Donaldson
Torit®

RFW_RFWH Baghouse

All Welded
RFW Models 124, 156, 232, 276, 376 and 484
RFWH Models 118, 146, 226, 266, 356, 458
(Orders placed on or after March 29, 2021)

Installation and Operation Manual

Installation, Operation, and Service Information

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

English
Master Language

IOM AG8627801 (ENG)
Revision 0

IMPORTANT NOTES

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

For additional copies of this manual, contact Donaldson Torit.

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

NOTICE

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

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1 Safety Communication

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

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

Electrical installation must be performed by a qualified electrician.

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

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

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

Most dusts present safety and health hazards that require precautions. Wear eye, respiratory, head and other protection equipment suitable for the type of dust.

Some components may be heavier than they appear. Use appropriate lifting methods to avoid personal injury and/or property damage.

Combustible Dust Hazards

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

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

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

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

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

2 Product Description

The RF Baghouse is a continuous duty dust collector with filters designed to handle applications with heavy dust loads. Continuous-duty means the filters can be pulse cleaned on-line without interrupting airflow through the collector.

The cylindrical collector housing design features an all-welded construction in standard sizes from 118 to 484 filters available in various media types.

The collector housing design can include an involute scroll inlet or an upper body radial style high inlet.

The involute inlets are typically used for heavy non-abrasive dust loading applications. These inlet styles allow the majority of the incoming dust to cyclonically separate. The heavier dust separated in these inlets is directed downward into the hopper while the lighter dust is passed through air straightening veins to evenly distribute the air and entrained dusts over the filter bags for final separation.

The upper body radial style high inlet is typically used on abrasive dust applications or on lower density dust type applications. This style of inlet is located in the filter housing section below the tubesheet, and directs the incoming dust particles downward around the filter bags and into the hopper. This flow path assists the cleaning system by supporting an airflow pattern that encourages the dislodged dust pulsed off the filter bags to move downward into the hopper. Baffles in the inlet keep dusts from directly impinging on the filter bodies.

RF Baghouses come standard with a walk-in clean-air plenum (CAP). Filters, pulse and drive components can be serviced on the clean air side of the collector within the walk-in plenum. Access to the Clean Air Plenum is provided by an optional ladder and platform system.

Intended Use

The RF Baghouse collector is ideal for applications in the woodworking, grain and mining industries where it effectively handles high-volume, high dust-load applications. Additional applications include cement, chemical and food processing applications.

The RF Baghouse is typically used in applications between 15,000-90,000 cfm.

Sizes are available for lower airflow applications with any of the following conditions or requirements:

- Heavy dust load
- No compressed air available
- A round collector required for sanitary reasons
- High pressure or vacuum requirement
- A requirement for a single discharge hopper.

Operations involving higher temperatures, humidity, or air stream chemistry may require customized collector design options. Contact Donaldson Torit for design assistance.

Rating and Specification Information

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

Standard Equipment

All welded collectors can be lifted from the truck to the prepared site.

Filters

The RF collector ships with filter bags and cages. The standard bag media is Dura-Life™ which provides long life and energy savings due to lower pressure drop. Other filter bag media options are available.

Involute Scroll Style Inlet

The inlet develops a cyclonic airflow causing heavier particulate to drop directly into the hopper. The air continues through an internal flow straightener, reduces turbulence and evenly distributes the dust-laden air within the collector cross-section and around the filter bags.

RF Cleaning System

The RF is a continuous duty dust collector, meaning the filters can be pulse cleaned on-line without interrupting airflow through the collector. A timer energizes the cleaning system to ensure the bag-style filters are cleaned at least once every four minutes.

Hopper Access Cover

The access cover, when removed, allows access to the interior of the hopper.

Clean Air Outlet

Clean air exits the collector through the clean air outlet located in the clean air plenum.

Hopper Outlet

The hopper outlet is a singular outlet at the bottom of the hopper where the separated dust exits the collector and is routed to be disposed of via bin, pneumatic conveyor, screw conveyor, or other means. A rotary airlock is typically used to isolate the dust collection system from the dust disposal system.

Collector Body

The combination of the Dirty and Clean Air plenums along with the hopper represents the total collector body.

Leg Pack

The leg structure supports the collector body at an elevation to accommodate various dust disposal devices and systems which can be configured to meet customer needs.

Clean Air Plenum (CAP)

Air passes through the filters and into the Clean Air Plenum(CAP) where it exits through the Clean Air Outlet.

Tubesheet

The tubesheet is the metal panel the filters are sealed against to separate the Dirty Air and Clean Air Plenums of the collector. Through holes are cut to mount filters.

Clean Air Plenum (CAP) Door

The Clean Air Plenum (CAP) door allows access into the Clean Air Plenum for service and inspection.

Dirty Air Plenum (DAP)

Dust laden process air enters the Dirty Air Plenum via the involute scroll inlet or upper body radial style high inlet. As air enters it goes through a preseparation stage and then airflow straightening before it reaches the filters. This allows the majority of the dust to drop out into the hopper and the airflow to be evened out before reaching the filters.

Hopper

The hopper, located at the bottom of the collector body, is the discharge point for dust that has been preseparated and pulsed off of the filters.

Arm Drive

The arm drive consists of a gearbox, motor, tensioner, sprockets, and chain. This rotates the arm around the centerline of the collector to distribute the cleaning air.

Sweep Arm Assembly
The sweep arm assembly is a “Tee” or “L” shaped assembly with nozzles along the bottom to distribute the cleaning air into the filter bags. The arm assembly rotates around the centerline of the collector.

H Frame
The “H” or “X” shaped structure supports the RF cleaning system.

Options and Accessories

Cleaning Controls and Sensors

Magnehelic® Gauge

Simple mechanical gauges that measure differential pressure. May be passive mechanical versions or digital, may include electrical contacts and user adjustable setpoints.

Hopper Discharge Accessories

Hopper Transition

The collector comes with a standard size hopper outlet. Donaldson offers optional hopper outlet transitions to match up with various dust disposal devices.

Live Bottom Hopper

Short section of screw conveyor with a round to rectangle transition that handles tough dusts that bridge easily.

Rotary Airlock (RAL)

Used to isolate the dust collection system pressure from atmosphere. Options include flexible wipers, NFPA rated valves, Pneumatic conveying ready valves, and high clearance valves for tough to handle dusts.

Screw Conveyor

Can be mounted directly to the hopper outlet with the addition of an RAL at the discharge. Useful for loading bulk containers while maintaining a shorter overall height.

Platform and Ladder
Collector may be equipped with a ladder and platform system for gaining access to the clean air plenum for filter bag changeout. For all ladders over 24-ft OSHA requires a ladder safety system or personal fall arrest system. As a convenience, Donaldson offers ladder safety systems as an option.

Explosion Relief Panels
Collector may be equipped with optional explosion relief panels to support a process owners combustible dust mitigation strategy. Explosion vent sizing follows NFPA-68 formulas assuming outdoor location of collector with no duct or obstruction on the explosion vent panels. Contact Donaldson Torit for explosion venting requirements for other conditions.

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

Water Overflow Valve
An optional means to allow water evacuation. Some method of water evacuation must be provided if a water based extinguishing system is installed on the collector.

3 Operation

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

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

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

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

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

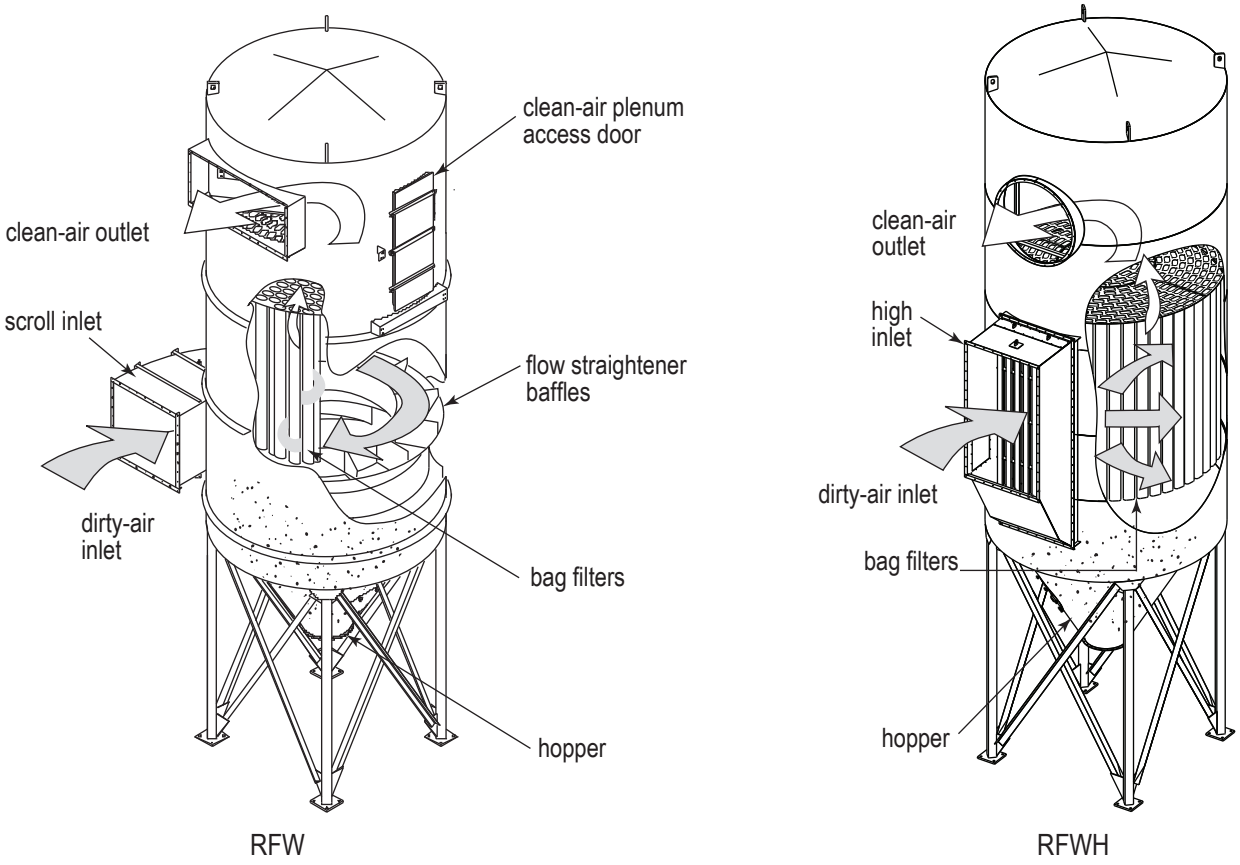
The RF Baghouse cleaning system consists of two opposing arms which rotate around the center of the collectors CAP. This system uses medium pressure air (7.5 PSI) generated by a PD pump typically located at ground level to charge a holding tank. The system has a 2 stage diaphragm valve set to provide the pulse air when a solenoid is activated.

Involute Inlet

During normal operation, dust-laden air enters the dirty-air inlet. The involute scroll-style inlet develops a cyclonic airflow causing heavier particulate to drop directly into the hopper. The air continues through an internal flow straightener that evenly distributes the dust-laden air within the collector cross-section and around the filters. After entering the collector the light dust collects on the outside surface of each filter forming a dust cake. Clean, filtered air passes through the filters to the clean-air plenum and discharges through the clean-air outlet.

High Inlet

During normal operation of an RF Baghouse with a high inlet, dust-laden air enters the dirty-air inlet. The high inlet section contains baffles that prevent the abrasion of filters by directing the incoming dust particles into a replaceable impaction zone then downward around the filters and into the hopper. This flow path reduces abrasion and assists the cleaning system by supporting an airflow pattern that encourages the dust dislodged when the filter is pulsed to move downward into the hopper. Baffles in the inlet keep dusts from directly abrading on the filter bodies.



Collector Operation

Typical Collector Operation Sequence*

Start-Up

1. Start material handling systems.
    a. Pneumatic conveying, compactor, RAL or screw conveyor
    b. Look for upset conditions upon start/waiting to clear/monitor for dust accumulation
2. Start filter cleaning system.
    a. Cleaning arm drive
    b. PD pump
    c. Cleaning system timer
3. Start main blower.

Shut-Down

1. Shut off main blower.

NOTICE

Slowly ramping down airflow will allow accumulated dust to drop into the hopper gradually while the collector continues cleaning. An abrupt reduction in airflow may result in one large release of dust from the filters which may overload the material handliing system resulting in a “plugged” condition.

2. Stop pulse system (pulse with no airflow for a short period of time in order to get better dust discharge and to reduce dust buildup prior to restarting system).
3. Stop material handling system once collector is clear (continue running until no additional material discharge is noted).

*Reference control panel IOM for control specific startup instructions.

4 Product Service

During service activities there is some potential for exposure to the dust in the collector. Most dusts present safety and health hazards that require precautions. Wear eye, respiratory, head and other protection equipment suitable for the type of dust when performing any service activities.

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

LOCK-OUT all energy sources prior to performing any service or maintenance on the equipment.

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

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. Monitor pressure drop across filters.
3. Abnormal changes in pressure drop may indicate a change in operating conditions and possibly a fault to be corrected.

Check the following items at the recommended intervals shown below.

DAILY-WEEKLY	
Item	**Typical Condition**
Pressure Drop	Between 1-in and 6-in
PD Pump Pressure	Peak should be 7.5PSI
PD Pump Lubrication Level	Above line in sight glass
PD Pump Filter	No heavy soiling noted
Clean Air Outlet	No visible dust discharge

MONTHLY - QUARTERLY	
Item	**Typical Condition**
CAP Condition	Interior is clean and all filters seated
Involute inlet	No significant wear spots
High Inlet baffle	No significant wear spots
Solenoid and diaphragm	Pulse operates periodically without squeal and strong pulse tone
Access door seals	Door seals intact, remains pliable, with no indication of air bypass
Cleaning arm drive	Operates smoothly with no noise
Cleaning arm drive chain	Clean and properly tensioned
PD pump drive	Belts are intact and don't squeal
Arm gearbox oil	Gearbox oil level is at the proper level and not excessively dirty
Explosion vents	Vents are intact and not leaking
Rotary Airlock (RAL) or discharge device	No air bypass during operation and no unusual noises
Motor rotation direction	Matches indicating arrows

If any items are not matching typical condition refer to the troubleshooting and service section. This list is not an all inclusive preventative maintenance schedule. This list is only meant to be an end user reference to develop a site specific preventative maintenance schedule.

Filter Replacement

Most dusts present safety and health hazards that require precautions. Wear eye, respiratory, head and other protection equipment suitable for the type of dust.

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

Dirty filters may be heavier than they appear. Use appropriate lifting methods to avoid personal injury and/ or property damage.

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

Do not operate with missing or damaged filters.

Felt Bag Filter and Cage with Boltsafe™ Hardware

1. Turn all power to collector and material handling system OFF.
2. Access clean air plenum through door.
3. Loosen bolts (2) from each filter cage flange.
4. Remove cage leaving the filter bag suspended in dirty air plenum.
5. Push the filter bag through the tubesheet into the dirty air plenum.
6. Repeat steps 3-6 for all filter bags and cages in the current row.

   Note: The cleaning arm may need to be manually rotated to access some filter bags.
7. Remove dirty filter bags through hopper access opening and dispose of in accordance with local requirements for the materials being collected.
8. Slide the filter bag onto the filter cage until the top edge of the bag reaches the top flange of the filter cage.

   Note: Place the bottom seam of the filter bag parallel to the long side of the oval.
9. From the clean air plenum, insert the filter bag and filter cage assembly through the tubesheet aligning the two bolts with the two threaded inserts factory installed in the tubesheet.
10. Secure with the provided Boltsafe bolts.

NOTICE

Hand start each bolt before tightening either bolt. Do not use a power or impact driver to tighten bolts. A speed wrench using a maximum of 20 ft/lb is recommended.

11. Proceed to the next row of filters and repeat for all remaining filters.
12. Replace the hopper access opening cover and close clean air plenum access door.
13. The collector can now be returned to service following typical start up procedures.

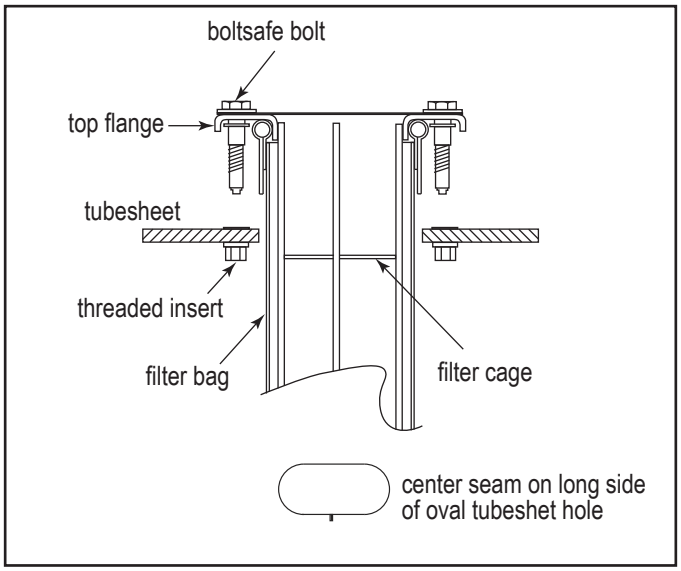
Pleated Bag Filter with Boltsafe™ Hardware

1. Turn all power to collector and material handling system OFF.
2. Access clean air plenum through door.
3. Loosen bolts (2) from each pleated bag filter.
4. Remove pleated filter bag and dispose of in accordance with local requirements for the materials being collected.
5. Repeat steps 3-4 for all pleated bag filters in the current row.

   Note: The cleaning arm may need to be manually rotated to access some filter bags.
6. From the clean air plenum, insert the pleated bag assembly through the tubesheet aligning the two bolts with the threaded inserts in the tubesheet. It may be necessary to squeeze the pleated bag as it is inserted into the tubesheet.
7. Secure with the provided Boltsafe bolts.

NOTICE Hand start each bolt before tightening either bolt. Do not use a power or impact driver to tighten bolts. A speed wrench using a maximum of 20 ft/lb is recommended.

8. Proceed to the next row of filters and repeat for all remaining filters.
9. Close the clean air plenum access door.
10. The collector can now be returned to service following typical start-up procedures,

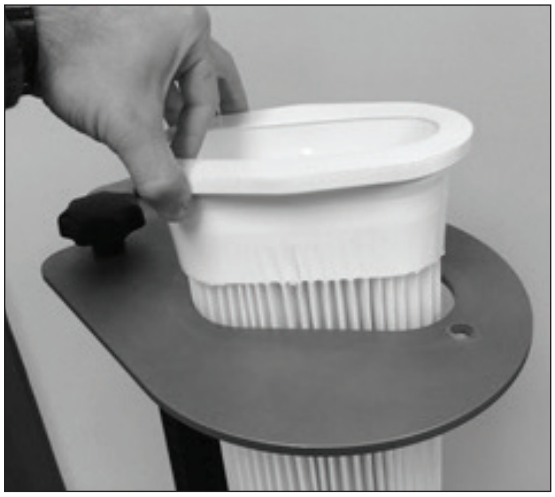


Felt Bag and Cage and Pleated Bag with Boltsafe Hardware Filter Installation

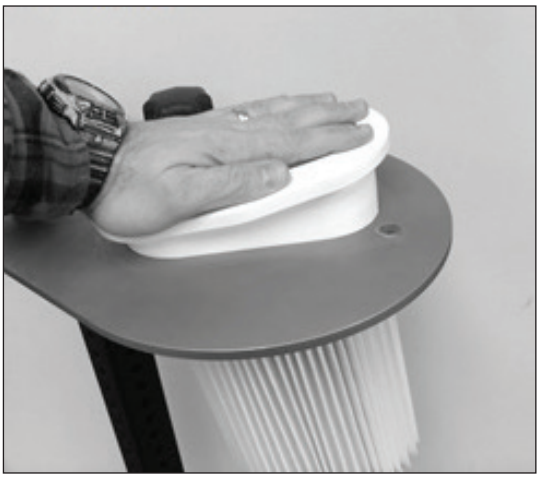
Pleated Bag Filter with Snap-In Design

1. Turn all power to collector and material handling system OFF.
2. Access clean air plenum through door.
3. Grab snap band finger loop to remove the snap band and discard. The replacement bag filter comes with a new snap band.
4. Squeeze the flange of the molded top at the center of the straight-a-ways of the oval. While doing so, rock and lift to release the molded tops from the tubesheet.
5. Lift the bag filter out of the tubesheet.
6. Remove pleated filter bag and dispose of in accordance with local requirements for the materials being collected.
7. Repeat steps 3-6 for all pleated bag filters in the current row.

   Note: The cleaning arm may need to be manually rotated to access some filter bags.
8. Proceed to the next row of filters and repeat for all remaining filters.
9. Slowly lower the bag filter through the tubesheet hole. Squeezing the bag filter to get the straps through the tubesheet may be required.



10. Gently push the flexible urethane top of the bag filter on one side until it snaps into the tubesheet hold.

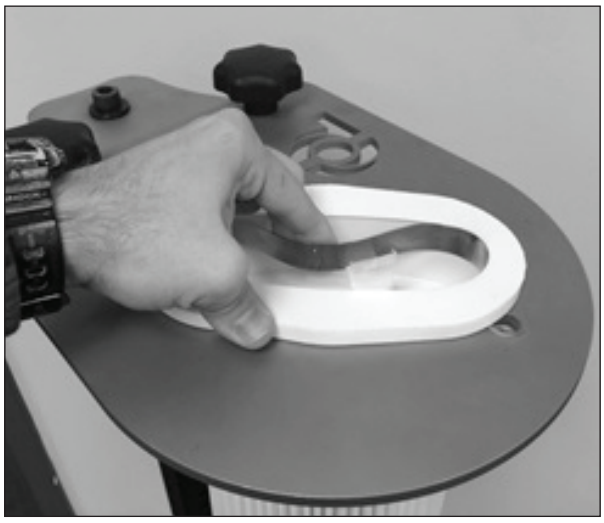


11. Push the opposite side of the top of the pleated bag filter until it is securely snapped into the tubesheet hole.

Note: A snapband retainer has been shipped for each filter. If you do not have these snapband retainers, call your Donaldson representative immediately so they can be sent to you for proper installation.

12. Pinch the snapband retainer in the center to form a figure “8”.

13. Bend the loop slightly and place the retainer under the molded lip of the top flange of the filter. This shallow lip prevents upward movement of the snapband retainer after proper installation. With the snapband retainer held against one side of the filter top interior, slowly allow the retainer to expand into the recessed area between the lip rim and the four interior post stops.



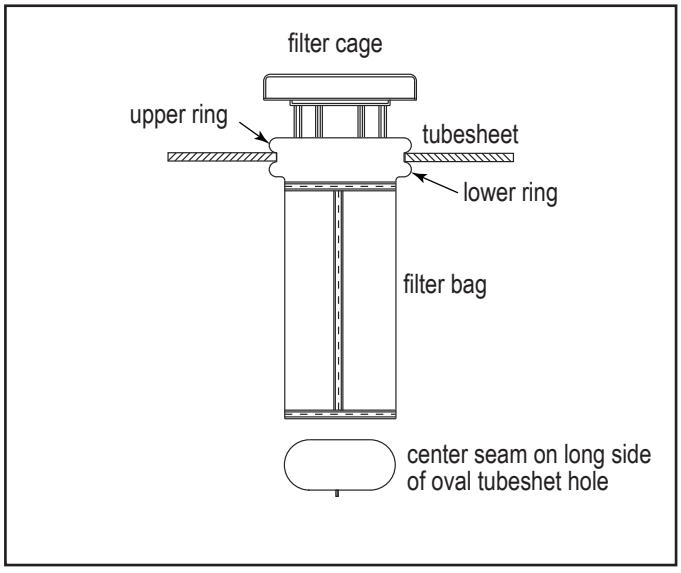
14. The snapband retainer should fit snugly between the lip rim and the vertical post stops. Be sure the snapband retainer is level and not installed crooked. A correctly installed snapband retainer will help prevent any potential leakage at the tubesheet and keep the filter firmly in place.

15. Proceed to the next row of filters and repeat for all remaining filters.
16. Close the clean air plenum access door.
17. The collector can now be returned to service following typical start up procedures.

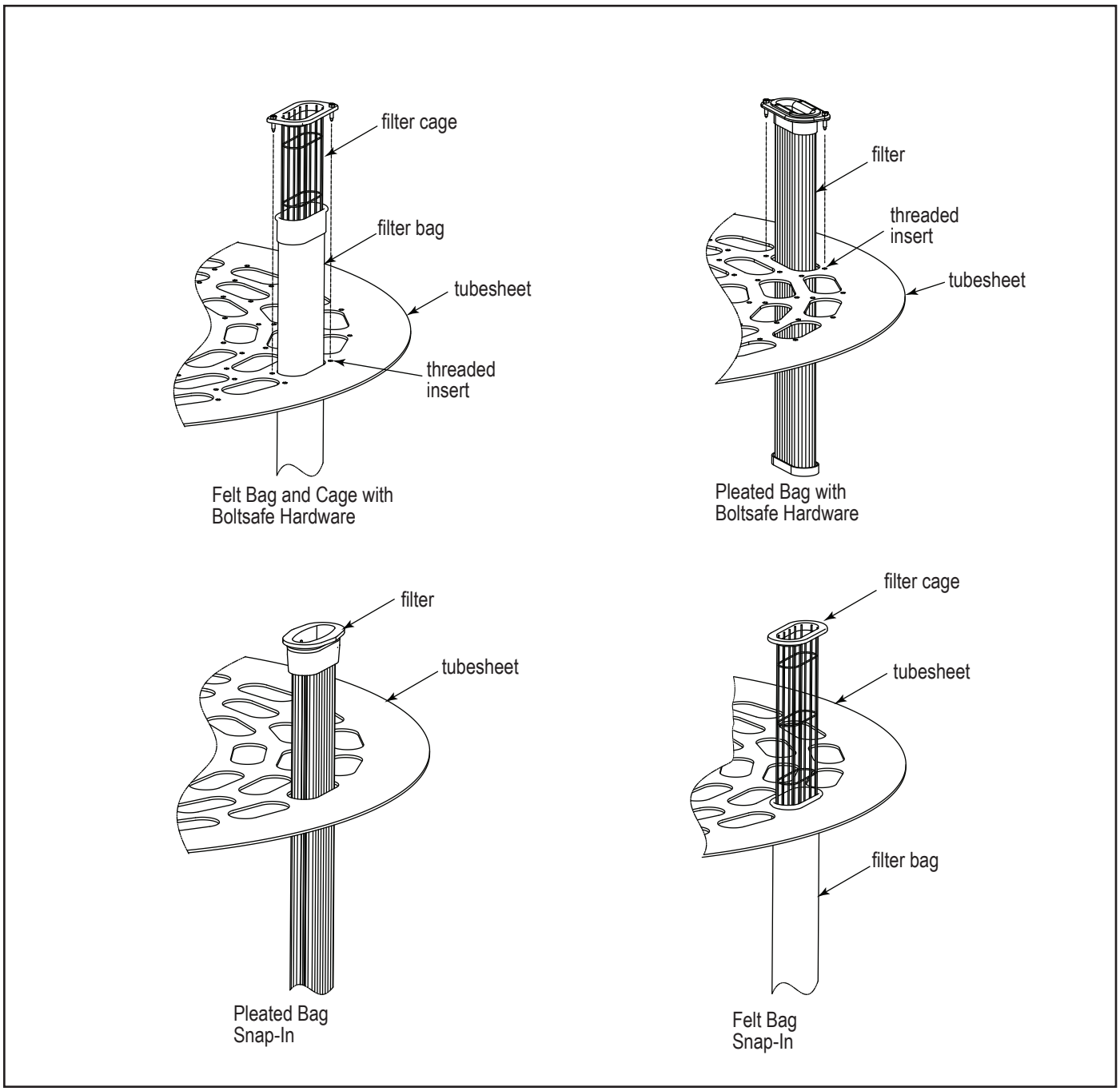
Felt Snap-In Bag Filter

1. Turn all power to collector and material handling system OFF.
2. Access clean air plenum through door.
3. Remove bag filter cage leaving the bag filter hanging in dirty air plenum.
4. Push one side of snap band to deform and release from the tubesheet.
5. Push the bag filter down into the bottom of the dirty air plenum.
6. Repeat steps 3-5 for all bag filters in the current row.

   Note: The cleaning arm may need to be manually rotated to access some filter bags.
7. Proceed to the next row of filters and repeat for all remaining filters.
8. Remove dirty filter bags through hopper access opening and dispose of in accordance with local requirements for the materials being collected.
9. From the clean air plenum, carefully insert the snap-in filter bag aligning the seam with the long edge of the oval in the tubesheet.
10. Snap the filter bag in place with the tubesheet between the upper and lower rings of the filter bag collar.
11. Slide the filter cage into the filter bag and seat firmly.
12. Proceed to the next row of filters and repeat for all remaining filters.
13. Replace the hopper access opening cover and close the clean air plenum access door.
14. The collector can now be returned to service following typical start up procedures.



Felt Snap-In Bag Filter Installation



Filter Bag Installation

Troubleshooting

Problem	Probable Cause	Remedy
Fan blower and 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.
	Collector not wired for available voltage	Correct wiring for proper supply voltage.
	Input circuit down	Check power supply to motor circuit on all leads.
	Electrical supply circuit down	Check power supply circuit for proper voltage. Check for fuse or circuit breaker fault. Replace as necessary.
	Damaged motor	Replace damaged motor.
Fan blower and 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.
	Hopper discharge open	Check that dust container is installed and properly sealed.
	Damper control not adjusted properly	Check airflow in duct. Adjust damper control until proper airflow is achieved and the blower motor’s amp draw is within the manufacturer’s rated amps.
	Electrical circuit overload	Check that the power supply circuit has sufficient power to run all equipment.
Clean-air outlet discharging dust	Filters not installed correctly	See Filter Installation.
	Filter(s) damaged or worn	Replace filters as necessary. Use only genuine Donaldson replacement parts. See Filter Replacement.
	Access cover(s) loose	Tighten access doors securely. See Filter Installation.
Insufficient airflow	Fan rotation backwards	Proper fan rotation is clockwise when viewed from the motor side or counterclockwise when viewed through the inlet cone. See Start-Up/Commissioning.
	Access doors open or not closed tight	Check that all access doors are in place and secured. Check that the hopper discharge opening is sealed and that dust container is installed correctly.
	Fan exhaust area restricted	Check fan exhaust area for obstructions. Remove material or debris. Adjust damper flow control.
	Filters need replacement	Remove and replace using genuine Donaldson replacement filters. See Filter Replacement.

Problem	Probable Cause	Remedy
Insufficient airflow continued	Lack of compressed air	See the Specification Control Drawing shipped with the collector for compressed air supply requirements. Verify operation of PD pump.
	Pulse cleaning not energized	Use a voltmeter to check the solenoid on the diaphragm and the output of the PLC. Check for an orifice plug on the solenoid valve and remove if present.
	Dust storage area overfilled or plugged	Clean out dust storage area. See Dust Disposal.
	Pulse valve leaking air	Lock out all electrical power to the collector and bleed the compressed air supply. Check for debris, valve wear, or diaphragm failure by removing the diaphragm cover on the pulse valves. Check for solenoid leaks or damage. If pulse valves or solenoid valves are damaged, replace.
	Pulse PLC failure	Using a voltmeter, check the PLC supply voltage. Correct any power supply issues found. If the proper power is supplied, and the pulse should be active, and still no signal output to the solenoid is present, replace the pulse controller.
	Pulse Logic sensors out of adjustment	See Pulse Alignment instructions in the installation section in Appendix A.
	Cleaning arm failure	Check for adequate clearance between nozzles and tubesheet for free rotation. Check drive chain for proper tension.
	Low pressure system pressure	Check gauge at PD pump for proper pressure, 7.5PSI. If pressure does not reach 7.5PSI before pulsing (expect 1 low pressure pulse every minute), check the PD pump filter, Pressure Relief Valve, or if applicable compressed air supply setting.
	PD pump filter	Check for dirty filter. Clean and oil per manufacturer recommendations if needed.
	Pressure reflief valve	Check operation and verify that it is not discharging air during normal operation.
	Compressed air supply	Check settings and verify tank pressure reaches 7.5PSI before pulsing.

Appendix A - Installation

Installation

Electrical Installation (including bonding and grounding of the collector) must be performed by a qualified electrician.

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

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

Service must be performed by trained and qualified maintenance personnel.

This equipment may start or stop unexpectedly from a remote location

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

Location and Site Selection

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.

Equipment location must conform to all codes and standards, should be suitable fot the type of dust being handled and should ensure easy access for service and utility connections. Site selection must account for wind, seismic zone and other load condidtions.

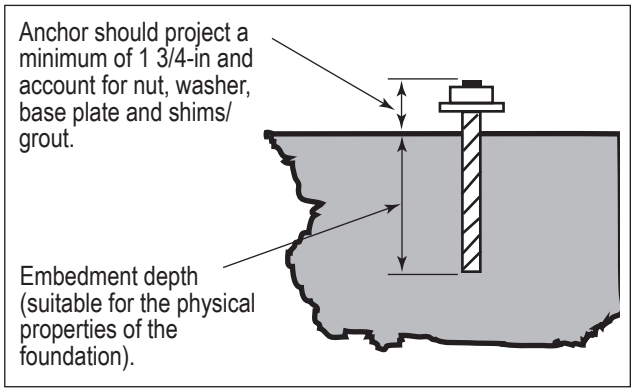
The equipment must be anchored once in final position. Anchors must comply with local code requirements. Anchors, foundation or support framing must be capable of supporting dead, live, wind, seismic, and other applicable loads. Consult a qualified engineer for final selection of foundation or support framing.

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

Follow industry practice relative to clean air velocity into a fan.

Provisional Anchor Bolt Recommendations

The quantity of anchor bolts should match the number of holes provided in the base plates of the collector. Anchor diameter is typically 1/8-inch less than the baseplate hole diameter. Anchors should project a minimum of 1 ¾ -inch and account for nut, washer, baseplate, and shims/grout.



Typical Foundation Anchor

Delivery and Inspection

Upon arrival inspect equipment and report any damage to delivery carrier. File any damage claims with the delivery carrier. Request a written inspection report from the Claims Inspector to substantiate all damage claims.

Compare the equipment received with the description of product ordered. Report any incomplete shipments to the delivery carrier and your Donaldson Torit representative.

Unloading and Positioning

Equipment should be lifted only by qualified crane or fork truck operators.

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

1. Remove any crates or shipping straps.
2. Lift the packaged collector from transport container.
3. Inspect for any damage and/or missing parts and report to freight carrier.
4. Check for any hardware which may have become loose during shipment and tighten as necessary.

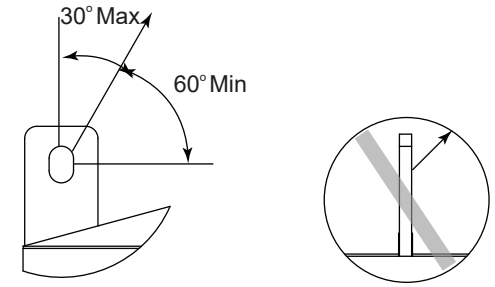
Lifting Information

Failure to lift the equipment or sub-assemblies correctly can result in severe personal injury and/or property damage.

Only qualified crane or forklift operators should be allowed to lift equipment.

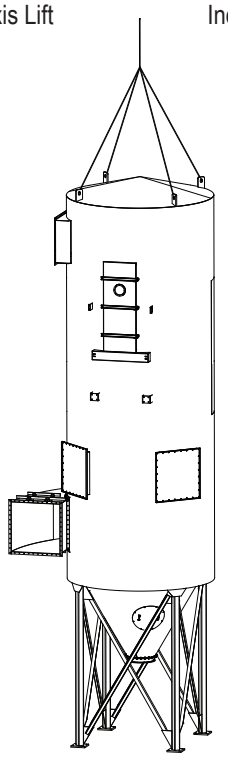
1. Use all lifting points provided.
2. Use clevis connectors, not hooks, on lifting slings.
3. Use spreader bars to prevent damage to equipment.
4. Check the Specification Control drawing for weight and dimensions of the collector and components to ensure adequate crane capacity.
5. Lift collector and accessories separately and assemble after collector is in place.
6. Use drift pins to align holes in section flanges during assembly.

Typical Lifting Guidance



Correct Axis Lift

Incorrect Axis Lift



Support Installation

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

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

Consult a qualified engineer for final selection of suitable anchors.

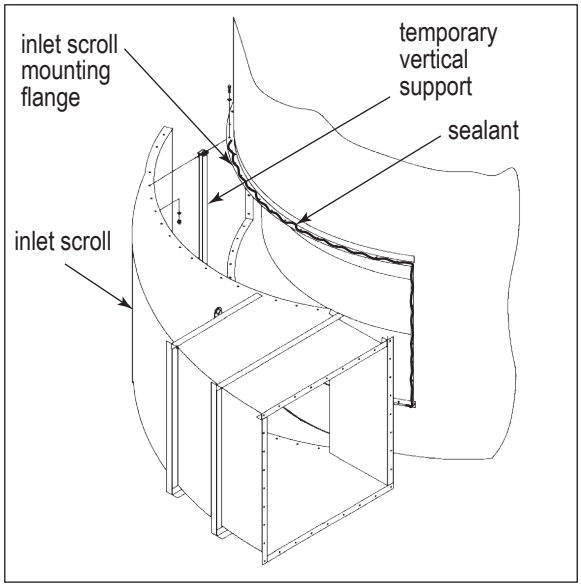
Temporary support is required until all legs and cross-bracing are in place.

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

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

Inlet Scroll Installation

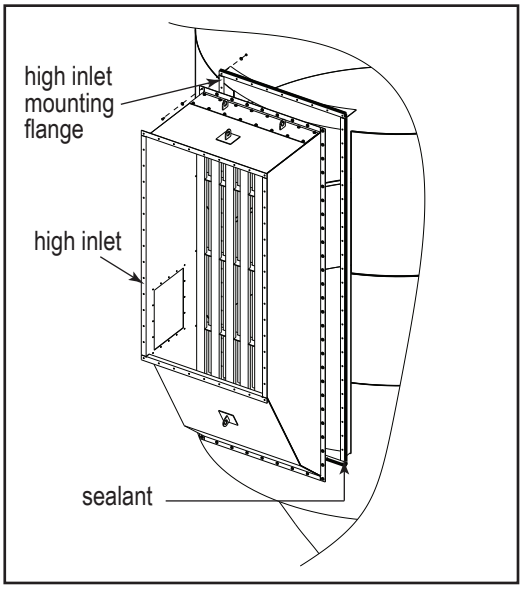
1. After the collector housing is upright and secure, remove the temporary vertical supports from the inlet scroll opening on the collector.
2. Place 1/4-in diameter, rope-type sealant toward the inside and outside edge of the bolt pattern in a figure 8 pattern such that sealant will be on inside and outside edge of all flange bolt holes on the inlet-section scroll mounting flanges.
3. Lift inlet scroll into position and secure with the hardware provided.



Inlet Scroll Installation
(Clockwise inlet shown)

High Inlet Installation

1. After the collector housing is upright and secure, remove the braces from the high inlet opening on the collector.
2. Place 1/4-in diameter, rope-type sealant toward the inside and outside edge of the bolt pattern in a figure 8 pattern such that sealant will be on the inside and outside edge of all flange bolt holes on the inlet section mounting flanges.
3. Lift high inlet into position and secure with the hardware provided.



High Inlet Installation

Platform and Ladder Installation

To avoid possible severe injury or equipment damage do NOT use hand rails or ladders as a lifting point.

Locate ladders to minimize risk of injury from site specific hazards including explosion relief panels.

NOTICE

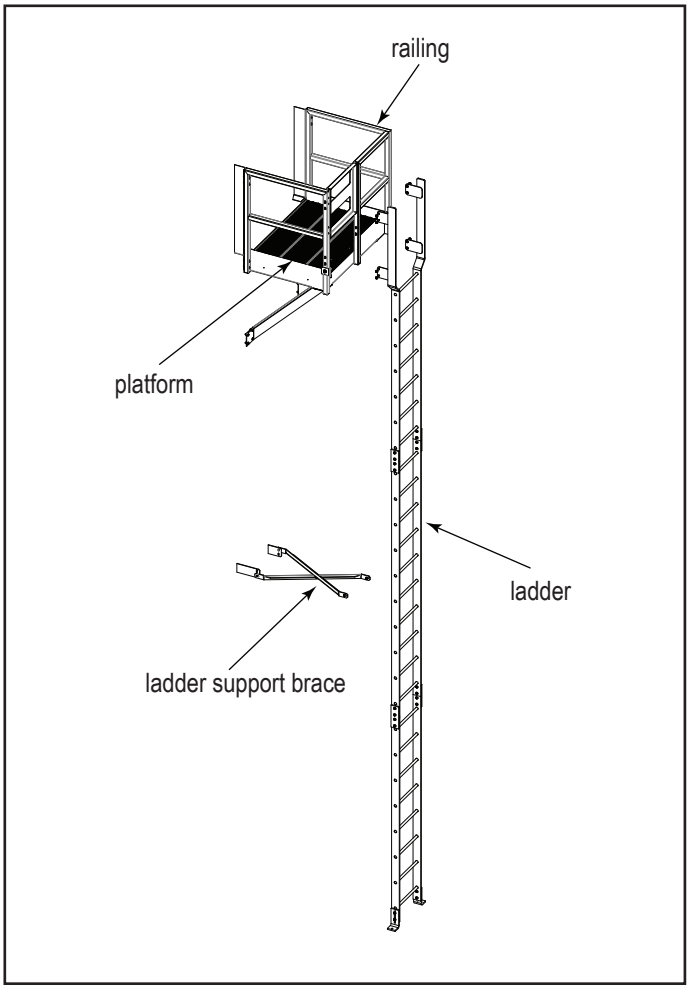
Install the handrail and ladder only after the filter housing and hopper assemblies are securely fastened to avoid damaging the platform or ladder.

Platform

1. Depending on the collector model and size, the ladder/platform pack may include one or more platforms.
2. For a list and schematic of components, refer to the ladder and platform (if applicable) assembly drawings provided with the collector.
3. Assemble the platform pack to the collector first.
4. Continue assembling the additional ladder and platform components from top to bottom paying close attention to the assembly drawings.
5. Make sure that all platform and ladder support brackets are installed and the bottom ladder is secured to the foundation with the appropriate brackets and anchors.

Ladder

1. Assemble the ladder on the ground following the assembly drawing provided with the ladder. Tighten all hardware securely.
2. Attach the crane's lifting slings to the top four ladder rungs.
3. Lift the assembled ladder into position, align holes and secure ladder to the collector using the hardware provided.
4. Position lateral ladder support bracket(s) following the assembly drawing provided with the ladder.
5. Secure bottom of ladder to the ground using anchor bolts.
6. Tighten all hardware.
7. Remove crane.
8. Ladder safety system/personal fall arrest system to be provided by process owner or by others where required.



Ladder Installation

Cleaning Mechanism Assembly and Adjustment

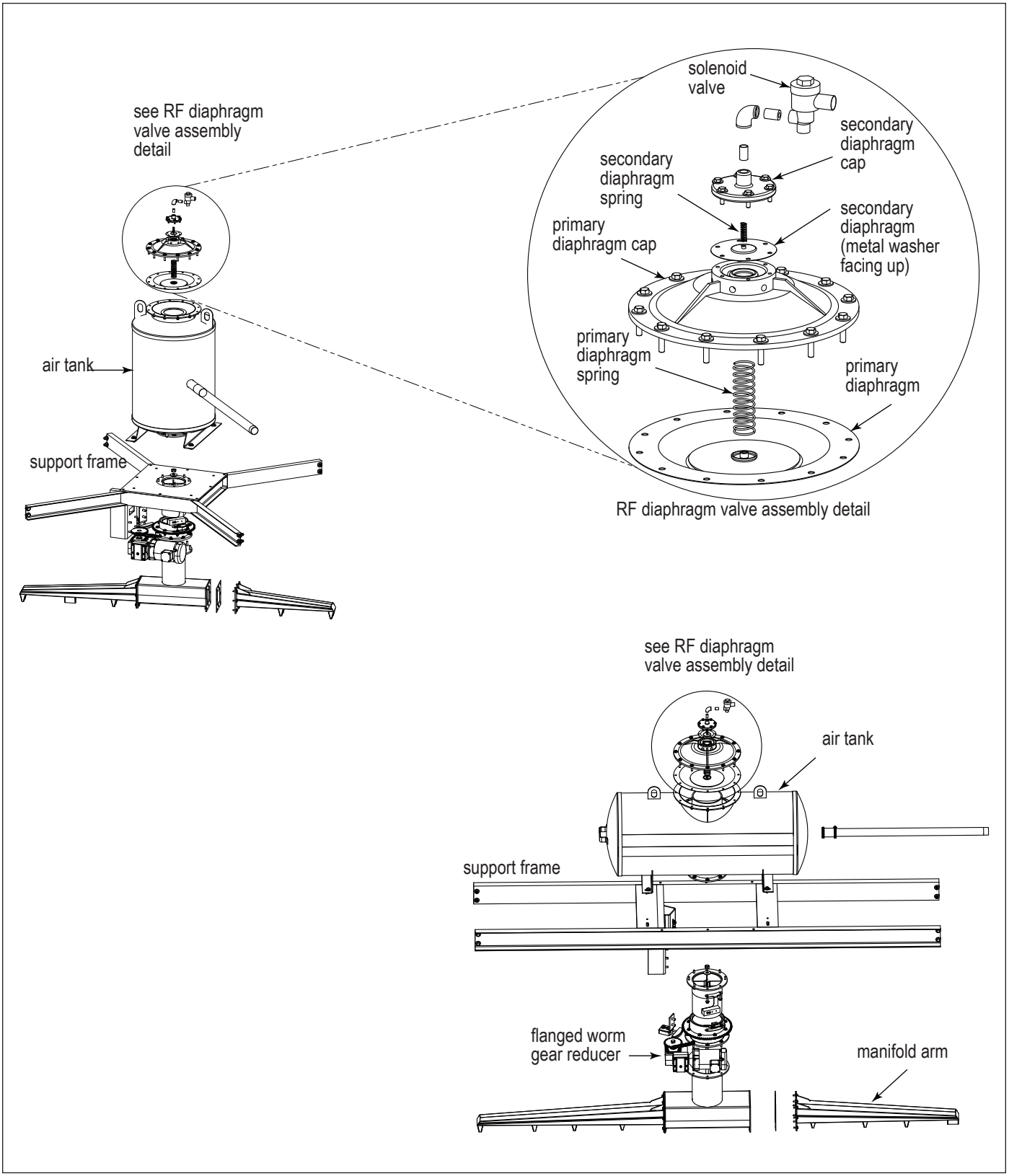
Electrical installation, service, or maintenance work must be performed by a qualified electrician and comply with all applicable national and local codes.

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

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

If the collector was supplied with an electrical control panel, the wiring diagram supplied with the control panel takes precedence over the general diagrams shown in this manual.

1. The gear reducer ships prefilled with lubricant. Remove the pipe plug and install the breather.
2. Remove the plastic exhaust-port plug from the bottom of the solenoid valve.
3. Wire the motor to a customer-supplied motor starter with overload and short circuit protection.
4. Remove all shipping restraints from manifold arms and shipping braces from the cleaning system and cleaning system support frame.

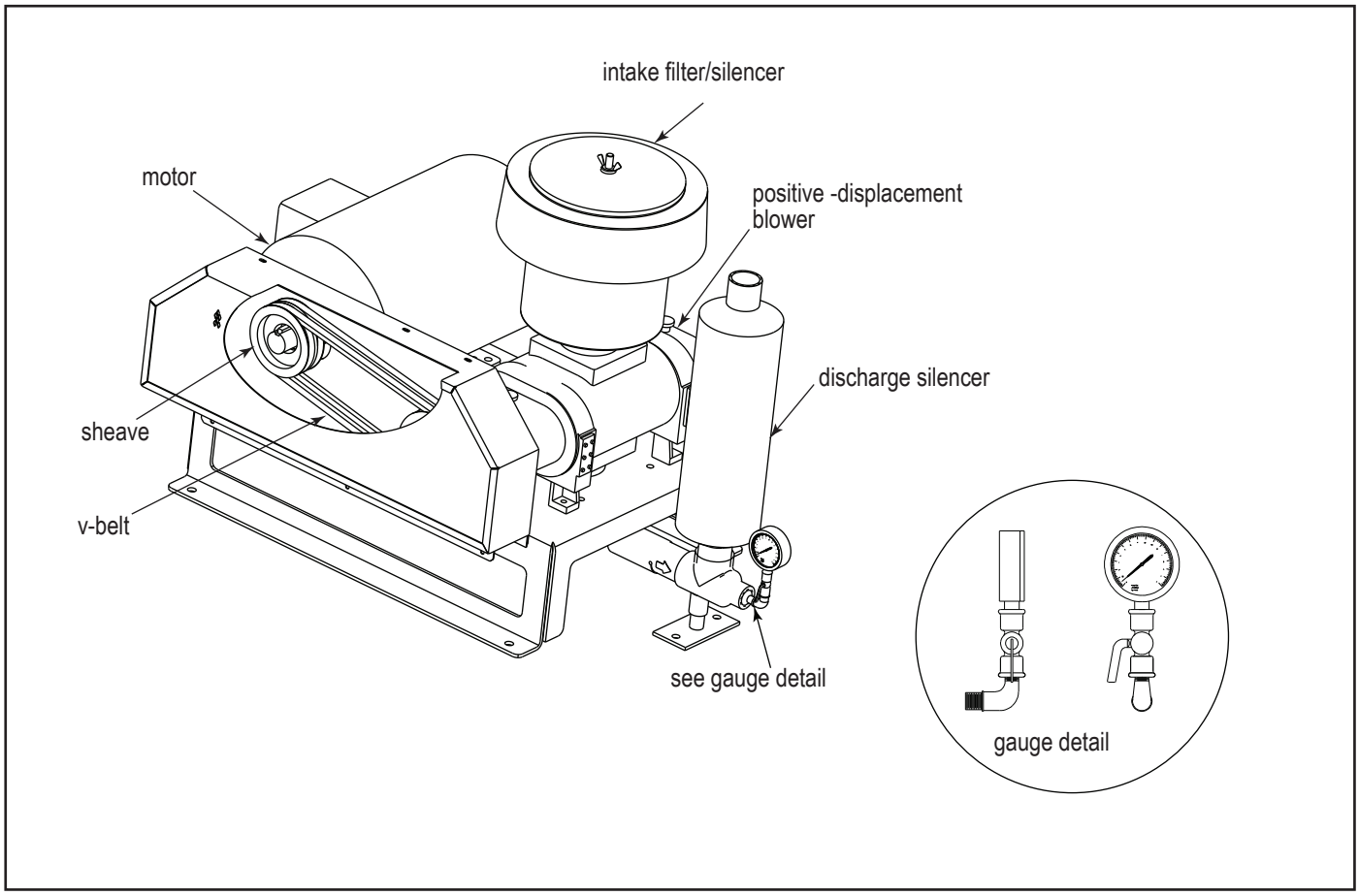


Cleaning Mechanism

PD Pump

A positive-displacement (PD) blower provides the air used for filter cleaning and is sized for each model's cleaning air requirements. The PD blower should be installed on a level surface. Follow the installation instructions provided with the positive-displacement blower.

Air Supply Pipe Sizing	
Model	Pipe Diameter
118-156	1 1/4-in
226-276	1 1/2-in
356-484	2-in



Positive-Displacement Blower Assembly

Electrical Wiring

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

This equipment may start or stop unexpectedly from a remote location.

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

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

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

Solid-State Timer Installation

1. Choose a location convenient for accessibility and maintenance.
2. Using the wiring diagram supplied, wire the blower motor, blower-motor starter, solid-state timer, and solenoid valve. Use appropriate wire gauge for rated amp load as specified by the local codes.

NOTICE

The solid-state timer requires a 105 to 135-Volt, customer-supplied power supply.

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

Solenoid Connection

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

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

Timer and Solenoid Specifications

Power to the solid-state timer is supplied to Terminals L1 and L2, which are intended to operate in parallel with the positive displacement blower 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 solenoid valve to provide the ON time cleaning pulse for the diaphragm valve and repeats this cycle until the system is shut down. The timer can also be wired for on demand cleaning with an external pressure switch. If this option is selected, the high and low limit pressure switch relays will be connected to the TB2 corresponding terminals. Otherwise, the common and high limit terminals on TB2 are jumpered to provide continuous operation.

Note: If the collector was supplied with an electrical control panel, the wiring diagram supplied with the control panel takes precedence over the general diagrams shown in this manual.

Input
102-132V/50-60Hz/1Ph

Output Solenoids
2-3A max per channel

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.

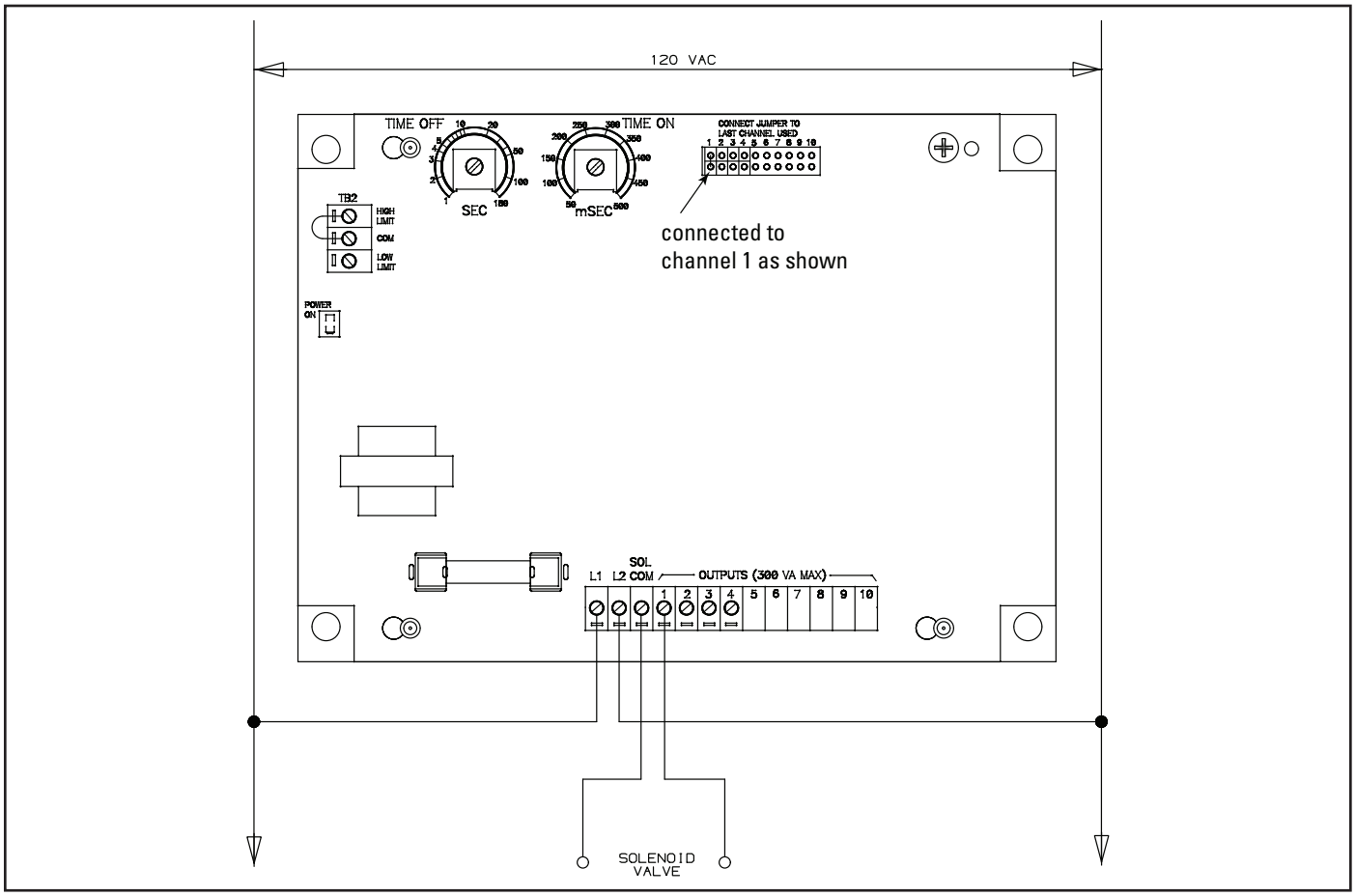
Pulse ON Time
Factory set at 100-milliseconds, or 1/10-second.

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, the OFF time must be field adjusted such that the pressure at the air reservoir peaks at 7.5-psig just before the next pulse. Make final adjustments by observing the LOAD ON light flashing on the timer.

NOTICE	Open the valve to the air reservoir gauge only when adjusting OFF time.

Operating Temperature Range
-20° F to 130° F



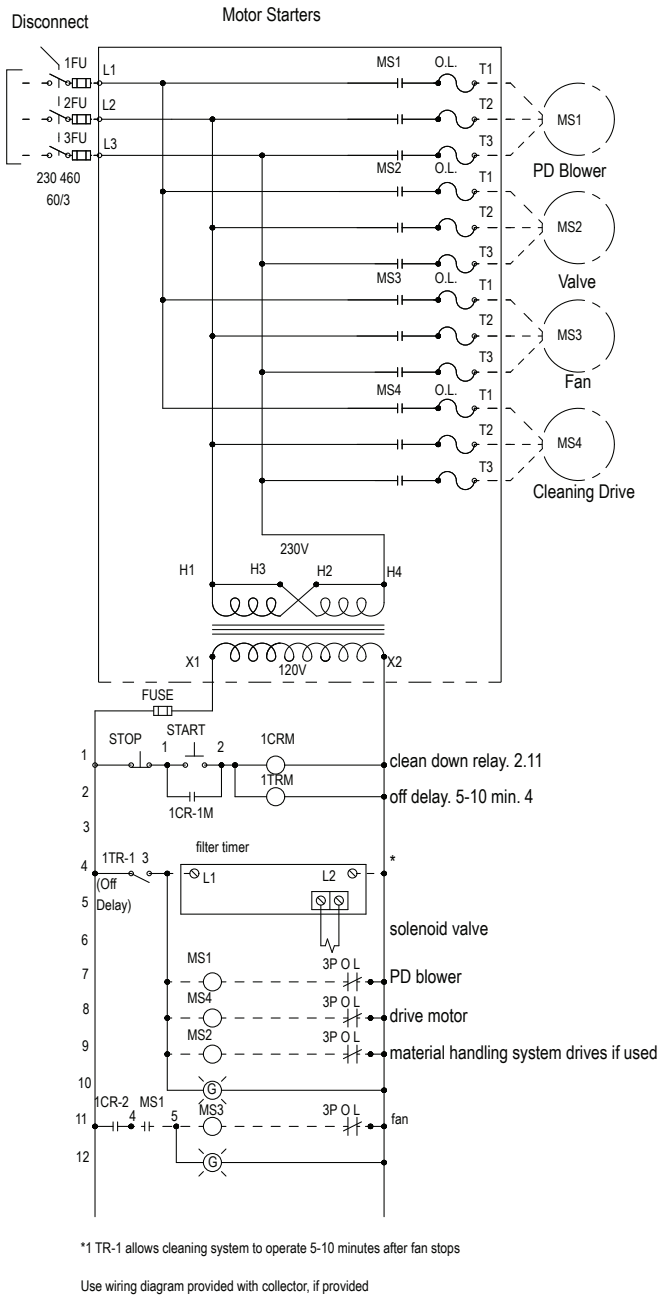
Timer Wiring

Solenoid Valve
120V/60 Hz intermittent duty @ 20.9 watts

Interlocking
To ensure proper operation of the system the main blower should not start unless the cleaning mechanism, positive-displacement blower and material handling system are all operating. It is recommeded that an interlock device is installed between these motors. Failure of interlocked devices should generally not shut down the main blower, but should activate an alarm system, if available. Failure of material handling components with separate drives should shut down all other drives and alarm the operator. This will avoid filling the collector with dust.

Time Delay, Start-Up
Starting motors at 3-second intervals is recommended to minimize inrush current and to allow interlocking.

Time Delay, Shut-Down
A sequenced shut down approach is recommended for optimal performance of the collector. After the main blower shuts down, the remaining components should continue to run for several minutes to empty the hopper and material handling system of all dust that drops from the filter bags after the primary airflow stops.



*1 TR-1 allows cleaning system to operate 5-10 minutes after fan stops

Use wiring diagram provided with collector, if provided

Solid State Timer Typical Wiring Diagram

Filter Installation

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

Dirty filters may be heavier than they appear.

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

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

Do not operate with missing or damaged filters.

Felt Bag Filter and Cage with Boltsafe™ Hardware

1. Turn all power to collector and material handling system OFF.
2. Access clean air plenum through hopper access door.
3. Loosen bolts (2) from each filter cage flange.
4. Slide the filter bag onto the filter cage until the top edge of the bag reaches the top flange of the filter cage.

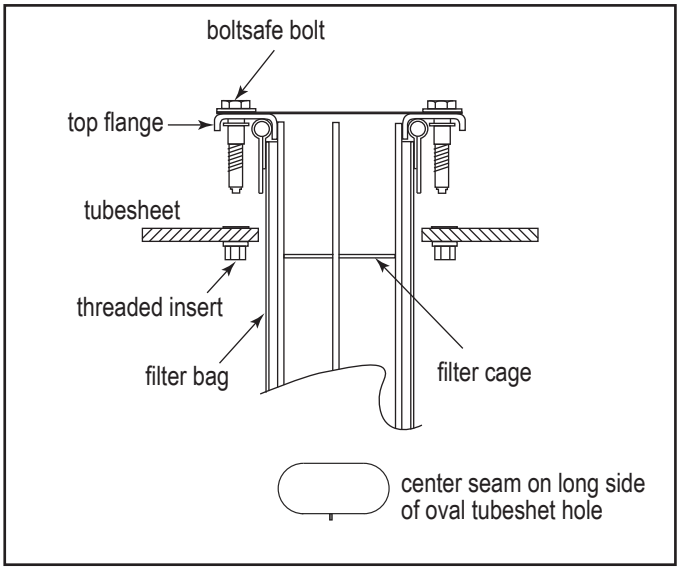
   Note: Place the bottom seam of the filter bag parallel to the long side of the oval.
5. From the clean air plenum, insert the filter bag and filter cage assembly through the tubesheet aligning the two bolts with the two threaded inserts factory installed in the tubesheet.
6. Secure with the provided Boltsafe bolts.

NOTICE

Hand start each bolt before tightening either bolt. Do not use a power or impact driver to tighten bolts. A speed wrench using a maximum of 20 ft/lb is recommended.

7. Repeat steps 3-5 for all filter bags and cages in the current row.

   Note: The cleaning arm may need to be manually rotated to access some filter bags.
8. Proceed to the next row of filters and repeat for all remaining filters.
9. Replace the clean air access door.
10. The collector is now ready to place in service following typical start-up procedures.



Felt Bag and Cage and Pleated Bag with Boltsafe Hardware Filter Installation

Pleated Bag Filter with Boltsafe™ Hardware

1. Turn all power to collector and material handling system OFF.
2. Access clean air plenum through door.
3. From the clean air plenum, insert the pleated bag assembly through the tubesheet aligning the two bolts with the threaded inserts in the tubesheet. It may be necessary to squeeze the pleated bag as it is inserted into the tubesheet.
4. Secure with the provided Boltsafe bolts.

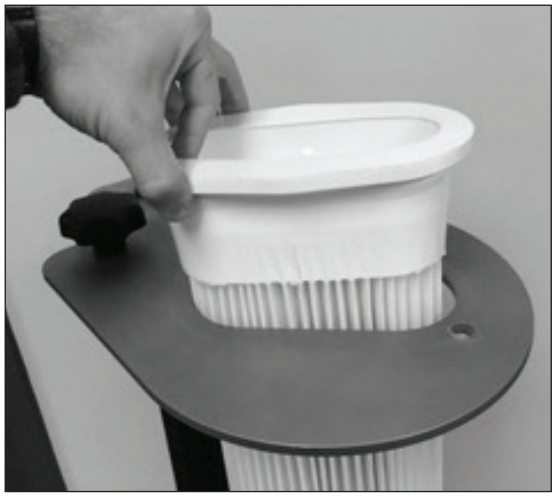
NOTICE	Hand start each bolt before tightening either bolt. Do not use a power or impact driver to tighten bolts. A speed wrench using a maximum of 20 ft/lb is recommended.

5. Repeat steps 3-4 for all pleated bag filters in the current row.

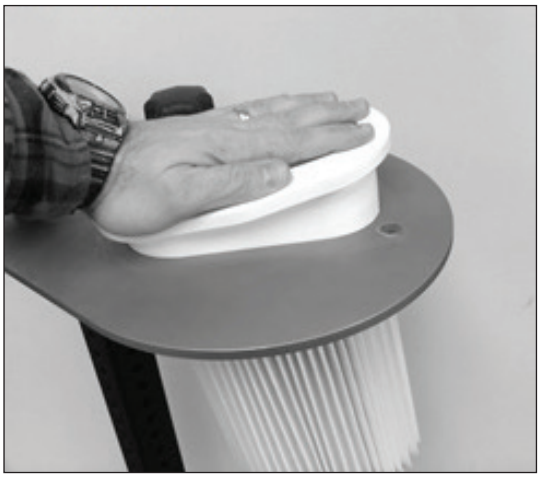
   Note: The cleaning arm may need to be manually rotated to access some filter bags.
6. Proceed to the next row of filters and repeat for all remaining filters.
7. Replace the clean air access door.
8. The collector is now ready to place in service following typical start-up procedure.

Pleated Bag Filter with Snap-In Design

1. Turn all power to collector and material handling system OFF.
2. Access clean air plenum through door.
3. Slowly lower the bag filter through the tubesheet hole. Squeezing the bag filter to get the straps through the tubesheet may be required.



4. Gently push the flexible urethane top of the bag filter on one side until it snaps into the tubesheet hold.

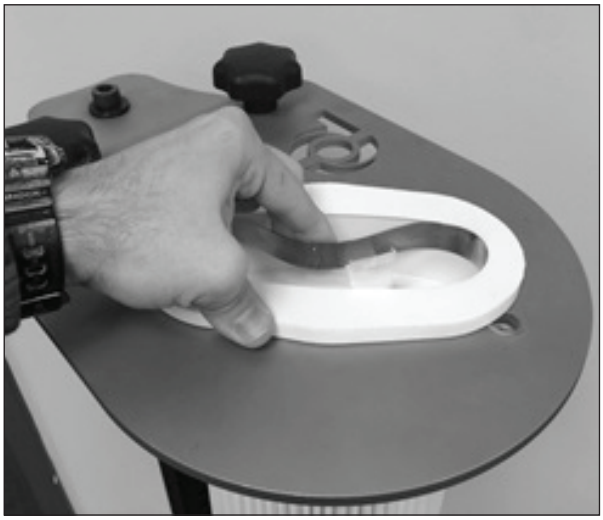


5. Push the opposite side of the top of the pleated bag filter until it is securely snapped into the tubesheet hole.

Note: A snapband retainer has been shipped for each filter. If you do not have these snapband retainers, call your Donaldson representative immediately so they can be sent to you for proper installation.

6. Pinch the snapband retainer in the center to form a figure “8”.

7. Bend the loop slightly and place the retainer under the molded lip of the top flange of the filter. This shallow lip prevents upward movement of the snapband retainer after proper installation. With the snapband retainer held against one side of the filter top interior, slowly allow the retainer to expand into the recessed area between the lip rim and the four interior post stops.



8. The snapband retainer should fit snugly between the lip rim and the vertical post stops. Be sure the snapband retainer is level and not installed crooked. A correctly installed snapband retainer will help prevent any potential leakage at the tubesheet and keep the filter firmly in place.

9. Repeat steps 3-8 for all pleated bag filters in the current row.

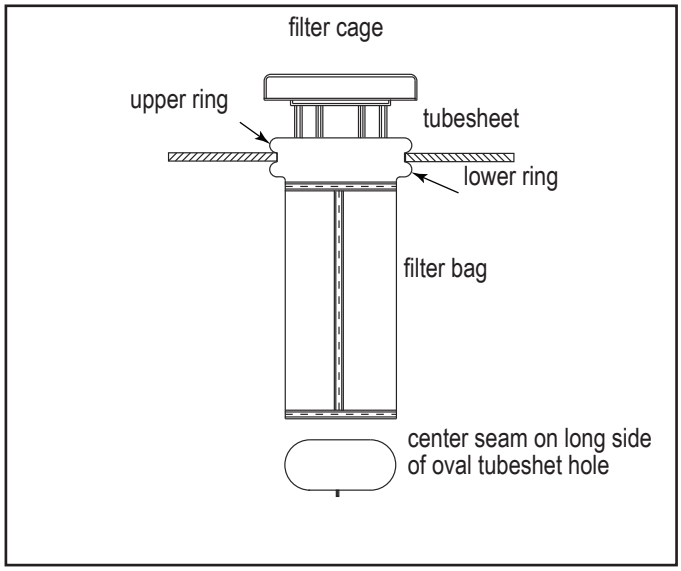
   Note: The cleaning arm may need to be manually rotated to access some filter bags.

10. Proceed to the next row of filters and repeat for all remaining filters.
11. Replace the clean air access door.
12. The collector is now ready to place in service following typical start-up procedures.

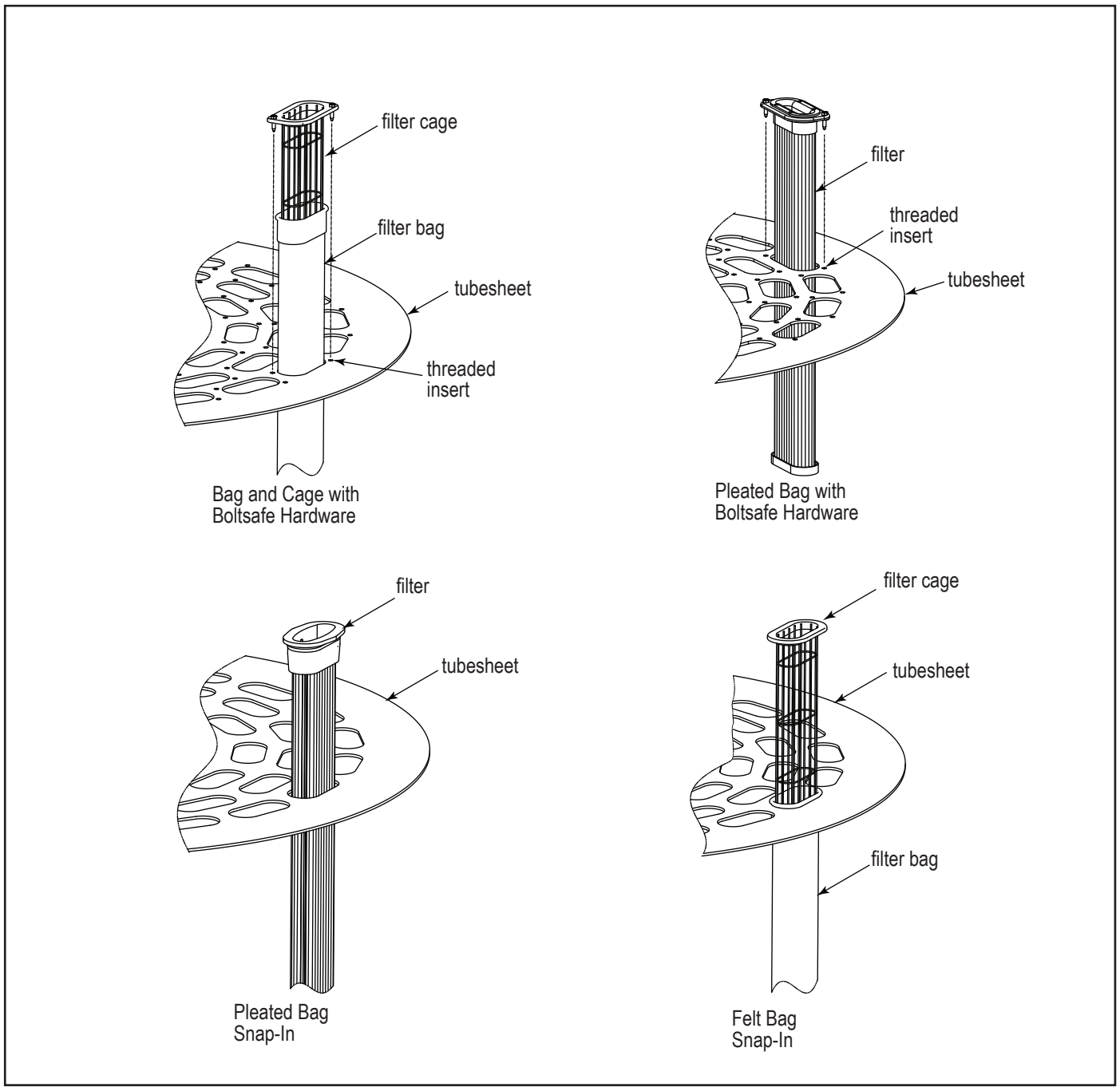
Felt Snap-In Bag Filter

1. Turn all power to collector and material handling system OFF.
2. Access clean air plenum through door or hopper access door.
3. From the clean air plenum, carefully insert the snap-in filter bag aligning the seam with the long edge of the oval in the tubesheet.
4. Snap the filter bag in place with the tubesheet between the upper and lower rings of the filter bag collar.
5. Slide the filter cage into the filter bag and seat firmly.
6. Repeat steps 3-5 for all bag filters in the current row.

   Note: The cleaning arm may need to be manually rotated to access some filter bags.
7. Proceed to the next row of filters and repeat for all remaining filters.
8. Replace the clean air access door.
9. The collector is now ready to place in service following typical start-up procedures.



Felt Snap-In Bag Filter Installation



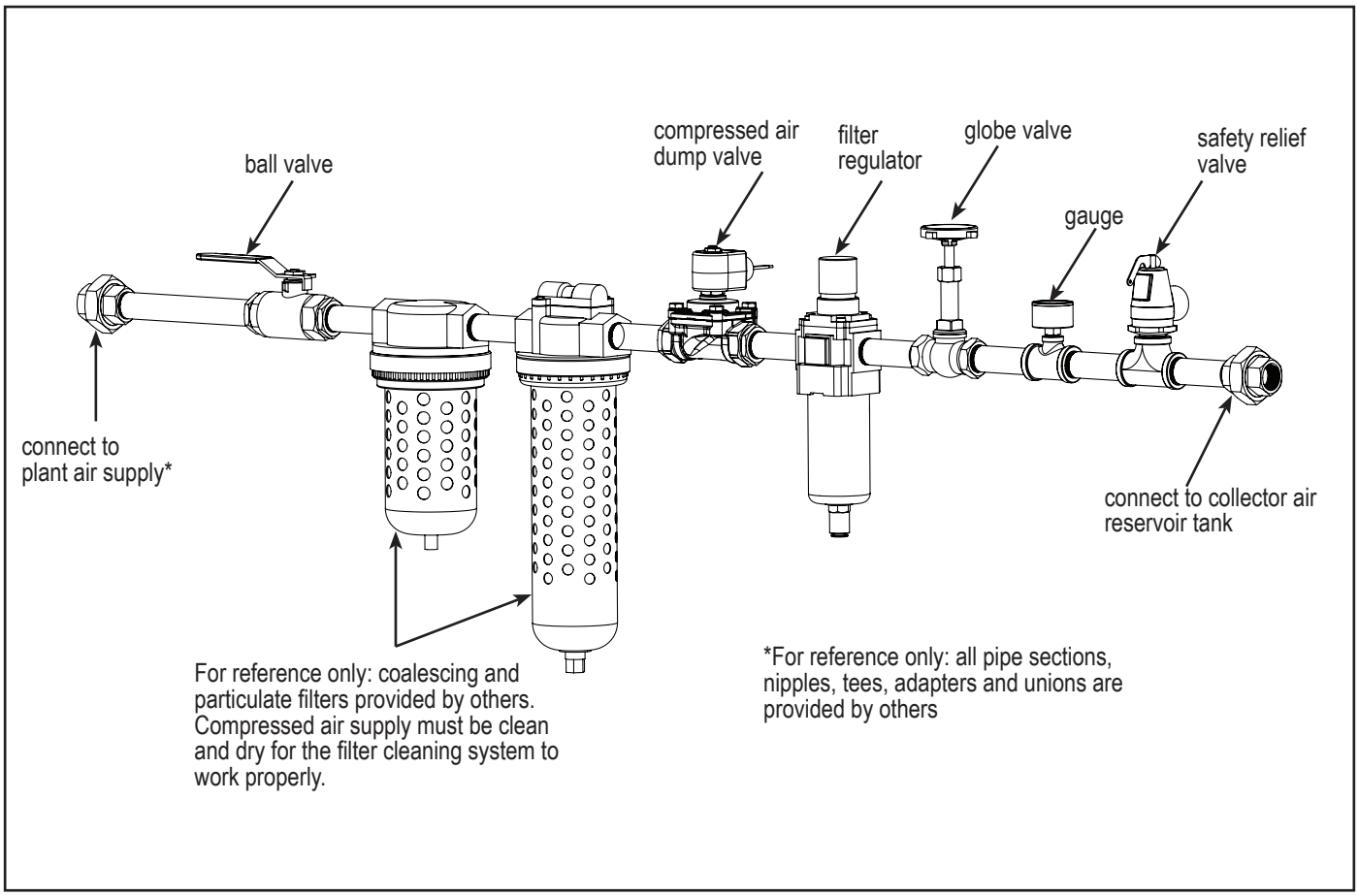
Filter Bag Installation

Options and Accessories

Plant Air Kit

In place of the positive displacement cleaning blower, plant air can be used for the filter cleaning system. The plant air must be clean, dry, and filtered to prevent any oil or water from entering the cleaning system. An optional plant air kit is available to control the flow and regulate the pressure of the customer's plant air. In addition, optional coalescing and particulate filters can be provided with this kit.

Reference the plant air manifold kit drawing shipped with the collector for installation instructions.



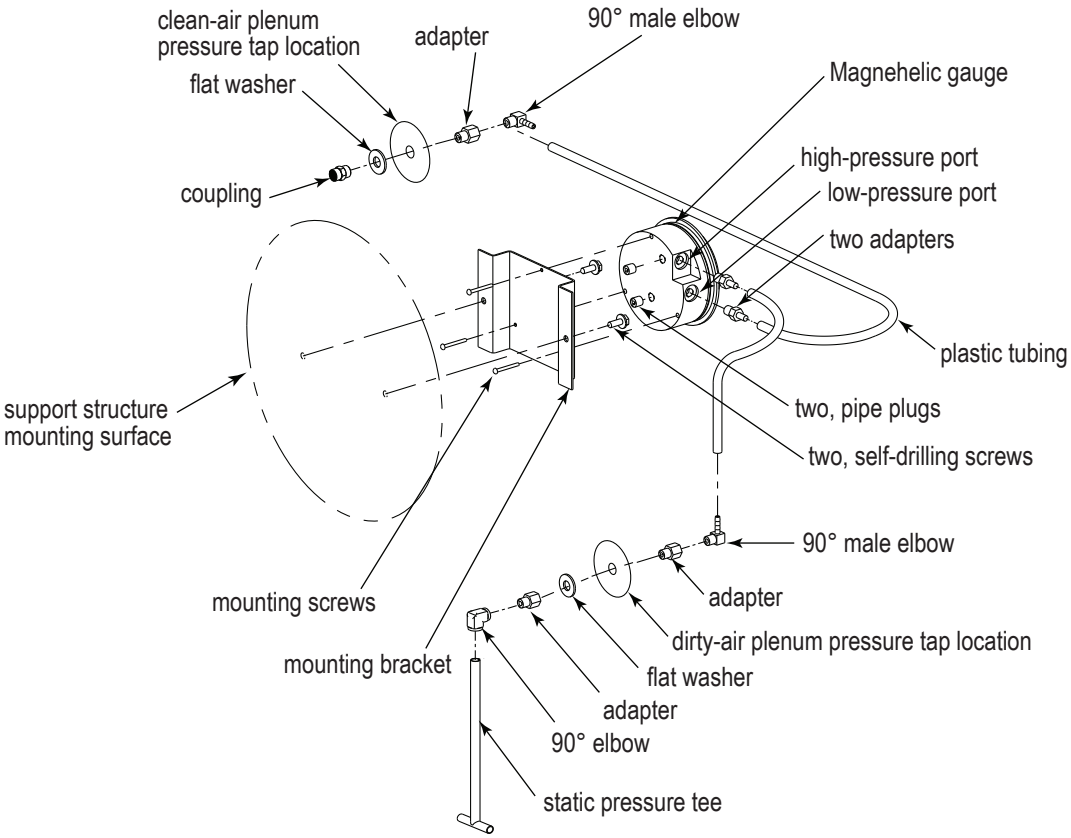
Optional Plant Air Kit

Cleaning Controls and Sensors

Magnehelic® Gauge

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

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



Magnehelic Gauge Installation

Explosion Vent

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

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

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

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

Standard explosion vents are intended for outdoor installations only.

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

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

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

Sprinkler Coupling

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

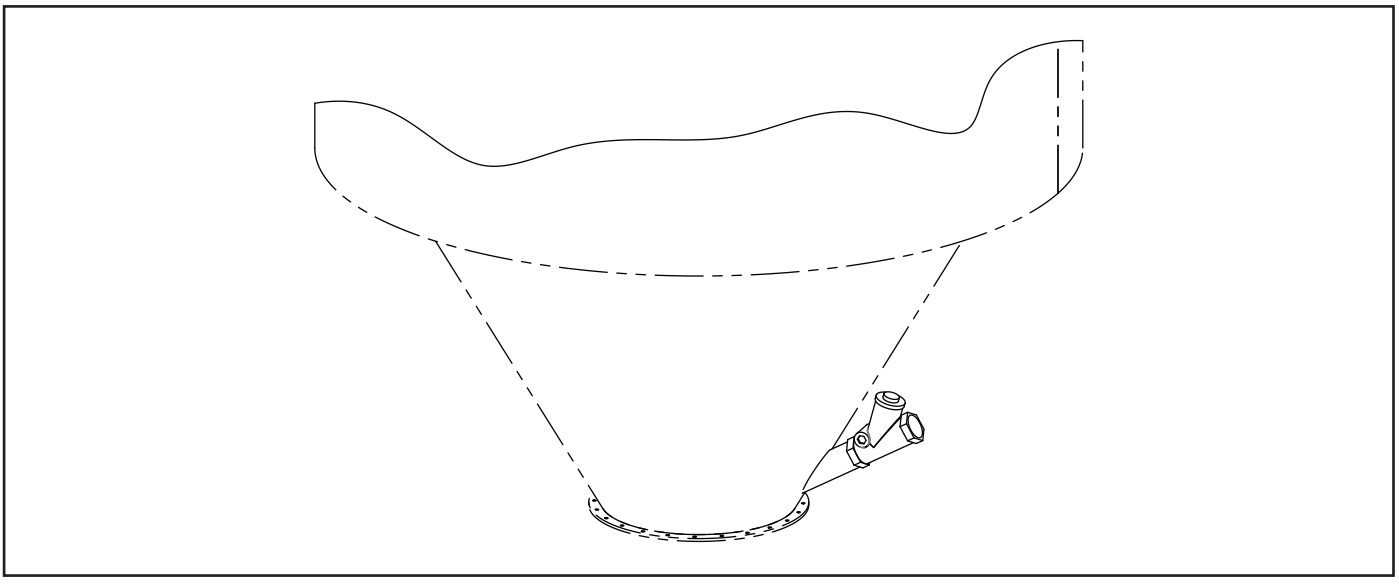
Consult with local authorities when installing fire control systems on dust collection equipment.

NOTICE

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

Water Overflow Valve

1. Remove the hopper access cover and set aside.
2. Align holes in water overflow valve access cover with holes in hopper. Secure using the flat washers and hex nuts removed in Step 1.
3. Tighten all hardware securely.



Water Overflow Valve

Start-up / Commissioning

Instruct all personnel on safe use and maintenance procedures.

Electrical installation, service, or maintenance work must be performed by a qualified electrician and comply with all applicable national and local codes. This equipment may start or stop unexpectedly from a remote location.

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

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

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

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

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

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 fan rotation.

Stand clear of exhaust to avoid personal injury.

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

   a. “Bump” the fan to initiate rotation.
   b. As the fan is winding down (unpowered) compare fan rotation to the rotation label (located on fan housing) direction.
3. If the fan rotation is reversed, correct the rotation.
   a. Lock-Out all energy sources.
   b. Within the junction box, swap the connection location of two power leads on the terminal block, making certain not to swap a power lead and the ground wire.

      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.

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

4. Ensure all equipment access panels are sealed and secure.
5. Check that the hopper discharge material handling system is properly sealed as needed to keep the collector under operating pressure.
6. Check that fan exhaust damper (if applicable) is set to the fully-closed position.
7. Check and remove all loose items in or near the inlet and outlet of the collector.
8. Check that all remote controls and system components are properly wired and all service switches are in the OFF position.
9. Check that all optional accessories are installed properly and secured.
10. Ensure all filters are installed and properly seated in the tubesheet.
11. Turn power ON at source.
12. Turn powered hopper discharge material handling system components ON.
13. Turn pulse system ON.
14. Turn fan motor ON.
15. Adjust airflow with the Airflow Controller or exhaust damper.

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

16. Ensure fire mitigation system water is installed and functioning correctly, if present.

Decommissioning

Once the collector has reached the end of operational life it will need to be decommissioned.

During decommissioning, there is potential for exposure to the dust in the collector. Most dusts present safety and health hazards that require precautions. Wear eye, respiratory, head, and other protection equipment suitable for the type of dust when performing any decommissioning activities.

LOCK-OUT all energy sources prior to performing any decommissioning activities on the equipment.

Electrical service must be performed by a qualified electrician.

Disconnection of ducts must be performed by a qualified tinsmith or contractor.

1. Follow the typical shut-down sequence steps located in the operation section to remove as much contaminant from collector as possible.
2. Lock-Out all energy sources to the collector, material handling system and other associated equipment.
3. Remove all filters from the collector and dispose of in a suitable fashion for the dust in the collector. (See Filter Replacement for removal instructions).
4. Disconnect electrical power from the collector and material handling components and remove any associated conduit or hardware from the exterior of the collector.
5. Clear residual dust accumulations from surfaces inside the collector and associated components in a fashion suitable for the dust, prior to further disassembly.
6. Remove and dispose of all material handling equipment from the collector hopper discharge.
7. Disconnect all ducts from the collector.
8. Proceed to disassemble collector by removing sub-assemblies in the reverse order of the steps given in Appendix A.

   Note: The clean air plenum, dirty air plenum, tube sheet, H-frame and cleaning assembly may be removed in separate steps instead of as one unit.
9. Once all cross-bracing has been taken down, remove anchor bolts and lower leg pack columns.
10. Secure all collector components to a suitable transport carrier and transport to a disposal site suitable for the dust in the collector.

Product Information

(Process Owner to complete and retain for your records)

Model Number _____ Serial Number _____

Ship Date _____ Installation Date _____

Filter Type_____

Collected Dust _____

Dust Properties: Kst _____Pmax_____ MIE _____MEC _____

Accessories _____

Other _____

_____

Service Notes

Date	Service Performed	Notes

Donaldson Industrial Air Filtration Warranty

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

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

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

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

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Significantly improve the performance of your collector with genuine Donaldson Torit replacement filters and parts.

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

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