

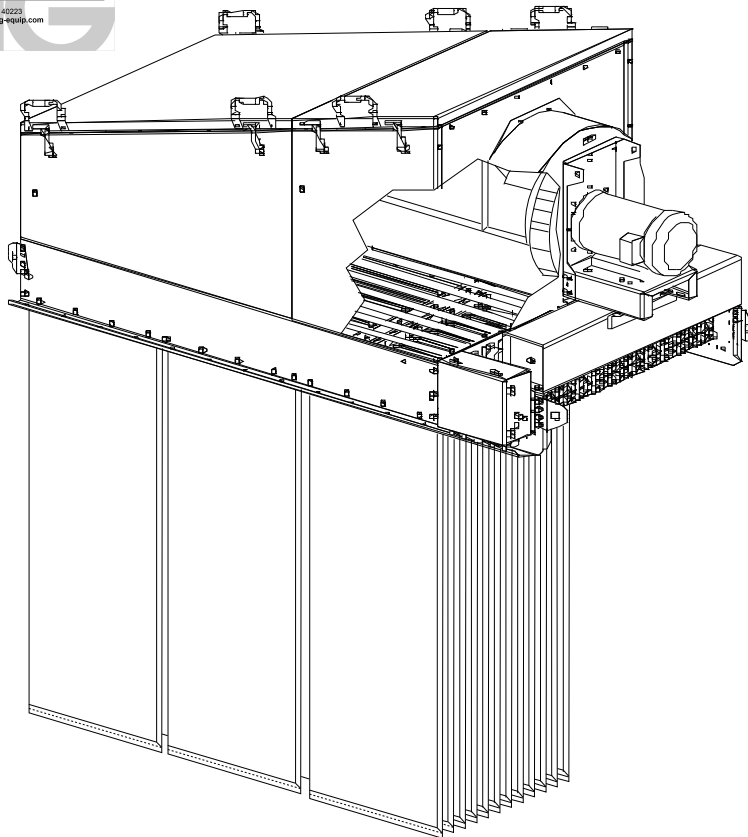
Donaldson  
Torit®

## Dalamatic® Insertable

DLMV

## 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.**

English  
Master Language

IOM 7592601 (ENG)  
Revision 6



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.

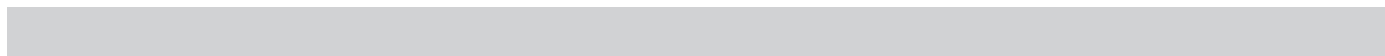
Improper operation of a dust control system may contribute to conditions in the work area or facility that could result in severe personal injury and product or property damage. Check that all collection equipment is properly selected and sized for the intended use.

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 _____<br>_____ |                         |
| Filter Type _____      |                         |
| Accessories _____      |                         |
| Other _____            |                         |



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

## Description

The Dalamatric Model DLMV Insertable dust collectors are continuous-duty collectors with bag-style filters designed to handle known quantities of dust. Primarily installed in storage vessels or silos, they provide continuous filtration and maintain high collection efficiency at constant system resistance. Variations are available for pneumatic conveying operations where high dust concentrations of raw materials and particulate products are found. Continuous duty means no downtime. The filters are pulse-cleaned one at a time without turning the unit off. Standard sizes range from 43 to 645 sq ft of filter area and feature either a Delta P or DeltaP Plus controller to control the filter cleaning operation.

## Purpose and Intended Use



Misuse or modification of this equipment may result in personal injury.

Do not misuse or modify.

In pneumatic conveying systems, Dalamatric Insertables can be inserted through the top of silos or storage vessels to separate the product conveying from displaced air to prevent product loss and nuisance dust. DLMV, Type B and W are suitable for positive pressure systems and Type F and H are applied when a suction fan is required to overcome negative system pressure. In mechanical conveying systems, the dust generated by product loading, transfer, and discharge can be controlled using a DLMV, Type F in an enclosure. The collected dust returns directly to the product conveyed making expensive ductwork systems unnecessary, saving space, and eliminating dust disposal issues.

Dalamatric Insertables can be integrated with process machinery requiring dust control such as fluid bed reactors, mixers, blenders, mills, and crushers. Some typical applications include powder paint booths and automatic bag-slitting machines. The DLMV is commonly used in the chemical, mineral, food, plastic, metal compounds, and pharmaceutical industries. With custom modifications, the DLMV is suitable for high-temperature applications.

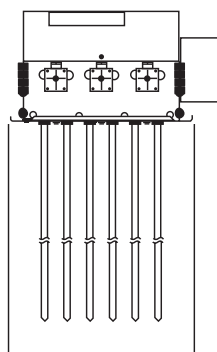


Combustible materials such as buffing lint, paper, wood, metal dusts, weld fume, or flammable coolants or solvents represent potential fire and/or explosion hazards. Use special care when selecting, installing, and operating all dust, fume, or mist collection equipment when such combustible materials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

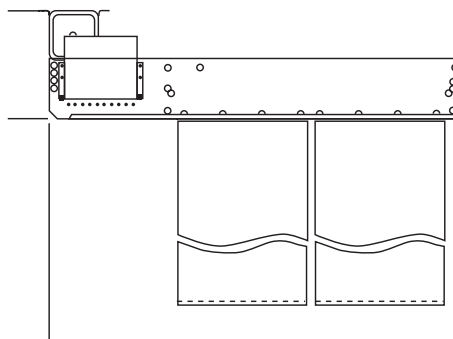
Consult and comply with all National and Local Codes related to fire and/or explosion properties of combustible materials when determining the location and operation of all dust, fume, or mist collection equipment.

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

## Rating and Specification Information



Front View  
DLMV B



Typical Side View  
DLMV B

All Units:

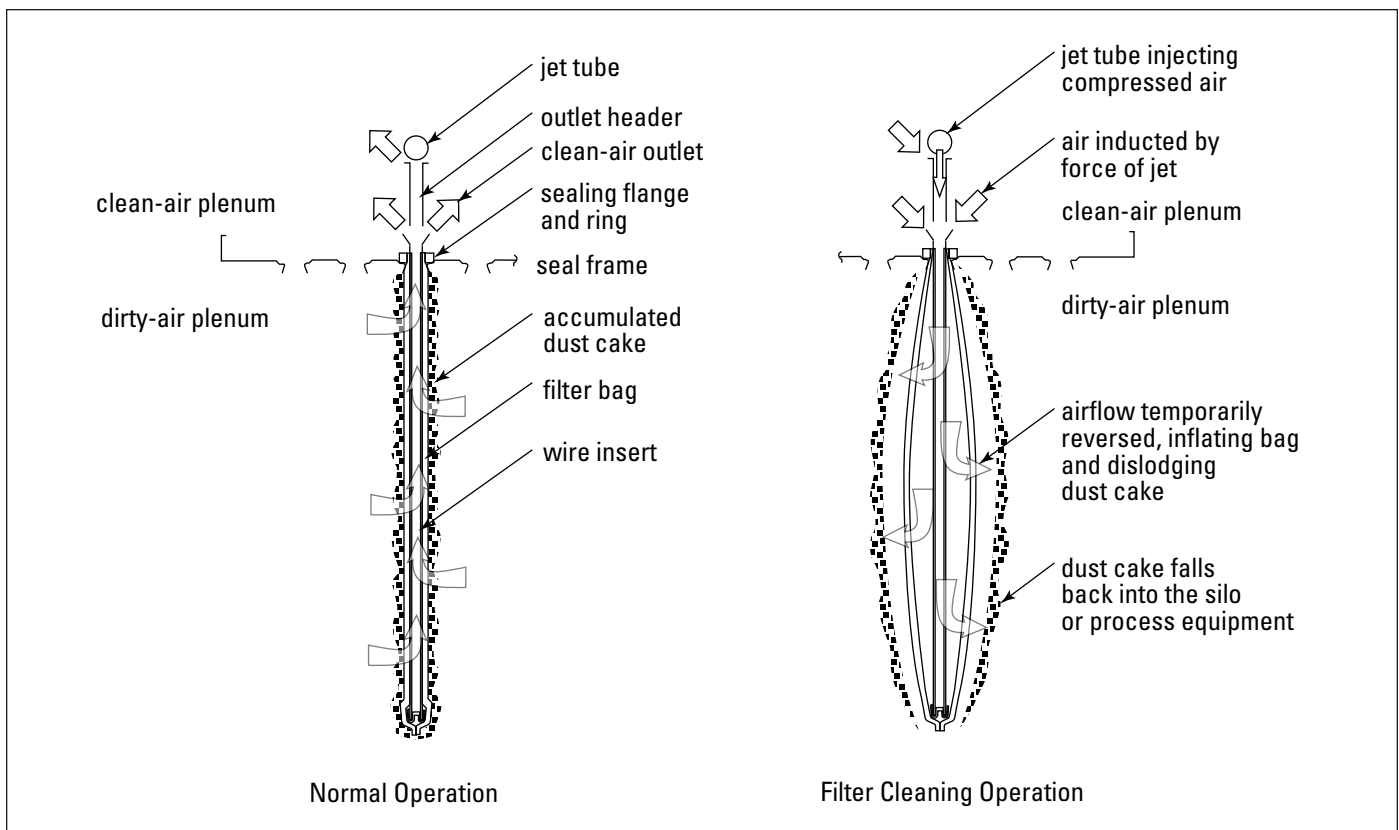
Compressed air, maximum psig ..... 90-100  
 Housing rating, inches water gauge ..... +/- 20  
 Control power ..... 120-Volt 50/60 Hz

\*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 is drawn to the filter bags. The velocity is reduced and natural pre-separation, caused by the effects of gravity, takes place. Fine particles collect on the outside surface of the filter bag and clean, filtered air passes to the center of the bag and discharges through the clean-air outlet.

Filter cleaning is completed using pulse-jet technology. A jet tube positioned over each filter bag distributes a pulse of compressed air through the filter. As the compressed air enters the filter bag, airflow is temporarily reversed and the bag inflates dislodging the dust cake formed on the outside of the bag. The bag deflates and the dust cake falls back into the silo or process equipment.



## 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



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



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.



Site selection must account for wind, seismic zone, and other

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.

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

Component damage can occur.

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

The unit is suitable for either indoors or outdoors. 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.

### 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.

**CAUTION** If combustible materials will be processed through this collector, local codes may require the collector be located either outside or adjacent to an exterior wall to accommodate devices related to a fire or explosion mitigation strategy. Consult local codes prior to installation.

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.

### Site Selection

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

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

Portable units require special installation accommodations.

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

If unit is to be located outdoors, an appropriate exhaust and remote electrical controls may be necessary.

### NOTICE

When outdoor locations are selected, always mount motors with drain holes pointed down for proper drainage of moisture.

### 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 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.

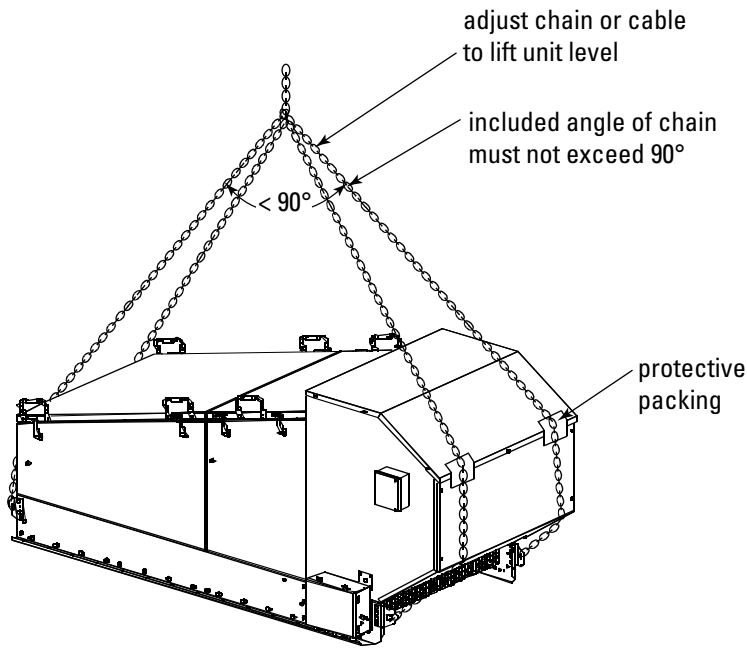
Allow only qualified crane operators to lift the equipment.

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

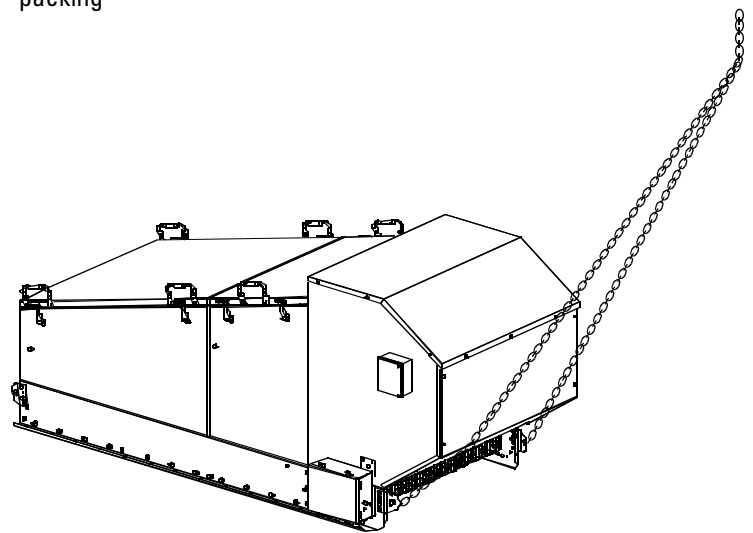
Lift unit and accessories separately and assemble after unit is in place.

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

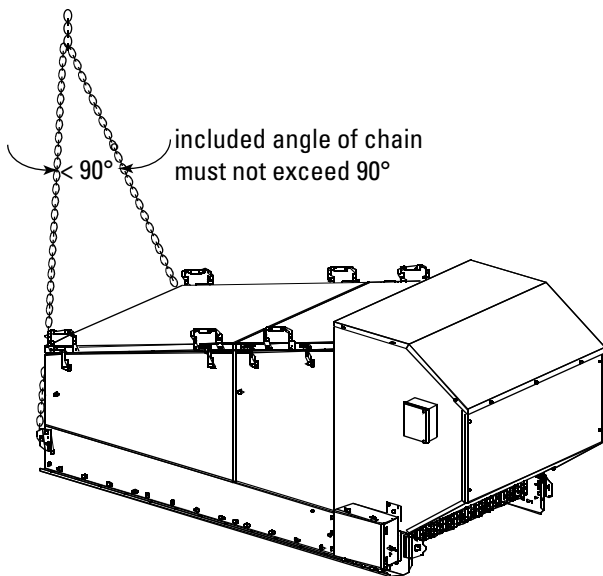
## Typical Installation



Four-Point Lift for Vertical Installation



Two-Point Lift for Horizontal Installation, Manifold Up



Two-Point Lift for Horizontal Installation, Manifold Down

Note: Horizontal installations are normally placed manifold up for service and maintenance access. However, if headroom is restricted, they may be placed manifold down.

Typical Installation

## Standard Equipment

Dalamatic Insertable dust collectors are delivered partially assembled. Unit installation, filter bag installation, compressed air, and electrical connections are completed at the job site.

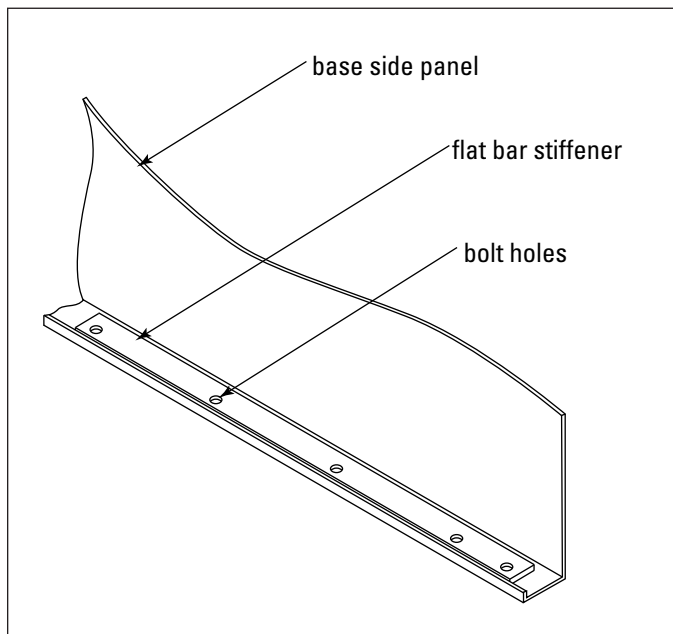
### Unit Installation

**Note:** Compare the position and spacing of the bolt pattern on the unit's mounting flange to the bolt pattern on the mounting surface.

1. Open the header cover and remove the components shipped loose inside.
2. Apply two strips of 1/4-in diameter rope-type sealant or caulk to the mounting surface: one toward the inside of the bolt pattern and one toward the outside of the bolt pattern.
3. Lift unit into position over mounting surface and lower slowly.
4. Use drift pins to align holes.

**Note:** Install flat bar stiffeners, if equipped. See Optional Flat Bar Stiffener Installation.

5. Secure with bolts, washers, and hex nuts supplied. Tighten to form an airtight seal.



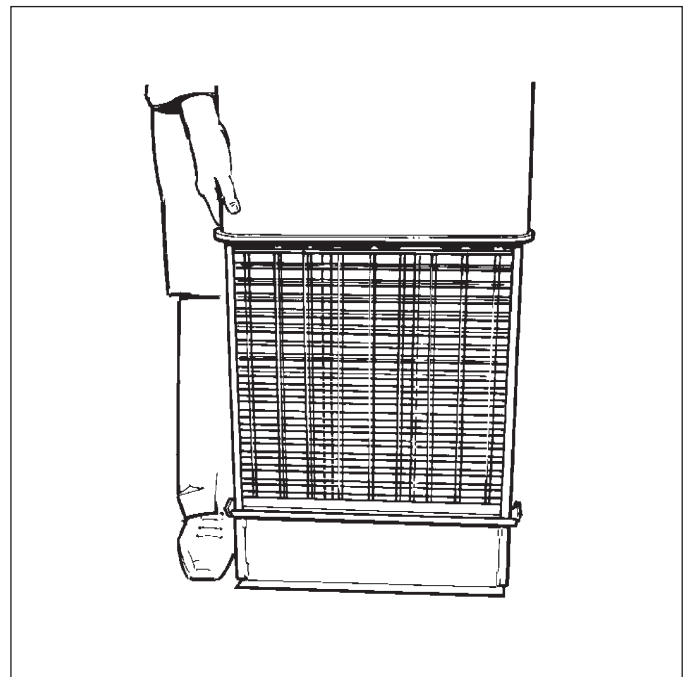
Optional Flat Bar Stiffener Installation

### Filter Bag Installation

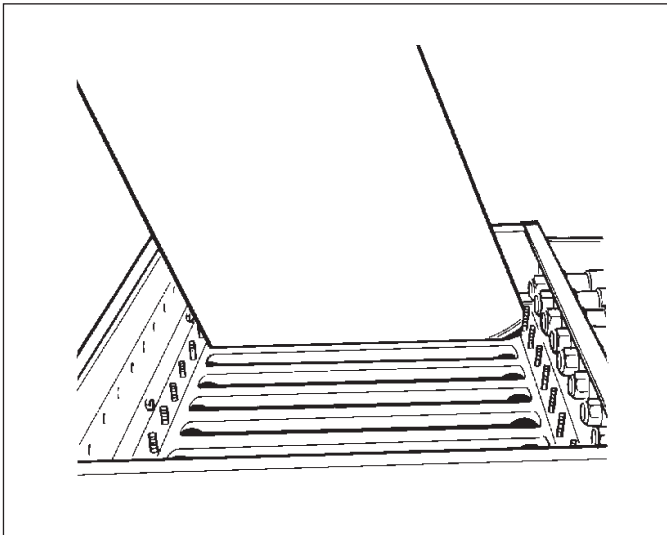
1. Remove header cover, if equipped.
2. Remove jet tubes and set aside.
3. Slide the filter bag over the wire support frame as shown. Slide bag carefully until top of bag is tight against the support frame flange.
4. Place filter bag and wire support assembly in seal frame slots as shown.
5. Position clamps and tighten using a deep well socket and extension. Do not overtighten. Maximum recommended torque is 20 ft/lb.

**Note:** If filter bags are mounted horizontally, tighten bottom clamp first.

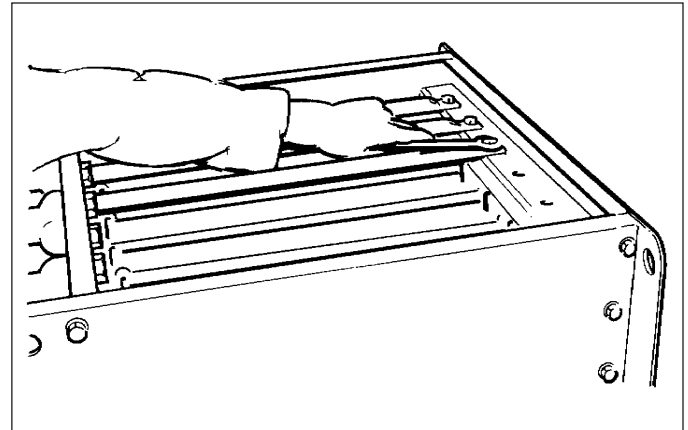
6. Repeat to install all bags.
7. Replace jet tubes with the open end pressed firmly into its locator and the orifices directed toward the filter bag.



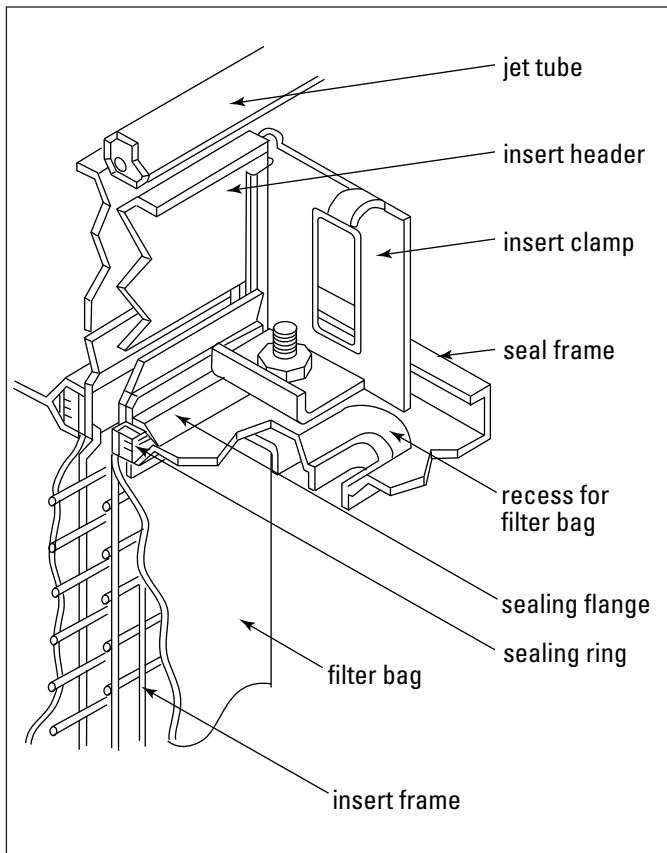
Filter Bag Assembly



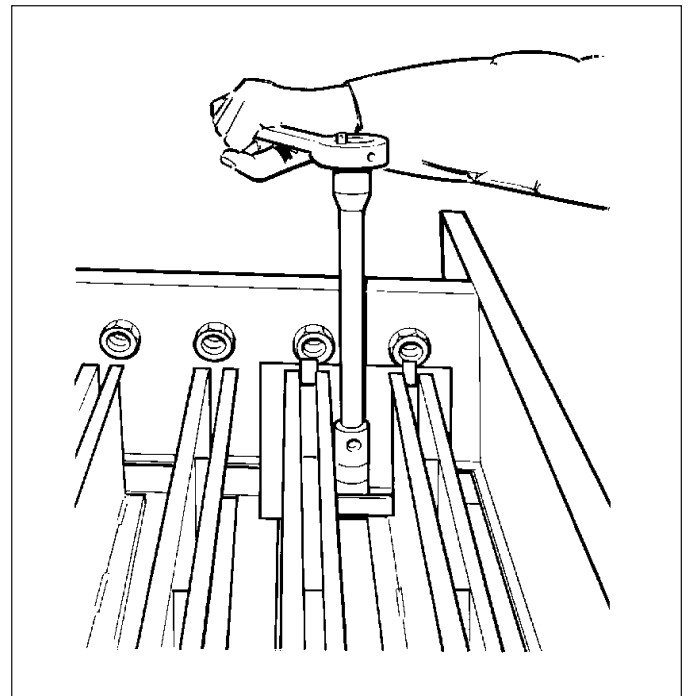
Filter Bag Installation



Jet Tube Installation



Filter Bag Detail



Clamps and Inserts

## 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 100-psig.

Component damage can occur.

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

1. Remove the plastic pipe plug from the unit's air manifold and connect the compressed-air supply line. 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 between 90-100 psig. The pulse-cleaning controls are factory set to clean one or more filters every 10-seconds during a cleaning cycle.

## Compressed Air Requirements

| Model                      | Compressed Air Pressure* | Pulse Duration, millisecond | Pipe Diameter, inches*** |
|----------------------------|--------------------------|-----------------------------|--------------------------|
| DLMV 4/7, 6/10, and 9/15   | 65 psi                   | 200                         | 1/2                      |
| DLMV 7/7, 10/10, and 15/15 | 65 psi                   | 200                         | 1/2                      |
| DLMV 8/7, 12/10, and 18/15 | 90 psi                   | 200                         | 1/2                      |
| DLMV 14/7, 20/10, 5-valve  | 90 psi                   | 200                         | 1/2                      |
| at 12-second intervals*    |                          |                             |                          |
| DLMV 21/7 and 30/10        | 75 psi                   | 60                          | 1/2                      |
| DLMV 30/15                 | 65 psi                   | 110                         | 1/2                      |
| DLMV 45/15                 | 75 psi                   | 110                         | 1/2                      |
| DLMV 60/15                 | 90 psi                   | 110                         | 1/2                      |

\* Normal operating pressure

\*\* Recommended initial setting

\*\*\* Up to 100 ft

### Using Existing Compressed-Air Supply

Install a customer-supplied shut-off valve, bleed-type regulator with gauge, filter, and automatic condensate valve in the compressed-air supply line to the unit.

### Using Compressor-Supplied Compressed-Air

1. Use a compressor of adequate capacity. An overloaded compressor will produce contaminated, moisture-laden air.
2. Avoid locating the air intake in an excessively polluted area and install an air intake filter.
3. The piping between the compressor and the unit should act as a cooling device for the compressed air. A typical requirement for a smaller installation would be 30-ft of 1/2-in diameter pipe. Install the pipe to provide a fall in the direction of airflow to assist drainage of accumulated moisture.
4. Install a customer-supplied shut-off valve, bleed-type regulator with gauge, filter, and automatic condensate valve in the compressed-air supply line.

## 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 unit'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 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.

## 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. Available options include 3, 6, 10, 20, or 32-pin solenoid valve control.

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 solenoid 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 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 unit. Mechanical vibration can damage the timer.

## Solenoid Connection

The unit is equipped with a solenoid valve (typically 120V) that controls the pulse-cleaning valves, which clean the filters.

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

Wire the solenoids to the solid-state timer following the wiring diagram supplied with the unit. 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.

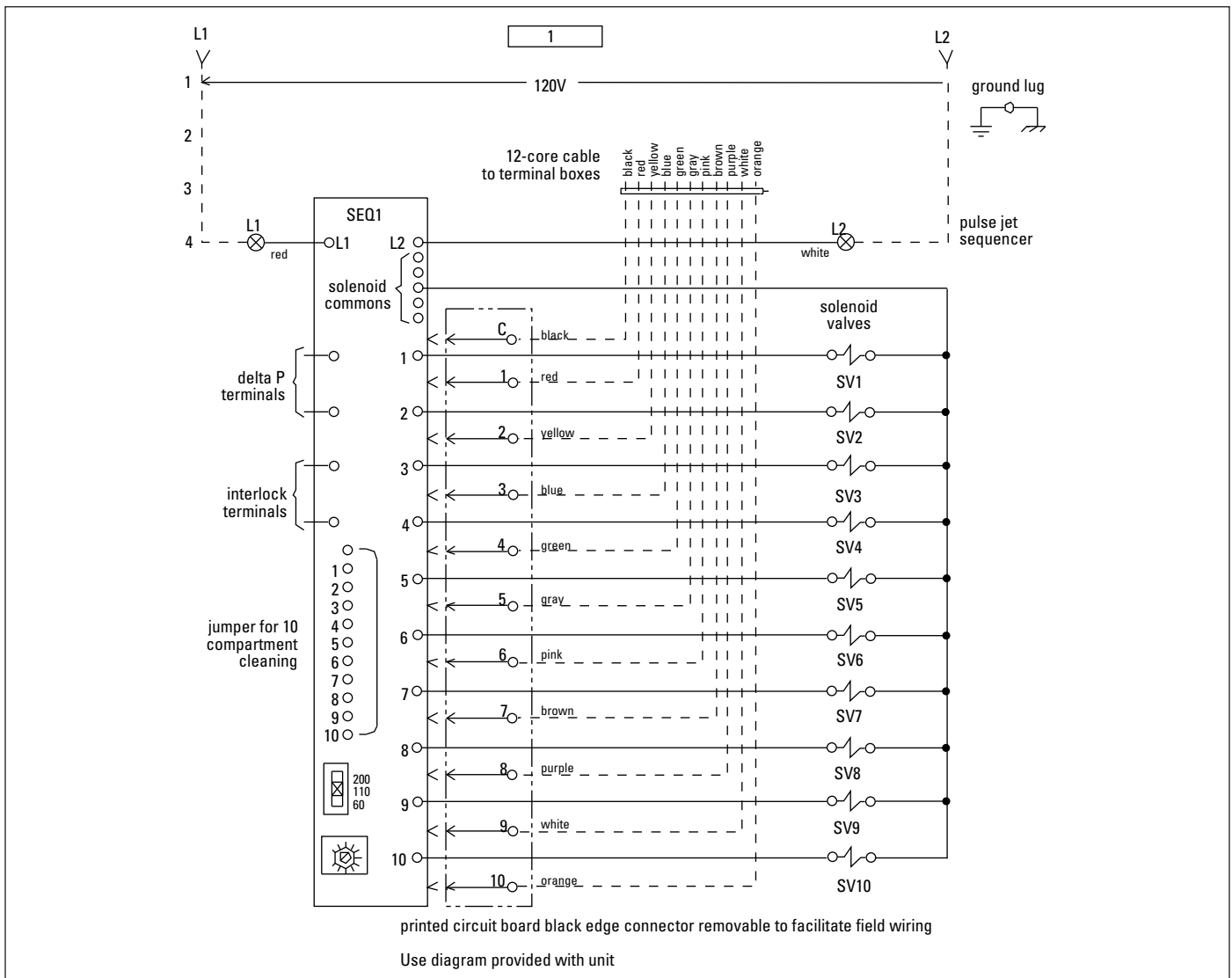
**Operating Temperature Range**  
-20° F to 130° F

**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

**Compressed-Air**  
Set compressed-air supply at 90-psig. The timer is factory set to clean one filter or set of filters every 10-seconds.

**NOTICE** Do not increase supply pressure above 100-psig. Component damage can occur.



Solid-State Timer Typical Wiring Diagram

## 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 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. Check for proper rotation as noted on the fan 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 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 setting in Compressed Air Requirements table.
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.

## Start-Up

1. Turn compressed-air supply ON.
2. Turn the equipment being served ON.
3. Turn timing controls ON.
4. Turn main fan ON, if equipped.

## Shut Down

Follow this shutdown procedure to clear residual deposits from the filter bags, filter body, and equipment served:

1. Turn main fan OFF, leaving compressed air supply ON to allow off-line filter cleaning.

**Note:** Contact your Donaldson representative for shutdown instructions for explosion vented units.

2. Wait 10 to 15 minutes and turn timing controls and compressor OFF.

## 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 100-psig.

Component damage can occur.

All compressed air components must be sized to meet the maximum 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 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.

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 flow usually restores the filters to normal pressure drop.

4. Monitor exhaust.
5. Monitor dust disposal.

### Check Monthly

1. Proper solenoid and diaphragm valve operation.
2. If equipped, check door seals for condition and contact. Replace or adjust as necessary.
3. If equipped, check that the clean-air plenum is free of dust accumulation. If dust is present, check the surrounding filter bags for tears or loose seals.

### Check Annually

#### Moisture Separator

Isolate the compressed-air supply and remove and clean the filter.

#### Compressed-Air Manifold

Isolate the compressed air supply, remove the drain plug and air inlet connections and clean thoroughly.

#### Filter Bags

Remove one or two filter bags and inspect for general condition. Replace if necessary.

#### Jet Tubes

Check that jet tubes are clean and the orifices are clear.

## Diaphragm Replacement

1. Remove nylon tubing by pushing inward on the fitting collar and withdraw the tubing.
2. Remove the hex-head set screws and washers securing the valve bonnet.
3. Check that the bleed-hole pin is not blocked.
4. Place the diaphragm over the bleed hole pin with the nylon sealing washer inside the valve throat.
5. Position spring, if equipped, inside the bonnet recess.
6. Replace valve bonnet with the spring over the diaphragm disk shoulder and bonnet over the bleed hole pin. Secure using the hex-head set screws and washers removed in Step 2.
7. Reconnect nylon tubing and secure.

5. Slide the filter bag over the wire support frame as shown. Slide bag carefully until top of bag is tight against the support frame flange.
6. Place filter bag and wire support assembly in seal frame slots as shown.
7. Position clamps and tighten using a deep well socket and extension. Do not overtighten. Maximum recommended torque is 20 ft/lb.  
**Note:** If filter bags are mounted horizontally, tighten bottom clamp first.
8. Repeat to install all bags.
9. Replace jet tubes with the open end pressed firmly into its locator and the orifices directed toward the filter bag.

## Filter Removal and Installation



### WARNING

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

Dirty filters may be heavier than they appear.

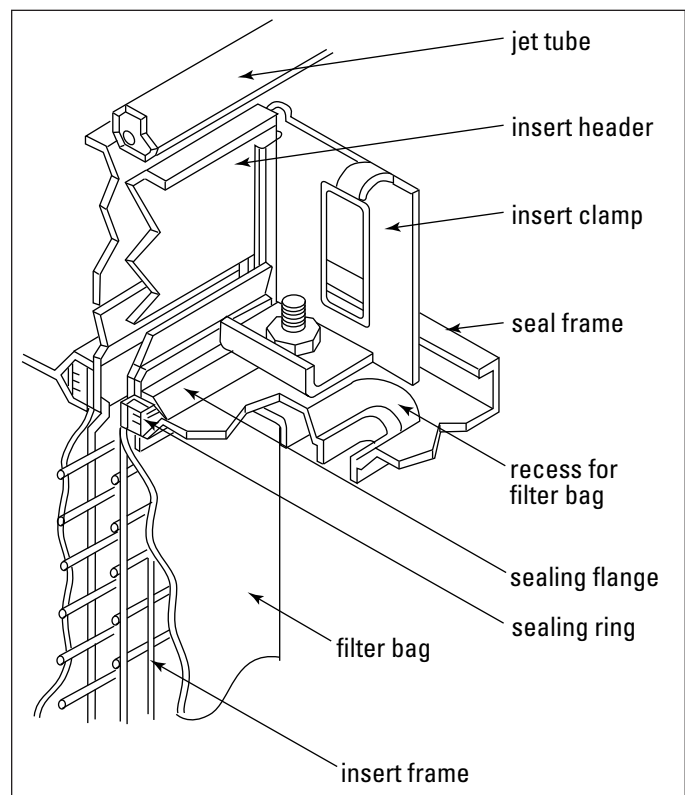
Use care when removing filters to avoid personal injury.

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

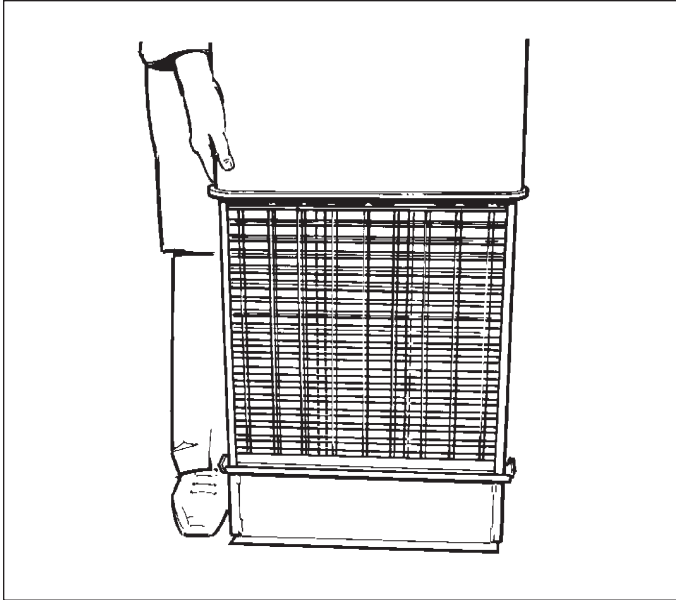
Turn compressed air supply OFF and bleed lines before performing service or maintenance work.

## Filter Bag

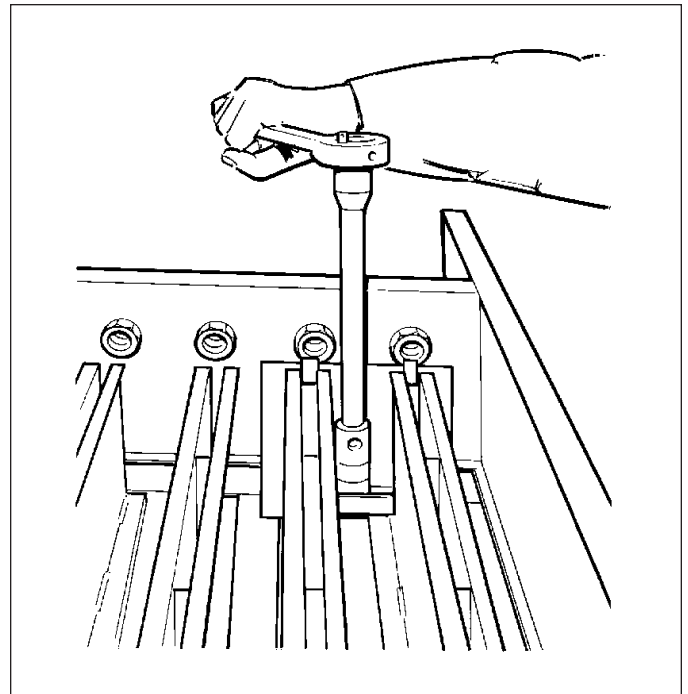
1. Activate the pulse cleaning for 10 to 15 minutes to remove excess dust from the filter bags.
2. Remove header cover, if equipped.
3. Remove jet tubes and set aside.
4. Remove the hex nuts securing the wire insert. Remove the clamps and withdraw the insert and filter bag. Inspect insert for excess corrosion, broken mesh, or other damage and replace as necessary.



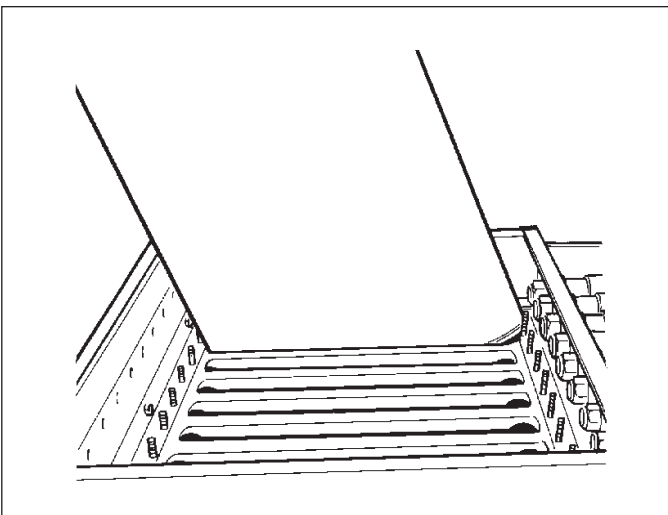
Filter Bag Detail



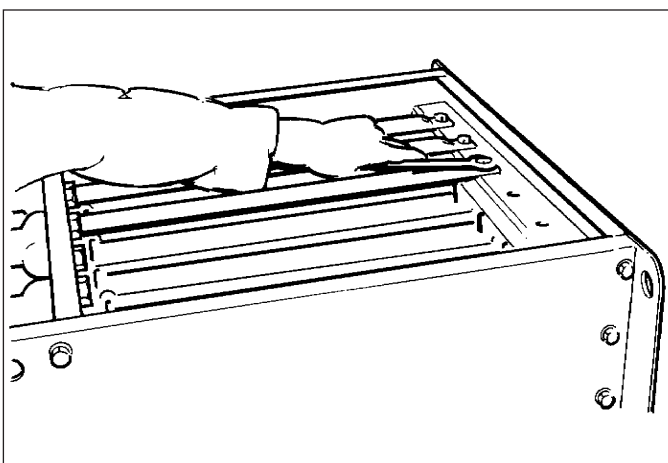
Filter Bag Assembly



Clamps and Inserts



Filter Bag Installation



Jet Tube Installation

### Compressed Air Components

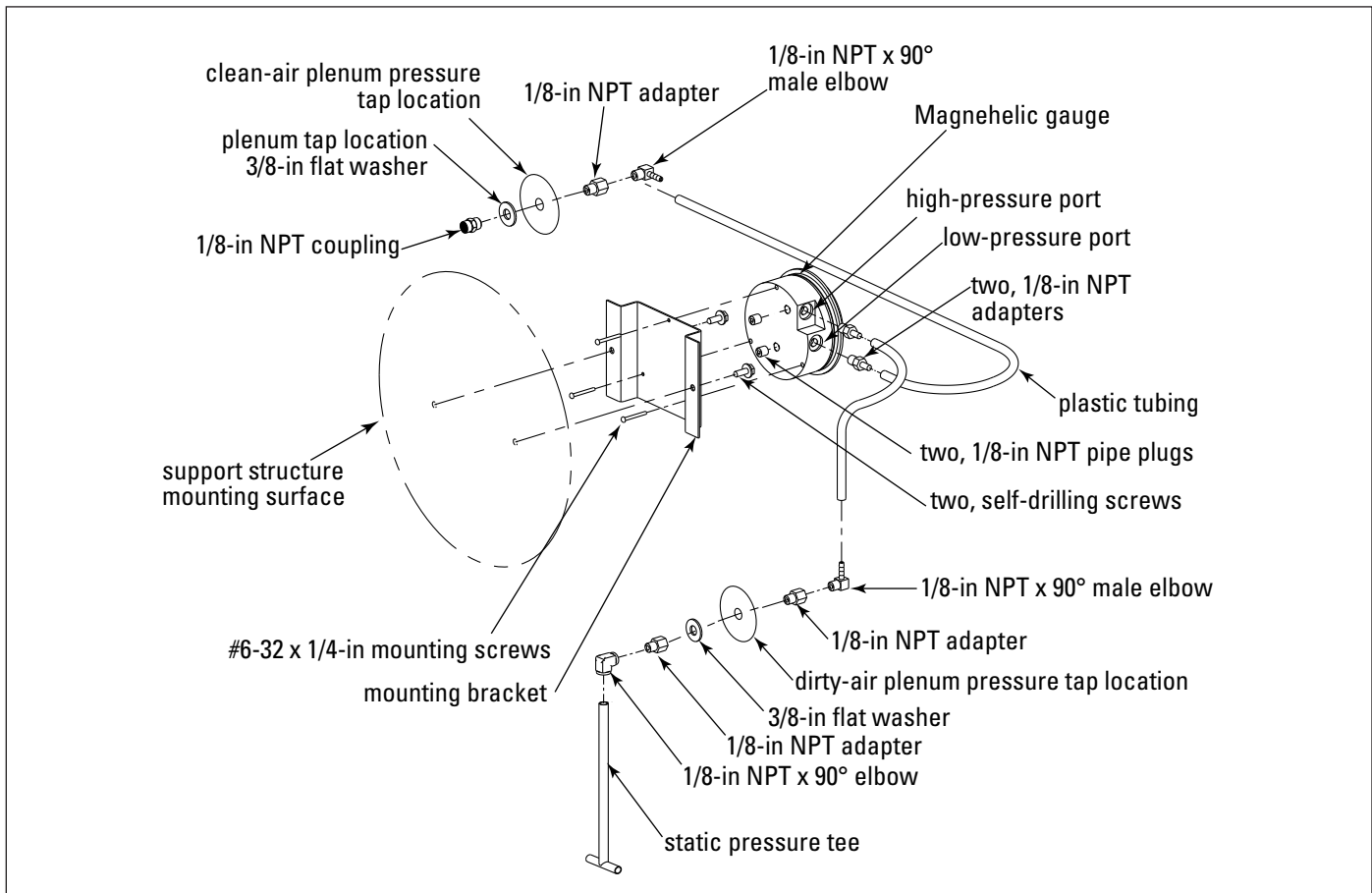
1. Periodically check the compressed air components and replace compressed-air filters.
2. Drain moisture following the manufacturer's instructions.
3. With the compressed-air supply ON, check the cleaning valves, solenoid valves, and tubing for leaks. Replace as necessary.

## Optional Equipment

### 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 unit 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

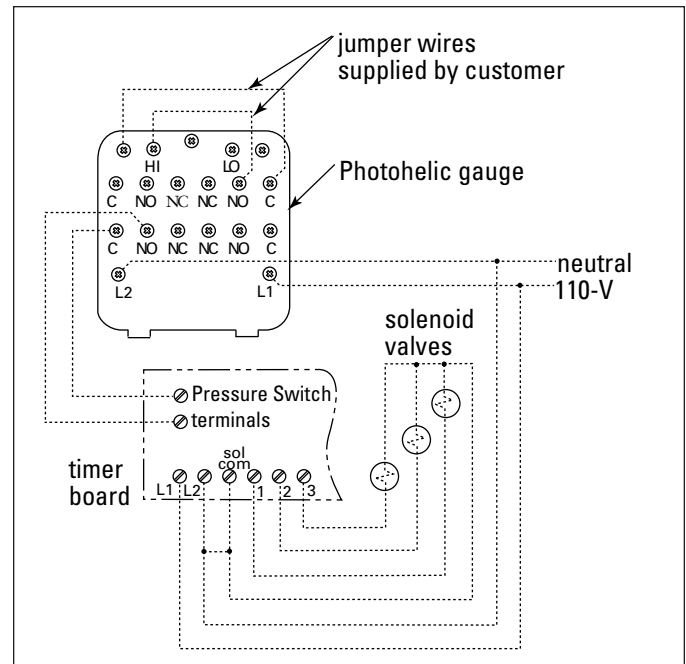
be performed by a qualified electrician and comply with all applicable national and local codes.

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

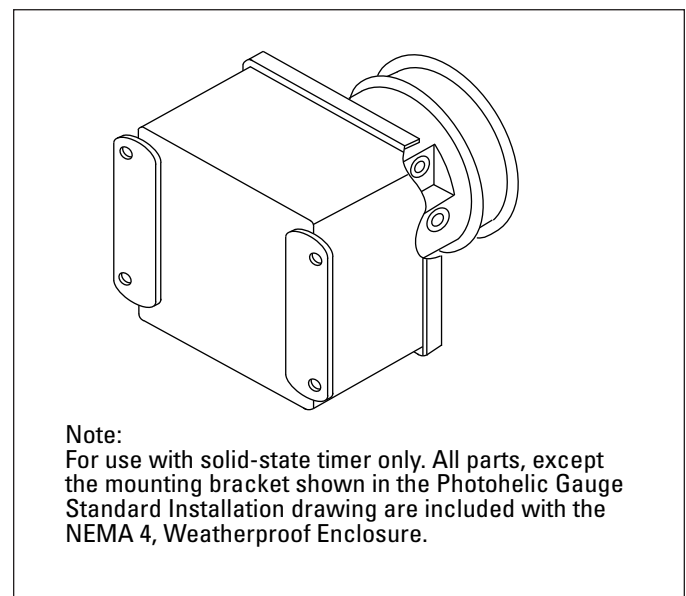
Do not install in classified hazardous atmospheres without an enclosure rated for the application.

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 unit for mounting that provides the best visual advantage.
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.



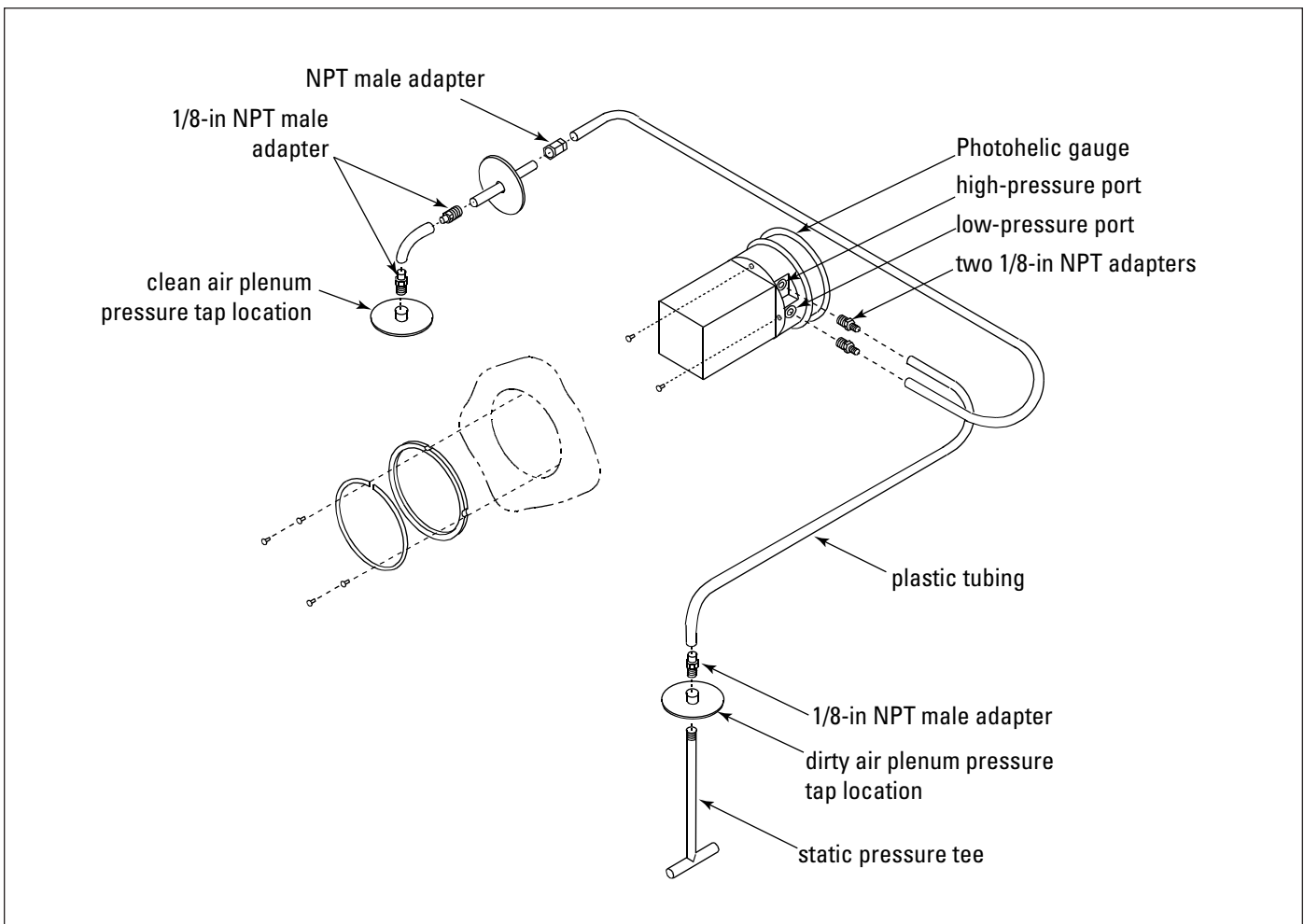
Photohelic Gauge Wiring Diagram



**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

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.



Photohelic Gauge, Remote Panel or Door 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 unit is running. The blower draws air through the filters, creating a pressure drop. The Delta P Controller measures the pressure drop and provides a visual display in inches water gauge or metric (SI) units of daPa.

#### Filter Cleaning

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

#### Alarm

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



Delta P Control

## 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 unit 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) units 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.

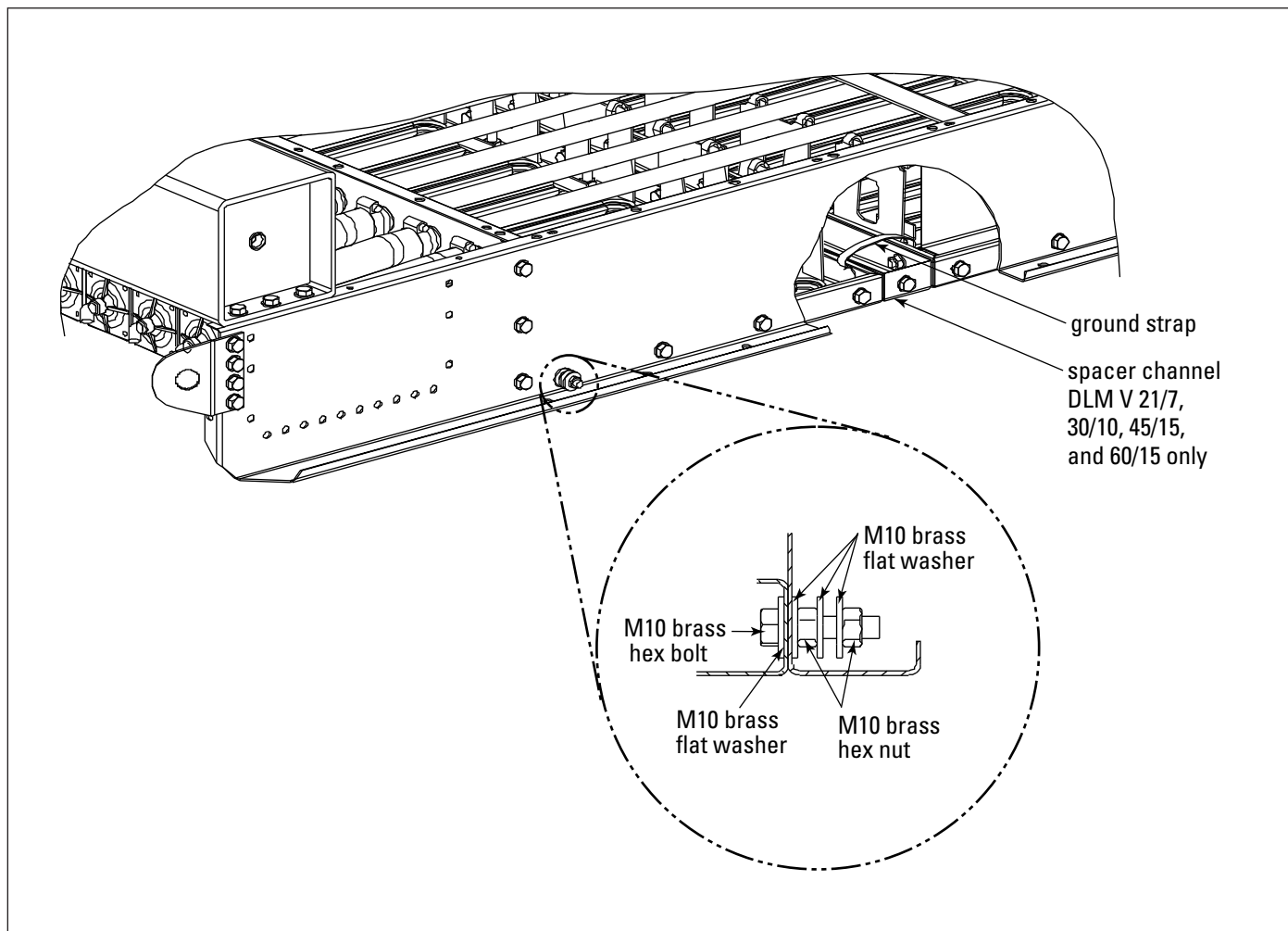


Delta P Control

## Antistatic Option

Units using antistatic filter bags must be properly grounded.

1. Remove and replace the standard hardware with the brass hardware as shown.
2. Loop grounding strap from seal frame to seal frame and fasten using existing hardware as shown.
3. Connect a suitable ground wire to the grounding lug located on the side of the collector housing.



Antistatic Ground Connection

## Explosion Vent

### **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 damage to property and personal injury.

The risk of damage or injury 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.

## 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>Insufficient airflow</b>              | Faulty interlock                                     | Check and replace if necessary.  |
|  | 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 vent opening on the solenoid valve for pulse. If all valves are affected, check that the LED LP1 on the controller is ON. If not illuminated, check power supply and printed circuit board fuse. If illuminated, check that the interrupt function is not enabled. If interrupt function is not enabled and still no pulse, replace the printed circuit board. If isolated solenoid or diaphragm valve is affected, check LED LP3 on the controller that flashes corresponding to the malfunctioning valve. If illuminated, replace solenoid valve. Replace printed circuit board if LED is not illuminated. |
|  | Filters plugged                                      | Check that the dust storage silo or bin is not full or 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 replace. Replace damaged or torn filter bags.   |
|  | Verify remedy as it talks about vacuuming filter bag |  |
|  | 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.  |
| <b>Clean-air outlet discharging dust</b> | Filter bags not installed correctly                  | See Filter Installation.   |
|  | Filter damage or holes in media                      | Replace filters as necessary. Use only genuine Donaldson replacement parts. See Filter Installation.   |









## 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.

Craig Equipment Company

13055 MIDDLETOWN INDUSTRIAL BLVD, LOUISVILLE, KY 40223  
TF:800-928-7100 • T:502-245-4840 • F:502-245-1665 [craig-equip.com](http://craig-equip.com)



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