

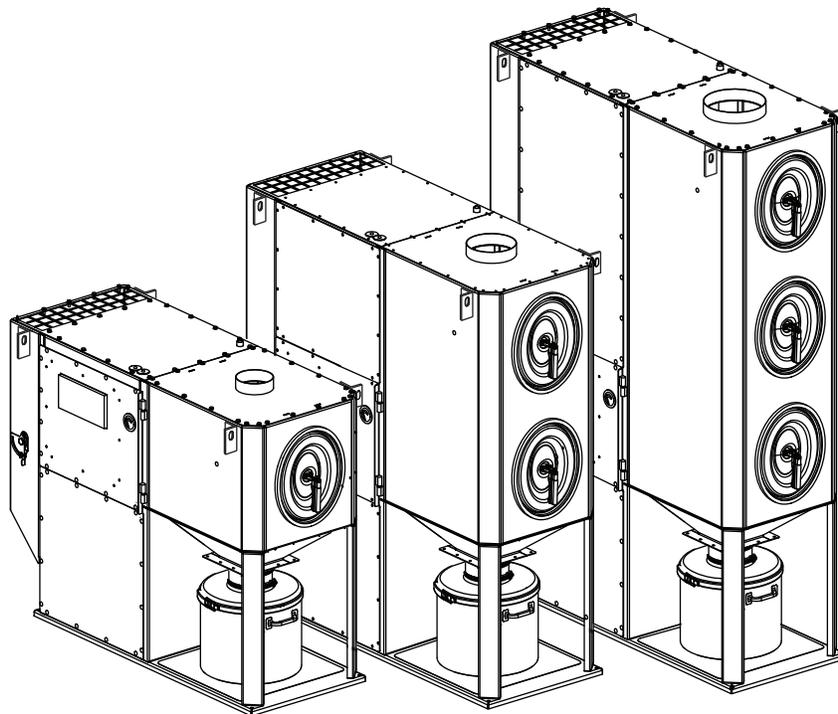
Donaldson  
Torit®

## Downflo® Oval

DFO 1-1, 2-2 and 3-3

### Installation and Operation Manual

Installation, Operation, and Service Information



This manual contains specific precautions related to worker safety. The hazard alert image denotes safety related instructions and warnings in this manual. **DO NOT** operate or perform maintenance on this collector until you have read and understood the instruction and warnings contained within this manual.

English  
Master Language

IOM AD3092901 (ENG)  
Revision 11

## IMPORTANT NOTES

This manual has been supplied to assist with the installation, operation and maintenance for the collector purchased. Please read the manual before installing, operating, or performing maintenance on the collector as it contains specific precautions for worker safety. It is the owner's responsibility to ensure that this manual is available for use by installers, operators and maintenance personnel that will be working with this collector. This manual is the property of the owner and should be left with the collector when installation has been completed. **DO NOT** operate this collector until you have read and understood the instructions and warnings located in the installation and operation manual.

For additional copies of this manual, contact Donaldson Torit



The Safety Alert Symbol indicates a hazardous situation which, if not avoided could result in death or serious injury. Obey all safety messages following this symbol to avoid possible injury or death. The possible hazards are explained in the associated text messages.



**CAUTION**, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTICE**

**NOTICE** indicates a potential situation or practice which is not expected to result in personal injury, but which if not avoided, may result in damage to equipment.

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## Safety Communication



Improper operation of dust collectors and/or dust control systems may contribute to conditions in a work area or facility which could result in severe personal injury, and product or property damage. All dust collection equipment should be used only for its intended purpose and should be properly selected and sized for its intended use.

Process owners have important responsibilities relating to identifying and addressing potential hazards in their processes. When the potential for handling combustible dust exists within a process the process owner should include combustion hazards in their risk management activities and should comply with applicable codes and standards related to combustible dust.

Electrical installation must be performed by a qualified electrician.

This equipment is not designed to support site ducts, piping, or electrical services. All ducts, piping, or electrical services must be adequately supported to prevent injury and/or property damage.

Site selection must account for wind, seismic zone, and other load conditions.

Equipment may reach peak sound pressure levels above 80 dB (A). Noise levels should be considered when selecting collector location.

## Combustible Dust Hazards

Among other considerations, the current NFPA standards require owners whose processes involve potentially combustible materials to have a current Dust Hazard Analysis, which can serve as the foundation for their process hazard mitigation strategy. Mitigation may include but is not limited to:

- Prevention of all ignition sources from entering any dust collection equipment.
- Selection and implementation of fire and explosion mitigation, suppression, and isolation strategies appropriate for the risks in their process.
- Development and use of work practices to maintain safe operating conditions, and to ensure combustible dust does not accumulate within their plant or process equipment.

Donaldson designs, manufactures, and sells industrial air filtration products for a wide variety of applications. Some applications may include processes or materials with inherent fire and explosion hazards. Donaldson is neither an expert nor a certified consultant in fire, spark, or explosion detection, suppression, or control. Donaldson does not provide engineering consulting services related to process or dust hazard analyses, or code and standard compliance. Complying with applicable codes and standards and managing the risks associated with the process or materials remains the responsibility of the process owner/operator. Donaldson may provide referrals to consultants, suppliers of equipment or services related to the detection and/or mitigation of sparks, fires and/or explosions, but Donaldson does not assume responsibility for any such referrals, nor does Donaldson assume any liability for the fitness of a mitigation strategy or product for a particular installation or application. The process owner's final selection of dust collectors and risk mitigation strategies should be based on the outcome of a Dust Hazard / Process Hazard Analysis performed by the process owner. Although early engagement of a dust collector supplier provides helpful insights on the availability and features of various products, process owners should consult with a combustible dust expert and/or a process safety expert before making actual product and mitigation strategy selections.

Donaldson recommends that all industrial air filtration system designs be reviewed and approved by an expert consultant who is responsible for the integrity of the system design and compliance with applicable codes and standards. It is the process owner's responsibility to understand the risks in their process and mitigate those risks in accordance with all applicable laws, regulations and standards, including those published by the NFPA. Donaldson also recommends that proper maintenance and housekeeping procedures and work practices be evaluated, developed, and followed to maintain any industrial air filtration products in safe operating condition.

Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the Donaldson products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, product specifications, and data (airflow, capacity, dimensions, or availability) are subject to change without notice, and may vary by region or country.

## Description

The Downflo Oval is a dust collector with oval, cartridge-style filters. The downward airflow design delivers high filtration efficiency while using less energy. The filters for DFO 1-1 are pulse-cleaned off-line while filters for DFO 2-2 and DFO 3-3 can be pulse-cleaned on- or off-line, depending on the type of cleaning control options selected. All models are one-filter deep collectors; model DFO 1-1 is a single filter collector, model DFO 2-2 is a two filter high collector, and model DFO 3-3 is a three filter high collector.

Options include various cleaning controls with and without motor starter controls, HEPA afterfilter packs, Bag-Out, and various dust container options.

## Purpose and Intended Use



Misuse or modification may result in severe personal injury and/or property damage.

Do not misuse or modify.

Downflo Oval collectors are widely used on nuisance dust where the load to the collector is less than two grains per cubic foot. Some typical point-of-use applications include abrasive blasting, thermal cutting, grinding, pharmaceutical blending and packaging, powder paint applications, sand handling, and welding. Each application is different and selecting the correct filter for the application and type of dust collected is important. Contact Donaldson Torit for selection assistance.

- Ambient, extremely fine, and non-fibrous dust, typically use Ultra Web® filter cartridges which offer high efficiency and performance on fine particulate.
- Fibrous dusts often benefit from a cartridge with an open-pleat design, such as Fibra-Web®.
- Operations involving high temperature and high humidity may require special attention. Temperature, moisture content, and chemistry issues may require custom collector modifications.
- Hygroscopic dust such as fertilizer, salt, and sugar should be handled under a controlled, low-humidity environment.
- Flammable or explosive dust may require customized collector design options.
- Applications with high hydrocarbon or high oil content may require special treatment or filter media.

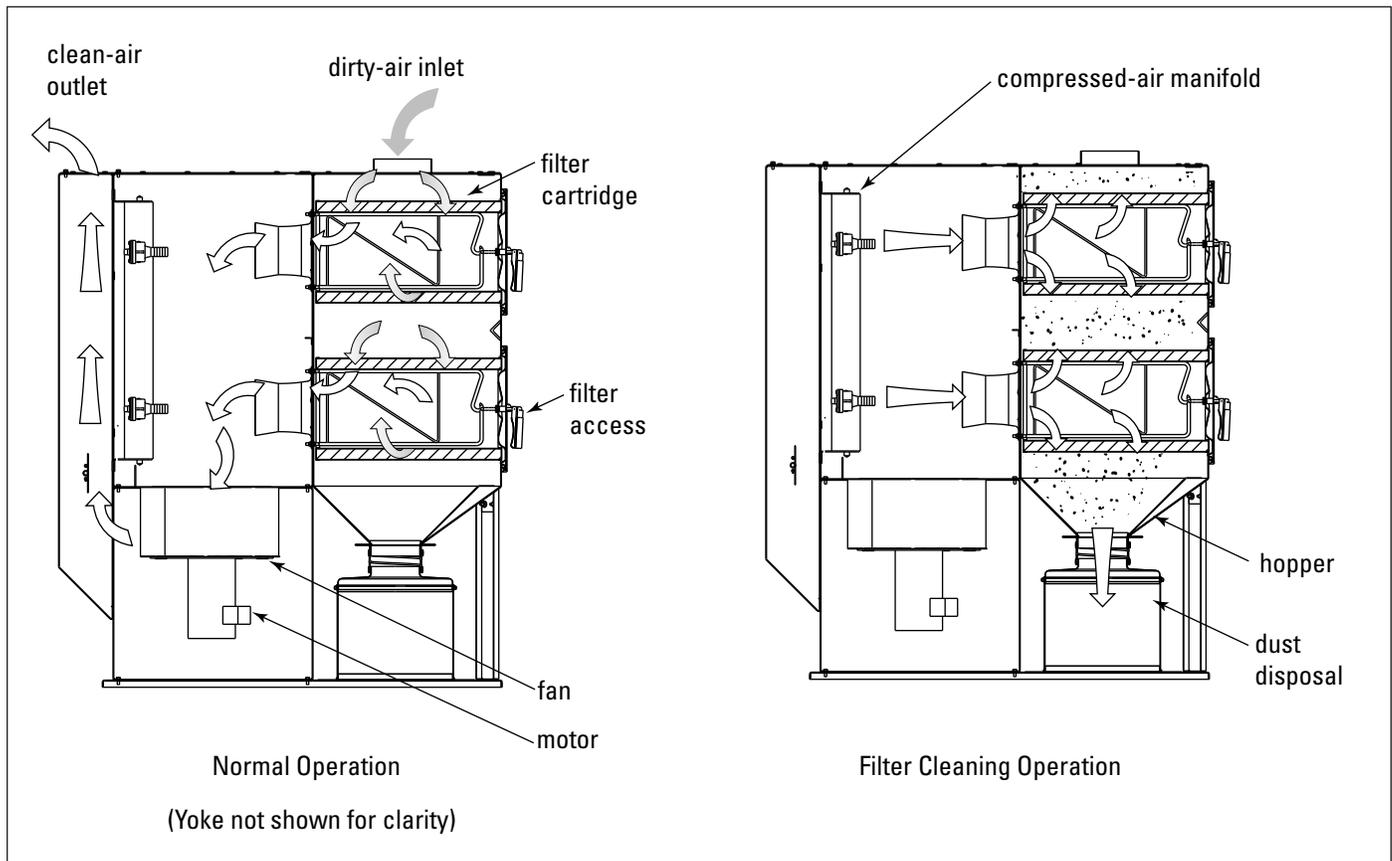
## Rating and Specification Information

General rating and specification information can be found in the product literature provided with the collector or available on the Donaldson website. For specific load values for a collector, see the Specification Control Drawing shipped with the collector.

## Operation

During normal operation, dust-laden air enters the collector through the top dirty-air inlet. Airflow is directed downward through the collector and heavier particulate falls directly into the hopper. The cartridges remove fine particulate and clean, filtered air passes through the cartridge to the clean-air plenum and discharges through the clean-air outlet.

Filter cleaning is completed using pulse-jet technology. An air diaphragm valve aligned to each filter provides the pulse cleaning. Either a manual push-button valve or electronic solenoid valve actuates the pulse cleaning. The cleaning sequence starts at the top filter and continues down through each filter. Remove, inspect, or change the filter cartridges from outside the collector by removing the filter access cover and sliding the filter out.



## Inspection on Arrival

1. Inspect collector upon delivery.
2. Report any damage to the delivery carrier.
3. Request a written inspection report from the Claims Inspector to substantiate any damage claim.
4. File claims with the delivery carrier.
5. Compare collector received with description of product ordered.
6. Report incomplete shipments to the delivery carrier and your Donaldson Torit representative.
7. Remove crates and shipping straps. Remove loose components and accessory packages before lifting collector from truck.
8. Check for hardware that may have loosened during shipping.
9. Use caution removing temporary covers.

## Installation Codes and Procedures



Codes may regulate recirculating filtered air in your facility.

Consult with the appropriate authorities having jurisdiction to ensure compliance with all national and local codes regarding recirculating filtered air.

Safe and efficient operation of the collector depends on proper installation.

Authorities with jurisdiction should be consulted before installing to verify local codes and installation procedures. In the absence of such codes, install collector according to the National Electric Code, NFPA No. 70-latest edition and NFPA 91 (NFPA 654 if combustible dust is present).

A qualified installation and service agent must complete installation and service of this equipment.

All shipping materials, including shipping covers, must be removed from the collector prior to or during collector installation.

### NOTICE

Failure to remove shipping materials from the collector will compromise collector performance.

Inspect collector to ensure all hardware is properly installed and tight prior to operating collector.

## Installation



Use proper equipment and adopt all safety precautions needed for servicing equipment.

Electrical service or maintenance work must be performed by a qualified electrician and comply with all applicable national and local codes.

Turn power off and lock out all power before performing service or maintenance work.

Do not install in classified hazardous atmospheres without an enclosure rated for the application.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.

Site selection must account for wind, seismic zone, and other load conditions when selecting the location for collectors.

Codes may regulate acceptable locations for installing dust collectors. Consult with the appropriate authorities having jurisdiction to ensure compliance with all national and local codes regarding dust collector installation.

Collectors must be anchored in a manner consistent with local code requirements.

Anchors must be sufficient to support dead, live, seismic, and other anticipated loads.

Consult a qualified engineer for final selection of anchorage.

### NOTICE

Do not set compressed-air pressure above 60-psig as component damage can occur.

All compressed air components must be sized to meet the system requirements of 60-psig supply pressure.

The compressed-air supply must be oil and moisture free. Contamination in the compressed air used to clean filters will result in poor cleaning, cleaning valve failure, or poor collector performance.

Purge compressed air lines to remove debris before connecting to the collector's compressed air manifold.

The collector is suitable for indoor installations. Reference the Rating and Specification Information.

### Foundations or Support Framing

Prepare the foundation or support framing in the selected location. Foundation or support framing must comply with local code requirements and may require engineering.

Foundation and support framing must be capable of supporting dead, live, wind, seismic and other applicable loads. Consult a qualified engineer for final selection of foundation or support framing.

### Collector Location



Donaldson Torit equipment is not designed to support site installed ducts, interconnecting piping, or electrical services. All ducts, piping, or electrical services must be adequately supported to prevent severe personal injury and/or property damage.

When hazardous conditions or materials are present, consult with local authorities for the proper location of the collector.

Dust collection equipment may reach peak sound pressure levels above 80 dB (A). Noise levels should be considered when selecting collector location.

Locate the collector to ensure easy access to electrical and compressed air connections, to simplify solids collection container handling and routine maintenance, and to ensure the straightest inlet and outlet ducts.

Provide clearance from heat sources and avoid any interference with utilities when selecting the location.

Portable collectors may require special installation accommodations.

Note: Collectors with explosion vents are not available in portable configurations.

### Site Selection

This collector can be located on a foundation or structural framing.

### Hoisting Information



Failure to lift the collector correctly can result in severe personal injury and/or property damage.

Use appropriate lifting equipment and adopt all safety precautions needed for moving and handling the equipment.

A crane or forklift and qualified operator are recommended for unloading, assembly, and installation of the collector.

Location must be clear of all obstructions, such as utility lines or roof overhang.

Use all lifting points provided.

Use clevis connectors, not hooks, on lifting slings.

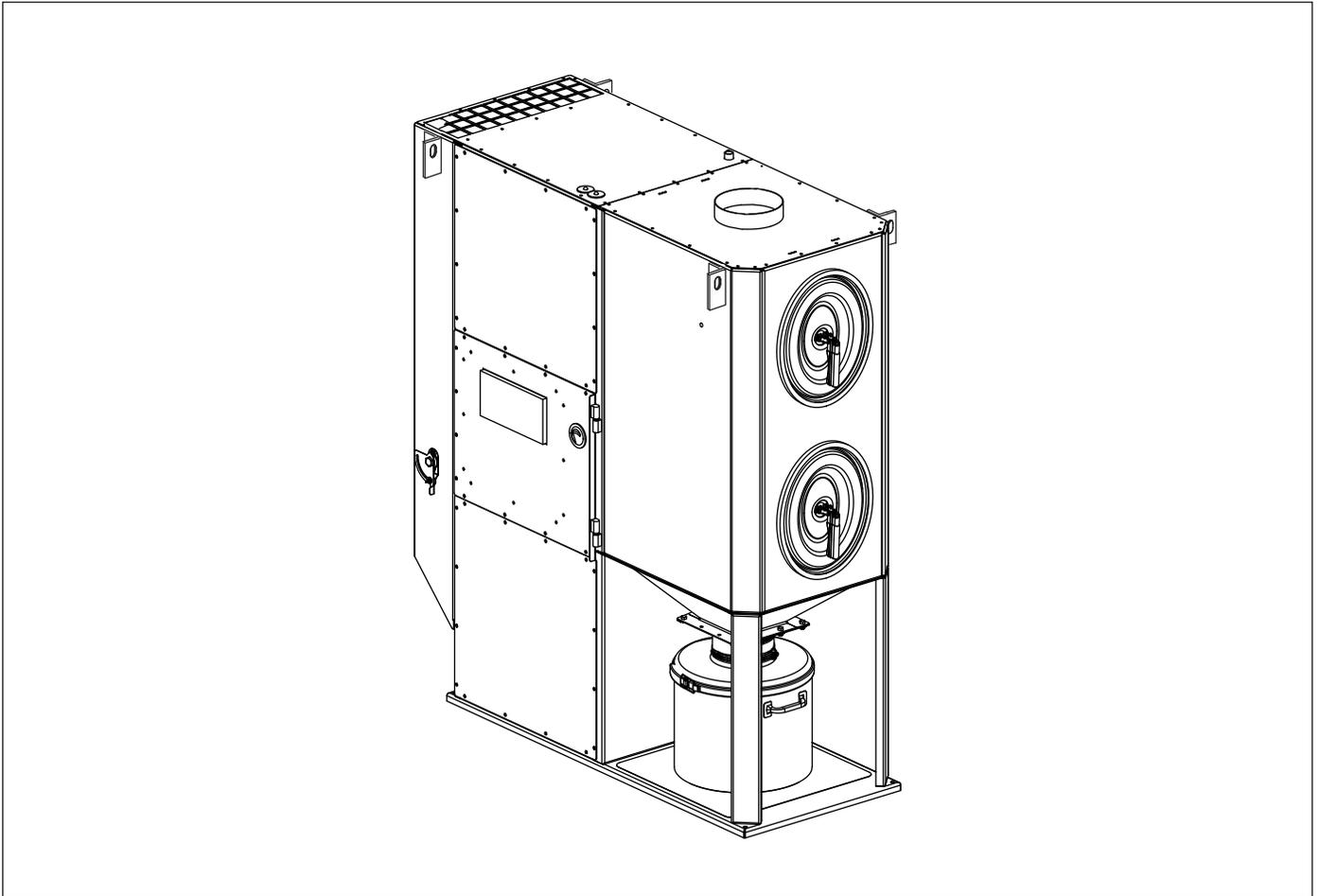
Check the Specification Control drawing for weight and dimensions of the collector and components to ensure adequate crane capacity.

Allow only qualified crane or forklift operators to lift the equipment.

Refer to applicable OSHA regulations and local codes when using cranes, forklifts, and other lifting equipment.

Lift collector and accessories separately and assemble after collector is in place.

## Typical Installation



Typical Installation

## Standard Equipment

Standard collectors include a fan, motor, control panel, 10-gallon dust container, and an exhaust silencer and damper. Depending on the type of control selected, the motor may or may not be pre-wired. Otherwise, the collector is fully assembled and ready to connect to electrical supply, compressed air, and ductwork. A detailed drawing, shipped with each collector, provides weight, specifications, and collector dimensions including anchor bolt locations for the collector's base plate.

## Cleaning Controls

All collectors include standard cleaning controls that are manually- or timer-controlled depending on the model and options selected. Controls are available in a variety of voltages and are available in one of four basic types:

1. Manual push-button with or without motor starter.
2. Downtime cleaning with or without motor starter.
3. Delta P cleaning with or without motor starter.
4. Manual push-button, Delta P, or downtime cleaning without motor starter in a remote-mount option.

Model DFO 1-1 standard controls include a manual motor starter that is prewired to the motor and a push-button valve for pulse cleaning control. Options include downtime cleaning with or without motor starter and remote-mount, downtime cleaning without motor starter.

Models DFO 2-2 and DFO 3-3 standard controls include downtime cleaning without a motor starter. Available options include downtime cleaning with a motor starter, remote-mount downtime cleaning without motor starter, Delta P cleaning with or without motor starter, and remote-mount Delta P cleaning without motor starter.

All control panels, except remote-mount, are located inside the collector.

## Manual Motor Starter Option

The manual motor starter is the standard option for Model DFO 1-1 and is not available for other models. It is prewired to the motor and filter cleaning is completed using a separate, manual push-button valve located next to the motor starter.

## Downtime Cleaning Option

Primarily used for intermittent duty, light dust-load applications, the downtime cleaning option provides automatic, downtime filter cleaning when the collector is turned OFF. Downtime cleaning WILL occur every time the collector is shut down. The valves start to pulse one minute after the collector is shut down and continue pulsing every 10-seconds for 3 minutes to reduce the differential pressure.

Downtime cleaning without motor starter is standard for Models DFO 2-2 and DFO 3-3. The option is specified at the time of order and available with and without a motor starter.

## Delta P Cleaning Option

Primarily used for continuous duty or heavy dust-load applications, the Delta P option provides automatic, on-line filter cleaning. The high- and low-pressure setpoints initiate the pulse cleaning cycle. The pulse-cleaning cycle begins when the filter pressure reaches the high-pressure setpoint. The valves continue to pulse every 10 seconds until the low-pressure setpoint is reached.

The Delta P option is available for models DFO 2-2 and DFO 3-3 only, with or without a motor starter.

## Remote-Mount Cleaning Option

Primarily used in applications that require the cleaning controls to be located away from a hazardous environment, remote-mount controls are available with downtime cleaning and Delta P cleaning options. Remote downtime cleaning is available for all three models while the remote Delta P is available for models DFO 2-2 and DFO 3-3 only. This option is specified at the time of order and the collector is equipped with a 115-Volt AC NEMA 12 solenoid valve enclosure. Explosion-protected collectors include a NEMA 9 dust explosion-proof solenoid enclosure. Contact Donaldson for information about a NEMA 7 gas explosion-proof solenoid enclosure.

Motor starters for remote-mount cleaning options are customer-supplied.

## Collector Anchoring

### **CAUTION**

Anchors must comply with local code requirements and must be capable of supporting dead, live, wind, seismic, and other applicable loads.

Anchor sizes shown are provisional, as final anchor sizing will depend on jobsite load conditions, collector location, foundation/framing design variables and local codes.

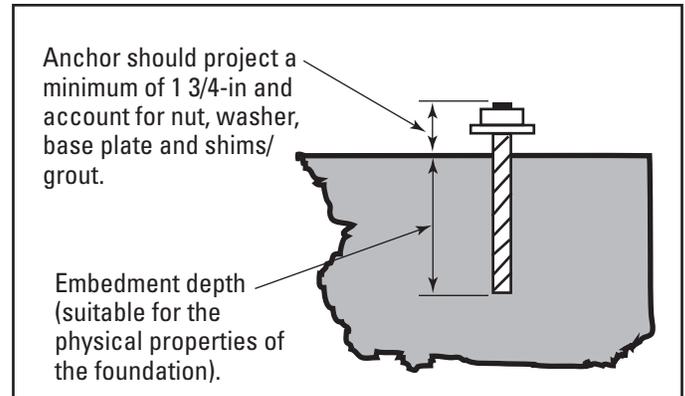
Consult a qualified engineer for final selection of suitable anchors.

Tighten all hardware before removing crane to prevent personal injury and/or property damage.

Prepare the foundation or support framing in the selected location. Locate and install anchors.

## Provisional Anchor Bolt Recommendations

1. Consider Hilti HIT-HY 200 Anchor System or equivalent. Quantity of anchor bolts should match the number of holes provided in the base plates.
2. Anchor diameter is typically 1/8-in less than baseplate hole diameter.
3. Corrosive environment or outdoor installation may require stainless steel anchors.



Typical Foundation Anchor

## Compressed Air Installation

### CAUTION

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.

A safety exhaust valve should be used to isolate the compressed air supply. The safety exhaust valve should completely exhaust pressure in the collector manifolds when closed, should be capable of being interlocked with fire or explosion mitigation equipment and should include provisions to allow closed-position locking.

### NOTICE

Do not set compressed-air pressure above 60-psig as component damage can occur.

All compressed air components must be sized to meet the system requirements of 60-psig supply pressure.

The compressed-air supply must be oil and moisture free. Contamination in the compressed air used to clean filters will result in poor cleaning, cleaning valve failure, or poor collector performance.

Purge compressed-air lines to remove debris before connecting to the collector's compressed-air manifold.

1. Remove the plastic pipe plug from the collector's air manifold and connect the compressed-air supply lines. Use thread-sealing tape or pipe sealant on all compressed-air connections.
2. Install a customer-supplied shut-off valve, bleed-type regulator with gauge, filter, and automatic condensate valve in the compressed-air supply line.
3. Set compressed-air supply pressure to a level suitable for the filters (60-psig). The pulse-cleaning controls are factory set to clean one or more filters every 10-seconds during a cleaning cycle.

## Electrical Wiring

### CAUTION

Electrical installation, service, or maintenance work must

be performed by a qualified electrician and comply with all applicable national and local codes.

Turn power off and lock out all power before performing service or maintenance work.

Do not install in classified hazardous atmospheres without an enclosure rated for the application.

All electrical wiring and connections, including electrical grounding, should be made in accordance with the National Electric Code (NFPA No. 70-latest edition).

Check local ordinances for additional requirements that apply.

The appropriate wiring schematic and electrical rating must be used. See collector's rating plate for required voltage.

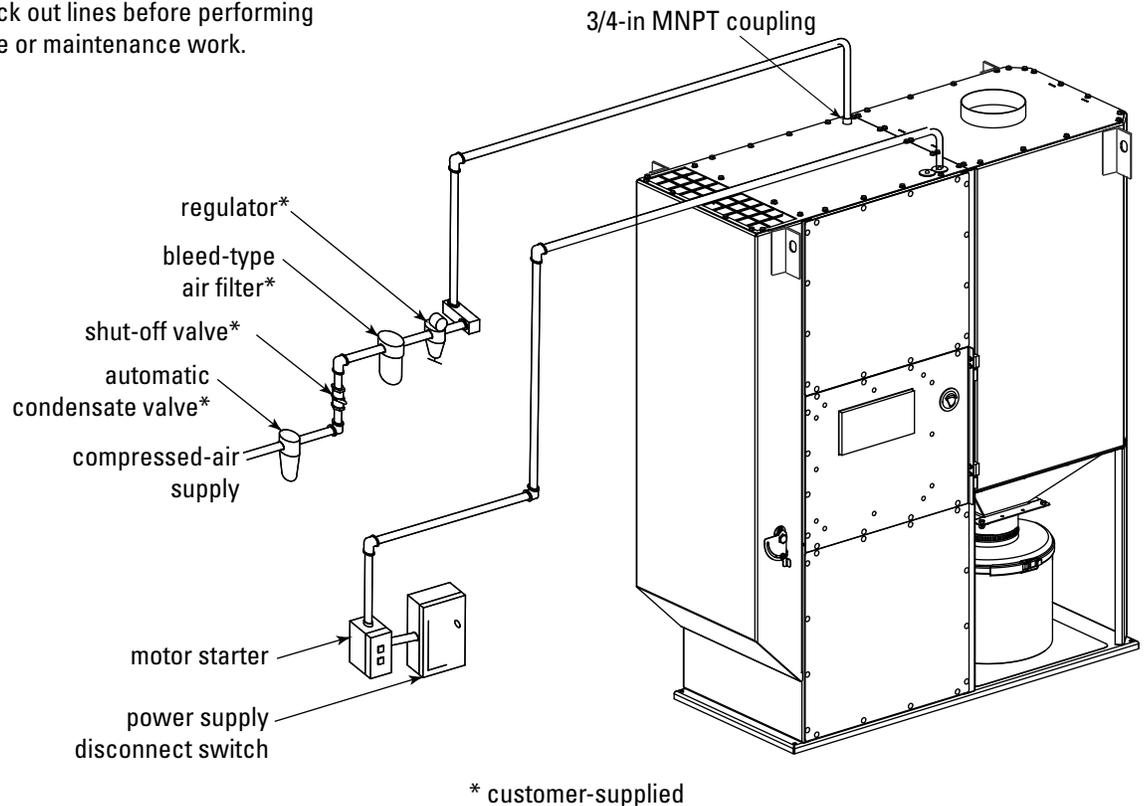
An electric disconnect switch having adequate amp capacity shall be installed in accordance with Part IX, Article 430 of the National Electrical Code (NFPA No. 70-latest edition). Check collector's rating plate for voltage and amperage ratings.

Refer to the wiring diagram for the number of wires required for main power wiring and remote wiring.

**CAUTION**

Turn power off and lock out electrical power sources.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.



Compressed Air and Component Installation

## Control Panel and Motor Wiring

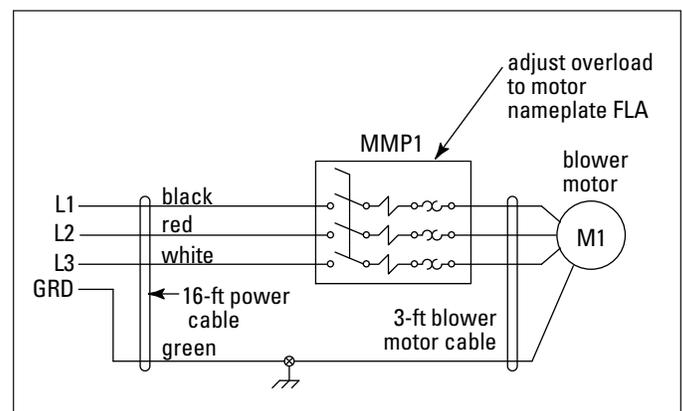
**CAUTION**

Electrical installation, service, or maintenance work must

be performed by a qualified electrician and comply with all applicable national and local codes.

Turn power off and lock out all power before performing service or maintenance work.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.



Manual Motor Starter (DFO 1-1)

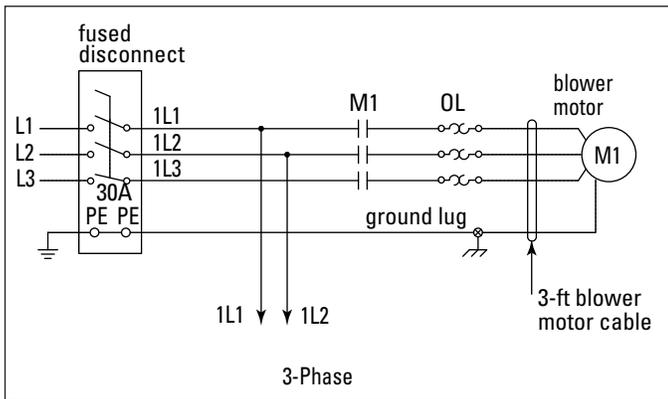
## Manual Motor Starter

Control panels with a manual motor starter require three-phase power with the requirements as listed on the motor's nameplate and are wired directly to the terminals on the motor disconnect switch located inside the control panel. See wiring diagram inside control panel.

## Downtime Cleaning

### With Motor Starter

The downtime cleaning control panel with motor starter requires three-phase power with the requirements as listed on the motor's nameplate and is wired directly to the terminals on the motor disconnect switch located inside the control panel. See wiring diagram inside control panel.

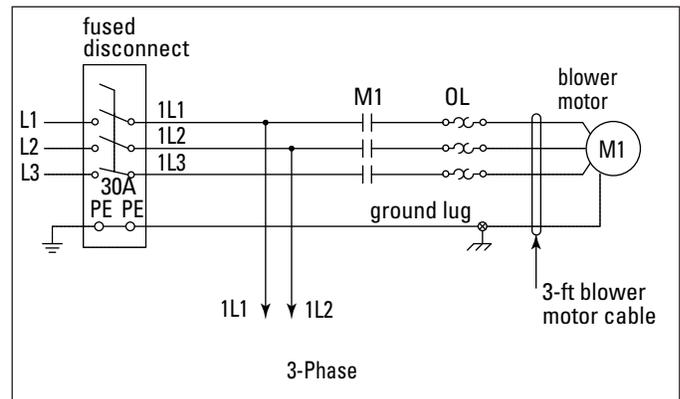


Downtime Cleaning with Motor Starter

## Delta P Cleaning

### With Motor Starter

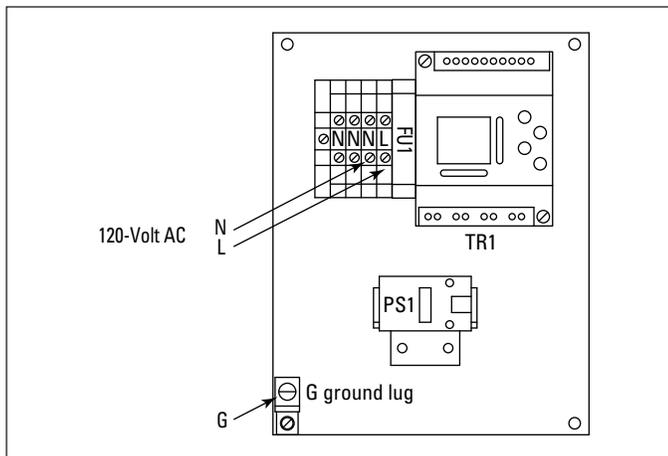
The Delta P control panel with motor starter requires three-phase power with the requirements as listed on the motor's nameplate and is wired directly to the terminals on the motor disconnect switch located inside the control panel. See wiring diagram inside control panel.



Delta P Cleaning with Motor Starter

### Without Motor Starter

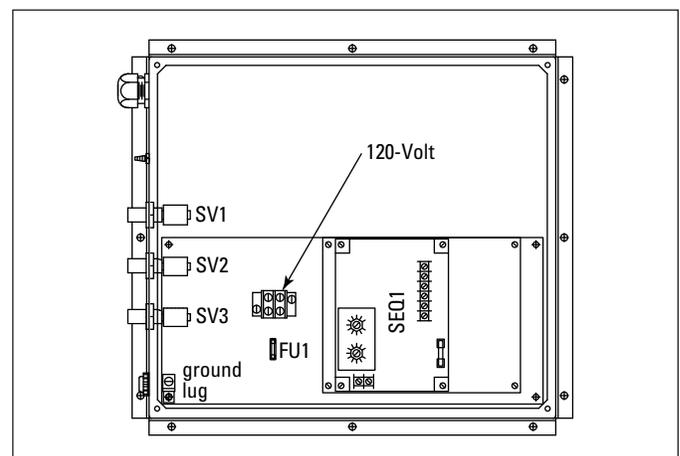
The downtime cleaning panel without motor starter requires 120-Volt AC, single-phase power to be wired directly to the control panel terminal block at Terminals L, N, and G. Separate power must be supplied directly to the motor. See the wiring diagram on the motor's nameplate and Motor Wiring Instructions.



Downtime Cleaning without Motor Starter

### Without Motor Starter

The Delta P control panel without motor starter requires 120-Volt AC, single-phase power to be wired directly to the control panel two-point terminal block located on the 3-pin timer subpanel. Separate power must be supplied directly to the motor. See the wiring diagram on the motor's nameplate and Motor Wiring Instructions.



Delta P Cleaning without Motor Starter

## Remote-Mount Cleaning

Remote-mount control panels are not equipped with a motor starter and require 120-Volt AC, single-phase power to be wired directly to the control panel. Separate power must be supplied directly to the motor. See the wiring diagram on the motor's nameplate and Motor Wiring Instructions.

### Downtime Cleaning

Wire 120-Volt AC directly to the control panel PLC terminal block at Terminals L, N, and G.

#### Solenoid Connection

Connect solenoid valves to the PLC relay outputs located inside the control panel.

### Delta P Cleaning

Wire 120-Volt AC power directly to the control panel two-point terminal block located on the 3-pin timer subpanel.

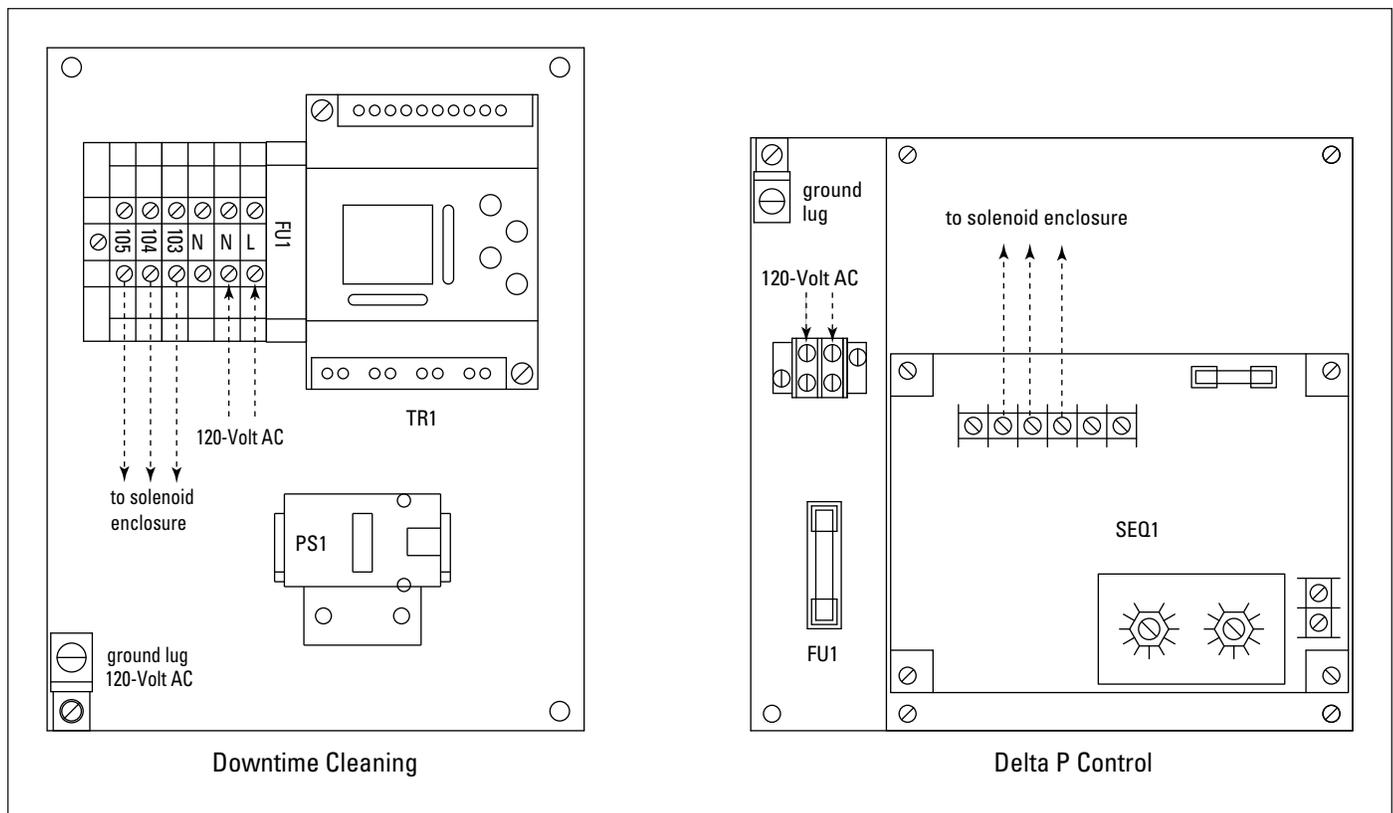
#### Solenoid Connection

Wire each solenoid valve to the 3-pin timer board.

## Motor Wiring Instructions

### For Customer-Supplied Motor Starters

1. Power is always routed through one or both of the top electrical openings and through an internal bulkhead knockout provided on the blower motor plate inside the collector.
2. Remove electrical-access panels and set aside.
3. Using the wiring diagram on the motor, wire directly to motor. Do not wire through the control panel. Use appropriate wire gauge for rated amp load as specified by local codes.
4. With power supply ON, check the operation of the motor and fan rotation. The fan can be viewed through the control panel access door. Proper rotation is counterclockwise from the top of the collector.



Remote-Mount Cleaning Controls

## Control Panels and Solenoid Specifications

### Control Panel Input

Without Motor Starter

105-135 Volts AC/50-60Hz/1 Phase

With Motor Starter

See motor voltage/50-60 Hz/3 Phase

### Pulse ON Time

Factory set at 200-milliseconds.

### Pulse OFF Time

Factory set at 10-seconds. The pulse OFF time can only be adjusted by modifying the parameters contained in the microprocessor software. Contact your representative for assistance.

### Pulse Cleaning Cycle

Downtime Cleaning

3 minutes

Delta P Cleaning

Until low-pressure setpoint is reached.

### Solenoid Valves

115-Volt AC at 19.7 watts each

### Operating Temperature Range

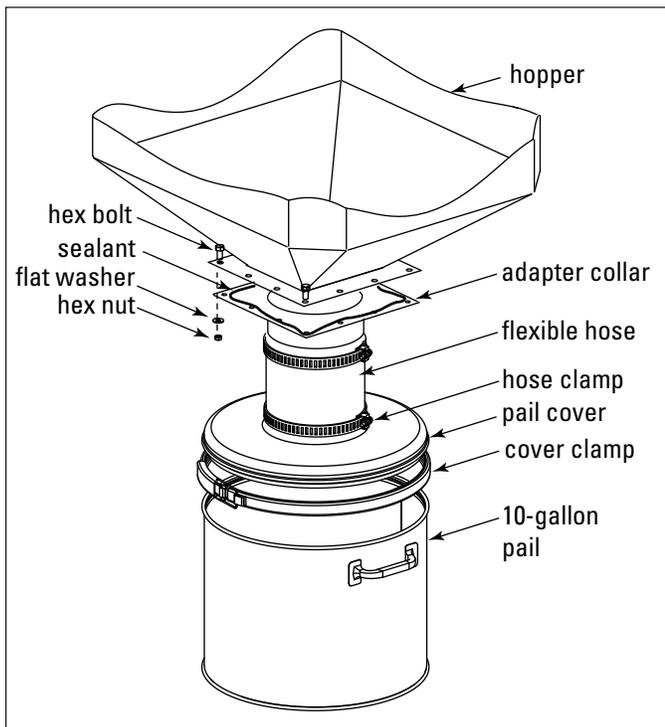
Ambient 0° to 140° F

## 10-Gallon Pail Pack

A 10-gallon pail pack is standard with all models. A sturdy band clamp secures the cover to the 10-gallon pail.

For dust removal:

1. Loosen and remove cover clamp and cover.
2. Dispose of dust.
3. Reinstall the dust bin, cover and clamp.



10-Gallon Pail Pack

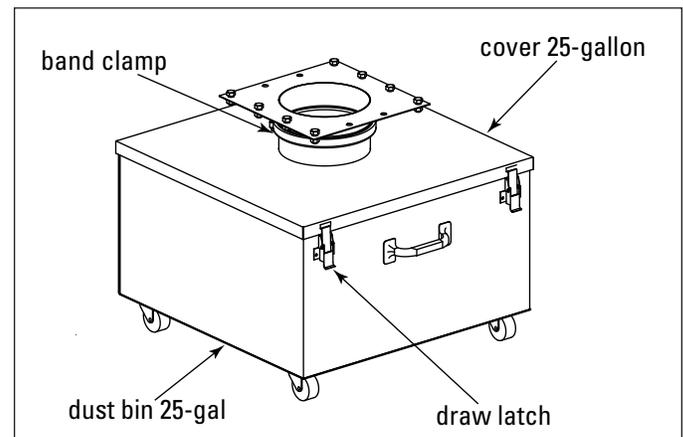
## 25-Gallon Dust Bin

A 25-gallon dust bin is optional with all models. A sturdy band clamp secures the cover and dust bin to the collector hopper flange.

For dust removal:

1. Loosen and remove band clamp.
2. Remove dust bin with cover.
3. Remove cover by releasing draw latches.
4. Empty dust bin.
5. Install cover on the dust bin and clamp down with draw latches.

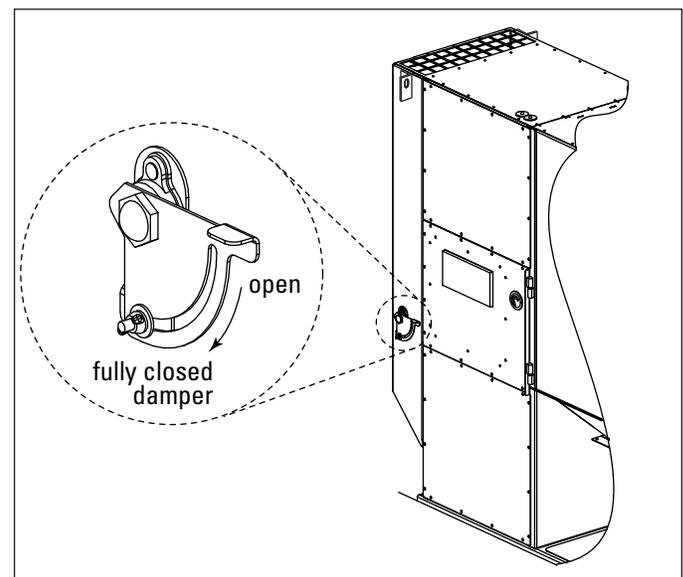
6. Install dust bin with cover under collector hopper flange.
7. Install band clamp over hopper outlet and bin cover and tighten band clamp.



25-Gallon Dust Bin

## Exhaust Damper

An exhaust damper control regulates or limits airflow when collector is in operation. Before start-up, set damper control to the fully-closed position as shown below. Adjust airflow by loosening the wing nut and sliding the handle to open the damper. When replacing filters, reset the damper to the fully-closed position and adjust airflow.



Exhaust Damper Adjustment

## Preliminary Start-Up Check

Instruct all personnel on safe use and maintenance procedures.

### CAUTION

Electrical work during installation, service or maintenance must be performed by a qualified electrician and comply with all applicable national and local codes.

Turn power off and lock out all power before performing service or maintenance work.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.

Check that the collector is clear and free of all debris before starting.

Do not install in classified hazardous atmospheres without an enclosure rated for the application.

Optional fans over 600 lbs must be independently supported.

1. Check all electrical connections for tightness and contact.
2. Check for proper rotation on all motors as described below.

To reverse rotation, single-phase power supply:  
Follow manufacturer's instructions on the motor's nameplate.

To reverse rotation, three-phase power supply:  
Switch any two leads on the motor junction box.

### CAUTION

Do not look into fan outlet to determine rotation. View the fan rotation through the back of the motor.

Check that the exhaust plenum is free of tools or debris before checking blower/fan rotation.

Stand clear of exhaust to avoid personal injury.

Do not interchange a power lead with the ground wire. Severe personal injury and/or property damage may result.

3. All access panels should be sealed and secure.
4. Check that the dust container is properly sealed and clamped.

5. Check that fan exhaust damper is set to the fully-closed position (one row of open slots).
6. Check and remove all loose items in or near the inlet and outlet of the collector.
7. Check that all remote controls and solenoid enclosures (if applicable) are properly wired and all service switches are in the OFF position.
8. Check that all optional accessories are installed properly and secured.
9. Turn power ON at source.
10. Turn the compressed-air supply ON. Adjust pressure regulator for 60-psig.
11. Turn fan motor ON.
12. Adjust airflow with the exhaust damper.

### NOTICE

Excess airflow can shorten filter life, cause electrical system failure and fan motor failure.

13. Turn powered hopper discharge devices ON.

## Maintenance Information

Instruct all personnel on safe use and maintenance procedures.

### CAUTION

Use proper equipment and adopt all safety precautions needed for servicing equipment.

Use appropriate access equipment and procedures. Note the standard collector is not equipped with access platforms unless noted on the specification drawings.

Electrical service or maintenance work must be performed by a qualified electrician and comply with all applicable national and local codes.

Turn power off and lock out all power before performing service or maintenance work.

Do not install in classified hazardous atmospheres without an enclosure rated for the application.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.

### NOTICE

Do not set compressed-air pressure above 60-psig as component damage can occur.

All compressed air components must be sized to meet the system requirements of 60-psig supply pressure.

The compressed-air supply must be oil and moisture free. Contamination in the compressed air used to clean filters will result in poor cleaning, cleaning valve failure, or poor collector performance.

Purge compressed air lines to remove debris before connecting to the collector's compressed air manifold.

2. Periodically check the compressed air components and replace compressed air filters.

Drain moisture following the manufacturer's instructions. With the compressed air supply ON, check the cleaning valves, solenoid valves, and tubing for leaks. Replace as necessary.

3. Monitor pressure drop across filters.

Abnormal changes in pressure drop may indicate a change in operating conditions and possibly a fault to be corrected. For example, prolonged lack of compressed air will cause an excess build-up of dust on the filters resulting in increased pressure drop. Cleaning off-line with no airflow usually restores the filters to normal pressure drop.

4. Monitor exhaust.
5. Monitor dust disposal.

## Filter Removal and Installation

### CAUTION

Use proper safety and protective equipment when removing contaminants and filters.

Dirty filters may be heavier than they appear.

Use care when removing filters to avoid personal injury and/or property damage.

Turn power off and lock out all power before performing service or maintenance work.

Turn compressed air supply OFF, bleed and lock out lines before performing service or maintenance work.

Do not operate with missing or damaged filters.

## Operational Checklist

1. Monitor the physical condition of the collector and repair or replace any damaged components.

Routine inspections will minimize downtime and maintain optimum system performance. This is particularly important on continuous-duty applications.

## Filter Removal

1. Start at the top access port.
2. Remove access cover by lifting latch handle and lifting cover to remove from yoke.

If the access cover clamp fails to operate smoothly, apply a lubricant to the riveted pivot points and to the clamp rod where it passes through the outside of the cover. Wipe off over spray.

3. Break the seal between the filter cartridge and the sealing surface.
4. Slide the filter out the access port along the suspension yoke and dispose of properly.
5. Clean the sealing surface with damp cloth.

### **NOTICE**

Clean dust from gasket sealing area to ensure a positive filter

gasket seal.

6. Check for an accumulation of dust in the storage area and empty as necessary.

## Filter Installation

1. Slide the new filter cartridge onto each suspension yoke.

Note: Insert the filter gasket-end first.

2. Wipe cover gaskets clean and replace covers by attaching cover to yoke hook and firmly latching cover handle.

Replace access covers carefully by securing them using the handle provided. Keep fingers away from the sealing surface to avoid pinching.

### **NOTICE**

Check that access covers are seated and seal properly.

Gaskets must be compressed to ensure an airtight seal.

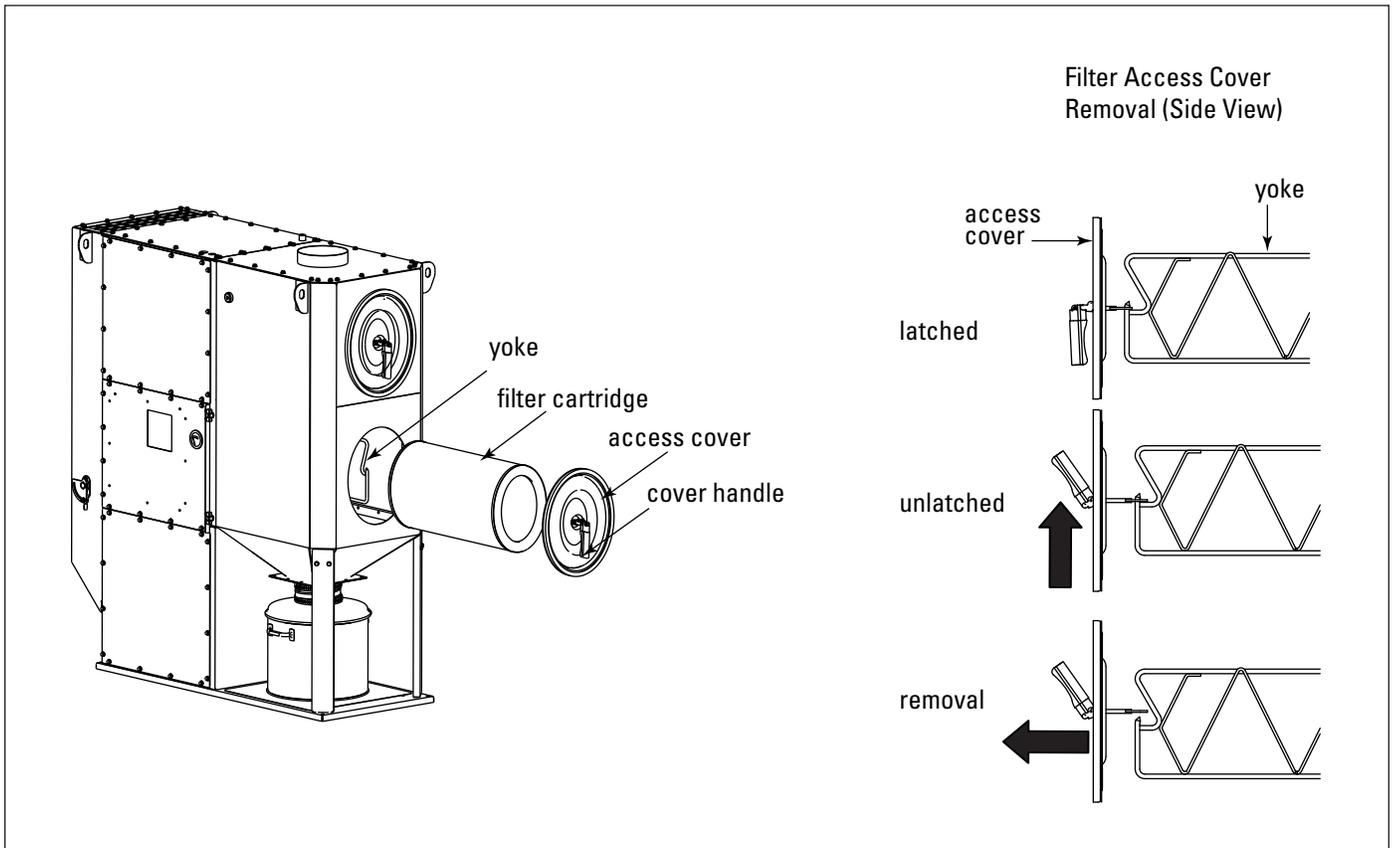
3. Reset exhaust damper control to fully closed position.
4. Turn electrical power and compressed air supply ON before starting collector.

## Dust Disposal

1. Empty dust container(s) as necessary to minimize dust in the hopper.
2. Replace or reinstall dust container(s).

## Compressed Air Components

1. Periodically check the compressed air components and replace damaged or worn components as necessary.
2. Drain moisture following the manufacturer's instructions.
3. With the compressed-air supply ON, check the cleaning valves, solenoid valves, and tubing for leaks. Repair or replace as necessary.



Filter Removal and Installation

## Split Taper™ Bushing Mounting Instructions

Many fans are furnished with split taper bushings for mounting the impeller to the shaft. When properly assembled, the bushings grip the hub with a positive clamping action.

1. Bushel barrel and bore of impeller are tapered to ensure concentric mounting and a true running propeller.
2. Capscrews, when tightened, lock bushing in propeller. Use special plated capscrews and nylock nuts.

Bushing No.	Bolt Size	Torque Ft-Lbs
QT/QH/L/H	1/4-20	7-1/2

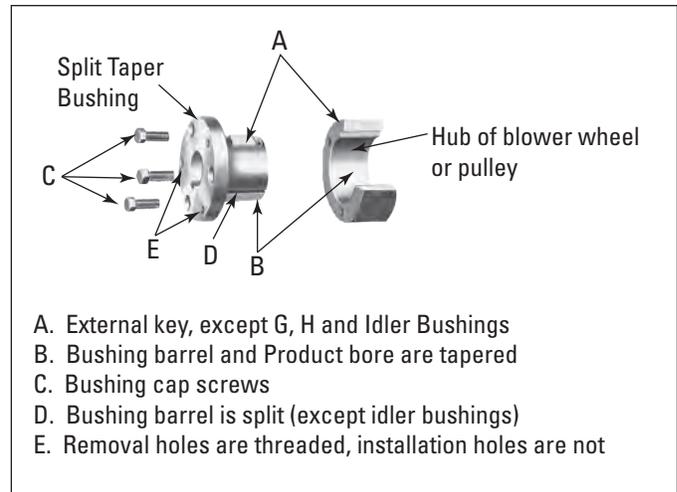
3. Bushing is split so that when the locking capscrews force bushing into tapered bore, the bushing grips the shaft with a positive clamping fit. This will withstand vibration and heavy loads without being loosened.
4. Impeller and bushing assembly is keyed to the shaft and held in place by compression, which adds driving strength.

### NOTICE

Before assembly, ensure shaft and keyway are clean and smooth. Check key size with both shaft and bushing keyway.

5. To assemble, insert the capscrews through the clearance holes in the bushing and install bushing loosely into the impeller. Do not press or drive. Start capscrews by hand, turning them just enough to engage threads in the nylock nut. Do not use a wrench at this time. The bushing should be loose enough in the propeller to move freely. Slide impeller and bushing assembly onto shaft, allowing adequate clearance for shaft end play to prevent friction. Fit key into keyway. Do not force impeller and bushing onto shaft. If it does not go on easily, check shaft, bushing, and key sizes once again.

Tighten capscrews gradually and evenly with wrench similar to mounting an automobile wheel. Rotate a quarter turn on each capscrew successively until



Spilt Taper Bushing Installation

all capscrews are tight. These capscrews force the taper bushing into the hub, which in turn compresses the bushing onto the shaft. This makes a positive clamping fit. The torque must not exceed the value specified in the table.

### CAUTION

Do not attempt to pull bushing flange flush with hub end.

There should be a clearance which varies approximately 3/16-in to 1/4-in with the bushing size when tightened. This is not a locating dimension.

### Impeller Assembly Removal

1. Remove all capscrews from impeller and hub assembly.
2. Insert capscrews into the threaded holes in the bushing flange.
3. Tighten each bolt in quarter of a turn increments to push the impeller off the bushing. This forces the bushing loose from the propeller hub and releases the compression so that the entire assembly will slide from the shaft.
4. Pull the bushing off the shaft.

### NOTICE

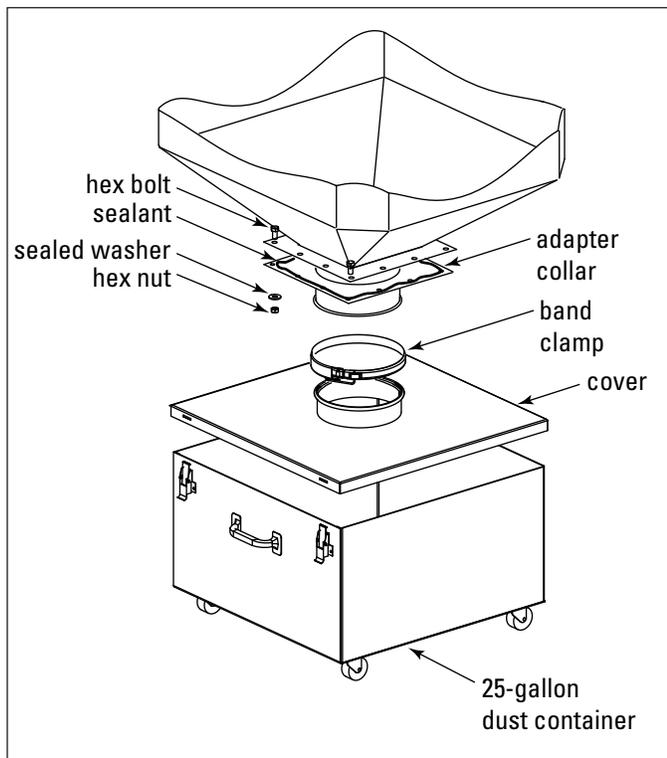
If the assembly has been in place sometime it may be necessary to use a wheel puller to remove the bushing. Never use a wheel puller on the impeller.

## Optional Equipment

### 25-Gallon Dust Container

An optional 25-gallon dust container with casters is also available. The 25-gallon dust container is secured to the adapter collar with a band clamp similar to the standard 10-gallon dust container.

1. Apply sealant to the adapter collar mounting flange toward the inside edge of the bolt pattern.
2. Attach adapter collar to the hopper flange using the bolts, washers, and hex nuts supplied.
3. Place cover on container and secure latches.
4. Position container under hopper outlet.
5. Secure the adapter collar and the container cover the wide band clamp.



25-Gallon Dust Container

## Sealer Gear Installation

The sealer gear provides an airtight seal between the hopper flange and the 10-gallon dust disposal container. Simply lift the sealer gear handle to remove the dust container or lower the handle to seal the dust container.

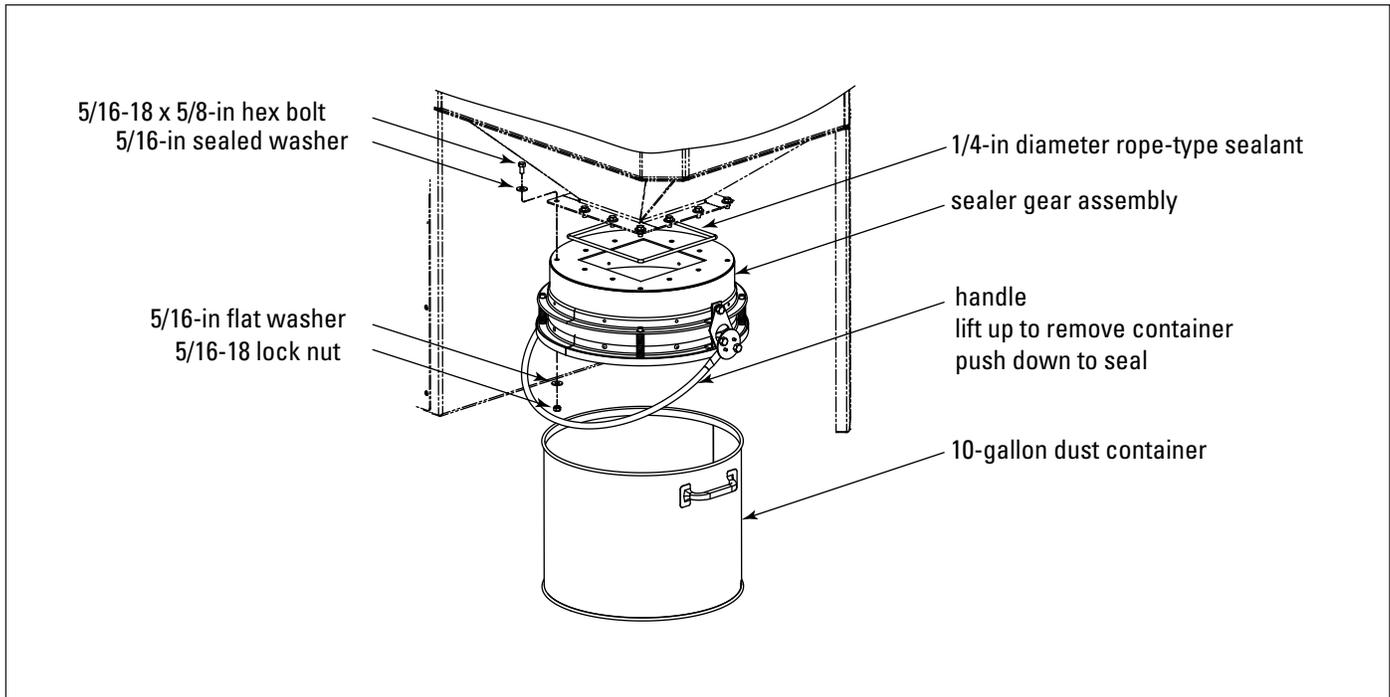
To install on an existing collector:

1. Remove the cover and clamp from the dust container.
2. Remove the dust container and set aside.
3. Remove the flexible duct and adapter collar from the collector's hopper flange.

4. Place 1/4-in diameter rope-type sealant on the sealer gear flange toward the inside edge of the bolt pattern. See Sealer Gear Installation.
5. Lift sealer gear to hopper flange, align bolt patterns, and secure using 5/16-18 x 5/8-in bolts, flat washers, and lock nuts supplied.

Note: For ease of maintenance, position the sealer gear with the handle toward the front or side of the collector.

6. Replace the dust container and push the sealer gear handle down.



Sealer Gear Installation

## Delta P Control

For complete information, see the most current version of the Delta P Installation, Operation, and Maintenance manual.

### Description

The Delta P Controller monitors the differential pressure between the clean-air and dirty-air plenums, providing a visual display of the filter condition. When combined with a pulse timer, it manages the pressure drop by turning the cleaning mechanism On and Off at the chosen limits. There are three (3) set points: High Pressure On, Low Pressure Off, and Alarm. The first two, High Pressure On and Low Pressure Off, control the filter cleaning system. The third, Alarm, provides a relay output to activate an external alarm supplied by others.

### Operation

#### Normal

The Delta P Controller monitors the pressure in the clean-air and dirty-air air plenums while the collector is running. The blower draws air through the filters, creating a pressure drop. The Delta P Controller measures the pressure drop and provides a visual display in inches water gauge or metric (SI) units of daPa.

#### Filter Cleaning

When the pressure drop across the filters reaches the High Pressure On setpoint, the controller closes an output relay allowing a timer to trigger the cleaning valves sequentially. When the controller senses that the pressure drop has decreased to the Low Pressure Off setpoint, the relay opens and the cleaning cycle stops. This sequence continues as long as the collector is in use, maintaining the pressure drop within a narrow range.

#### Alarm

The Alarm setpoint is set to a higher setting than the High Pressure On setpoint used to start the filter cleaning cycle. It indicates situations when the cleaning system cannot reduce the pressure drop due to cleaning system failure, lack of compressed air, or the end of the filter's useful life. There is a time delay prior to setting the Alarm to prevent nuisance trips. The Delta P Controller also provides an input connection for a remote alarm reset.

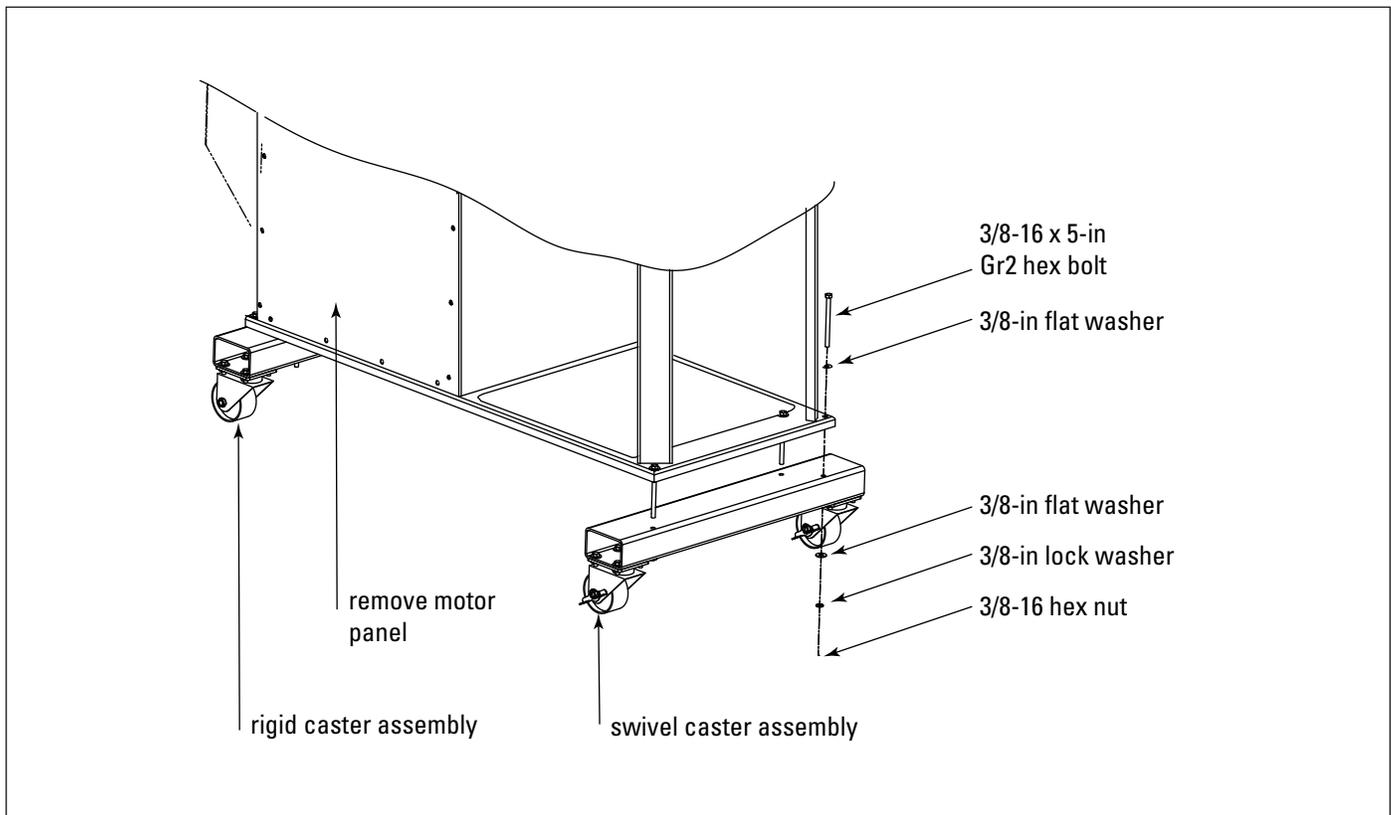


Delta P Control Display

## Caster Assembly

The caster assembly includes one rigid and one swivel caster set.

1. Lift collector approximately 24-in with a crane or forklift.
2. Position the swivel caster assembly under the front filter-access end of the collector. Align bolt holes and secure using the 3/8-16 x 5-in bolts, flat washers, lock washers, and hex nuts supplied. See Caster Installation.
3. Remove the lower side motor panel from the collector.
4. Position the rigid caster assembly under the back edge of the collector and fasten as described in Step 2.
5. Replace motor panel and lower collector.

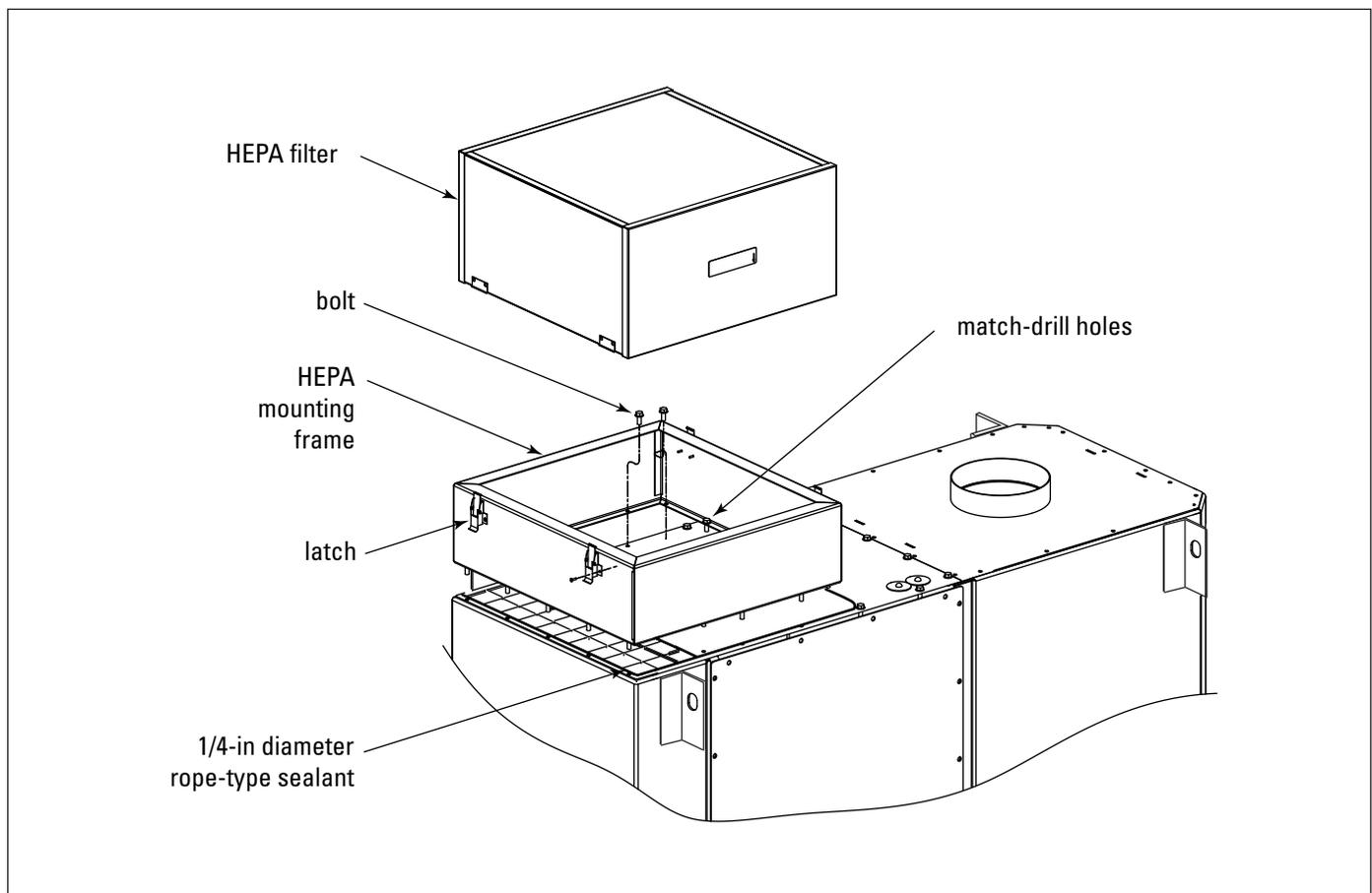


Caster Assembly

## HEPA Afterfilter Installation

The optional HEPA afterfilter is designed to capture small particulate and is attached to the collector's clean-air outlet.

1. Turn supply power OFF.
2. Remove the bolts from the top back roof panel.
3. Position the HEPA mounting frame on top of the clean-air outlet aligning existing hole pattern.
4. Mark and match-drill the front flange holes in the roof panel using a 0.266-in diameter drill bit.
5. Apply 1/4-in diameter rope-type sealant toward the inside of bolt pattern.
6. Position the HEPA mounting frame on the top panel aligning the bolt patterns.
7. Bolt in place using the hardware supplied and the hardware removed in Step 2.
8. Position HEPA filter on mounting frame and secure with latches.
9. Reset exhaust damper to fully closed position.
10. Turn collector ON.
11. Adjust airflow using the airflow control damper.



HEPA Afterfilter Installation

## Extraction Arm and Adapter Installation

Extraction Arms (Ex-Arms) are designed to carry dust, fume, and mist away from the worker's breathing zone. The operator positions the hood 8- to 12-inches above the work area. Contaminated air is drawn into the hood, through the Ex-Arm and into the dirty-air plenum of the collector where it is filtered and exhausted.

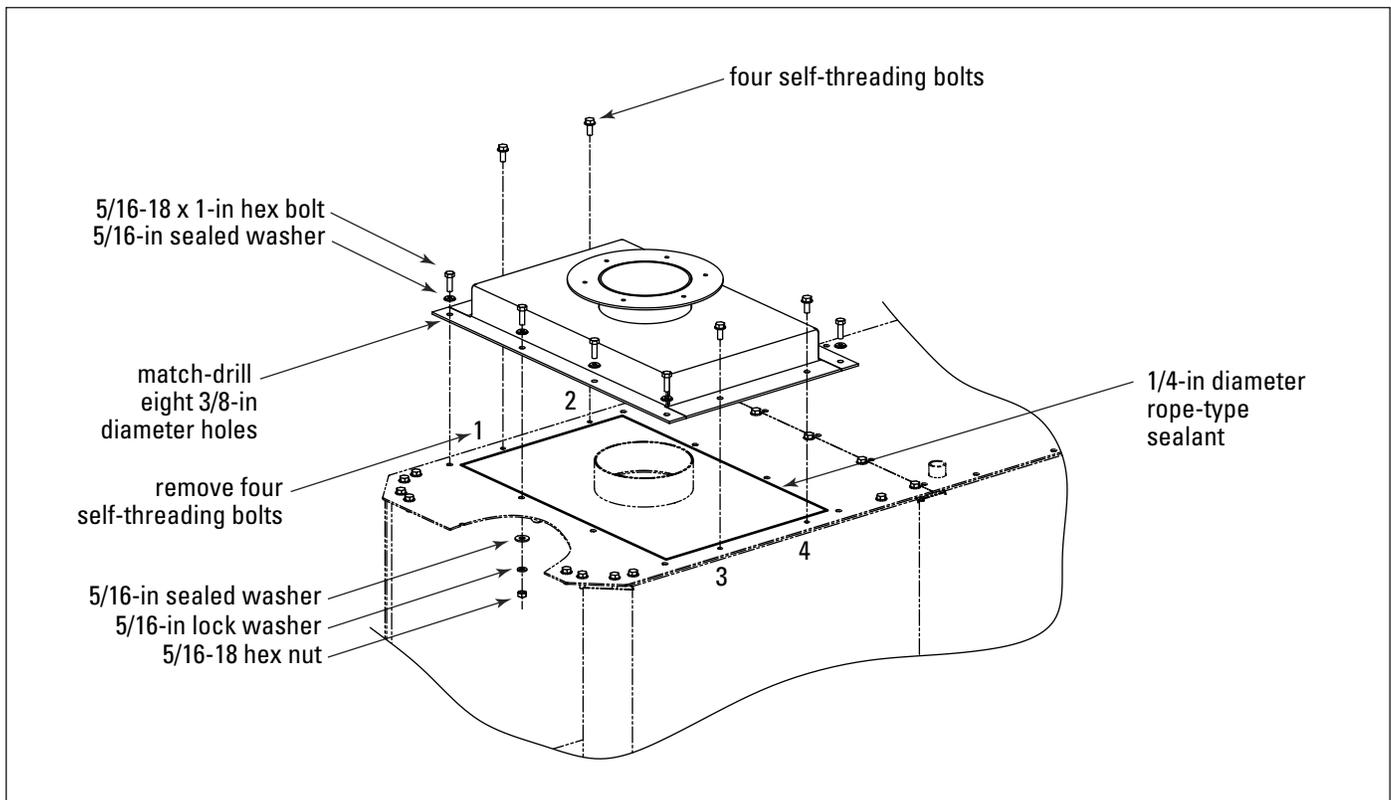
### Mounting Adapter

1. Remove the four self-threading bolts from the roof panel. See Mounting Adapter Installation.
2. Place the mounting adapter on the roof panel aligning the bolt holes from the bolts removed in Step 1 with the bolt pattern on the mounting adapter.

Note: The bolt pattern of the mounting adapter is not symmetrical. If the bolt patterns do not line up, turn the mounting adapter 180°.

3. Match-drill eight 3/8-in holes in the roof panel using the mounting adapter as a guide.

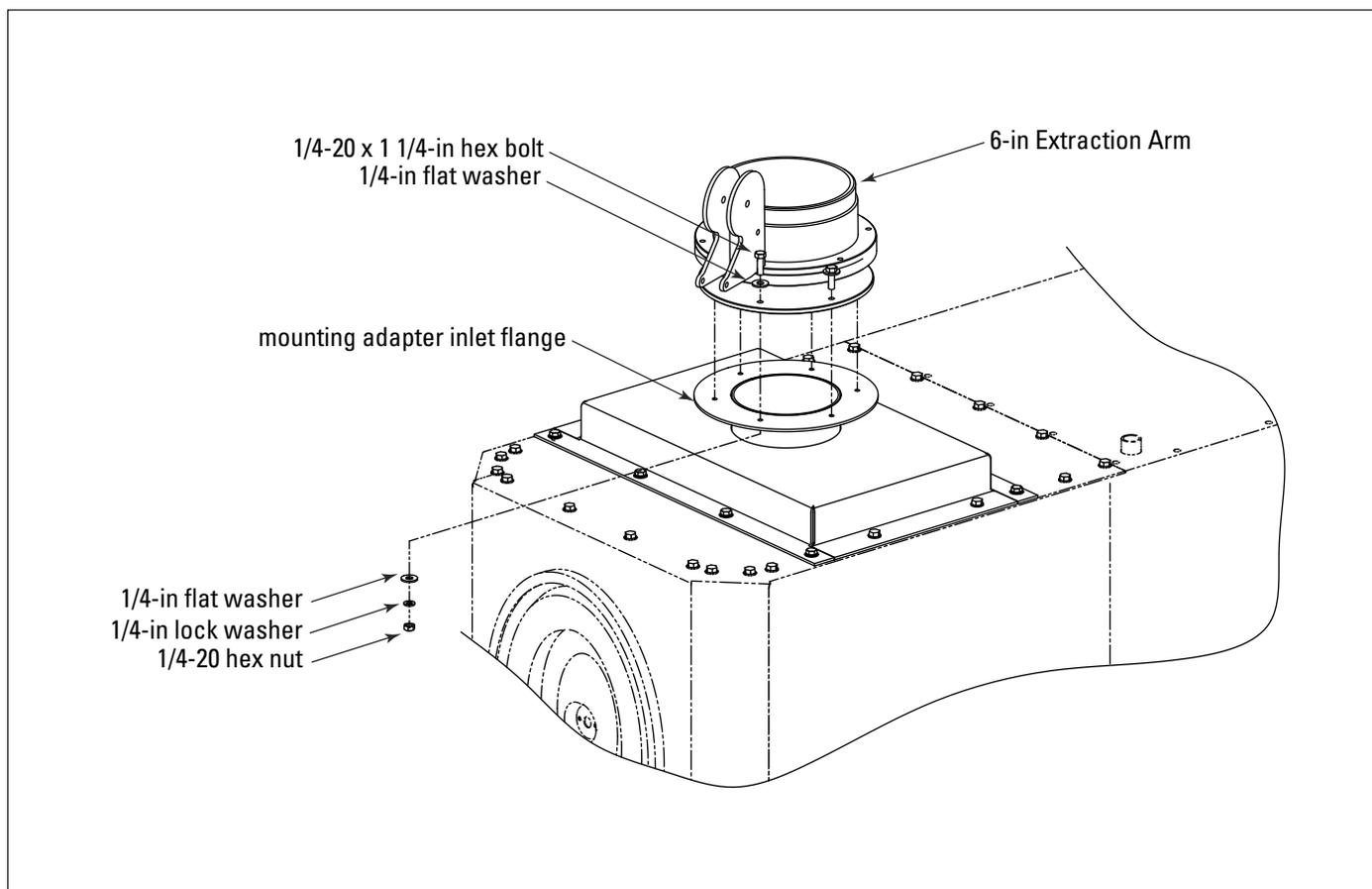
4. Remove the mounting adapter and set aside.
5. Place 1/4-in diameter, rope-type sealant on the roof panel toward the inside of the bolt pattern.
6. Place mounting adapter on the roof panel and align bolt patterns.
7. Remove the filter-access cover and filters to access the inside of the collector when attaching the mounting adapter.
8. Secure mounting adapter to roof panel using the four self-threading bolts removed in Step 1 and the 5/16-18 x 1-in bolts, sealed washers, lock washers, and hex nuts provided. See Mounting Adapter Installation.
9. Tighten all hardware securely.
10. Replace filter and filter access cover.



Mounting Adapter Installation

## Extraction Arm Installation

Lift the Ex-Arm into position over the mounting adapter inlet flange, align bolt patterns, and secure with hardware provided. See Extraction Arm Installation.



Extraction Arm (Ex-Arm) Installation

## Explosion Vent

 **CAUTION**

Personal injury, death, and/or property damage can result from material discharge during venting.

The material discharged during the venting of an explosion must be safely directed outdoors away from areas occupied by personnel to reduce risk of personal injury and/or property damage.

The risk of personal injury and/or property damage can be minimized or avoided by locating vented equipment outside buildings and away from normally occupied areas.

Explosion vents should be inspected regularly to confirm physical and operational condition. Replace any damaged parts immediately.

Standard explosion vents are intended for outdoor installations only.

Unless otherwise noted, the explosion venting calculations are based on formulas from NFPA-68 for outdoor applications only, with no duct or obstructions on the explosion vent panel.

Contact Donaldson Torit for assistance in calculating specific venting requirements for equipment.

NFPA 68 can provide guidance on both the frequency of and appropriate details for inspections.

## Sprinkler

 **CAUTION**

Sprinklers can place a large quantity of water in the dust collector when activated. Provide adequate drainage to remove water. Excess water weight can cause the leg structure to collapse.

**NOTICE**

Consult with local authorities when installing fire control systems on dust collection equipment.

Sprinkler couplings are provided for the convenience of fire control system installers. The fire control system installer shall make their own decisions on the appropriate location of fire control system components.

## Troubleshooting

Problem	Probable Cause	Remedy
<b>Fan blower and motor do not start</b>	Improper motor wire size	Rewire using the correct wire gauge as specified by national and local codes.
	Not wired correctly	Check and correct motor wiring for supply voltage. See motor manufacturer's wiring diagram. Follow wiring diagram and the National Electric Code.
	Collector not wired for available voltage	Correct wiring for proper supply voltage.
	Input circuit down	Check power supply to motor circuit on all leads.
	Electrical supply circuit down	Check power supply circuit for proper voltage. Check for fuse or circuit breaker fault. Replace as necessary.
	Damaged motor	Replace damaged motor.
<b>Fan blower and motor start, but do not stay running</b>	Incorrect motor starter installed	Check for proper motor starter and replace if necessary.
	Access doors are open or not closed tight	Close and tighten access doors. See Filter Installation.
	Hopper discharge open	Check that dust container is installed and properly sealed.
	Damper control not adjusted properly	Check airflow in duct. Adjust damper control until proper airflow is achieved and the blower motor's amp draw is within the manufacturer's rated amps.
	Electrical circuit overload	Check that the power supply circuit has sufficient power to run all equipment.
<b>Clean-air outlet discharging dust</b>	Filters not installed correctly	See Filter Installation.
	Filter damage, dents in the end caps, gasket damage, or holes in media	Replace filters as necessary. Use only genuine Donaldson replacement parts. See Filter Installation.
	Access cover(s) loose	Tighten access doors securely. See Filter Installation.
<b>Insufficient airflow</b>	Fan rotation backwards	Proper fan rotation is clockwise when viewed from the motor side or counterclockwise when viewed through the inlet cone. See Preliminary Start-Up Check.
	Access doors open or not closed tight	Check that all access doors are in place and secured. Check that the hopper discharge opening is sealed and that dust container is installed correctly.
	Fan exhaust area restricted	Check fan exhaust area for obstructions. Remove material or debris. Adjust damper flow control.
	Filters need replacement	Remove and replace using genuine Donaldson replacement filters. See Filter Removal and Installation.

## Troubleshooting

Problem	Probable Cause	Remedy
<b>Insufficient airflow continued</b>	Lack of compressed air	See Rating and Specification Information for compressed air supply requirements.
	Pulse cleaning not energized	Use a voltmeter to check the solenoid valves in the control panel. Check pneumatic lines for kinks or obstructions.
	Dust storage area overfilled or plugged	Clean out dust storage area. See Dust Disposal.
	Pulse valves leaking compressed air	Lock out all electrical power to the collector and bleed the compressed air supply. Check for debris, valve wear, pneumatic tubing fault, or diaphragm failure by removing the diaphragm cover on the pulse valves. Check for solenoid leaks or damage. If pulse valves or solenoid valves and tubing are damaged, replace.
<b>No display on the Delta P Controller</b>	No power to the controller	Use a voltmeter to check for supply voltage.
	Fuse blown	Check the fuse in the control panel. See wiring diagram inside the control panel. Replace if necessary.
<b>Display on Delta P Controller does not read zero when at rest</b>	Out of calibration	Recalibrate as described in Delta P Maintenance Manual.
	With collector discharging outside, differential pressure is present from indoor to outdoor	Recalibrate with the pressure tubing attached as described in the Delta P Maintenance Manual.
<b>Delta P Controller ON, but cleaning system does not start</b>	Pressure tubing disconnected, ruptured, or plugged	Check tubing for kinks, breaks, contamination, or loose connections.
	Not wired to the timing board correctly	Connect the pressure switch on the timer board to Terminals 7 and 8 on TB3.
	Faulty relay	Using a multimeter, test relay for proper closure. Replace if necessary.
<b>Pulse cleaning never stops</b>	Pressure switch not operating correctly	Check pressure switch inside the control panel.
	High Pressure On or Low Pressure Off setpoint not adjusted for system conditions	Adjust setpoints to current conditions.
	Pressure tubing disconnected, ruptured, plugged, or kinked	Check tubing for kinks, breaks, contamination, or loose connections.

Problem	Probable Cause	Remedy
<b>Alarm light is ON</b>	Alarm setpoint too low	Adjust to a higher value.
	Excess pressure drop	Check cleaning system and compressed air supply. Replace filters if filters do not clean down.
	Pressure tubing disconnected, ruptured, plugged, or kinked	Check tubing for kinks, breaks, contamination, or loose connections.
<b>Delta P arrow keys to not work</b>	Improper operation	Press and hold one of the three setpoint keys to use arrow keys.
	Programming keys disabled	Remove the Program Disable jumper from Terminals 3 and 4 on TB2.
<b>Cleaning light is ON, but cleaning system not functioning</b>	Improper wiring	Check wiring between the Delta P Control and the timer board, and between the timer board and solenoid valve coils.
	Defective solenoids	Check all solenoid coils for proper operation.
	Timer board not powered	Check power ON light on timer board's LED display. If not illuminated, check the supply voltage to the timer board. Check the fuse on the timer board. Replace if necessary.
	Timer board defective	If LED is illuminated, observe the output display. Install a temporary jumper across the pressure switch terminals. Output levels should flash in sequence. Check output using a multimeter set to 150-Volt AC range. Measure from SOL COM to a solenoid output. The needle will deflect when LED flashes for that output if voltage is present. If LED's do not flash, or if no voltage is present at output terminals during flash, replace the board.



## Donaldson Industrial Air Filtration Warranty

Donaldson warrants to the original purchaser only that the Goods will be free from defects in material and manufacture for the applicable time periods stated below: (1) Major structural components for a period of ten (10) years from the date of shipment; (2) Non-Structural, Donaldson-built components and accessories including Donaldson Airlocks, TBI Fans, TRB Fans, Fume Collector products, Donaldson built electrical control components, and Donaldson-built Afterfilter housings for a period of twelve (12) months from date of shipment; and (3) Donaldson-built filter elements for a period of eighteen (18) months from date of shipment.

Buyer is solely responsible for determining if goods fit Buyer's particular purpose and are suitable for Buyer's process and application. Seller's statements, engineering and technical information, and recommendations are provided for the Buyer's convenience and the accuracy or completeness thereof is not warranted. If, after Seller receives written notice, within the warranty period, that any goods allegedly do not meet Seller's warranty, and Seller, in its sole discretion, determines that such claim is valid, Seller's sole obligation and Buyer's exclusive remedy for breach of the foregoing warranty or any Seller published warranty, will be, at Seller's option, either: (i) repair or replacement of such goods or (ii) credit or refund to Buyer for the purchase price from Seller. In the case of repair or replacement, Seller will be responsible for the cost of shipping the parts but not for labor to remove, repair, replace or reinstall the allegedly defective goods. Refurbished goods may be used to repair or replace the goods and the warranty on such repaired or replaced goods shall be the balance of the warranty remaining on the goods which were repaired or replaced. Any repair or rework made by anyone other than Seller is not permitted without prior written authorization by Seller, and voids the warranty set forth herein. Seller warrants to Buyer that it will perform services in accordance with the Sales Documents using personnel of required skill, experience and qualifications and in a professional and workmanlike manner in accordance with generally recognized industry standards for similar services. With respect to any services subject to a claim under the warranty set forth above, Seller shall, in its sole discretion, (i) repair or re-perform the applicable services or (ii) credit or refund the price of such services at the pro rata contract rate and such shall be Seller's sole obligation and the exclusive remedy for breach of the foregoing warranty on services. Products manufactured by a third party ("Third Party Product") may constitute, contain, be contained in, incorporated into, attached to or packaged together with, the goods. Buyer agrees that: (a) Third Party Products are excluded from Seller's warranty in this Section 7 and carry only the warranty extended by the original manufacturer, and (b) Seller's liability in all cases is limited to goods of Seller's design and manufacture only. EXCEPT FOR SELLER'S WARRANTY OF TITLE TO THE GOODS, SELLER EXPRESSLY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES WHATSOEVER, WHETHER, EXPRESSED OR IMPLIED, ORAL, STATUTORY, OR OTHERWISE, INCLUDING BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY AND ANY WARRANTIES ARISING FROM TECHNICAL ADVICE OR RECOMMENDATIONS, COURSE OF DEALING OR OF PERFORMANCE, CUSTOM OR USAGE OF TRADE. Seller's obligations do not cover normal wear and tear or deterioration, defects in or damage to any goods resulting from improper installation, accident or any utilization, maintenance, repair or modification of the goods, or any use that is inconsistent with Seller's instructions as to the storage, installation, commissioning or use of the goods or the designed capabilities of the goods or that, in its sole judgment, the performance or reliability thereof is adversely affected thereby, or which is subjected to abuse, mishandling, misuse or neglect or any damage caused by connections, interfacing or use in unforeseen or unintended environments or any other cause not the sole fault of Seller, and shall be at Buyer's expense. Seller's warranty is contingent upon the accuracy of all information provided by Buyer. Any changes to or inaccuracies in any information or data provided by Buyer voids this warranty. Seller does not warrant that the operation of the goods will be uninterrupted or error-free, that the functions of the goods will meet Buyer's or its customer's requirements unless specifically agreed to, or that the goods will operate in combination with other products selected by Buyer or Buyer's customer for its use.

The terms of this warranty may only be modified by a special warranty document signed by a Director, General Manager or Vice President of Donaldson. To ensure proper operational performance of your equipment, use only genuine Donaldson replacement parts.

This Product is provided subject to and conditioned upon Donaldson's Terms of Sale ("Terms"), a current copy of which is located at [termsofsale.donaldson.com](http://termsofsale.donaldson.com). These Terms are incorporated herein by reference. By purchasing or using this Product, the user accepts these Terms. The Terms are available on our website or by calling our customer service line at 1-800-365-1331.

Significantly improve the performance of your collector with genuine Donaldson Torit replacement filters and parts. **Call Donaldson Torit at 800-365-1331.**

**Important Notice**

Many factors beyond the control of Donaldson can affect the use and performance of Donaldson products in a particular application, including the conditions under which the product is used. Since these factors are uniquely within the user's knowledge and control, it is essential the user evaluate the products to determine whether the product is fit for the particular purpose and suitable for the user's application. All products, product specifications, availability and data are subject to change without notice, and may vary by region or country.



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