HDLV® Color Module Transfer System

Customer Product Manual
Part 1102226–02
Issued 5/17

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

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Contact Us

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Change Record

Revision	Date	Change
02	5/17	Updated software version.

HDLV® Color Module Transfer System

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 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 off the spray system and exhaust fans.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Grounding

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

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

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

Action in the Event of a Malfunction

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

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

Disposal

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

Description

The HDLV Color Module Transfer System consists of a Nordson HDLV (high density low volume) high-capacity transfer pump station with pneumatic controls and pump, a system controller, a port-switching manifold assembly, and the required air and powder tubing. The system is easily integrated into new and existing cartridge filter-based recovery systems with color modules.

Benefits

The system provides the following advantages over standard venturi-type transfer pumps:

- Because the HDLV transfer pump uses less air to move more powder, it consumes 75% less compressed air than standard venturi pumps. One HDLV transfer pump transports the equivalent powder volume of three venturi transfer pumps.
- HDLV transfer uses lower velocity air resulting in longer part life and less impact fusion, resulting in lower spare parts usage and less maintenance time.
- Unlike traditional venturi throat transfer pumps that are difficult to clean and maintain, pump and hose cleaning can be achieved quickly and easily with the simple push of a button.
- Pump cycle times for each color module fluid bed as well as the virgin powder supply can be adjusted individually, making it easier to manage the virgin and reclaim powder mix resulting in better application performance.
- Sieve performance is improved due to the reduction in air flowing into the sieve.
- Better management of recovered powder means less scrap powder and less maintenance time required to remove scrap powder.

Specifications

120/230 Vac single phase, (0.8 amps)
Universal 24 Vdc power supply accommodates dual voltage.

Air consumption at 6.9 bar (100 psi):
7 SCFM (0.2 m^3/min.) – Normal operation
20 SCFM (0.57 m^3/min.) – Purge sequence

Air input size:
6-mm tubing – Controller
$^3/_8$ in. NPT – Pump Station

HDLV transfer pump maximum output capacity:
Fluidized source – 272 kg/hr (600 lb/hr)
Unfluidized box or drum – 136 kg/hr (300 lb/hr)

System Components and Configurations

The system can be configured in two ways: with the manifold mounted on the fan section support, or with the manifold mounted on the color module.

Fan-Mounted Manifold

Figure 1 shows a transfer system with the manifold (6) mounted on the fan section support. This configuration requires one manifold assembly per system and one quick-disconnect plate and set of suction hoses for each color module. When changing colors, the operator disconnects the suction hose (3) from the bulk powder supply (4) and connects it to the purge adapter (11), then purges the pump and powder hoses. When changing the color module, the operator unclamps and disconnects the quick disconnect plate. The virgin and reclaim suction hoses and quick disconnect plate stay with the color module.

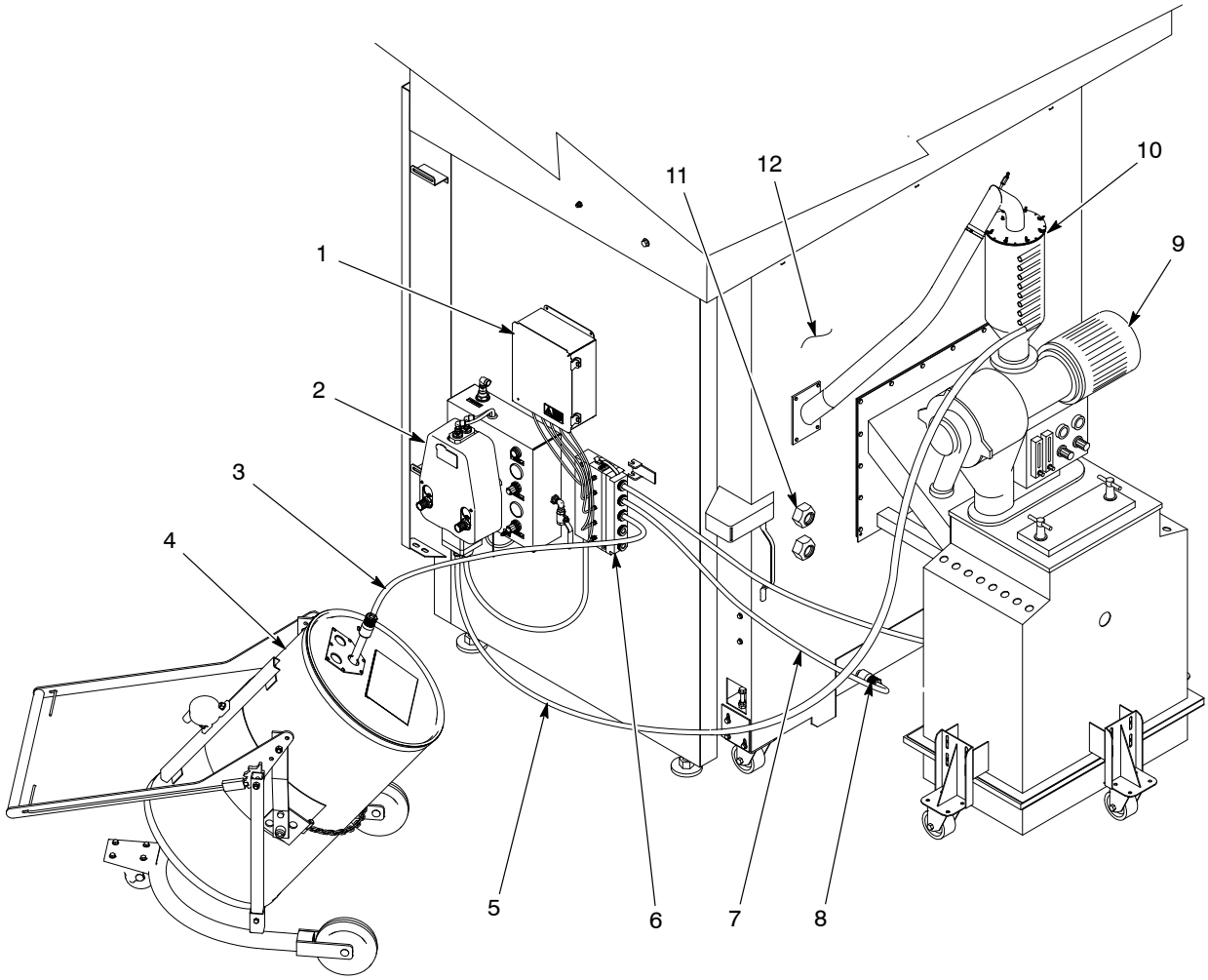

Figure 1 Typical Color Module HDLV Transfer System with Fan-Mounted Manifold

1. Control panel
2. HDLV pump station
3. Suction tubing – virgin powder
4. Virgin powder supply
5. Delivery line – reclaim and virgin
6. Manifold
7. Suction tubing – reclaim
8. Pickup tube hose adapter
9. Sieve
10. Sieve accumulator
11. Purge adapter
12. Color module

Color Module-Mounted Manifold

Figure 2 shows a transfer system with the manifold (6) mounted on the color module. This configuration requires one manifold assembly and set of suction hoses for each color module. When changing colors, the operator disconnects the suction hose (3) from the bulk powder supply (4) and connects it to a purge adapter (11), then purges the pump and powder hoses. When changing the color module, the operator disconnects the pump suction hose and solenoid tubing from the manifold. The virgin and reclaim suction hoses and manifold stay with the color module.

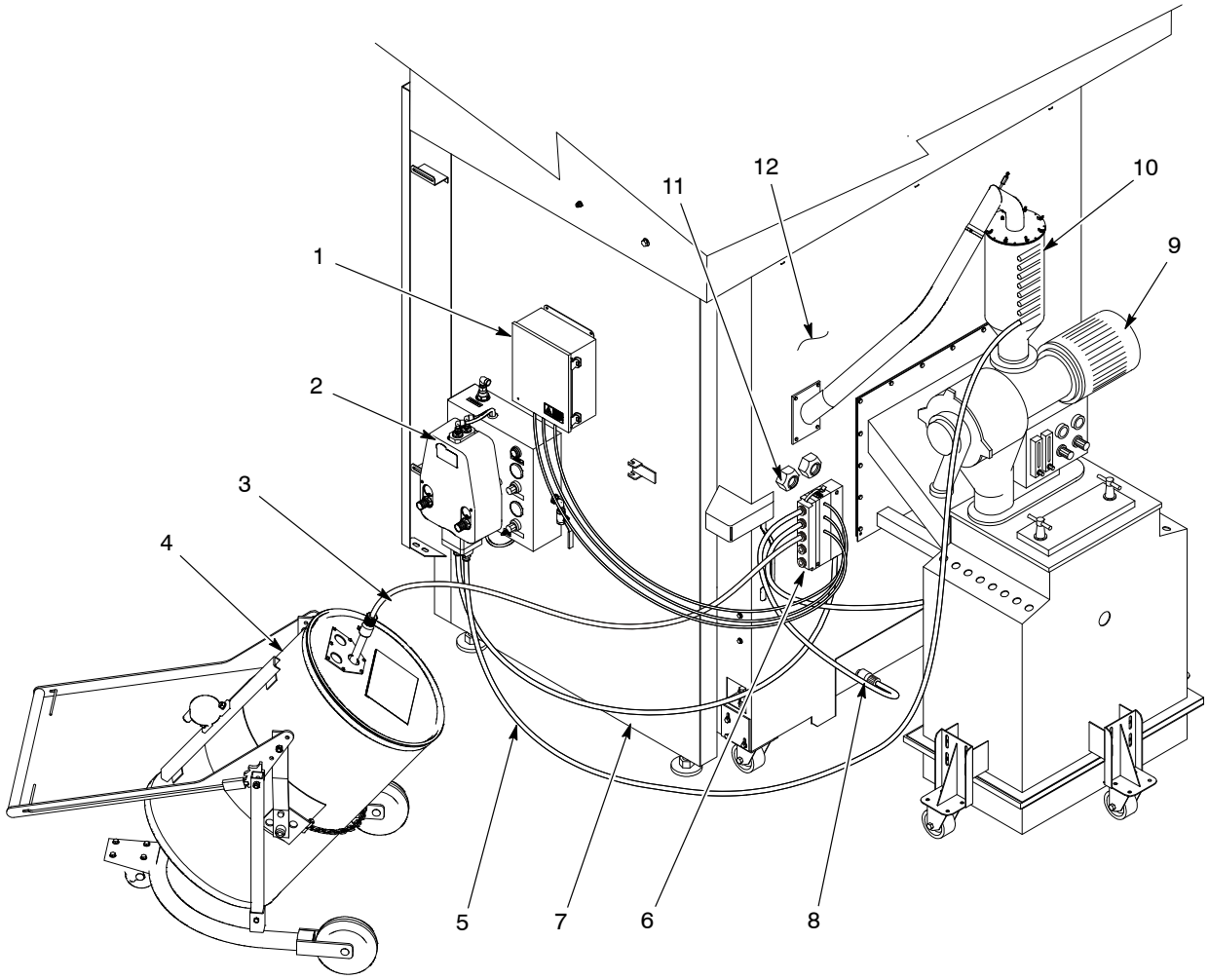

Figure 2 Typical Color Module HDLV Transfer System with Color Module-Mounted Manifold

1. Control panel
2. HDLV pump station
3. Suction tubing – virgin powder
4. Virgin powder supply
5. Delivery line – reclaim and virgin
6. Manifold
7. Suction tubing – reclaim
8. Pickup tube hose adapter
9. Sieve
10. Sieve accumulator
11. Purge adapter
12. Color module

Manifold Assembly

Figure 3 shows the components of the transfer system manifold assembly.

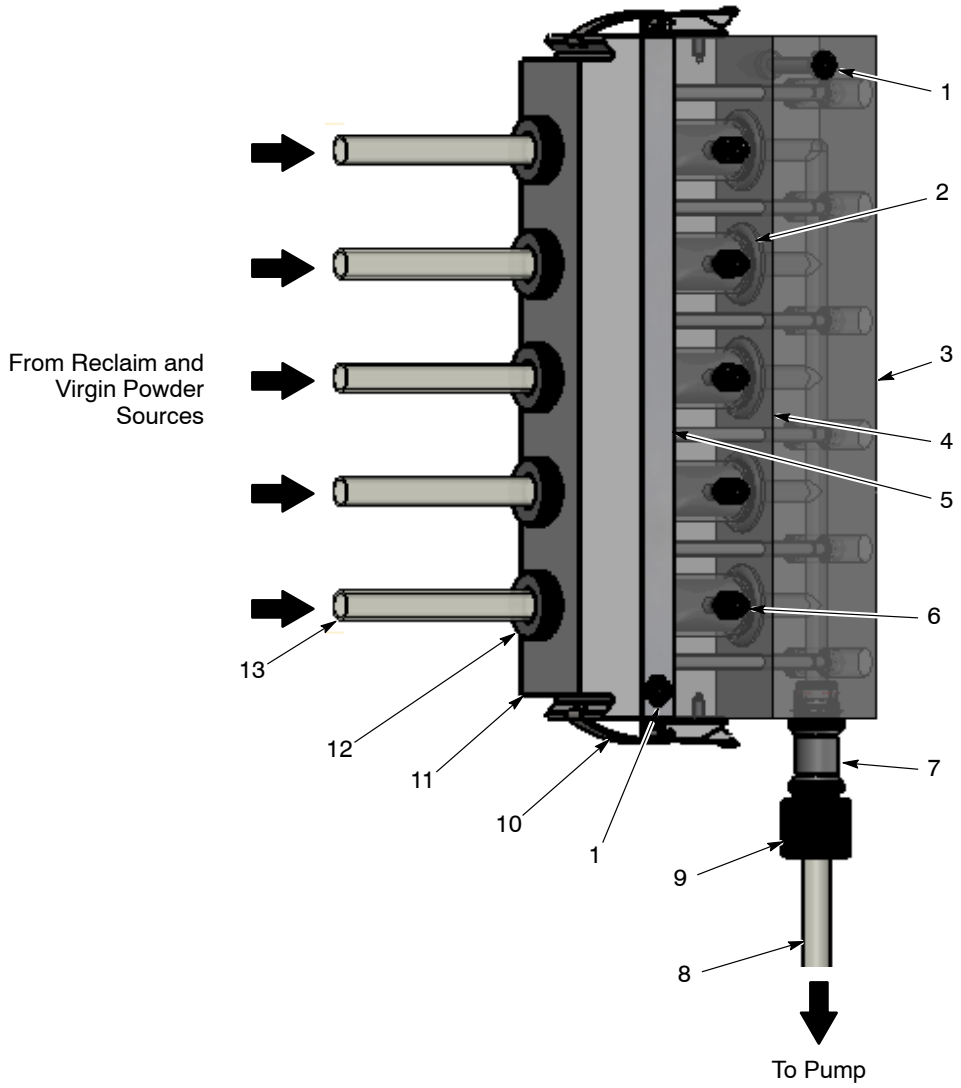

Figure 3 Manifold Assembly Components

1. Mounting fasteners
2. Pinch valves
3. Output plate
4. Pinch valve chamber
5. Input plate
6. Pinch valve actuation air fittings
7. Quick-disconnect adapter
8. 16-mm suction tube to pump
9. Tubing retainer nut
10. Quick disconnect latches
11. Quick disconnect plate
12. Tube lock knobs
13. 16-mm suction tubes (to powder sources)

Pump Station

See Figure 4.

Item	Control	Function
1	Manual Purge	Press to manually purge the pump. Air at the supply pressure is delivered to the two fittings on top of the pump.
2	Pump Supply Air Regulator	Regulates pump operating air. Normal operating pressure is 4.8 bar (70 psi).
3	Vibrator Air Control Valve	Controls air flow to the vibrator motor or to an auxiliary function.
4	Vibrator Air Regulator	Regulates air pressure to the vibrator motor or to an auxiliary function. Normal vibrator motor operation pressure is 2.75–3.45 bar (40–50 psi).
5	Pinch Valve Air Regulator	Regulates air pressure used to operate the pump pinch valves. Normally set to 2.4–2.75 bar (35–40 psi).
6	Conveying Air Regulator	Regulates air pressure applied to the fluidizing tubes to push powder out of the pump. Normally set to 0.7–1.0 bar (10–15 psi).

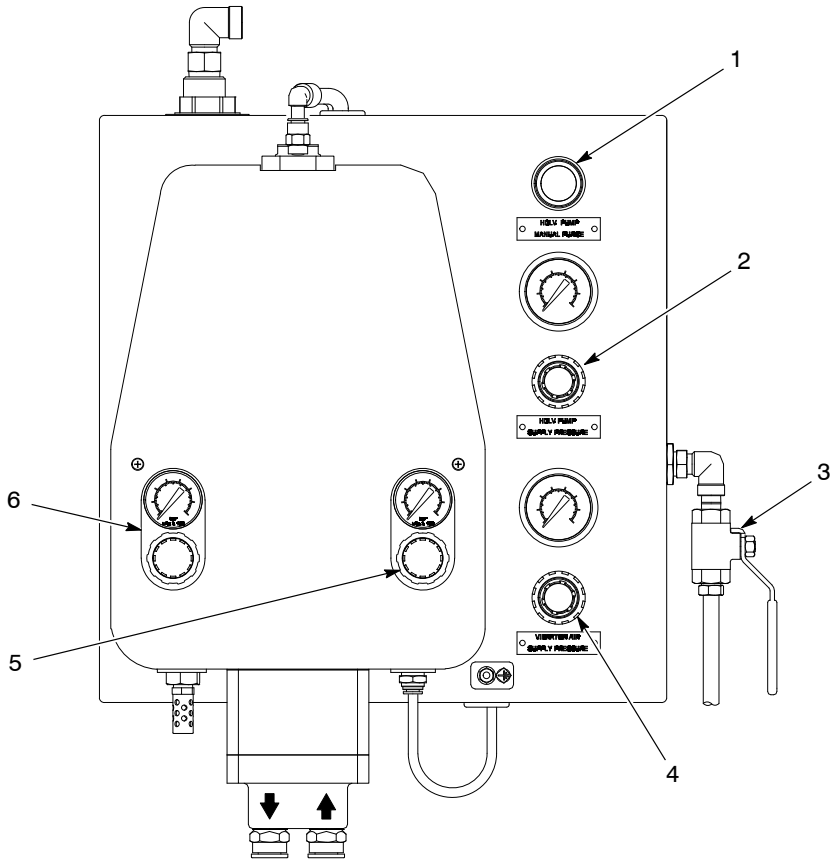

Figure 4 Pump Station and Pump Controls

Theory of Operation

The manifold assembly has 5 inlet ports and 1 outlet port, each controlled by a pinch valve. The 16-mm pump suction tubing is connected to the outlet port. The inlet ports are typically connected to up to four pickup tubes on the color module and one pickup tube at the virgin powder supply with 16-mm tubing. The system controller has 5 solenoid valves that are connected by 6-mm tubing to 5 inlet port pinch valves. When a solenoid valve is opened, air pressure is applied to the connected pinch valve, closing it and stopping the flow of powder.

The controller has two pressure switches, PS1 and PS2, that sense pump operating air and pump purge air. When the pump is operating, pressure switch PS1 in the system controller is closed. The system controller automatically opens each manifold pinch valve in sequence, from inlet 1 through 5, for a user-programmed duration, to pump reclaimed powder out of the color module fluidized beds, and virgin powder out of the bulk supply, and delivers the powder to the sieve and feed hopper.

When it is time to change powder colors, the operator presses the Purge button on the pump station, sending purge air through the pump, manifold, and powder tubing and closing pressure switch PS2 at the system controller. The system controller then opens and closes all the pinch valves according to the user programming. The pinch valves can be either continuously open, or opened and closed repeatedly to pulse the purge air. The purge continues as long as the operator presses on the purge button.

If desired, purging can be controlled from a remote device, by installing a shuttle valve in the pump station and applying pilot air pressure to the valve.

Refer to Controller Programming on page 16 for more information on system operation and system settings.

Installation

NOTE: The manifold and HDLV pump station should be positioned so that the suction tubing can be kept as short as possible (2 meters (6 ft) or less).

Pump Station Modification

Before mounting the pump station, install two push-in tubing tees in the pump station air tubing as shown in Figure 5.

Connect air tubing to the tees. Route the PS2 tubing out of the enclosure through the bottom grommet, along with the pump operating air tubing.

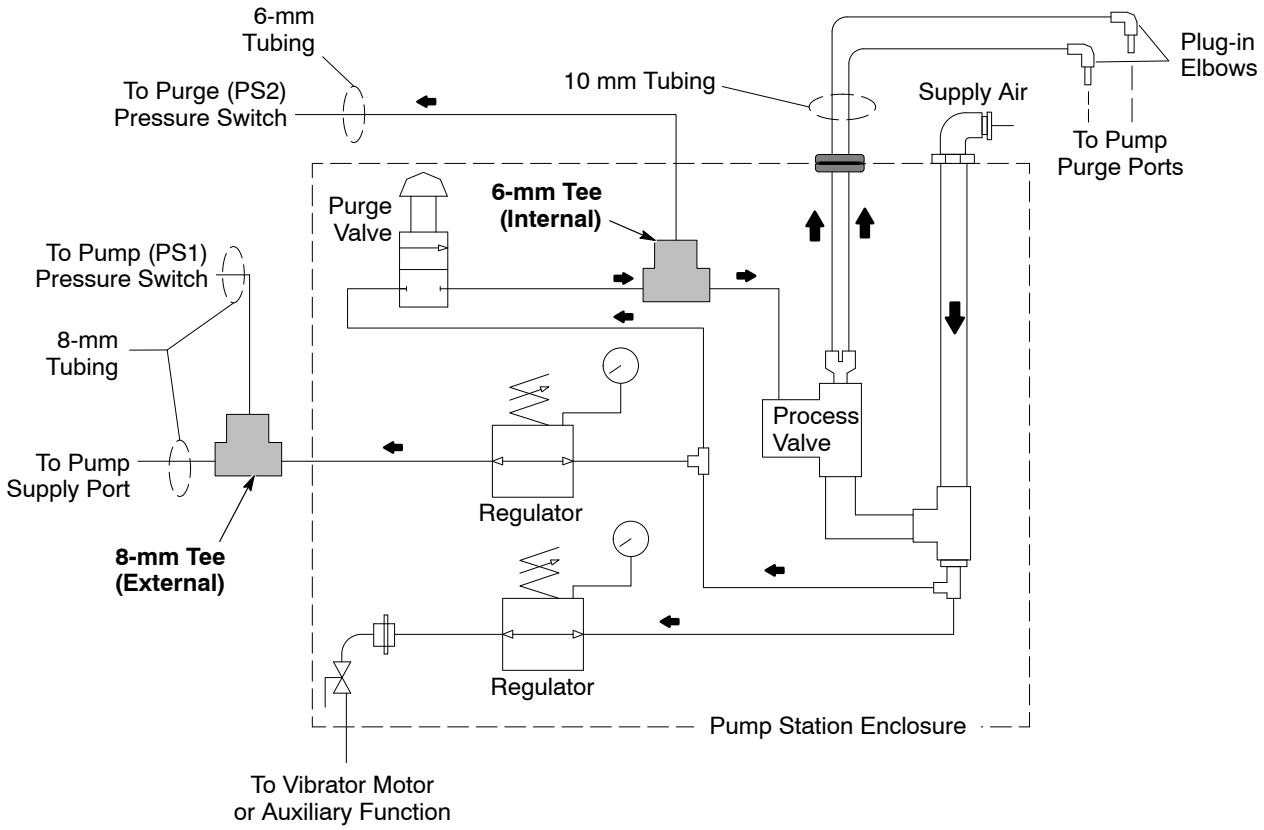

Figure 5 Pump Station Tee and Tubing Installation for Controller PUMP and PURGE Pressure Switches

Mounting

Mount the the system components as shown in Figures 1 and 2, with the manifold and pump station positioned in order to keep the suction tubing as short as possible (less than 2 meters long).

System Connections

See Figure 6.

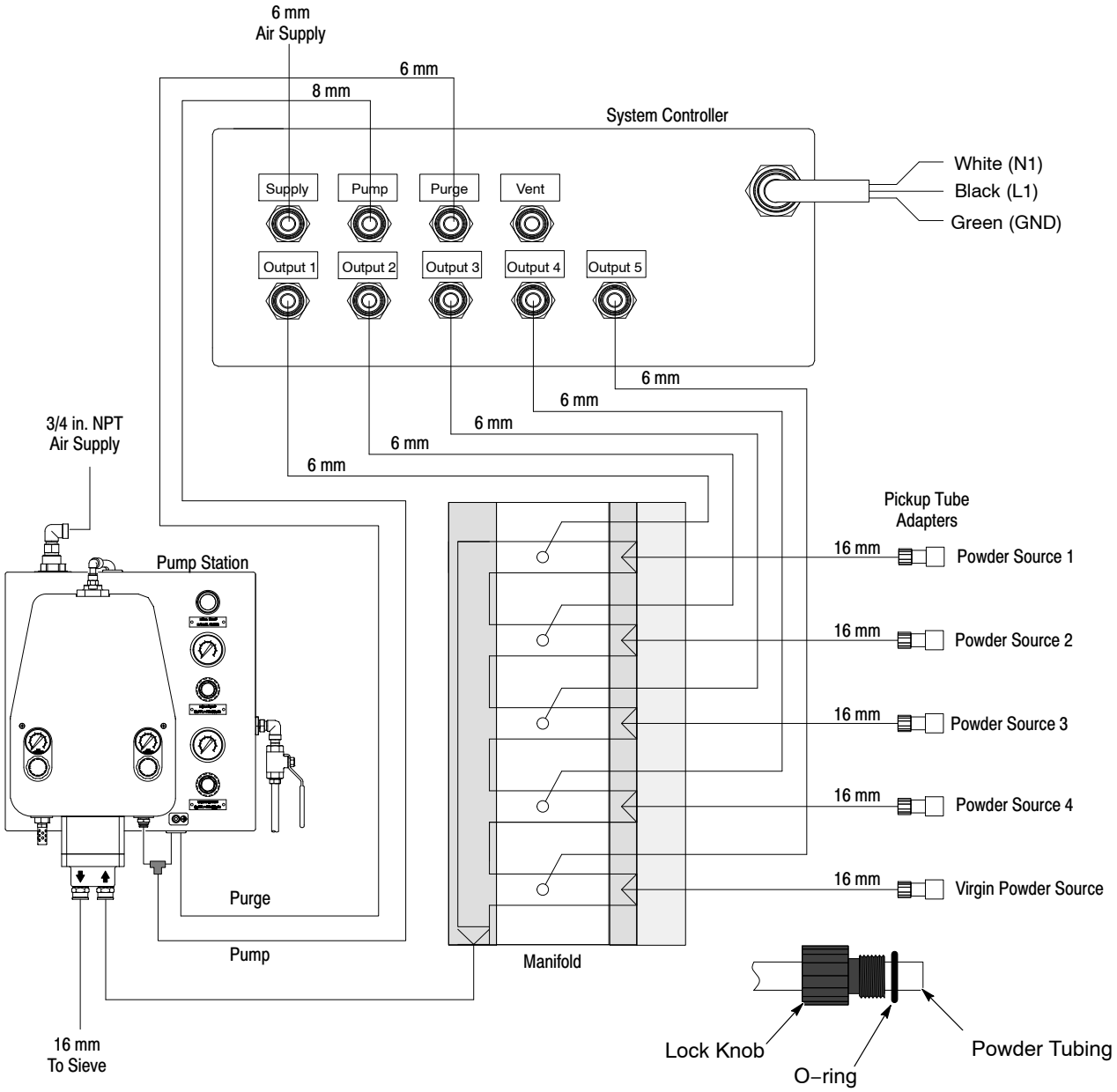

Figure 6 System Connections

Electrical Connections

WARNING: Power should always be supplied through a disconnect or other device that can be locked out for service. Failure to observe this warning may result in personal injury or death.

See Figure 6. The system controller requires 120/230 Vac single phase power. Connect the 3 wire SO cable furnished with the controller directly to an electrical panel or install a suitable 3 prong grounded plug on the cable. A liquid-tight cord grip is supplied with the cable for installation in a panel knockout.

White: N1 (neutral)
Black: L1 (hot)
Green: Ground

Air Supply

See Figure 6. Connect a source of clean, dry, compressed air to:

- the $^{3}/_{4}$-in. NPT elbow on the top of the pump station
- the 6-mm tube fitting labeled SUPPLY on the bottom of the system controller.

Manifold and Pressure Switch Air Tubing

NOTE: Cut all air tubing ends square with a tubing cutter.

- Connect 6-mm tubing from the OUTPUT 1–5 ports on the bottom of the controller to the pinch valve air fittings on the side on the manifold.
- Connect 6- and 8-mm tubing from the pump station to the PUMP and PURGE pressure switch ports on the bottom of the controller. Refer to *Pump Station Modification* and Figure 5 on page 11 for the pump station connections.

Powder Tubing – Sieve to Pump

NOTE: Cut all powder tubing ends square with a tubing cutter.

Plug 16-mm powder tubing into the quick-disconnect fitting at the pump delivery port and route the tubing to the sieve accumulator. Connect the tubing to an inlet port.

Powder Tubing – Manifold to Pump

NOTE: A quick-disconnect adapter plugs into the manifold output plate. Once the powder tubing is installed into the adapter, it does not need to be removed.

1. Remove the tubing retainer nut from the tubing adapter. Install the nut and O-ring on the 16-mm powder tubing, insert the tubing into the adapter, thread the nut onto the adapter and tighten finger-tight.
2. Route the tubing to the pump suction port and plug the tubing into the quick-disconnect fitting.

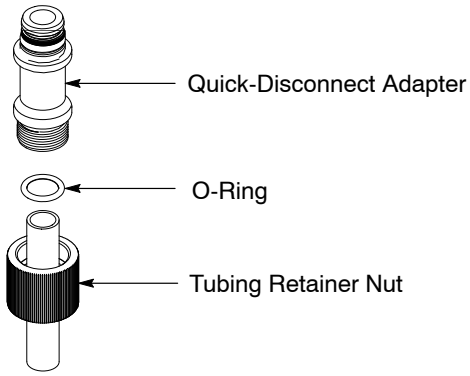

Figure 7 Installing Tubing into the Manifold Quick-Disconnect Adapter

Powder Tubing – Manifold to Powder Sources

NOTE: Two types of pickup tube adapters are available: one with an internal O-ring for pickup tubes without an external O-ring, and one without an internal O-ring for pickup tubes with an external O-ring. Refer to *Parts* for the adapter part numbers.

1. Install a lock knob and O-ring on 16-mm powder tubing.
2. Insert the tubing into the quick-disconnect plate.
3. Thread the lock knob into the plate and tighten finger-tight.
4. Route the tubing to the powder source.
5. Install an adapter on the pickup tube.
6. Remove the lock knob and O-ring from the adapter and install them on the powder tubing, lock knob first.
7. Insert the tubing into the adapter, thread the lock knob into the adapter, and tighten finger-tight.

Purge Receptacle

The purge receptacle is used when the manifold is mounted on the color module. The pump suction tubing quick-disconnect adapter plugs into it.

NOTE: This requires access to the inside of the color module. Remove cartridge filters as required.

1. The purge receptacle (2) has $^3/_4$-in. NPSM threads. Drill an appropriately sized hole in the face of the color module.
2. Install the threaded end of the receptacle in the hole, install the seal washer(3) over the threads, then secure the receptacle to the color module with the conduit nut (4).
3. Make sure the coil spring (1) is installed correctly in the internal groove in the receptacle.

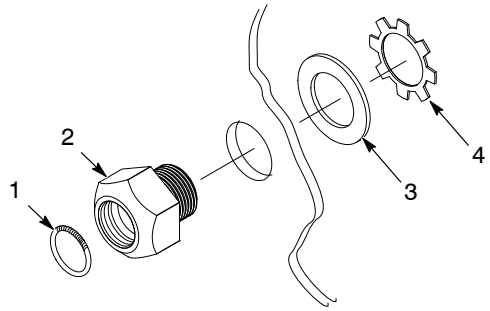

Figure 8 Purge Receptacle Installation

1. Spring
2. Receptacle
3. Seal washer
4. Conduit nut

Remote Purge Operation

See Figure 5. Purging can be controlled remotely if desired. To do so, install a shuttle valve in the pilot air line between the purge valve and the 6-mm tee installed in the line to the process valve, inside the pump station enclosure.

Purge air can then be turned on and off by applying pilot air pressure to the process valve from a remote device. Refer to the pump station manual for a shuttle valve part number.

Controller Programming

The manifold has five ports for powder flow. The controller has five outputs corresponding to the the five manifold ports. When an output is on, air pressure is applied to the corresponding port, closing the port and stopping the flow of powder. When an output is off, then the corresponding port is open and powder can flow through the port. Each output can be set independently to allow varied durations of powder transfer, depending on the source. Each output is cycled in sequence, from output 1 to output 5.

During a purge, the controller turns off the normal sequencing of the outputs. All outputs are cycled on and off based on the open and close purge duration values programmed into the controller. The outputs can be cycled on and off repeatedly or held open continuously while purge air flows through the pump and manifold.

Powder Transfer Settings

Transfer Output OFF Duration: This sets the amount of time that an output is off and the corresponding port is open. These values are used when the PUMP pressure switch PS1 senses that the pump is operating. The controller cycles the outputs in sequence from output 1 to 5, repeating after the duration for output 5 is completed.

Disable Output: To disable an output that is not needed, set the Transfer Output OFF Duration to 0.00. When set to this value, the output will be on continuously, keeping the corresponding port closed.

Purge Operation

Purge Output OFF Duration: This sets the amount of time that all outputs are turned off, the ports are open, and purge air is allowed to flow through the manifold and powder tubing. These values are used when the PURGE pressure switch senses that purge air has been applied to the pump. The controller turns off the normal sequencing of the outputs, then cycles the outputs on and off, using the purge duration values programmed into the controller. Any disabled outputs will also be cycled during the purge.

Purge Output ON Duration: This sets the amount of time that all outputs are turned on. When the outputs are on, all ports are closed and purge air does not flow.

Purge With Continuous Flow: To allow air to flow continuously through the ports during a purge, set all Purge Output ON Durations to 0.00. When set to this value, the outputs will be off continuously, and all ports will be open.

Using the PLC Operator Interface

See Figure 9.

1. Press the ▼ key followed quickly by the **ESC** key.
2. Press the ▼ key until the display pointer is on **SET PARAM**.
3. Press the **OK** key. The display will show **B0x:T** and the register preset valve. Refer to *Data Value Descriptions* on page 17.
4. Press the ▼ or ▲ key to select the the register preset value to change.
5. Press the **OK** key again. The display will highlight the first digit of the preset value.
6. Press the ◀ or ▶ key until the the digit to change is highlighted.
7. Press the ▲ or ▼ key to change the value.
8. After each digit is changed to the desired value, press **OK**.
9. Either go back to step 4 and change the next preset value or press the **ESC** key twice to return to the **RUN** display.

Figure 9 Controller PLC Operator Interface

Data Value Descriptions

Data Value	Description	Initial Setting
B01:T	Output 1 off (port open) duration (seconds)	5.00
B02:T	Output 2 off (port open) duration (seconds)	5.00
B03:T	Output 3 off (port open) duration (seconds)	5.00
B04:T	Output 4 off (port open) duration (seconds)	5.00
B06:T	Output 5 off (port open) duration (seconds)	5.00
B11:T	Purge cycle, outputs off (ports open) duration (seconds)	0.50
B12:T	Purge cycle, outputs on (ports open) duration (seconds)	0.50

Operation

Startup

See Figure 4. Transfer pump and pump station air regulators should be set as follows.

- pump supply air pressure: 4.8 bar (70 psi).
- pinch valve air pressure: 2.4–2.75 bar (35–40 psi.
- conveying air pressure: 0.7–1.0 bar (10–15 psi).

1. Check all powder tubing connections: at the pump, manifold, color module, virgin powder source, and sieve accumulator.
2. Make sure the supply of virgin powder is adequate for the application.
3. Turn on power and air to the system.

   If the pump air regulators are all adjusted properly, the pump will start and reclaimed and virgin powder will be pumped through the manifold to the sieve. Each manifold port will be opened in sequence for the duration set on the controller PLC.

Color Change

See Figures 1 and 2.

1. Stop the pump (2) by reducing the pump supply air pressure to zero, or shutting off the air supply.
2. Disconnect the virgin powder tubing (3) and pickup tube adapter from the powder source, and route the tubing into the booth.
3. If the manifold is mounted on the color module, disconnect the pump suction tubing quick-disconnect adapter from the manifold and plug it into a purge receptacle (11).
4. Turn on the pump again, then press and release the PURGE button repeatedly on the pump station to purge the system, or if remotely controlled, initiate the purge. Pulsing the purge air cleans the pump better than a continuous flow. Purge the system until satisfied that it has been cleaned.
5. Disconnect tubing as necessary, remove the color module from the system, and replace it with a new color module:

   Fan Section Mounted Manifold:

   a. Disconnect the delivery tubing (5) from the sieve (9).

   b. See Figure 3. Release the manifold quick-disconnect plate clamps (10).

   c. Secure the powder tubing and quick-disconnect plate on the color module.

   d. Relieve the color module seal air pressure, unclamp the color module from the fan section, and roll the color module away from the booth.

e. Roll the new color module under the fan section and clamp it in place. Inflate the seal.

f. Connect the delivery tubing to the sieve, and the manifold quick disconnect plate to the manifold.

g. Connect the virgin powder tubing adapter to the new powder source pickup tube.

Color Module-Mounted Manifold:

a. See Figures 1 and 2. Disconnect the delivery tubing (5) from the sieve (9).

b. See Figure 3. Disconnect the pinch valve air tubing from the manifold fittings (6).

c. See Figures 1 and 2. Disconnect the pump suction tubing quick disconnect (7) from the purge receptacle.

d. Relieve the color module seal air pressure, unclamp the color module from the fan section, and roll the color module away from the booth.

e. Roll the new color module under the fan section and clamp it in place. Inflate the seal.

f. Connect the pump suction tubing quick disconnect to the manifold.

g. Connect the pinch valve air tubing to the manifold fittings.

h. Connect the virgin powder tubing adapter to the new powder source pickup tube.

Maintenance

To keep the system clean and functioning properly, perform the following:

- Purge the system daily, even if you do not change colors.
- Check the powder tubing and replace any sections that are damaged or clogging with powder.
- The manifold pinch valves are visible through the clear pinch valve chamber. Check the pinch valves daily. If powder is visible in the chamber around a pinch valve, the valve may have failed and should be replaced.
- Maintain the pump as described in the pump manual.

Troubleshooting

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

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

Troubleshooting Chart

Problem	Possible Cause	Corrective Action
1. Powder color contamination	System not being purged long enough.	Increase purge cycle time.
	Purge pulsing inadequate to properly clean system.	Increase purge cycle on durations. Refer to page 17.
2. Powder not being pumped out of color module or virgin source	Obstructed suction line	Check for blockage, clean as necessary.
	Solenoid valve in controller failed	Check solenoid valve operation when pump is operating. If solenoid valve is not actuating, check PLC programming. Check wiring. Replace solenoid valve if necessary.
	Pump pressure switch tubing disconnected, or switch failed	Pump operating air closes pressure switch PS1. Check switch wiring and tubing to pump. Replace switch if necessary.
	Pinch valve failed	Replace pinch valve.

Schematics

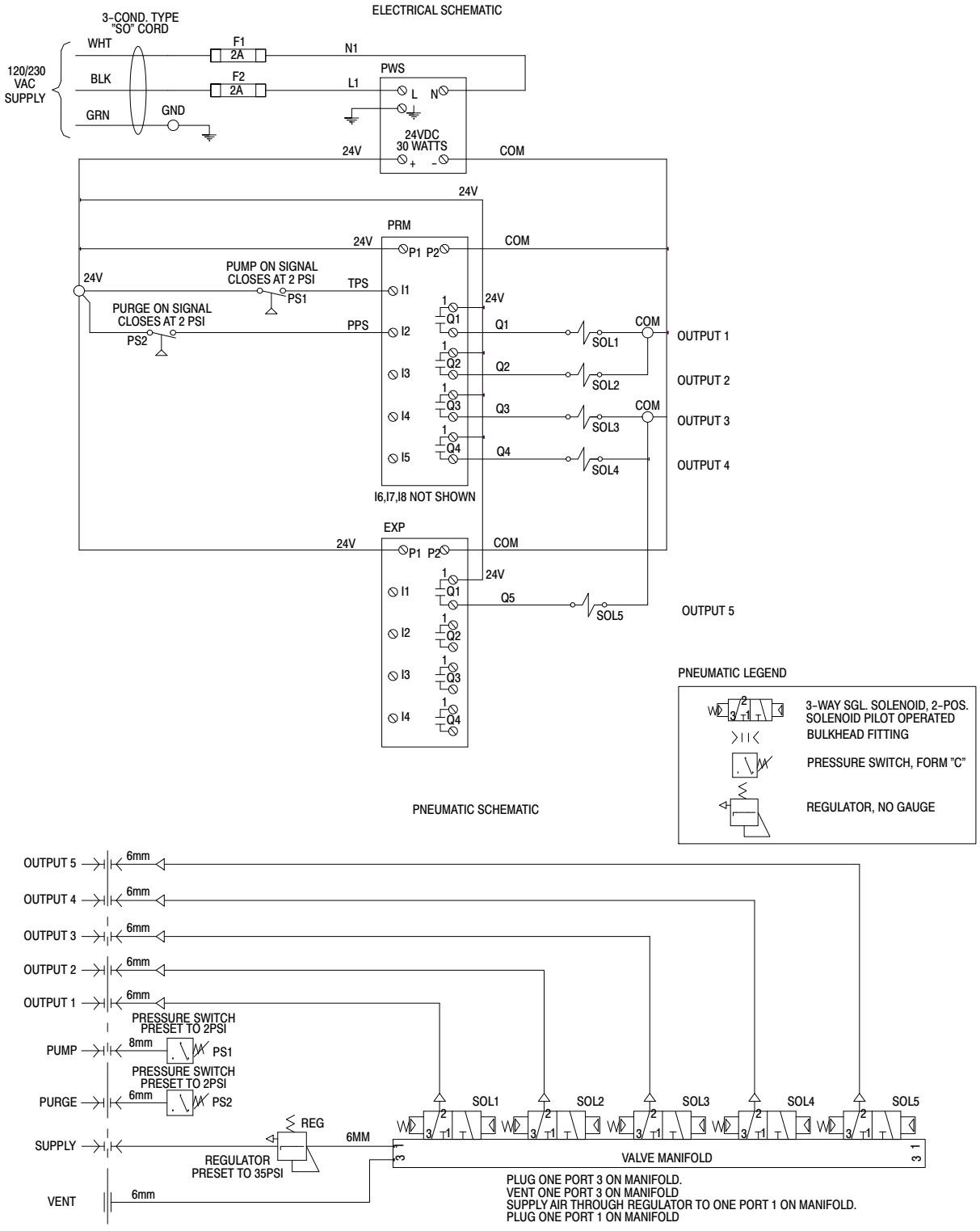

Figure 10 System Controller Electrical and Pneumatic Schematics

Repair

Manifold Disassembly

1. Purge the system until free of powder.
2. Unclamp and remove the quick-disconnect plate (1) and powder tubing.
3. Pull the quick-disconnect adapter (10) and pump suction tubing out of the output plate.
4. Remove the two screws, washers, and nuts (6) and remove the manifold from its mounting.

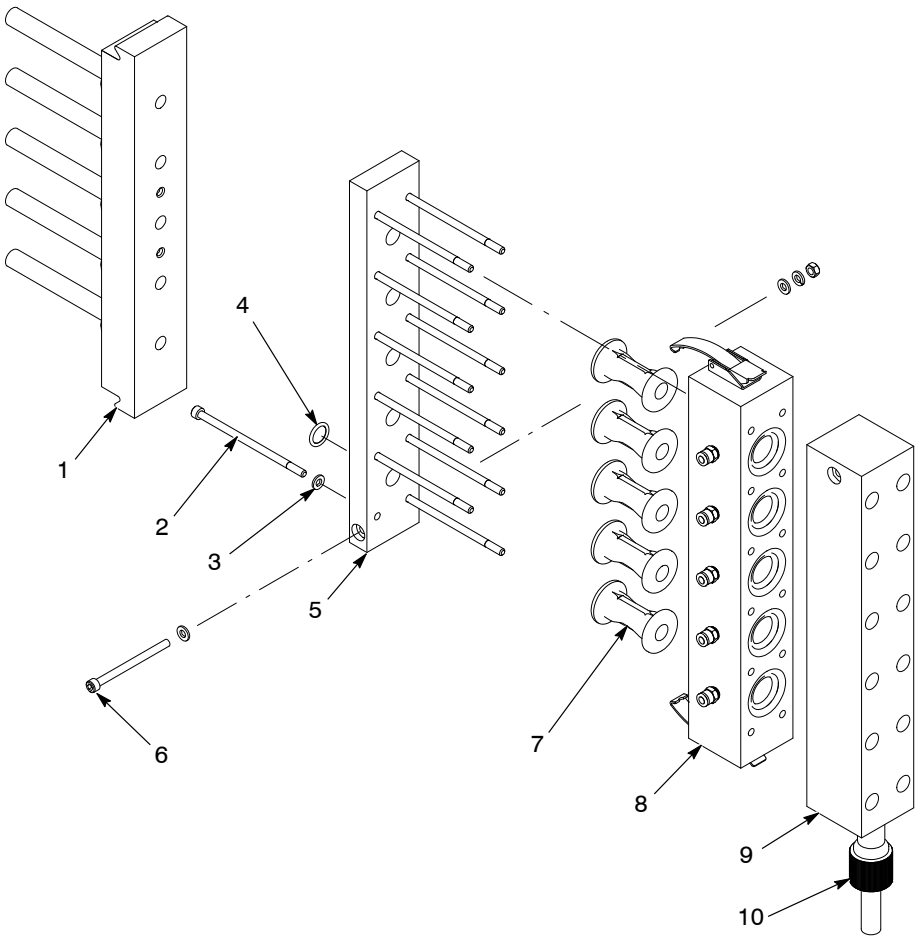

Figure 11 System Controller Electrical and Pneumatic Schematics

1. Quick-disconnect plate
2. Screws
3. Washers
4. O-rings
5. Input plate
6. Mounting screws
7. Pinch valves
8. Pinch valve chamber
9. Output plate
10. Quick-disconnect adapter

5. Remove the 12 socket-head screws and washers (2, 3) from the input plate (5) and remove the input plate from the pinch valve chamber.
6. Inspect the five O-rings (4) in the input plate and replace any that are damaged.

Pinch Valve Removal

See Figure 12. The pictures show the pump pinch valve body, but the removal and installation procedures are the same for the color module manifold.

1. Place the pinch valve chamber in a padded vise with the bottom end facing you. Grasp and pull the bottom end of the pinch valve with one hand, while using your other hand to pinch the opposite end of the pinch valve.
2. Pull the pinch valve firmly until it comes out of the pinch valve chamber.

Figure 12 Pinch Valve Removal (Pump Valve Body Shown, Procedure is Same)

Pinch Valve Installation

See Figure 13. The pictures show the pump pinch valve body, but the removal and installation procedures are the same for the color module manifold.

1. Turn the pinch valve chamber around so that the top end faces you. Insert the pinch valve insertion tool into the pinch valve chamber.
2. Pinch the UP end of the pinch valve and insert it into the pinch valve insertion tool.
3. While pinching the UP end of the pinch valve in the insertion tool, pull on the insertion tool to pull the pinch valve through the chamber.
4. Pull the pinch valve insertion tool firmly until the UP end of the pinch valve and the entire insertion tool come out the top of the pinch valve body.

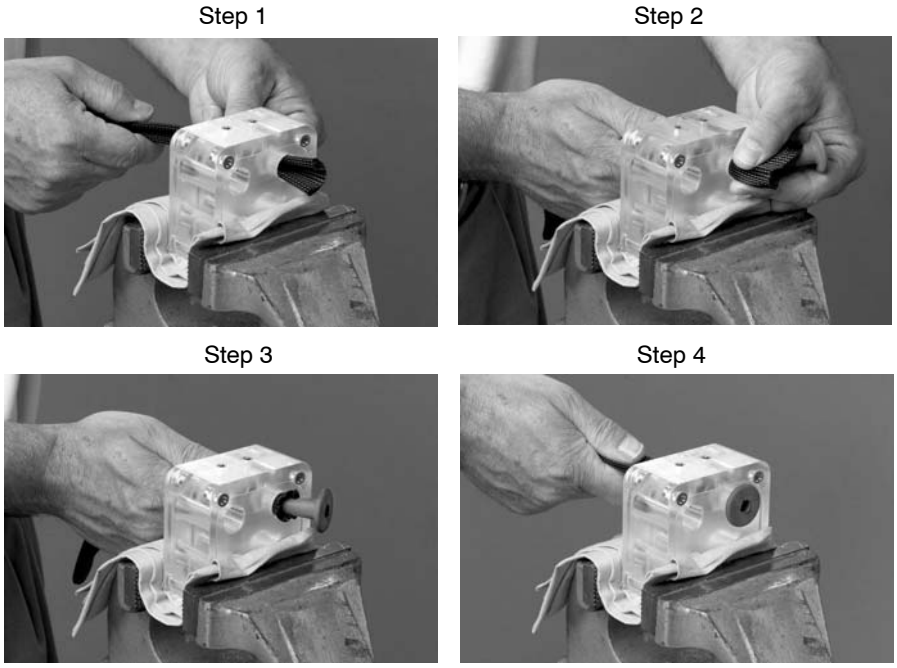

Figure 13 Pinch Valve Installation (Pump Valve Body Shown, Procedure is Same)

Pump Repairs

For pump repairs, refer to the following manuals:

HDLV Transfer Pump: 1092270A
Transfer Station: 1073134A

These manuals are available for download from:
http://emanuals.nordson.com/finishing

Parts

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

Pump and Pump Station Parts

For pump and pump station parts, refer to the following manuals:
HDLV Transfer Pump: 1092270A
Transfer Station: 1073134A
These manuals are available for download from:
http://emanuals.nordson.com/finishing

One Manifold per Fan Section Order Matrix

Part	Component	Qty/Instruction
1102247	System Assembly, HDLV-CMT	Qty = 1 (includes 1067320 pump station with pump, 102225 manifold, 110224 plate assembly, system controller, and 100 ft spool of 16-mm tubing).
1102224	Plate Assembly, quick disconnect, manifold, HDLV-CMT	Qty = number of color modules minus 1 (1102247 system assembly includes 1 plate).
1068408	Disconnect, High-Capacity HDLV pump, w/mount O-ring	Qty = total qty of old style venturi pumps per module and per bulkfeed (O-ring internal to pump body).
1068409	Disconnect, High-Capacity HDLV pump, w/out mount O-ring	Qty = total qty of new style venturi pumps per module and per bulkfeed (O-ring on pump mount)
1063654	Tube, polyethylene, 16-mm OD	Qty = total qty required in excess of the 30.5 m (100 ft) spool supplied with system.

One Manifold per Color Module Order Matrix

Part	Component	Qty/Instruction
1102247	System Assembly, HDLV-CMT	Qty = 1 (includes 1067320 pump station with pump, 102225 manifold, 110224 plate assembly, system controller, and 100 ft spool of 16-mm tubing).
1102225	Manifold Assembly, HDLV-CMT	Qty = number or color modules minus 1 (1102247 system assembly includes 1 plate).
1102139	Kit, Purge Receptacle, HDLV-CMT	Qty = number of color modules.
1068408	Disconnect, High-Capacity HDLV pump, w/mount O-ring	Qty = total qty of old style venturi pumps per module and per bulkfeed (O-ring internal to pump body).
1068409	Disconnect, High-Capacity HDLV pump, w/out mount O-ring	Qty = total qty of new style venturi pumps per module and per bulkfeed (O-ring on pump mount)
1063654	Tube, polyethylene, 16-mm OD	Qty = total qty required in excess of the 30.5 m (100 ft) spool supplied with system.

Manifold Parts

See Figure 14.

Item	Part	Description	Quantity	Note
–	1102225	MANIFOLD ASSEMBLY, HDLV–CMT	1	
1	1102221	• KNOB, tube lock, manifold, HDLV-CMT	5	A
2	941143	• O-RING, silicone, 0.625 x 0.813 x 0.094 in.	10	A
3	1102224	• PLATE, quick disconnect, manifold, HDLV-CMT	1	A
4	1054518	• SCREW, socket head, M6 x 120, stainless steel	12	
5	983201	• WASHER, flat, regular, M6, steel, zinc	28	
6	982185	• SCREW, socket head, M6 x 75, black	2	
7	1102217	• PLATE, multi-port, quick-disconnect, manifold, HDLV-CMT	1	
8	1092273	• KIT, pinch, black, HDLV hi-capacity, 4-pack	2	B
9	972141	• CONNECTOR, male, 6 mm tube x $^1/_8$ in. unithread	5	
10	1102215	• CHAMBER, pinch, manifold, HDLV-CMT	1	
11	1102216	• PLATE, supply, quick-disconnect, manifold, HDLV-CMT	1	
12	- - - - - -	• SPRING, canted coil, 0.875 in. 302 stainless steel	1	
13	940175	• O-RING, silicone, 0.688 x 0.813 x 0.062 in.	1	C
14	- - - - - -	• ADAPTER, male, quick disconnect, 16-mm powder tube	1	C
15	941143	• O-RING, silicone, 0.625 x 0.813 x 0.094 in.	1	C
16	1068402	• NUT, tube retaining, hi-capacity HDLV pump	1	C
17	984703	• NUT, hex, M6, steel, zinc	14	
18	983409	• WASHER, lock, split, M6, steel, zinc	14	
19	- - - - - -	• SCREW, pan head, recessed, M4 x 12, zinc	4	
20	1102127	• LATCH, draw, over center, heavy duty, steel, zinc	2	

NOTE A: Noted parts are also available in part number 1102224 Plate Assembly, Quick Disconnect, Manifold, HDLV-CMT.

B: Pinch valve kit is also used on pump. Kit contains 4 pinch valves, 2 filter dics, 2 O-rings, and valve insertion tool. If replacing all 5 pinch valves, order 2 kits. Save filter dics and O-rings to use on pump.

C: Noted parts are also available in part number 1102222 Adapter Assembly, Male, Quick Disconnect, 16-mm Powder Tube.

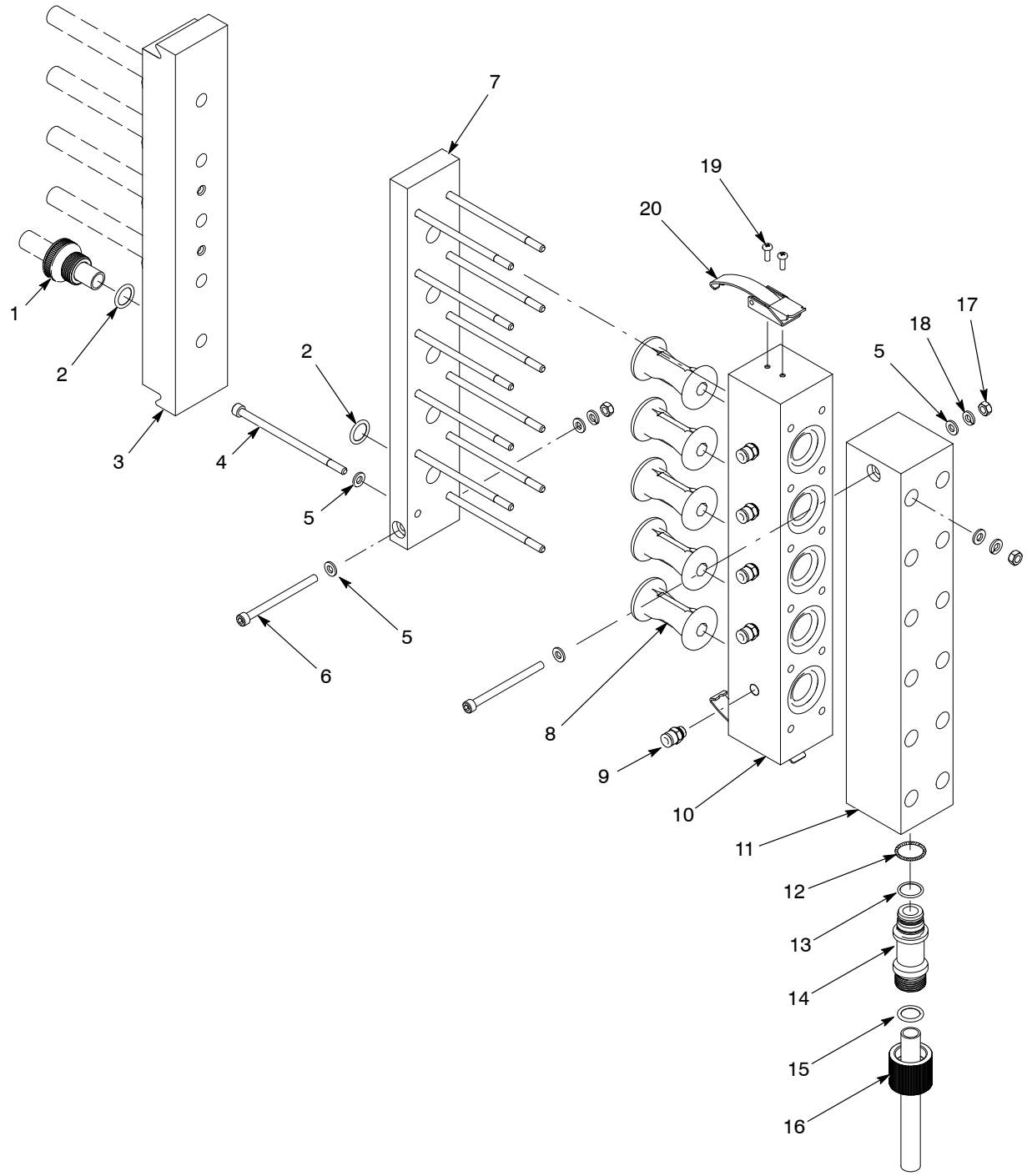

Figure 14 Manifold Parts

Controller Parts

See Figure 15.

ITEM	QTY	DESCRIPTION	PART NUMBER	MANUFACTURER
	1	ENCLOSURE, 12 x 12	A-1212CH	HOFFMAN
	1	SUBPANEL	A-12P12	HOFFMAN
	A/R	DIN RAIL	---	---
	3	TERMINAL BLOCK	1492-J4	ALLEN-BRADLEY
	1	TERMINAL BLOCK, GROUND	1492-JG4	ALLEN-BRADLEY
	1	JUMPER, TERMINAL, 2-POS	1492-CJLJ6-2	ALLEN-BRADLEY
	1	END PLATE, TERMINAL	1492-EBJ3	ALLEN-BRADLEY
	2	END STOP, TERMINAL	1492-EAJ35	ALLEN-BRADLEY
FU1, FU2	2	FUSEHOLDER, 1-POLE	1492-H6	ALLEN-BRADLEY
FU1, FU2	1	END PLATE, FUSEHOLDER	1492-N37	ALLEN-BRADLEY
FU1, FU2	2	FUSE, 2A	MDQ-2	BUSSMANN
PWS	1	POWER SUPPLY, 24VDC, 30WATT	PS5R-VC24	IDEC
PRM*	1	RELAY MODULE, PROGRAMMABLE	6ED1052-1HB00-0BA8	SIEMENS
EXP	1	RELAY MODULE, EXPANSION	6ED1055-1HB00-0BA2	SIEMENS
PS1, PS2	2	PRESSURE SWITCH, N.O., 2 PSI	76056	HOBBS
MANIFOLD	1	MANIFOLD BAR ASSEMBLY, 5-POS	EBM35A-001A-05	MAC
SOL1, 2, 3, 4, 5	5	SOLENOID VALVE, 3-WAY, 24VDC	35A-B00-DDACA-1BA	MAC
SOL1, 2, 3, 4, 5, REG (2), MANIFOLD (2)	9	MALE ELBOW, 6MM X 1/8RPT, W/SEALANT	KQ2L06-01S	SMC
OUTPUT1, 2, 3, 4, 5, SUPPLY	6	BULKHEAD UNION, 6MM T	KQ2E06-00	SMC
VENT	1	BREATHER VENT	F28	ALWITCO
VENT	1	FEMALE CONNECTOR, 6MM X 1/4NPT	KQ2F06-02	SMC
PS1	1	BULKHEAD CONNECTOR, 8MM X 1/8NPT	KQ2E08-01	SMC
PS2	2	BULKHEAD CONNECTOR, 6MM X 1/8NPT	KQ2E06-01	SMC
REG	1	REGULATOR,FIXED PRES, 35PSI	14RCB1FL035	WATTS
REG	1	BRACKET (WITH PANEL NUT)	PS417BP	WATTS
REG		PIPE PLUG, 1/8NPT	---	---
	A/R	6MM OD POLYTUBING	TU0604-BU	SMC
	2	CORD GRIP CONNECTOR	---	---
	20 FT.	4-COND. TYPE "SO" CORD, LIGHT GAGE	---	---

NOTE: The programmable relay module must be loaded with an application program (part 1101714A) when ordered as a replacement or spare part.

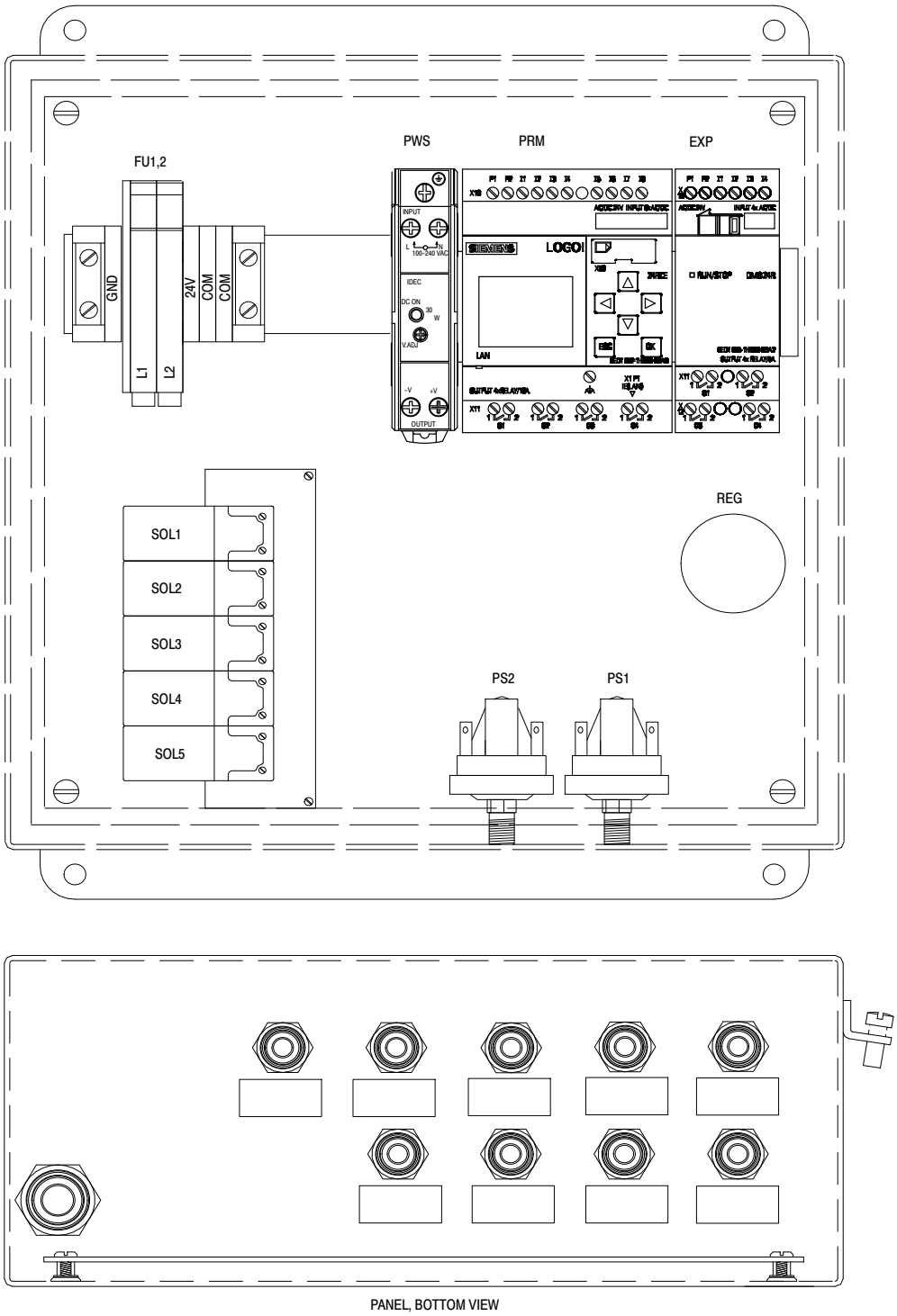

Figure 15 System Controller Parts

Purge Receptacle

See Figure 16.

Item	Part	Description	Quantity	Note
–	1102139	KIT, purge receptacle, HDLV-CMT	1	
1	- - - - - -	• SPRING, canted coil, 0.875 in ID 302 stainless steel		
2	- - - - - -	• RECEPTACLE, purge, HDLV-CMT	1	
3	983055	• WASHER, pump mount	1	
4	939613	• LOCKNUT, conduit, 3/4 in. NPS	1	

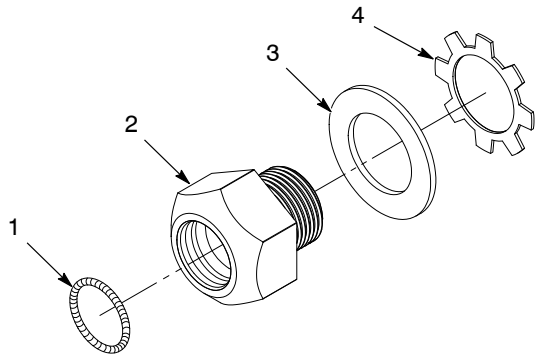

Figure 16 Purge Receptacle Parts

Pickup Tube Adapters

See Figure 17. Use the adapter with the O-ring mount for pickup tubes without O-rings; use the adapter without the O-ring mount for pickup tubes with external O-rings.

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	

Item	Part	Description	Quantity	Note
—	1068409	DISCONNECTOR, high-capacity HDLV pump, without 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	1068400	• MOUNT, pump adapter, without O-ring gland	1	

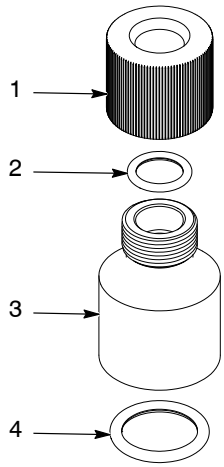

Figure 17 Pickup Tube Adapter Parts

Miscellaneous Parts

Part	Description	Note
1063654	TUBE, polyethylene, 16 mm OD	A
900742	TUBING, polyurethane, 6/4 mm, blue	B
900618	TUBING, polyurethane, 8 mm OD, blue	B
972313	UNION, tee, 8 mm tube x 8 mm tube x 8 mm tube	
971114	UNION, tee, 6 mm tube x 6 mm tube x 6 mm tube	

NOTE A: This part number is a 30 meter (100 ft) roll.
B: Minimum order quantity is 15.25 meters (50 ft)