

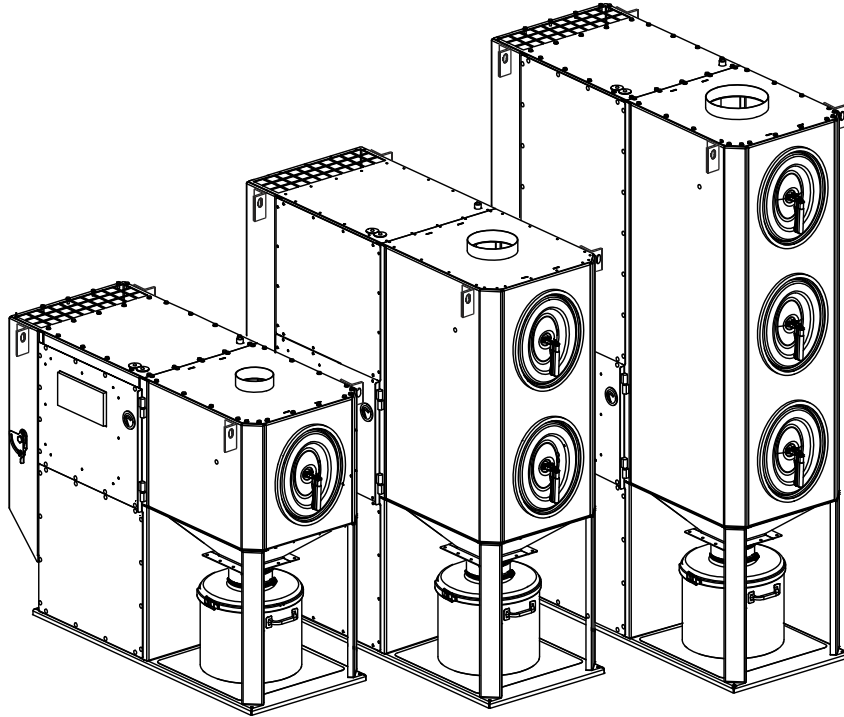


## Downflo® Oval

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

### Installation and Operation Manual

Installation, Operation, and Service Information



This manual is property of the owner. Leave with the unit when set-up and start-up are complete. Donaldson Company reserves the right to change design and specifications without prior notice.

Illustrations are for reference only as actual product may vary.



**This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.**



## APPLICATION OF DUST CONTROL EQUIPMENT

Combustible materials such as buffing lint, paper, wood, metal dusts, weld fume, or flammable coolants or solvents represent potential fire and/or explosion hazards. Use special care when selecting, installing, and operating all dust, fume, or mist collection equipment when such combustible materials may be present in order to protect workers and property from serious injury or damage due to a fire and/or explosion.

Consult and comply with all National and Local Codes related to fire and/or explosion properties of combustible materials when determining the location and operation of all dust, fume, or mist collection equipment.

When combustible materials are present you must consult with an expert in fire extinguishing and/or explosion protection systems, who is also familiar with the local codes, for support and guidance on the selection and installation of an appropriate fire and/or explosion protection system.

DO NOT allow sparks, cigarettes or other burning objects to enter the hood or duct of any dust, fume, or mist collection equipment as these may initiate a fire or explosion of any combustible materials accumulated in the collector.

Portions of dust, mist, and fume-collection equipment, including the clean- and dirty-air plenums may be considered "OSHA Confined Spaces." Refer to the appropriate OSHA regulations to determine if a specific installation should be considered a confined space and if a permit program is required.

Recirculating filtered air in your facility can be a hazard. Consult with OSHA to ensure compliance with all codes regarding recirculating filtered air.

Improper operation of a dust, fume, or mist control system may contribute to conditions in the work area or facility that could result in severe personal injury and product or property damage. Check that all dust, fume, or mist collection equipment is properly selected, installed, and operated for its intended use.

This manual contains specific precautionary statements relative to worker safety. Read this manual thoroughly and comply as directed. Instruct all personnel on the safe use and maintenance procedures related to this equipment. Discuss any questions on the application, use, or maintenance of this equipment with a Donaldson Torit representative.

For optimum collector performance, use only Donaldson Torit replacement parts.

### Data Sheet

Model Number _____	Serial Number _____
Ship Date _____	Installation Date _____
Customer Name _____	
Address _____ _____	
Filter Type _____	
Accessories _____	
Other _____	

## Contents

Description.....	1	Preliminary Start-Up Check .....	15
Purpose and Intended Use .....	1	Maintenance Information.....	16
Rating and Specification Information.....	2	Operational Checklist .....	16
Operation.....	3	Filter Removal and Installation.....	17
Inspection on Arrival.....	4	Filter Removal .....	17
Installation Codes and Procedures .....	4	Filter Installation.....	17
Installation.....	4	Dust Disposal .....	17
Site Selection, Grade-Mounted Units.....	4	Compressed Air Components.....	17
Unit Location .....	4	Split Taper™ Bushing Mounting Instructions .....	19
Rigging Instructions.....	5	Optional Equipment.....	20
Hoisting Information .....	5	25-Gallon Dust Container .....	20
Electrical Wiring.....	5	Sealer Gear Installation .....	21
Typical Installation.....	6	Delta P Control.....	22
Standard Equipment.....	7	Delta P Control Calibration .....	22
Cleaning Controls.....	7	Caster Assembly.....	23
Manual Motor Starter Option.....	7	HEPA Afterfilter Installation.....	24
Downtime Cleaning Option .....	7	Extraction Arm and Adapter Installation.....	25
Delta P Cleaning Option .....	7	Mounting Adapter .....	25
Remote-Mount Cleaning Option .....	8	Extraction Arm Installation.....	26
Control Panel and Motor Wiring .....	8	Explosion Vents .....	27
Manual Motor Starter.....	8	Sprinkler Installation.....	27
Downtime Cleaning .....	9	Troubleshooting.....	28
Delta P Cleaning .....	9	Service Notes.....	30
Remote-Mount Cleaning .....	10		
Motor Wiring Instructions .....	10		
Control Panels and Solenoid Specifications .....	11		
Compressed Air Installation .....	11		
10-Gallon Pail Pack.....	13		
25-Gallon Dust Bin.....	13		
Exhaust Damper .....	13		



**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.



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

**NOTICE**

**NOTICE** is used to address practices not related to personal injury that may result in damage to equipment.

## Description

The Downflo Oval, Model DFO 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 units; model DFO 1-1 is a single filter unit, model DFO 2-2 is a two filter high unit, and model DFO 3-3 is a three filter high unit.

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

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 cartridge for the application and type of dust collected is important.

- For extremely fine non-fibrous dust, use Ultra- Web® filter cartridges which offer high efficiency and performance on fine particulate.
- For fibrous dust, use 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. Appropriate cartridge options are available from Donaldson.
- Hygroscopic dust such as fertilizer, salt, and sugar should be handled under a controlled, low-humidity environment. Contact Donaldson for filter cartridge selection.
- Flammable or explosive dust require custom collector modifications, special cartridges, and special installation instructions. Contact Donaldson for design assistance and review related local codes for guidance on equipment location.
- Applications with high hydrocarbon or high oil content may require special treatment or filter media.



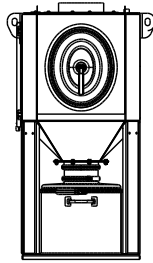
### **WARNING**

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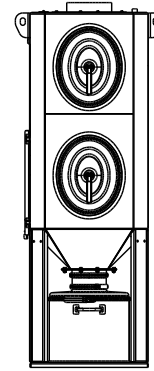
Consult and comply with all National and Local Codes related to fire and/or explosion properties of combustible materials when determining the location and operation of all dust, fume, or mist collection equipment.

Standard Donaldson Torit equipment is not equipped with fire extinguishing or explosion protection systems.

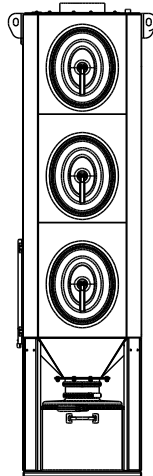
## Rating and Specification Information



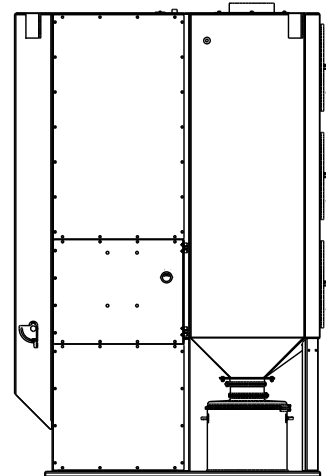
Front View 1-1



Front view 2-2



Front View 3-3



Typical Side View

All Units (as per IBC 2006 Specifications\*):

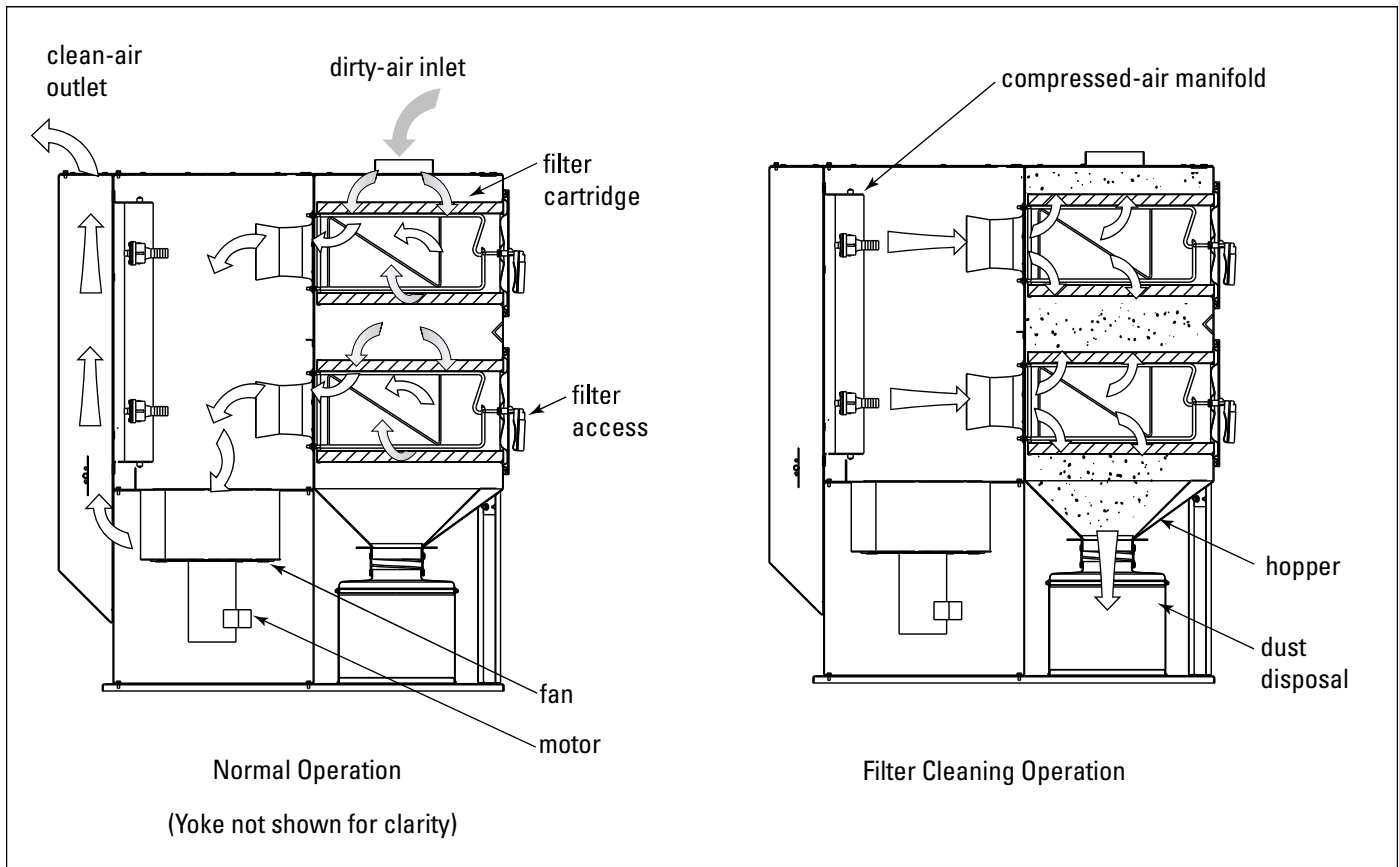
Seismic Spectral Acceleration, $S$ .....	1.5 g
Seismic Spectral Acceleration, $S_1^s$ .....	0.6 g
Installed Unit Base Elevation .....	Grade
Occupancy Category .....	II
Compressed air, maximum psig .....	60
Housing rating, inches water gauge .....	- 20
Power, valves and controls .....	120-Volt 50/60 Hz

\*If unit was supplied with a Record Drawing, the specifications on the drawing will supersede the standard specifications above.

## Operation

During normal operation, dust-laden air enters the unit 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 unit by removing the filter access cover and sliding the filter out.



Unit Operation

## Inspection on Arrival

1. Inspect unit on 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 unit 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 unit from truck.
8. Check for hardware that may have loosened during shipping.
9. Use caution removing temporary covers.

## Installation Codes and Procedures



**WARNING** 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 unit 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 unit 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 unit prior to, or during unit installation.

### **NOTICE**

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

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

## Installation



**CAUTION** Site suitability must account for wind, seismic zone, and other live-load conditions when selecting the location for all units.

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.

## Site Selection, Grade-Mounted Units

1. The unit is to be located indoors on a reinforced concrete foundation.
2. Portable units require no special installation accommodations.

## Unit Location



**WARNING** Donaldson Torit equipment is not designed to support site-installed ducts, interconnecting piping, or electrical services. All ducts, piping, or electrical services supplied by others 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

Foundation must be capable of supporting the entire weight of the unit, plus the weight of the collected material, piping, and ductwork.

Prepare the foundation in the selected location. Install anchor bolts to extend a minimum of 1 3/4-inches above foundation.

Locate the collector to ensure easy access to electrical and compressed-air connections and routine maintenance.

If explosion protection devices are part of the system, locate the collector in accordance with local code requirements (Example: NFPA 654). These codes may require units handling combustible dust be located either outside or against an exterior wall.

## Rigging Instructions

### Suggested Tools & Equipment

Clevis Pins and Clamps	Lifting Slings
Crane or Forklift	Pipe Sealant
Drift Pins	Pipe Wrenches
Drill and Drill Bits	Screwdrivers
End Wrenches	Socket Wrenches
Adjustable Wrench	Spreader Bars
Torque Wrench (inch/lbs, 9/16-in Socket)	

### Hoisting Information



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

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

A crane or forklift is 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.

Use spreader bars to prevent damage to unit's casing.

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

Allow only qualified crane operators to lift the equipment.

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

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

## Electrical Wiring



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

Turn power off and lock out electrical power sources 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.

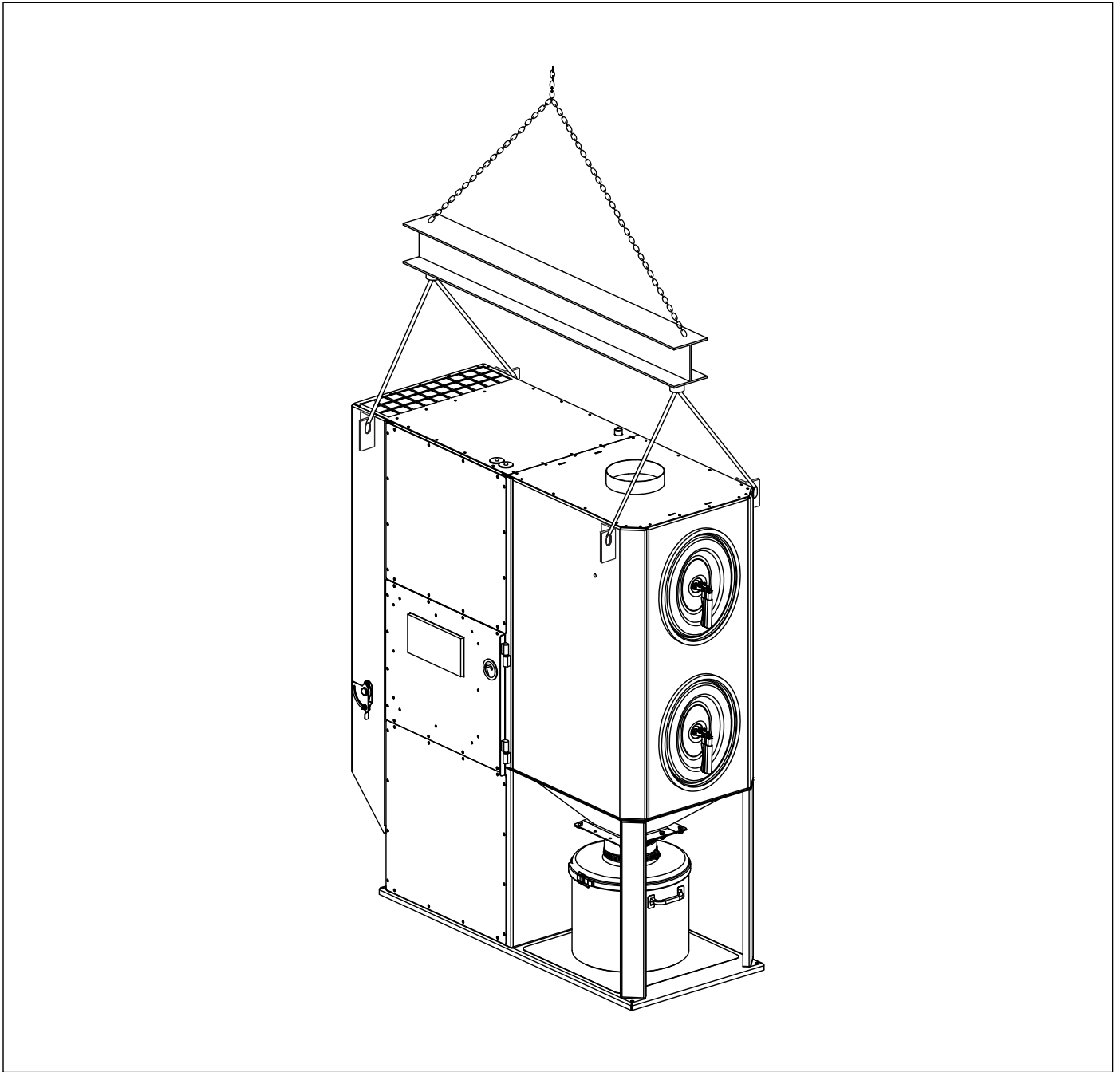
The appropriate wiring schematic and electrical rating must be used. See unit's rating plate for required voltage.

If the unit is not furnished with a factory-mounted disconnect, 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 unit'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.



## 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 unit 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 unit dimensions including anchor bolt locations for the collector's base plate.

## Cleaning Controls

All units 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 unit.

## 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 unit is shut down. The valves start to pulse one minute after the unit 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 units 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.

## Control Panel and Motor Wiring



### WARNING

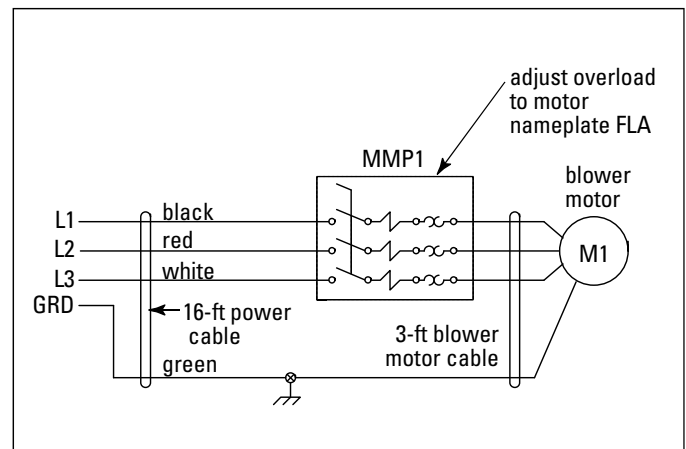
Electrical work must be performed by a qualified electrician and comply with all applicable national and local codes.

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

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

## 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.

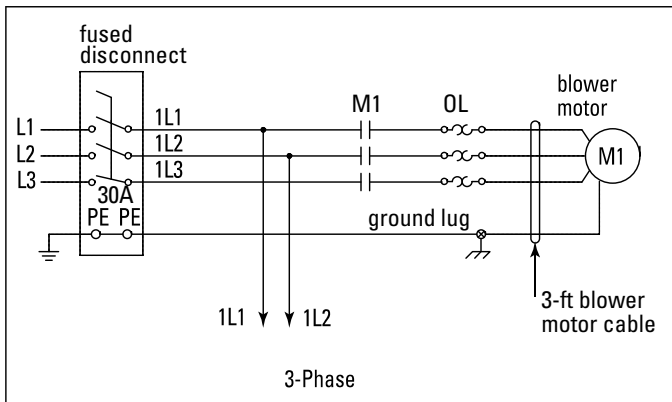


Manual Motor Starter (DFO 1-1)

## Downtime Cleaning

### With Motor Starter

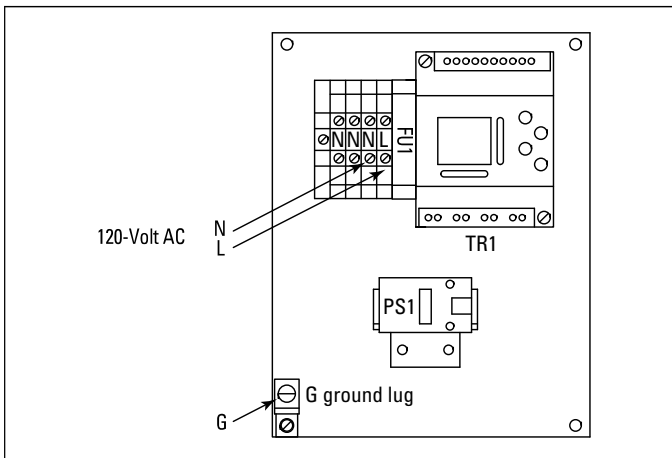
The downtime cleaning control panel with motor starter requires three-phase power with the requirements as listed on the motor's nameplate and is wired directly to the terminals on the motor disconnect switch located inside the control panel. See wiring diagram inside control panel.



Downtime Cleaning with Motor Starter

### 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.

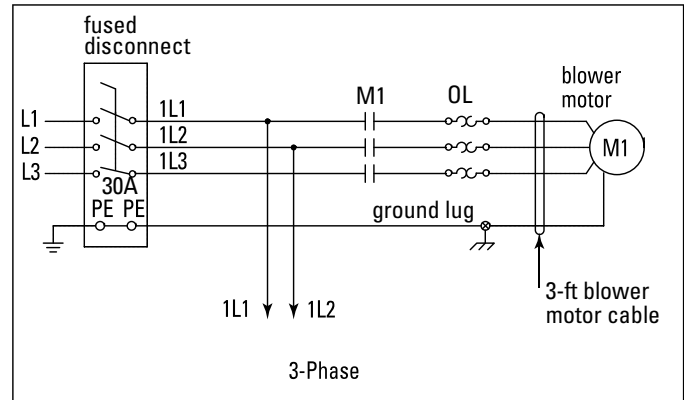


Downtime Cleaning without Motor Starter

## Delta P Cleaning

### With Motor Starter

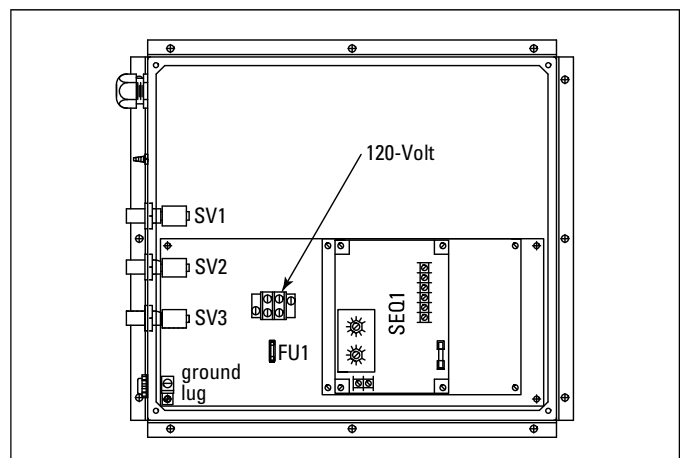
The Delta P control panel with motor starter requires three-phase power with the requirements as listed on the motor's nameplate and is wired directly to the terminals on the motor disconnect switch located inside the control panel. See wiring diagram inside control panel.



Delta P Cleaning with Motor Starter

### Without Motor Starter

The 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.

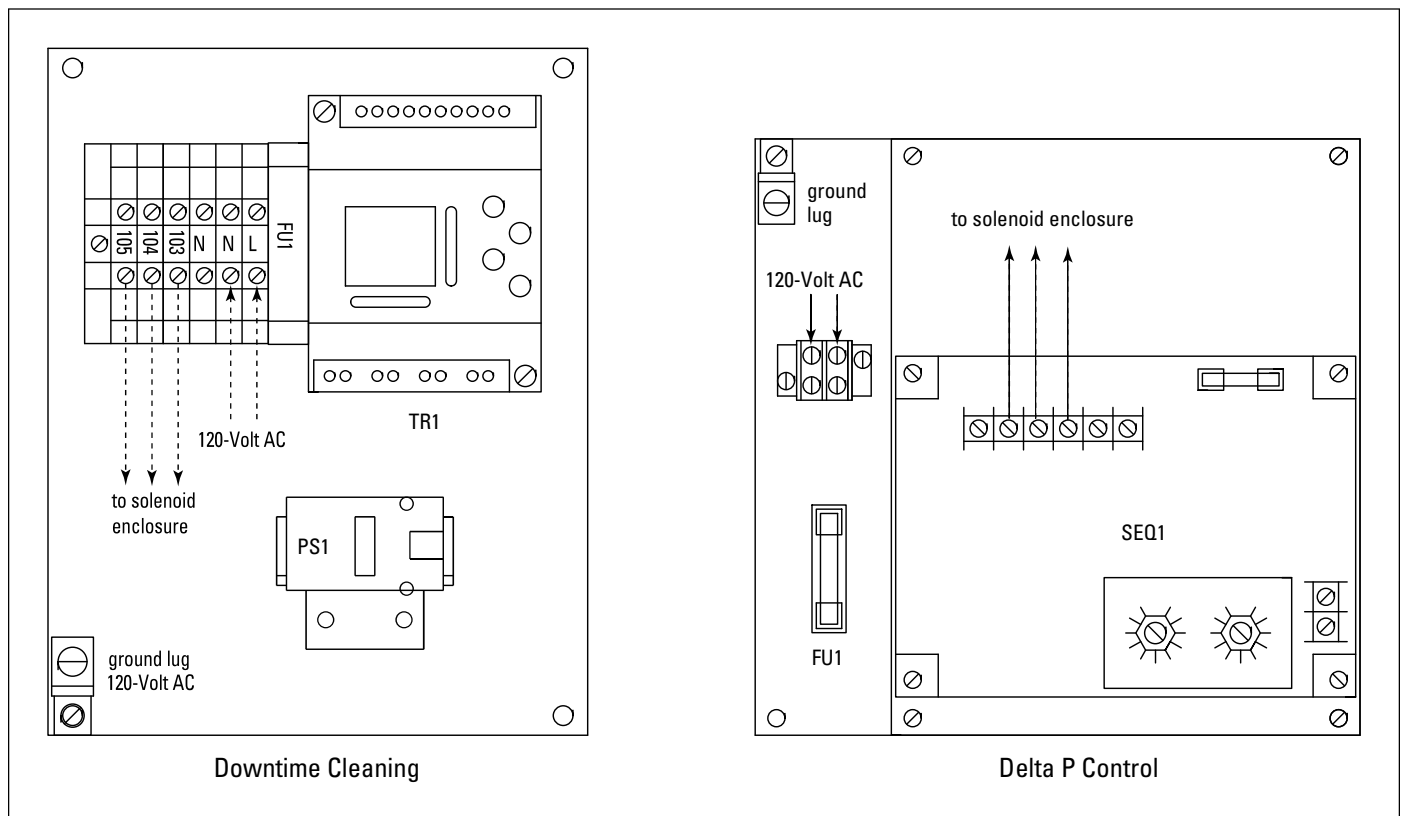
### Solenoid Connection

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 unit.



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

## Compressed Air Installation

### **WARNING**

Turn compressed-air supply OFF and bleed 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 downstream pressure when closed and include provisions to allow closed-position locking.

### **NOTICE**

Do not set compressed-air pressure above 60-psig.

Component damage can occur.

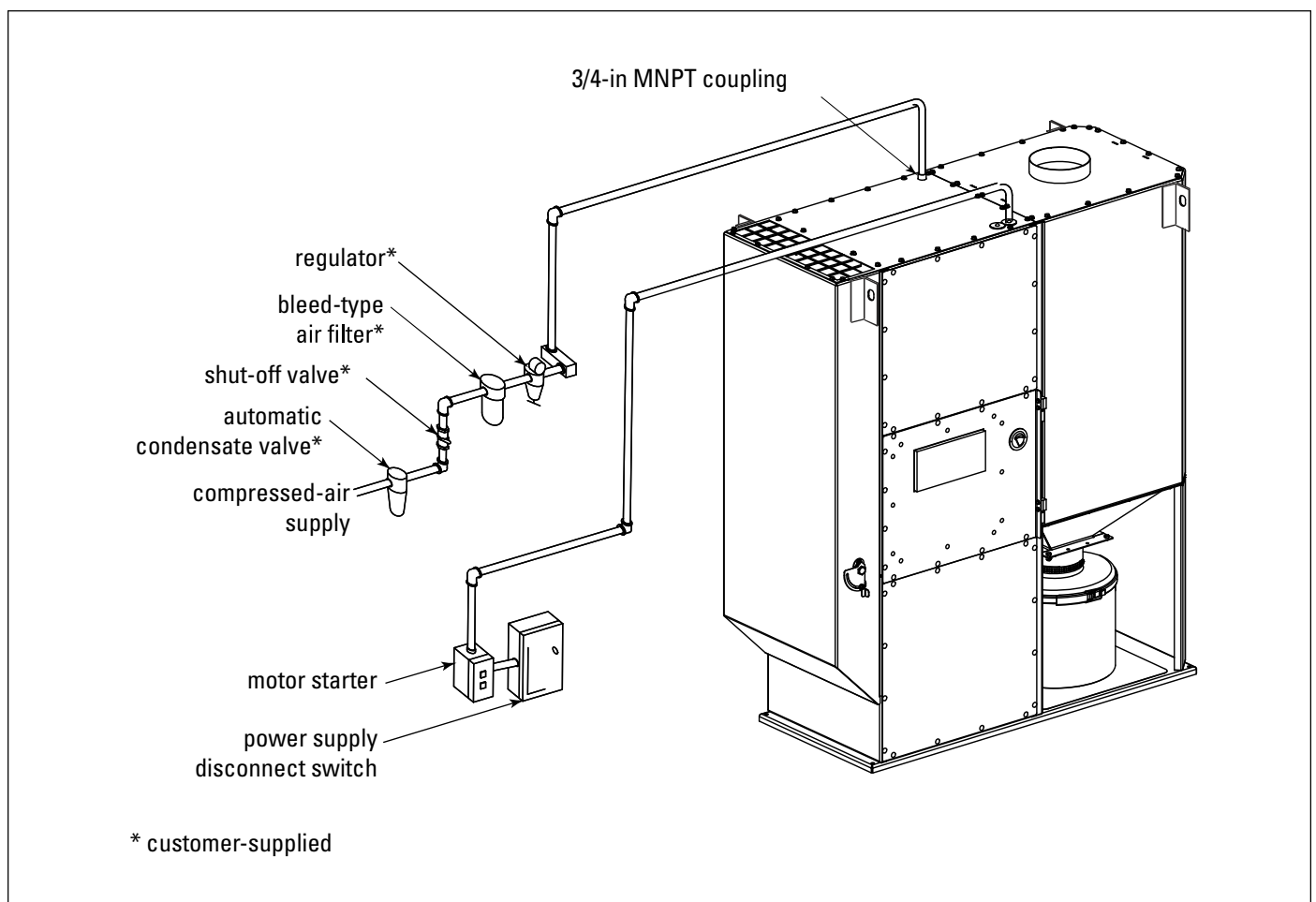
All compressed air components must be sized to meet the maximum system requirements of 0.86 cu ft/pulse at 60-psig supply pressure.

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 unit's compressed-air manifold.

Use thread-sealing tape or pipe sealant on all compressed-air connections and fittings.

1. Connect the compressed-air supply line to the 3/4-in MNPT compressed-air coupling located on the top roof panel of the unit.
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 at 60-psig. The pulse-cleaning controls are factory set to clean one filter every 10-seconds during a cleaning cycle.



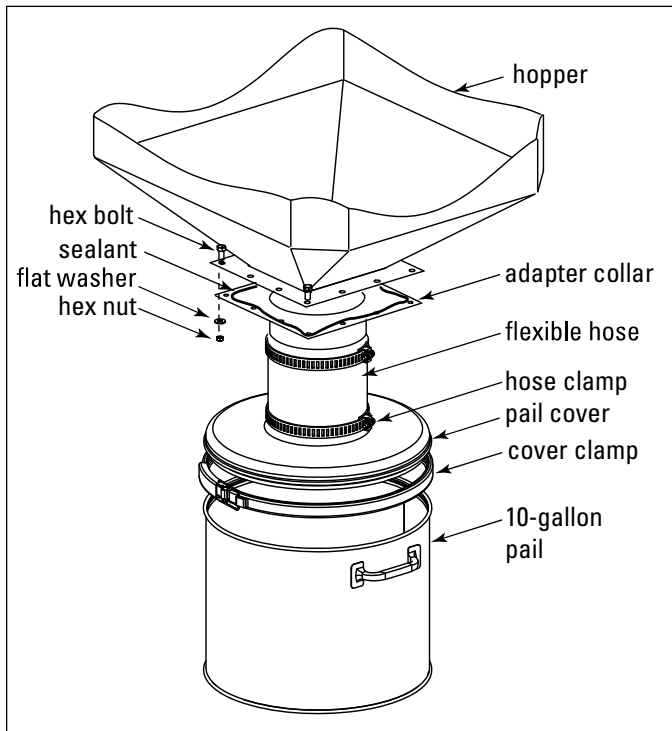
Compressed Air and Component Installation

## 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

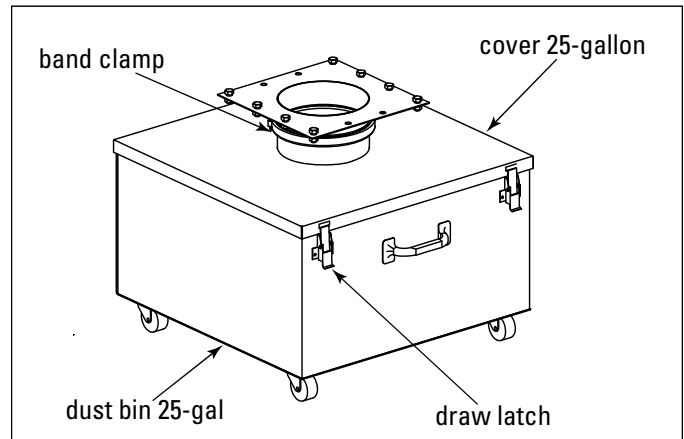
## 25-Gallon Dust Bin

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.

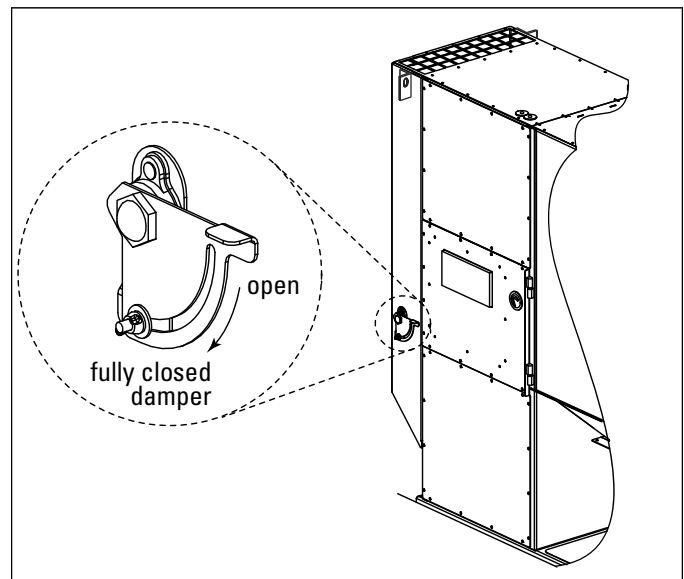
6. Install dust bin with cover under collector hopper flange.
7. Install band clamp over hopper outlet and bin cover and tighten band clamp.



25-Gallon Dust Bin

## Exhaust Damper

An exhaust damper control regulates or limits airflow when unit 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 then adjust airflow.



Exhaust Damper Adjustment



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## Preliminary Start-Up Check

Instruct all personnel on safe use and maintenance procedures.

### **WARNING**

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

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

Turn compressed air supply OFF and bleed 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. Motor and fan should be wired for clockwise rotation when viewed from the back of the motor.

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

To reverse rotation, three-phase power supply:  
Turn electrical power OFF at source and switch any two leads on the motor junction box.

### **WARNING**

Do not interchange a power lead with the ground wire. Severe damage or personal injury 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 exhaust damper is set to the fully-closed position.
6. Check and remove all loose items in or near the inlet and outlet of the unit.

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 blower fan motor ON.

### **WARNING**

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.

12. Adjust airflow with the exhaust damper.

### **NOTICE**

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

## Maintenance Information

Instruct all personnel on safe use and maintenance procedures.

### **WARNING**

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 electrical power sources 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 and bleed lines before performing service or maintenance work.

### **NOTICE**

Do not set compressed-air pressure above 60-psig.

Component damage can occur.

All compressed air components must be sized to meet the maximum 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 unit's compressed air manifold.

## 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.

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.

2. Monitor pressure drop across filters.

Abnormal changes in pressure drop 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 flow usually restores the filters to normal pressure drop.

3. Monitor exhaust.
4. Monitor dust disposal.

## Filter Removal and Installation

### **WARNING**

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.

### Filter Removal

1. Turn power to unit OFF.
2. Start at the top access port.
3. Remove access cover. See Filter Removal and Replacement illustration.

If the access cover clamp fails to operate smoothly, apply WD-40® to the riveted pivot points and to the clamp rod where it passes through the outside of the cover. Wipe off over spray.

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

### **NOTICE**

Clean dust from gasket sealing area to ensure a positive filter gasket seal.

7. 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 unit.

### Dust Disposal

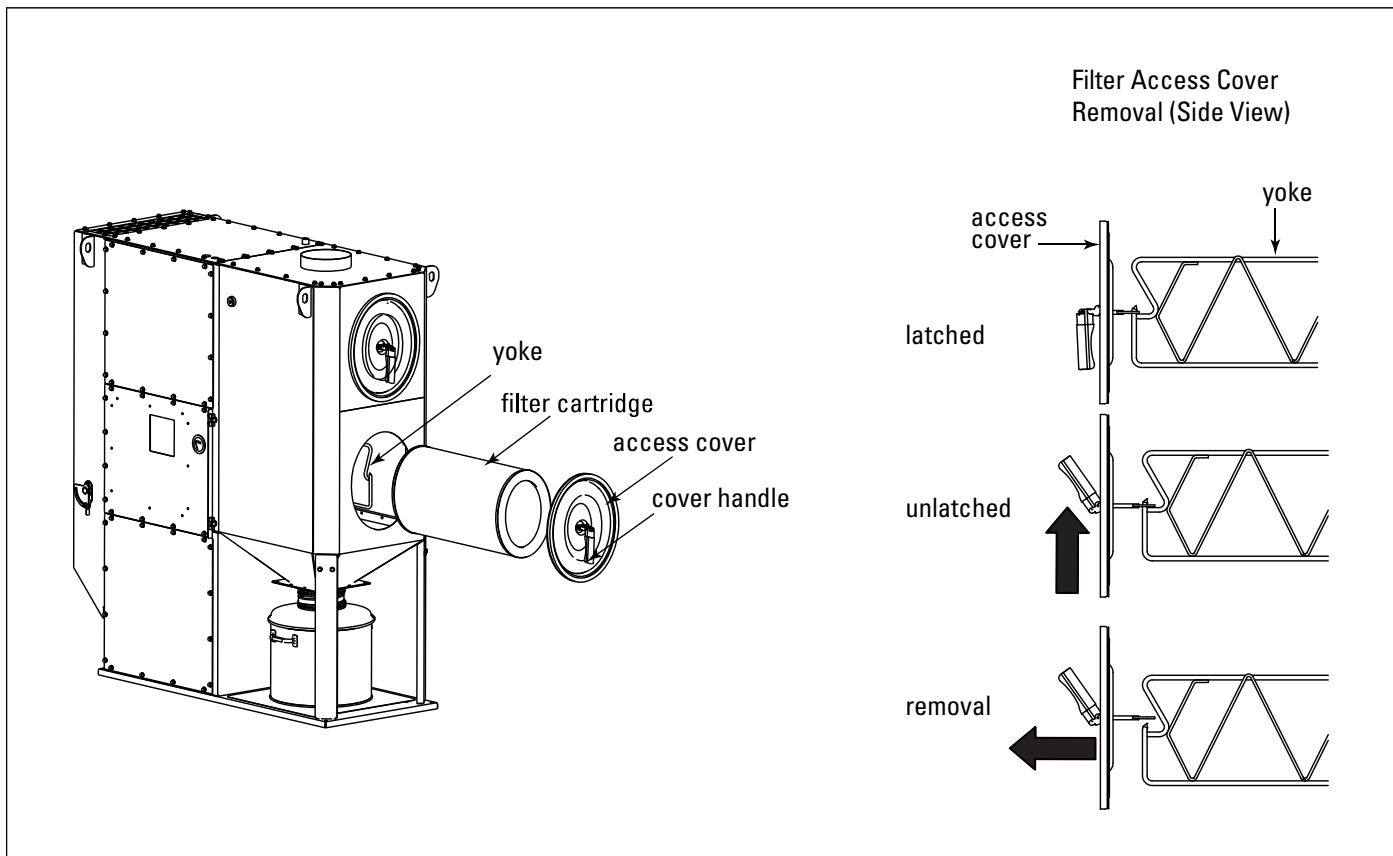
1. Turn unit OFF and empty dust container as necessary to minimize dust in the hopper.
2. Reinstall dust container.

### Compressed Air Components

### **NOTICE**

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

1. Periodically check the compressed air components and replace compressed-air filter.
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. 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

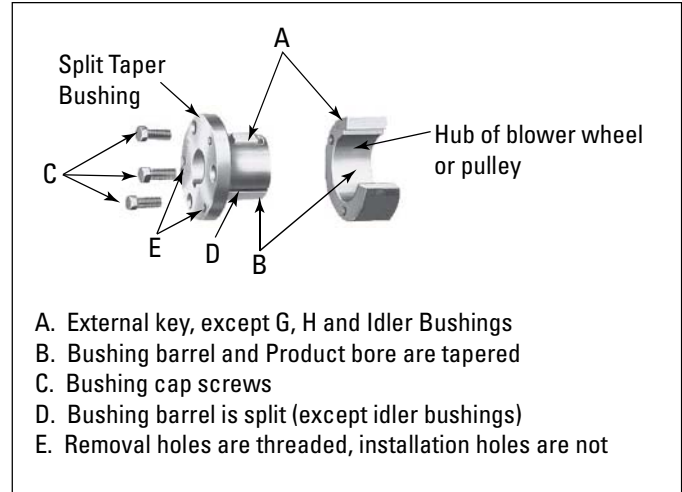
3. Bushing is split so that when the locking capscrews force bushing into tapered bore, the bushing grips the shaft with a positive clamping fit. This will withstand vibration and heavy loads without being loosened.
4. Impeller and bushing assembly is keyed to the shaft and held in place by compression,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

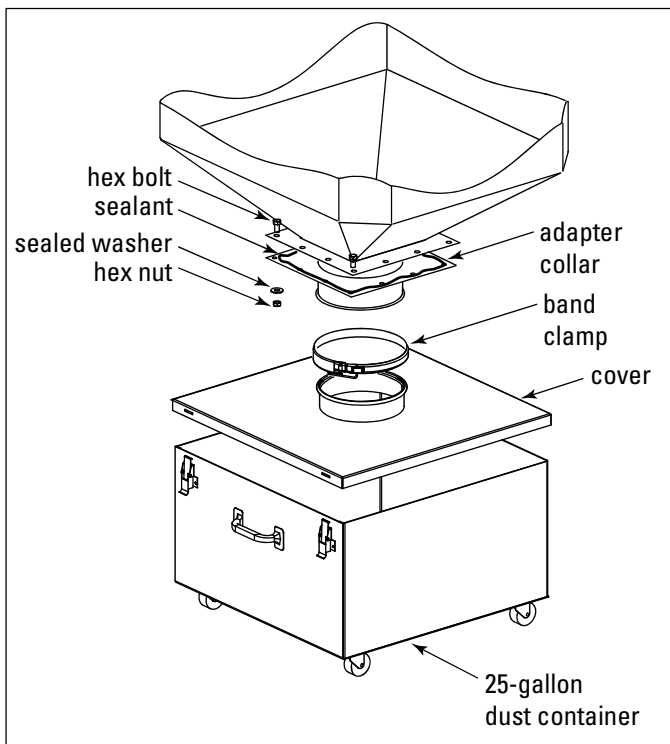
If the assembly has been in place sometime it may be necessary to use a wheel puller to remove the bushing. Never use a wheel puller on the impeller.

## 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

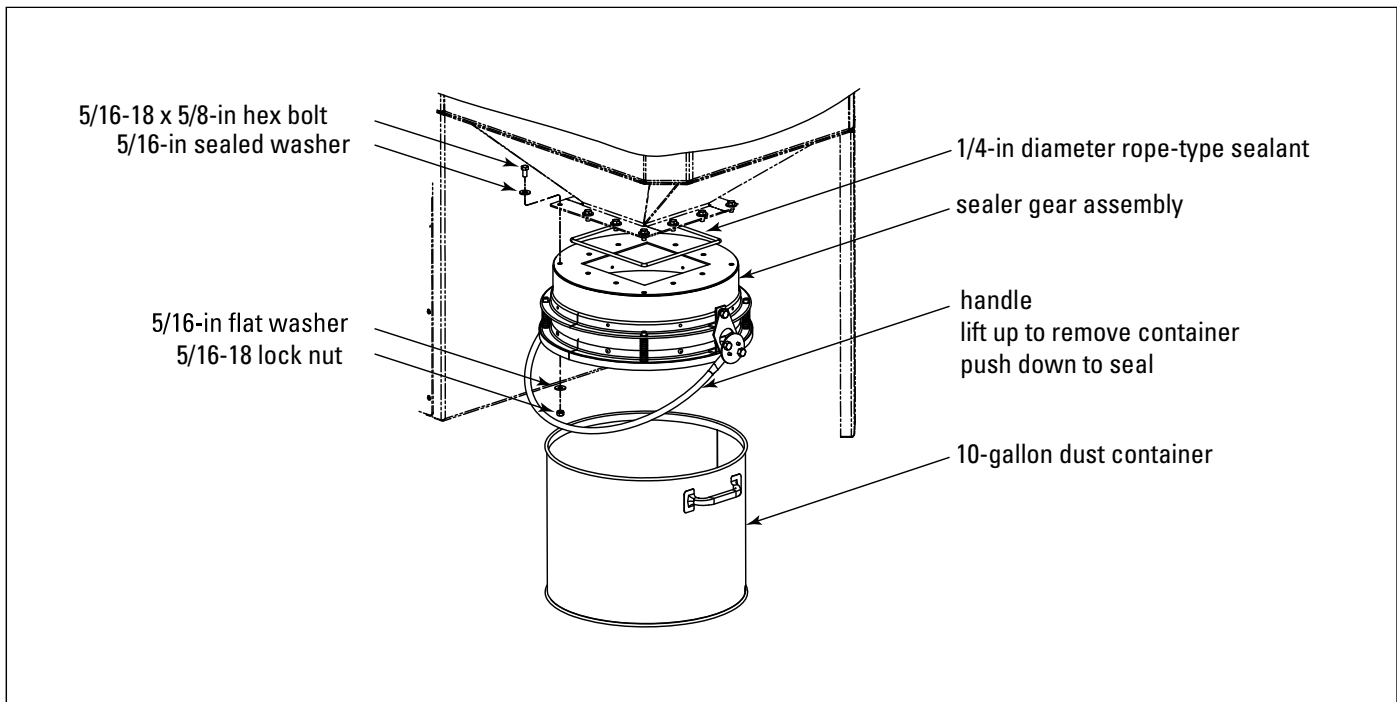
The sealer gear provides an airtight seal between the hopper flange and the 10-gallon dust disposal container. Simply lift the sealer gear handle to remove the dust container or lower the handle to seal the dust container.

To install on an existing unit:

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 unit'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 unit.

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



Sealer Gear Installation



## Delta P Control

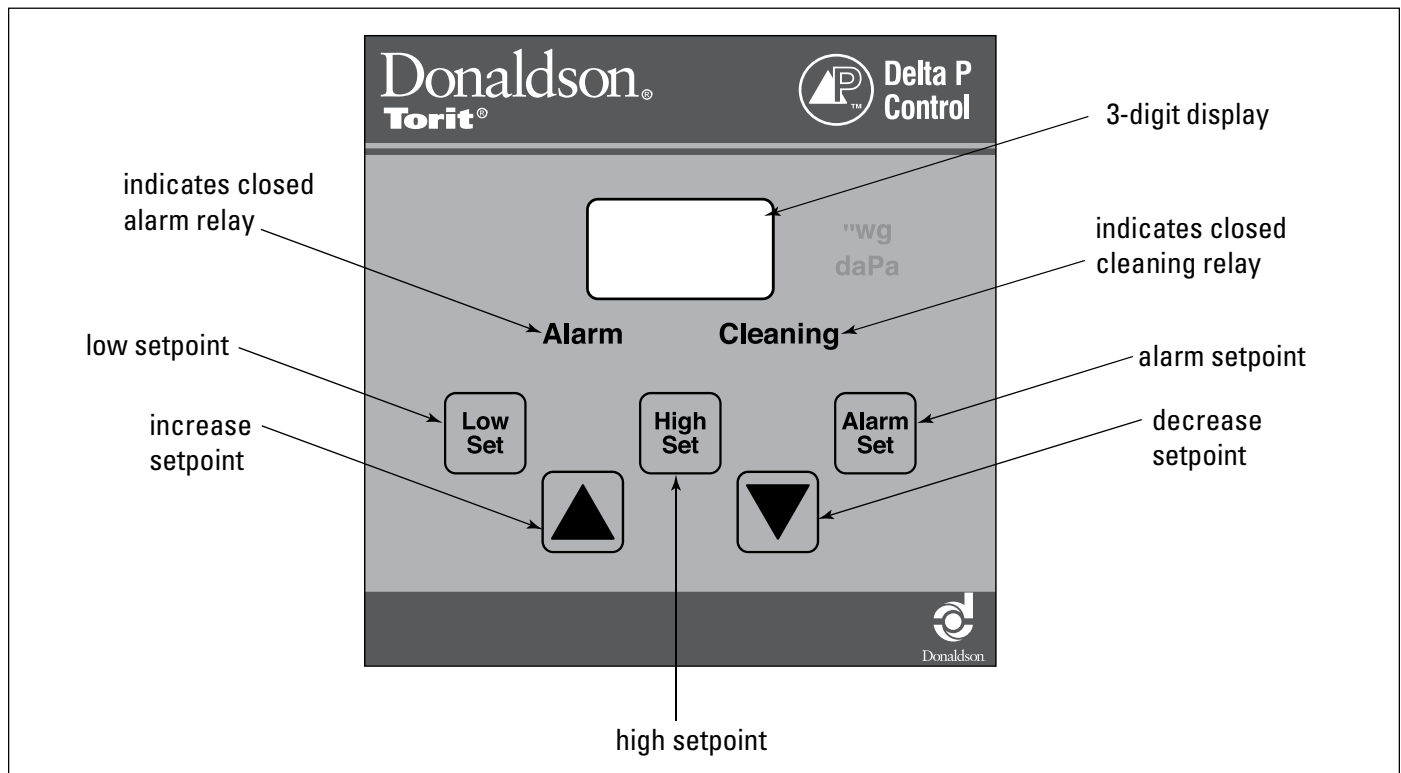
Delta P control monitors the differential pressure between the clean- and dirty-air chambers, providing a visual display of the filter condition. Set the high-pressure ON and low-pressure OFF setpoints to control the filter cleaning system. The ALARM setpoint activates the alarm display indicating filter replacement. The ALARM setpoint must be set higher than the high-pressure setpoint.

### Delta P Control Calibration

The only user calibration is the zero adjustment of the display. Due to slight changes in electronic components over time or pressure differentials within the plant environment, the display may read something other than 0.0 while at rest.

To recalibrate the operating system:

1. Turn power to the Delta P Control ON for a minimum of 30-minutes to stabilize the operating temperature.
2. Turn power to the control OFF.
3. Press and hold the LOW SET, HIGH SET, and ALARM SET keys while turning power to the control back ON. Continue holding the keys as the control goes through its power-up sequence. The number 8 is displayed in each digit, and then the display reads 0.0.
4. Release the three keys. The new calibration is automatically stored in memory.

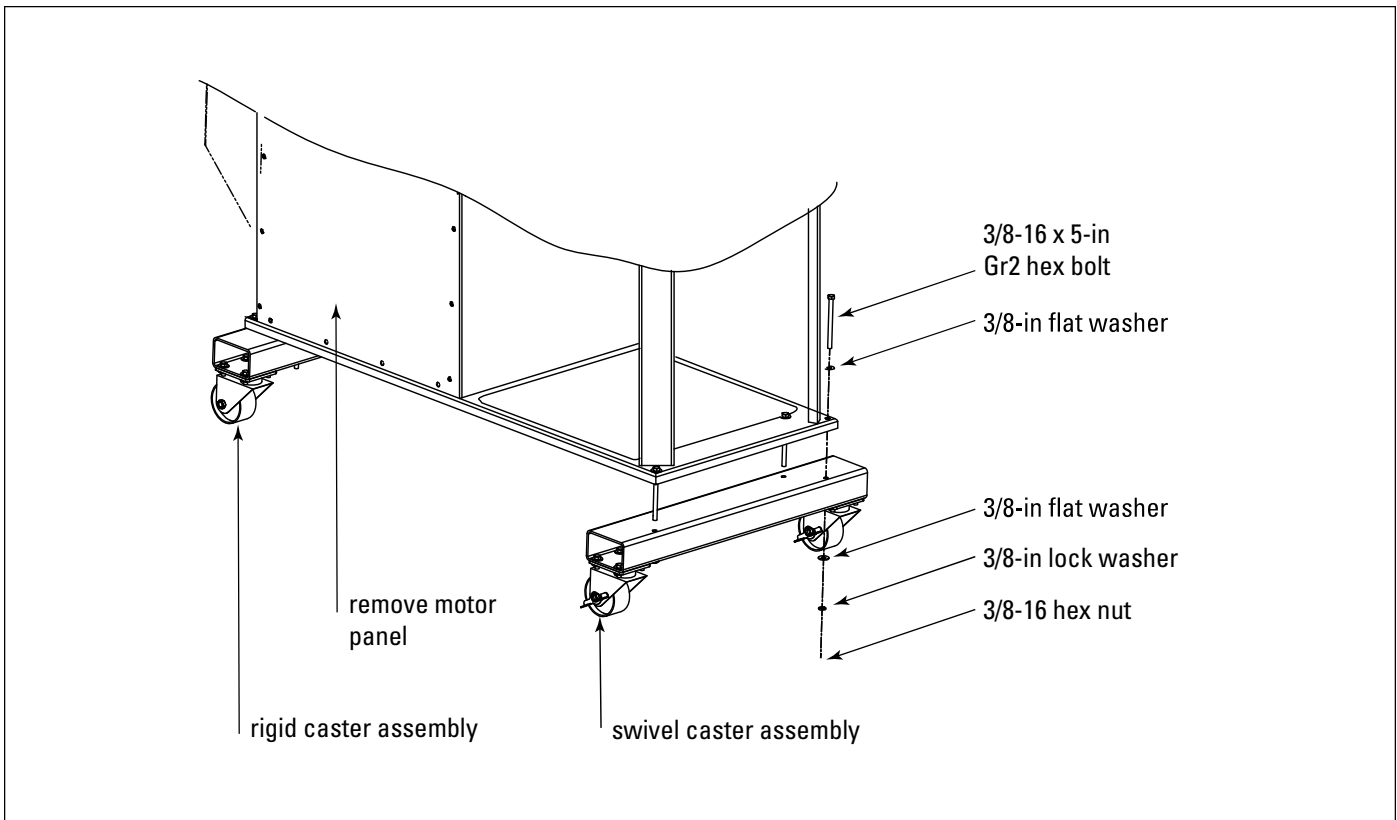


Delta P Control Display Panel

## Caster Assembly

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

1. Lift unit approximately 24-in with a crane or forklift.
2. Position the swivel caster assembly under the front filter-access end of the unit. 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 unit.
4. Position the rigid caster assembly under the back edge of the unit and fasten as described in Step 2.
5. Replace motor panel and lower unit.

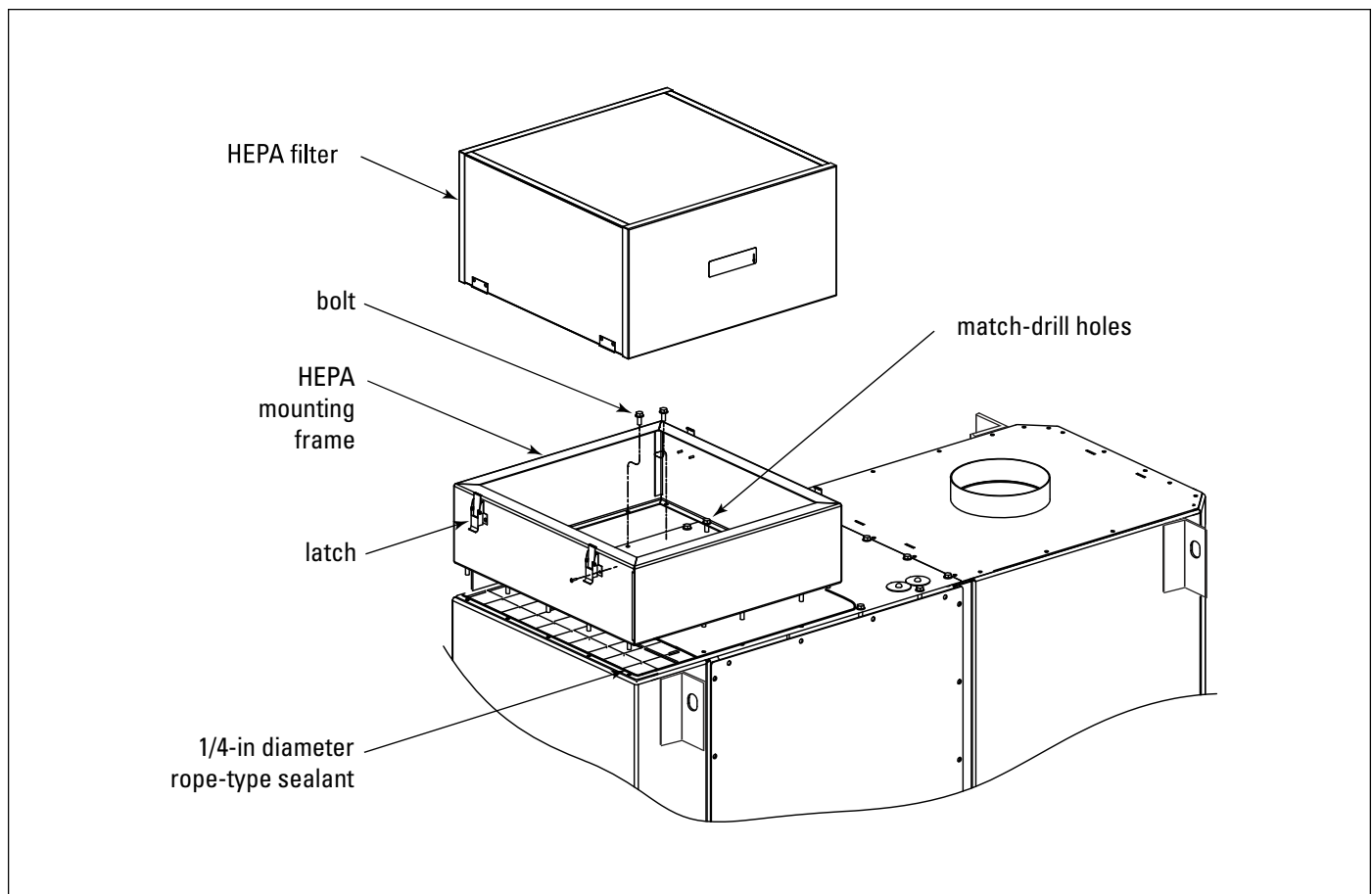


Caster Assembly

## HEPA Afterfilter Installation

The optional HEPA afterfilter is designed to capture small particulate and is attached to the units 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 unit ON.
11. Adjust airflow using the airflow control damper.



HEPA Afterfilter Installation

## Extraction Arm and Adapter Installation

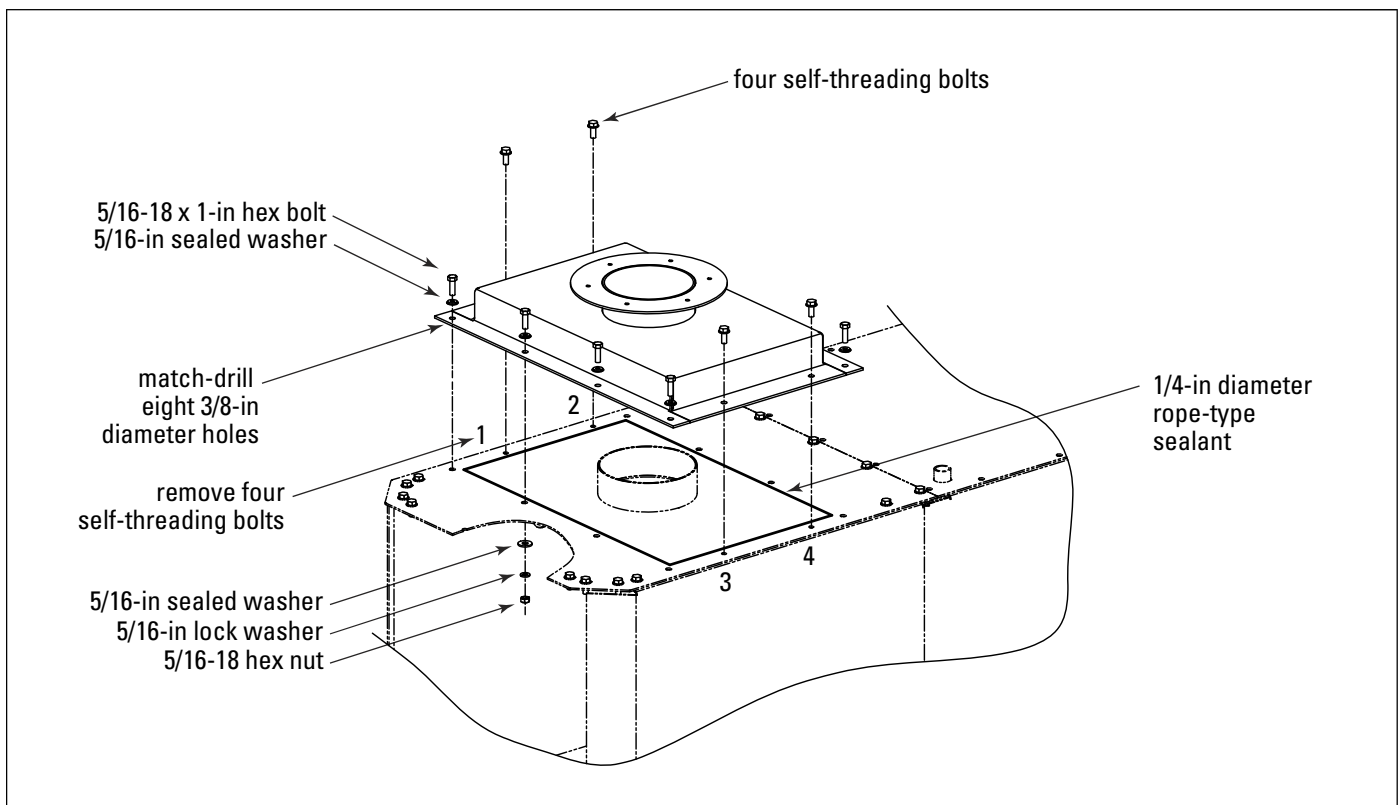
Extraction Arms (Ex-Arms) are designed to carry dust, fume, and mist away from the worker's breathing zone. The operator positions the hood 8- to 12-inches above the work area. Contaminated air is drawn into the hood, through the Ex-Arm and into the dirty-air plenum of the unit where it is filtered and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

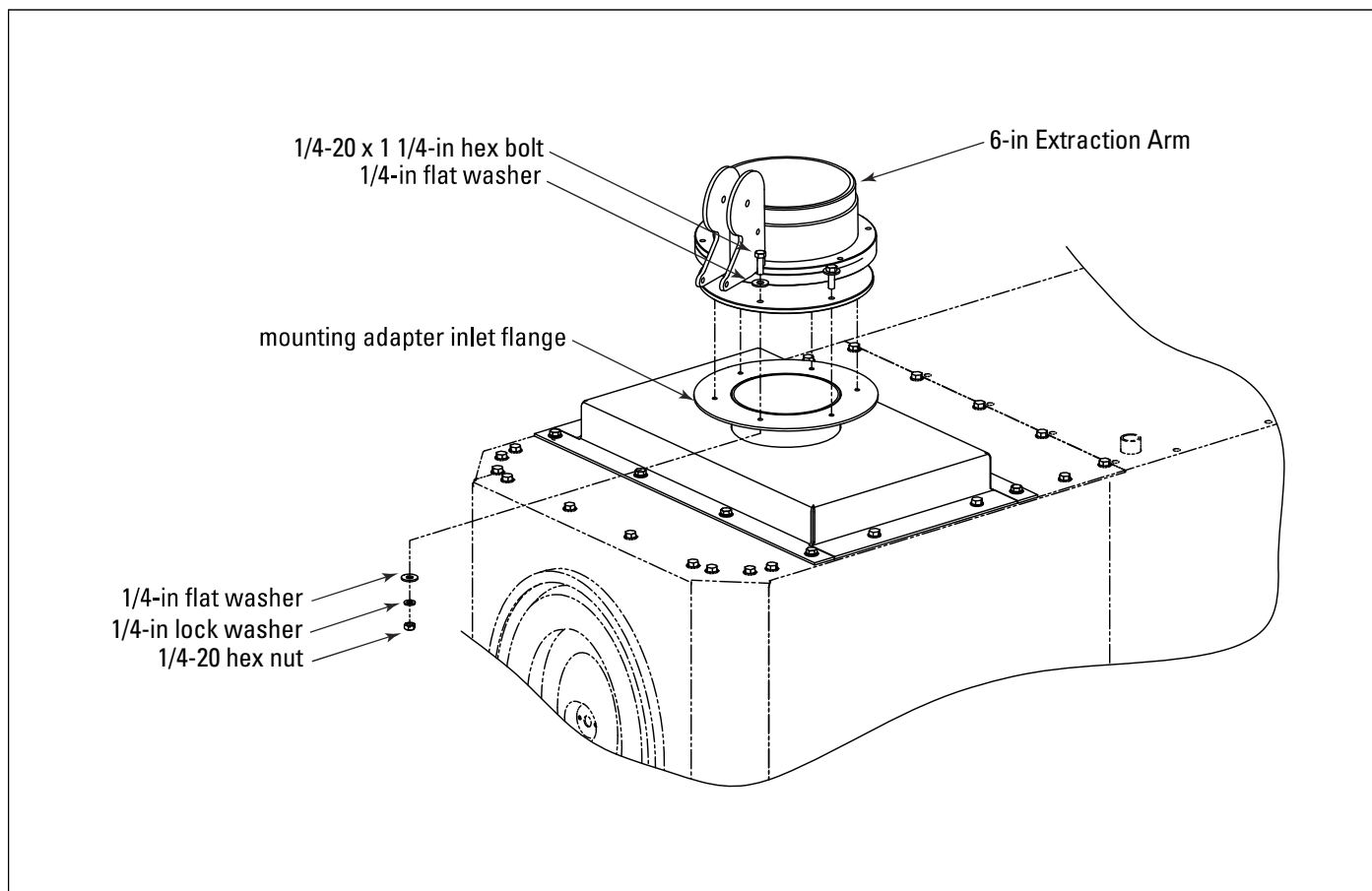
3. Match-drill eight 3/8-in holes in the roof panel using the mounting adapter as a guide.
4. Remove the mounting adapter and set aside.
5. Place 1/4-in diameter, rope-type sealant on the roof panel toward the inside of the bolt pattern.
6. Place mounting adapter on the roof panel and align bolt patterns.
7. Remove the filter-access cover and filters to access the inside of the unit 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 Vents

### **WARNING**

Personal injury, death, 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 or property damage.

The risk of injury or 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.

### **NOTICE**

Remove all shipping materials, including covers, from the explosion relief vents prior to installation. Failure to remove shipping covers will seriously compromise explosion vent operation.

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..

## Sprinkler Installation

### **WARNING**

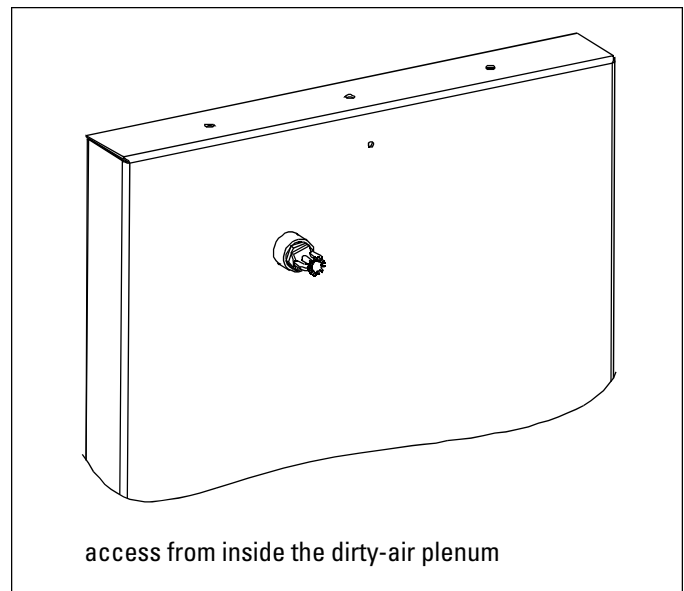
Sprinkler systems place a large quantity of water in the dust collector when activated. Provide adequate drainage to remove water. Excess water weight can cause the leg structure to collapse.

Fire control sprinklers are available for all models operating under negative pressure. Donaldson Torit supplied sprinklers require a minimum of 15-psig water pressure. The volume of water discharged per sprinkler head is 17 gallons per minute.

### **NOTICE**

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

1. Remove or open the filter access covers to access the sprinkler tap located in the dirty-air plenum.
2. Apply pipe sealant to the threads of the pipe reducer located on the sprinkler assembly.
3. Thread sprinkler assembly onto the 1-in diameter sprinkler tap.
4. Tighten securely.



Sprinkler Installation

## Troubleshooting

Problem	Probable Cause	Remedy
<b>Blower fan 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.
	Unit 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.
<b>Blower fan 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 Replacement.
	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 Replacement.
	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 Replacement.
	Access cover(s) loose	Tighten access doors securely. See Filter Installation.
<b>Insufficient airflow</b>	Fan rotation backwards	Proper fan rotation is clockwise from the top of the unit. The fan can be viewed through the back of the motor. 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 filter packs. See Filter Replacement.

## 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 unit 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.
<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.
	High Pressure On or Low Pressure Off setpoint not adjusted for system conditions	Adjust setpoints to current conditions.
<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.
<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.









## The Donaldson Torit Warranty

Donaldson warrants to the original purchaser that the major structural components of the goods will be free from defects in materials and workmanship for ten (10) years from the date of shipment, if properly installed, maintained and operated under normal conditions. Donaldson warrants all other 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 twelve (12) months from date of shipment. Donaldson warrants Donaldson built filter elements to be free from defects in materials and workmanship for eighteen (18) months from date of shipment. Donaldson does not warrant against damages due to corrosion, abrasion, normal wear and tear, product modification, or product misapplication. Donaldson also makes no warranty whatsoever as to any goods manufactured or supplied by others including electric motors, fans and control components. After Donaldson has been given adequate opportunity to remedy any defects in material or workmanship, Donaldson retains the sole option to accept return of the goods, with freight paid by the purchaser, and to refund the purchase price for the goods after confirming the goods are returned undamaged and in usable condition. Such a refund will be in the full extent of Donaldson's liability. Donaldson shall not be liable for any other costs, expenses or damages whether direct, indirect, special, incidental, consequential or otherwise. The terms of this warranty may be modified only by a special warranty document signed by a Director, General Manager or Vice President of Donaldson. Failure to use genuine Donaldson replacement parts may void this warranty. THERE EXIST NO OTHER REPRESENTATIONS, WARRANTIES OR GUARANTEES EXCEPT AS STATED IN THIS PARAGRAPH AND ALL OTHER WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHETHER EXPRESS OR IMPLIED ARE HEREBY EXPRESSLY EXCLUDED AND DISCLAIMED.



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