

Econo-Coat Series II Powder Coating System

Customer Product Manual

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Section 1

Safety

Introduction

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

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

Qualified Personnel

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

Intended Use

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

Some examples of unintended use of equipment include

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

Regulations and Approvals

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

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

Personal Safety

To prevent injury follow these instructions.

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

Fire Safety

To avoid a fire or explosion, follow these instructions.

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

Grounding



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

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

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

Action in the Event of a Malfunction

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

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

Disposal

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

Section 2

Description

Introduction

See Figure 2-1. The Econo-Coat Series II powder coating system is a compact powder booth and recovery system for batch, short-run, and custom-color manual coating operations. The system features a 25-square-foot polypropylene or stainless steel booth enclosure and a collector module with control panel, exhaust fan, two primary filter cartridges, and two final filters.

The system can be fixed in place. Optional casters are available. It does not include powder application equipment. Manual application systems must be purchased separately.

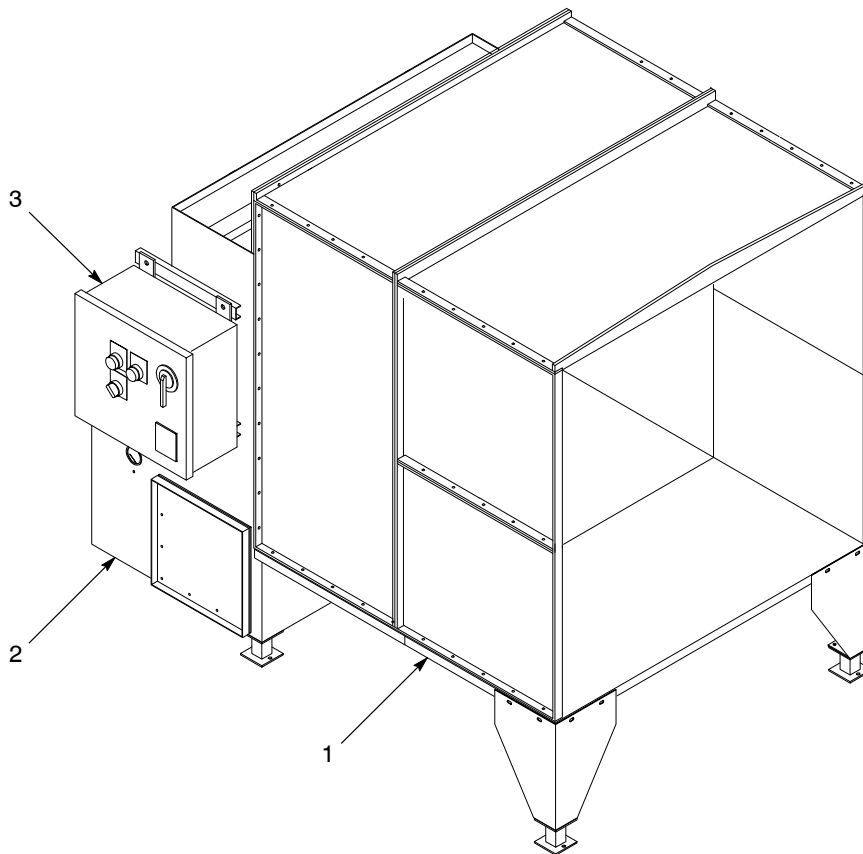


Figure 2-1 Econo-Coat Powder Coating System

1. Enclosure

2. Collector module

3. Electrical panel

System Components and Operation

See Figure 2-2. Powder is fluidized (made to assume the properties of a liquid) in a feed hopper by compressed air diffused through a porous fluidizing plate. A powder pump, operated by compressed air, supplies the fluidized powder to the spray gun.

A high-voltage, low-amperage power supply in the spray gun (3) generates an electrostatic field at the nozzle. Powder particles passing through this field are charged and attracted to the grounded parts hanging in the booth enclosure (1).

The exhaust fan in (8) the collector module (5) pulls air from the spray room through the booth enclosure and into the cartridge filters (10). The air passes through the cartridge filters and is forced through the final filters (7). The clean, powder-free air is returned to the spray room.

Overspray (powder not adhering to the parts) is carried by the air flowing through the booth to the cartridge filters, where it collects on the external surfaces. When activated, the pulse valves (6) force air from the pulse air manifold (4) through the cartridge filters in the opposite direction from the normal flow (called reverse-pulsing or blowdown). The pulse air cleans accumulated powder from the cartridge filter media. The powder falls to the bottom of the collector module where it can be recovered and reused or discarded.

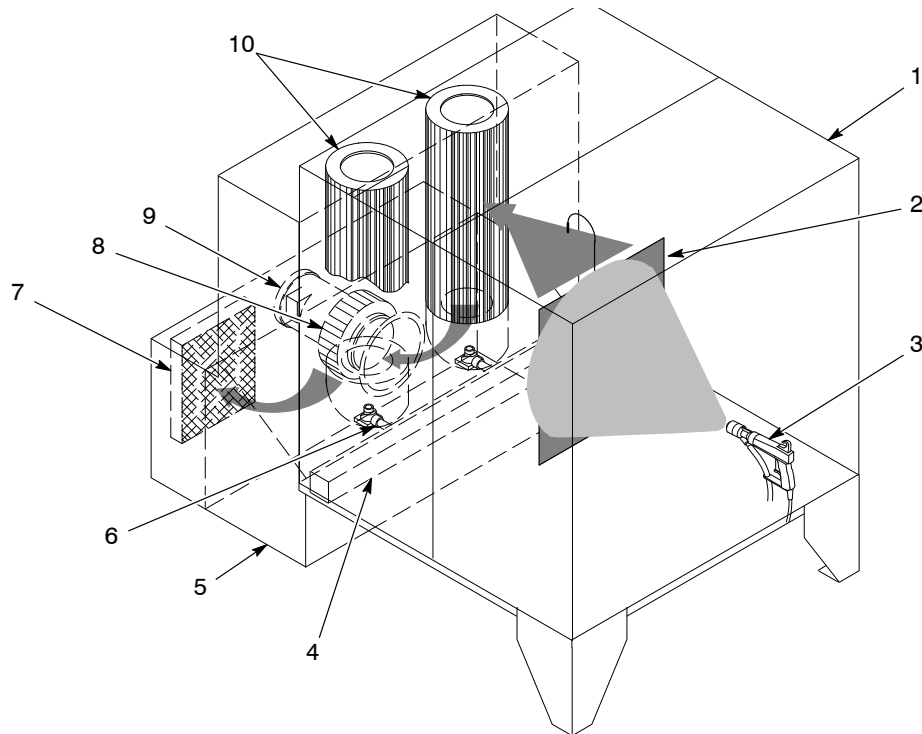


Figure 2-2 System Operation

- | | | |
|-----------------------|---------------------|-----------------------|
| 1. Enclosure | 5. Collector module | 8. Exhaust fan |
| 2. Part | 6. Pulse valve | 9. Fan motor |
| 3. Spray gun | 7. Final filters | 10. Cartridge filters |
| 4. Pulse air manifold | | |

Options

The optional equipment listed below can be ordered from your Nordson representative.

- stainless steel or polypropylene enclosure
- apparatus for sliding hanging parts in and out of the booth
- non-conductive squeegees for cleaning the booth enclosure
- casters
- compressed air dryers
- compressed air filter packages
- powder application equipment—separately or as a mobile system:
 - dolly with vibratory box feeder and air control panel
 - powder pump
 - manual electrostatic powder spray gun
 - manual gun control unit
 - air tubing, powder feed hose, ground cables

Booth Controls

Refer to Table 2-1 and Figure 2-3 for a description of the booth controls.

Table 2-1 Booth Control Component Functions

Item	Function
1. Main disconnect switch	Turns system electrical power on and off.
2. Exhaust fan stop pushbutton (EXHAUSTER STOP)	Shuts off the exhaust fan, and turns off power to the system electrical and pneumatic devices. When pressed, the amber exhaust fan light turns off.
3. Exhaust fan start pushbutton (EXHAUSTER START)	Starts the exhaust fan, and turns on power to the system electrical and pneumatic devices. When pressed, the amber exhaust fan light turns on.
4. Pulse air selector switch (BLOWDOWN)	Activates the pulse timer to allow pulsing at preset intervals.
5. Differential pressure gauge	Shows the air pressure drop across the final filters.
6. Solenoid valves	Provide pilot air to trigger the pulse valves upon signals from timer board.
7. Pulse timer OFF adjustment screw	Sets the time between cartridge filter air pulses. Range is 1.5–30.0 seconds.
8. Pulse timer ON adjustment screw	Sets the duration of cartridge filter air pulses. Range is 0.05–0.50 seconds.
9. Timer board LEDs	Light when the timer board triggers the solenoid valves.
10. Pressure switch	Senses the air pressure drop across the final filters. Shuts the system down if the final filters clog, causing the air pressure drop to exceed the switch setting. The adjustment screw on the switch changes the setting. The factory setting is 5-in. wc (water column).

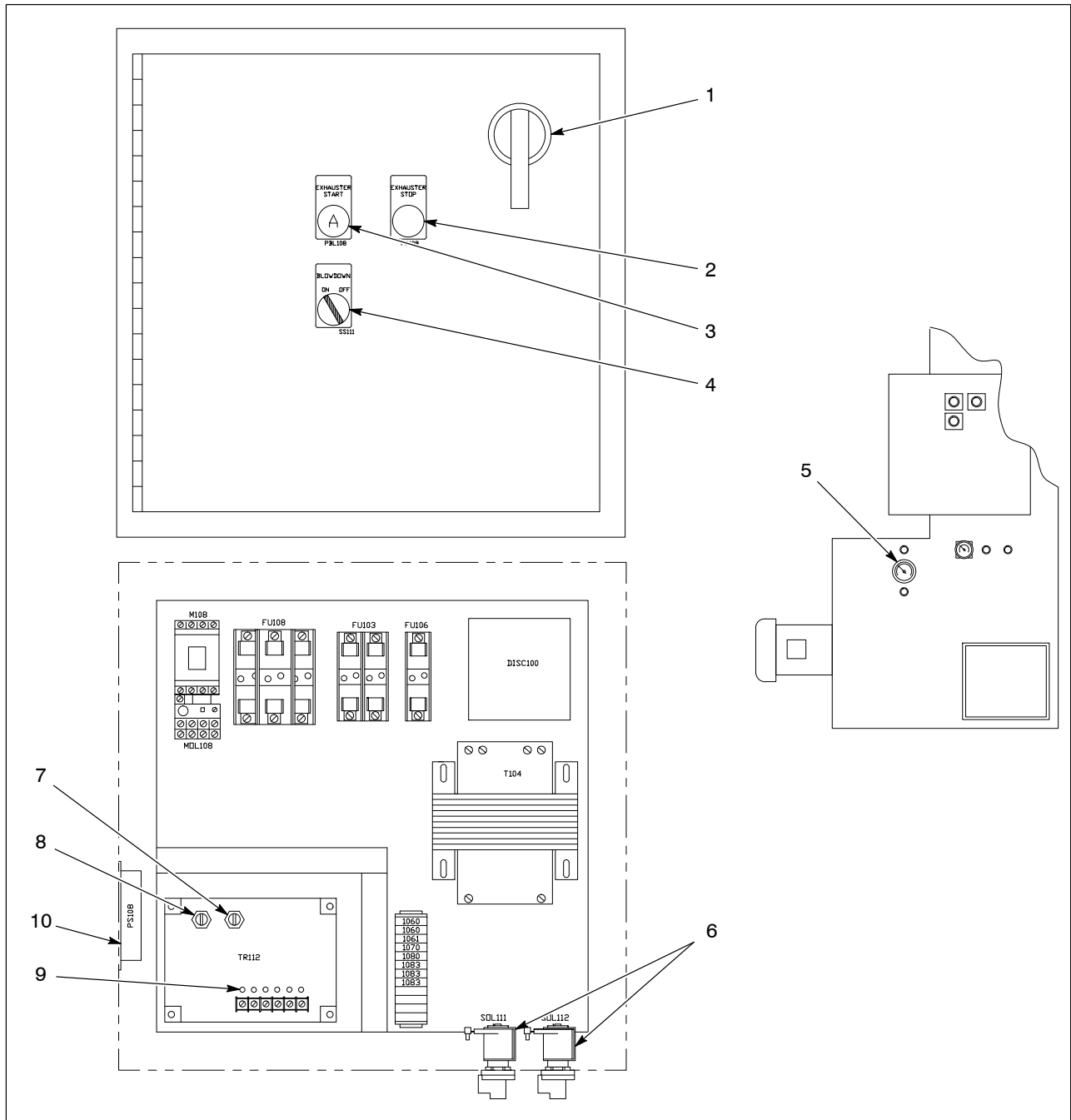


Figure 2-3 Booth Control Components

Specifications

Weight

Assembled system: Approximately 409 kg (900 lb)

Dimensions, Overall System

Width	160.02 cm (5 ft 3 in.)
Length	276.86 cm (9 ft 1 in.)
Height	210.82 cm (6 ft 11 in.)

Dimensions, Enclosure

(Inside dimensions)	
Width	152.4 cm (5 ft)
Length	152.4 cm (5 ft)
Height	152.4 cm (5 ft)

Utilities Required

The customer must supply the following utilities to the system.

Electrical

230/460 Vac, 30 ampere, 3 phase, 50/60 Hz primary electrical service. A lockable, fused disconnect switch must be installed in the service line ahead of powder system.

Compressed Air

Clean, dry, oil-free air at 4.1–6.89 bar (60–100 psi). Condition the system air supply with a dedicated refrigerated or regenerative desiccant-type air dryer that can produce a pressure dewpoint of -6.7–3.4 °C (20–38 °F) or lower dewpoint at 6.89 bar (100 psi). Filtration should be 99% efficient at removing all particles, including liquid and oil aerosols, larger than 0.3 microns. Oil vapor or aerosol content should not be more than 0.1 parts per million (ppm).

Operating Environment

The system should be located in a controlled environment. If the temperature and humidity within the spray room exceed the ranges listed below, air conditioning should be installed.

Temperature	21–26.7 °C (70–80 °F)
Humidity	45–55% RH

Design Considerations

Observe the design considerations listed in Table 2-2 while installing and operating the Econo-Coat Series II system.

Table 2-2 Design Considerations

Average face velocity	The exhaust fan should pull air through all enclosure openings at 31.25 mpm (100 fpm) minimum to contain the powder within the booth.
Area of enclosure openings	Total area of all enclosure openings must not exceed 2.34 square meters (25 square feet)
Cross drafts	Air moving across the booth openings should not exceed 18.75 mpm (60 fpm).
Part temperature	Parts should not be hotter than 49 °C (120 °F). Convection currents created by hot parts will prevent powder from coating the parts evenly.
Powder quality	Nordson powder coating systems are designed to operate with commercially available powders. The characteristics and properties of a powder coating material can affect system performance. Powder coatings generally have an average particle size of 25–35 microns, with no more than 10% of the total being less than 10 microns (fines). If recycling and sieving causes the percentage of fines to reach 10% of the total, plugging (blinding) of the cartridge filter media can occur.

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.

Unpacking

The collector module is shipped attached to a wooden pallet. The enclosure panels, support legs, cartridge filters, and other system components are shipped in a separate crate.

1. Move the pallet and crate to a clean, open area near the installation site.
2. Dismantle the wooden crate containing the system components. Identify the enclosure panels, angle braces (used on stainless steel enclosures), and legs, and lay them out on the floor.
3. See Figure 3-1. Locate the 3 extension legs (5) or casters (6) and 12 $\frac{3}{8}$ -16 x 1 in. hex bolts (A) and lock washers (B, D).
4. Cut the metal bands holding the collector module (1) to the pallet. Secure the extension legs or casters to the bottom of the collector module as shown in Figure 3-1.
5. Remove the collector module from the pallet, set it upright on the floor, and move it to the installation site.

Assembly

1. Locate and identify the fasteners used to assemble the enclosure.
 - a. See Figure 3-3. $\frac{3}{8}$ -16 nylon hex bolts (A) and nylon nuts (B) for joining polypropylene panels and attaching them to the collector module and floor panels.
 - b. See Figure 3-1. $\frac{3}{8}$ -16 steel hex bolts (A), nuts (E), flat washers (C), and lock washers (B, D) to join steel panels and to secure enclosure legs to floor panels.
 - c. $\frac{3}{8}$ -16 steel hex bolts (A) and lock washers (B) to secure the extension legs or casters to the enclosure legs.
2. Level the collector module from side-to-side and end-to-end to ± 1.59 mm ($\frac{1}{16}$ in.). Shim under the module corners as necessary.
3. Assemble the enclosure as described in the following steps.

Floor Assembly

1. See Figure 3-1. Use the fasteners shown to bolt the leg extensions (5) or casters (6) to the legs (4).
2. Bolt the floor panel (2) to the floor panel (3).
3. Bolt the legs (4) to the floor panel (3).
4. Bolt the floor panel (2) to the collector module (1).

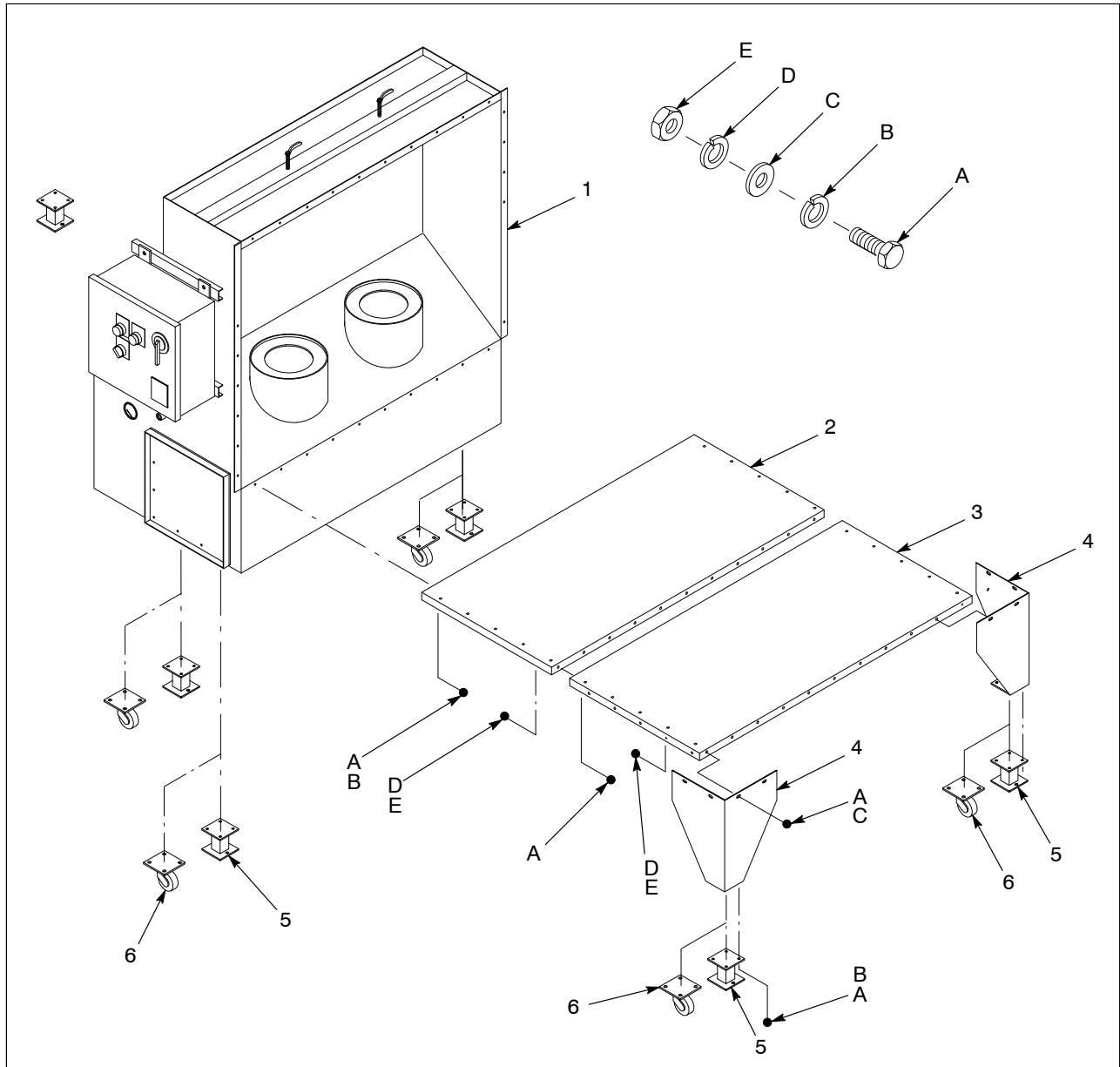


Figure 3-1 Floor Assembly

- | | | |
|---------------------|--|--|
| 1. Collector module | 5. Leg extensions | C. $\frac{3}{8}$ -16 steel flat washer |
| 2. Floor panel | 6. Caster | D. $\frac{3}{8}$ -16 steel lock washer |
| 3. Floor panel | A. $\frac{3}{8}$ -16 steel hex bolts | E. $\frac{3}{8}$ -16 steel nut |
| 4. Leg | B. $\frac{3}{8}$ -16 steel lock washer | |

Polypropylene Enclosure Assembly

1. See Figure 3-2. Use the fasteners shown to bolt the side panels (3, 4) to the floor panels and to the collector module.
2. Bolt the back panel (1) to the side panels and to the collector module.
3. Bolt the roof panel (2) to the side panels.

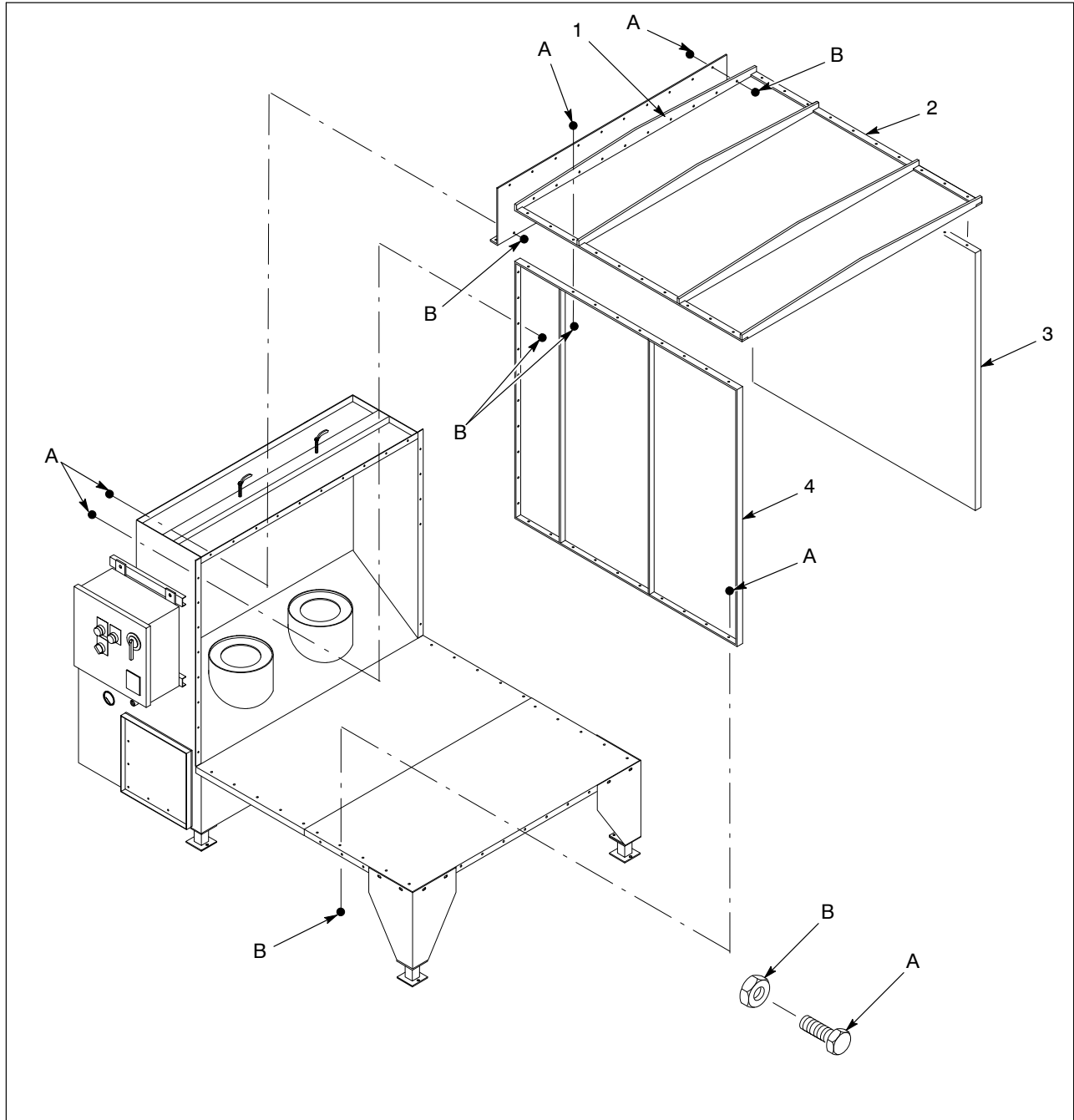


Figure 3-2 Polypropylene Enclosure Assembly

- 1. Back panel
- 2. Roof panel

- 3. Side panel
- 4. Side panel

- A. $\frac{3}{8}$ -16 nylon bolt
- B. $\frac{3}{8}$ -16 nylon nut

Stainless Steel Enclosure Assembly

1. See Figure 3-3. Use the fasteners shown to bolt the side panels (3) to the floor panels, to each other, and to the collector module.
2. Bolt the back panel (1) to the side panels and to the collector module.
3. Bolt the roof panels (2) to the side panels.
4. Bolt the angles (4) to the front edge of the side panels. Overlap the joint between the upper and lower panels evenly.

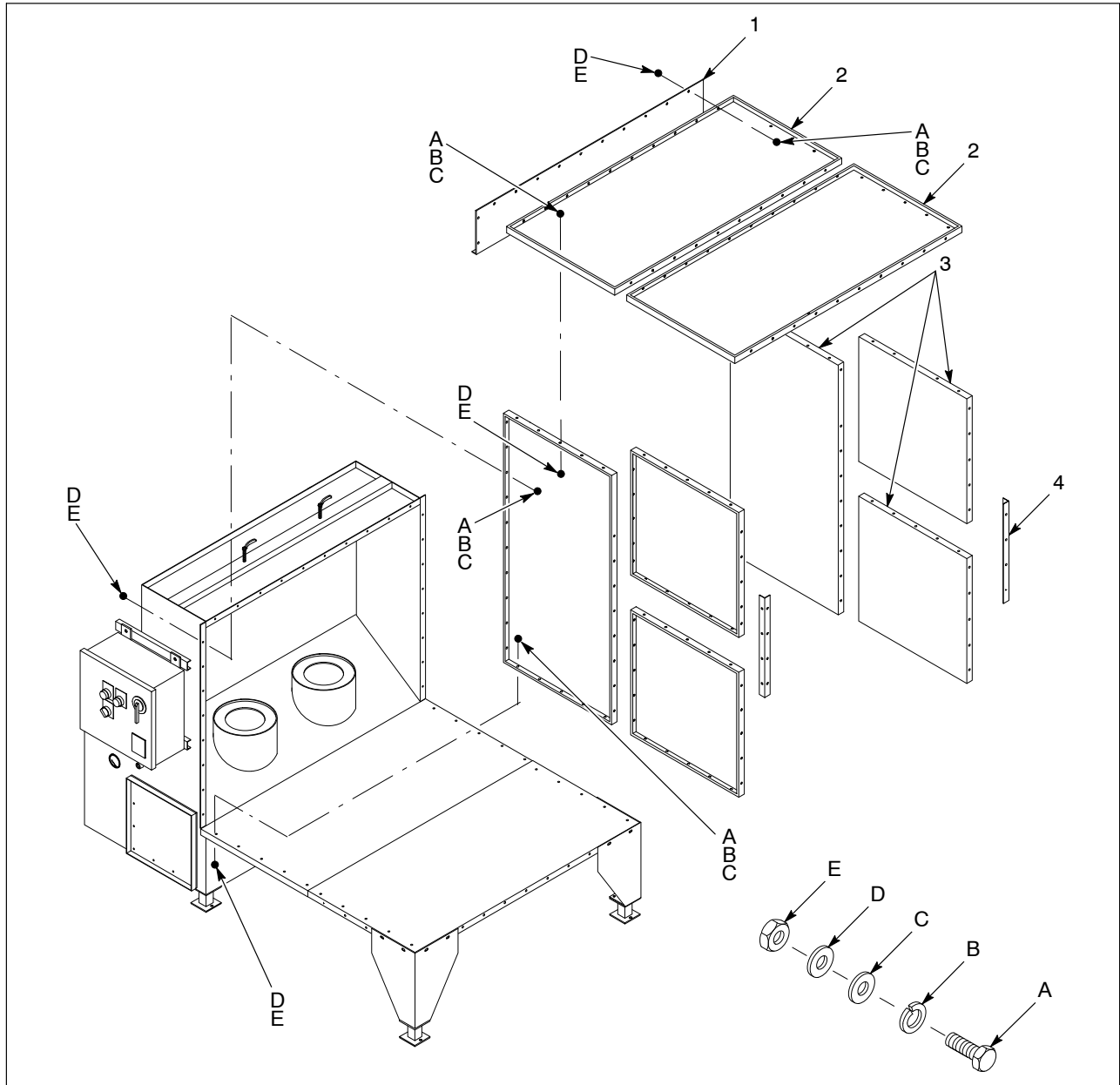


Figure 3-3 Stainless Steel Enclosure Assembly

- | | | |
|----------------|---|---|
| 1. Back panel | 4. Angles | C. $\frac{3}{8}$ -16 steel flat washers |
| 2. Roof panels | A. $\frac{3}{8}$ -16 steel bolts | D. $\frac{3}{8}$ -16 steel flat washers |
| 3. Side panels | B. $\frac{3}{8}$ -16 steel lock washers | E. $\frac{3}{8}$ -16 steel nuts |

Part Hanger Bar Installation

1. See Figure 3-4. Thread the flanges (2) onto the part hanger bar (1).
2. Position the bar between the side panels (3). Hold the bar level and equidistant from the ends of the side panels. Drill four bolt holes in each side panel. Use the flanges as templates.
3. Secure the hanger bar to the side panels with the fasteners shown.

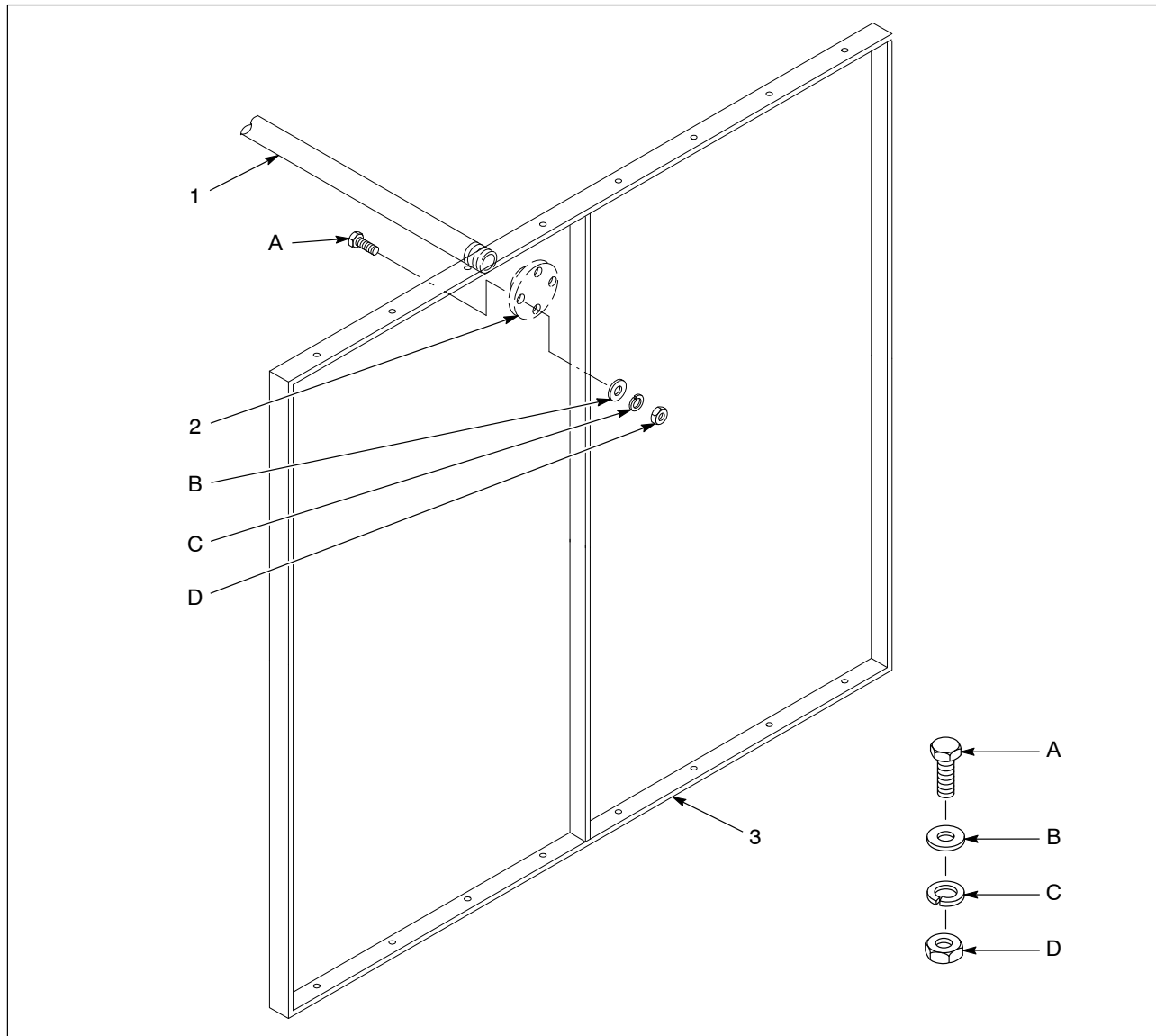


Figure 3-4 Part Hanger Bar Installation

- | | | |
|--------------------|---|------------------------------------|
| 1. Part hanger bar | A. $\frac{1}{4}$ -20 steel bolt | C. $\frac{1}{4}$ steel flat washer |
| 2. Flanges | B. $\frac{1}{4}$ -in. steel lock washer | D. $\frac{1}{4}$ -20 steel nut |
| 3. Side panel | | |

Electrical Connections



WARNING: Shut off and lock out electrical power before connecting the service line to the system electrical panel. Failure to observe this warning could result in personal injury or death from electrocution.



WARNING: Electrical connections must be performed by qualified personnel. All wiring and connections must conform to codes.

1. See Figure 3-5. Install a fused service disconnect and lockout switch (3) where the service line to the Econo-Coat Series II system connects to the plant electrical system.
2. Route rigid or flexible armored conduit and wiring from the disconnect to a knockout in the top right side of the system electrical panel (14).



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.

3. Connect the service line wiring (15) to the L1, L2, L3, and ground connections at the top of the panel disconnect switch.
4. Connect the booth and the electrical panel to a true earth ground.
5. Check all wiring connections inside the electrical panel. Tighten any loose connections.
6. Check the conduit and wiring from the fan motor (9) to the system electrical panel.

Pneumatic Connections

The system air supply must be clean, dry, and oil-free. Refer to the specifications in the *Description* section.

1. See Figure 3-5. Install a manual shutoff valve (11) in the system air supply line.
2. Connect $\frac{3}{4}$ -in. air tubing (12) from the shutoff valve to the system air supply regulator (5).
3. Check the pilot air tubing (4) and the pressure sensing tubing connections. The pilot air tubing connects the two solenoid valves on the underside of the system electrical panel to the pulse valves. The pressure sensing tubing (13) connects the differential pressure switch in the system electrical panel to the fitting above the differential pressure gauge (8).

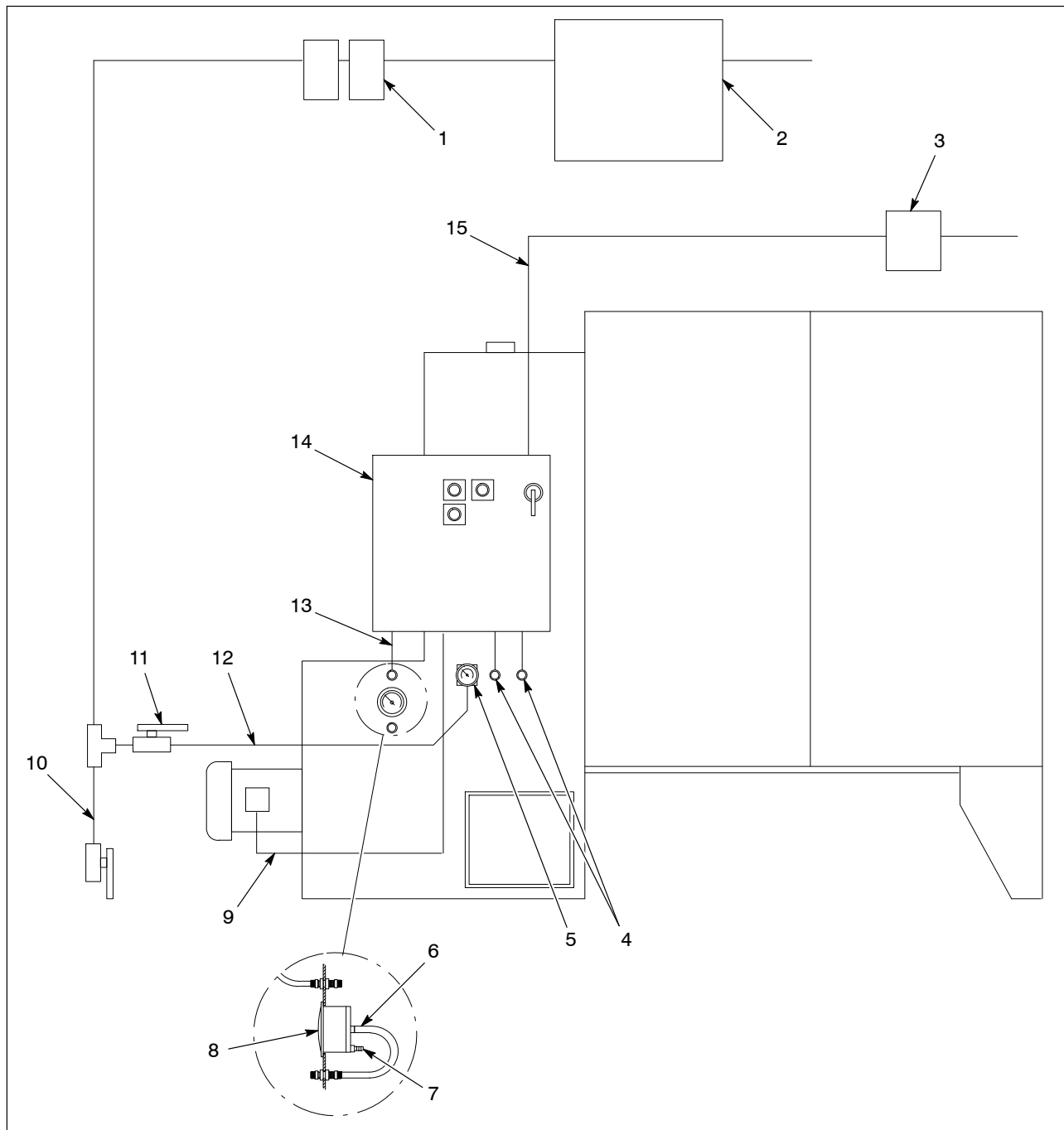


Figure 3-5 Electrical and Pneumatic Connections

- | | | |
|-------------------------------------|--------------------------------|-------------------------------|
| 1. Air filters | 6. Low port | 11. Shutoff valve |
| 2. Air dryer | 7. High port | 12. 3/4-in. air supply tubing |
| 3. Disconnect switch | 8. Differential pressure gauge | 13. Pressure-sensing tubing |
| 4. Pilot air tubing to pulse valves | 9. Conduit and wiring to motor | 14. System electrical panel |
| 5. Air regulator and gauge | 10. Drop leg | 15. Electrical service line |

Final Assembly, Adjustments, and Inspection

Perform these procedures before operating the Econo-Coat booth.

Cartridge Filter Installation

1. See Figure 3-6. Remove the cartridge filters (4) from their boxes. Inspect the filter media and gaskets. Do not use damaged filters.
2. Turn the push-plate handles (1) on top of the collector module counterclockwise until the push-plates are retracted up against the ceiling of the module.
3. Install the cartridge filters, gasket end down, into the filter retainers (3) in the collector module.
4. Turn the push-plate handles clockwise until the push-plates slide into the recesses on the top of the cartridge filters. When the bottom end cap of the cartridge contacts the retainer, the gasket will be compressed enough to form an air-tight seal. Do not tighten the handles any further, or you could damage the cartridge filters.

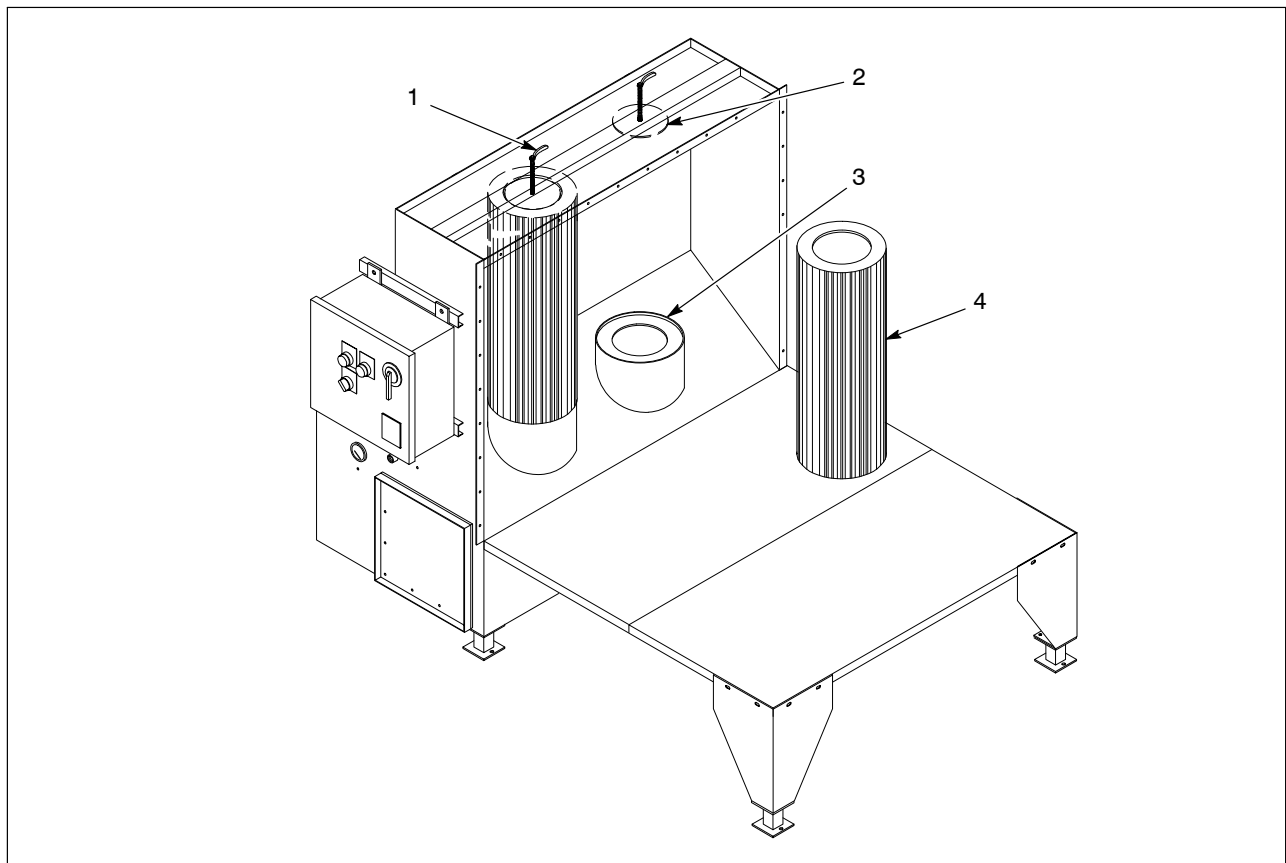


Figure 3-6 Cartridge Filter Installation

1. Push-plate handles
2. Push-plate

3. Cartridge filter retainers

4. Cartridge filters

Pulse Delay and Duration Adjustment

See Figure 3-7. Disconnect electrical power to the system and turn the PULSE SELECTOR switch to the off position. Open the electrical panel door and use a small screwdriver to adjust the pulse timer adjustment screws.

- | | |
|-------------------|---------------|
| (1) Duration (On) | 00.07 seconds |
| (2) Delay (Off) | 15.00 seconds |

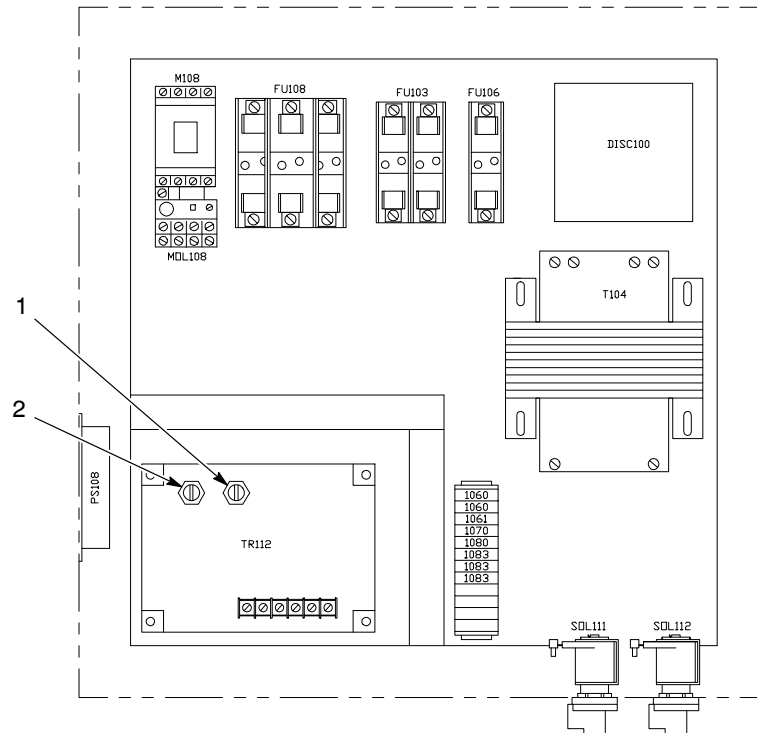


Figure 3-7 Pulse Delay and Duration

Final Filter Gasket Check

Final filters are installed at the factory. Check the gaskets between the final filters and the fan housing. Tighten the bracket screws to compress the gaskets, if necessary, to obtain a good seal on all four sides of each filter.

Air Leak Check

Turn the system electrical power on. Open the air supply manual shutoff valve. Check all pneumatic connections and tubing for leaks.

Fan Rotation Check

1. Press the EXHAUSTER START pushbutton on the system electrical panel. Make sure air flows into the booth, through the cartridge filters, and is returned to the room through the final filters.
2. If no air flow can be felt coming out of the final filters, shut off and lock out electrical power at the service line disconnect. Open the system electrical panel door and reverse the L1 and L2 wires at their connection to the disconnect switch. The exhaust fan must rotate in a clockwise direction.
3. Turn the system electrical power on and restart the fan. Check for air flowing from the final filters.

Powder Application Equipment Installation

Refer to the manuals shipped with your powder application equipment for installation instructions.

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.

Startup

1. Turn the BLOWDOWN switch to the off position.
2. Turn on the system electrical power and open the air supply shutoff valve.
3. Adjust the system air pressure to 2.75 bar (40 psi) with the regulator on the collector module.
4. Press the EXHAUSTER START pushbutton. Check the final filter differential pressure gauge on the side of the fan housing. The pressure should be less than 3-in. wc (water column). If higher, the final filters are clogged and need to be replaced. If powder is leaking around the cartridge gaskets try tightening the push-plate handles to compress the gaskets and seal the leak. Replace the cartridges if the gaskets will not seal, or if the filter media is damaged.

NOTE: A preset pressure switch inside the electrical panel is interlocked with the system electrical supply. It will shut down the system if the final filter differential pressure exceeds 5-in. wc.

5. Refer to your powder application equipment manuals for operating instructions.

Shutdown

1. Turn the BLOWDOWN switch to the on position. Pulse the cartridge filters for 5 minutes, then turn the switch to the off position. This will clean the accumulated powder off the filters.
2. Press the EXHAUSTER STOP pushbutton to shut off the fan.
3. Turn the electrical panel disconnect switch to the off position.
4. Perform the daily maintenance procedures. Refer to your powder application equipment manuals for additional daily maintenance procedures.

Maintenance

Perform the following procedures as directed to maintain the Econo-Coat system.

Daily

Equipment	Procedure
Booth Enclosure	Turn the system exhaust fan on. Leave the BLOWDOWN switch in the off position. Clean the enclosure and collector module with a rubber squeegee or other grounded, non-metallic device. Reclaim or discard the collected powder.
Air Supply	Open the air supply drop leg and check for signs of oil, water, or other contamination. A white cloth held under the drop leg will be stained by contaminants in the air supply. Do not operate the system or spray powder with contaminated air. Drain and clean the air supply filters. Make sure the air dryer is working properly.
Grounding	Check the system, part, and application equipment ground connections with a standard ohmmeter. All conductive equipment within 3.1 meters (10 feet) of the spray booth must be grounded. Resistance from part to ground should be no more than 500 ohms for best coating results.

Periodically



WARNING: Disconnect and lock out electrical power before performing the following tasks. Failure to observe this warning could result in personal injury or death.

Equipment	Procedure
Cartridge Filters	Inspect the cartridge filters for damage to the filter media or gaskets. Remove the final filters and inspect the module interior for powder leaks. If powder is leaking past the cartridge filter gaskets, tighten the push-plate handles to compress the gaskets and stop the leaks (refer to <i>Cartridge Filter Installation</i> in Section 3). Replace the cartridge filters if necessary.
Final Filters	Check the differential pressure gauge on the side of the fan housing while the fan is on. Replace the final filters when the gauge reads 3-in. wc. Eliminate any powder leaks before restarting the system.
Fan Motor	Lubricate the motor bearings every six months with one of the following greases or an equivalent grease. Clean the motor grease fittings and apply two full strokes of a grease gun to each fitting. Do not overgrease. Dolium R (Shell Oil Co.) SRI No. 2 (Chevron USA, Inc.) Premium RB (Texaco Inc.)

Section 5

Troubleshooting



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

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

Troubleshooting Chart

Problem	Possible Cause	Corrective Action
1. System automatically shuts down	Cartridge filter gaskets are damaged or not compressed properly or filter media is damaged, allowing powder to leak into fan housing and clog final filters	<p>With the fan on, check the differential pressure gauge. If the gauge reads close to or above 5-in. wc, the final filters are clogged and need to be replaced.</p> <p>Check the cartridge filters for powder leaks. Pulse the cartridge filters for 5 minutes then disconnect and lock out electrical power. Remove the cartridge filters and inspect the media for damage. Clean and inspect the filter gaskets. Replace the filters if damage is found. If the filters are undamaged, reinstall them and tighten the push-plate handles to compress the gaskets.</p> <p>Replace the final filters.</p>
	Fuse blown	Correct the electrical problem that caused fuse to blow, then replace the fuse.

Continued...

Problem	Possible Cause	Corrective Action
1. System automatically shuts down <i>(continued)</i>	Motor overload shutdown	Rotate the motor by hand and make sure the shaft turns freely without binding. Check all wiring connections for corrosion. Check the motor overload protectors (OL108) for proper operation. Clean the wiring contacts and replace components as necessary.
	Wiring problem	Possible circuit failure. Contact a qualified electrician.
2. Powder escapes from the booth enclosure when the fan is on; cartridge filters are clogged (blinded)	Pulse air pressure is not high enough to adequately clean the filters	With the fan on, turn the BLOWDOWN switch to the on position and watch the cartridges. When the pulse valves are triggered, powder should be blown off the cartridge filters. The air pressure should be 2.75 bar (40 psi). Increase the pulse air pressure and pulse the filters for 5 or 10 minutes. Replace the cartridge filters if necessary.
	Blockage in air supply line to the pulse valves or pilot air line to the solenoid valves	Make sure both pulse valves are operating. Check the supply air line and pilot air lines for restrictions.
	Pulse valve or solenoid valve malfunction	Replace the solenoid valves if they do not exhaust air when triggered by the timer. Repair or replace malfunctioning pulse valves if the solenoid valves are working properly.
	Powder is too fine or is contaminated	Check powder particle size. Reduce the ratio of reclaimed-to-virgin powder. If the cartridge filters are clogged, replace them. Eliminate the source of contamination and replace contaminated powder.
<i>Continued...</i>		

Problem	Possible Cause	Corrective Action
3. Powder escapes from the booth enclosure when the fan is on; cartridge filters are NOT clogged (blinded)	Fan rotation backwards	Reverse fan rotation.
	Cross drafts are pulling powder out of booth	Eliminate drafts near booth openings.
	Parts brought into booth to be coated are too hot	Cool parts before bringing them into booth.
	Powder flow higher than booth designed to contain	Reduce the powder flow.
	Booth opening has been enlarged	Reduce the size of the booth opening.
	Parts larger than booth designed to handle	Contact your Nordson representative.

Electrical Schematic

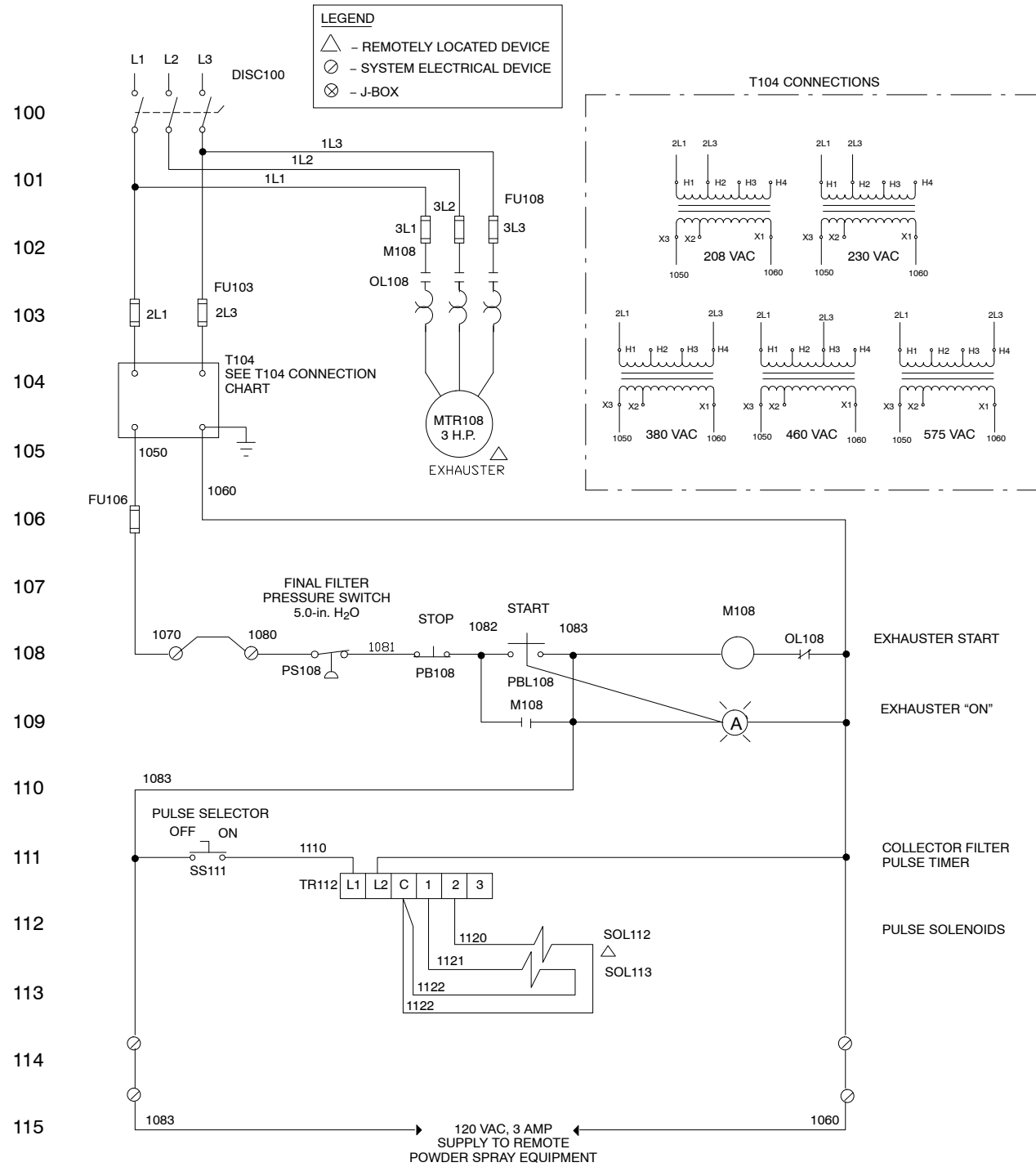


Figure 5-1 Electrical Schematic

Pneumatic Schematic

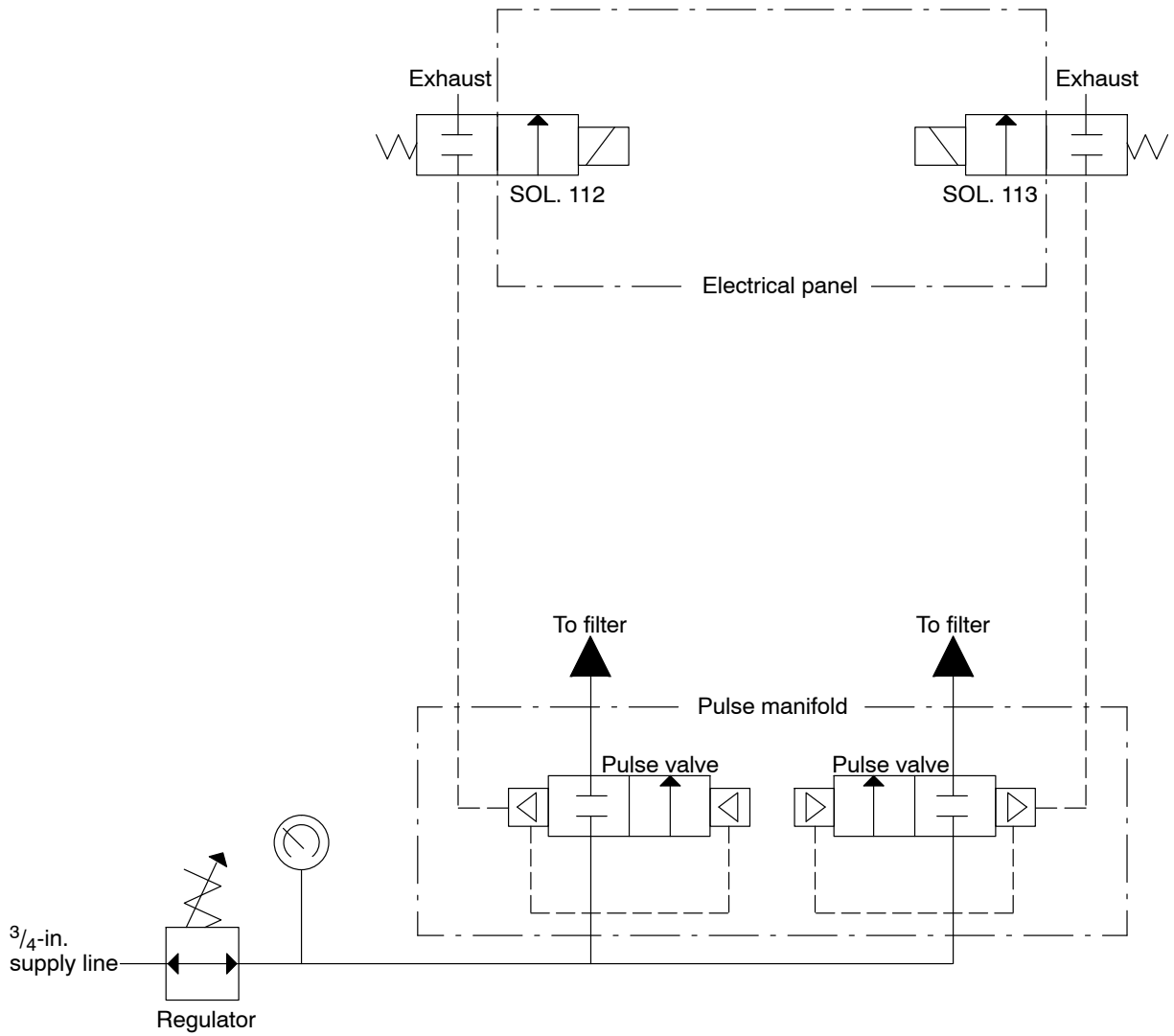


Figure 5-1 Pneumatic Schematic

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: The interior of the fan compartment contains moving parts which can cause serious personal injury. Disconnect and lock out electrical power before removing and replacing final filters.

Final Filter Replacement

1. Turn off the exhaust fan. Disconnect and lock out system electrical power.
2. See Figure 6-1. Remove the nuts (5), lock washers (4), flat washers (3), and upper Z-brackets (2).
3. Loosen the lower Z-bracket nuts. Remove the old filters (1).
4. Remove the new filters from their cartons and inspect them for damage. Do not use damaged filters.
5. Install the new filters on the lower Z-brackets. Do not damage the gaskets.
6. Install the upper Z-brackets, flat washers, lock washers, and nuts. Finger-tighten the nuts.
7. Check the position of the filters to make sure the gaskets will seal on all four sides.
8. Tighten the Z-bracket nuts until the gaskets are compressed slightly. Make sure the gaskets are compressed equally on all four sides of the filters.

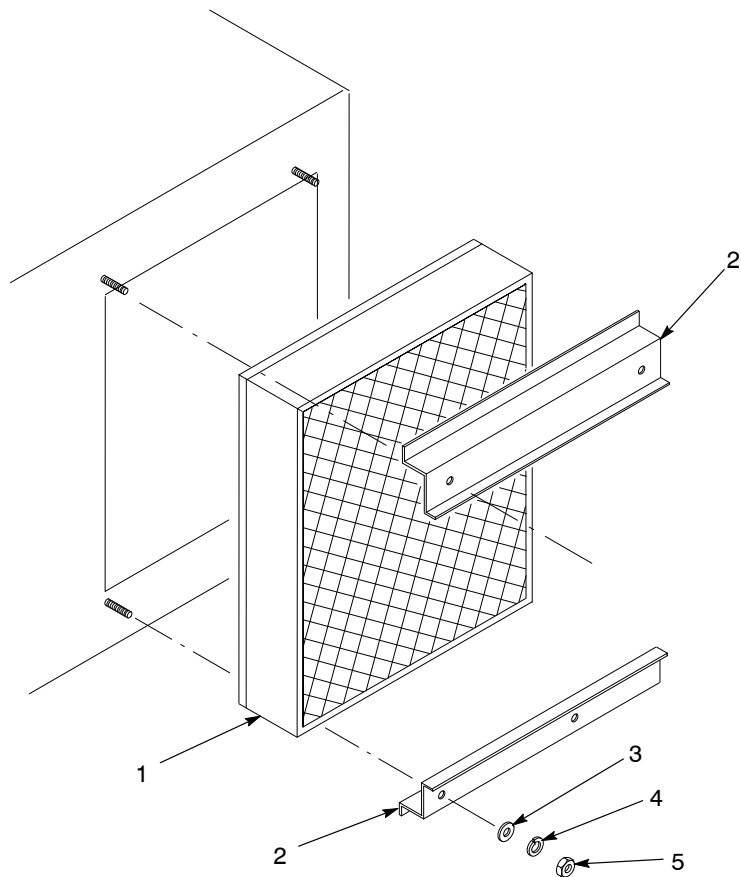


Figure 6-1 Final Filter Replacement

- | | |
|-----------------|-----------------|
| 1. Final filter | 4. Lock washers |
| 2. Z-brackets | 5. Nuts |
| 3. Flat washers | |

Cartridge Filter Replacement

NOTE: Do not use any cartridge filters other than those approved by Nordson Corporation. Using unapproved filters could seriously affect the operation and performance of the system.

1. Turn on the fan and pulse the cartridge filters for 5 minutes. Shut off filter pulsing and the fan.
2. Disconnect and lock out the system electrical power.
3. Clean the powder out of the enclosure and collector module with a rubber squeegee or other non-metallic device. Use approved respiratory protection.
4. See Figure 6-2. Turn the push-plate handles (1) counterclockwise until the push-plates (2) are approximately 1-inch above the top of the cartridges filter (4).
5. Remove the old cartridge filters from the collector module. Clean the filter retainers (3).

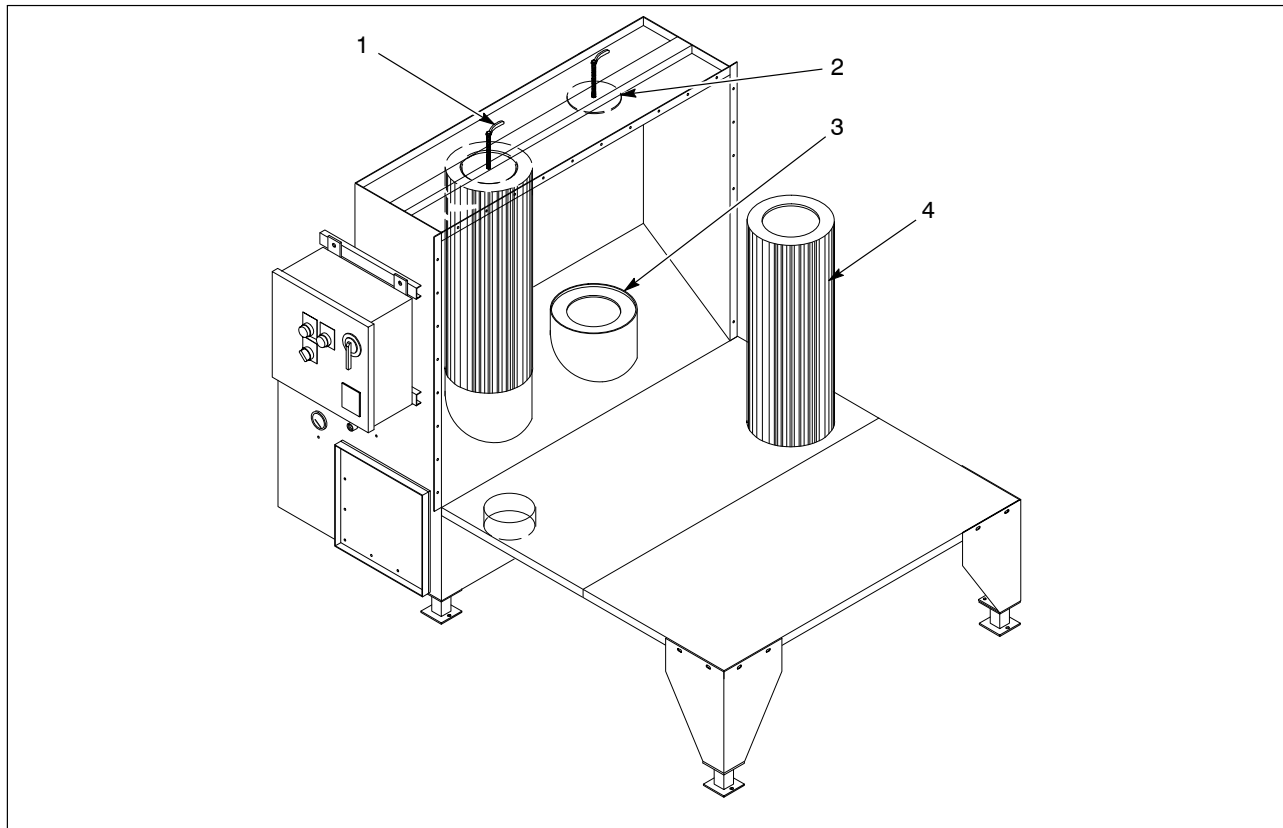


Figure 6-2 Cartridge Filter Replacement (Enclosure Not Shown for Clarity)

- | | | |
|----------------------|------------------------------|---------------------|
| 1. Push plate handle | 3. Cartridge filter retainer | 4. Cartridge filter |
| 2. Push plate | | |

Pulse Valve Replacement



WARNING: The interior of the fan compartment contains moving parts which can cause serious personal injury. Disconnect and lock out electrical power before removing and replacing the pulse valves.

1. Disconnect and lock out the system electrical power. Shut off the air supply and relieve the system air pressure.
2. See Figure 6-3. Remove the screws (10) and lock washers (9) from the cover plate (8) on the side of the compartment.
3. Remove the cover plate. Do not damage the gasket (7).
4. Disconnect the air tubing (5) from the pulse valve elbow tube fittings (4).
5. Unscrew the pulse valves (2) from the manifold pipe nipples (3).
6. Remove the showerhead nozzles (1) and elbow tube fittings from the old pulse valves.
7. Wrap the pipe nipple threads with PTFE tape.

Pulse Valve Replacement *(contd)*

8. Wrap the showerhead nozzle and elbow fitting threads with PTFE tape and install them on the new pulse valves.
9. Screw the new pulse valves onto the nipples. Position the valves so the nozzles point straight up into the center of the cartridge filters.
10. Reconnect the air tubing to the pulse valves.
11. Inspect the cover plate gasket for damage. Replace the gasket if it is damaged.
12. Secure the cover plate to the fan compartment with the screws and lock washers.

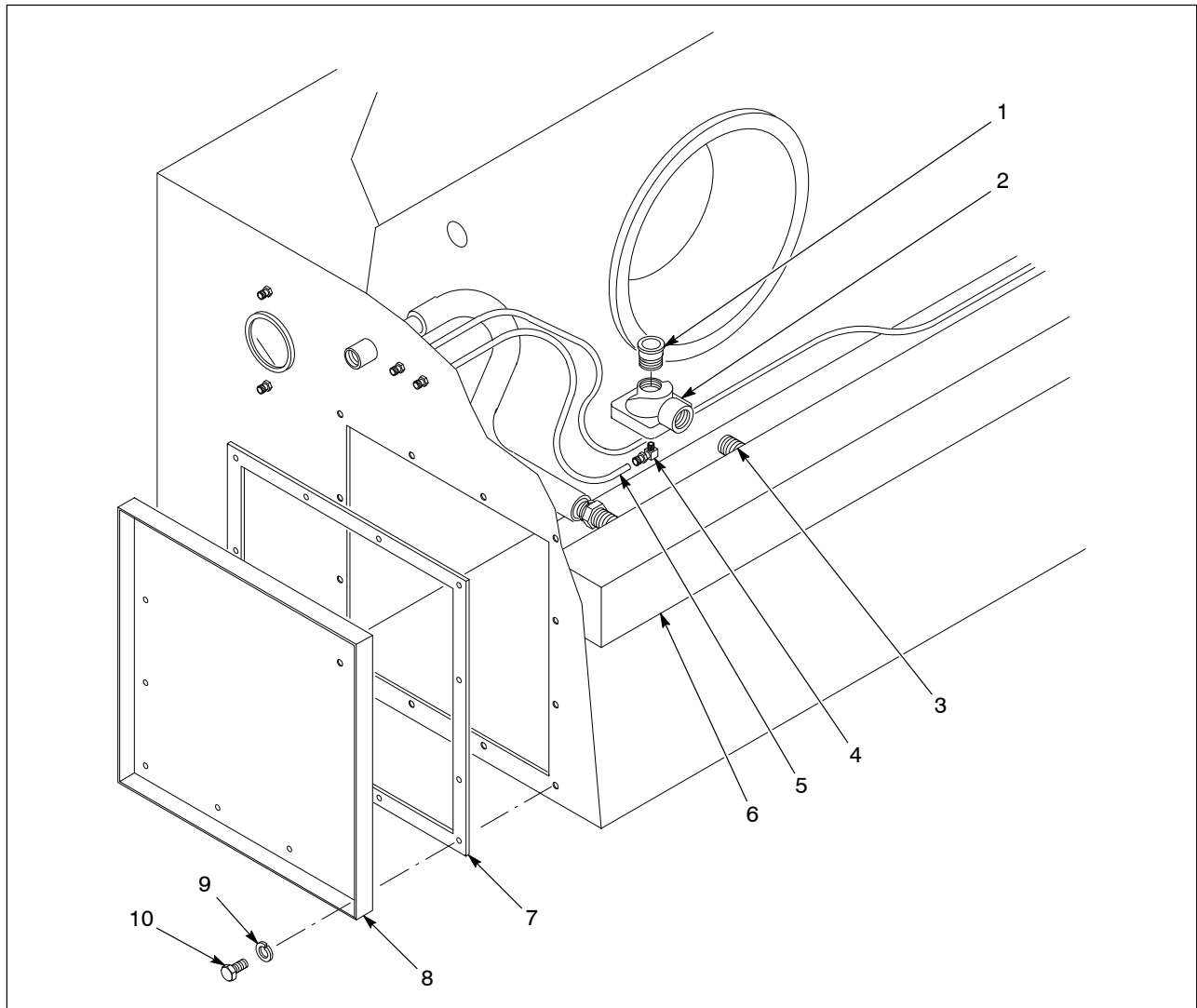


Figure 6-3 Pulse Valve Replacement

- | | | |
|-------------------------|-----------------------|-----------------|
| 1. Showerhead nozzle | 5. Air tubing | 8. Cover plate |
| 2. Pulse valve | 6. Pulse air manifold | 9. Lock washers |
| 3. Manifold pipe nipple | 7. Cover gasket | 10. Screws |
| 4. Elbow fitting | | |

Fan and Motor Replacement



WARNING: The interior of the fan compartment contains moving parts which can cause serious personal injury. Disconnect and lock out electrical power before removing and replacing the fan or motor.



WARNING: The fan motor is heavy. Do not attempt to lift it by yourself. Get help or use lifting equipment.

1. Disconnect and lock out the system electrical power.
2. See Figure 6-4. Remove the cover plate from the motor junction box and disconnect the booth wiring from the motor leads. Note the wire colors and numbers so you can reconnect them correctly later.
3. Disconnect the flexible conduit from the junction box.
4. Block up the motor (1), then remove the screws (3) and lock washers (4) securing the motor plate (5) to the collector module.
5. Pull the entire assembly (motor and fan) straight out of the fan compartment.
6. Loosen the 3 square-head setscrews in the fan wheel hub and pull the fan wheel (9) off the motor shaft. Save the shaft key (2) for reuse. The fan wheel must be keyed to the shaft.
7. To replace the motor, remove the screws (8) and lock washers (7) securing the motor to the motor plate.
8. Install the new motor on the motor plate (with the junction box oriented as shown in Figure 6-4) with the screws and lock washers removed in step 7.
9. Insert the key removed in step into the key slot in the new motor shaft.
10. Loosen the 2 square-head setscrews in the new fan wheel hub. Align the slot in the fan wheel hub with the key in the motor shaft and slide the fan wheel onto the shaft. Torque the fan wheel setscrews to 4.0 N•m (36.0 in.-lb).
11. Check the motor plate gasket (6) and replace it if it is damaged.
12. Install the fan and motor assembly onto the collector module with the screws and lock washers removed in step 4.
13. Rotate the fan by hand 360° to make sure it does not rub against the cone. If it does, remove the cover plate on the side of the collector module (see Figure 6-3), loosen the bolts securing the inlet cone and adjust the cone's position.
14. Remove the motor junction box cover and connect the flexible conduit to the box.

Fan and Motor Replacement *(contd)*

15. Connect the motor leads to the booth wiring according to code and reinstall the junction box cover.

16. Restore system electrical power. Turn on the fan and make sure it is pulling air in through the cartridge filters and out through the final filters. If it is not, turn off the fan, disconnect system electrical power, and reverse any two leads in the motor junction box.

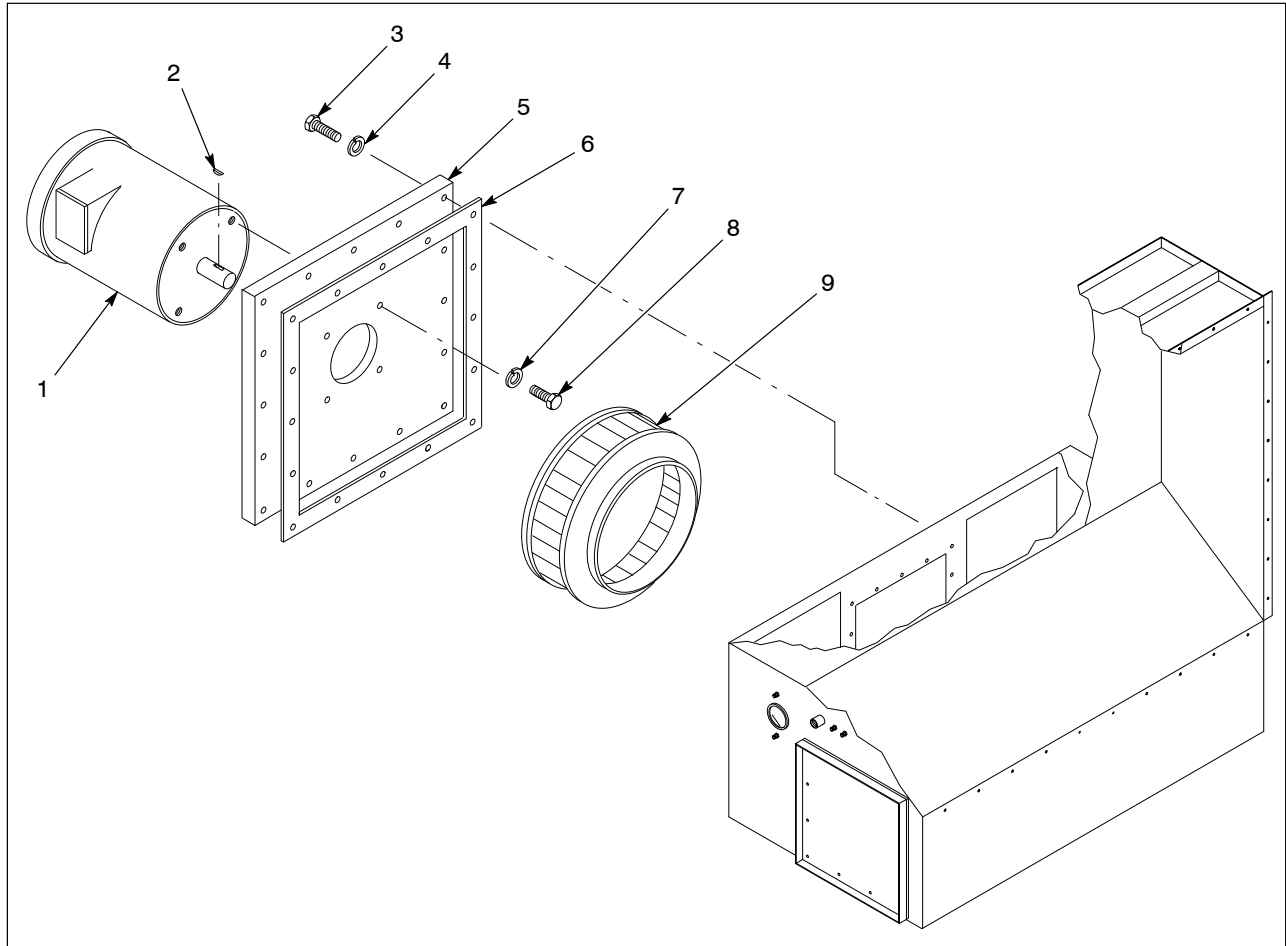


Figure 6-4 Fan and Motor Replacement

- | | | |
|--------------|----------------|----------------|
| 1. Motor | 4. Lock washer | 7. Lock washer |
| 2. Shaft key | 5. Motor plate | 8. Screw |
| 3. Screw | 6. Gasket | 9. Fan wheel |

Section 7

Parts

Introduction

To order parts, call the Nordson Finishing 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	Description	Quantity	Note
—	0000000	Assembly	1	
1	000000	• Subassembly	2	A
2	000000	• • Part	1	

Collector Module

See Figure 7-1.

Item	Part	Description	Quantity	Note
1	174760	Motor, 3450 rpm, 3 hp, 182T, 208/230/480 Vac, 3Ø	1	
2	-----	Screw, hex head, $\frac{3}{8}$ -16 UNC-2A x 1 in.	AR	
3	-----	Washer, lock, spring, $\frac{3}{8}$ in.	AR	
4	165704	Plate, motor mount	1	
5	-----	Gasket, $\frac{1}{4}$ in. x 1 in., neoprene, self-adhesive	AR	A
6	-----	Washer, lock, $\frac{1}{2}$ in.	4	
7	-----	Screw, hex head, $\frac{1}{2}$ -13 UNC-2A x 1 in.	4	
8	174740	Wheel, fan, 1.125 in. bore, external mount hub	1	
9	-----	Nut, hex, $\frac{3}{8}$ -16 UNC-2B	AR	
10	-----	Washer, flat, $\frac{3}{8}$ in. x 0.065 in. thick	AR	
11	176358	Clamp, final filter	4	
12	101432	Filter, final	2	
13	158658	Clip, retainer	8	
14	174748	Cone, aluminum	1	
15	-----	Tubing, $\frac{1}{4}$ in. poly	AR	A
16	165726	Nozzle, pulse	2	
17	174710	Valve, pulse, RCA25T	2	
18	-----	Fitting, elbow, $\frac{1}{4}$ in. tube x $\frac{1}{8}$ in. NPT	2	
19	-----	Fitting, barbed swivel, $\frac{3}{4}$ in. hose x $\frac{3}{4}$ in. NPT	1	
20	-----	Clamp, hose, $\frac{3}{4}$ in.	2	
21	-----	Hose, $\frac{3}{4}$ in. air line, 300 psi	AR	A
22	-----	Fitting, bulkhead, $\frac{1}{4}$ in. tube	5	
23	176331	Gauge, differential pressure	1	
24	-----	Fitting, barbed, $\frac{3}{4}$ in. hose x $\frac{3}{4}$ in. NPT	1	
25	165703	Plate, access door	1	
26	-----	Fitting, conduit, straight, $\frac{3}{4}$ in.	1	
27	-----	Conduit, flexible, $\frac{3}{4}$ in.	AR	

NOTE A: Order length desired in increments of one foot.

AR: As Required

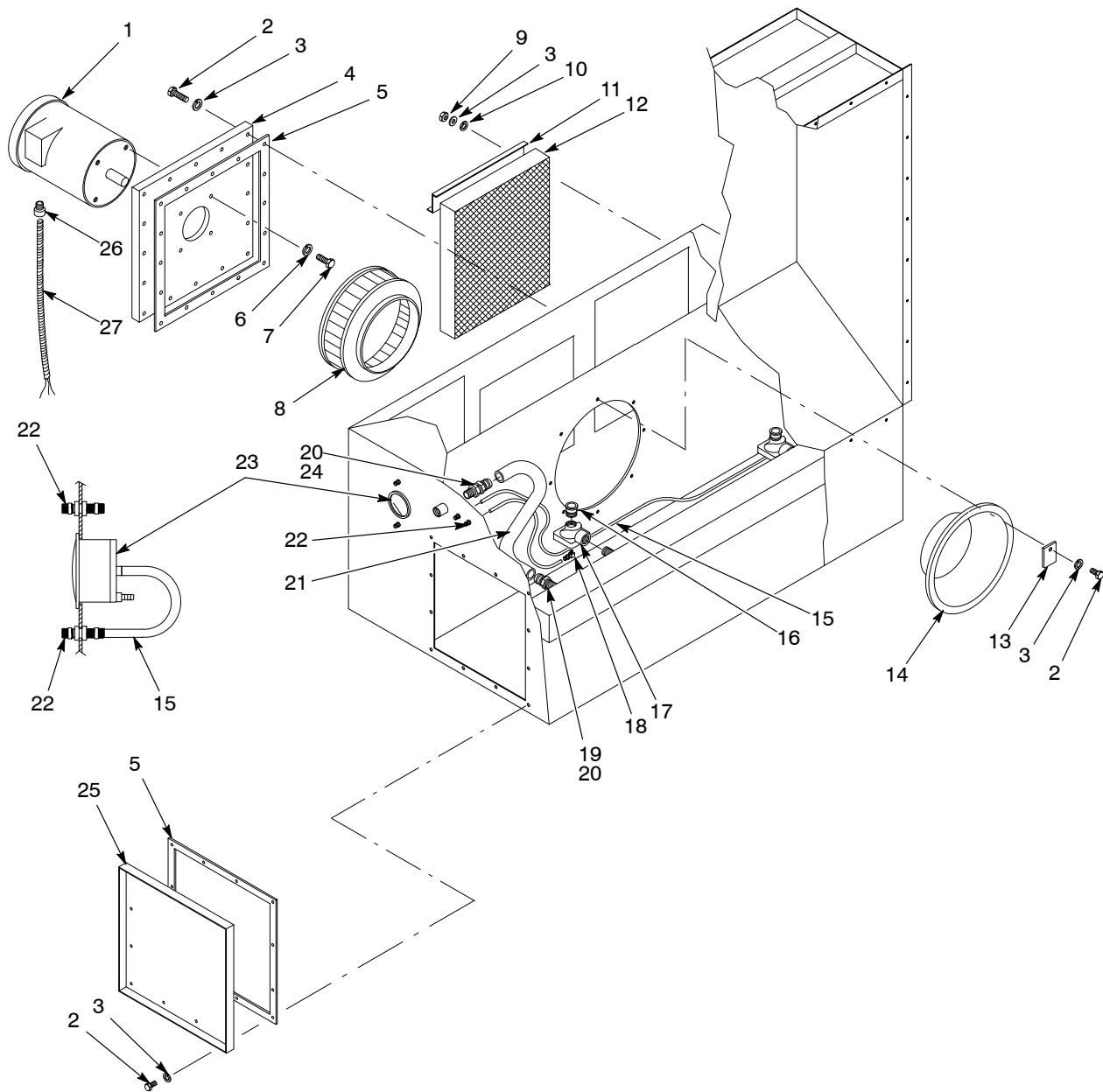


Figure 7-1 Collector Module Parts

Cartridge Filters and Floor

See Figure 7-2.

Item	Part	Description	Quantity	Note
28	-----	Screw, hex head, $\frac{3}{8}$ -16UNC-2A x 1 in.	AR	
29	-----	Washer, lock, spring, $\frac{3}{8}$ in.	AR	
30	165706	Rod, with handle	2	
31	165705	Plate, push, filter	2	
32	-----	Washer, flat, #10 x 0.040 in. thick	2	
33	-----	Screw, hex head, #10-24UNC-2A x 1.25 in.	2	
34	153134	Filter, cartridge, 36 in., high-efficiency, closed-end	2	
35	165707	Leg	2	
36	-----	Washer, flat, $\frac{3}{8}$ x 0.065 in. thick	AR	
37	165708	Leg, extension	5	
38	-----	Caster	5	B
39	-----	Nut, hex, $\frac{3}{8}$ -16UNC-2B	AR	
40	-----	Pipe, $\frac{1}{2}$ in. NPT, sched 40, 59 in. long	1	
41	-----	Screw, hex head, $\frac{1}{4}$ -20UNC-2A x 1.25 in.	8	
42	-----	Fitting, flange mount, $\frac{1}{2}$ in. NPT	2	
43	-----	Washer, flat, $\frac{1}{4}$ in.	8	
44	-----	Washer, lock, $\frac{1}{4}$ in.	8	
45	-----	Nut, hex, $\frac{1}{4}$ -20UNC-2B	8	
46	165709	Panel, floor	1	
47	1102940	Panel, floor	1	

NOTE B: Optional equipment.
AR: As Required
NS: Not Shown

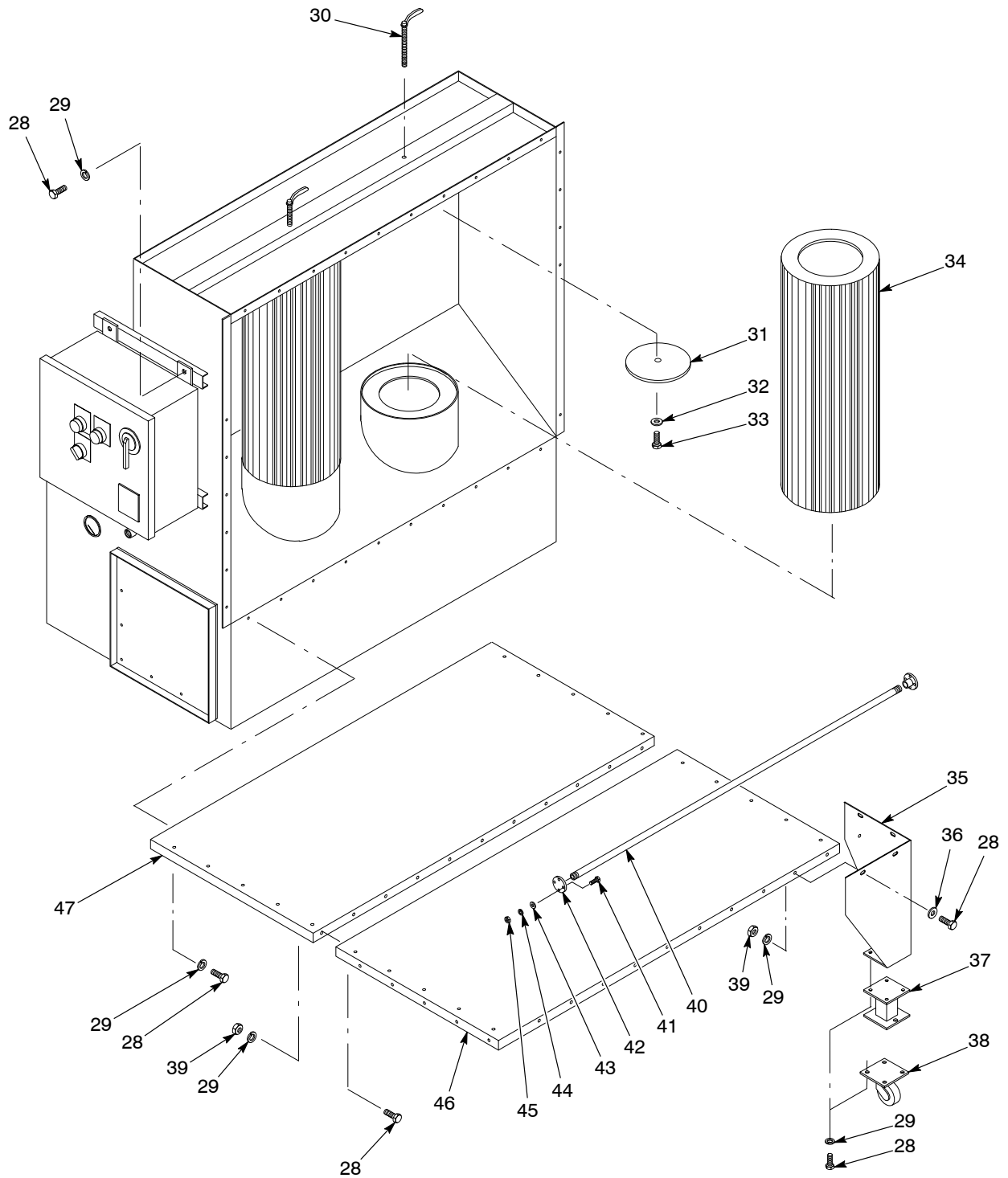


Figure 7-2 Collector Module and Floor Parts

Stainless Steel Enclosure

Item	Part	Description	Quantity	Note
1	984163	Nut, hex, $\frac{3}{8}$ -16 UNC	AR	
2	983133	Washer, lock, split, $\frac{3}{8}$ in.	AR	
3	983061	Washer, flat, $\frac{3}{8}$ in.	AR	
4	981710	Screw, hex head, $\frac{3}{8}$ -16 UNC x 0.75 in.	AR	
5	-----	Panel, back	1	
6	-----	Panel, roof	2	
7	-----	Panel, side, front	4	
8	-----	Bracket, panel, side, middle	2	
9	-----	Panel, side, rear	2	

AR: As Required

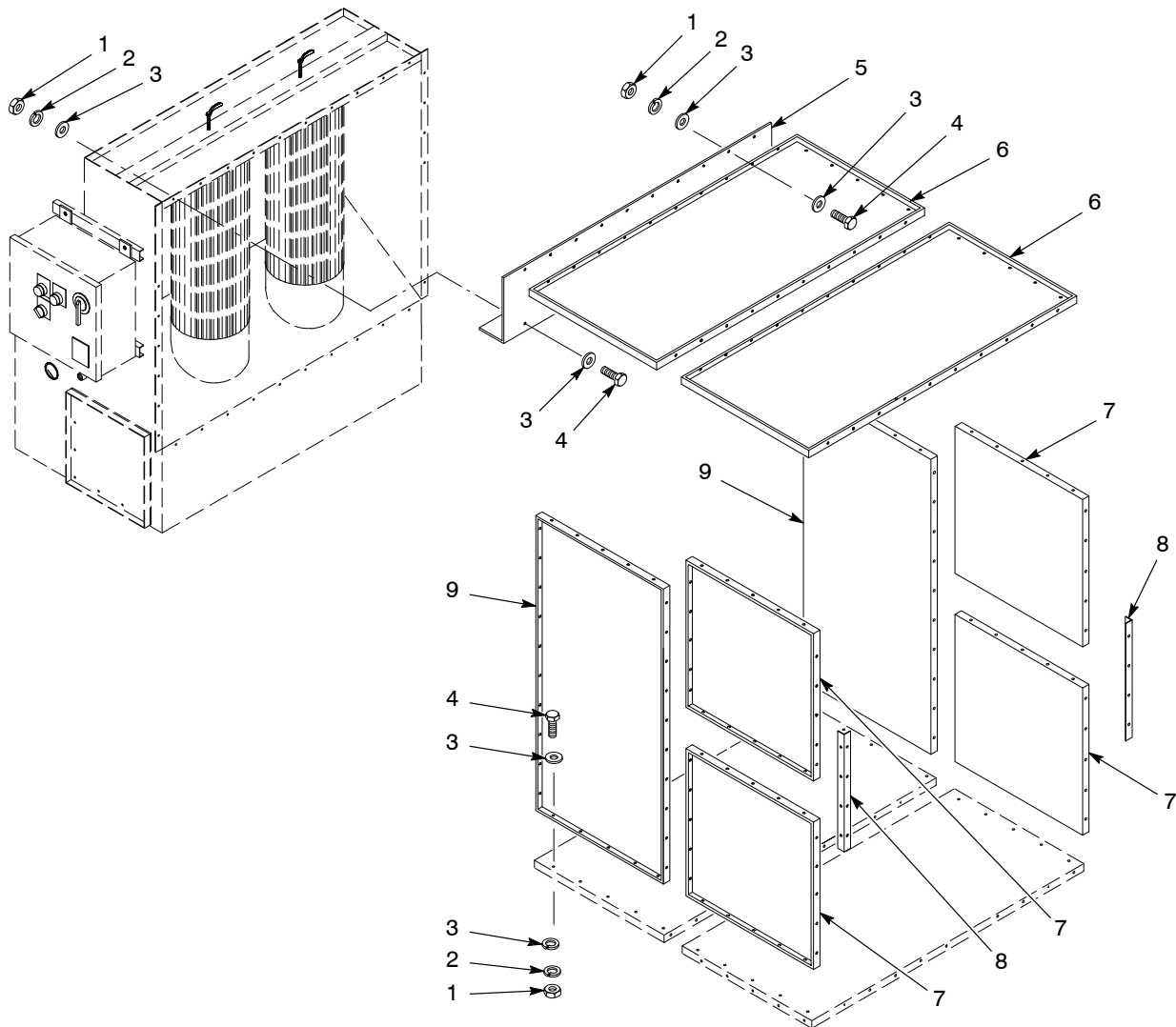


Figure 7-3 Stainless Steel Enclosure Parts

Polypropylene Enclosure

Item	Part	Description	Quantity	Note
1	984163	Nut, hex, poly, $\frac{3}{8}$ -16 UNC	AR	
2	981710	Screw, hex head, poly, $\frac{3}{8}$ -16 UNC x 1.25 in.	AR	
3	1102928	Enclosure, canopy, assembly	1	
4	-----	• Panel, canopy, back	1	
5	-----	• Panel, canopy, roof	2	
6	-----	• Panel, side, right	4	
7	-----	• Panel, side, left	2	

AR: As Required

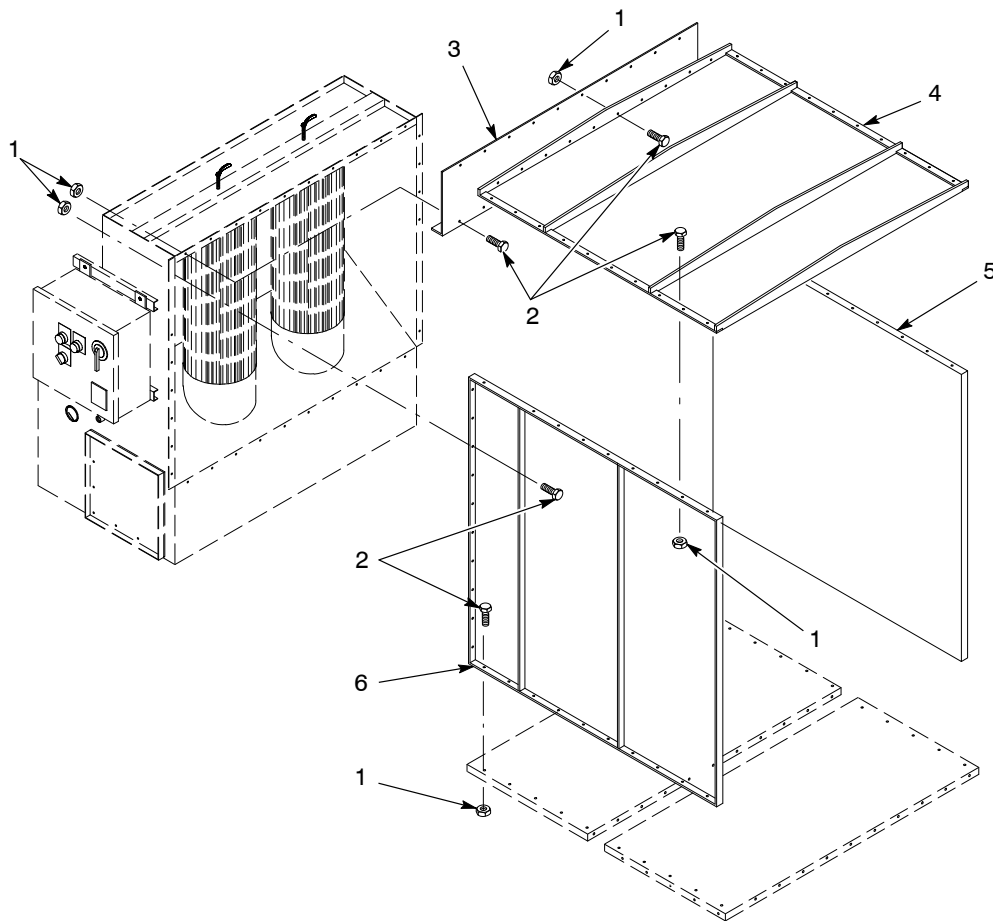


Figure 7-4 Polypropylene Enclosure

Electrical Panel

See Figure 7-5.

Item	Quantity	Description	Part	Manufacturer
	1	Enclosure with panel	SCE20C20ALP	Saginaw
	1	Subpanel	SCE20P20	Saginaw
DISC100	1	Disconnect	DETLNF60	Stromberg
	1	Handle	DETLZX47	Stromberg
FU108	1	Fuse block	60308J	Gould
M108	1	Motor starter	Reference chart	General Electric
MOL108	1	Motor overload relay	Reference chart	General Electric
T104	1	Transformer	Reference chart	General Electric
FU103	1	Fuse block	L60030C-1PQ	Littelfuse
FU106	1	Fuse block	L60030N-1PQ	Littelfuse
PS108	1	Pressure switch	1910-5	Dwyer
TR112	1	Timer board	DNCT2003B10	N.C.C.
TB	10	Terminal block	1492F1	Allen-Bradley
PBL108	1	Operator	080PLGG	General Electric
PBL108	1	Power supply	080ADV120	General Electric
PBL108	1	Contact block	080B10V	General Electric
PB108	1	Operator	080PRS	General Electric
PB108	1	Contact block	080BF01V	General Electric
SS111	1	Operator	080SMDN	General Electric
SS111	1	Contact block	080BF11V	General Electric
FU108	3	Fuses	Reference chart	Gould
FU103	2	Fuses	Reference chart	Gould
FU106	1	Fuse	KLR-6	Littelfuse
SOL111	1	Solenoid	RCA3D2	Goyen
SOL112	1	Solenoid	RCA3D2	Goyen

Fuses and Motor Overload Protectors

Item	Voltage Ratings				
	208 Vac	230 Vac	380 Vac	460 Vac	575 Vac
FU103	ATHR-7	ATHR-6	ATHR-4	ATHR-3	ATHR-3
FU108	AJT-20	AJT-17.5	AJT-12	AJT-10	AJT-6
M108	CR7CBA	CR7CBA	CR7CBA	CR7AA	CR7AA
MOL108	CR7G1WM	CR7G1WM	CR7G1WK	CR7G1WK	CR7G1WJ
T104	9T58B90	9T58B70	9T58B90	9T58B70	9T58B70
Total amperage	16	14	8	7	6

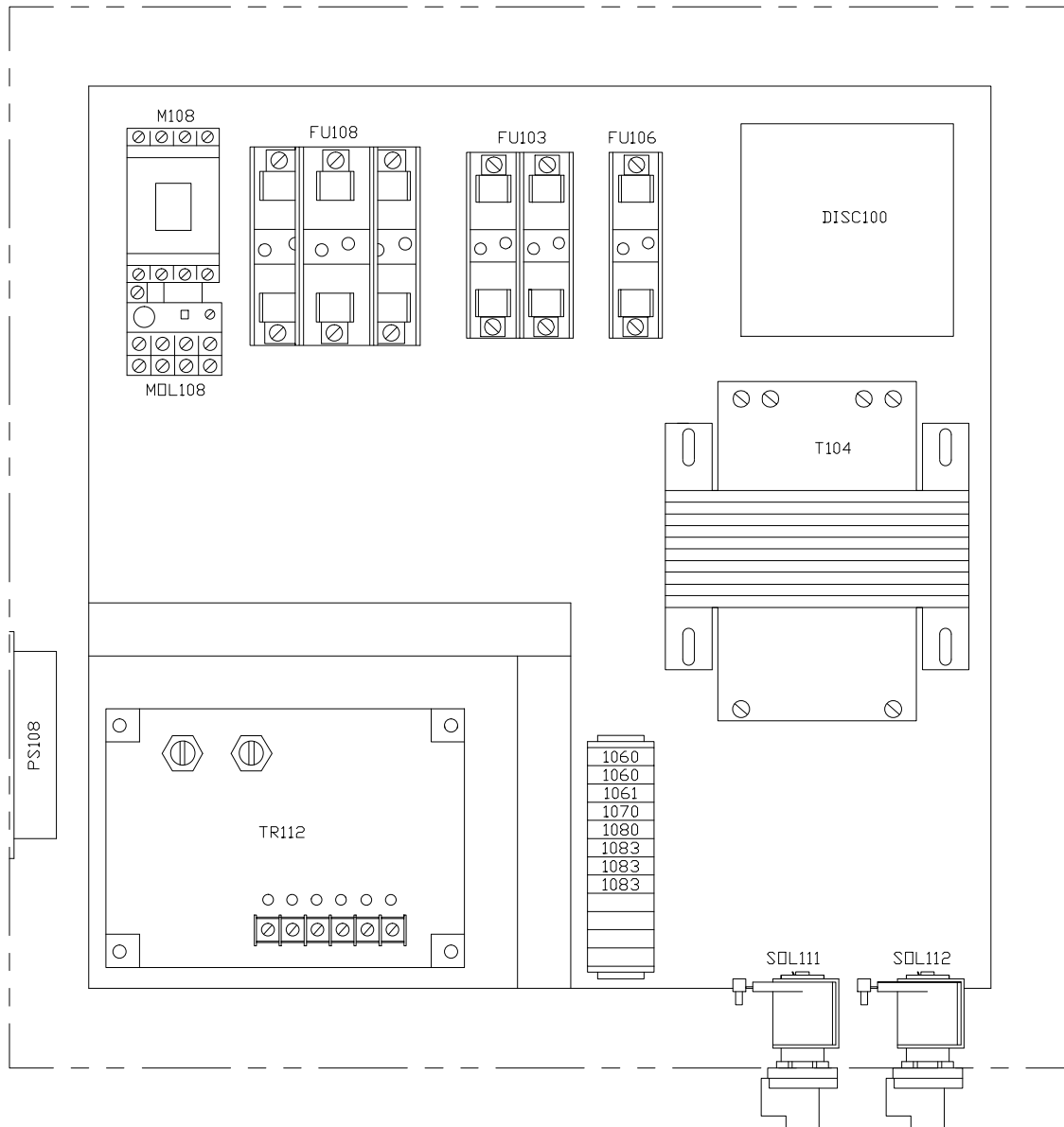


Figure 7-5 Electrical Panel Parts

