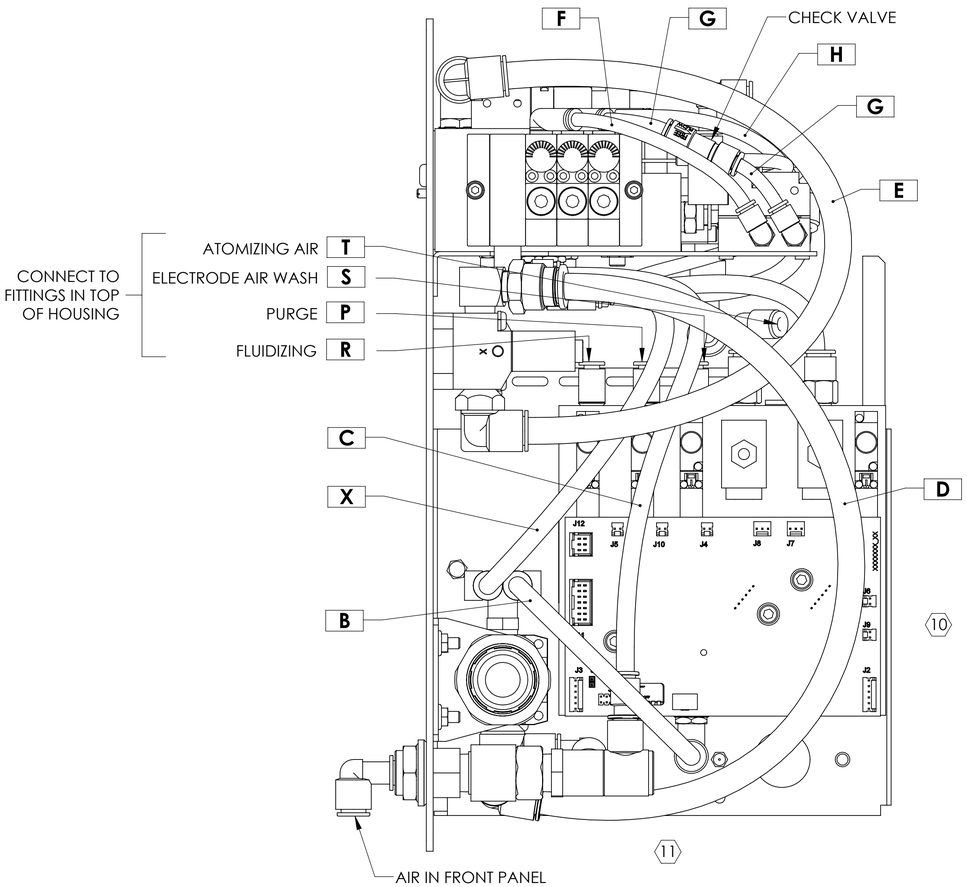
NOTE:
1. SHEET 1 DEPICTS THE FINAL ASSEMBLY
2. SHEET 2 DEPICTS THE PANEL COMPONENT ASSEMBLY INDICATING TUBING KIT TO HOUSING
3. SHEET 3 SHOWS THE WIRING DIAGRAM FOR THE ASSEMBLED PANEL & HOUSING ADDING THE EXTERNAL CONNECTORS
4. REFER TO WORK INSTRUCTION DOCUMENTS FOR ASSEMBLY PROCEEDURE
5. FOR PACKAGED VERSION: PRINT LABEL WITH MATERIAL NUMBER, & PLACE IN BOX WITH PAPER DUNNAGE
6. CONTROLLERE IS CONSTRUCTED FOR IP6X PROTECTION (DUST TIGHT).
7. INSPECT ALL SEALS & GASKETS FOR DAMAGE, AND REPLACE IF NEEDED
8. HIGH POT TEST: 08
   - POWER SUPPLY LEADS SHALL WITHSTAND AN AC VOLTAGE OF 1400V RMS
   - TO GROUND FOR 2 SECONDS WITHOUT BREAKDOWN. LEAKAGE CURRENT SHALL NOT EXCEED 7mA.
   - RELAY BOARD, (NUMBER 1605875), MUST BE JUMPERED OUT OF SYSTEM FOR THIS TEST
9. GROUND BOND TEST:
   - INPUT GROUND MUST WITHSTAND A MIN. OF 25 AMP RMS 60Hz CURRENT FOR
   - A MINIMUM OF 10 SECONDS. THE GROUND PATH RESISTANCE MUST NOT EXCEED 0.1 OHMS.

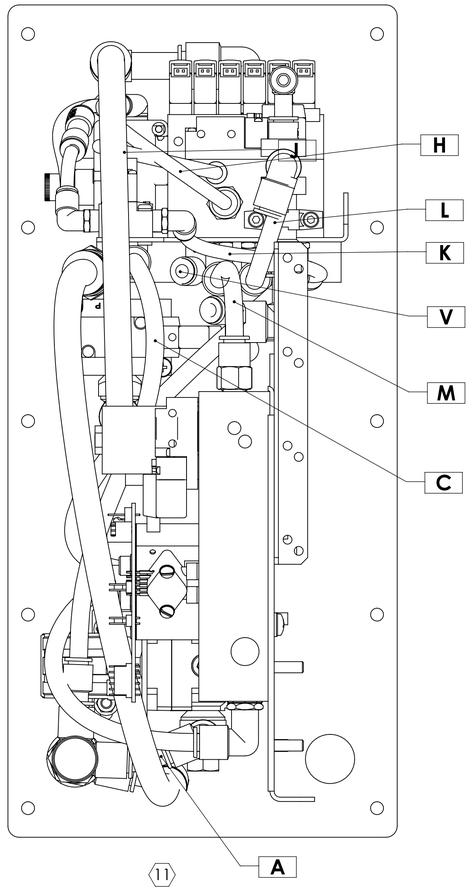
CRITICAL
No revisions permitted without approval of the proper agency.

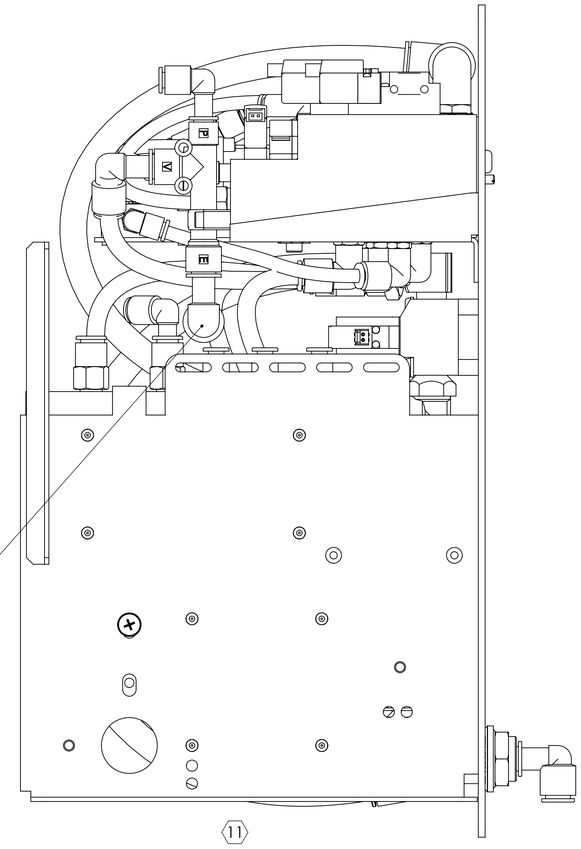
ALL DIMENSIONS IN MM EXCEPT AS NOTED X±0.8 X.X±0.25 X.XX±0.13 MACHINED SURFACES 63 BREAK INSIDE/OUTSIDE CORNERS 0.1/0.8 THREAD LENGTH DIMENSIONS ARE FULL THREAD INTERPRET DRAWINGS PER ASME Y14.5-2009 PERFECT FORM AT MMC REQUIRED FOR INTERRELATED FEATURES THIRD ANGLE PROJECTION	NORDSON CORPORATION WESTLAKE, OH, U.S.A. 44145 DESCRIPTION: REF DWG,PWR/PNEU CTRLR ASSY,ENCORE HD DRAWN BY: DC — DATE: 12AUG13 — RELEASE NO.: PE603483 CHECKED BY: TMF — APPROVED BY: TMF SIZE: D — FILE NAME: PD16096 — MATERIAL NO.: 01 10013427 — REVISION: 14 SCALE: 1:2 — CADD GENERATED DWG. — SHEET 1 OF 3

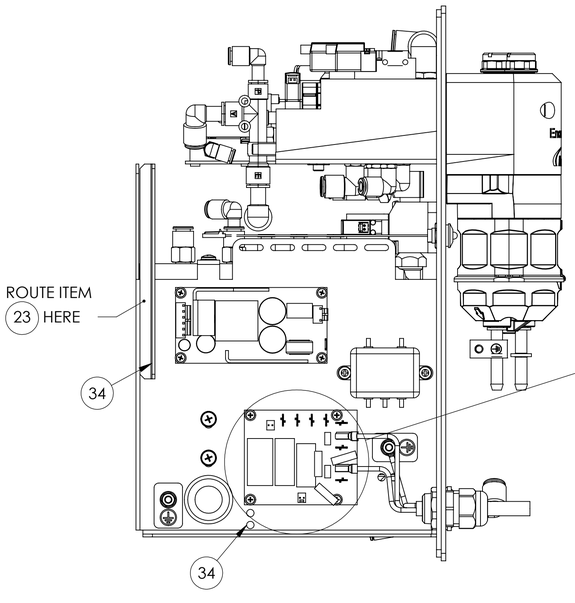
MATERIAL NO. 10013427 REVISION 14

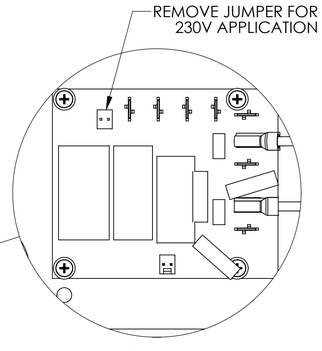
ZONE	REV	DESCRIPTION	BY	CHK	RELEASE NO.	DATE
		SEE SHEET 1				



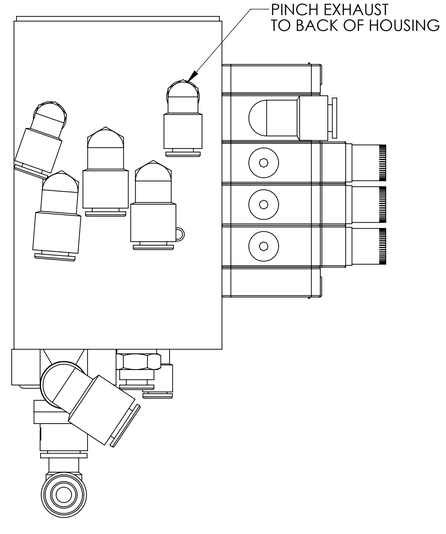




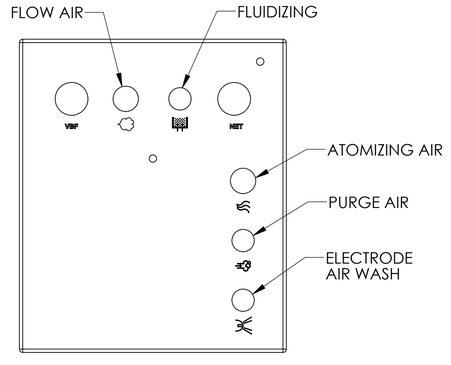




DETAIL E
SCALE 1 : 1



BOTTOM VIEW MANIFOLD

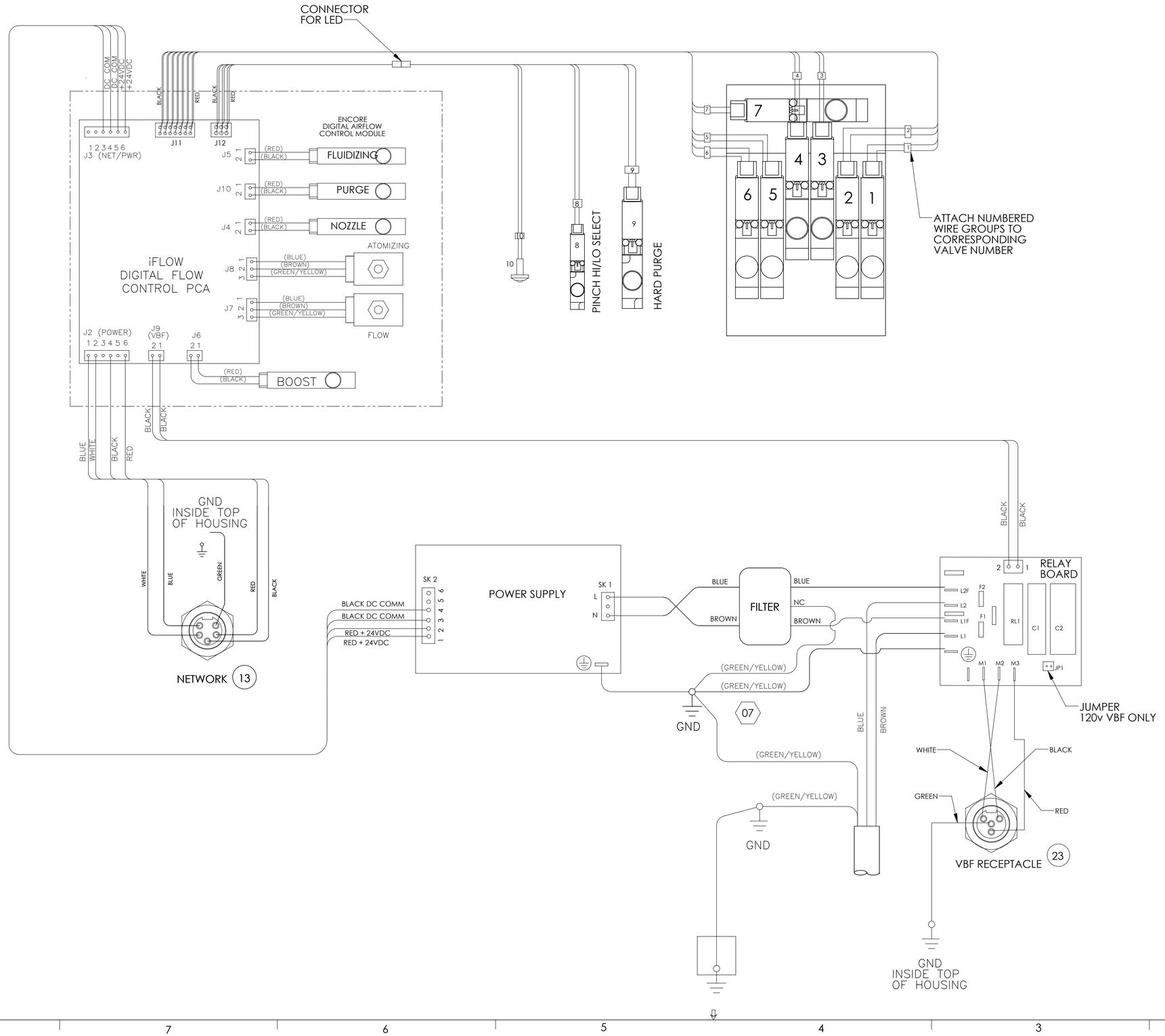


TOP VIEW OF HOUSING

ALL DIMENSIONS IN MM EXCEPT AS NOTED	NORDSON CORPORATION WESTLAKE, OH, U.S.A. 44145		
X±0.8 X.X±0.25 X.XX±0.13	DESCRIPTION: REF DWG,PWR/PNEU CTRLR ASSY,ENCORE HD		
MACHINED SURFACES 125			
BREAK INSIDE/OUTSIDE CORNERS 0.1/0.8	DRAWN BY: DC	DATE: 12AUG13	RELEASE NO.: PE603483
THREAD LENGTH DIMENSIONS ARE FULL THREAD	CHECKED BY: TMF	APPROVED BY:	
INTERPRET DRAWINGS PER ASME Y14.5-2009	SIZE: D	FILE NAME: PD16096	MATERIAL NO.: 10013427 REVISION: 14
PERFECT FORM AT MMC REQUIRED FOR INTERRELATED FEATURES			
THIRD ANGLE PROJECTION	SCALE: 1:2	CADD GENERATED DWG.	SHEET 2 OF 3

MATERIAL NO. 10013427 REVISION 14

ZONE	REV	DESCRIPTION	BY	CHK	RELEASE NO.	DATE
	00	SEE SHEET 1 FOR REVISIONS				



ALL DIMENSIONS IN MM EXCEPT AS NOTED	NORDSON CORPORATION WESTLAKE, OH, U.S.A. 44145	
X±0.8 X.X±0.25 X.XX±0.13	DESCRIPTION	REF DWG,PWR/PNEU CTRLR ASSY,ENCORE HD
MACHINED SURFACES 16		
BREAK INSIDE/OUTSIDE CORNERS 0.1/0.8	DRAWN BY DC	DATE 12AUG13
THREAD LENGTH DIMENSIONS ARE FULL THREAD	CHECKED BY TMF	APPROVED BY
INTERPRET DRAWINGS PER ASME Y14.5-2009		RELEASE NO. PE603483
PERFECT FORM AT MMC REQUIRED FOR INTERRELATED FEATURES	SIZE D	FILE NAME PD16096
THIRD ANGLE PROJECTION	MATERIAL NO. 10013427	REVISION 14
SCALE 1:2	CADD GENERATED DWG.	SHEET 3 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) 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: +15ºC to +40ºC
- Ex tb IIIB T60ºC / Ex II 2 D / 2mJ = (Encore XT and HD Applicators)
- Ex tc IIIB T60ºC / 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: 05NOV24

_____

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Industrial Coating Systems
Nordson Deutschland GmbH
Heinrich-Hertz-Straβe 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)	EN50050-2 (2013)	
EN1953 (2013)	EN60079-31 (2014)	EN61000-6-2 (2005)	EN55011 (2009)	EN60204-1 (2018)

Principles:
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Type of Protection:
- Ambient Temperature: +15ºC to +40ºC
- Ex tb IIIB T60ºC / Ex II 2 D / 2mJ = (Encore XT and HD Applicators)
- Ex tc IIIB T60ºC / 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: 05Nov24

_____
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Supervisor Product Development Engineering
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Nordson UK Ltd.; Unit 10 Longstone Road
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England

Encore® HD/XD Pump

Customer Product Manual
Document Number 1605708-12
– English –
Issued 04/2025

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

This document is subject to change without notice.
Check http://emanuals.nordson.com for the latest version.

NORDSON CORPORATION • 100 NORDSON DRIVE AMHERST, OHIO 44001• USA

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Contact Us
Nordson Corporation welcomes requests for information, comments, and inquiries about its products. General information about Nordson can be found on the Internet using the following address:
http://www.nordson.com.

http://www.nordson.com/en/global-directory

Change Record

Revision	Date	Change
01	11/17	Initial Release
02	03/18	Added CE mark and new DOC14045-01.
02_update	12/18	1093557 was 1903557.
03	06/19	Added repair and parts information on gaskets 1608603 and 1613013. Updated parts lists with 940175, 940137, 983401, 1616440.
04	09/19	Removed washer from assembly and corrected part number for fluidizing tube kit and check valve kit. Updated torque for pump screw.
05	09/20	Replacing screw.
06	03/21	Added anti-static tubing kit (1620023)
07	05/21	Updated specifications and gasket.
08	06/22	Updated approval information.
09	10/23	Removed P/N 1620004 & P/N 768181, Added P/N 7035356 per tubing consolidation
10	04/24	Updating parts and service kits. Removed HD+ references. Updated lower Y-block.
11	08/24	Updated parts section for clarification on kits and available parts.
12	04/25	Added delivery and suction notations to installation section. Added lower Y block assembly part number to parts list.

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.

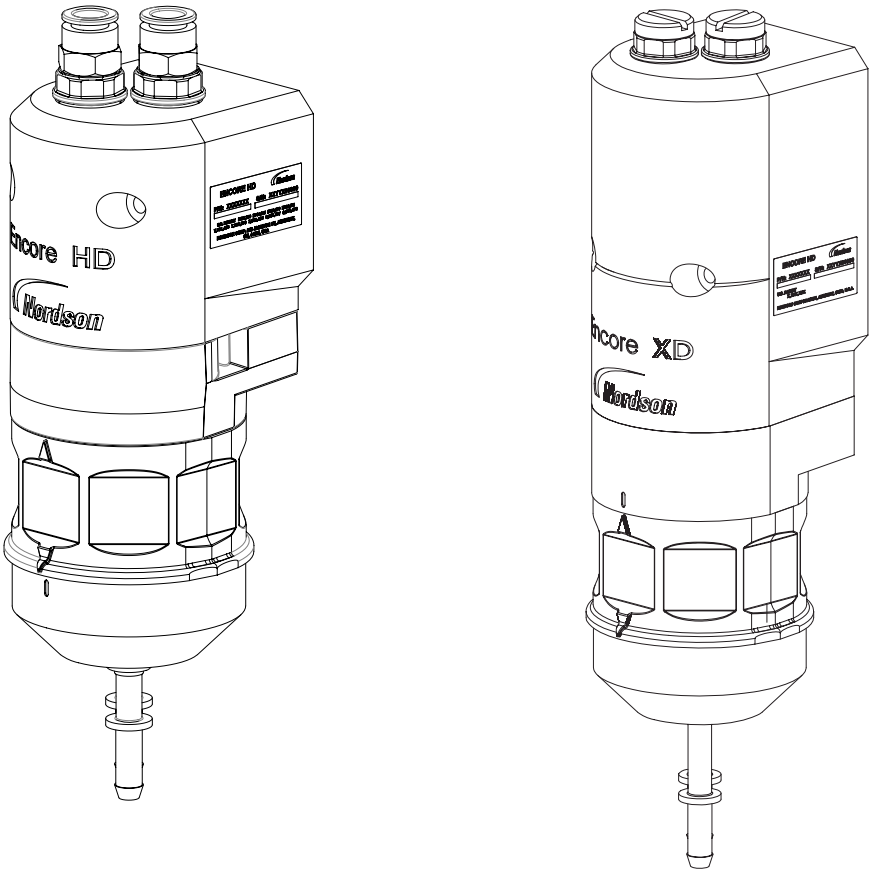
Disposal

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

Description

Pump

See Figure 1. The Encore HD and XD powder feed pump transports precise amounts of powder from a feed source to a powder spray gun.



Encore HD **Encore XD**

Figure 1 Encore HD/XD Pump

Features and Benefits

- Standard pump (HD) has blue pinch valves, machined Tivar® Y blocks and standard porous tubes.
- Extreme duty pump (XD) is the same as the HD pump with high flow rate capacity.
- Higher powder output.
- Improved uniformity of powder output.
- Maintains high reliability of pinch valves.
- One screw maintenance design.
- Easier filter replacement.
- Improved gasket design.
- Centralized wear parts.
- Over torque protection.

Pump Components

See Figure 2.

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 Chamber Block	Houses the pinch valves. Made from clear plastic allowing for visual inspection of the pinch valves.
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

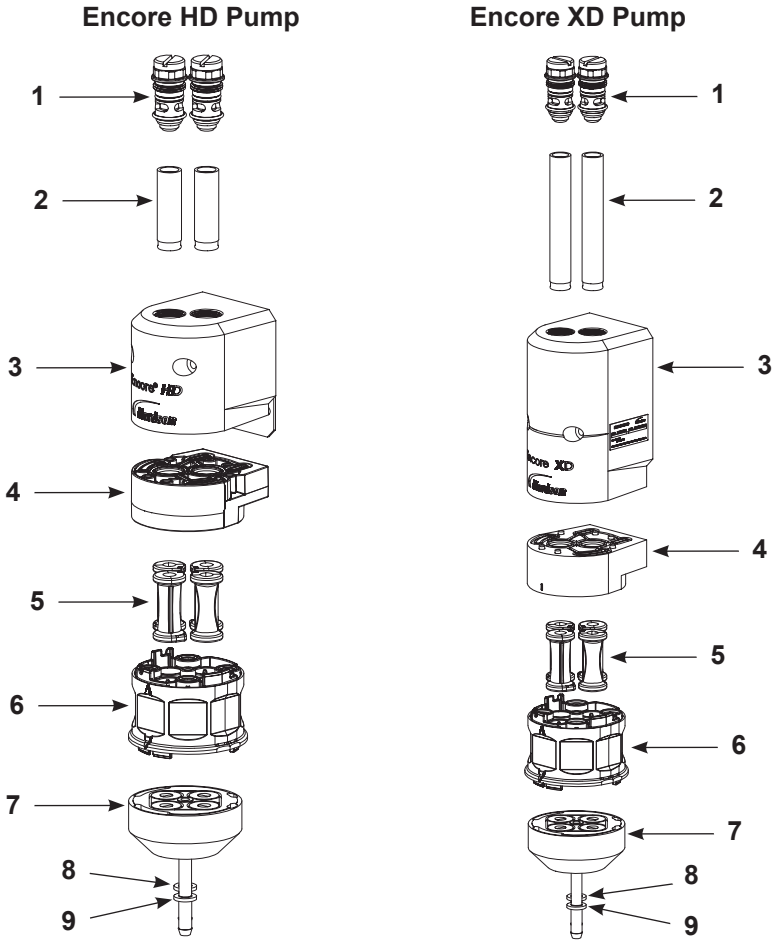


Figure 2 Encore HD/XD Pump Components

Theory of Operation

Pumping

The Encore HD/XD 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 3.

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 4.

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.

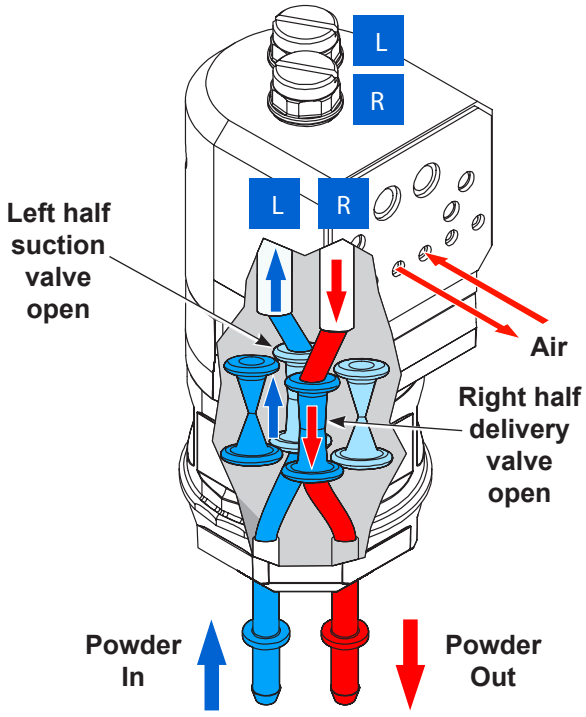


Figure 3 Left Side Drawing In, Right Side Dispensing

NOTE: Illustration is viewed from the right, rear of the pump.

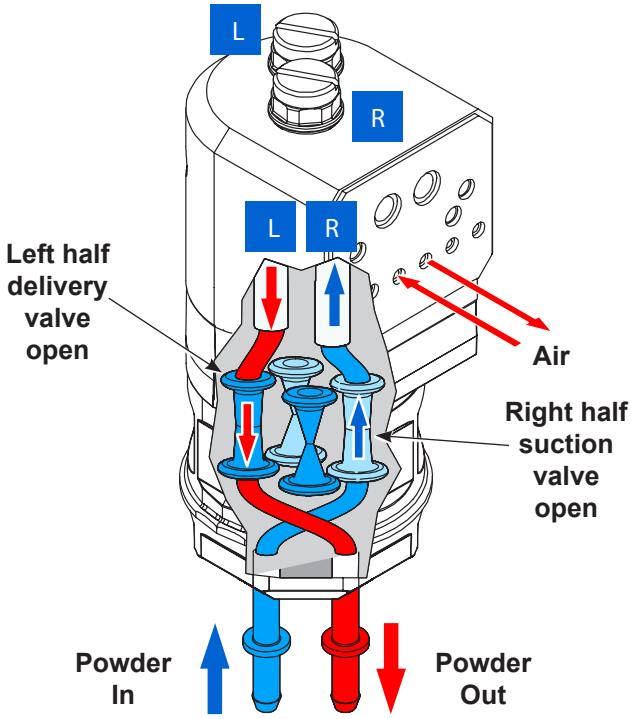


Figure 4 Left Side Dispensing, Right Side Drawing In

Purging

See Figure 5. 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.

Stages 3 and 4: 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.

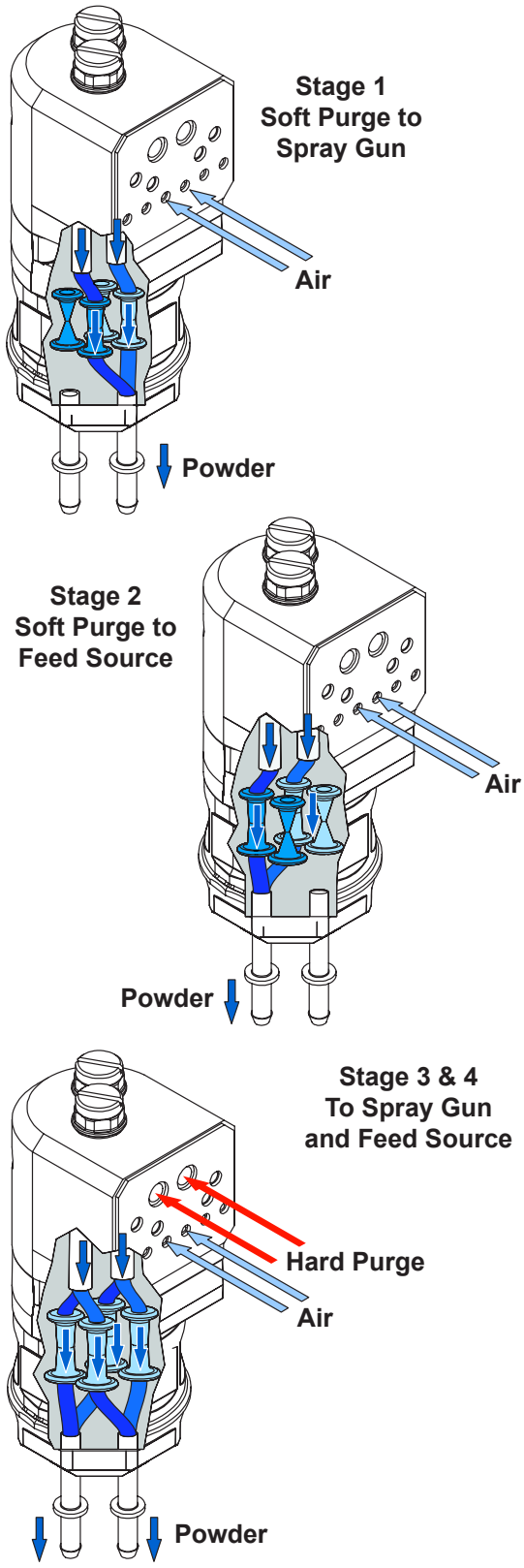


Figure 5 Purging Operation

Pump Port Functions

Figure 6 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

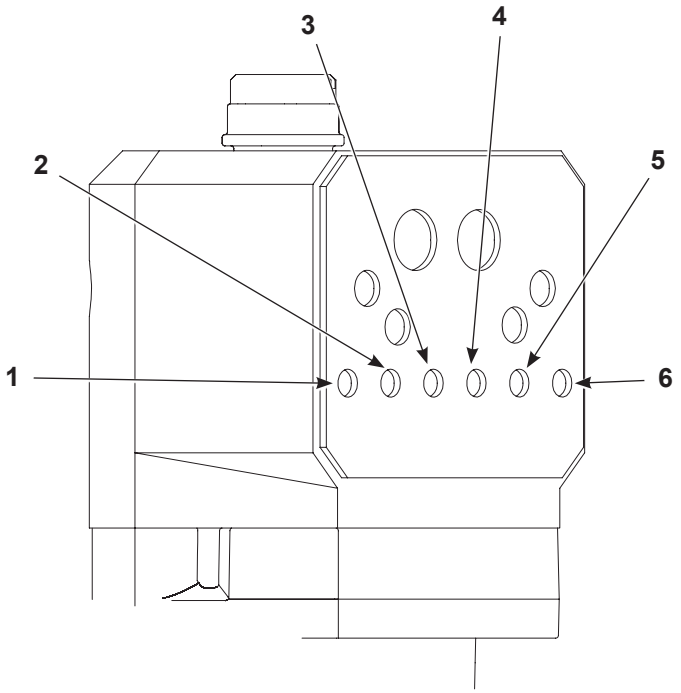


Figure 6 Pump Port Functions

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.

Pump operation is controlled through the spray gun controller. Refer to the *Operation* section of the applicable controller manual for specific instructions.

Pump operation is controlled by specifying a set point from 0-100 (which translates to a percent of flow) at the spray gun controller. At the pump, each set point results in a predefined cycle rate. Increasing the cycle rate increases the powder delivery rate. Decreasing the cycle rate decreases the powder delivery rate.

The manifold also has a spray gun pattern air flow control valve. spray gun pattern air is controlled by setting the flow rate (in either scfm or m3/hr) at the spray gun control unit.

NOTE: When the fluidizing tubes become clogged with powder, the powder delivery rate decreases The spray gun controller will generate a fault to indicate this condition and notify you that it is time to replace the fluidizing tubes. Correct vacuum reading is (9-14 in. Hg).

Specifications

See Figure 7.

Standard Pump Output (Maximum)	
HD: 80 lb/hour (600 g/min) XD: 100 lb/hour (750 g/min)	
Air Consumption	
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)
Operating Air Pressure	
Pinch Valves	37 psi (2.6 bar)
Flow Control (to pattern air/ pump assist)	85 psi (5.9 bar)
Vacuum Generator	80 psi (5.5 bar)
Powder Tubing	
Size	8 mm OD x 6 mm ID
Length	Output: 18.3 m (60 ft) Input: 3.5-12 ft (1-3 m)

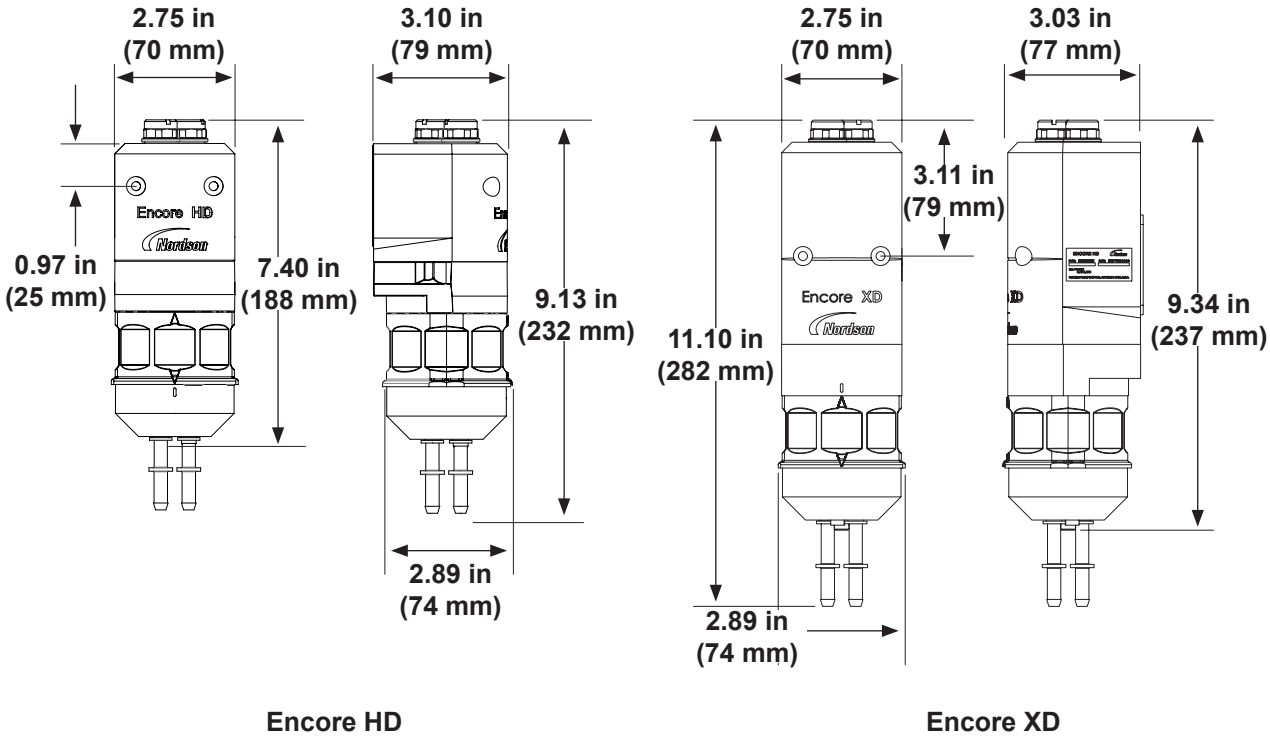


Figure 7 Encore Pump Dimensions

Installation

Pump Tubing Installation

See Figure 8.

Standard 8 mm OD Poly (Semi-Rigid) Tubing

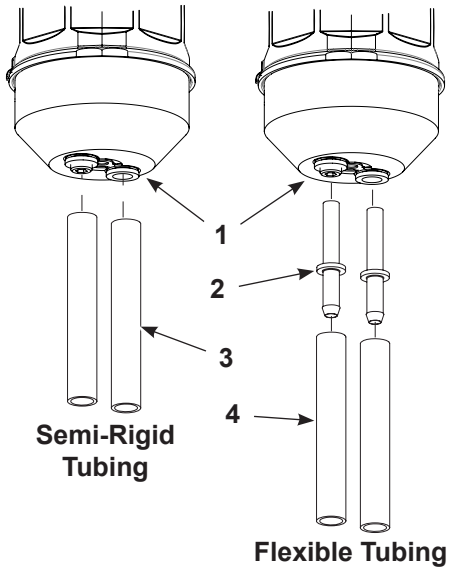
NOTE: Cut the semi-rigid tubing with a tubing cutter. Powder cross-contamination may result if the powder tubing is cut unevenly.

Install the semi-rigid tubing (3) into the lower Y block (1) and push to internal connector fitting (not shown).

Flexible 8 mm OD Tubing

NOTE: The barbed adapters used to connect flexible tubing to the pump are shipped with the pump.

1. Install the end of the adapter (2) into the lower Y block (1). Push to internal connect fitting.
2. Push the flexible powder tubing (4) over the barbed ending of the adapter (2).



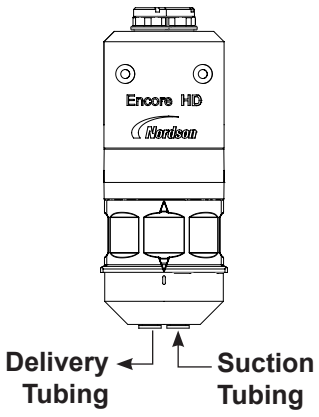


Figure 8 Powder Tubing Installation

Antistatic 8.2 mm OD/5.6 mm ID Tubing

Refer to the *Encore HD Antistatic Tubing Grounding Kit* instruction sheet (1620023). Only used with Encore HD Antistatic Tubing Grounding Kit.

Installing the Pump Gasket

See Figure 9.

NOTE: If replacing a damaged gasket with a new gasket, refer to the *Replacing Pump Gasket* in the *Repair* section.

Remove the sticker backing from gasket (1) and place on the pump (2), aligning the holes of the gasket (1) with the port holes on the pump (2).

CAUTION: Ensure gasket is not covering any of the port holes on pump. A second gasket is provided with pumps as an additional spare.

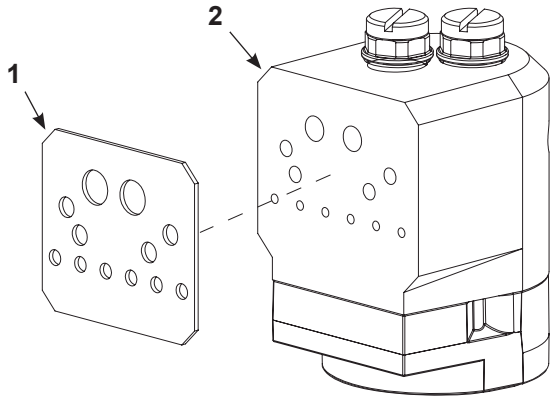


Figure 9 Replacing the Pump Gasket

Pump to Cabinet, Panel, or Housing

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

Follow the below instructions to install the pump to an existing pump panel.

See Figure 10.

1. Make sure that the gaskets on the pump (1), are not damaged, replace them if necessary.
2. Line the pump to the appropriate mounting location on the cabinet wall or housing (3). See *Pump Port Functions* in the *Description* section for port locations.
3. Secure the pump hand tight to the cabinet wall with the pump mounting hardware (2).
4. Tighten all hardware securely.

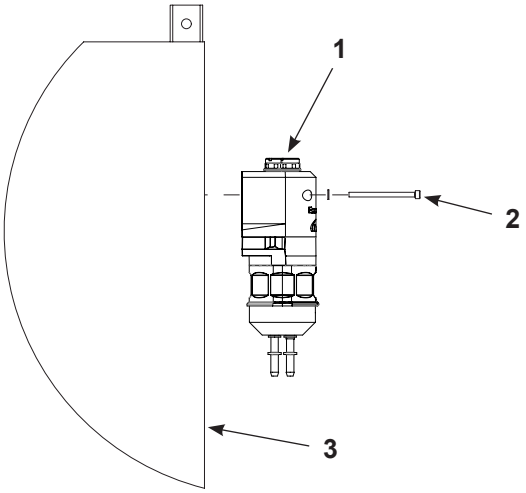


Figure 10 Pump Mounting to Cabinet

Pump Ground Check

NOTE: This procedure requires a multimeter.

See Figure 11

Perform a resistence test with a multimeter to ensure their are good ground connections.

1. Check for good ground connection between the manifold (1) and the screw (3) on the bottom of the pump. Resistance should be less than 1 MΩ.

If the resistence ground is high or there is no continuity, check the following:

- Improper torque - confirm the bottom screw (3) does not exceed 20-25 in-lb (2.3-2.8 N•m).
- Damaged upper Y block (2) or its custom O-ring (4) - replace both upper Y block and custom O-ring.

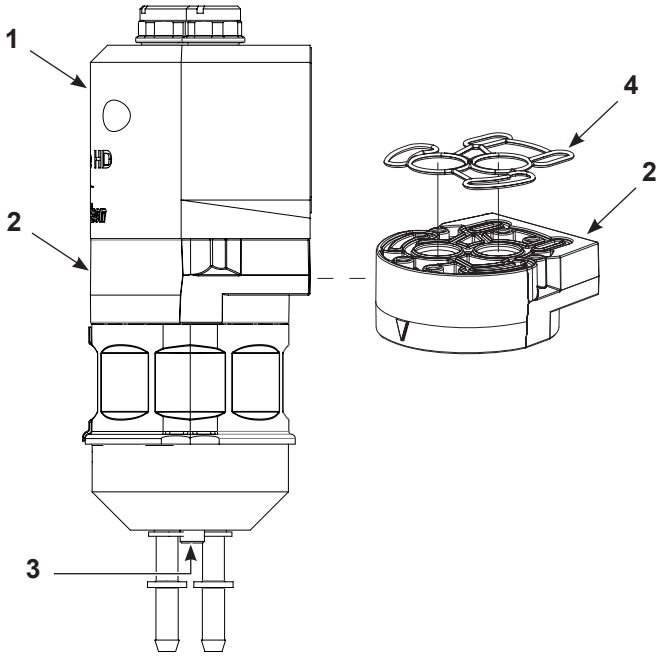


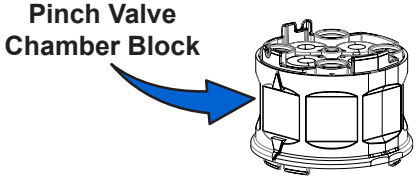
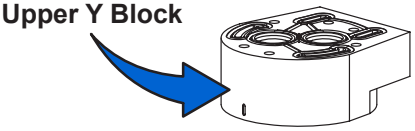
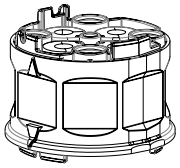
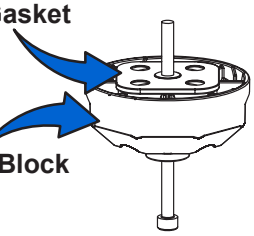
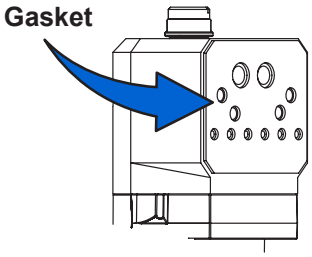
Figure 11 Pump Ground Check

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	**Pinch Valve Chamber Block** 	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 valve chamber block and filter discs using HD or XD service kit.
Every Six Months **or** **Each Time the Pump Is Disassembled**	**Upper Y Block**   **Y Block Gasket** **Lower Y Block** 	**NOTE:** 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. 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. Replace the Y block gasket. **NOTE:** Y block gasket must be replaced any time the pump is disassembled. **NOTE:** Torque screw to 25-30 in.-lb (2.8-3.4 N●m) for assembly.
	Gasket 	Inspect the gasket for damage. Replace if necessary.

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 that you may encounter. If you cannot solve the problem with the information given here, call the Nordson Finishing Customer Support Center at (800) 433-9319 or contact your local Nordson representative for help.

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. If the problem persists, replace the pump air flow control valve.
	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 valve chamber block and filter discs using the HD or XD service kit.
	Defective solenoid valve.	Replace the solenoid valve. Refer to the the applicable controller manual (per application) 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. If the problem persists, replace the pump air flow control valve.
4. Spray gun fan pattern changes	Defective pattern air flow control valve	Clean the pattern air flow control valve. If the problem persists, replace the pattern air flow control valve.

Continued...

Problem	Possible Cause	Corrective Action
5. Powder tubing too stiff	Spiral wrap too close to the spray gun.	Remove any spiral wrap that is within 24 in. of the spray gun handle.
6. Streams of powder disrupting uniform spray pattern	Pattern air setting too low.	Increase the pattern air setpoint.
	Nozzle plugged.	Remove the nozzle, disassemble, and clean.
	Input air pressure too low.	Increase the input air pressure.
	Calibration constants incorrect.	Verify that the calibration constants on the manifold match what is entered in the manual spray gun controller.
7. Powder delivery problems: Surging, fading, intermittent flow, low flow	Assist air compensation incorrect.	Increase or decrease the assist air compensation setting for the current preset.
		Set the controller to a positive number if the spray gun is surging.
		Set the controller to a negative number if the spray gun is fading.
	Fluidizing air pressure incorrect	Increase or decrease the fluidizing air pressure. The powder should be gently boiling.
	Powder damp or contaminated	Check the air driers and filter/separators. Check the powder in the feed hoppers and make sure it flows easily.
	Suction tubing too long.	Move the hoppers closer to the pump and shorten the suction tube length. The tube length must be less than 12 ft. from the powder feed.
	Suction or delivery tubing blocked or kinked.	Check the tubing. Blow out the tubing or replace it as necessary.
	Pump panel regulator pressure incorrect.	Adjust the regulators in the pump panel to the proper pressures. Refer to *Delivery Check* in *Troubleshooting* section for the proper pressure settings.
	Pump mount O-rings worn.	Replace the pump mount O-rings. Refer to your pickup tube instruction sheet or hopper manual for part numbers.
	Pickup tube not tightly threaded into pump mount.	Tighten the pickup tube into the pump mount.
	Loose connections.	Check the barbed tubing adapter for wear. Replace if damaged. Replace lower Y block. Check for air leaks between the manifold and cabinet and between the manifold and pump.
	Improper delivery tubing arrangement.	The delivery tubing must be arranged in a 3-ft. coil and be parallel to the ground.
	Delivery tubing length is not to specification.	The delivery tubing can be either 20 or 60 ft in length from the pump to the spray gun depending on type of system. Check system documentation for applicable length.
	Problem with pump or pump control manifold.	Perform *Vacuum Check* procedure in *Troubleshooting* section. (Requires 0-30 in. Hg vacuum gauge.)

Continued...

Problem	Possible Cause	Corrective Action
8. Pump is bad, requires repair (Suction Check)	Fluidizing tube blinded or plugged.	Replace the fluidizing tubes. Verify O-rings are in place. If missing, powder buildup could occur in the muffler. **NOTE:** The filter discs must be installed flush with the aluminum body. If the discs are even slightly raised, the gasket will leak, causing the pump to malfunction.
	Pinch valve leaking.	Replace the pinch valve chamber block and filter disks using the HD or XD service kit.
	Lower Y block plugged.	Remove and clean the lower Y blocks.
9. Control manifold is bad, requires repairs (Suction Check)	Pump manifold valves 2 and 5 are contaminated with powder.	Remove and inspect the valves. If they are contaminated, blow out the manifold and replace the valves. **NOTE:** If using an old harness with three positions, use the supplied adapter. If using a new harness with two positions, the supplied adapter can be discarded.
	Vacuum generator is blocked.	Remove and inspect the vacuum generator venturi nozzle. If it is blocked, blow it out or replace the vacuum generator. 1. Remove the vacuum generator at the manifold. Check for vacuum with your finger. 2. Remove the vacuum generator vent hose at the bottom of the cabinet (inside). Trigger the spray gun on. Check for exhaust and increase the powder flow. 3. Check for proper direction of the check valve.

Vacuum Check

NOTE: Procedure requires a 0-30 in. Hg vacuum gauge. See Figure 13 for reading examples.

1. Purge the pump and spray gun. Do not load a new color.
2. Set the kV output to 0. Set the powder flow to 35%.
3. Disconnect the powder tubing from the pump. Connect a vacuum gauge to the suction fitting or place your finger over the fitting as shown in Figure 12.
4. Trigger the spray gun and watch the vacuum gauge or feel for the vacuum.

- For correct vacuum readings (9-14 in. Hg) on both sides of pump (or you feel less vacuum on one side of pump than the other), proceed to Delivery Check procedure.
- For low vacuum readings (less than 8 in. Hg) on one side of pump (or you feel less vacuum on one side of pump than the other), proceed to Suction Check procedure.
- For low vacuum readings (less than 8 in. Hg) on both sides of pump (or you feel weak or no vacuum on both sides of pump cycle), proceed to Suction Check procedure.

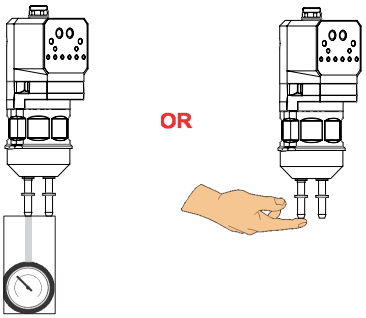


Figure 12 Vacuum Check Options

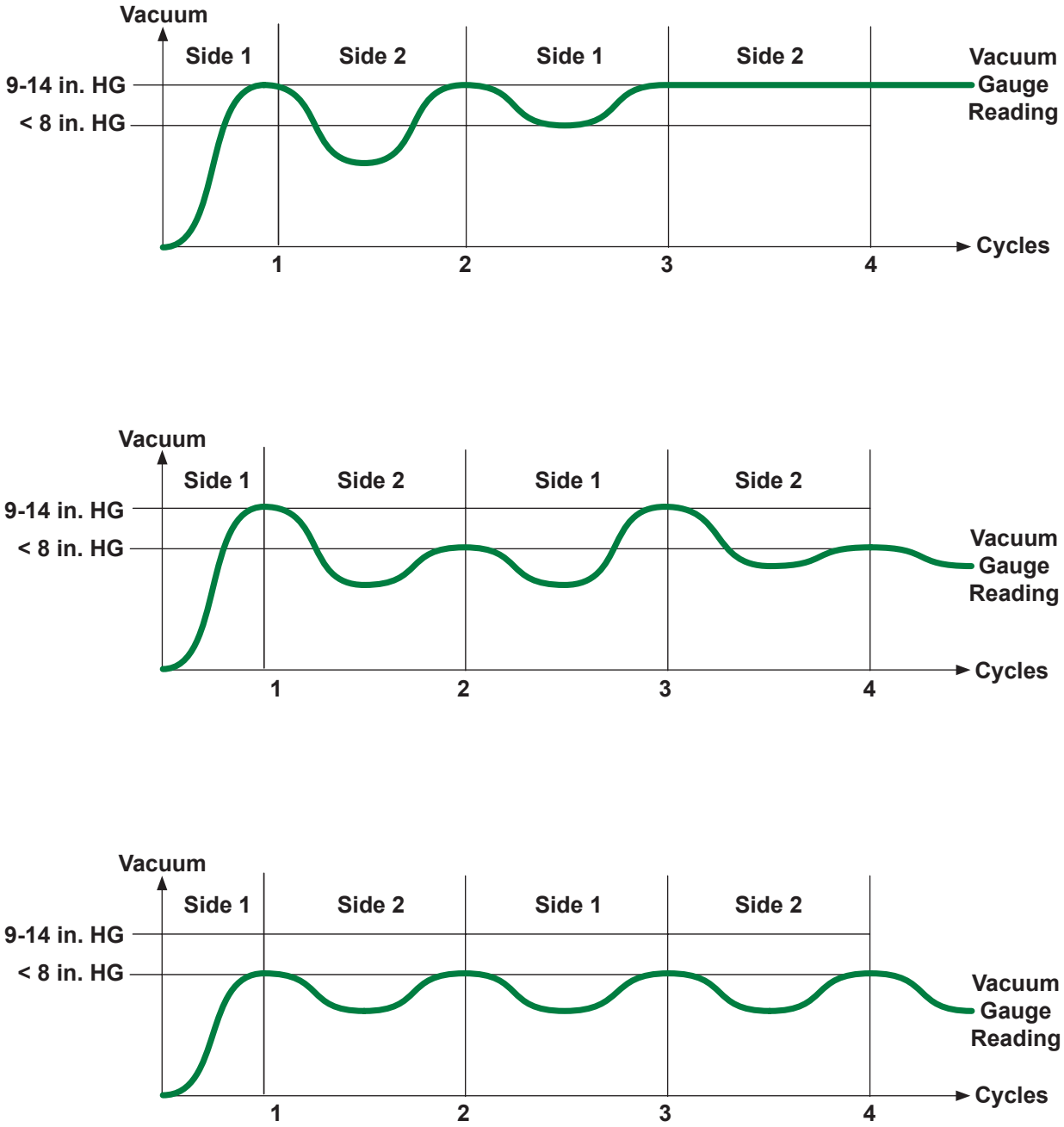


Figure 13 Vacuum Readings

Delivery Check

The problem is not in the pump or the control manifold. Check for problems in delivery tubing or suction tubing.

1. Reconnect the delivery tubing to the pump.
2. Trigger the spray gun and observe the vacuum gauge. The correct vacuum reading ranges from 9-14 in. Hg.

If the problem is in the delivery tubing or spray gun:

1. Clean or replace the delivery tubing.
2. Check the spray gun lock nut O-ring and replace it if it is missing or damaged.
3. Remove the nozzle and powder tubing adapter from the spray gun and clean or replace it.

If the problem is in the suction tubing, fittings, pickup tube, or powder:

1. Connect the suction tubing as shown in Figure 14.
2. Trigger the gun and observe the powder flow.

Suction Check

Low vacuum reading: less than 8 in. Hg in one or both sides of the pump

The problem is not in the pump or control manifold.

1. Remove the pump and replace it with a functioning pump.
2. Connect the vacuum gauge to the pump suction fitting.
3. Trigger the spray gun and observe the vacuum gauge.

- If the problem disappears, then check the suction tubing fittings and adapter O-rings. Clean the pickup tube. For Color-on-Demand® systems, proceed to procedure on page 19.
- If the problem persists, the suction tubing is blocked. Replace the suction tubing.
- If the problem disappears, the original pump was bad. See *Pump is bad, requires repair* in the *Troubleshooting* table.
- If the problem remains, the pump control manifold is bad. See *Pump is bad, requires repair* in the *Troubleshooting*.

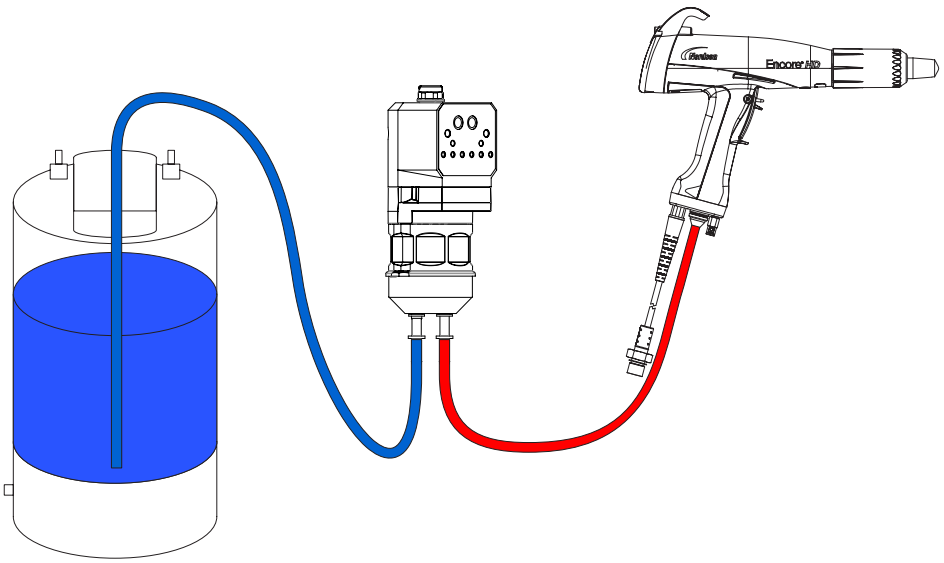


Figure 14 Tubing Connections

Repair

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

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. See Figure 15. Perform a color change to remove old powder from the pump, then relieve the system air pressure and disconnect the purge air tubing.

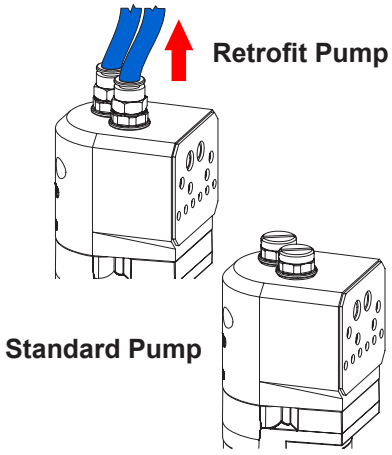


Figure 15 Removing the Purge Air Tubing

2. See Figure 16. Loosen the fluidizing tube access plug and pull the fluidizing tube straight out of the pump body.

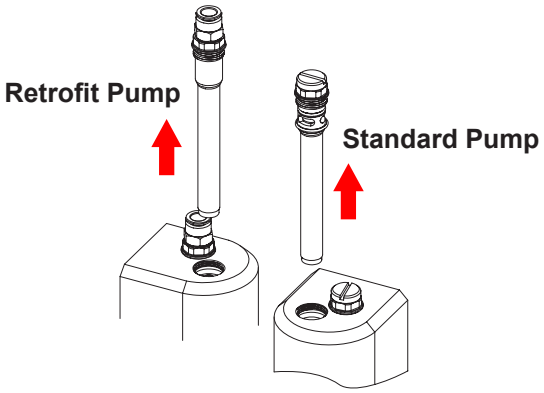


Figure 16 Loosening the Fluidizing Tubes

3. See Figure 17. Pull the old fluidizing tube off the access plug, then seat the new fluidizing tube against the red O-ring.

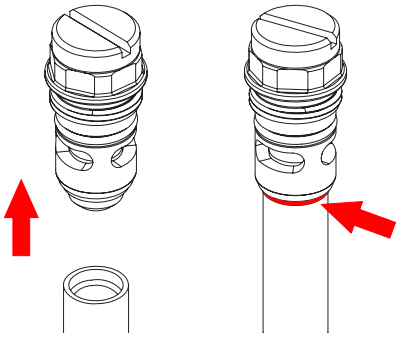


Figure 17 Removing the Tube from the Access Plugs

4. See Figure 18. Install the fluidizing tube assemblies into the pump body. Tighten the access plugs, then reconnect the purge air tubing.

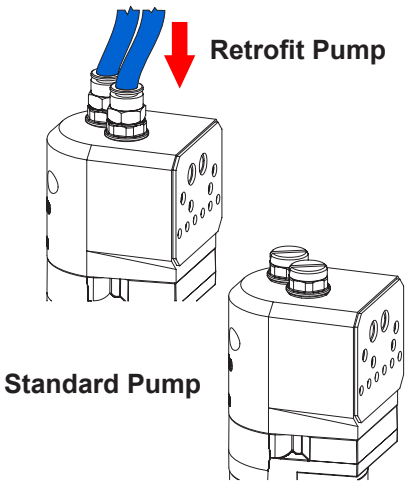


Figure 18 Reinstalling the Purge Air Tubing

Pump Disassembly

To reduce downtime, keep a spare pump in stock to replace a pump that is being repaired.

NOTE: Any time the pump is disassembled, the Y block gasket (item 19 in Figure 20) must be replaced.

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 19. Disconnect the purge air lines from the top of the retrofit pump (1) where applicable.
2. See Figure 20. Disconnect the inlet (2) and outlet powder tubing (3) from the bottom of the pump.
3. Remove the cabinet mounting hardware securing the pump to the pump panel (4) and move the pump to a clean work surface.
4. See Figure 21. 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. Refer to *Replacing Pump Gasket* in the *Repair* section if replacement is needed.

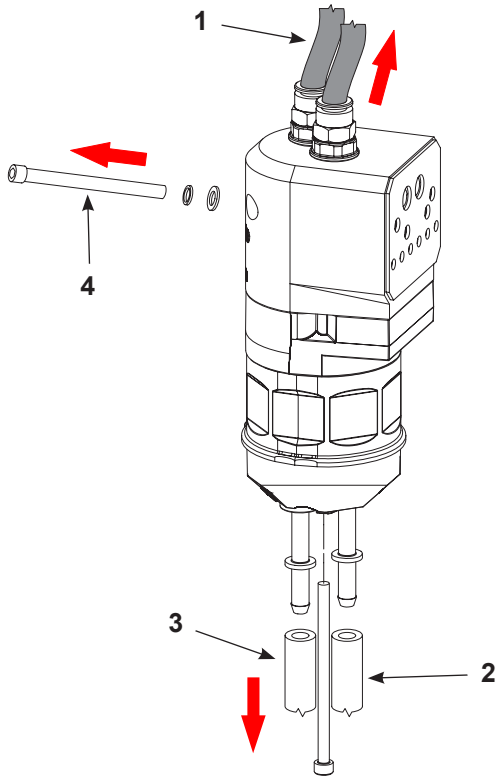


Figure 19 Retrofit Pump Disassemble Preparation

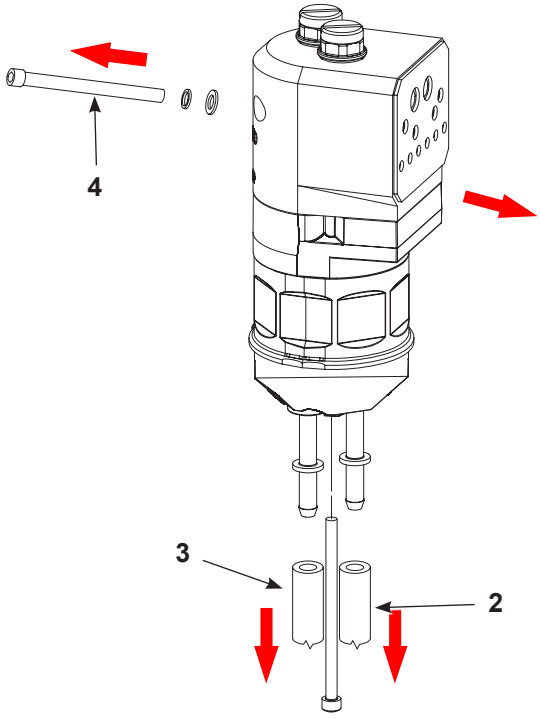


Figure 20 Standard Pump Disassemble Preparation

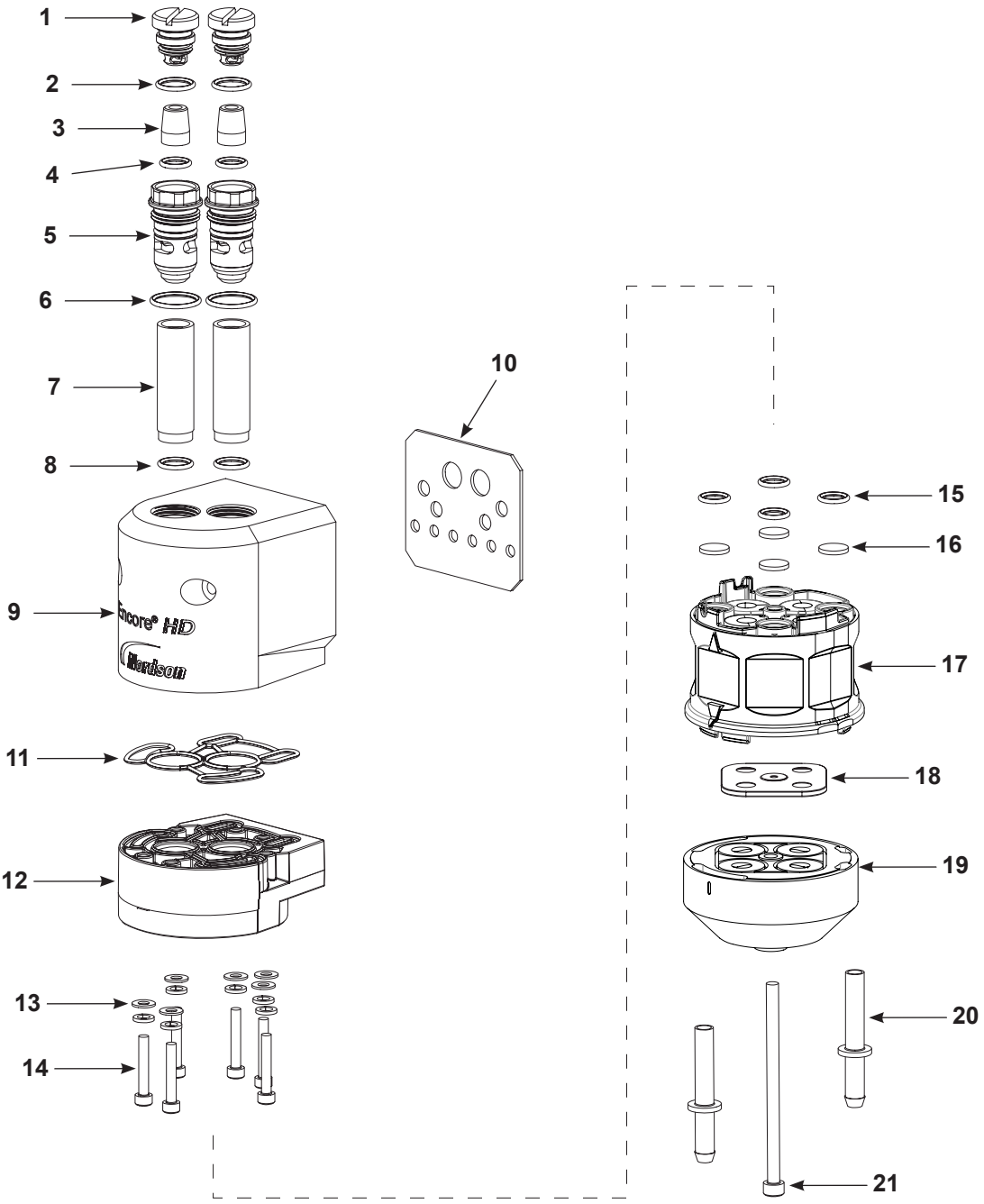


Figure 21 Pump Disassembly (Encore HD Shown)

1. Fitting caps (2)
2. O-Rings (2)
3. Check valves (2)
4. O-rings (2)
5. Access plugs (2)
6. O-rings (2)
7. Fluidizing tubes (2)
8. O-rings (2)
9. Purge manifold (1)
10. Manifold gasket (1)
11. Block seal (1)
12. Upper Y block (1)
13. Lock washers (12)
14. Screws, M4 x 25 (6)
15. O-rings (2)
16. Filter discs (4)
17. Pinch valve chamber block (1)
18. Y block gasket (1)
19. Lower Y block (1)
20. Hose barbs (2)
21. Screw, M5 x 85 (1)

Pump Assembly

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

NOTE: Any time the pump is disassembled, the Y block gasket (item 10 in Figure 23) must be replaced.

Procedure

1. See Figure 22. 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.

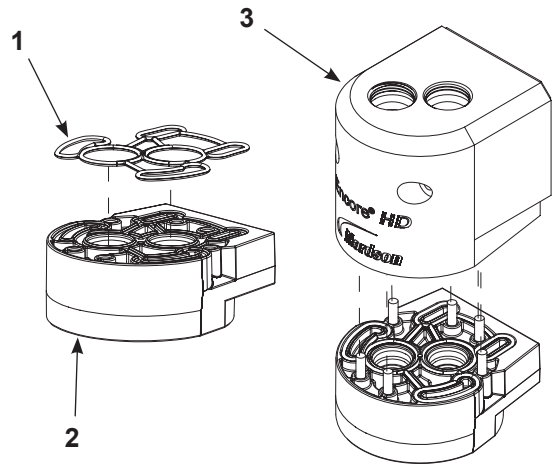


Figure 22 Assemble the Lower Y Block to Purge Manifold

2. See Figure 23. Assemble filter discs (4) and O-rings (5) into pinch valve chamber block (6).

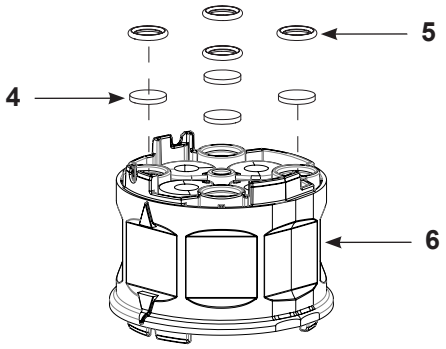


Figure 23 Assemble the Pinch Valve Housing

3. See Figure 24. Assemble gasket (8) over lower Y block (9), then thread long screw (10) through the lower y block and into the pinch valve housing, upper Y block and purge manifold. Torque screw to 25-30 in.-lb (2.8-3.4 N●m).

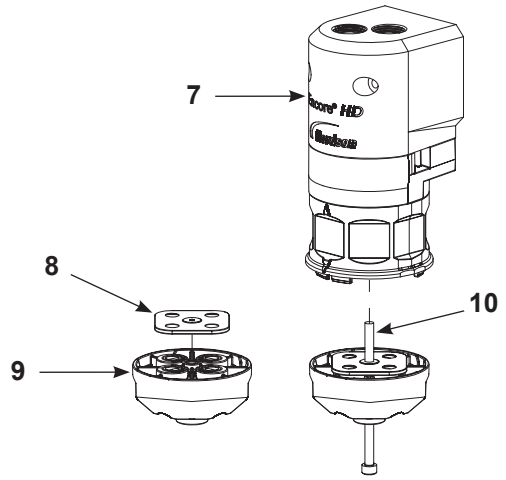


Figure 24 Assemble Gasket and Lower Y Block

4. See Figure 25. Assemble the check valves (13) O-rings (12) access plugs (14), and fitting caps (11) together before replacing the fluidizing tubes (16). Then, once that is complete, assemble the complete access plugs (15) and additional O-rings onto the fluidizing tubes (16).

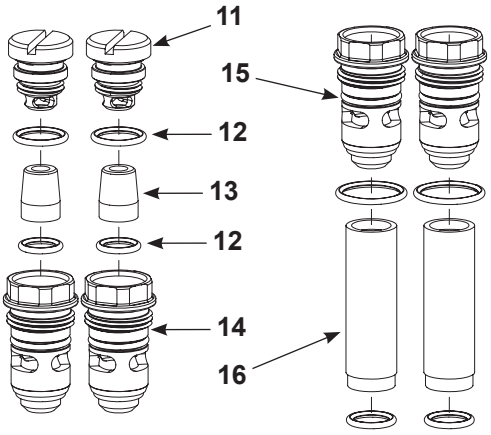


Figure 25 Assemble Fittings to Fluidizing Tubes

5. See Figure 26. Insert the assembled fluidizing tube (17) into the top of the purge manifold (18). Snug fit tubes to manifold.

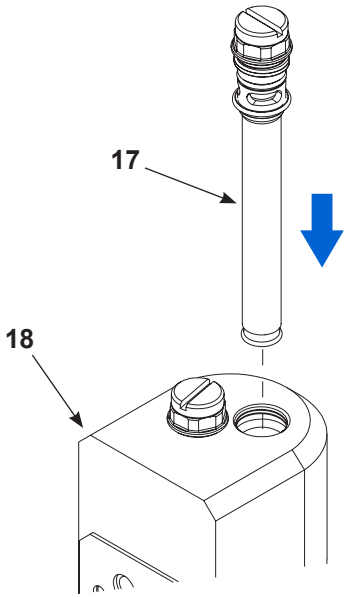


Figure 26 Fasten Fluidizing Tubes into Manifold

6. See Figure 24. After the pump is assembled, completely tighten the long screw (10) to fit all components together completely.
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 10 for more information.

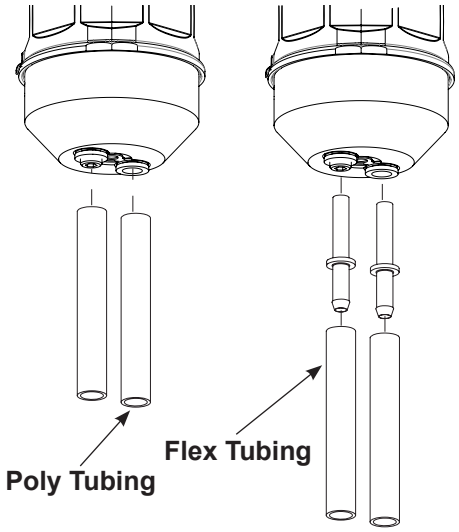


Figure 27 Assemble Tubing into Lower Y Block

Replacing Pump Gasket

1. See Figure 28. Remove pump gasket from the pump.
2. Using an industrial citrus based adhesive remover and plastic scraper, remove any residual adhesive left from old gasket from the pump. Clean any debris from port holes.
3. Remove the sticker backing from the new gasket and place on the pump, aligning the holes of the gasket with the port holes on the pump.

CAUTION: Ensure gasket is not covering any of the port holes on pump. A second gasket is provided with pumps as an additional spare.

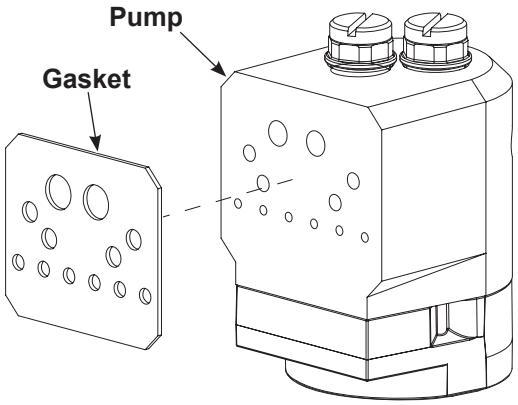


Figure 28 Replacing Pump Gasket

Parts

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

See Figure 29 and the following parts lists.

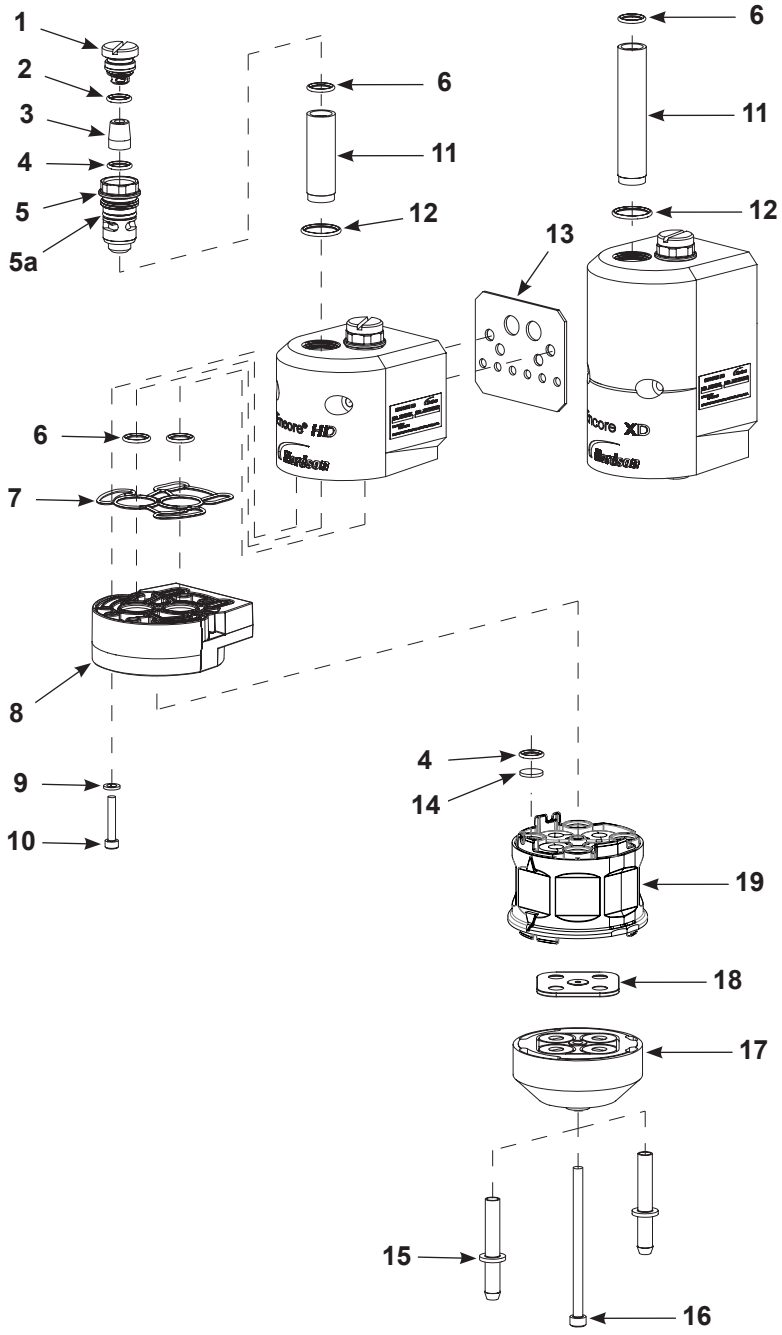


Figure 29 Encore HD and XD Standard Parts (shown with manual system pumps)

Pump for Manual Systems

Part	Description	Quantity	Note
1605940	PUMP ASSEMBLY, Encore HD	—	
1611247	PUMP ASSEMBLY, Encore XD	—	

Pump for Automatic Systems

Part	Description	Quantity	Note
1612248	PUMP, Encore HD retrofit assembly		
1612250	PUMP, Encore XD retrofit assembly		

Kits for Both Manual and Automatic System Pumps

See Figure 29 and the following parts list.

Pump Service Kits

Item	Description	Quantity	Note
1625730 - KIT, service, HD pump		—	
1625731 - KIT, service, XD pump		—	
4	• O-RING, -012, 0.375 x 0.500 x 0.063 in., silicone, 70 Duro	4	
6	• O-RING, -013, 0.437 x 0.562 x 0.063 in., silicone, 70 Duro	4	
11	• Fluidizing tube	2	
12	• O-RING, -017, 0.688 x 0.813 x 0.062 in., silicone, 70 Duro	2	
14	• DISC, filter, pump	4	
18	• GASKET, conductive, lower Y block	1	A
19	• BLOCK, pinch valve chamber	1	B

NOTE: A. Must be replaced any time pump is disassembled.

B. Pinch valves come preassembled in chamber block.

Fluidizing Tube Kits

See Figure 29 and the following parts list.

Item	Description	Quantity	Note
1057258 - KIT, HDLV pump fluid tube, 4 pack, HD pump		—	
1093557 - KIT, hi-flow fluid tube, HDLV pump, 4 pack, XD pump		—	
6	• O-RING, -013, 0.437 x 0.562 x 0.063 in., silicone, 70 Duro	8	
11	• Fluidizing tube	4	

Kits for Both Manual and Automatic System Pumps continued

Gaskets

Item	Part	Description	Quantity	Note
7	1625736	KIT, conductive gasket, upper Y-block, 4 pack, HD/XD pump	4 pack	
13	1625735	KIT, manifold gasket, 8 pack, HD/XD pump	8 pack	
18	1625734	KIT, conductive lower gasket, 4 pack, HD/XD pump	4 pack	

Miscellaneous Parts

Item	Part	Description	Quantity	Note
9	UA	WASHER, lock, split M4, zinc plated steel, DIN 7980	1	
10	UA	SCREW, socket cap M4 x 25, zinc plated steel, DIN 912	1	
15	1078006	ADAPTER, tube, barb, powder	1	
16	1619013	SCREW, socket M5, shoulder, stainless steel, HD pump	1	A
	1620035	SCREW, socket, M5, shoulder, blue, stainless steel, XD pump	1	A
17	1626212	BLOCK, lower Y assembly, pump, Encore HD Tivar	1	A

NOTE: A. If removing screw, replace lower conductive gasket (18).

UA: Unavailable for purchase through Nordson. Contact local distributor or local source.

Kits for Manual System Pumps

See Figure 29 and the following parts list.

Cap and Plug Kit

Item	Description	Quantity	Note
1625732 - KIT, cap and plug, HD/XD pump		—	
1	• PLUG, fluid	2	
2	• O-RING, -014, 0.500 x 0.625 x 0.063 in., silicone, 70 Duro	2	
4	• O-RING, -012, 0.375 x 0.500 x 0.063 in., silicone, 70 Duro	2	
5	• PLUG, fluid access	2	
5a	• O-RING, -015, 0.563 x 0.688 x 0.063 in., silicone, 70 Duro	2	
6	• O-RING, -013, 0.437 x 0.562 x 0.063 in., silicone, 70 Duro	2	

Check Valve Kit

Item	Description	Quantity	Note
1625733 - KIT, check valve, HD/XD pump		—	
3	• VALVE ASSEMBLY, check, Encore HD	2	
4	• O-RING, -012, 0.375 x 0.500 x 0.063 in., silicone, 70 Duro	2	

Kits for Automatic System Pumps

Fluid Tube and Plug Kit

See Figure 30 and the following parts list.

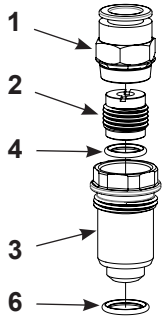


Figure 30 Retrofit Fluid Tube and Plug Kit

Item	Description	Quantity	Note
1610812 - PLUG, retrofit, fluid tube, Encore HD		—	
1	• CONNECTOR, 10 mm T x 3/8 uni	1	
2	• CHECK VALVE ASSEMBLY, pump	1	
3	• PLUG, retro, fluid tube access, Encore HD	1	
4	• O-RING, -012, 0.375 x 0.500 x 0.063 in., silicone, 70 Duro	1	
6	• O-RING, -013, 0.437 x 0.562 x 0.063 in., silicone, 70 Duro	1	
1078161 - KIT, service, check valve, pump Prodigy		—	
2	• CHECK VAVLE ASSEMBLY, pump, Prodigy	2	

Manifold Kit

See Figure 31 and the following parts list.

Item	Description	Quantity	Note
1616440 - KIT, Encore to Prodigy manifold		—	
1	• ADAPTER, Encore, HD pump to Prodigy manifold	1	
2	• GASKET, adapter, Encore HD pump to Prodigy	1	
1625737 - KIT, adapter gasket, 8 pack, HD/XD pump		—	
2	• GASKET, adapter, Encore HD pump to Prodigy	8	

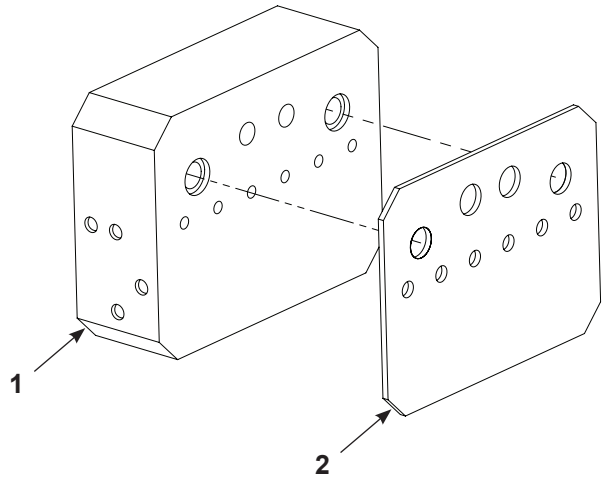


Figure 31 Manifold Kit

Kits for Automatic System Pumps continued

Grounding Kits

See Figure 32 and the following parts list.

Item	Description	Quantity	Note
1621252 - KIT, ground, pump controller, Encore HD		—	
1	• JUMPER, ground, 72 in.	4	
2	• LUG, ground, dual tap	1	
3	• SCREW, socket set, 1/4-20 x 0.50, flat zinc	2	
4	• NUT, hex, M5, brass	1	
5	• WASHER, lock, M, split, M5, steel, zinc	9	
6	• WASHER, flat, M5, brass	9	
7	• TAG, ground	1	
8	• SCREW, pan, slot, M5 x 16, brass	8	
9	• FITTING, barb, 8 mm, anitstatic hose, stainless steel	8	
10	• GROUND BLOCK, right, hose, pump, Encore	8	
11	• GROUND BLOCK, left, hose, pump, Encore	8	
1620013 - KIT GROUND PUMP, Encore, antistatic tubing		—	
9	• FITTING, barb, 8 mm, anitstatic hose, stainless steel	1	
11	• GROUND BLOCK, left, hose, pump, Encore	1	
1	• JUMPER, ground, 72 in.	1	
6	• WASHER, flat, M5, brass	1	
5	• WASHER, lock, M, split, M5, steel, zinc	1	
8	• SCREW, pan, slot, M5 x 16, brass	1	
10	• GROUND BLOCK, right, hose, pump, Encore	1	

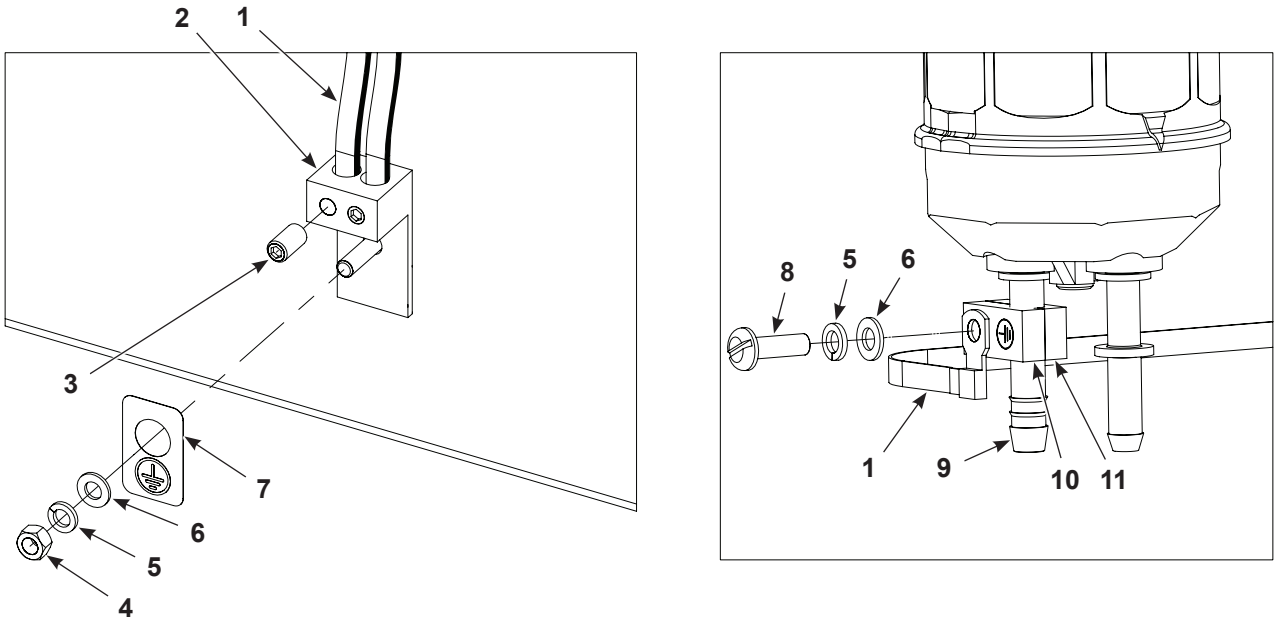


Figure 32 Grounding Kits

Air and Powder Tubing Part Numbers

See Figure 33 and the following parts list..

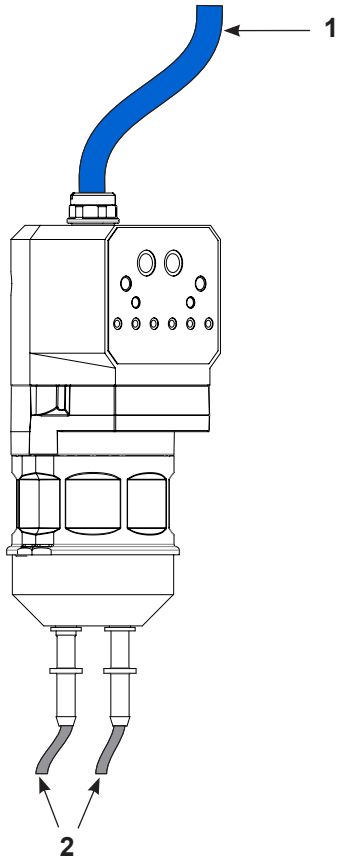


Figure 33 Air and Powder Tubing Part Numbers

Item	Part	Description	Note
1	900740	6.5 mm x 10 mm OD, blue polyurethane	D
2	1613849	6 mm ID x 8 mm OD, polyolefin, 40 m	A
2	1613850	6 mm ID x 8 mm OD, polyolefin, 160 m	A
2	1615026	6 mm ID x 8 mm OD, polyurethane 60 ft	B
2	1606695	6 mm ID x 8 mm OD, polyurethane 500 ft	B
2	173101	6 mm ID x 8 mm OD, natural, polyethylene	B, E
2	1620002	TUBING, powder, antistatic, 5.6 x 8.2 mm 160 m roll	C
2	7035356	TUBING, powder, antistatic, 5.6 x 8.2 mm 23 m roll	C

NOTE: A. Barbed fitting required.

B. Optional powder hose to use in place of the standard polyolefin.

C. Encore HD antistatic tubing for eliminating turbo-charging. Must be used with Encore pump grounding kits 1620013 and 1621252.

D. For purge air.

E. For suction line.

EU DECLARATION of Conformity

Product: Encore HD High Density Powder Pump

Models: Encore HD, Encore HD+, Encore XD Pump

Description: These pumps allow for low velocity air / high density powder and are used to deliver powder coating material to the applicator. These pumps are labeled for use in a Zone 22 area. The Encore HD is the standard Model. The Encore HD+ has higher flow then the standard. The Encore XD is for high abrasive powders and powder which have tendency to impact fuse.

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 #2813, Sira CSA Group, Netherlands B.V.
DNV ISO9001
ATEX Quality Notification – Baseefa Fimko Oy, Helsinki Finland

Date: 16March2021

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

UK DECLARATION of Conformity

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

Product: Encore HD High Density Powder Pump

Models: Encore HD, Encore HD+, Encore XD Pump

Description: These pumps allow for low velocity air / high density powder and are used to deliver powder coating material to the applicator. These pumps are labeled for use in a Zone 22 area. The Encore HD is the standard Model. The Encore HD+ has higher flow then the standard. The Encore XD is for high abrasive powders and powder which have tendency to impact fuse.

Applicable UK Regulations:
Supply Machinery Safety 2008
Equipment & Protective Systems Intended for use in Potentially Explosive Atmosphere Regulation 2016

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

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DNV ISO9001
- SGS Baseefa NB 1180 (Buxton, Derbyshire, UK)

Date: 08FEB22

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