

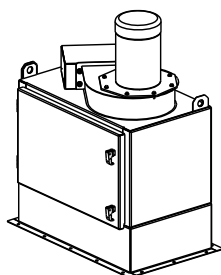


## **Torit® PowerCore®**

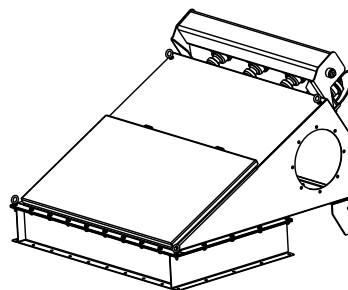
CPV-1, -2, -3, -4, -6, -8, and -12 After November 2008

### **Installation and Operation Manual**

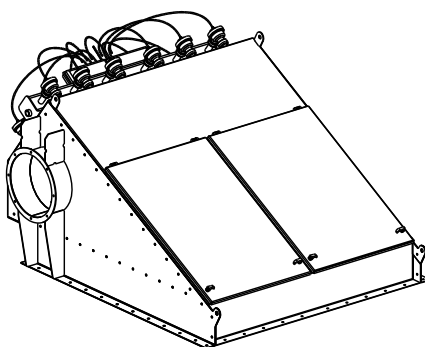
Installation, Operation, and Service Information



**CPV-1**



**CPV-2 through CPV-4**



**CPV-6 through CPV-12**

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

Illustrations are for reference only as actual product may vary.



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



## APPLICATION OF DUST CONTROL EQUIPMENT

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

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

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

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

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

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

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

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

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

### Data Sheet

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

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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 Torit PowerCore CPV collector is a continuous duty dust collector that uses obround style filter packs with the proprietary axial flow PowerCore filter media. The system is designed to provide optimum performance for high efficiency, low operating pressure drop (energy usage) within a small size collector. The filters can be pulse-cleaned on- or off-line. Standard sizes range from 1 to 12 obround filter packs.

## Purpose and Intended Use



injury.

Do not misuse or modify.

Misuse or modification of this equipment may result in personal

Discuss the use and application of this equipment with a Donaldson Torit representative.

In pneumatic conveying systems, Torit PowerCore CPV can be mounted on the top of silos or storage vessels to separate the product conveying from displaced air to prevent product loss and nuisance dust. In mechanical conveying systems, the dust generated by product loading, transfer, and discharge can be controlled using Torit PowerCore CPV on an enclosure. The collected dust returns directly to the product conveyed making expensive ductwork systems unnecessary, saving space, and eliminating dust disposal issues.

Torit PowerCore CPV collectors can be integrated with process machinery requiring dust control such as fluid bed reactors, mixers, blenders, mills, and crushers. They can also be used in bulk materials handling applications and for bin venting. The CPV model is commonly used in the grain, chemical, mineral, plastic, wood, composites, paper, packaging, and textile industries.

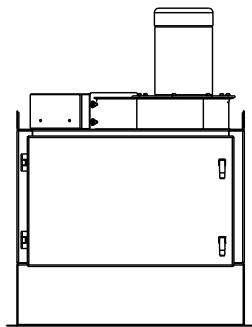


Combustible materials such as buffing lint, paper, wood, metal dusts, weld fume, or flammable coolants or solvents represent potential fire and/or explosion hazards. Use special care when selecting, installing, and operating all dust, fume, or mist collection equipment when such combustible materials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

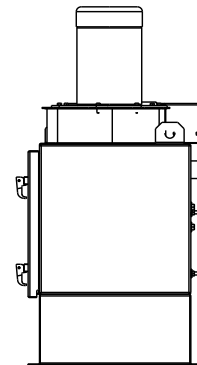
Consult and comply with all National and Local Codes related to fire and/or explosion properties of combustible materials when determining the location and operation of all dust, fume, or mist collection equipment.

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

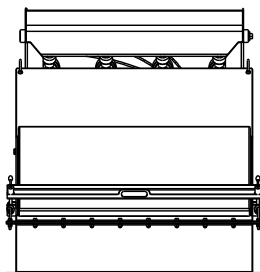
# Rating and Specification Information



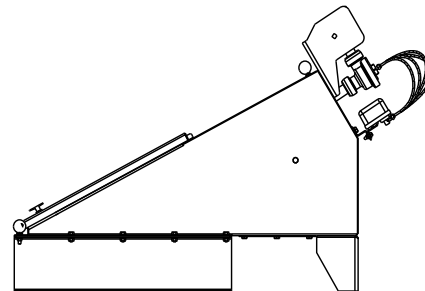
Front  
Torit PowerCore CPV-1



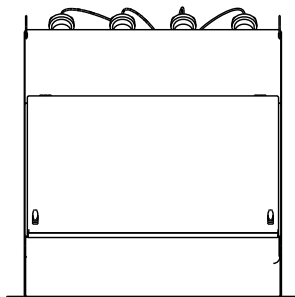
Typical Side View  
Torit PowerCore CPV-1



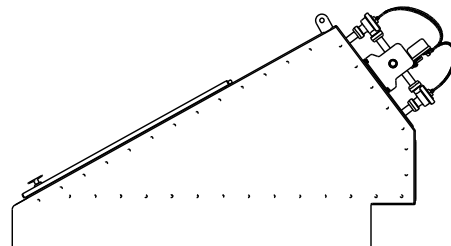
Front  
Torit PowerCore CPV-2 through CPV-4



Typical Side View  
Torit PowerCore CPV-2 through CPV-4



Front  
Torit PowerCore CPV-6 through CPV-12



Typical Side View  
Torit PowerCore CPV-6 through CPV-12

## All Units:

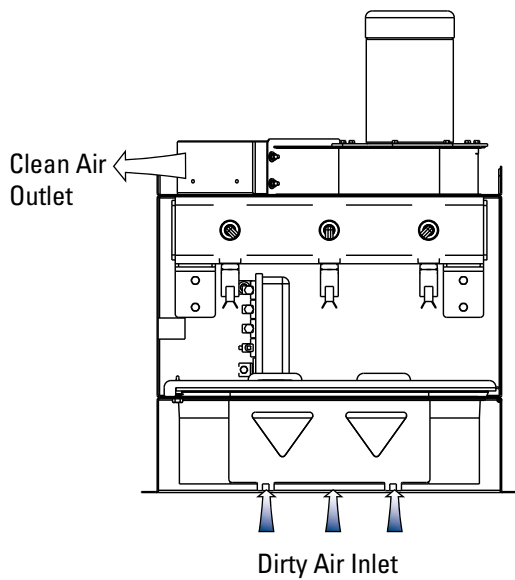
Compressed air, maximum psig.....	90-100
Housing rating, inches water gauge (CPV-1) .....	+/-12
Housing rating, inches water gauge (CPV-2 through CPV-12) .....	+/-20
Power and controls .....	120-Volt 50/60 Hz

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

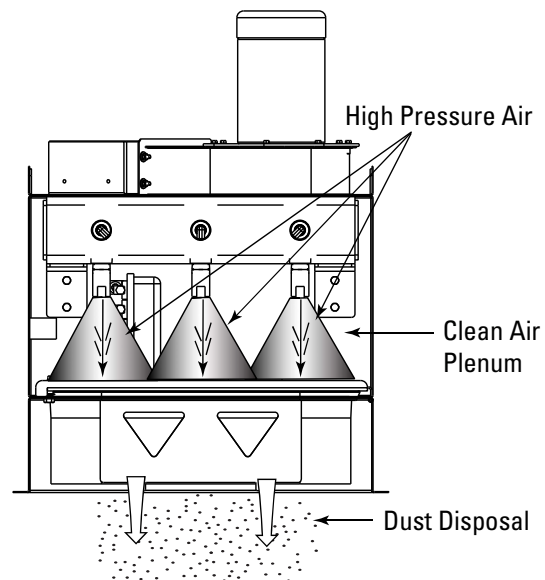
## Operation

During normal operation, dust-laden air enters the unit through the cabinet opening at the bottom of the unit, which is fastened to the silo or storage container. Airflow is directed upwards through the collector. The CPV filter packs remove fine particulate and clean, filtered air passes through the CPV filter pack to the clean-air plenum and discharges through the clean-air outlet.

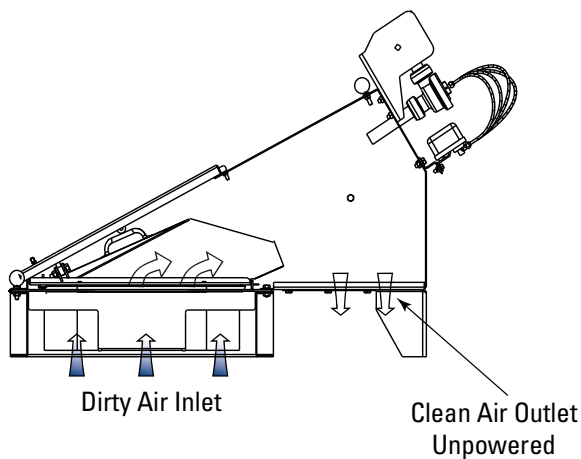
Filter pack cleaning is completed using pulse-jet technology. Air diaphragm valves provide the pulse cleaning. An electronic solenoid valve actuates the pulse cleaning. Filter packs are easily removed without tools when they need to be changed.



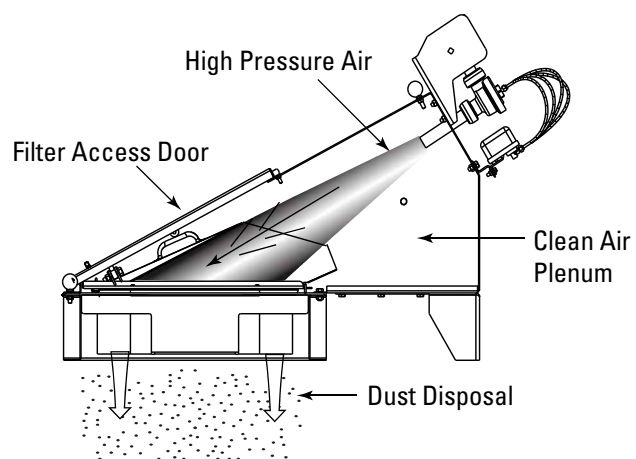
Normal Operation (1 filter pack unit)



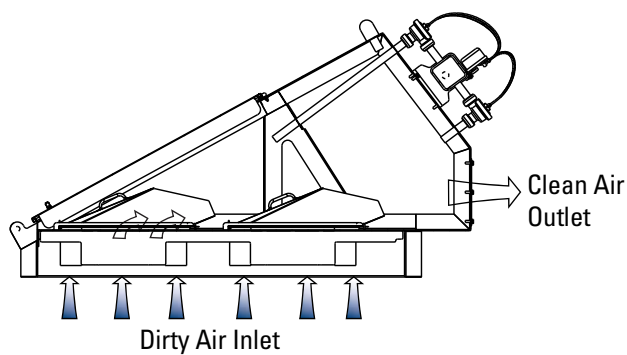
Filter Cleaning Operation (1 filter pack unit)



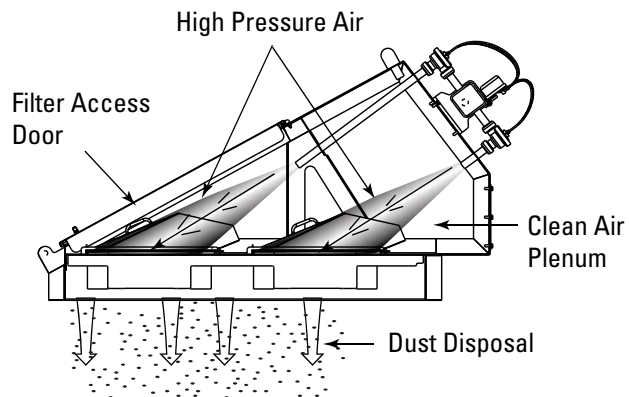
Normal Operation (2 to 4 filter pack units)



Filter Cleaning Operation (2 to 4 filter pack units)



Normal Operation (6 to 12 filter pack units)



Filter Cleaning Operation (6 to 12 filter pack units)

Typical Unit Operation

## Inspection on Arrival

1. Inspect unit on delivery.
2. Report any damage to the delivery carrier.
3. Request a written inspection report from the Claims Inspector to substantiate 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.

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



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

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

The Torit PowerCore CPV is not designed as a "stand alone" unit. Rather, it is designed to be a filtration/ventilation component of another component, such as a silo or bin container. The open bottom of the Torit PowerCore CPV is intended for roof mounting applications. Some preparation work may be required before installing the unit. An opening in the silo or storage bin must have the correct dimensions and be properly reinforced to support the weight of the Torit PowerCore CPV. Reference the Rating and Specification Information.

## Unit Location



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.

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

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
Open End Wrenches	Socket Wrenches
Large Crescent Wrench	Spreader Bars

### Hoisting Information



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

Do not lift unit by the door handle or air manifold. Follow IOM guidelines and illustrations.

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

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

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

Use all lifting points provided.

Use clevis connectors, not hooks, on lifting slings.

Use spreader bars to prevent damage to unit's casing. Check the Specification Control drawing for weight and dimensions of the unit and components to ensure adequate crane capacity.

Allow only qualified crane operators to lift the equipment.

Refer to applicable OSHA regulations and local codes when using cranes, forklifts, and other lifting equipment. Lift unit and accessories separately, and assemble after unit is in place.

## Electrical Wiring



Electrical 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.

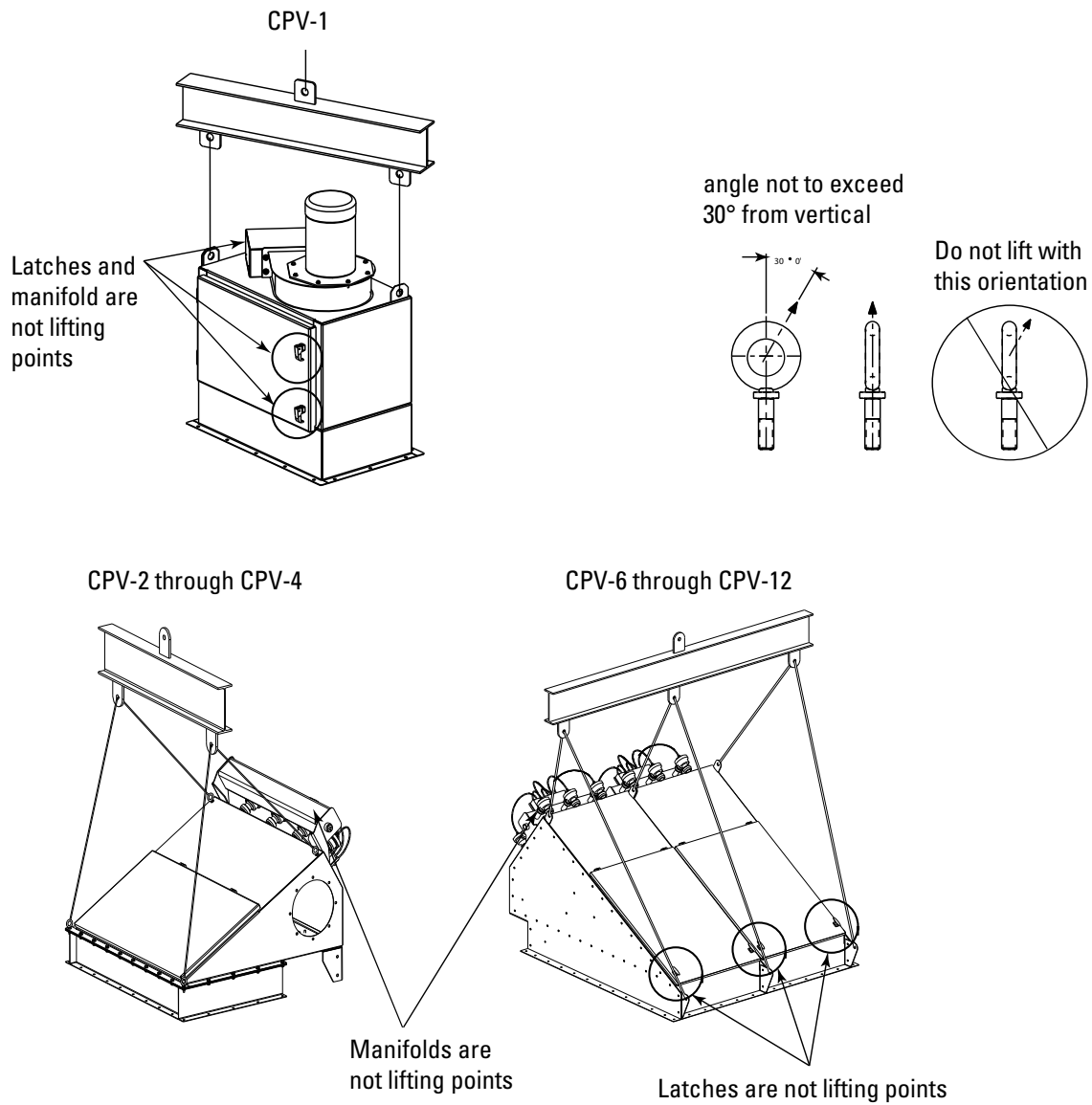
If the unit is not furnished with a factory-mounted disconnect, an electric disconnect switch having adequate amp capacity shall be installed in accordance with Part IX, Article 430 of the National Electrical Code, NFPA No. 70-latest edition. Check unit's rating plate for voltage and amperage ratings.

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

### Standard Equipment

Standard installation consists of base unit, electrical, and compressed air connections.

## Typical Installation



### **CAUTION**

Take center of gravity into consideration when lifting unit.

Do not install blower before lifting unit (except CPV-1).

Typical Installation

## 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.

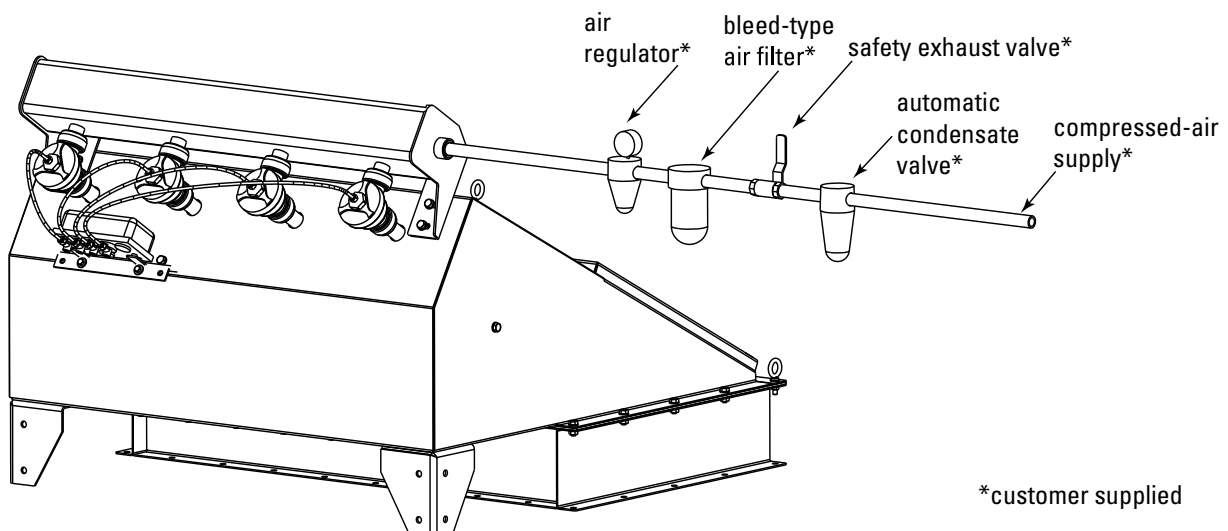
Component damage can occur.

All compressed air components must be sized to meet the maximum 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 and fittings.
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 filter every 10-seconds during a cleaning cycle.



\*customer supplied

Compressed Air Installation

## Antistatic Grounding Installation

If the collector is equipped with antistatic filters and bonded construction, then the collector will need to be grounded by a qualified electrician.

1. Follow the instructions provided by the antistatic grounding drawing provided.
2. Ground the collector using the grounding lug at the rear of the collector.
3. Take resistance readings from the filter media to ground to ensure conductivity. Records results as indicated on the drawing.

## Solid-State Timer Installation



### WARNING

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 installation, service, or maintenance work.

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

The solid-state timer is an electronic timer used to control the filter cleaning system. Available options include 3, 6, 10, 20, and 32-pin solenoid valve control.

1. Using the supplied wiring diagram, wire the fan motor, fan-motor 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 Photohelic gauge or similar device is used to control the solid-state timer and the jumper on the pressure switch portion of the timer is removed, the solenoid valves pulse only when the differential

pressure reaches the high-pressure setpoint. The valves 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 115VAC).

Do not mount the solid-state timer directly to the unit. Mechanical vibration can damage the control.

## Solenoid Connection

The unit is equipped with 115-V solenoid valves that control the pulse-cleaning valves, which clean the filters.

One of three types of solenoid enclosures, the weatherproof NEMA 4 with 3D2 solenoids, the explosion proof NEMA 7 with 5D2 solenoids, or the explosion proof NEMA 9 with 5D2 solenoids, is 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 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 to 1.5-second minimum to maximum 60 to 66-second.

**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-V 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.

**Preliminary Start-Up Check**

Instruct all personnel on safe use and maintenance procedures.

**WARNING**

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

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

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

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

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

Optional fans over 600 lbs must be independently supported.

1. Check all electrical connections for tightness and contact.
2. Motor and fan should be wired for clockwise rotation when viewed from the back of the motor.

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

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

**WARNING**

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

3. Check that filter retention brackets are properly tightened to achieve proper filter seal.
4. All access panels should be sealed and secure.
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 90-100 psig.
11. Turn blower fan motor ON.
12. Adjust airflow with the exhaust damper, if equipped.

### NOTICE

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

## Maintenance Information

Instruct all personnel on safe use and maintenance procedures.

### WARNING

Use proper equipment and adopt all safety precautions needed

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

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

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

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

### NOTICE

Do not set compressed-air pressure above 100-psig.

Component damage can occur.

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

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

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

## Operational Checklist

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

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

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

2. Monitor pressure drop across filters.

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

3. Monitor exhaust.
4. Monitor dust disposal.

## Filter Removal and Installation

### **⚠ WARNING**

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

Dirty filters may be heavier than they appear.

Use care when removing filters to avoid personal injury.

3. Lift left side of retainer up while moving the right side towards the back wall.
4. Pull the raised left side of the retainer through upper left of opening.
5. Remove pack vertically until clear of tubesheet.

### Filter Removal (CPV-1 Only)

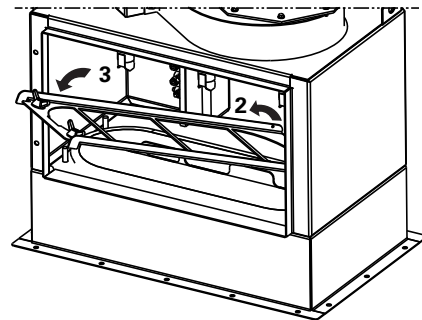
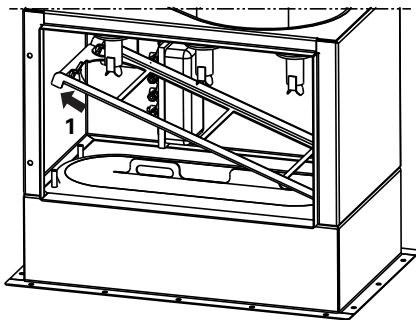
### **⚠ CAUTION**

When inserting the filter pack, start at the back edge of the pack first to ensure alignment tabs do not damage the filter packs.

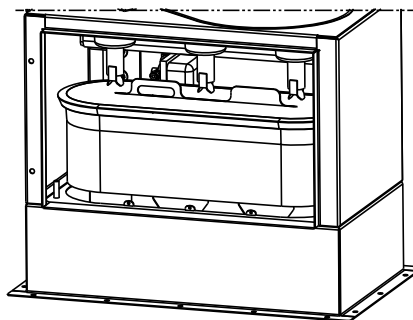
1. Turn power to unit OFF.
2. Loosen wing nuts and slide filter retainer left to release from hold down.

### Filter Installation (CPV-1 Only)

1. Insert the filter pack, starting with the back edge first, to ensure alignment tabs do not damage filter pack.
2. Slide the right side of the retainer through lower right of opening.
3. Lower the right side of retainer while moving the left side toward the back wall.



Filter Retainer Removal (hinged access panel removed for clarity)



Filter Removal and Installation  
(hinged access panel removed for clarity)

Filter Removal and Installation for CPV-1 Units

4. Slide filter retainer right and under the hold down lip.
5. Position wing nuts over studs and tighten until stops are in contact with tubesheet.

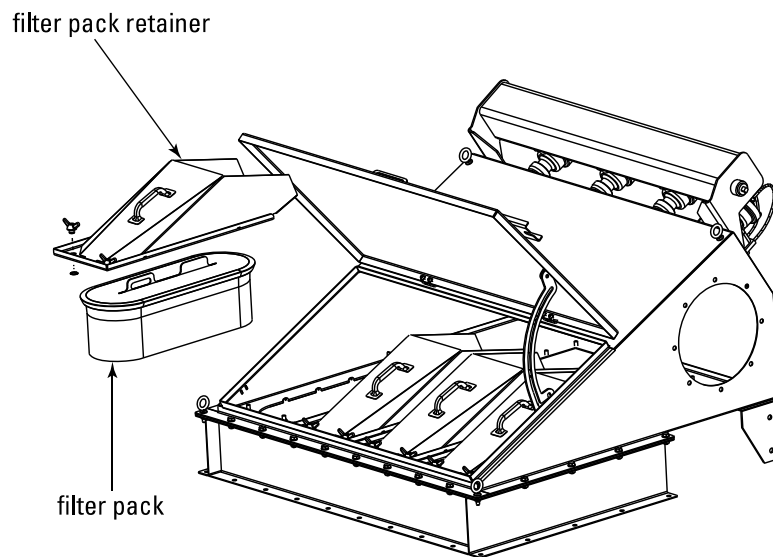
### Filter Removal (except CPV-1)

1. Turn power to unit OFF.
2. Open access door by releasing locking mechanism. Swing door fully open. Prevent door from closing by engaging door locking mechanism (except CPV-1).
3. Turn filter pack retention wing nuts counterclockwise and remove filter pack retainer. Removal of back row of filter packs first is recommended.
4. Remove filter pack by lifting straight up.
5. Repeat steps 1-4 to remove remaining filter packs.

### Filter Installation

1. Clean the surface around the filter opening where the gasket is seated to ensure a good seal.
2. Insert first filter pack into the tubesheet. Installing front row of filter packs first is recommended.

3. Insert filter pack retainer by engaging both rear tabs of the retainer into the slots located just behind the filter pack opening, or on opposite side of the threaded studs, then align the filter pack retention wing nuts over the posts.
4. Turn filter pack retention wing nuts clockwise until filter pack gasket is fully seated.
5. Repeat steps 2 through 4 for remaining filter packs.
6. Disengage door locking mechanism (except CPV-1). Use caution when closing door to avoid personal injury.
7. Turn access door latch to lock.
8. Reset exhaust damper to required setting if so equipped.
9. Turn electrical power and compressed air supply ON before starting unit.



Filter Removal and Installation



## Compressed Air Components

### **NOTICE**

Do not set compressed-air pressure above 100-psig.

Component damage can occur.

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

## Electrical Connection (CPV-1 Only)

### **WARNING**

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

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

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

1. Using the wiring diagram supplied, wire the customer-supplied disconnect switch and fan starter. Make the connections to the fan motor. Use appropriate wire gauge for rated amp load as specified by local codes.
2. Turn the fan motor On then OFF to check for proper rotation by referencing the rotation arrow located on the motor's mounting plate.

### **WARNING**

Do not look into fan outlet to determine rotation. View the fan rotation from 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.

To reverse rotation, three-phase power supply: Turn electrical power OFF at source and switch any two leads on the output-side of the fan motor starter.

### **WARNING**

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

## Optional Equipment

### Power Pack (Except CPV-1)

The two types of power packs, Torit Backward Inclined (TBI) and Torit Radial Blade (TRB) are installed following similar procedures.

1. Power packs are shipped assembled and partial disassembly is required before installing.
2. Remove eight motor-mount bracket fasteners; remove the motor, motor-mount bracket, and fan wheel as an assembly.
3. Turn housing over and apply sealant to the outside edge of the bolt pattern on the fan housing. Mount the fan housing to the collector using the inlet cone fasteners.
4. Apply sealant to the outside edge of the bolt pattern on the fan housing. Reinstall the motor, bracket, and fan wheel assembly. Align motor mount bracket to the mark on the housing on 30 Hp/60 Hz, and 20-30 Hp/50 Hz units. Other motor sizes do not require alignment, but consider the electrical connection location.
5. Rotate fan wheel after installation to ensure proper clearance between the inlet cone and the fan wheel.

#### **WARNING**

Do not look into fan outlet to determine rotation. View the fan rotation from 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.

To reverse rotation, three-phase power supply: Turn electrical power OFF at source and switch any two leads on the output-side of the fan motor starter.

#### **WARNING**

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

#### **CAUTION**

Do not allow the fan wheel to come loose from the motor as it may cause severe injury or property damage. To ensure proper attachment of the fan wheel:

Tighten all set screws in fan wheel.\*

Tighten all set screws in bearings.\*

Repeat after 8 hours of operation.

Repeat again after two weeks of operation.

Reference Wheel Set Screw Torque Table.

Setscrew Size Diameter	Carbon Steel Setscrew Torque*	
In.	Lb. - In.	Lb. - Ft.
1/4	75	6.2
5/16	144	12
3/8	252	21
7/16	396	33
1/2	600	50
5/8	1164	97
3/4	2016	168
7/8	3204	267
1	4800	400

\*Stainless steel setscrews are not hardened and should not be tightened to more than half of the values shown.

#### Wheel Set Screw Torque

## Side-Mount Power Pack

### **WARNING**

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.

### **CAUTION**

Mounting a power pack on the side of a collector requires a power pack adapter to support the weight of the power pack.

Poorly installed power packs may separate from the collector resulting in personal injury and damage to equipment or property.

1. Disconnect power supply.
2. Apply 1/4-in diameter rope-type sealant to the outside surface of the power pack adapter between the fan mount bolt holes and the round fan inlet hole.
3. Install the fan housing to the power pack adapter using 3/8 x 1 1/4-in bolts, flat washers, and hex nuts.

### **NOTICE**

Install bolts with the bolt head in the fan housing and the threaded end in the power pack adapter.

4. Reinstall the motor, bracket, and fan wheel assembly. Align motor mount bracket to the mark on the housing on 30 Hp/60 Hz and 20-30 Hp/50 Hz units. Other motor sizes do not require alignment, but consider the electrical connection location.
5. Connect power supply to the motor. Turn the fan motor ON then OFF to check motor rotation by referencing the rotation arrow on the blower.

### **NOTICE**

To change rotation on three phase units, turn power supply OFF and switch any two leads on the output side of the fan motor starter.

### **WARNING**

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

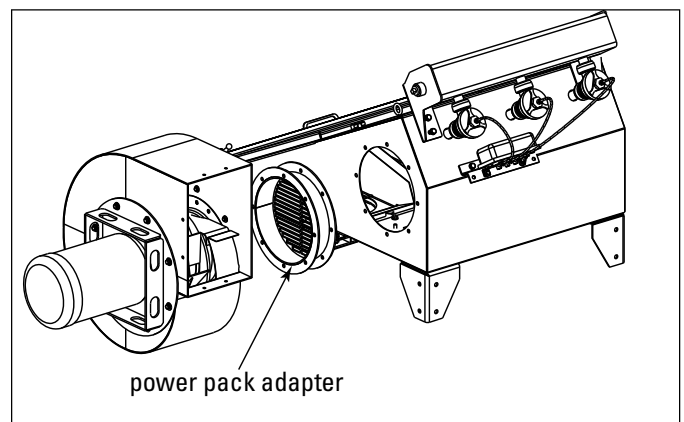
Check that the exhaust plenum is free of tools or debris before checking blower/fan rotation.

Stand clear of exhaust to avoid personal injury.

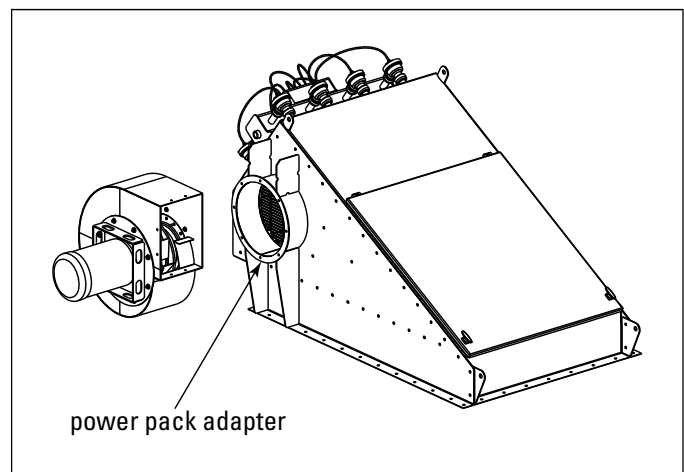
To reverse rotation, three-phase power supply: Turn electrical power OFF at source and switch any two leads on the output-side of the fan motor starter.

### **WARNING**

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



CPV-2, -3, or -4 Side Mount Power Pack

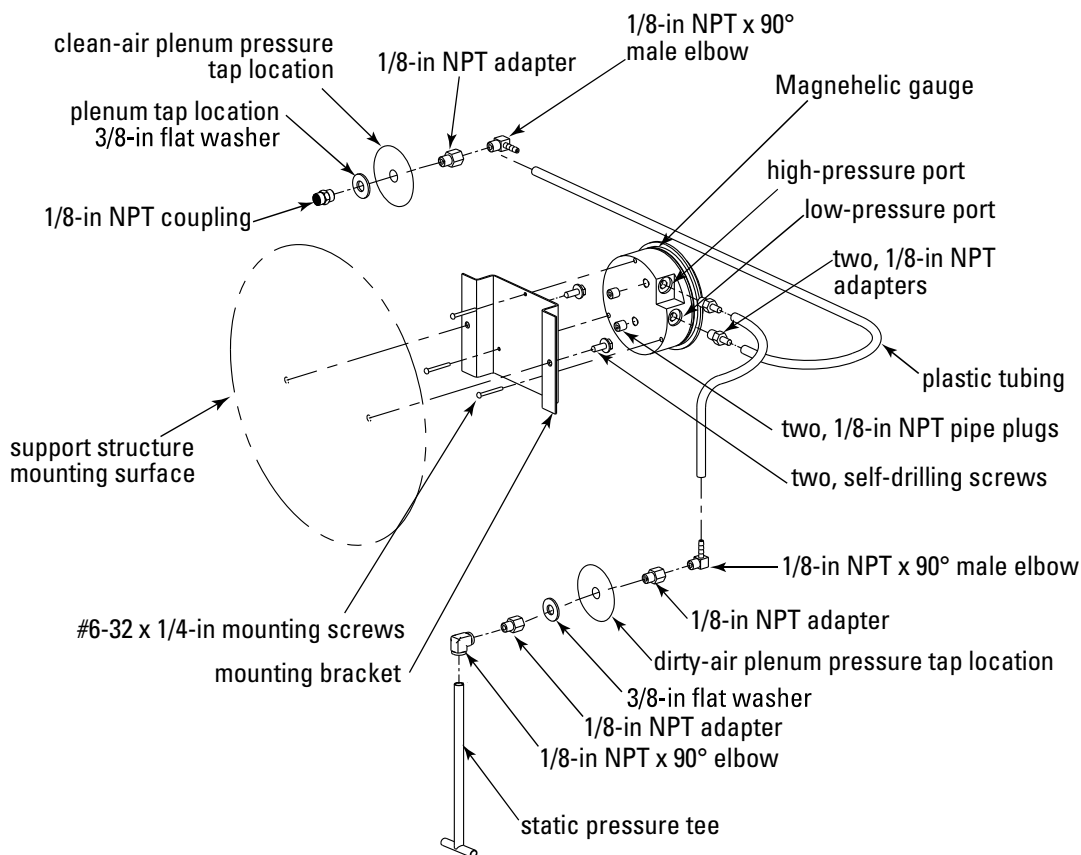


CPV-6, -8, or -12 Side Mount Power Pack

## 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 gauge.
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



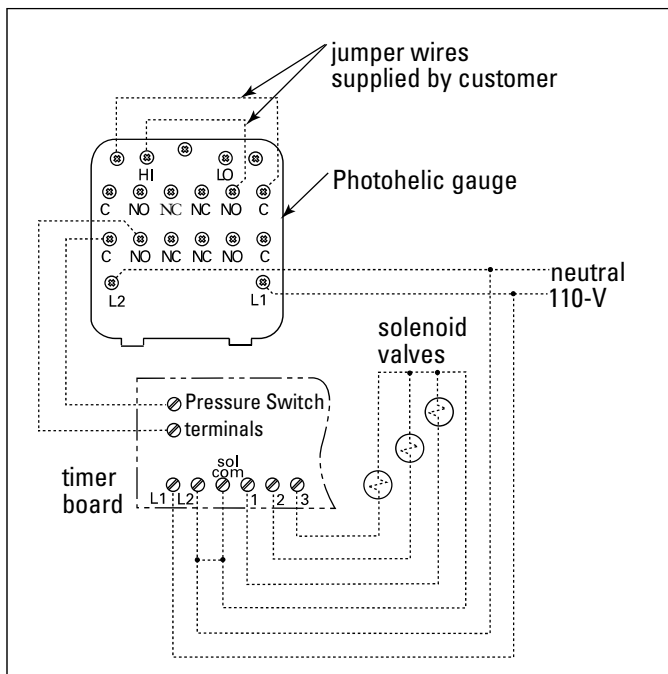
**WARNING** Electrical service or maintenance work must be performed by a qualified electrician and comply with all applicable national and local codes.

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.

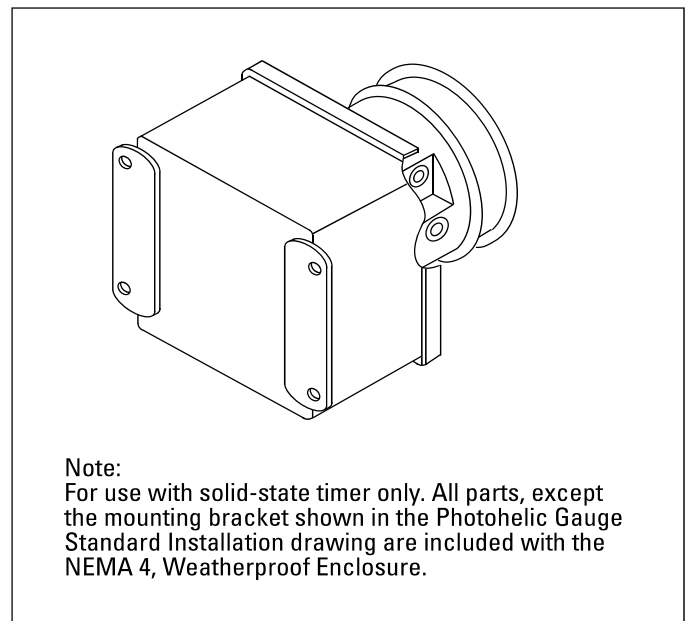
The Photohelic combines the functions of a differential pressure gauge and a pressure-based switch. The gauge function measures the pressure difference between the clean-air and dirty-air plenums and provides a visual display of filter condition. The high-pressure tap is located in the dirty-air plenum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



Photohelic Gauge Wiring Diagram

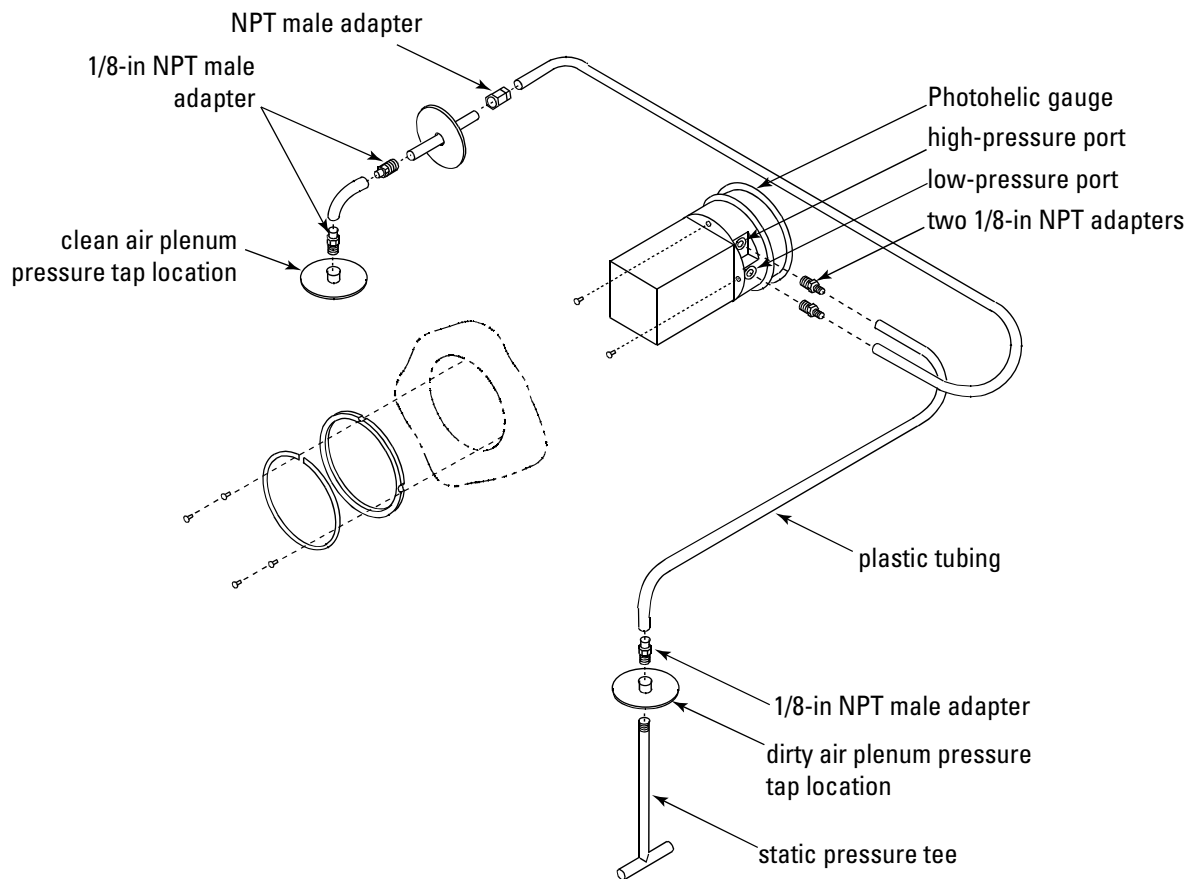
2. Mount the gauge to the remote panel or door using the mounting ring, retaining ring, and four #6-32 x 1 1/4-in screws. Do not tighten screws. Connect two, 1/8-in NPT x 1/4-in OD male adapters to the gauge's high- and low-pressure ports. Tighten screws.
3. On the back of the gauge, remove four #6-32 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.



**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

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

### Description

The Delta P Controller monitors the differential pressure between the clean and dirty air plenums, providing a visual display of the filter condition. When combined with a pulse timer, it controls 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 and dirty 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.

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



Delta P Control Display

## Delta P Plus Control

### Description

The Delta P Plus Controller monitors the differential pressure between the clean and dirty air plenums, providing a visual display of the filter condition. When combined with a pulse timer, it controls 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

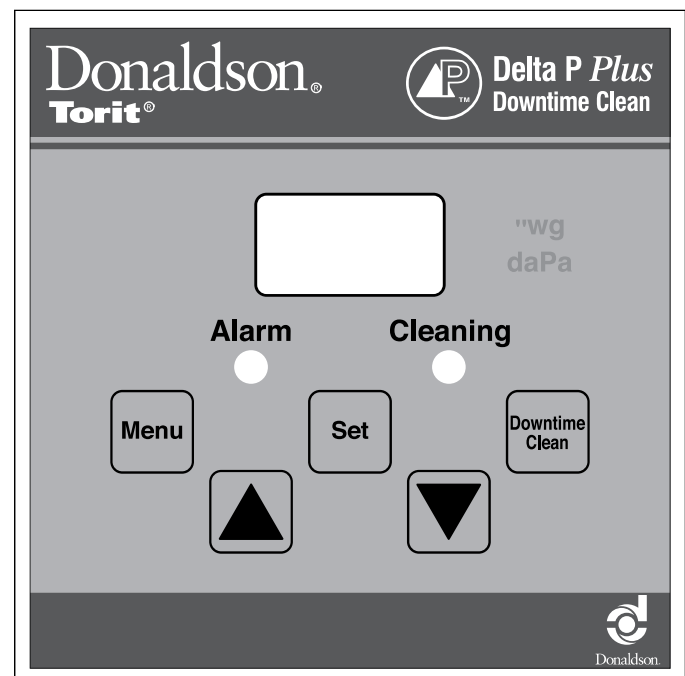
the pressure drop exceeds the Low Pressure Off set point and then approaches zero again, the Delta P Plus Controller runs a delay timer to allow the blower to come to a stop and then engages the cleaning mechanism for a preselected time.

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.

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



Delta P Plus Control Display



## Damper Only (CPV-1)

### Side Mount

1. Attach the damper to the fan exhaust outlet using the hardware supplied.
2. Loosen the wing nut on the damper and adjust from 30 to 50% closed.
3. Drill pilot holes with a 0.339-in bit.
4. Secure brackets using 3/8-in thread-forming bolts.
5. Loosen the wing nut on the damper and adjust from 30 to 50% closed.

## Damper and Silencer, TBI

### Side Mount

1. Install the power pack as described in the previous section.
2. Attach the damper to the fan exhaust outlet using the hardware supplied.
3. Attach the flange to the damper using the bolts, washers, and hex nuts supplied.
4. Apply sealant to the flange and attach silencer to flange. Tighten all hardware.
5. Loosely assemble the silencer's support brackets.
  - a. Align the support bracket to the underside of the silencer, flush with the cabinet wall and mark the drill locations.

### Cold Climate Kit

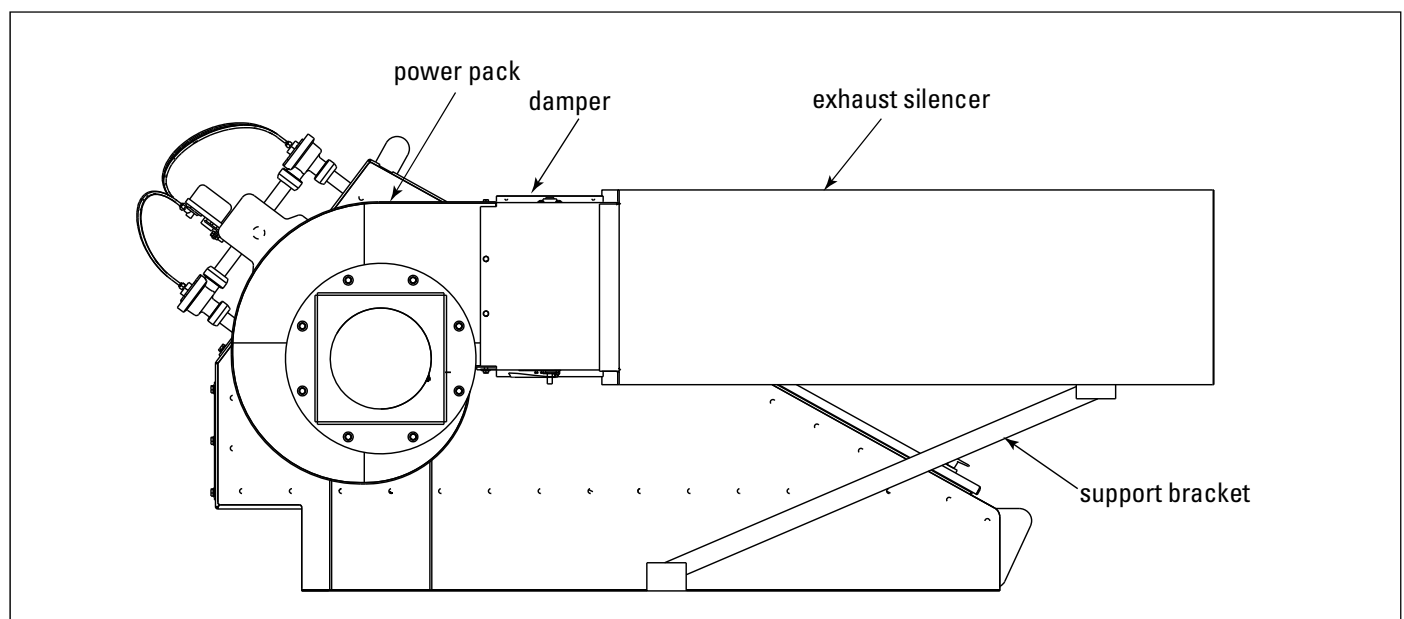


#### WARNING

Electrical 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 service or maintenance work.

A cold climate kit provides heat to the pulse valves to prevent cold weather freeze up. The basic kit, for use in applications that have a moderate amount of moisture in the compressed-air supply, consists of a small heating element and thermostat installed in the solenoid enclosure. The basic kit is factory-installed and supplied with the appropriate solenoid wiring instructions.



Side Mount Silencer and Damper Installation

A heavy-duty kit is available for applications that have moderate-to-high amounts of moisture in the compressed-air supply and consists of the basic kit plus a heat cable to deliver heat to the large pulse valves. This kit is customer-installed and detailed installation instructions are provided.

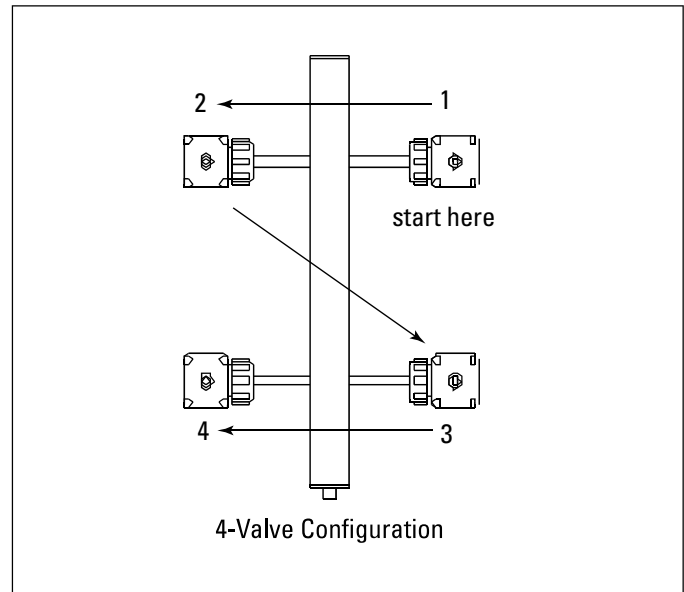
1. Install the power connection kit on the heat cable following the manufacturer's instructions.
2. Start with the upper right-hand valve, wrap heat cable around the valve as shown in Detail A. Pull heat cable tight.

**NOTICE**

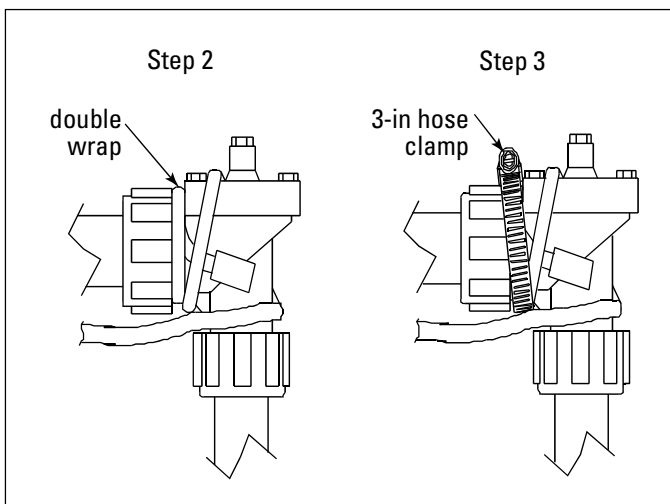
Double wrap between round coupling and square valve cover.

3. Position a 3-in hose clamp around the double wrapped heat cable and tighten securely.
4. Wrap remaining valves using the same technique in the order shown in Detail B.
5. Drill a 1-in diameter hole in the back of the junction box. See Detail C. Assemble the power connection kit following the manufacturer's instructions.

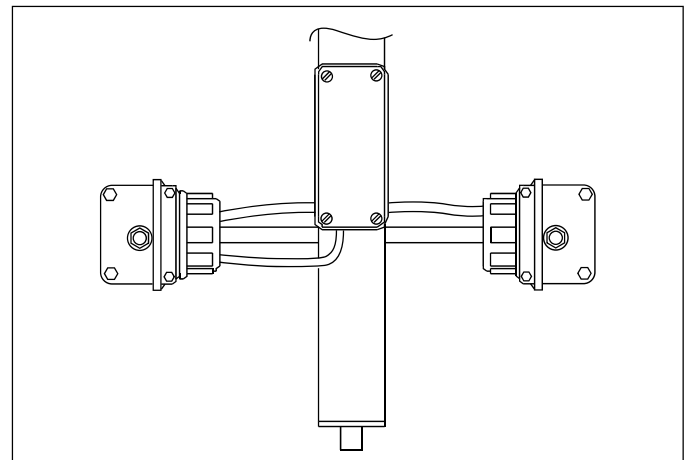
6. Secure junction box to manifold using two, 8-in hose clamps wrapped around the standoff.
7. Wrap 6-ft of pipe insulation tape around each heat-cable wrapped valve. Wrap the entire valve, double wrapping the hose-clamped heat cable. Secure with cable ties.



Cold Climate Kit, Detail B



Cold Climate Kit, Detail A



Cold Climate Kit, Detail C

## Troubleshooting

Problem	Probable Cause	Remedy
Power pack/fan motor do not start	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.
Power pack/fan motor start, but do not stay running	Incorrect motor starter installed	Check for proper motor starter and replace if necessary.
	Access doors are open or not closed tight	Close and tighten access doors. See Filter Replacement.
	Damper control not adjusted properly	Check airflow in duct. Adjust damper control until proper airflow is achieved and the blower motor's amp draw is within the manufacturer's rated amps.
	Electrical circuit overload	Check that the power supply circuit has sufficient power to run all equipment.
Clean-air outlet discharging dust	Filter packs not installed correctly	See Filter Replacement.
	Filter pack damage, gasket damage, or holes in media	Replace filter packs as necessary. Use only genuine Donaldson replacement parts. See Filter Replacement.
Insufficient airflow	Fan rotation backwards	Proper fan rotation is clockwise from the top of the unit. The fan can be viewed from the back of the motor. See Preliminary Start-Up Check.
	Access doors open or not closed tight	Check that all access doors are in place and secured. Check that the hopper discharge opening is sealed and that dust container is installed correctly.
	Fan exhaust area restricted	Check fan exhaust area for obstructions. Remove material or debris. Adjust damper flow control.
	Filter packs need replacement	Remove and replace using genuine Donaldson replacement filter packs. See Filter Replacement.
	Lack of compressed air	See Rating and Specification Information for compressed air supply requirements.

## Troubleshooting

Problem	Probable Cause	Remedy
Insufficient airflow continued	Pulse cleaning not energized	Use a voltmeter to check the solenoid valves in the control panel. Check pneumatic lines for kinks or obstructions.
	Pulse valves leaking compressed air	Lock out all electrical power to the unit and bleed the compressed air supply. Check for debris, valve wear, pneumatic tubing fault, or diaphragm failure by removing the diaphragm cover on the pulse valves. Check for solenoid leaks or damage. If pulse valves or solenoid valves and tubing are damaged, replace.
No display on the Delta P Controller	No power to the controller	Use a voltmeter to check for supply voltage.
	Fuse blown	Check the fuse in the control panel. See wiring diagram inside the control panel. Replace if necessary.
Display on Delta P Controller does not read zero when at rest	Out of calibration	Recalibrate as described in Delta P Maintenance Manual
Delta P Controller ON, but cleaning system does not start	Pressure tubing disconnected, ruptured, or plugged	Check tubing for kinks, breaks, contamination, or loose connections.
	High Pressure On or Low Pressure Off setpoint not adjusted for system conditions	Adjust setpoints to current conditions.
Pulse cleaning never stops	Pressure switch not operating correctly	Check pressure switch inside the control panel.
	High Pressure On or Low Pressure Off setpoint not adjusted for system conditions	Adjust setpoints to current conditions.
	Pressure tubing disconnected, ruptured, plugged, or kinked	Check tubing for kinks, breaks, contamination, or loose connections.
Alarm light is ON	Alarm setpoint too low	Adjust to a higher value.
	Excess pressure drop	Check cleaning system and compressed air supply. Replace filter packs if filter packs do not clean down.
	Pressure tubing disconnected, ruptured, plugged, or kinked	Check tubing for kinks, breaks, contamination, or loose connections.
Delta P Controller arrow keys to not work	Improper operation	Press and hold one of the three setpoint keys to use arrow keys.

## Service Notes

[illegible]

## Service Notes

[illegible]



## 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.



### Parts and Service

