

Donaldson  
Torit®

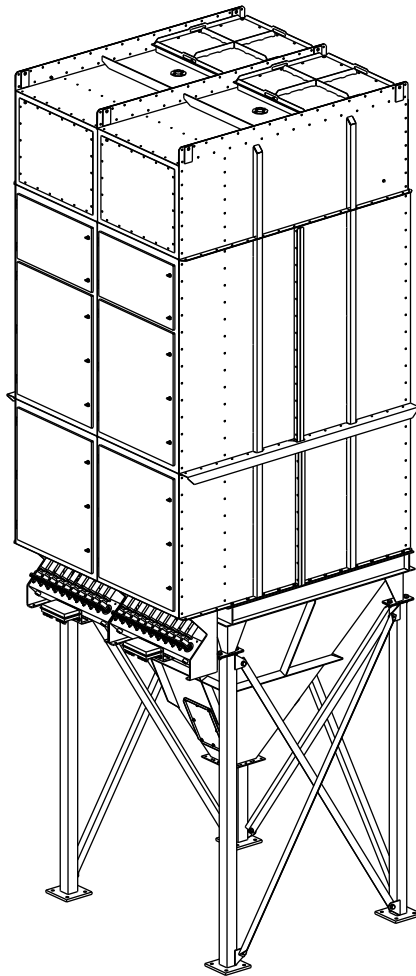


## Dalamatic® Cased

DLMC 1/2/15, 1/3/15, 1/4/15, 1/5/15, 1/7/15, 2/2/15, 2/3/15, 2/4/15,  
2/5/15, 2/6/15, 2/8/15, 3/3/15, 3/5/15, 3/6/15, 3/7/15, 3/8/15, 4/5/15 and  
4/8/15 - Units Built After July 2006

## Installation and Operation Manual

Installation, Operation, and Service Information



This manual is property of the owner. Leave with the collector 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.

**⚠ WARNING**

Process owners/operators have important responsibilities relating to combustible hazards. Process owners/operators must determine whether their process creates combustible dust, fume, or mist. If combustible dust, fume, or mist is generated, process owners/operators should at a minimum:

- Comply with all applicable codes and standards. Among other considerations, current NFPA standards require owners/operators whose processes involve potentially combustible materials to have a current Hazard Analysis, which can serve as the foundation for their process hazard mitigation strategies.
- Prevent all ignition sources from entering any dust collection equipment.
- Design, select, and implement fire and explosion mitigation, suppression, and isolation strategies that are appropriate for the risks associated with their application.
- Develop and implement maintenance work practices to maintain a safe operating environment, ensuring that combustible dust, fume, or mist does not accumulate within the plant.

Donaldson recommends process owners/operators consult with experts to insure each of these responsibilities are met.

As a manufacturer and supplier of Industrial Filtration Products, Donaldson can assist process owners/operators in the selection of filtration technologies. However, process owners/operators retain all responsibility for the suitability of fire and explosion hazard mitigation, suppression, and isolation strategies. Donaldson assumes no responsibility or liability for the suitability of any fire and/or explosion mitigation strategy, or any items incorporated into a collector as part of an owner/operators hazard mitigation strategy.

Improper operation of a dust 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 collection equipment is properly selected and sized for the intended use.

DO NOT operate this equipment until you have read and understand the instruction warnings in the Installation and Operations Manual. For a replacement manual, contact Donaldson Torit.

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

## Data Sheet

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

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### **DANGER**

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

### **WARNING**

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

### **CAUTION**

**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 Dalamat Cased, Model DLMC, dust collectors are continuous-duty collectors with bag-style filters designed to handle product recovery applications and operations generating nuisance dust. The DLMC provides continuous filtration and high collection efficiency while maintaining a relatively constant system resistance. Standard sizes range from 323 to 5164 sq ft (30 to 480 sq meters) of filter area. A solid-state timer provides the interface for filter cleaning control.

Options include a pyramid hopper for use with a 55-gallon drum or rotary airlock, a trough hopper for use with a screw conveyor, or hoppers for use with bin-style, dust disposal pails.

## Purpose and Intended Use



### WARNING

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

Do not misuse or modify.

The DLMC separates solid particulate from an airstream as part of a manufacturing process.

The DLMC is commonly used in the chemical, mineral, food, plastic, metal compound, and pharmaceutical industries. High temperature applications are possible with attention to gaskets, caulking, and filter media choices. Extreme conditions may require special paint and structural modifications.

Although primarily designed for negative pressure systems, the DLMC can be used under positive pressure. Contact Donaldson Torit for information on positive pressure systems.



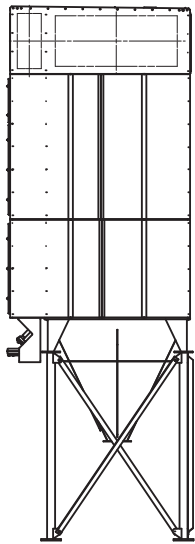
### WARNING

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.

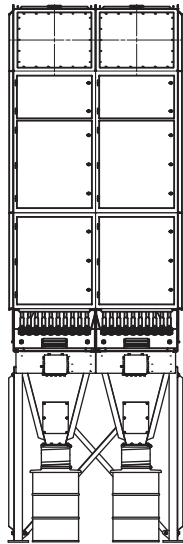
Consult and comply with all National and Local Codes related to fire and/or explosion properties of combustible materials when determining the location and operation of all dust, fume, or mist collection equipment.

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

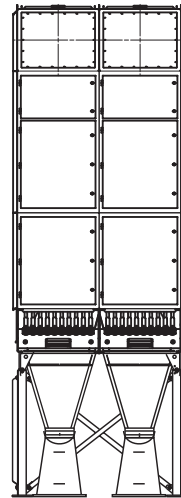
## Rating and Specification Information



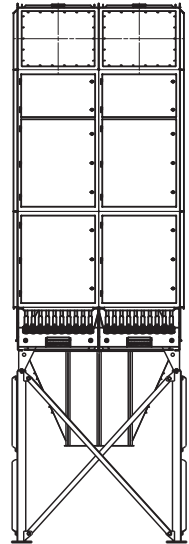
Pyramid Hopper  
Typical Side View



Pyramid Hopper



UMA Hopper with 4 cu  
ft. Bins



Trough Hopper

Collectors are rated for the following loads as calculated per relevant sections of the IBC 2012 code\*:

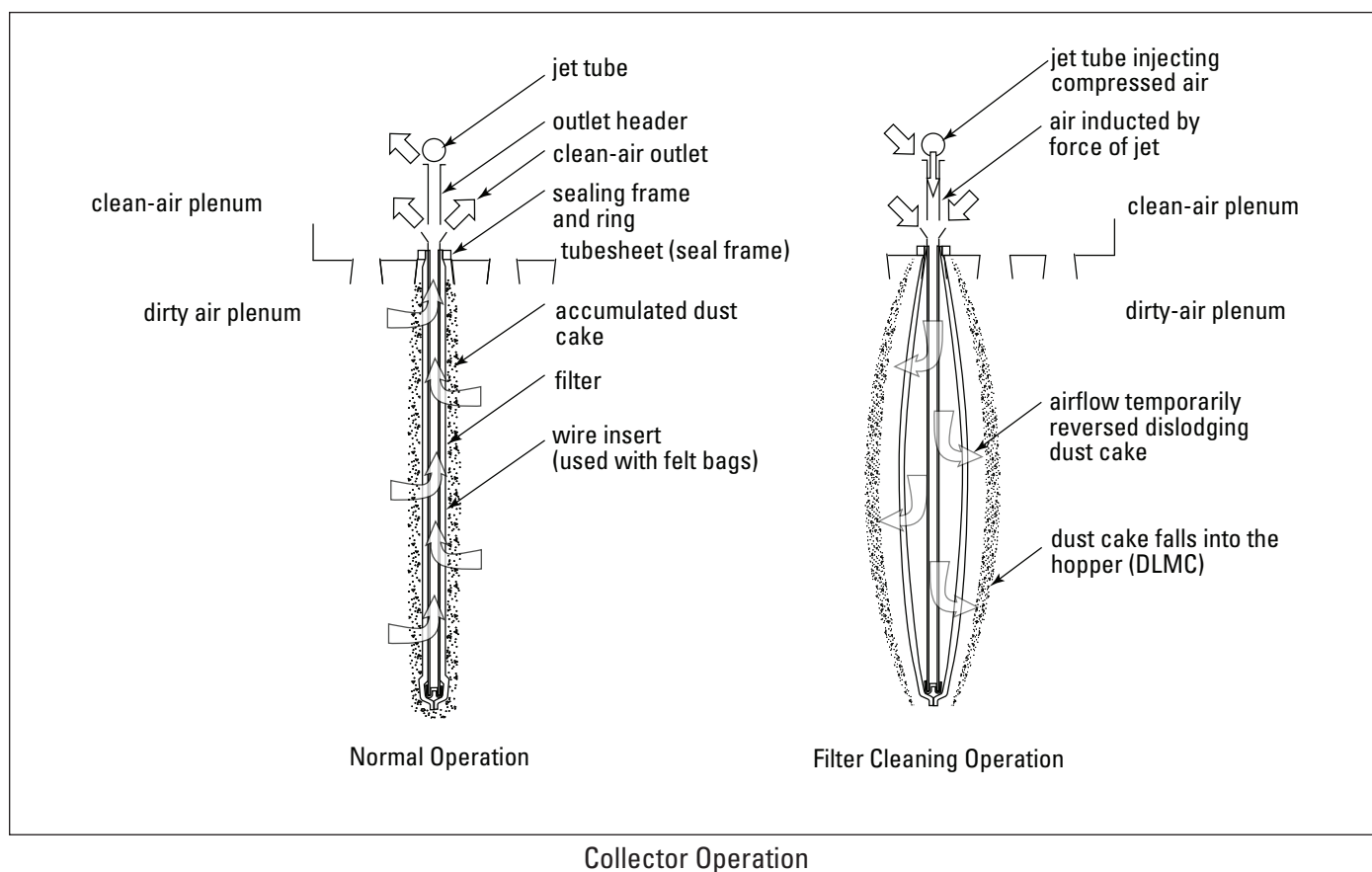
Basic Wind Speed & Exposure .....90 mph, Exposure C  
 Seismic Spectral Acceleration,  $S$  ..... 1.5 g  
 Seismic Spectral Acceleration,  $S_s$  ..... 0.6 g  
 Installed Collector Base Elevation.....Grade  
 Risk Category..... II  
 Compressed air supply, psig ..... 90-100  
 Housing rating, inches water gauge ..... - 20  
 Control power ..... 120-Volt 50/60 Hz

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

## Operation

During normal operation, dust-laden air is drawn through the dirty air inlet. Dust will hit the baffle causing the dust particle velocities to be reduced. From there, natural pre-separation, caused by the effects of gravity, takes place with larger particulate falling directly to hoppers and fine particles collecting on the outside surface of the filter. Clean, filtered air passes to the center of the filter and discharges through the clean-air outlet.

Filter cleaning is completed using pulse-jet technology. A jet tube positioned over each filter distributes a pulse of compressed air through the filter. As the compressed air enters the filter, airflow is temporarily reversed dislodging the dust cake formed on the outside surface of the filter. The dust cake falls into the hopper and exits through the hopper outlet.



## 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

### CAUTION

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

### 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, bleed and lock out lines before performing service or maintenance work.

### CAUTION

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 100-psig as component damage can occur.

All compressed air components must be sized to meet the system requirements of 90-100-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 either indoor or outdoor 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

### WARNING

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.

### CAUTION

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.

Ensure the inlet has at least five diameters of straight duct prior to the collector inlet including a transition to the full inlet dimensions. Inlet transition should have a taper with a maximum of a 90-degree included angle.

Consider the effects of condensation caused by temperature difference between the process airstream and outdoor temperatures.

Consider forklift access for solid collection container removal.

## Site Selection

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

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

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

## 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

### WARNING

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 is recommended for unloading, assembly, and installation of the collector.

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

Do not lift collector by the door handles.

The lifting lugs provided have been designed to support the individual sections of the collector as shipped to the site. Do not use the lifting lugs to lift the entire weight of the collector. Carefully follow the assembly sequence to avoid exceeding the load capacity of the lifting lugs.

Use all lifting points provided.

Use clevis connectors, not hooks, on lifting slings.

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

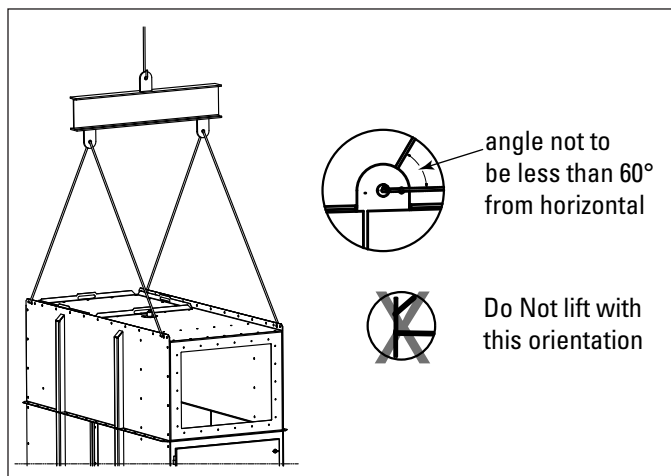
Check the Specification Control drawing for weight and dimensions of the collector and components to ensure adequate crane capacity.

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.

Use drift pins to align holes in section flanges during assembly.

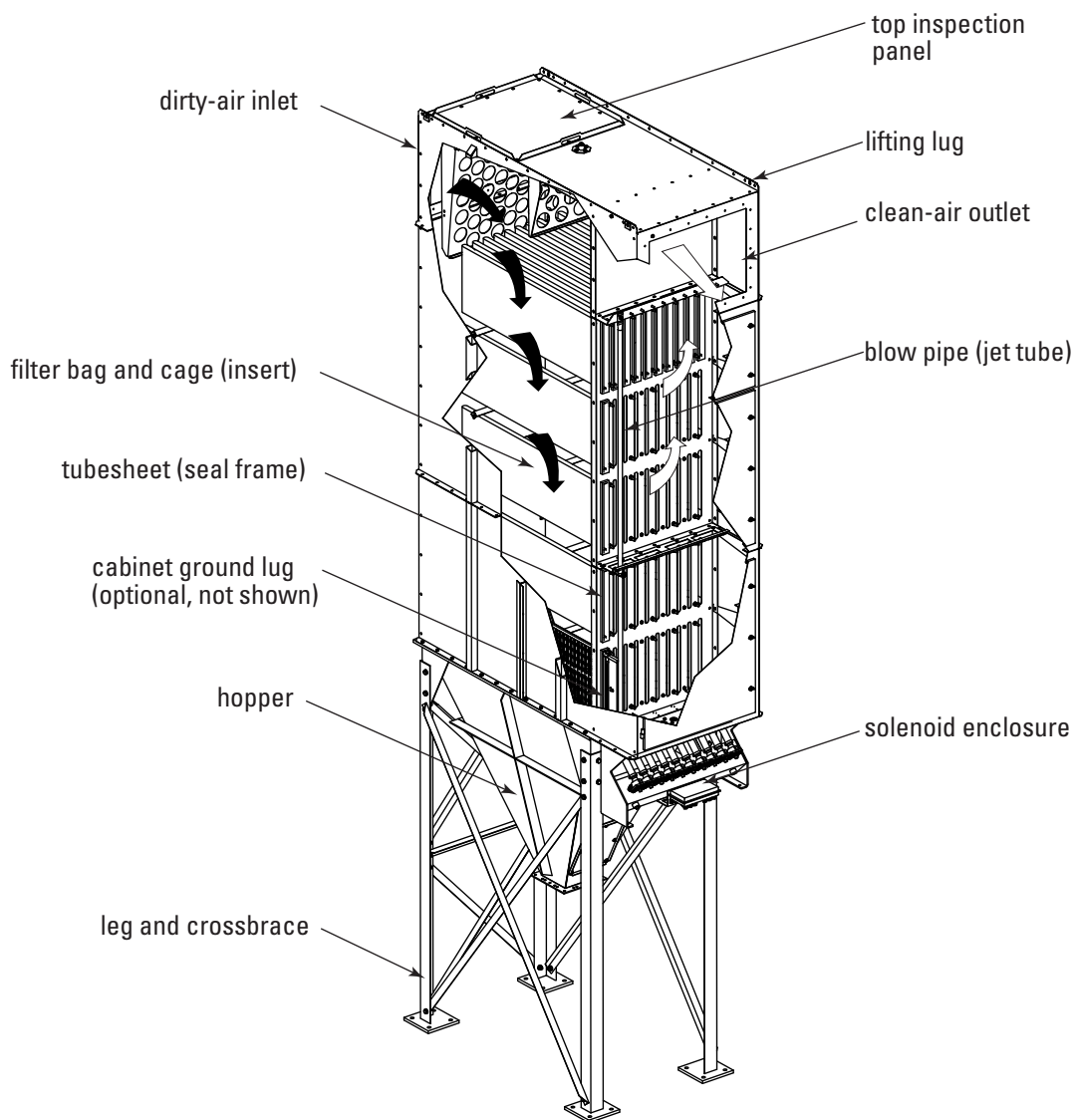


Recommended Lifting

## Standard Equipment

Dalamatic Cased dust collectors are delivered partially assembled in sections compatible with truck capacity and load restrictions. All models require field assembly of the leg, hopper, filter section, compressed air manifold, and ducts.

Typical systems include one of several hopper arrangements designed for compatibility with various solids-handling containers. A typical DLMC also has a steel structure to support the collector.

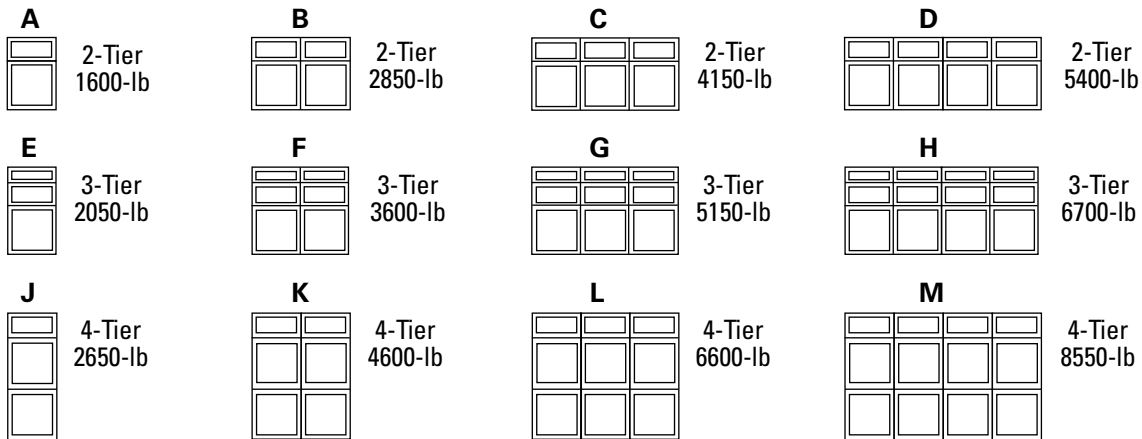


Typical Installation

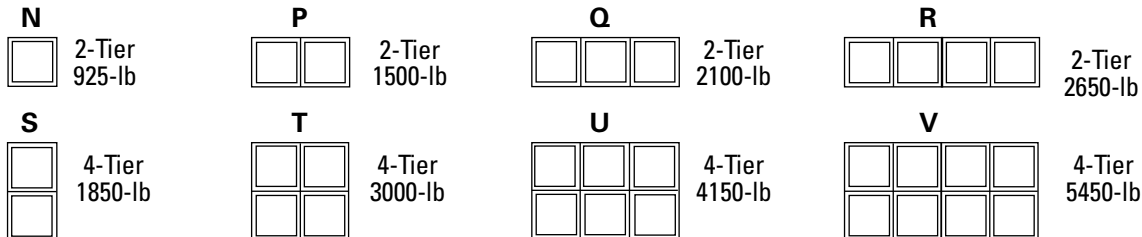
(Collector shown with rear inlet and front outlet. Other options include side inlets and outlets and a top outlet to be used with a mounted TBI fan.)

## Shipping Information

### Upper Section



### Lower Section, tarp required with open top



All weights are approximate  
Front view is shown

Banks	2-Tier	3-Tier	4-Tier	5-Tier	6-Tier	7-Tier	8-Tier
1	(1) A	(1) E	(1) J	(1) E, (1) N	(1) A, (1) S	(1) E, (1) S	(1) J, (1) S
2	(1) B	(1) F	(1) K	(1) F, (1) P	(1) B, (1) T	(1) F, (1) T	(1) K, (1) T
3	(1) C	(1) G	(1) L	(1) G, (1) Q	(1) C, (1) U	(1) G, (1) U	(1) L, (1) U
4	(1) D	(1) H	(1) M	(1) H, (1) R	(1) D, (1) V	(1) H, (1) V	(1) M, (1) V
5	(1) B, (1) C	(1) F, (1) G	(1) K, (1) L	(1) F, (1) P, (1) G, (1) Q	(1) B, (1) T, (1) C, (1) U	(1) F, (1) T, (1) G, (1) U	(1) K, (1) T, (1) L, (1) U
6	(2) C	(2) G	(2) L	(2) G, (2) Q	(2) C, (2) U	(2) G, (2) U	(2) L, (2) U
7	(1) C, (1) D	(1) G, (1) H	(1) L, (1) M	(1) G, (1) Q, (1) H, (1) R	(1) C, (1) U, (1) D, (1) V	(1) G, (1) U, (1) H, (1) V	(1) L, (1) U, (1) M, (1) V
8	(2) D	(2) H	(2) M	(2) H, (2) R	(2) D, (2) V	(2) H, (2) V	(2) M, (2) V
9	(3) C	(3) G	(3) L	(3) G, (3) Q	(3) C, (3) U	(3) G, (3) U	(3) L, (3) U
10	(2) B, (2) C	(2) F, (2) G	(2) K, (2) L	(2) F, (2) P, (2) G, (2) Q	(2) B, (2) T, (2) C, (2) U	(2) F, (2) T, (2) G, (2) U	(2) K, (2) T, (2) L, (2) U

#### Example:

Model DLM 6/4/15 = 6 banks wide x 4-tiers high

- Find the number of banks in the first column and follow the row to the 4-Tier column.
- This collectors ships with two upper sections (L).
- Hopper and legs ship separate.

	Pyramid Hopper and Legs	Single Outlet Pyramid Hopper and Legs	Trough Hopper and Legs	Manifold** Assembly
1-Bank	1250-lb*	NA	NA	2/5-Tier
2-Bank	1650-lb*	1400-lb*	1300-lb*	200-lb/Bank
3-Bank	2050-lb*	1850-lb*	1600-lb*	6/8-Tier
4-Bank	2800-lb*	NA	1850-lb*	225-lb/Bank

\*Add 150-lb for 72-in legs

\*\*Includes electrical, valves, tubing, and manifold

## Collector Installation

### **WARNING**

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

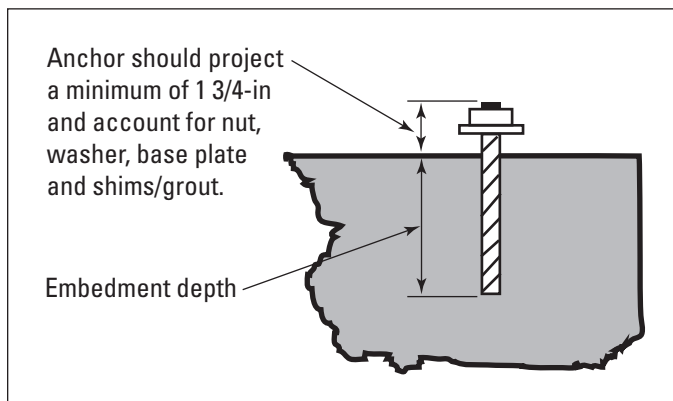
Anchor sizes shown are provisional, as final anchor sizing will depend on jobsite load conditions, collector location, foundation/framing design variables and local codes.

Consult a qualified engineer for final selection of anchors.

Reference Typical Foundation Anchor and leg assembly drawing shipped with the collector prior to starting assembly.

### 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.



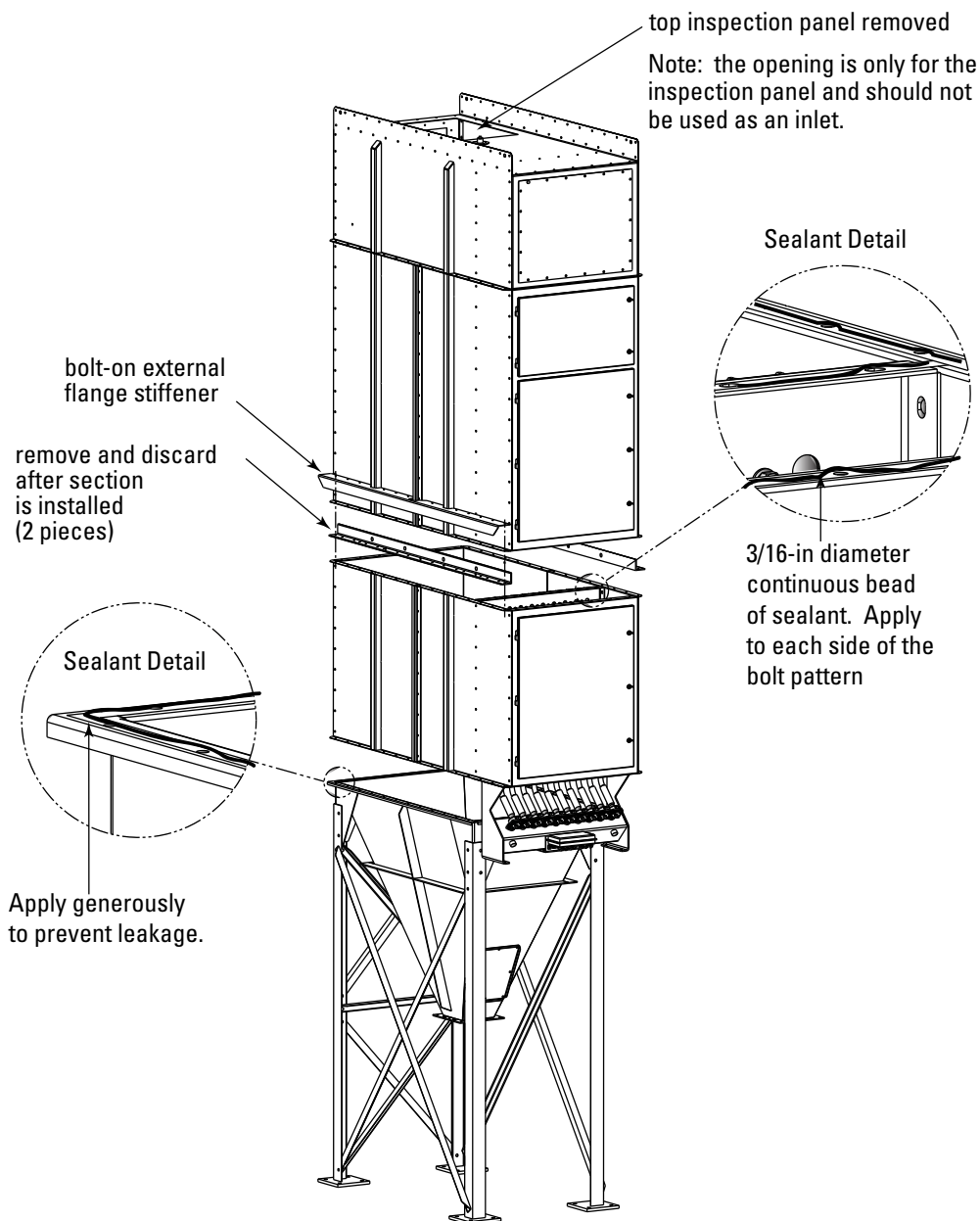
Typical Foundation Anchor

1. Carefully follow the caulking and sealing recommendations during the assembly process.
2. Prepare the foundation or support framing in the selected location. Locate and install anchors.
3. Assemble the legs and cross bracing.
4. Level all horizontal and vertical members. Use shims under legs if necessary.
5. Lift hopper into position over the leg structure and lower slowly.
6. Use drift pins to align holes.
7. Secure joints with bolts, washers, and hex nuts supplied.
8. Tighten all hardware on legs and cross braces before removing crane.
10. Apply sealant to the hopper flange. See Sealant Detail.
11. Lift the filter section into position over the hopper and lower slowly.
12. Use drift pins to align holes. Install bolts loosely until all bolts are in place. If the collector has vertical site joints, apply sealant as shown before bolting together.
13. Install the bolts at the clean-air plenum base to hopper flange first.
14. Access the tubesheet (seal plate) joining bolts through the front access doors. Take special care with sealant at the tubesheet joint between the clean- and dirty-air plenums. See Tubesheet Joining Bolts. Tighten bolts to distribute sealant.
15. Secure all bolts, washers, and hex nuts. Tighten uniformly to form an airtight seal.
16. Install upper filter sections and bolt on external flange stiffeners the same way if shipped separately.

### **NOTICE**

Models with horizontal site joints have lifting lugs that must be removed before installing the upper filter sections.

17. Ducts must be independently supported.



Sealant Detail

## Manifold Installation

1. Apply a suitable sealant, based on temperature and application, to the hose stem adapter flange and completely circle flange shown in manifold illustration.
2. Lift the assembly up to fit against the bottom of the clean-air plenum and bolt into position.

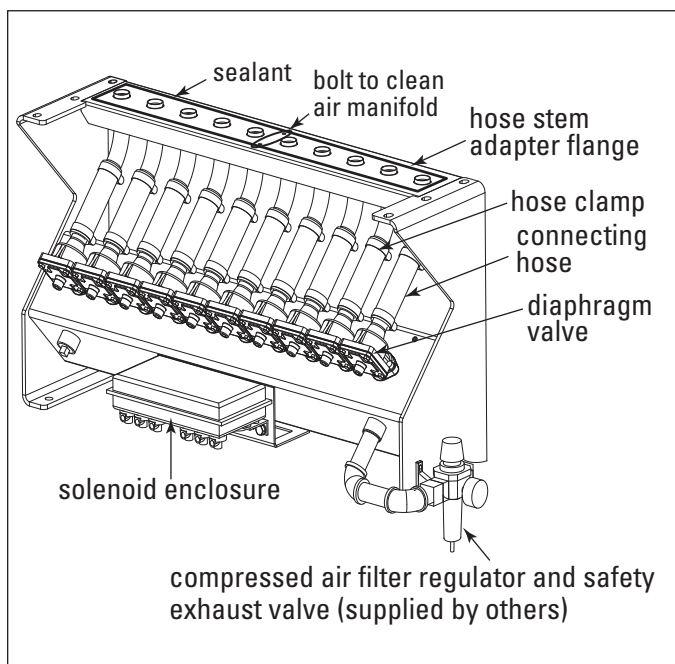
### NOTICE

For ease of installation, mount manifold assembly to a pallet and lift into place.

3. Remove plastic plug. If necessary, install steel plug from the opposite tap to the plug.
4. Carefully tighten the jet tubes.
5. Remove all plastic plugs.
6. Bolt center of manifold assembly (two bolts) to the collector clean air manifold.

### Compressed Air Requirements

2 Tier Collectors	55-psig
3 Tier Collectors	65-psig
4-8 Tier Collectors	90-100 psig



Manifold Installation

## Compressed Air Installation

### WARNING

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 100-psig as component damage can occur.

All compressed air components must be sized to meet the system requirements of 90-100-psig supply pressure.

Compressed air pressure must be set to the pressure listed in the Compressed Air Requirements table to ensure proper operation.

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 (90-psig). The pulse-cleaning controls are factory set to clean one or more filters every 10-seconds during a cleaning cycle.

## Electrical Wiring

### **⚠ WARNING**

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 electrical power sources before performing service or maintenance work.

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

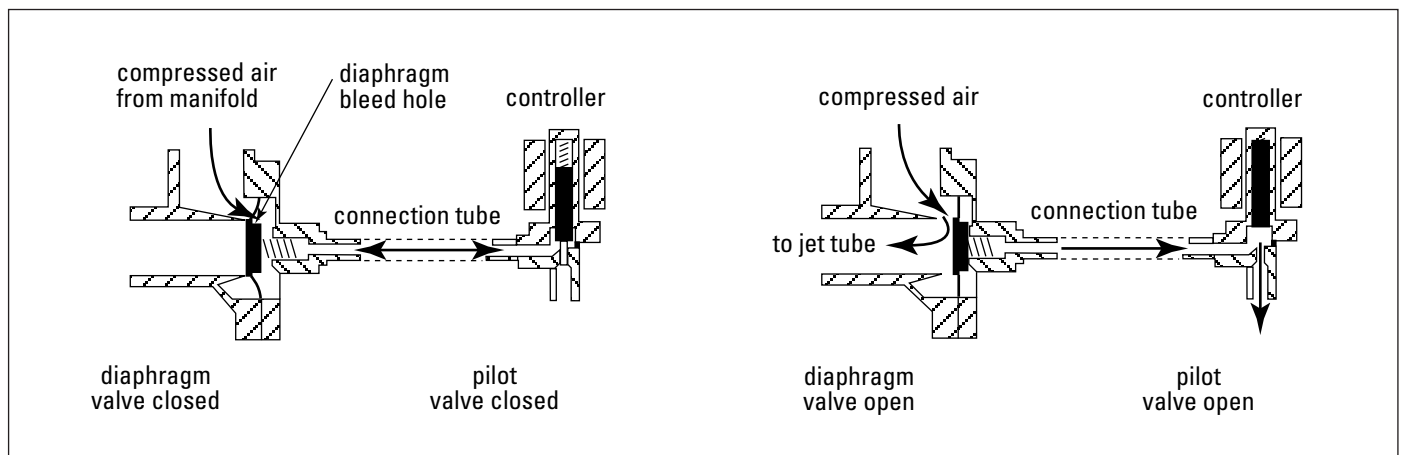
All electrical wiring and connections, including electrical grounding, should be made in accordance with the National Electric Code (NFPA No. 70-latest edition).

Check local ordinances for additional requirements that apply.

The appropriate wiring schematic and electrical rating must be used. See 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.



Compressed Air Pulse Cleaning Control System

## Solid-State Timer Installation

### **WARNING**

Electrical installation, service or maintenance 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 installation, service, or maintenance work.

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

The solid-state timer is used to control the filter cleaning system.

1. Using the wiring diagram supplied, wire the starter, solid-state timer and solenoid valves. Use appropriate wire gauge for rated amp load as specified by local codes.
2. Plug the program lug into the pin that corresponds with the number of solenoid valves controlled.
3. With power supply ON, check the operation of the timer and valves. The valves should open and close sequentially at factory set 10-second intervals.
4. If a gauge or similar device is used to control the solid-state timer, the jumper on the pressure switch portion of the timer should be removed. The solenoid valves will then pulse only when the differential pressure reaches the high-pressure setpoint. The valves will continue to pulse until the low-pressure setpoint is reached.

### **NOTICE**

The solid-state timer voltage must match the voltage of the rating of the timer provided (typically 120VAC).

Do not mount the solid-state timer directly to the collector as mechanical vibration can damage the timer.

## Solenoid Connection

The collector is equipped with electric solenoid valves (typically 120V) that controls the pulse-cleaning valves, which in turn clean the filters.

Solenoid enclosures are mounted near or on the collector's compressed-air manifold.

Wire the solenoids to the solid-state timer following the wiring diagram supplied with the collector. Filter life and cleaning operation will be affected if not wired correctly.

## Timer and Solenoid Specifications

Power to the solid-state timer is supplied to Terminals L1 and L2, which are intended to operate in parallel with the fan starter's low-voltage coil. On fan start-up, power is supplied to the timer and the preset OFF time is initiated. At the end of the OFF time, the timer energizes the corresponding solenoid valve to provide the ON time cleaning pulse for one diaphragm valve and then steps to the next until all filters have been cleaned.

To pulse when the fan is OFF, install a toggle switch as shown on the Solid-State Timer Wiring Diagram. When the toggle switch is ON, the timer receives power and energizes the solenoid valves' pulse-cleaning operation even though the fan is turned OFF.

Input  
105-135V/50-60Hz/1Ph

Output Solenoids  
The load is carried and turned ON and OFF by the 200 watt maximum-load-per-output solid-state switch.

Pulse ON Time  
Factory set at 100-milliseconds, or 1/10-second.

### NOTICE

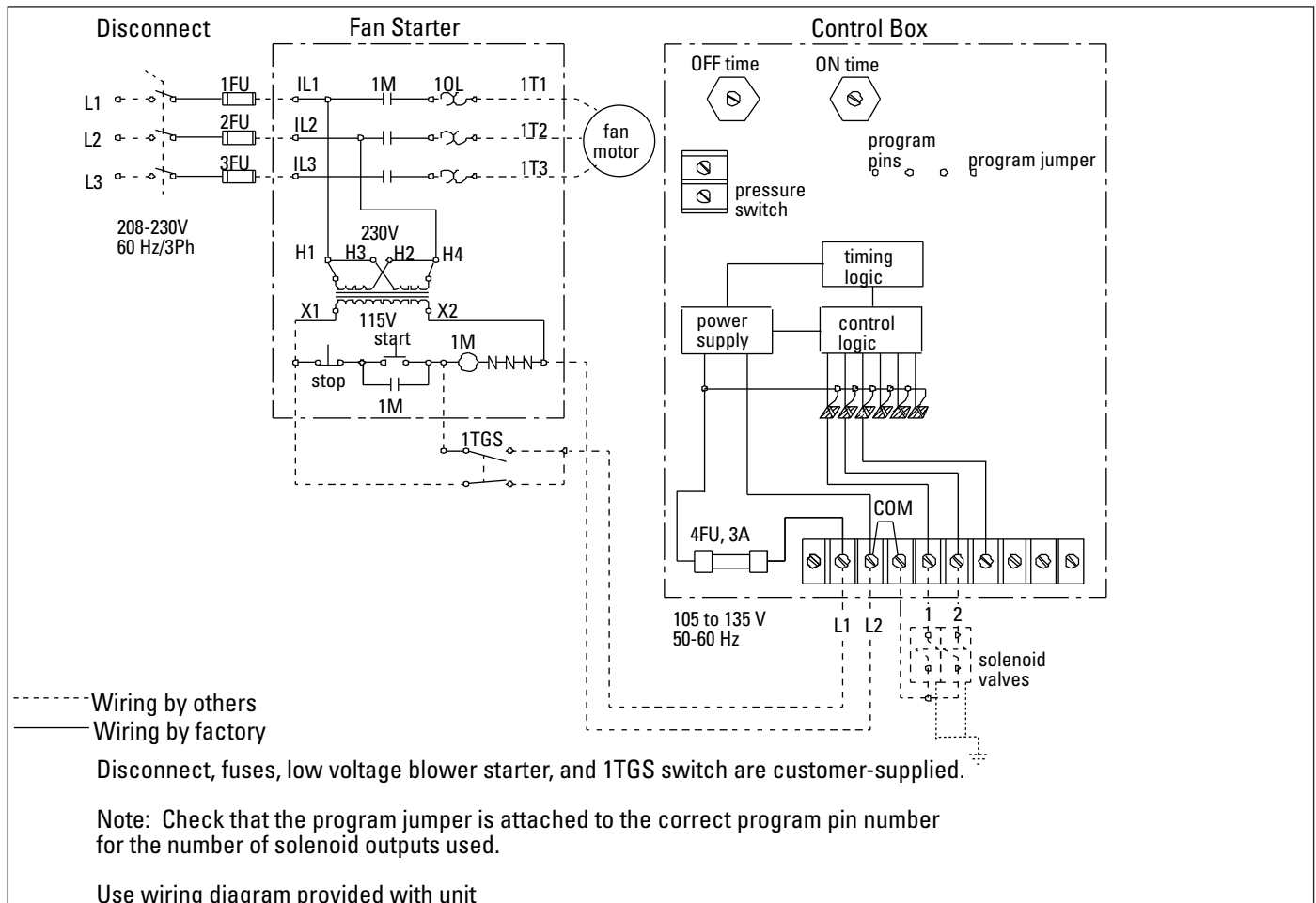
Do not adjust pulse ON time unless the proper test equipment is available. Too much or too little ON time can cause shortened filter life.

Pulse OFF Time  
Factory set at 10-seconds, adjustable from 1.5-sec minimum to maximum 30-seconds.

Operating Temperature Range  
-20° F to 130° F

Transient Voltage Protection  
50 kW transient volts for 20-millisecond duration once every 20 seconds, 1% duty cycle.

Solenoid Valves  
115-Volt at 19.7 watts each



Solid-State Timer Typical Wiring Diagram

## Helix Tube Filter Installation

1. Open access door and remove jet tube retainer. (Retainer is only used on collectors that are 4 tiers or taller.)
2. Remove jet tubes and set aside. Cover the openings to the diaphragm valves. To remove jet tube, unbolt the top of the jet tube from the top.
3. Remove the hex nuts securing the insert clamps. Remove the clamps and set aside.
4. Starting on one side of the collector, place a helix tube filter in a seal frame slot as shown Helix Tube Filter Installation.

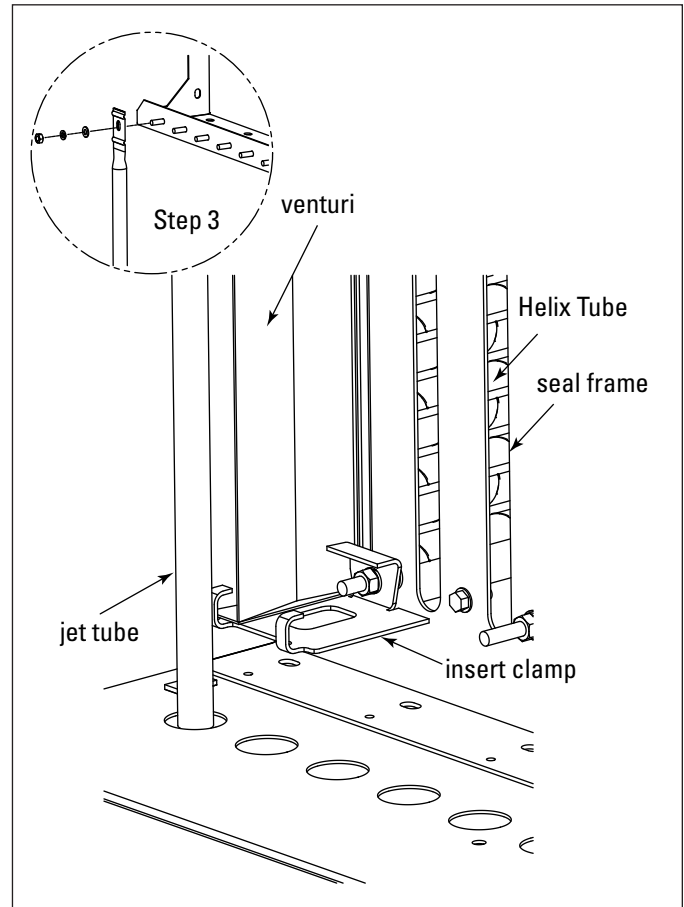
### NOTICE

Be careful to not scrape the filters when slipping them

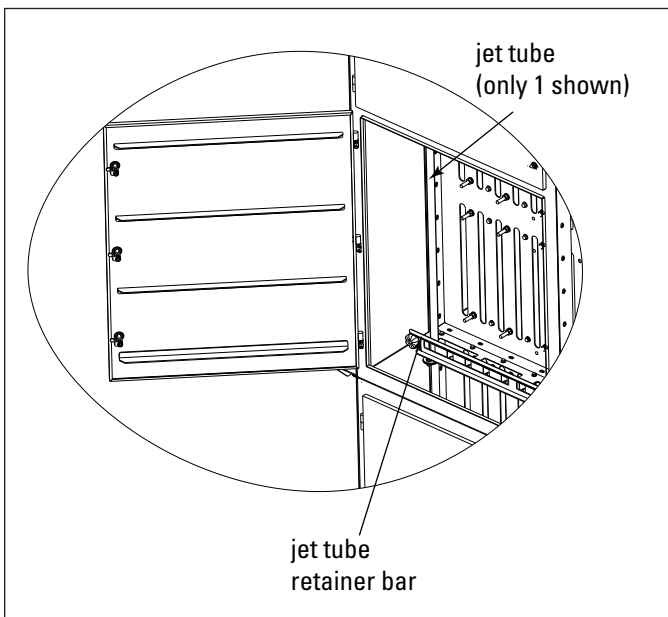
through the seal frame.

5. Install a second helix tube filter adjacent to the prior helix tube filter.
6. Install a venturi on both adjacent helix tube filters and place a clamp over one end of both venturis. Install a nut and tighten using a deep well socket and extension. See Clamps and Inserts. Do not overtighten. Maximum recommended torque is 20 ft/lb.

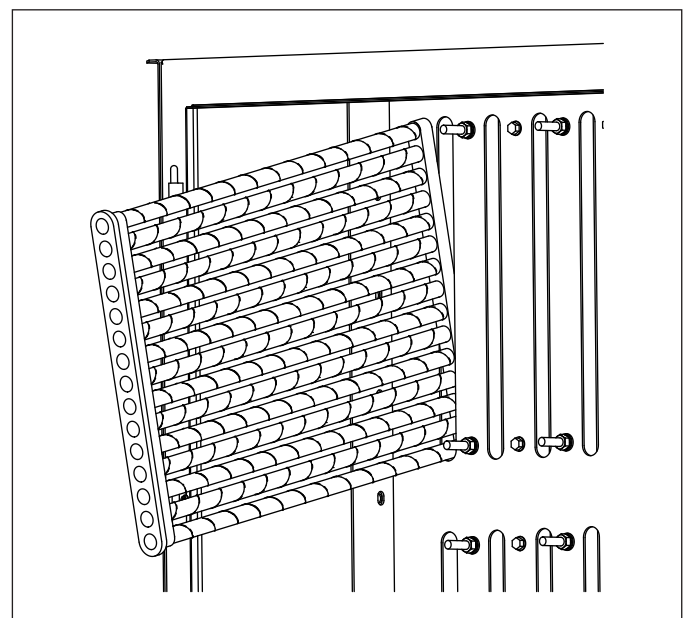
Note: Tighten bottom clamp first.



Helix Tube Filter Detail

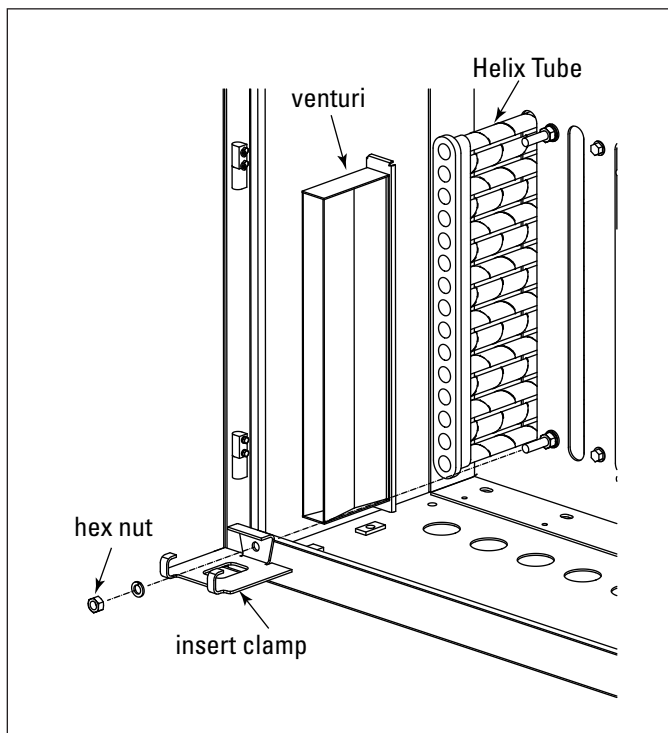


Jet Tube Retainer

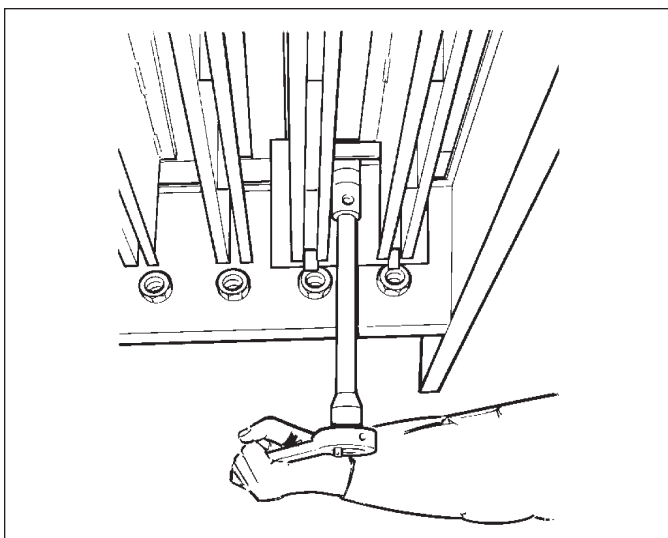


Helix Tube Filter Installation

7. Repeat to install all helix tubes.
8. Replace jet tubes with the open end pressed firmly into its locator and the orifices directed toward the helix tube filter. See Helix Tube Filter Detail.
8. Reinstall jet tube retainer bars on collectors 4 tiers tall or taller.



Venturi Installation



Clamp and Inserts

## Preliminary Start-Up Check

Instruct all personnel on safe use and maintenance procedures.

### **WARNING**

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 electrical power sources 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 that the collector is securely bolted to the floor or mounting pad.
2. Check that all duct installation is complete and all removable panels are in place.
3. Check that all hopper outlets are fitted with containers or closed to prevent airflow from entering the system through the hopper outlets.
4. Check all electrical connections for tightness and contact.
5. Check for proper rotation as noted on the fan and/or hopper discharge device housing.

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.

### **WARNING**

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

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. Set compressed-air supply pressure to a level suitable for the filters (90-psig).
11. Turn 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. Turn the Solid-State Timer ON and check that valves operate in the proper sequence by monitoring the LEDs on the front panel.
13. Verify operation of interlocks and audible warning system, if equipped.

## Typical Start-Up Sequence

1. Turn powered discharge components, such as screw conveyor or rotary airlock, ON.
2. Turn the equipment being served ON.
3. Turn Solid-State Timer and compressed-air supply ON.
4. Turn main blower ON, if equipped.

## Typical Shut-Down Sequence

To clear residual deposits from the filter bags, filter body, and equipment served:

1. Turn main blowers OFF, leaving compressed-air supply ON to allow off-line filter cleaning.  
**Note:** Contact your Donaldson representative for shutdown instructions for explosion vented collectors.
2. Wait 10 to 15 minutes and turn Solid-State Timer and compressor OFF.
3. Turn rotary valves, screw conveyors, or other discharge devices OFF after the dust dislodged by the aftershift cleaning is removed from the hopper.

## Maintenance Information

Instruct all personnel on safe use and maintenance procedures.

### **WARNING**

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

Use appropriate access equipment. The standard collector is not equipped with access platforms unless noted on 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 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, bleed and lock out lines before performing service or maintenance work.

### **NOTICE**

Do not set compressed-air pressure above 100-psig as component damage can occur.

All compressed air components must be sized to meet the system requirements of 90-100 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

### **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 and/or property damage.

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

### **CAUTION**

Do not operate with missing or damaged filters.

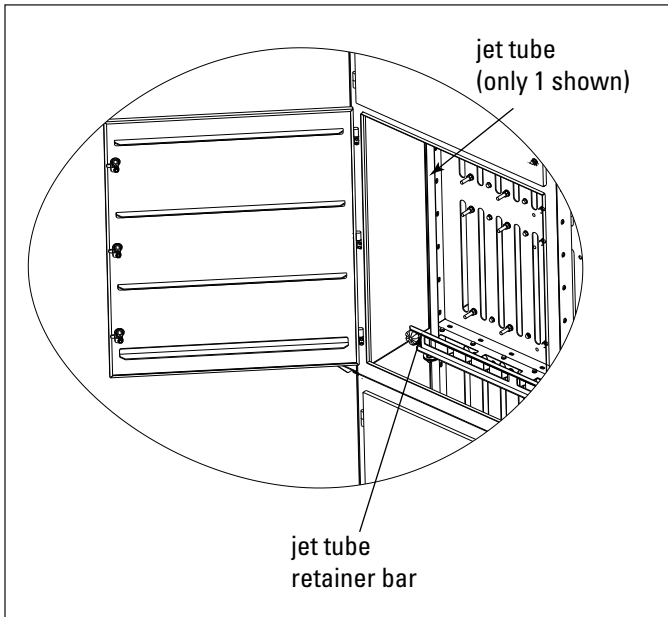
## Operational Checklist

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.

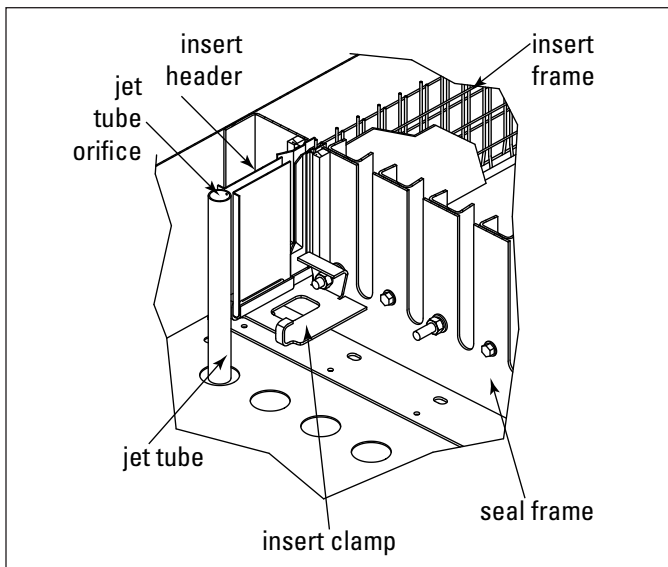
## Filter Bag Removal

1. Activate the pulse cleaning for 10 to 15 minutes to remove excess dust from the filter bags.
2. Turn power off and lock out electrical power sources before performing service or maintenance work.
3. Open access doors and remove jet tube retainer.



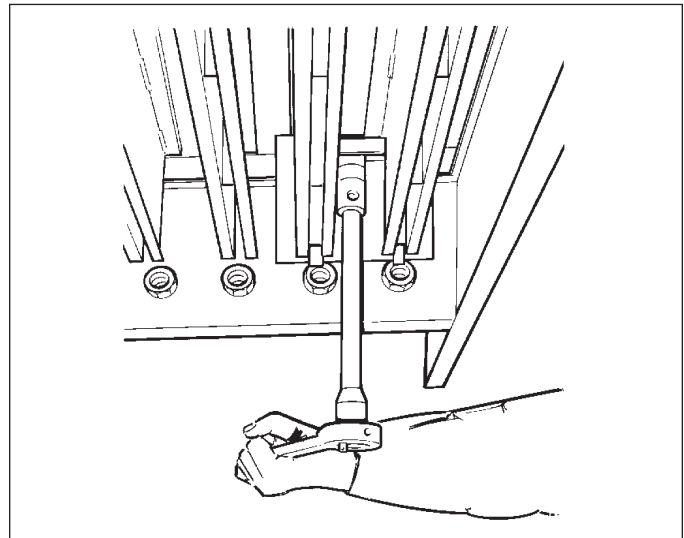
Jet Tube Retainer

4. Remove jet tubes and set aside. Cover the openings to the diaphragm valves.



Filter Bag Detail

5. Remove the hex nuts securing the wire cage (insert). Remove the clamps and withdraw the cage and filter bag. Remove bag and inspect cage for excess corrosion, broken mesh, or other damage and replace as necessary.



Clamp and Inserts

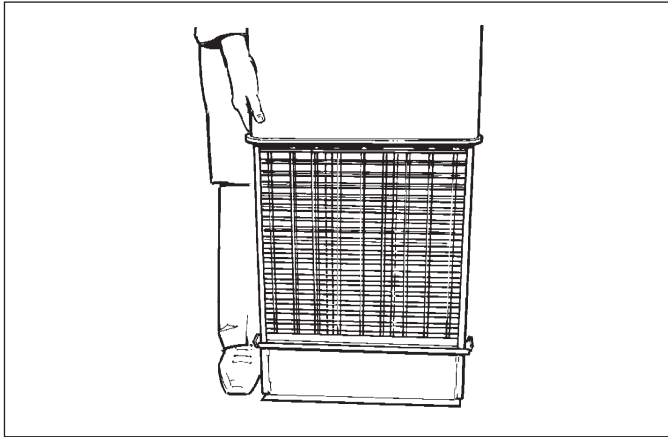
## Filter Bag Installation

1. Slide the new filter bag over the wire support frame shown in Filter Bag Assembly. Slide bag carefully until top of bag is tight against the support frame flange.
2. Starting at one side of the collector, place a filter bag assembly in a seal frame slot as shown in Filter Bag Installation. Hold insert up in the slot to prevent bag from dragging.
3. Install a second filter bag assembly adjacent to the prior filter bag assembly.
4. Position clamps and tighten using a deep well socket and extension. Do not overtighten. Maximum recommended torque is 20 ft/lb. See clamps and Inserts.

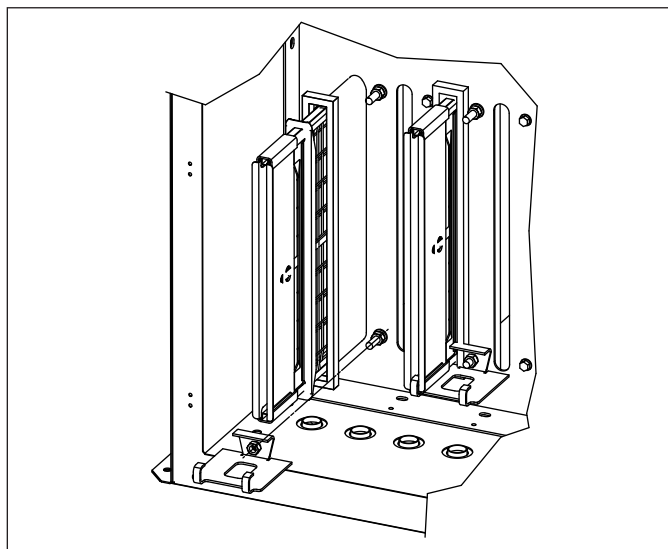
### NOTICE

Tighten bottom clamp first.

5. Repeat steps 1-4 to install all bags.



Filter Bag Assembly



Filter Bag Installation

6. Replace jet tubes with the open end pressed firmly into its locator and the orifices directed toward the filter bag assembly. See Jet Tube Installation.

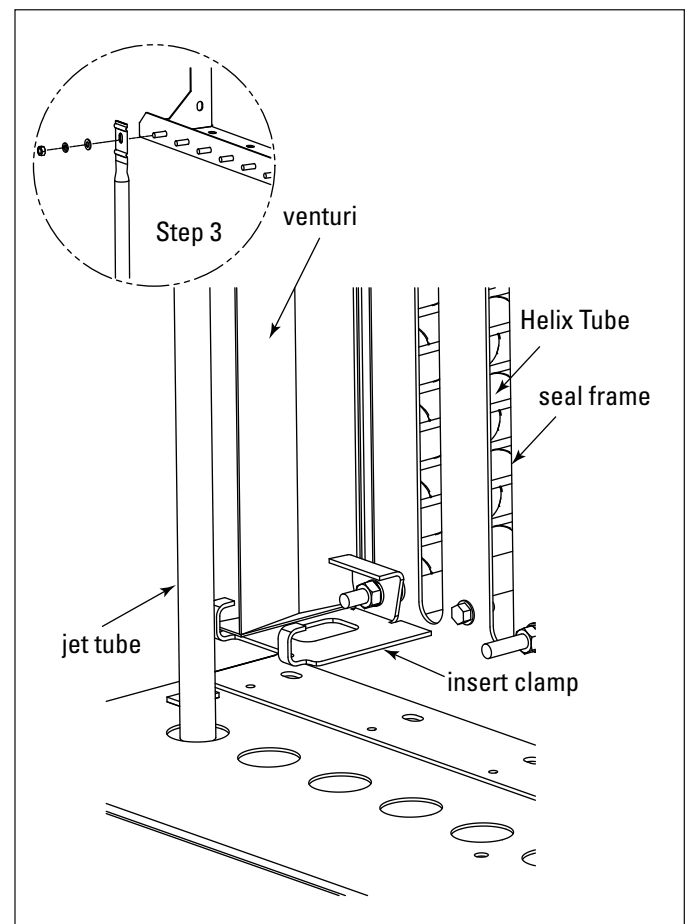
**NOTICE**

Check and clear any plugged orifices in the jet tubes prior to placing them back in the collector.

7. Reinstall jet tube retainer bars.

## Helix Tube Filter Removal

1. Open access door and remove jet tube retainer.
2. Remove jet tubes and set aside. Cover the openings to the diaphragm valves. To remove jet tube, unbolt the top of the jet tube from the top.
3. Remove the hex nuts securing the insert clamps. Remove the clamps and set aside.
4. Remove venturis and helix tubes. Set venturis aside as they will be reused.



Helix Tube Filter Detail

## Helix Tube Filter Installation

1. Starting on one side of the collector, place a helix tube filter in a seal frame slot as shown Helix Tube Filter Installation.

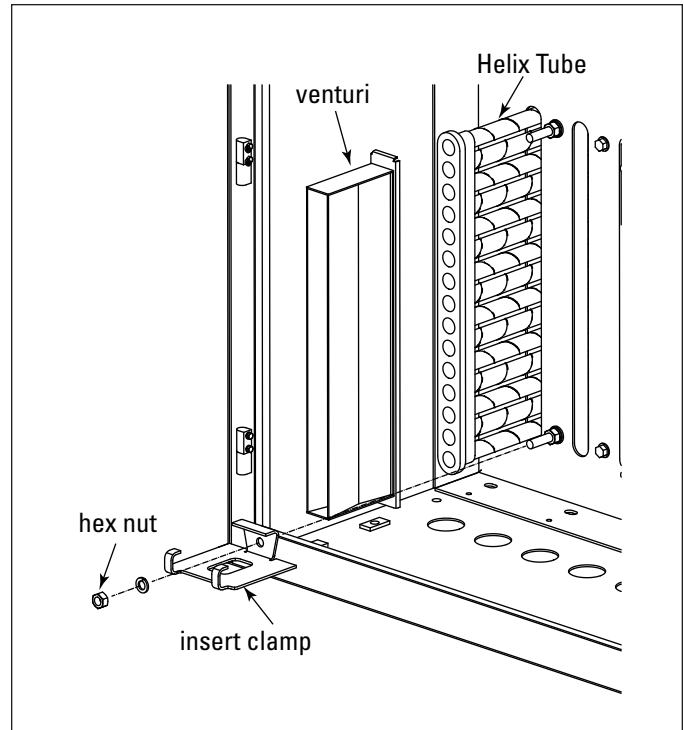
### NOTICE

Be careful to not scrape the filters when slipping them through the seal frame.

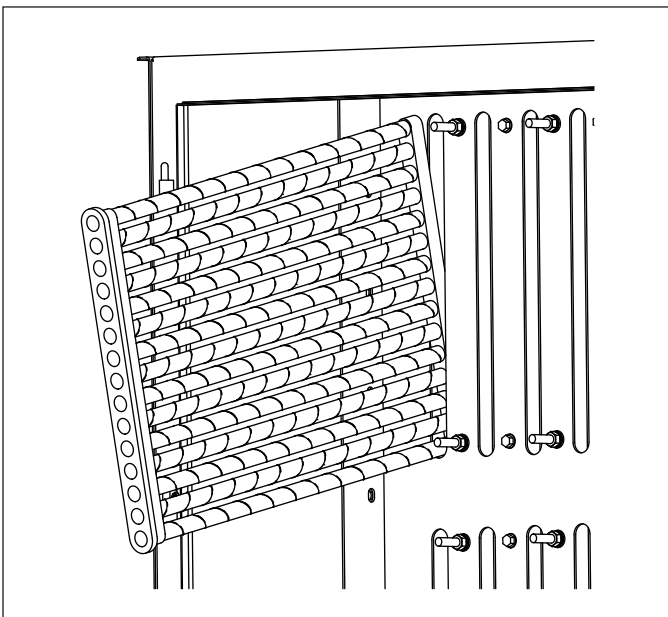
2. Install a second helix tube filter adjacent to the prior helix tube filter.
3. Install a venturi on both adjacent helix tube filters and place a clamp over one end of both venturis. Install a nut and tighten using a deep well socket and extension. Do not overtighten. Maximum recommended torque is 20 ft/lb.

Note: Tighten bottom clamp first.

4. Repeat to install all helix tubes.
5. Replace jet tubes with the open end pressed firmly into its locator and the orifices directed toward the helix tube filter. See Jet Tube Installation.
6. Reinstall jet tube retainer bars on collectors 4 tiers tall or taller.



Venturi Installation



Helix Tube Filter Installation

## Optional Equipment

### Fan Blower

**⚠ WARNING**

Failure to lift the fan 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 fan.

A crane or forklift is recommended for unloading, assembly, and installation of the fan.

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

**⚠ CAUTION**

To avoid personal injury and/or damage to equipment, ensure fan blowers are properly attached to equipment.

**NOTICE**

The use of a damper or variable fan drive (VFD) is required to control airflow through the collector. Lack of a control damper or VFD will shorten filter life.

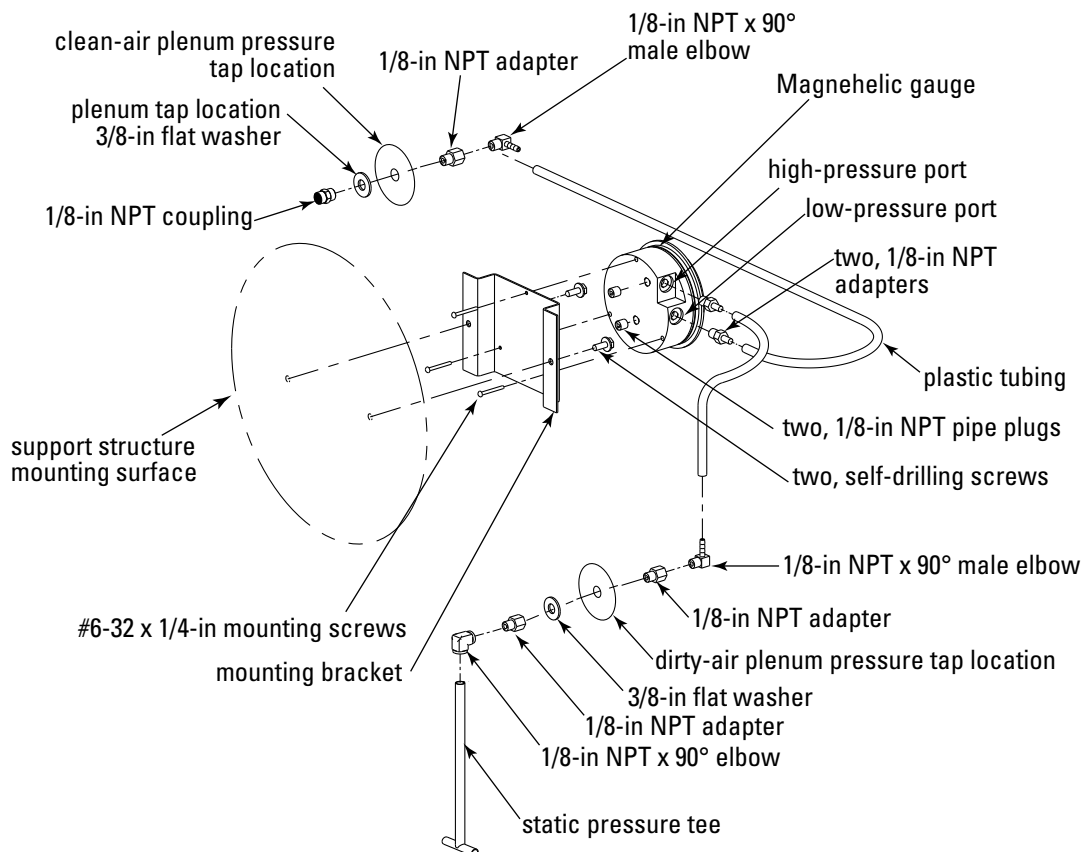
The Torit Backward Inclined (TBI) fan blower can be mounted to the top of the collector.

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

## Magnehelic® Gauge

The Magnehelic is a differential pressure gauge used to measure the pressure difference between the clean-air and dirty-air plenums and provides a visual display of filter change requirements. The high-pressure tap is located in the dirty-air plenum and the low-pressure tap is located in the clean-air plenum.

1. Choose a convenient, accessible location on or near the collector for mounting that provides the best visual advantage.
2. Plug the pressure ports on the back of the gauge using two, 1/8-in NPT pipe plugs supplied. Install two, 1/8-in NPT male adapters supplied with the gauge into the high- and low-pressure ports on the side of the gauges.
3. Attach the mounting bracket using three, #6-32 x 1/4-in screws supplied.
4. Mount the gauge and bracket assembly to the supporting structure using two, self-drilling screws.
5. Thirty-five feet of plastic tubing is supplied and must be cut in two sections. Connect one section of tubing from the gauge's high-pressure port to the pressure fitting located in the dirty-air plenum. Connect remaining tubing from the gauge's low-pressure port to the fitting in the clean-air plenum. Additional tubing can be ordered from your representative.
6. Zero and maintain the gauge as directed in the manufacturer's Operating and Maintenance Instructions provided.



Magnehelic Gauge Installation

## Photohelic® Gauge

### **⚠ WARNING**

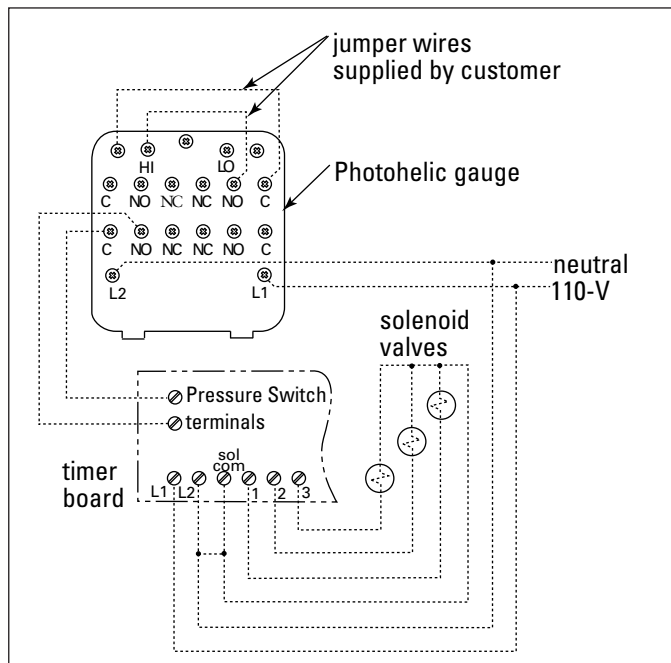
Electrical installation, service, or maintenance work must be performed by a qualified electrician and comply with all applicable national and local codes.

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

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

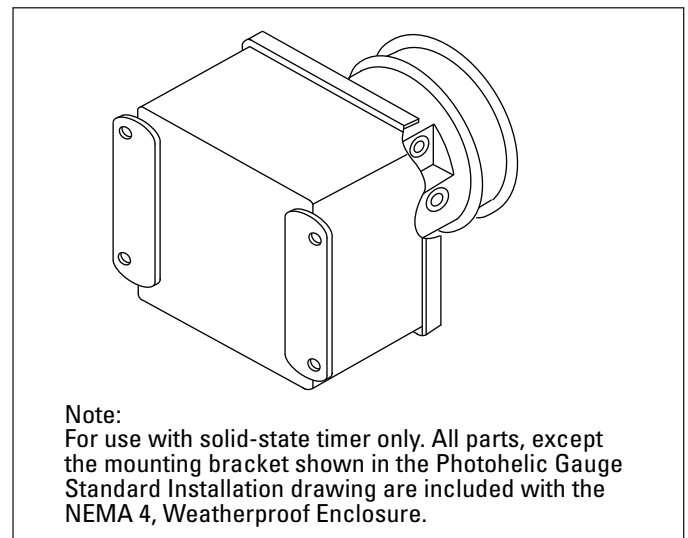
The Photohelic combines the functions of a differential pressure gauge and a pressure-based switch. The gauge function measures the pressure difference between the clean-air and dirty-air plenums and provides a visual display of filter condition. The high-pressure tap is located in the dirty-air plenum and a low-pressure tap is located in the clean-air plenum. The pressure-based switch function provides high-pressure ON and low-pressure OFF control of the filter cleaning system.

1. Choose a convenient, accessible location on or near the collector for mounting that provides the best visual advantage.



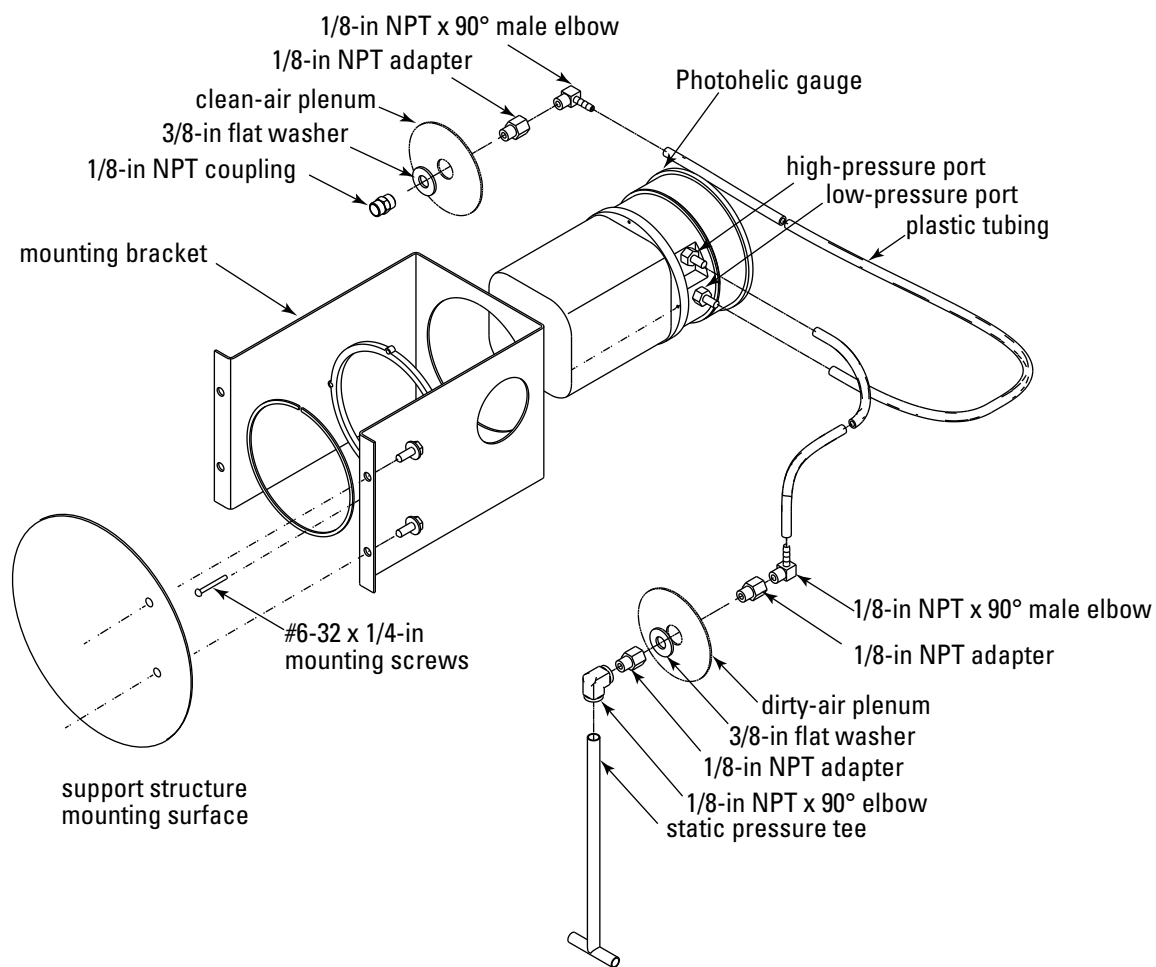
Photohelic Gauge Wiring Diagram

2. Mount the gauge to the remote panel or door using the mounting ring, retaining ring, and four #6-32 x 1 1/4-in screws. Do not tighten screws. Connect two, 1/8-in NPT x 1/4-in OD male adapters to the gauge's high- and low-pressure ports. Tighten screws.
3. On the back of the gauge, remove four #6-32 x 5/16-in screws and plastic enclosure. Set aside. Add two jumper wires supplied by customer. Remove the jumper from the pressure switch located on the timer board, if equipped. Using the 3/4-in conduit opening, wire the gauge as shown. Reassemble and fasten enclosure securely.
4. Thirty-five feet of plastic tubing is supplied and must be cut in two sections. Connect one section of tubing from the gauge's high-pressure port to the pressure fitting located in the dirty-air plenum. Connect remaining tubing from the gauge's low-pressure port to the fitting in the clean-air plenum. Additional tubing can be ordered from your representative.
5. Zero and maintain the gauge as directed in the manufacturer's Operating and Maintenance Instructions provided.
6. To install the Photohelic Gauge mounted in a NEMA 4, Weatherproof Enclosure, follow Steps 4 and 5.



**Note:**  
For use with solid-state timer only. All parts, except the mounting bracket shown in the Photohelic Gauge Standard Installation drawing are included with the NEMA 4, Weatherproof Enclosure.

Photohelic Gauge in Optional NEMA 4 Weatherproof Enclosure



Photohelic Gauge 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) collectors 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

## Delta P Plus Control

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

### Description

The Delta P Plus 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.

The user can program the Delta P Plus Controller to pulse while the collector is running, to maintain a relatively constant pressure drop across the filters, pulse only after the collector is shut down (after-shift cleaning), or a combination of both, cleaning while running as well as end of the shift.

### Operation

#### Normal

The Delta P Plus Controller monitors the pressure on both sides of the tubesheet while the collector is running. As air flows through the filters, the resistance of the media and collected dust creates a pressure difference or "drop" between the dirty and clean air plenums. The Delta P Plus Controller measures the pressure drop and provides a visual display in inches water gauge or metric (SI) collectors of daPa.

#### Filter Cleaning

The Delta P Plus Controller offers three filter cleaning options.

1. **Differential Pressure Cleaning (DFF)** - When the pressure drop across the filters reaches the Controller's High Pressure On setpoint, the Controller closes an output relay allowing a sequential timer to trigger the cleaning valves. 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.

2. **Downtime Cleaning (DTC)** - The Delta P Plus Controller monitors the collection system. When the pressure drop exceeds the Low Pressure Off set point and then approaches zero again, the Delta P Plus Controller runs a delay timer to allow the blower to come to a stop and then engages the cleaning mechanism for a preselected time.
3. **Combined Differential and Downtime Cleaning (ALL)** - The Delta P Plus Controller combines the two functions described above; maintaining the pressure drop in a narrow band and downtime cleaning the filters when the collector is shut down. The downtime cleaning function can be toggled On or Off from the keyboard.

#### Alarm

The Alarm setpoint is set to a higher setting than the High Pressure On 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 Plus Controller also provides an input connection for a remote Alarm reset.



Delta P Plus Control Display

## Antistatic Option

Collectors using antistatic filters must be properly bonded and grounded.

1. If the collector is ordered with antistatic filter bags, the grounding lug and internal components are factory installed.
2. Connect a suitably grounded wire to the grounding lug located on the side of the collector housing.

## Interlocks and Alarms

All ancillary equipment should be interlocked to ensure correct starting and stopping sequence. See the Typical Start-Up and Typical Shut-Down procedures. Discharge equipment such as rotary airlocks or screw conveyors should be separately controlled, but interlocked with the Solid-State Timer and blower motor to prevent complete collector failure. For example, if the motor of a screw conveyor that is not interlocked stops, the filter housing will gradually fill with dust until completely choked. Compressor failure could also cause similar blockage.

### **NOTICE**

If interlocking electrical components and possible flow interruption is not an option, installing an alarm system can help prevent sudden system failure. Use zero speed switches on rotating devices such as rotary airlocks and screw conveyors, high pressure drop alarms, low compressed-air pressure switches, or level alarms in hoppers. These devices, linked to an audible and visual alarm, provide early warning of system failure.

## Platforms and Ladders

It is recommended that the installation include suitable platforms and ladders for safe access to maintenance areas on the DLMC. If optional platforms and ladders are purchased, follow the drawings provided for proper installation.

## Explosion Vent

### **⚠ WARNING**

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.

### **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.

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.

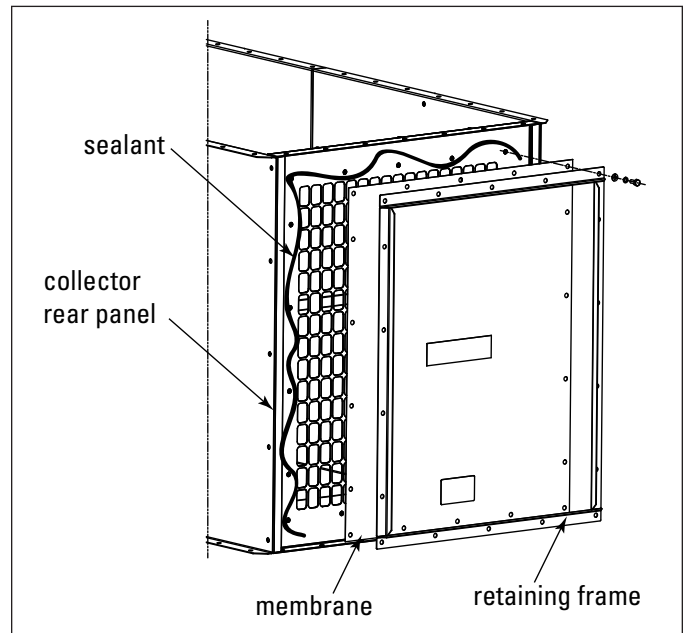
NFPA 68 can provide guidance on both the frequency of and appropriate details for inspections.

## Explosion Vent Membrane Replacement

### **⚠ CAUTION**

Do not damage or pierce the membrane during installation. A damaged membrane will leak and fail.

1. Remove the bolts, flat washers, and hex nuts from the retaining frame and set aside.
2. Remove retaining frame and set aside.
3. Remove the Membrex™ vent panel and discard.
4. Clean old sealant and debris from the outside surface of the grid panel.
5. Apply sealant to rear panel around bolt pattern.
6. Install replacement membrane realigning the mounting holes carefully.
7. Reinstall the retaining frame using the hardware removed in Step 1. Tighten hardware equally to compress the sealant evenly.



Membrex Explosion Membrane Replacement

## 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.
<b>Partial loss of suction</b>	Compressed air system	Check compressor for operation. Check interlocks, motor, power supply, and drive belts.
	Incorrect manifold pressure	Check pulse pressure at manifold. See Rating and Specifications in this manual.
	Excess moisture in the compressed air supply	Check that the compressed air supply is oil and moisture free.
	No pulse to diaphragm valves	Check the solenoid and diaphragm valves by feeling the rubber hose for pulse. Feel the vent opening on the solenoid valve for pulse. If all valves are affected, check that the LED on the controller is ON. If not illuminated, check power supply and printed circuit board fuse. If isolated solenoid or diaphragm valve is affected, repair or replace as necessary.
	Filters plugged	Check that the dust removal container is not full and that the equipment served is operating. Turn fan OFF and allow the controller to perform several complete cleaning cycles. Replace damaged or torn filters.
	Blower belt slipping	Adjust or replace the drive belts.
	Motor speed low	Check all supply voltage, phase, and motor connections.
	Fan rotation backward	Check and correct. See Preliminary Start-Up.

## Troubleshooting

Problem	Probable Cause	Remedy
<b>Total loss of suction</b>	Blower motor stopped	Check motor started overloads, fuses and interlocks.
		Check motor connections and windings.
	Filters plugged	Check that the dust removal container is not full and that the equipment served is operating. Turn fan OFF and allow the controller to perform several complete cleaning cycles. Remove each filter bag, vacuum outside surfaces, and reinstall. Replace damaged or torn filters.
	Obstructed ductwork	Check and remove obstructions.
<b>Clean-air outlet discharging dust</b>	Filter bags not installed correctly	See Filter Bag Replacement.
	Torn or damaged filters	Replace as necessary.



## 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 and Donaldson built Afterfilters 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. To ensure proper operational performance of the equipment, use only genuine Donaldson replacement parts. 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.

