Prodigy® Generation II High-Capacity HDLV® Powder Transfer Pump

Customer Product Manual
Part 1092[illegible]-09
Issued 7/24

For parts and technical support, call the Finishing Customer Support Center at (800) 433-9319.

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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.

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Change Record

Revision	Date	Change
A02	7/09	Removed 1034396 muffler and replaced with 1097195 muffler. Added 170269 mufflers to miniature valve. Changed all illustrations that mufflers appear in.
A03	8/09	Added pinch valve kit 1097919 and cleaning instructions
A04	10/10	Added fluidizing tube kit 1104542 for powders with high proportions of fines.
05	9/17	Removed Kit 1092272, Other miscellaneous nomenclature and part number changes.
08	4/18	Added grounded tubing adapter, new tip valve, updated fluidizing tubes kit part number, and caution regarding factory set

Prodigy Generation II High-Capacity HDLV Pump

Safety

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

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

Qualified Personnel

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

Intended Use

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

Some examples of unintended use of equipment include

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

Regulations and Approvals

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

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

Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing any moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.

- Obtain and read Material Safety Data Sheets (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.

- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Provide adequate ventilation to prevent dangerous concentrations of volatile materials or vapors. Refer to local codes or your material SDS for guidance.
- Do not disconnect live electrical circuits while working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.
- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut the spray system and exhaust fans.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for information and advice.

Grounding

WARNING: Operating faulty grounding 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 2, 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 ground electrostatic equipment.
- Operators must maintain skin-to-handle contact between the hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If gloves must be worn, cut away the palm or fingers, wear electrically conductive gloves, or wear a grounding strap connected to the gun handle or other true earth ground.
- Shut off electrostatic power supplies and ground gun electrodes before making adjustments or cleaning powder spray guns.
- Connect all disconnected equipment, ground cables, and wires after servicing equipment.

Action in the Event of a Malfunction

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

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

Disposal

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

Description

The Prodigy High-Capacity HDLV (High-Density powder, Low-Volume air) powder pump transports large amounts of powder from one location to another.

The pump design and the small diameter suction and delivery tubing used with the pump allow it to be purged quickly and thoroughly.

The pump is more efficient than traditional venturi-style pumps in that very little of the air that is used to operate the pump is mixed into the powder stream. Only the air that is used to move the powder out of the pump and into the delivery tubing enters the powder stream.

NOTE: Available with grounded tubing connections.

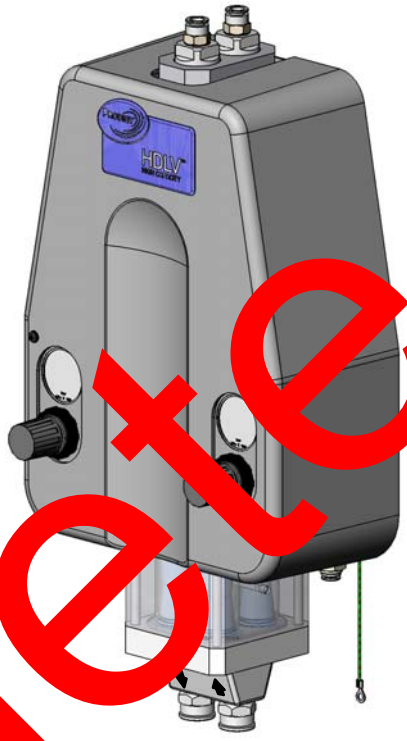


Figure 1 Prodigy High-Capacity HDLV Pump

High-Capacity HDLV Pump Components

See Figure 2.

Item	Description	Function
Air Control Components		
1	Fluidizing Tube Control Valve	Cycles to alternate positive and negative air pressure to the fluidizing tubes.
2	Pinch Valve Control Valve	Cycles to switch the pinch pressure between the pinch valves in each pump halves.
3	Conveying Air Regulator and Gauge	Regulates the positive and negative air pressure applied to the fluidizing tubes. Typically set to 0.7–1 bar (10–15 psi).
4	Exhaust Muffler	Allows the pump's operating air to silently exit the pump.
5	Input Air Fitting	Connects the high-capacity HDLV pump to a 8 bar (70 psi) air source.
6	Pinch Pressure Regulator and Gauge	Regulates the air pressure being applied to the pinch valves. Typically set to 2 bar (35 psi).
7	Vacuum Generator	Works on the venturi principle to generate the negative air pressure required to draw powder in the fluidizing tubes.
8	Timing Valve	Controls the fluidizing air control valve and pinch valve control valve operating sequences.
Pump Assembly Components		
9	Purge Air Fittings	Send air pressure through the pump assembly during the purge process.
10	Fluidizing Tubes	Porous cylinders that alternately draw powder in when a vacuum is applied to their exterior, and force powder out when air pressure is applied to their exterior. The tubes act as a filter to prevent powder from passing through and contaminating the control valves and air tubing.
11	Powder Delivery Tube Fitting	16-mm OD polyethylene tube fitting to the powder destination.
12	Powder Suction Tube Fitting	16-mm OD polyethylene tubing from the powder source.
13A	Lower Y-Block	Provides a powder path from the suction and delivery fittings to the pinch valves on both halves of the pump.
13B	Lower Y-Block with grounded tubing barbed fittings	Provides a powder path from the suction and delivery fittings to the pinch valves on both halves of the pump, with grounded tubing barbed fittings.
14	Pinch Valves	Open and close to allow powder to be drawn in or forced out of the fluidizing tubes.
	Upper Y-Manifold	Interface between the pinch valves and the porous tubes; consists of two Y-shaped passages that join the pinch valves to the fluidizing tubes.

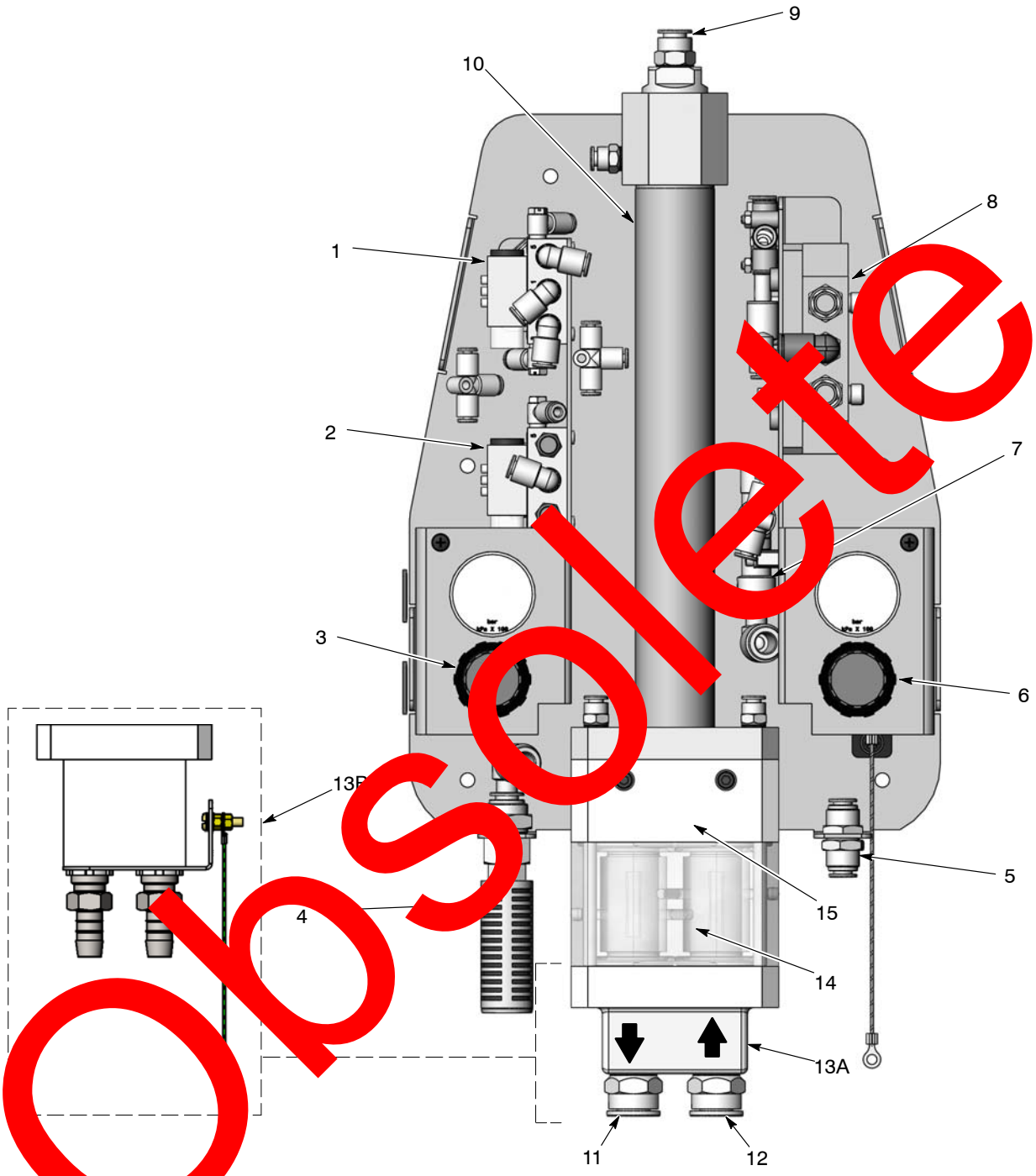


Figure 2 ponents (shown with cover removed)

Theory of Operation

Pumping

See Figure 3. The Prodigy high-capacity HDLV pump consists of two halves that function identically. The halves alternately draw powder in and force powder out of the pump; while one half is drawing powder in, the other half is forcing powder out.

Front Half in Suction Phase
The front suction pinch valve is open, and the front delivery pinch valve is closed. A vacuum is applied to the front fluidizing tube, which draws powder through the suction tubing, inlet fitting, inlet lower Y-block, front suction pinch valve, and into the front fluidizing tube. After a set period of time, the vacuum is shut off and the front suction pinch valve closes.

Rear Half in Delivery Phase
The rear suction pinch valve is closed, and the rear delivery pinch valve is open. [illegible]ure is applied to the rear fluidizing tub[illegible]forcing powder out of the fluidizing tub[illegible]and th[illegible]gh t[illegible]e rear delivery pinch [illegible]alve, lowe[illegible]-blo[illegible], deliv[illegible] fitting, and delivery [illegible]o the[illegible]der destination.

Next each halves [illegible]itches to [illegible]alternate phase. The front half [illegible]w for[illegible]out the[illegible]er in the fluidizing tub[illegible] while t[illegible]rear half draws powder in.

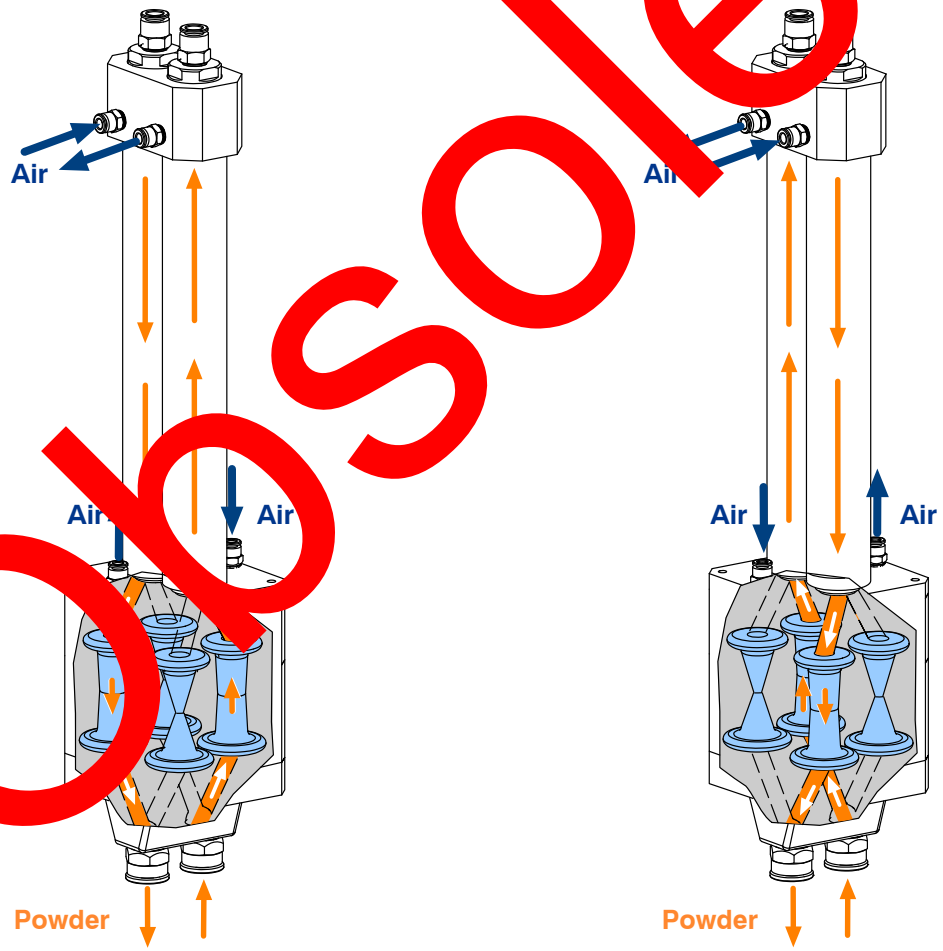


Figure 3 Theory of Operation — Pumping

Purging

NOTE: The pump purge process is dependent on how the pump is integrated into a powder coating system.

See Figure 4. The pump must be operating while it is purged. During the purge, line air pressure flows through the fluidizing tubes, the pinch valves, and out the suction and delivery lines.

If the purge air is supplied from a feed center or bulk delivery system it is typically pulsed. The pulses are typically 250 milliseconds on and 250 milliseconds off.

If the purge is manually initiated by pressing the purge button on a manual pump station, the purge air is not pulsed. The purge button should be pressed repeatedly to supply air in pulses.

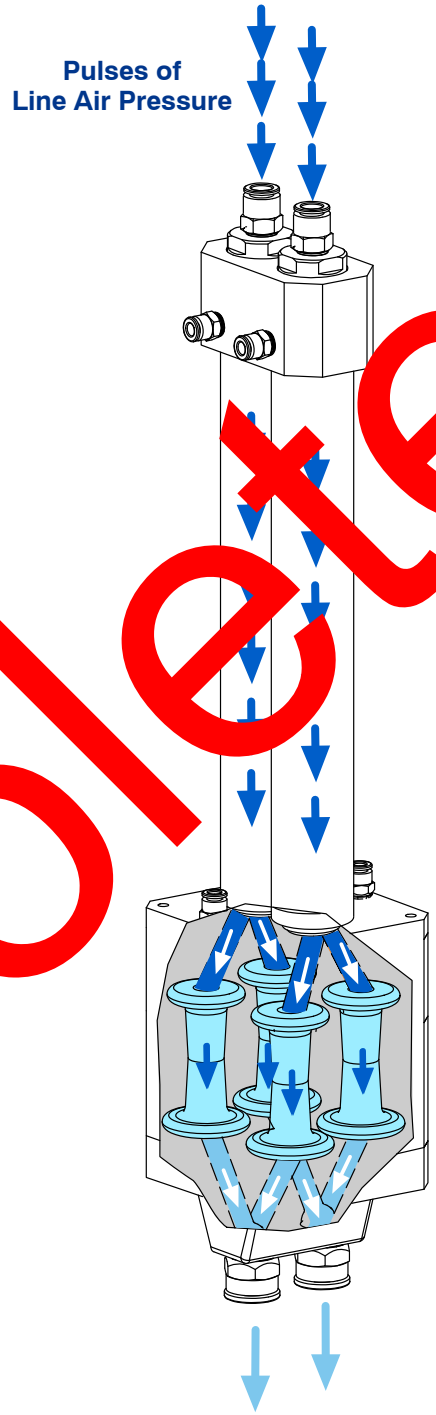


Figure 4 Theory of Operation — Purging

Specifications

Output (Maximum)	4 kg (9 lb) per minute
Input Air	4.8 bar (70 psi)
Purge Air	Line Air Pressure (7 bar (100 psi) maximum)
Operating Air Pressures	
Pinch Valves	2.4–2.75 bar (35–40 psi)
Conveying Air	0.7–1.0 bar (10–15 psi)
Air Consumption	
Conveying Air	28–56 l/min (1–2 cfm)
Total Consumption	198–255 l/min (7–9 cfm)
Tubing Size	
Air Input	8-mm OD polyurethane
Powder Suction	16-mm OD polyethylene, 3 m (12-ft) max
Powder Delivery	16-mm OD polyethylene, 30.5 (100-ft) long max **NOTE:** For b results ep the der suction and delivery ing as ort s possible.
Dimensions	Se igure 5

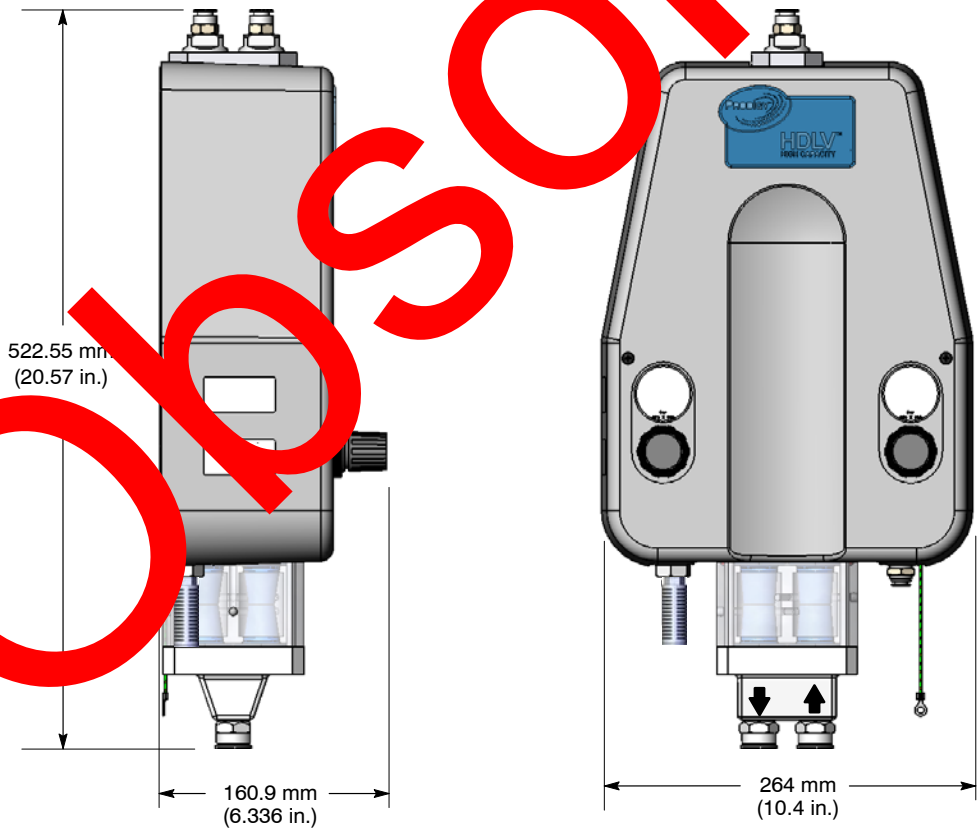
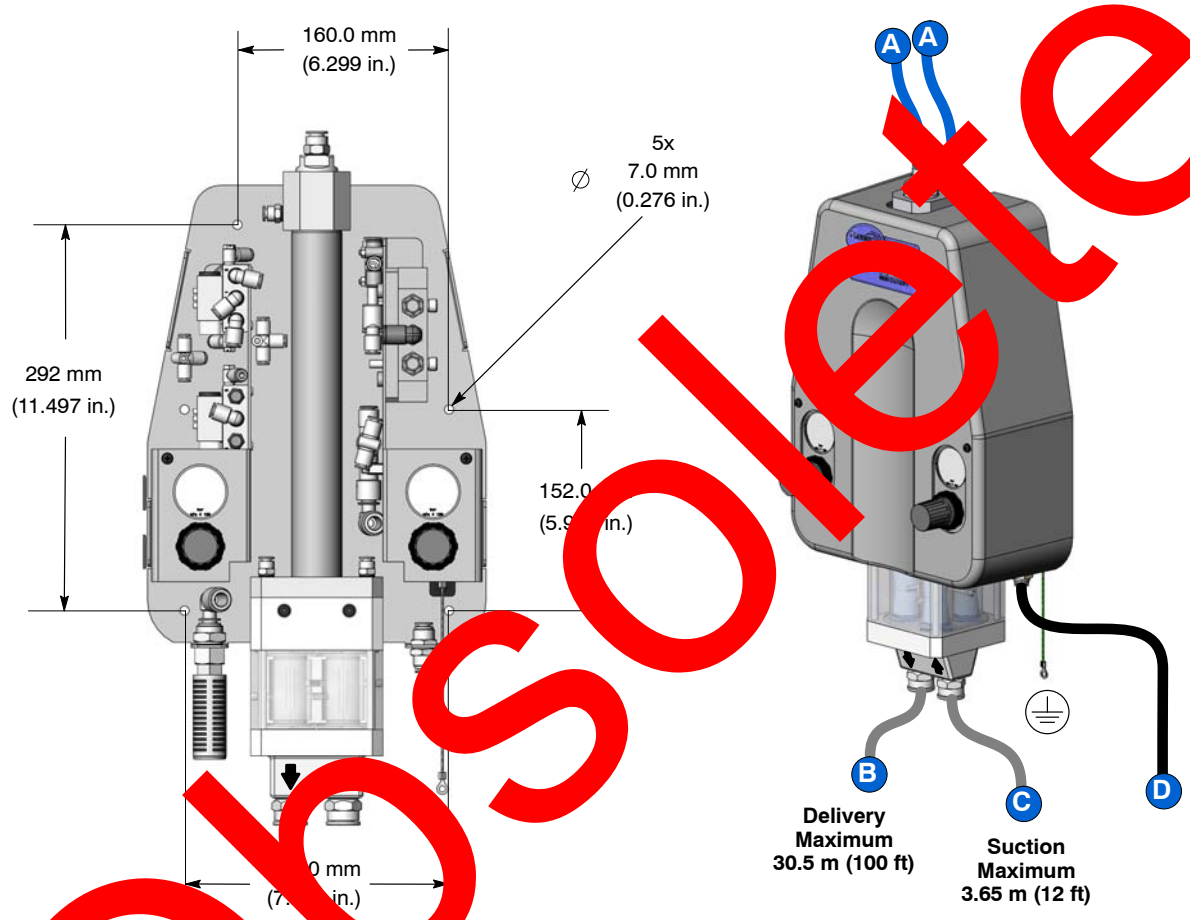


Figure 5 Pump Dimensions

Installation

WARNING: The pump must be securely connected to a true earth ground. Failure to ground the pump could result in a fire or explosion.

NOTE: The pump is normally mounted on a panel that includes an operating air regulator, and a manual pushbutton and piloted-operated air valve for manual purging. The panel may also include an auxiliary regulator for fluidizing the powder source.



Panel M nting D mensions

e the supplied M6 screv ashers, and nuts to mount the pump.

NO : Five mounting holes four sets of M6 fasteners are included.
U he four mounting hole at best match your mounting surface.

Tubing Connections

NOTE: For best results, keep the powder suction and delivery tubing as short as possible.

CONN ON	TYP	FUNCTION
A	mm blue polyurethane tubing	From customer-supplied purge air source (7 bar (100 psi) max)
B	16 mm clear polyethylene tubing	Delivery: to powder destination
C	16 mm clear polyethylene tubing	Suction: from powder source
D	8 mm black polyurethane tubing	From input air source 4.8 bar (70 psi)
⏚	Pump ground wire	To earth ground

Figure 6 Pump Installation

Pickup Tube Adapter Assembly

The pickup tube adapter assembly easily adapts 16-mm suction tubing to a standard pump pickup tube.

NOTE: Pickup tube adapter assemblies are available for pickup tubes with or without an external O-ring. Figure 7 shows a pickup tube with an external O-ring.

1. See Figure 7. Cut the end of the suction tubing (1) square with a tubing cutter.
2. Insert approximately 2 inches of the suction tubing through the retaining nut (2).
3. Install the O-ring (3) onto the suction tubing.
4. Insert the suction tubing into the pump adapter (4) until it bottoms out.
5. Slide the O-ring down the suction tubing until it bottoms out against the pump adapter.
6. Tighten the retaining nut onto the pump adapter.
7. Install the adapter assembly onto the pickup tube (5) using a twisting motion.

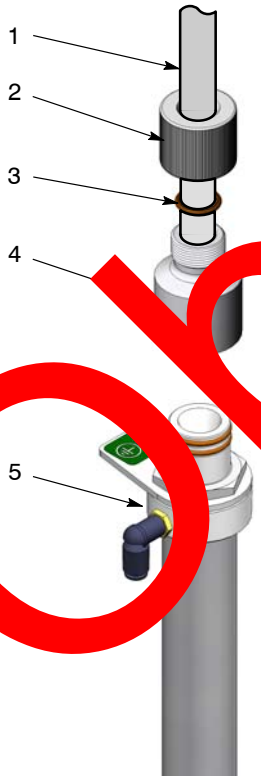


Figure 7 Pickup Tube Adapter Assembly

Operation

See Figure 8. After making the initial pump assist and pinch air pressure settings, you should not have to adjust them again.

- To start the pump, turn on the operating air supply. Regulate the air pressure to 4.8-bar (70-psi).
- To stop the pump, turn off the op air supply.

Operating the pump t the recom end 4.8-b (70-psi) pressure pro an ap mately 500-millisecond cycle r

CA ION: not adj ling valve se ence f factory setting, which are s or o nal p der output.

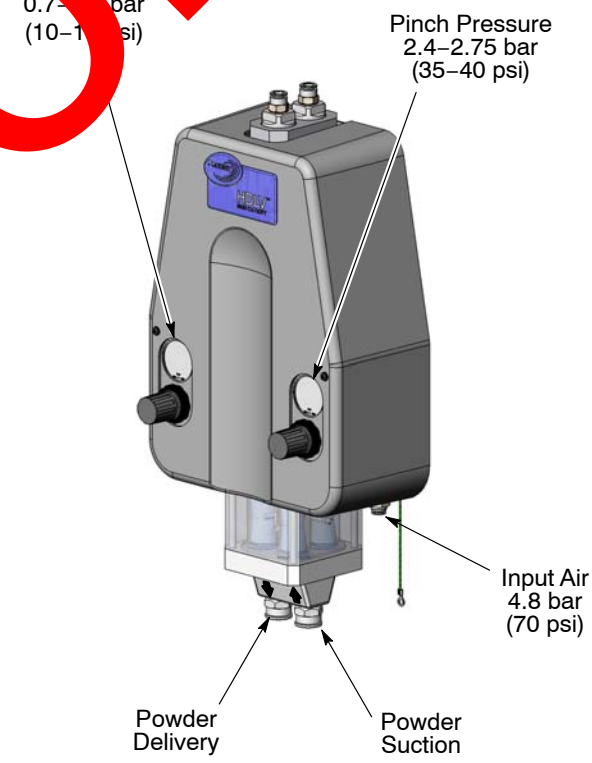


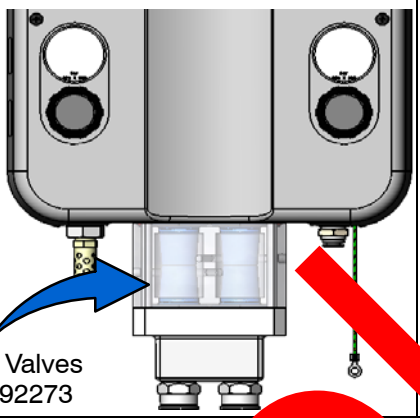
Figure 8 Pump Operation

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	 Pinch Valves Kit 1092273	Inspect the pinch valve body for signs of powder leakage. If you see powder in the pinch valve body or stress cracks in the pinch valves, replace the pinch valves.
Every Six Months or Each Time You Disassemble the Pump	 Upper Y-Manifold Kit 1053972 Lower Y-Block Part 1053976 Lower Y-Block with barbed fitting Part 1610762	Disassemble the pump assembly and inspect the lower Y-block and upper Y-manifold for signs of wear or impact fusion. Clean these parts in an ultrasonic cleaner if necessary. **NOTE:** To reduce downtime, keep a spare upper Y-manifold and lower Y-block in stock to install while you are cleaning the other set.

Troubleshooting

Problem	Possible Cause	Corrective Action
1. **Reduced powder output (pinch valves are opening and closing)**	Blockage in the powder tubing to the destination	Check the tubing for blockages. Purge the pump.
	Conveying air is set too high	Decrease the conveying air pressure.
	Conveying air is set too low	Increase the conveying air pressure.
	Defective pinch valve	Replace the pinch valves.
	Fluidizing tubes clogged	Replace the fluidizing tubes.
	Conveying air solenoid valve not actuating	Refer to the *Tubing Diagrams* on pages 20 and and 21. Turn off the pump and disconnect tubes J and from the top of the pump. Turn the pump on and check the tubes for alternating positive and negative air pressure. If there is no pressure, replace the valve. If the valve is actuating, but you cannot feel positive or negative air pressure at the tubes, check for obstructions in the air lines leading in and out of the valve.
	Timing valve not actuating	Replace the timing valve.
2. **Reduced powder output (pinch valves are not opening and closing)**	Defective pinch valve	Replace the pinch valves.
	Defective check valve	Replace the check valves.
	Pinch pressure solenoid valve not actuating	Refer to the *Tubing Diagrams* on pages 20 and and 21. Turn off the pump and disconnect tubes H and G from the pump. Turn the pump on and check the tubes for alternating positive air pressure. If there is no pressure, replace the valve. If the valve is actuating, but you cannot feel air pressure at the tubes, check for obstructions in the air lines leading in and out of the valve.
	Timing valve not actuating	Replace the timing valve.
3. **Reduced powder output (loss of suction from powder source)**	Blockage in the powder tubing from the feed source	Check the tubing for blockages. Purge the pump.
	Loss of vacuum at the vacuum generator	Check the vacuum generator for contamination. Check the exhaust muffler. If the exhaust muffler appears to be plugged, replace it.
	Damaged O-rings in powder path	Check all powder path O-rings. Replace any worn or damaged O-rings.
4. **Pinch valves failing rapidly, cracking around the flange**	Powder is tribo-charging in the pump and grounding through the pinch valves	Replace the standard blue pinch valves with black non-conductive pinch valves. Refer to *Parts* for the non-conductive pinch valve kit.

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 and relieve system air pressure before performing the following tasks. Failure to relieve air pressure may result in personal injury.

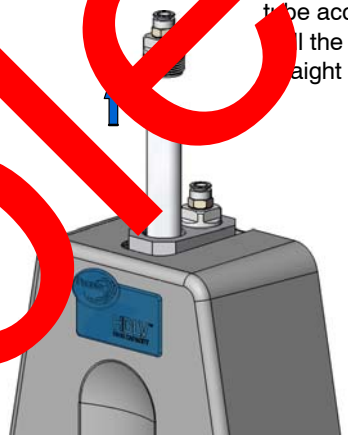
Fluidizing Tube Replacement

NOTE: Four O-rings are included in the fluidizing tube kit. Replace the O-rings [illegible]ey are [illegible]. It is n[illegible] necessary to replace the O-rings each time you replace the fluidizing tubes.

1

Shut off and relieve purge air pressure.
Disconnect the purge air tubing.

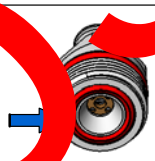
2



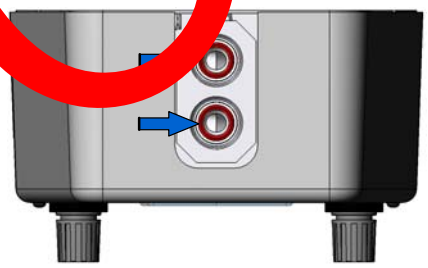
Remov[illegible] fluidizing t[illegible]e access plugs [illegible] the fluidizing tubes [illegible]aight out of the pump.

3

Check the O-rings [illegible]e inside diam[illegible] of the acc[illegible] plugs. [illegible] if nec[illegible]ary.

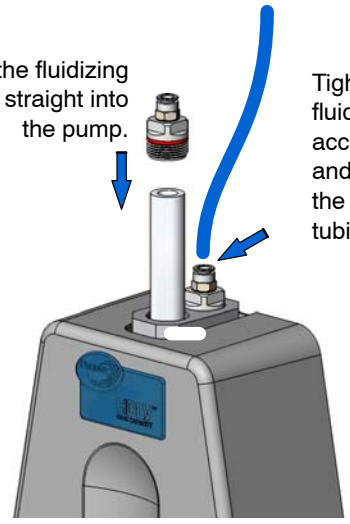


Lo[illegible] down into the pum[illegible] make s[illegible]e the O-rings a[illegible] eated in the upper-Y [illegible]anifold. If they are not se[illegible]d, use the fluidizing t[illegible]es to seat them.



4

Insert the fluidizing tubes straight into the pump.



Tighten the fluidizing tube access plugs and connect the purge air tubing.

Pump Disassembly

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 9. Disconnect the purge air lines from the top of the pump.
2. Disconnect the inlet and outlet powder tubing from the bottom of the pump.
3. Remove the two screws (A) and the cover from the pump.
4. See Figure 10. Disconnect one end of each of the seven air tubes indicated.

   NOTE: The letters in Figure 10 correspond to the letters in the *Tubing Diagram* on page 20.
5. See Figure 9. Remove the two screws (B) securing the pump assembly to the base. Remove the pump assembly to a clean work surface.
6. See Figure 11. Starting with the fluidizing tubes, disassemble the pump as shown.

NOTE: Refer to *Pinch Valve Replacement* on page 18 for pinch valve replacement instructions. Filter discs are included in pinch valve kits.

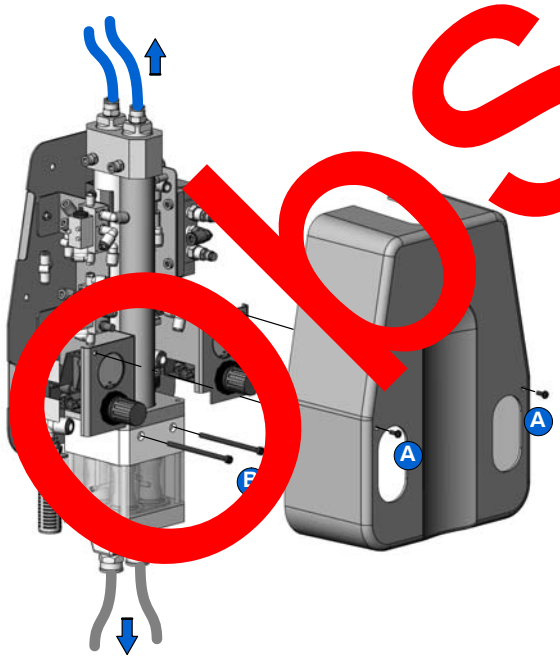


Figure 9 Removing the Pump Assembly

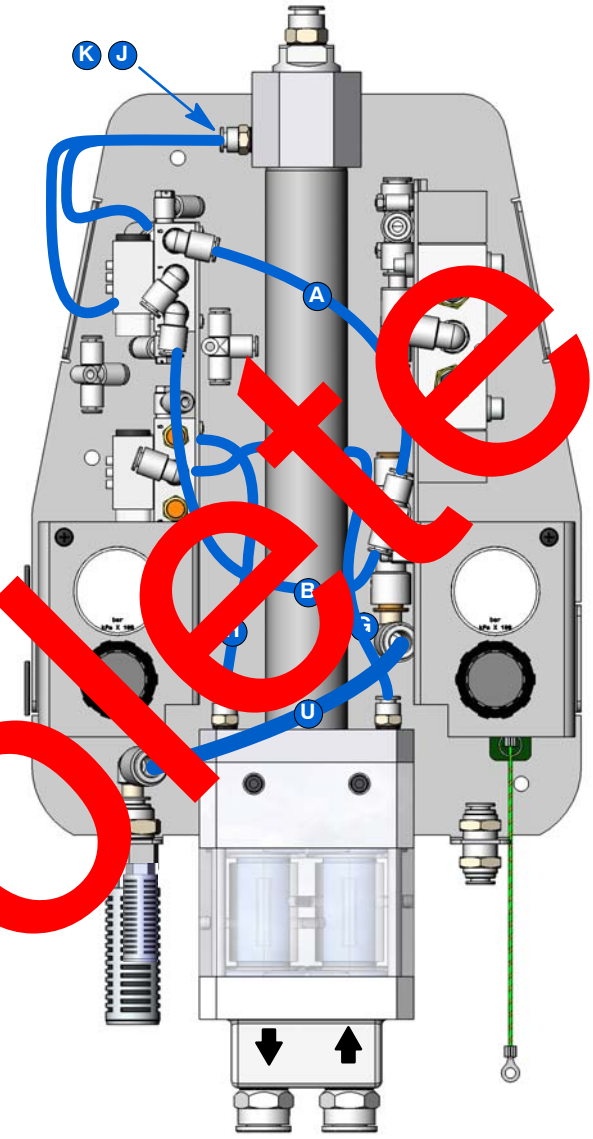


Figure 10 Disconnecting Air Tubing

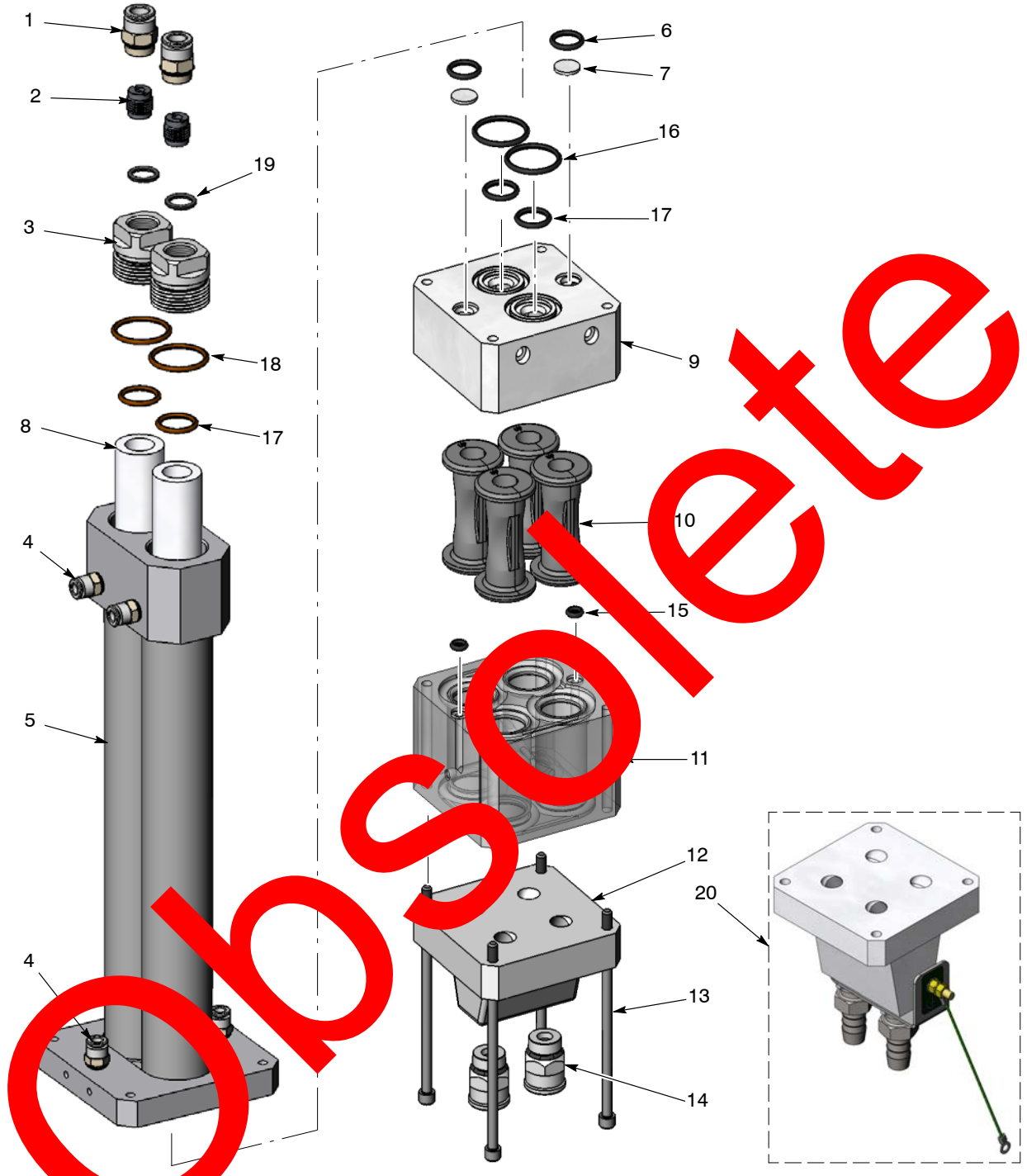


Figure 11 [illegible]sembly and Assembly

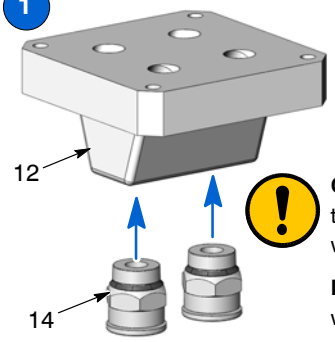
1. 10-mm tube connectors (2)
2. Check valves (2)
3. Fluidizing tube access plugs (2)
4. 6-mm tube connectors (4)
5. Outer fluidizing tube assembly
6. O-rings (2), 0.625 x 0.813 in.
7. Filter discs (2)
8. Fluidizing tubes (2)
9. Upper-Y manifold
10. Pinch valves (4)
11. Pinch valve body
12. Lower Y-block
13. 120-mm screws (4)
14. 16-mm tube connectors (2)
15. O-rings (2), 0.219 x 0.406 in.
16. O-rings (2), 1.188 x 1.375 in.
17. O-rings (4), 0.688 x 0.875 in.
18. O-rings (2), 1.25 x 1.063 in.
19. O-rings (2), 0.438 x 0.625 in.
20. Grounded tubing adapter with barbed fittings

Pump Assembly

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

NOTE: Upper and lower Y manifolds intended for repeated contact with food must be thoroughly cleansed prior to first use. However, do not clean the porous fluidizing tubes.

1

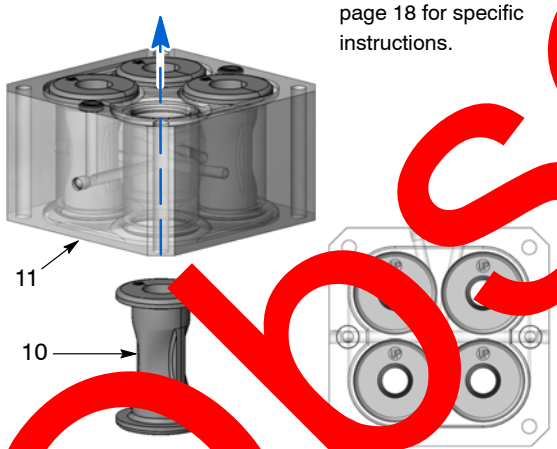


CAUTION: Do not over-tighten the fittings. You will strip the threads.

NOTE: Lower Y-block with grounded tubing requires no disassembly.

2

Refer to *Pinch Valve Replacement* on page 18 for specific instructions.



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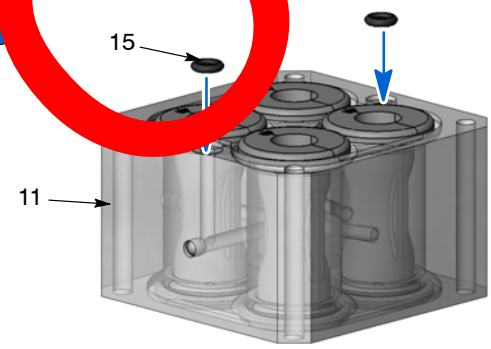

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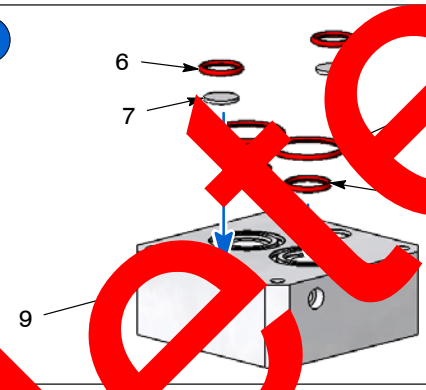

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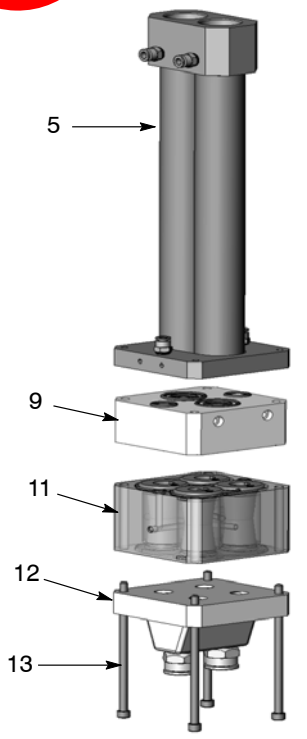
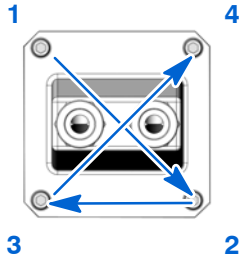
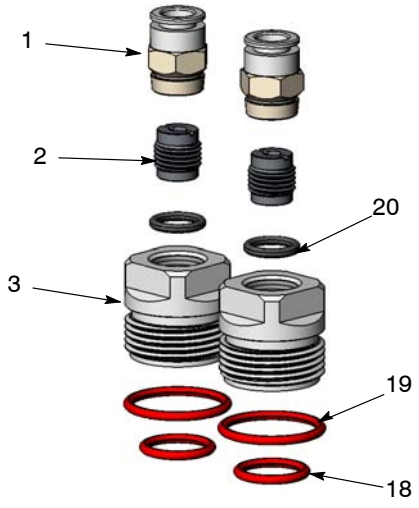




Tighten screws two turns at a time to 7–10 in. lb using an alternating pattern.

6



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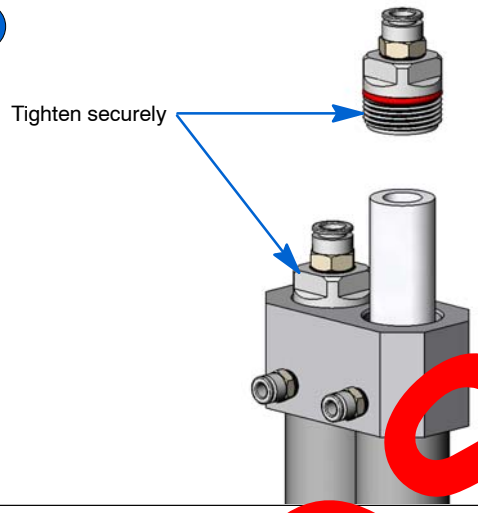

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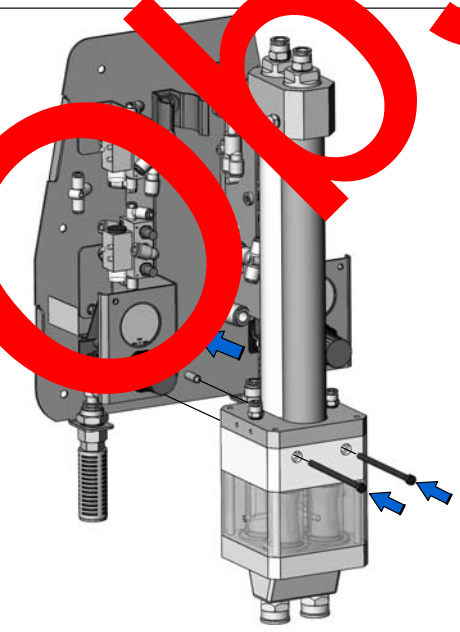

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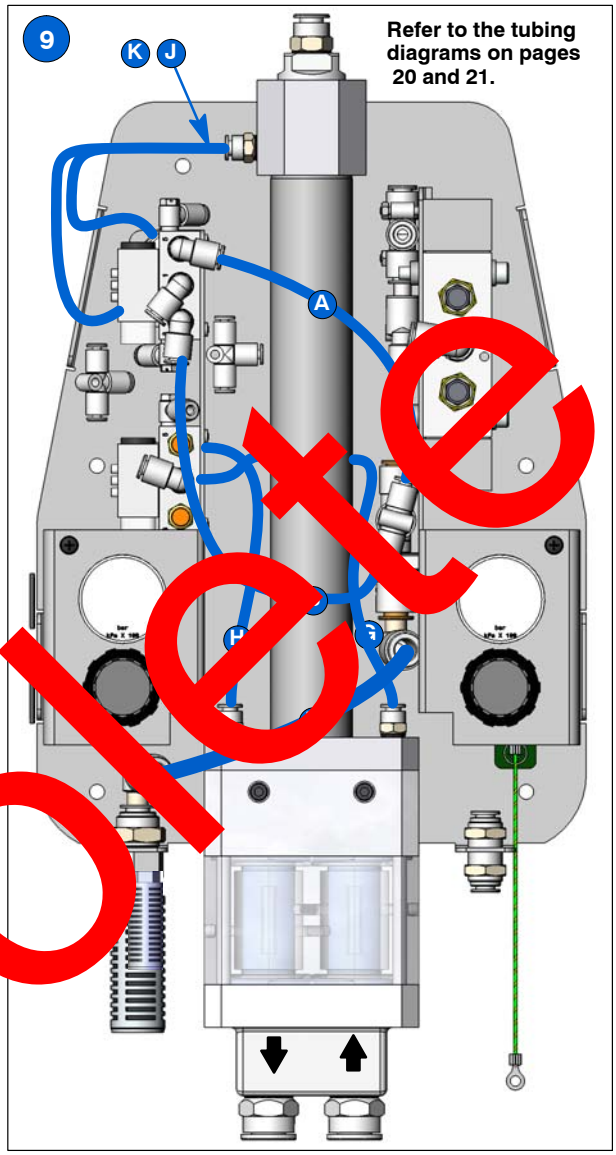
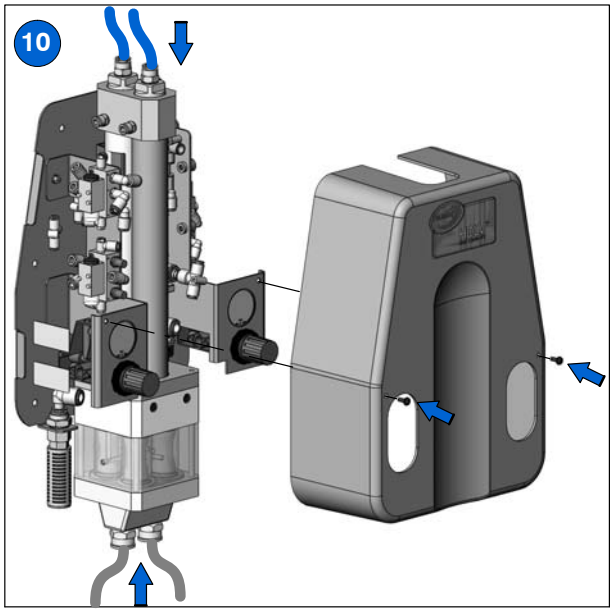


Refer to the tubing diagrams on pages 20 and 21.

10



Pinch Valve Replacement

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

NOTE: The top flanges of the pinch valves have the word UP molded into them.

NOTE: Replace the filter discs (included in the pinch valve kit) when you replace the pinch valves. Refer to step 7 of the *Pump Assembly* procedure.

Pinch Valve Removal

1. 

   Place the pinch valve body in a padded vise with the bottom end facing you. Grasp and pull the bottom end of the pinch valve with one hand.

2. 

   Use your other hand to pinch the filter on the opposite end of the pinch valve.

3. 

   Pull the pinch valve firmly until it comes out of the pinch valve body.

Pinch Valve Installation

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

1

Turn the pinch valve body around so that the top end faces you. Insert the pinch valve insertion tool through the pinch valve body.

NOTE: After you put the pinch valve into the insertion tool, pinch flat the flange on the UP end of the valve.

2

Insert the UP end of the pinch valve into the pinch valve insertion tool. Pinch the UP end flat and feed the small end of the flanged flange into the pinch valve body.

3

While keeping the UP end flange flat, pull on the the insertion tool.

4

Pull the insertion tool through the valve body until the UP end of the pinch valve and the insertion tool comes out the top of the pinch valve body.

Tubing Diagrams

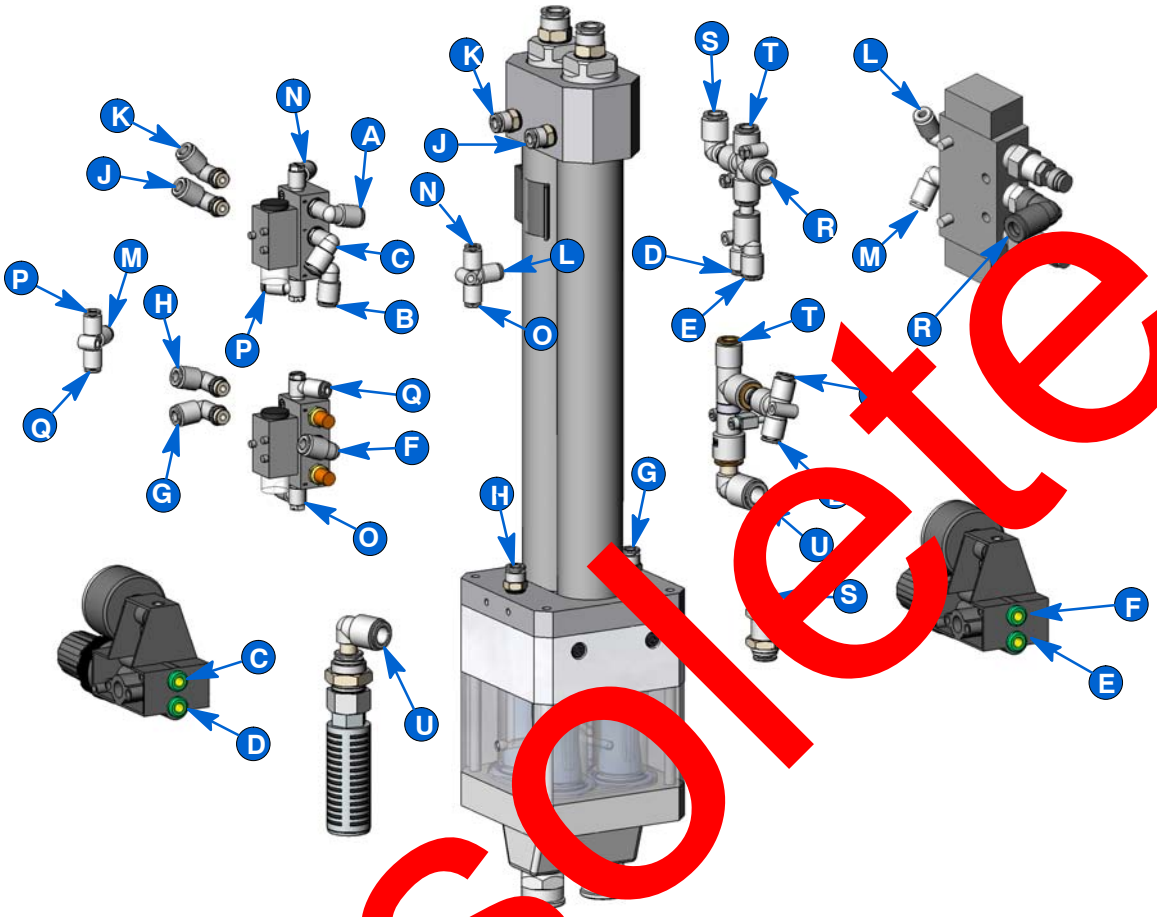


Figure 12 Tubing Diagram — 1 of 2

Note: Regulators shown rotated out of position to show fittings.

Refer to *Parts* for tubing part numbers.

	OD	Color	Length mm (in.)
A — A	6 mm	Blue	213 (8.37)
B — B	6 mm	Blue	213 (8.37)
C — C	6 mm	Blue	273 (10.74)
D — D	6 mm	Blue	238 (9.36)
E — E	6 mm	Blue	383 (15.07)
F — F	6 mm	Blue	383 (15.07)
G — G	6 mm	Blue	278 (10.93)
H — H	6 mm	Blue	213 (8.37)
J — J	6 mm	Blue	153 (6.01)
K — K	6 mm	Blue	118 (4.63)

	OD	Color	Length mm (in.)
L — L	4 mm	Clear	243 (9.56)
M — M	4 mm	Clear	243 (9.56)
N — N	4 mm	Clear	123 (4.83)
O — O	4 mm	Clear	123 (4.83)
P — P	4 mm	Clear	108 (4.25)
Q — Q	4 mm	Clear	108 (4.25)
R — R	8 mm	Blue	103 (4.04)
S — S	8 mm	Blue	433 (17.04)
T — T	8 mm	Blue	238 (9.36)
U — U	10 mm	Blue	223 (8.77)

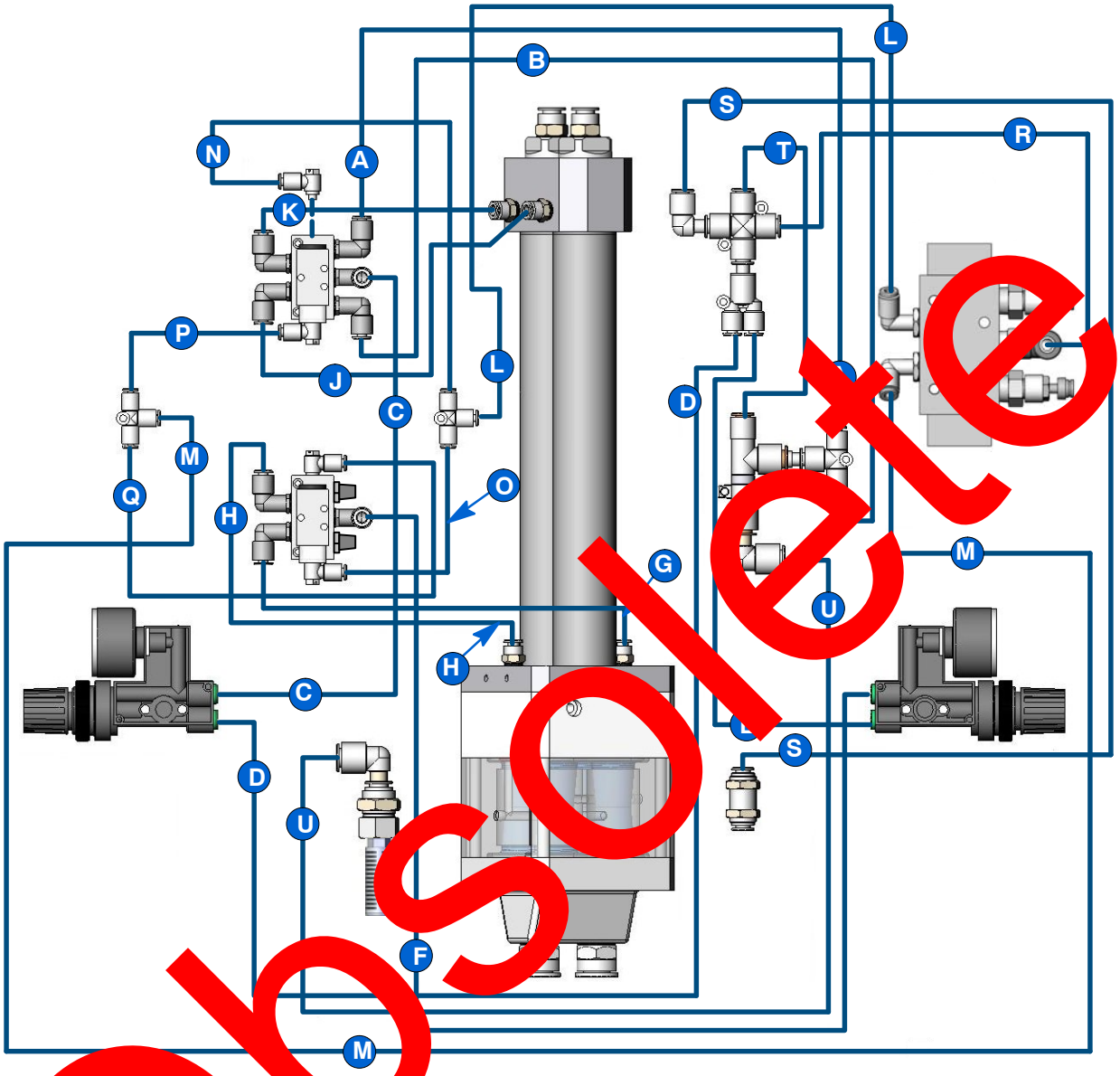


Figure 13 Tubing Diagram – 2 of 2

Parts

To order parts, call the Nordson Finishing Customer Support Center at (800) 433-9319 or your local Nordson representative. Use the parts illustrations and parts lists to locate and describe parts correctly.

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 the 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 varying lengths or if the quantity per assembly depends on the product version or model.

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

Item	Part	Description	Quantity	Note
—	0000000	Assembly	1	
1	000000	Subassembly	2	A
2	000	• •	1	

Pump Assembly

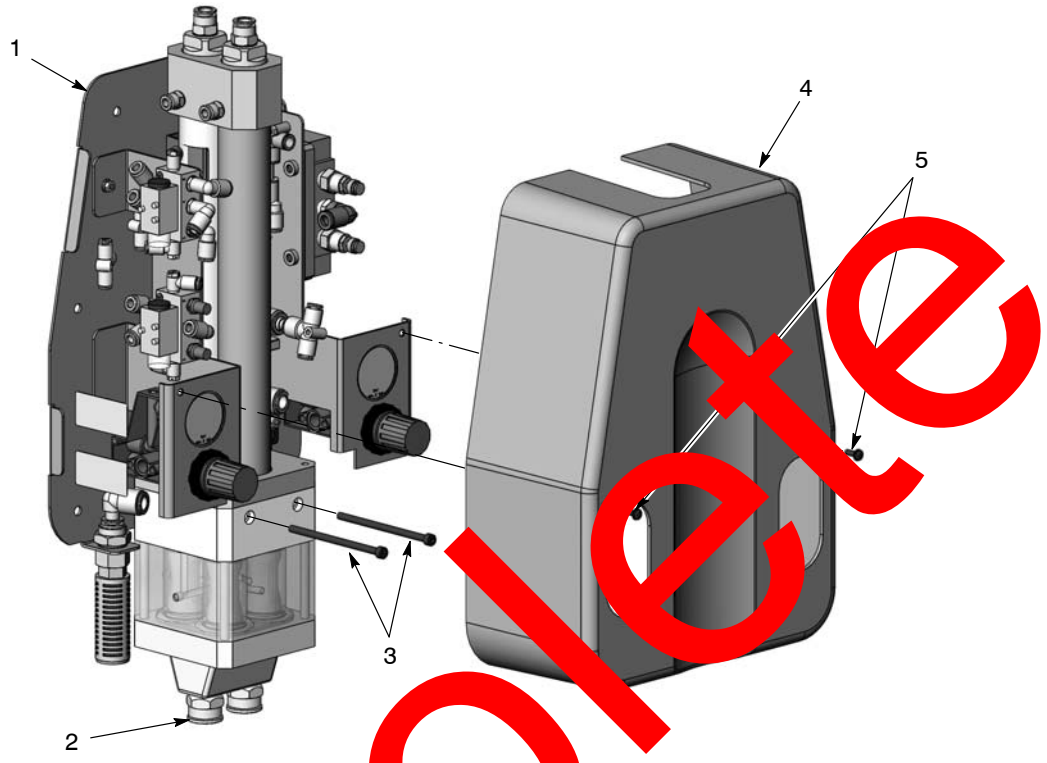


Figure 14 Cover and Mounting Parts

See Figure 14.

Item	Part	Description	Quantity	Note
—	1092240	PUMP ASSEMBLY, high capacity HDLV, Generation II, packaged	1	
—	1610760	PUMP ASSEMBLY, high capacity HDLV, Generation II, with barbed fittings, packaged	1	
1	- - -	• PUMP CONTROLS	1	A
2	1092240	• PUMP ASSY, HDLV, high capacity, Generation II, w/o controls	1	B,D
NS	1610761	• PUMP ASSY, HDLV, high capacity, Generation II, w/o controls, with barbed fittings	1	B,E
3	345515	• SCREW, socket, M5 x 90, black	2	
4	1054580	• COVER, high capacity HDLV pump	1	
5	982825	• SCREW, pan head, recessed, M4 x 12, with integral lockwasher bezel	2	
	9818	• SCREW, socket, M6 x 25, zinc	4	C
NS	03	• NUT, hex, M6, steel, zinc	4	C
NS	983029	• WASHER, flat, M, regular, M6, steel, zinc	8	C
NS	983409	• WASHER, lock, M, split, M6, steel, zinc	4	C

NOTE A: Refer to *Pump Controls* on page 27 for a breakdown of the parts included in this assembly.
B: Refer to *Pump Parts* on page 25 for a breakdown of the parts included in this assembly.
C: Use these fasteners to mount the pump.
D: Used with pump assembly 1092240.
E: Used with pump assembly 1610760.
NS: Not Shown

Pump Assembly without Controls

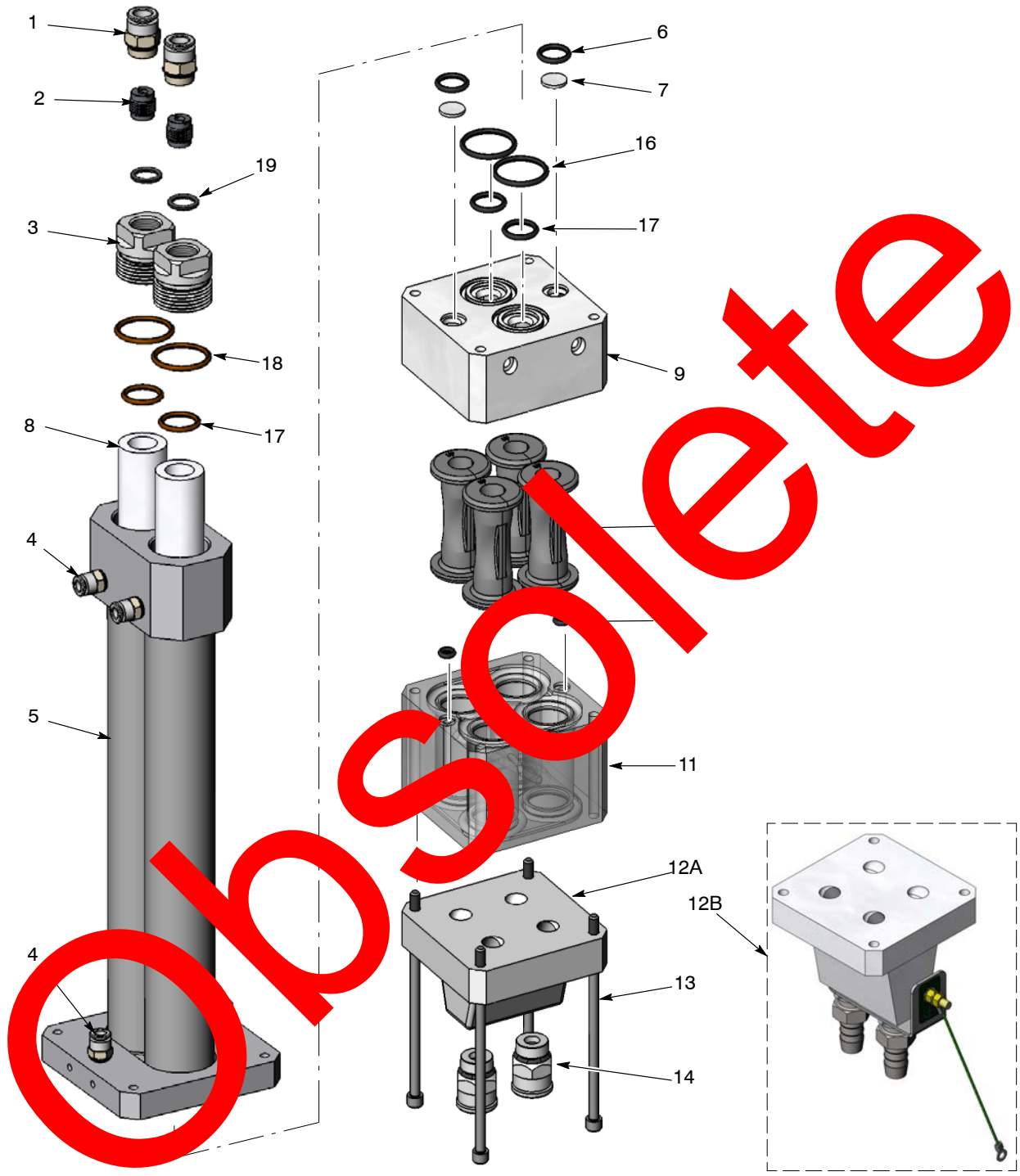


Figure 15 Pump Assembly Without Controls

See Figure 15.

Item	Part	Description	Quantity	Note
–	1092242	PUMP ASSY, HDLV, high capacity, Generation II, w/o controls	1	
–	1610761	PUMP ASSY, HDLV, high capacity, Generation II, w/o controls, with barbed fittings	1	
1	971102	• CONNECTOR, male, 10 mm tube x $^{3}/_{8}$ unithread	2	C
2	- - - - - -	• CHECK VALVE assembly, pump, Prodigy	2	C, D
3	- - - - - -	• PLUG, fluidizing tube, high capacity HDLV pump	2	
4	972141	• CONNECTOR, male, 6 mm tube x $^{1}/_{8}$ universal	4	
5	- - - - - -	• TUBE, outer fluid assembly, high capacity HDLV pump	1	
6	941143	• O-RING, silicone, 0.625 x 0.813 x 0.094 in.		
7	- - - - - -	• DISC, filter, Prodigy HDLV pump		A
8	- - - - - -	• TUBE, fluidizing, high capacity HDLV pum	2	B
9	1057269	• KIT, upper Y manifold, high capacity HD pump	1	
10	- - - - - -	• VALVE, pinch, high capacity LV pum		A, E
11	1090737	• BODY, pinch valve, high capaci DLV pu	1	E
12A	1053976	• BODY, lower Y, high capacity HDLV mp	1	F
12B	1610762	• KIT, lower Y-block, wi ittings, capacity HDLV pum	1	G
13	1054518	• SCREW, socket, M x 120, stainle steel	4	
14	1051108	• CONNECTOR, ma 16 mm tube 2 universal	2	
15	1053292	• O-RIN silicone, 0.219 0.094 in.	2	
16	941231	• O-R G, silico 8 x 1.375 x 0.094 in.	2	
17	941153	• O-RI ne, 0.6 x 0.875 x 0.094 in.	4	B, C
18	941215	O-RING, silicone, 1 0 x 1.063 x 0.094 in.	2	C
19	113	• G, sil 438 x 0.625 x 0.094 in.	2	C

NOTE A: These pa ncluded in t Pinch Valve Service Kit 1092273.

B: These parts a ncluded in the uidizing Tube Service Kit 1104542.

le olde mps to the ew style check valves pictured in Figure 15, order the Check Valve Upgrad 10801 rts are included in the kit.

D: To replace check es, order the Check Valve Service Kit 1078161.

E: To upgrade o pumps to new style pinch valves order Generation II Pinch Valve Assembly Kit 1092271. This kit includ 4 pinch valves and a new pinch valve body.

F: Used in pum ssembly 1092242.

Used in pu assembly 1610761.

Pump Controls

Left Side

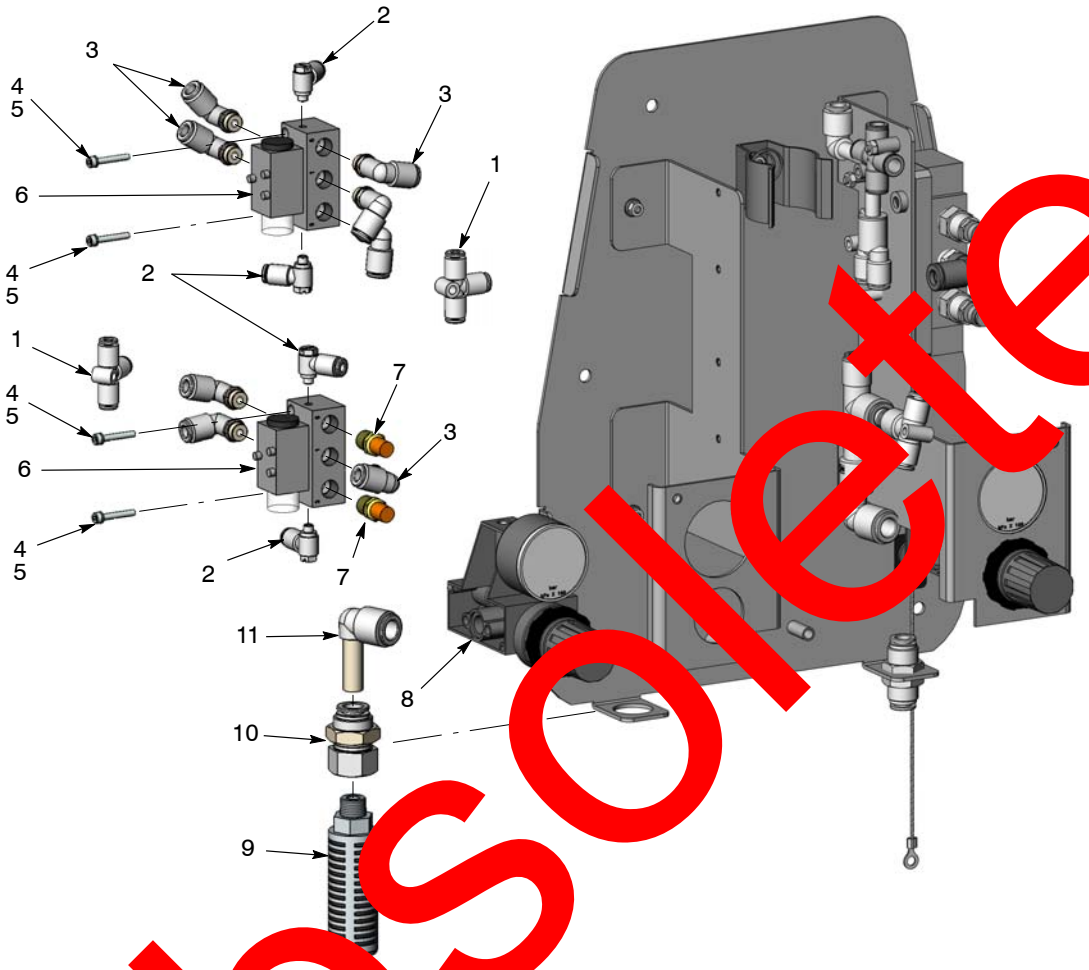


Figure 16 Pump Cont... Left Side

See Figure 16.

Item	Part	Description	Quantity	Note
1	1056480	UNION, tee, 4 mm tube x 4 mm tube x 4 mm tube	2	
2	1054534	CONNECTOR, male, universal elbow, 4 mm tube x M5	4	
3	972126	CONNECTOR, male, universal elbow, 6 mm tube x $^1/_8$ in.	8	
4	982650	SCREW, socket, M3 x 20 long, black	4	
5	983400	WASHER, lock, M, split, steel, zinc	4	
6	1054519	VALVE, miniature, double air piloted, 5 port	2	
7	170269	MUFFLER, exhaust, $^1/_8$ in. NPT	2	
8	1018157	REGULATOR ASSEMBLY, 0–25 psi, 0–1.7 bar	1	
9	1097195	MUFFLER, silencer, $^1/_4$ NPT	1	
10	1005068	UNION, female bulkhead, 10 mm tube x $^1/_4$ RPT	1	
11	1052893	ELBOW, plug in, 10 mm tube x 10 mm stem		

Right Side

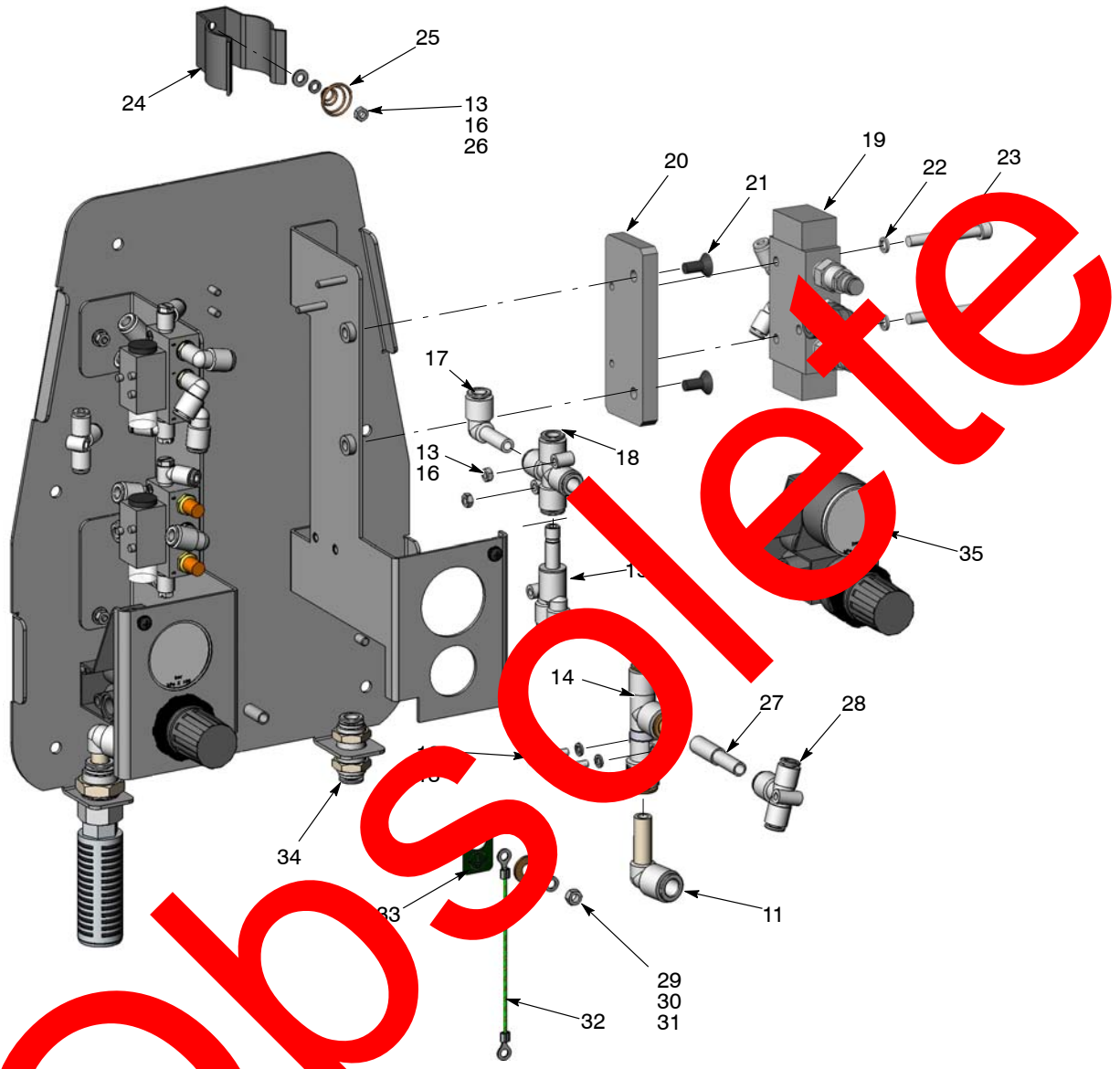


Figure 17 Pump Controls – Right Side

See Figure 17.

Item	Part	Description	Quantity	Note
12	982517	SCREW, socket, M4 x 20, zinc	2	
13	983403	WASHER, lock, M, split, M4, steel, zinc	8	
14	1052920	PUMP, vacuum generator	1	
15	1019093	CONNECTOR, plug in Y, 8 mm stem x 6 mm tube	1	
16	984715	NUT, hex, M4, steel, zinc	6	
17	1056465	ELBOW, plug in, 8 mm tube x 8 mm stem, plastic	1	
18	1054619	UNION, cross, 4 mm tube x 8 mm tube	1	
19	1611821	KIT, timing valve, HDLV pump	1	
20	- - - - - -	• PLATE MOUNT, valve, HDLV pump	1	
21	- - - - - -	• SCREW, flat, socket, M6 x 14, black	2	
22	- - - - - -	• WASHER, lock, M, split, M5, steel, zinc	2	
23	- - - - - -	• SCREW, socket, M5 x 30, black		
24	- - - - - -	HOLDER, clamping, spring action		
25	1063245	SPRING, tapered, 0.312 x 0.750 in., pump grounding	1	
26	983402	WASHER, flat, M, narrow, M[illegible]eel, zinc		
27	1054617	NIPPLE, reducing, 10 mm tube x [illegible]m tube, plastic		
28	1054616	UNION, tee, 8 mm tube x 6 mm tube x [illegible]m tube	1	
29	984706	NUT, hex, M5, steel, zinc	1	
30	983401	WASHER, lock, M, spl[illegible]M5, steel,	1	
31	983021	WASHER, flat, E, 0.2[illegible]x 0.406 x 0.0[illegible]n., brass	1	
32	138142	WIRE, ground, power [illegible]ribution	1	
33	240674	TAG, groun[illegible]	1	
34	1002711	UNION, [illegible]khead, 8 mm tube [illegible]mm tube	1	
35	288821	REGUL[illegible]TOR A[illegible] 0–60 psi, 0–4 bar	1	

Powder and Air Tubing

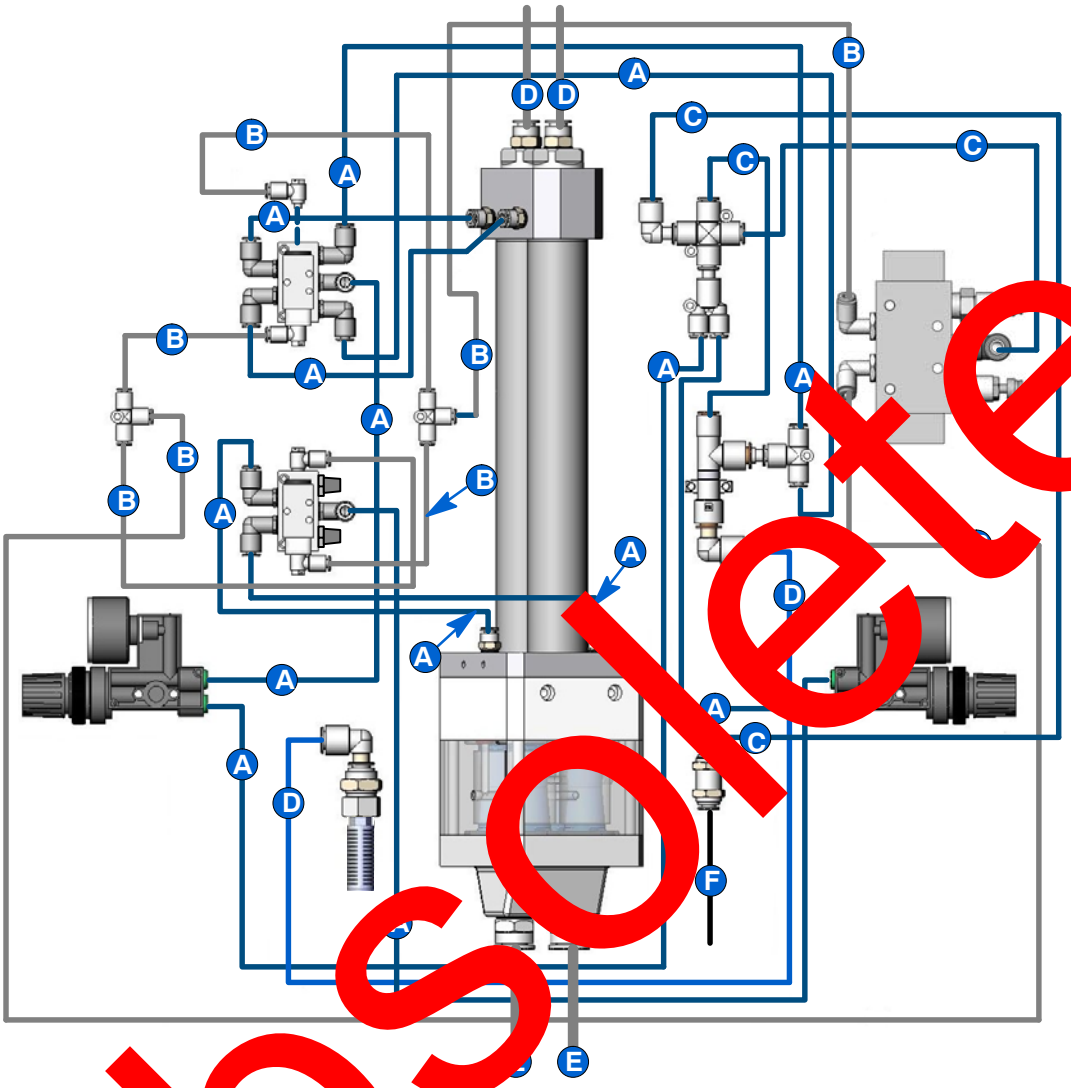


Figure 18 Powder and Air Tubing

Tubing	Part	Description	Notes
A	900741	6-mm OD, blue	
	900617	4-mm OD, clear	
	900618	6-mm OD, blue	
	900740	10-mm OD, blue	
E	1063654	16-mm OD, clear	
E	[illegible]	12.7-mm ID, antistatic	A
F	900619	8-mm OD, black	

NOTE A: Used on pump assemblies with grounded tubing connection with barbed fittings.

Pickup Tube Adapters

The pickup tube adapter assembly easily adapts the suction tubing onto a standard pump pickup tube. The adapter is available for pickup tubes with or without an external O-ring.

Adapter with Pump Mount O-Ring

See Figure 19. Use this adapter with pickup tubes that do not have an external pump mount O-ring.

Item	Part	Description	Quantity	Note
—	1068408	DISCONNECTOR, high-capacity HDLV pump, with pump mount O-ring	1	
1	1068402	• NUT, tube retaining, high-capacity HDLV pump	1	
2	941143	• O-RING, silicone, 0.625 x 0.813 x 0.094 in.	1	
3	1068379	• MOUNT, pump adapter, with O-ring gland	1	
4	942143	• O-RING, silicone, 1.00 x 1.250 x 0.125 in.	1	

Adapter without Pump Mount O-Ring

See Figure 19. Use this adapter with pickup tubes that h an exte l pu mou -ring.

Item	Part	Description	antity	Note
—	1068409	DISCONNECTOR, high-capacity HDL mp, without pump mount O-ring	1	
1	1068402	• NUT, tube retaining gh-capa HDLV p	1	
2	941143	• O-RING, silicone, 25 x 0.813 x 094 in.	1	
3	1068400	• MOUNT, pump ad er, without O- gland	1	

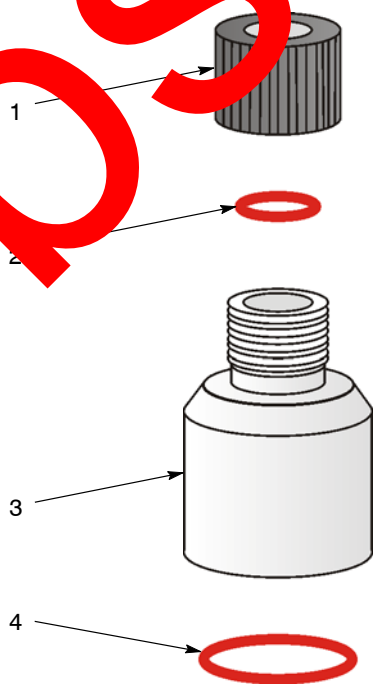


Figure 19 Pickup Tube Adapter Parts

Spare Parts

Keep one of each of these assemblies in stock for each pump in your system.

Pinch Valve
Kit 1097919
(Includes
4 pinch valves,
2 filter discs,
2 O-rings,
and 1 insertion tool)

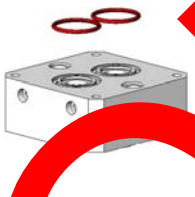
Instructions on page 18

Non-conductive Pinch Valve
Kit 1092273
(Includes
4 pinch valves,
2 filter discs,
2 O-rings,
and 1 insertion tool)

Instructions on page 18

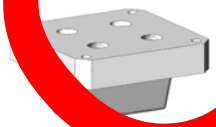
Standard Fluidizing Tube Kit
1104542
(Includes 2 fluidizing tubes
and 4 O-rings)

Instructions on page 13



Upper Y-Manifold
Kit 1057269
(Includes
Y-manifold
and 2 O-rings)

Instructions on page 14



Lower Y-Block
Part 1053976
(Quantity of 1)

Instructions on page 14

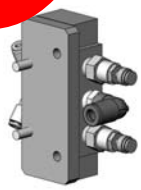
Lower Y-Block with
grounded tubing
barbed fittings
Part 1610762
(Quantity of 1)

Instructions on page 14

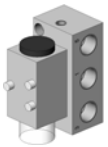
Check Valve Service
Kit 1078161
(Quantity of 2)

Check Valve Upgrade
Kit 1080160
(Includes
2 connectors,
2 check valves
2 plugs,
2 O-rings)

Use to upgrade older
pumps to new style
check valves



Timing Valve
Kit 1611821
(Quantity of 1)



Miniature Valve
Part 1054519
(Quantity of 1)

Generation II Pinch
Valve Upgrade Kit
Part 1092271
(Converts
1081246 to 1092240
1087221 to 1092242)