

THE WORLD LEADER IN CLEAN AIR SOLUTIONS

AAF® INTERNATIONAL

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

OptiFlo® RC



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OptiFlo RC IOM V01

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1 INTRODUCTION

This document contains the information necessary to properly receive, assemble, install, operate, and maintain the AAF® OptiFlo® RC filter system and filters. The purchaser, installer, and operator of the filter system MUST read and comply with this document in its entirety prior to installation of the equipment and its operation. Failure to comply with the requirements of this manual may void the product warranty. The information and guidelines contained in this manual are not exhaustive, and additional or different precautions, measures, training, etc. may be needed depending on the specific circumstances.

CAUTION

These instructions are specific to the AAF OptiFlo RC filter system and filters. All ancillary tasks including, but not limited to, electrical and mechanical work, equipment handling, and safety procedures must be performed in accordance with industry accepted practice and all relevant local, state, and federal government codes, laws, and policies.

2 SAFETY

2.1 Safety statement

The air cleaning equipment supplied by AAF International ranges from very large multiple-component assemblies which require significant and complex, rigging, handling and assembly on-site, to small compact assemblies that are easily handled and maneuvered. In addition to size, many of the dust collectors will require electrical connections, compressed air connections, and will feature high speed rotating equipment.

At all times, when dealing with industrial equipment such as dust collection equipment personnel safety must be the highest priority of all involved, from riggers, installers, operators, users, and maintenance personnel. Those responsible on-site shall review the details of the equipment beforehand and develop a plan for dealing with all stages of the installation from receipt of the equipment on-site to start-up, commissioning, and hand-over. All applicable health, safety, and environmental (“HSE”) rules, regulations, and legislation shall be fully complied with at all times.

2.2 Safe working practices and staff training

AAF International is fully committed to the safety of its employees and those of its customers. In this spirit, the following guidelines are offered for the consideration of those responsible:

All personnel shall receive safety training specific to the site, the task, and the conditions under which the work will be conducted.

All personnel shall be equipped with appropriate PPE (personal protective equipment) such as clothing, footwear, hard-hats, gloves, ear protection, eye protection, and safety harness.

All personnel involved in any stage of the process shall have been trained for the tasks in which they will be involved and at all times shall be under the direct supervision of experienced supervisors and managers.

All personnel shall be equipped with appropriate tools and equipment to safely and efficiently complete their task.

Adequate lighting shall be supplied at all times while work is being conducted.

A work perimeter shall be set up to define the limits of the area within which the work will be conducted and outside which there will be no threat to the safety of personnel or plant. The perimeter shall be taped-off and marked appropriately to prevent accidental ingress of uninvolved personnel or equipment. When the work area impedes into existing access ways or traffic routes for which no practical alternative is available, barriers, wardens and flaggers shall be employed to safely control crossing traffic and personnel.

At any time only those personnel directly involved in completing the task at hand shall be allowed within the work perimeter.

2.3 Dust explosions

Dust explosions constitute a serious industrial hazard and may result in death, serious injury, and/or devastating property damage. It is the responsibility of the user to identify the nature of the dust and whether or not it poses an

explosive hazard and to properly mitigate this hazard. Except as otherwise expressly provided in writing, AAF makes no representation or warranty in connection with explosion hazard equipment, including, but not limited to, the necessity or effectiveness of explosion hazard equipment or to the design, installation, operation, and performance of such equipment. The basic standard for dealing with explosive dust applications is the National Fire Protection Agency ("NFPA"), NFPA 69: Standard on Explosion Prevention Systems. This standard applies to the design, installation, operation, maintenance, and testing of systems for the prevention of explosions by means of various methods. The user shall be fully conversant with the provisions of NFPA and shall comply in full with all of its requirements.

By its very nature AAF equipment is intended to be used to capture airborne particulate matter, otherwise known as dust. There are various methods for dealing with a dust explosion in a dust collector. These can include, but are not limited to, the use of properly designed explosion vents, explosion suppression systems, or flameless vents. The user shall understand which method is being used and who is responsible for the design and supply of the equipment required. When an explosive dust has been properly identified to AAF, the dust collector may be structurally designed to withstand the internal pressure generated during the explosive event and fitted with an explosion vent, or with multiple vents, designed to safely discharge the pressure and the resulting fireball. The user shall review the purchase order and the documents referenced within it to determine if explosion protection equipment has been supplied by AAF International. Where this is the case, review the appropriate sections of this manual that deal with the installation, operation and maintenance of the equipment ordered.

When explosion protection systems are supplied by multiple vendors, it is the responsibility of the user to coordinate between suppliers to ensure that the equipment supplied by each vendor will work together to achieve the required protection. For instance, if an explosion suppression system is being supplied by parties other than AAF, it is incumbent on the user to ensure that the dust collection equipment has been ordered to resist the internal pressure defined by the suppression equipment supplier.

Dust collectors fitted with explosion vents must not be located indoors, unless properly designed in accordance to NFPA regulations. The equipment shall

be oriented so that the vent will discharge to an unoccupied zone. Such a zone will be prohibited to personnel and shall not include critical equipment or services such as fuel storage tanks, flammable materials, fire hydrants, power distribution or electrical control equipment, or similar. If the vent(s) is/are located on the side(s) of the equipment the vent discharge area shall be isolated with barriers erected to prevent the parking of vehicles, pedestrian use, use of the area for temporary storage, etc. Warning signs shall be posted. Include diagrams showing the distribution of a typical dust explosion discharge.

2.4 Electrical hazards

Before doing any work on the AAF equipment make sure that all potential electrical hazards have been identified and that all electric current connected to the equipment, and to any connected or associated equipment, has been properly disconnected and securely locked-out to prevent accidental reconnection prior to completion of the work. All electrical work shall be done in full accordance with the current edition NFPA 70, the National Electrical Code, and all other applicable laws, rules, and regulations. All electrical work shall be performed by a licensed electrician. Only original AAF parts shall be used as replacements for ongoing maintenance and repair.

2.5 Rotating Equipment

The OptiFlo RC can include a fan which is installed with the dust collector. The fan wheel rotates and has the potential to cause severe injury. The fan wheel could be accessed from outside the housing through the fan discharge. All due care should be exercised to avoid any contact with the operating fan. Under no circumstances should the fan ever be allowed to operate when any of the access panels on the dust collector, or the silencer, have been removed. The fan must be disconnected and locked out prior to the performance of any maintenance work, see paragraph 2.4.

2.6 Safety Guards

The dust collector cabinet prevents access to the fan inlet. All access panels shall remain bolted in place while the fan is operating. Prior to the removal of any access panels, the electrical power to the collector shall be disconnected and locked out, see paragraphs 2.4 and 2.5. After electrical power is disconnected, the fan wheel will continue to rotate for a period of time before coasting to a stop. Do not access the fan until the fan wheel has come to a complete stop.

3 GENERAL PRODUCT INFORMATION

3.1 Description

The OptiFlo RC is a complete pulse-jet cartridge collector system capable of providing continuous on-line cleaning. This cartridge collector utilizes high efficiency pleated filter elements arranged in a horizontal arrangement. Dust laden air enters above the filter elements and moves in a true down flow direction between the filters. The airstream passes through the media as the dust is collected on the filter media. The clean air then moves through the tube sheet section and into a clean air plenum at the rear of the module.

3.2 Purpose and intended use

The OptiFlo RC is intended to be used for relatively dry nuisance dusts, with loadings generally less than 3 grains per cubic foot (7 g/m^3). Typical applications an OptiFlo RC is used for include weld fume, laser tables, thermal spray, chemical, pharmaceutical, and food processing. The cartridge that is used in the OptiFlo RC should be suitable for the intended application.

The REDClean® N cartridge is suitable for most applications where the OptiFlo RC is used. Contact AAF International for assistance on a cartridge design for your application. It is recommended that you use only AAF International cartridges on AAF International equipment.

3.3 Normal Operation

During normal operation, air enters the OptiFlo dust collector through the high inlet and moves downward through the dirty air plenum, in true "downflow" fashion. The cleaned air passes through the filter elements, while dust is collected on the outside surfaces of the elements. Clean air flows through the center of the elements into the clean air plenum, where it exits through the clean air outlet.

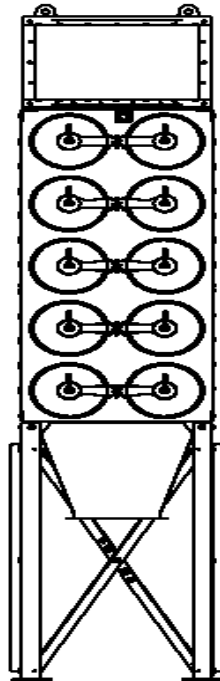
During filter element cleaning, a pulse controller automatically selects the element or pair of elements to be cleaned, activating solenoid valves which open air diaphragm valves. High pressure air pulses directly into the center of the selected element, or pair of elements, for 100 milliseconds, blowing collected dust off the filter element(s). The dust is swept downward into the hopper by the prevailing airflow and gravity.

3.4 Sizes

The OptiFlo RC pulse-jet cartridge collector is available in four basic configurations: 2RC, 3RC, 4RC, and 5RC. All modules are two filter elements wide and in every case, except for the 2RC4 and 3RC6, the filter elements are installed two cartridge elements deep – two cartridges behind each circular access door.

The 2RC modules have filters arranged two high, 3RC modules have filters arranged three high, 4RC modules have filters arranged four high, and 5RC have filters arranged five high. The “**RC**” is nomenclature for “**R**ound **C**artridge”. Each series offers standard factory assembled collectors with model designations such as: 2RC8, 2RC16, 3RC12, 3RC24, 3RC46, 4RC16, 4RC32, 4RC48, 5RC20, 5RC40, 5RC80, and many others.

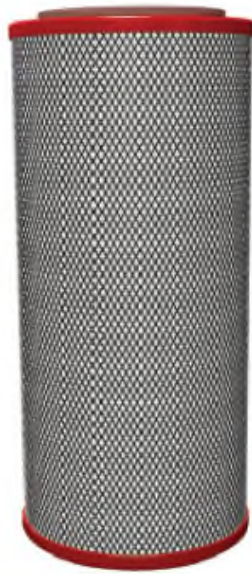
The second number is the designation of the total amount of filters in the unit. Therefore, a 4RC64 would have filters arranged 4 high and have 64 total cartridges. Each door is two cartridges deep, meaning there are 32 doors.



5RC20 OptiFlo RC collector

3.5 Filter elements

The OptiFlo RC utilizes cartridges with pleated media for dust collection. For optimal performance, the OptiFlo RC is fitted with REDClean® N media as the standard cartridge. The REDClean N cartridge is suitable for most applications where the OptiFlo RC is used. Contact AAF International for assistance on a cartridge design for your application. To ensure proper operation, it is recommended that you use only AAF International cartridges on AAF International equipment.



Typical REDClean N cartridge for the OptiFlo RC

3.6 Weights

Model	Approx. Shipping Weight	
	lb.	kg
2RC4	1662	754
2RC8	1763	800
2RC16	2565	1164
2RC24	4328	2072
3RC6	1999	907
3RC12	2103	954
3RC24	3123	1417
3RC36	4205	1908
3RC48	5587	2535
3RC60	7328	3325
4RC16	2352	1067
4RC32	3683	1671
4RC48	4966	2253
4RC64	6564	2978
4RC80	8648	3924
4RC96	10,246	4649
4RC112	11,529	5231
5RC20	2721	1234
5RC40	5690	2581
5RC60	8480	3846
5RC80	11,334	5141
5RC100	14,170	6427
5RC120	17,024	7722
5RC140	19,813	8987
5RC160	22,668	10,282
5RC180	25,388	11,516

Note: The table is for guidance only. The collector delivered may vary, according to a number of factors such as addition of accessories, greater stiffening for NFPA models, or where the unit is specially built for applications where the system pressure is greater than the standard 20" w.g. design pressure is anticipated.

4 PRODUCT SHIPMENT

4.1 How the product ships

The OptiFlo RC collectors are shipped with the filter elements installed. Units shipped as 4 or greater assembled modules are not skidded. The OptiFlo RC is usually shipped by truck or flat bed. Specific shipping information will be given to the customer for their specific collector at the time of shipment.

4.2 Items that ship separately

To save the customer money, AAF International may ship items separately. The customer will be notified which equipment ships separately when the order is placed. Items that ship separately should be set aside in an area that is clean, dry, and in a place where damage to the equipment will not occur.

5 PRODUCT RECEIPT AT THE DESIGNATED DELIVERY POINT

5.1 Responsibilities of the customer or customer's agent

Ensure all loading/unloading equipment and safety equipment is on site at the time of delivery. Safe and efficient operation of the collector depends on proper installation. Know proper laws, codes and regulations before installation starts.

5.2 Receiving

Remove crates, tarps, shipping straps, etc. along with any loose items or equipment before unloading the OptiFlo RC.

5.3 Inspection on arrival

The OptiFlo RC is normally shipped by truck and should be checked for damage that may have occurred en route. Compare the collector(s) received to the description and/or drawing of the collector(s) ordered. Immediately report any differences or missing items from the order to AAF International. Remove loose items or components before lifting the collector from the truck.

A qualified installation and service company should complete installation of the collector and accessories.

5.4 Damaged goods

If there is any visible damage to the packaging or the equipment notify the carrier and AAF before proceeding further and, if appropriate, file an immediate

claim with the carrier against such damage. Be aware that damage to packaging may indicate hidden damage to the product that is not immediately discernable.

Digital color photographs must be taken of any damage to the packaging and the equipment immediately on discovery. The nature of any damage must also be documented in writing. Adequate documentation will be critical to support any claims.

Contact AAF International for claim filing procedure.

5.5 Missing goods

Any missing goods should be noted on the delivery receipt, and the carrier and AAF notified immediately. Contact AAF International for claim filing procedure.

FOR ASSISTANCE: Contact AAF International at 1-800-477-1214. Have the AAF control number available. The control number can be found on the shipping papers.

6 UNLOADING AND HANDLING

6.1 Unloading and lifting into position

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

Connect lifting sling to all supplied lifting lugs, distributing the load evenly. Always use spreader bars on collectors field assembled wider than 4 modules.

Use clevises, not hooks, on lifting sling.

Use of spreader bars is recommended on all lifting slings.

Check the drawings of the specific OptiFlo RC ordered for dimensions and weights to ensure proper lifting and installation equipment.

All lifting operations must be made in compliance with the relevant HSE legislation.

7 STORAGE AND PROTECTION

In the event the OptiFlo RC is not placed in service within 30 days after receipt, the filter cartridges must be removed and stored in a clean, dry place to prevent possible moisture accumulation in the media.

8 SITE PREPARATION

8.1 Locating equipment

The dust collector site location must take into account the wind and seismic loadings. See collector specifications to ensure proper site location.

The collector is suitable for indoor and outdoor applications. Ensure proper equipment and accessories are equipped on the OptiFlo RC for such installations. The collector can be located on a foundation (by others) or on structural framing (by others).

Ensure local laws, codes and regulations are followed for the materials being collected. Noise levels should be considered when selecting the proper location of the OptiFlo RC.

Locate the OptiFlo RC in a location so that maintenance to the collector can be handled easily. See collector drawing for cartridge clearance.

In the case of hazardous dust, consult your local authorities, laws, codes, or regulations for the location of the unit.

8.2 Foundations

The OptiFlo RC dust collector is usually mounted on a reinforced concrete foundation. However, roof mounting is also possible. When calculating for foundation or roof mounting, the weight of the dust collector, material collected, and all auxiliary equipment must be considered together with snow, wind, and seismic loads. Check the drawings of the specific OptiFlo RC ordered for the dust collector weight.

8.3 Anchoring

See the specific OptiFlo RC collector drawing for anchor bolt location. Anchor bolts must extend at least 1.75 inches above the foundation. The collector should

be located with consideration for emptying hoppers, electrical and air connections and maintenance, and should have the shortest run of ductwork possible.

9 ASSEMBLY AND INSTALLATION

9.1 Introduction

Safe and efficient operation of the OptiFlo RC depends on proper installation.

AAF recommends that the ductwork going into the collector be as straight as possible, with at least 5 diameters of straight run recommended.

Authorities with jurisdiction should be consulted before installing the OptiFlo RC to ensure local installation laws, codes, regulations and procedures are followed.

A qualified installation and service agent must complete installation and service of the dust collector and equipment.

Ensure all covers from shipping and loose materials are removed from the collector before installation. Failure to do so can result in failure of the dust collector.

Ensure the hardware, on the dust collector assemblies, is properly installed and tight before installation.

9.2 Assembling and installing the structure

9.2.1 Modular assembly

OptiFlo RC units with multiple modules normally have their housings factory pre-assembled up to a minimum of 4 modules, with legs and hoppers sent for site assembly. If more than 4 modules are required or if there are site access problems that preclude delivery of very large assemblies, it may be necessary to join together on site the housing modules. In this case the modules to be joined will not have side panels. See also 9.2.4.

9.2.2 Flanged joints

Flanged joints exist where housing modules must be bolted together and where hoppers are bolted to the lower faces of the housing. In most cases, AAF will provide sufficient tubes of sealant which must be applied to one of the

opposing faces just prior to the faces being brought together. When applying sealant be careful to circle each bolt hole with the sealant. See also 9.2.4

9.2.3 Products shipped as a single assembly.

Some of the smaller sized units may be shipped each as a single assembly on a flat-bed truck. Careful lifting, using the supplied lifting lugs, is required to turn the unit to the vertical position prior to lowering the unit onto the legs and the pre-prepared foundation.

9.2.4 Products shipped in multiple modular assemblies

Where product is shipped with the main housings in multiple modular assemblies, with the hoppers and legs separate, proceed as follows:

Follow item 9.2.4.1 to pre-install the legs and then bring in the housing modules in turn bolting the first to its legs before bringing in the second.

Pre-apply the sealant to the flanges as 9.2.2 and then bolt the housings together.

Install all the supplied bolts between housings loosely at first. Access to the bolt holes is gained via the porthole covers and the inlet/outlet openings (remove the covers and cartridges). When all the bolts are loosely in position they must be tightened in a sequence working from the center bolts towards the corners, radiating outwards in opposite side in sequence so that the four corner bolts are last to be tightened. This pulls the modules together with all the mating flanges flat against each other with no bulges.

9.2.4.1 Leg structure

Assemble the leg structure onto the prepared foundations or steelwork using the supplied GA drawing which shows the position of all the legs and cross braces. Ensure all the nuts and bolts are tightened and the structure is mechanically sound and secure, and level before proceeding to the next stage.

Anchors (supplied by others) must comply with local code requirements and must be capable of supporting dead, live, wind, seismic, and other applicable loads for the area the dust collector is going to be installed.

Consult with a qualified engineer for foundation and anchoring design.

9.2.4.2 Hoppers

Position the hopper(s) onto the leg structure and fix it into position using the GA drawing as a guide. Level the hopper once installed.

9.2.4.3 Collector Housing

Apply sealant (supplied by AAF) to the upper flanges of the hopper(s) ensuring the sealant circles around each bolt hole.

Lift the housing module(s) using its lifting lugs and lower into position onto the hoppers so that the holes in the matching flanges correctly align.

CAUTION: Never stand or work beneath a suspended load.

Make certain that the housing is safely positioned onto the hoppers/supporting steel structure and that it cannot possibly fall should there be a failure of the lifting supports.

Secure the housing to the hopper with the bolts and washers that are supplied.

All the bolts must be tightened. The lifting equipment can now be removed.

NOTE: Check all access panels on the OptiFlo RC, including the top inlet panel, front inlet panel, and the side outlets, to ensure these are caulked. If these are not caulked and bolted, these could be leak points for the collector.

9.2.5 Installing the access components

When access components, such as an access platform, are ordered with the OptiFlo RC, separate installation instructions will be provided with the collector.

9.2.6 Installation of control panel

Refer to the electrical drawings issued with the general arrangement drawing.

When the AAF Control Center or Pressure Demand controller is to be used, select a location for fixing the enclosure within 15ft of the static taps located on either of the OptiFlo RC side panels. Usually the Pressure Demand controller is fixed to the leg structure but it can be remotely located if desired.

Once the pulse controller is fixed in position, connect two parallel lines of plastic tubing to the 2 connection taps on the pulse controller and the other ends to the static taps located on the side wall of the OptiFlo RC. These plastic pipes allow the pulse controller to measure and display the differential pressure that exists between the clean air plenum and dirty side plenum. In some modes of operation, this differential pressure is used to control the pulsing.

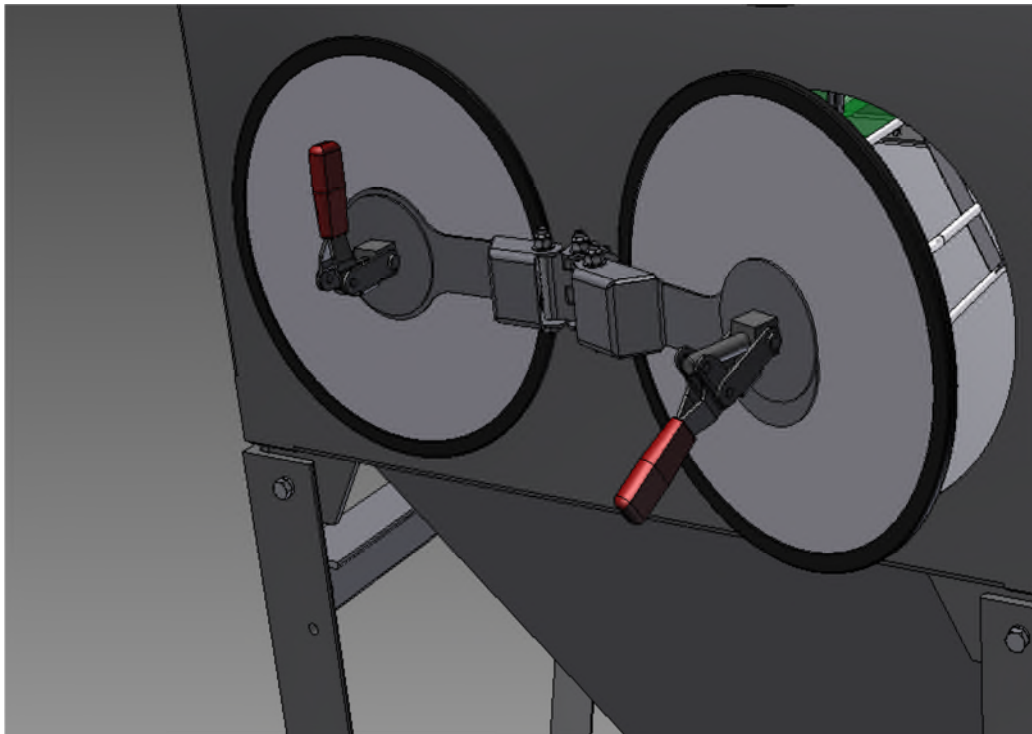
Connect the high pressure port to the dirty side of the collector and connect the low pressure port to the clean air side (back of the unit). Both ports are located on the side of the collector.

See the separate pulse controller manual for a full explanation of its features and modes of operation.

9.2.7 Installation of the cartridge filter elements

The cartridges supplied with new equipment are in most circumstances factory pre-installed by AAF. If the cartridges have been shipped separately, or uninstalled, then proceed as follows:

1. Provide safe access to the porthole doors at the front of the OptiFlo RC.
2. Open the porthole covers by lifting the red cam action handle to release the internal door fastening and swing open the door on its supporting hinge.



3. Unpack and inspect new cartridges for any damage during shipping, storage or handling. DO NOT use damaged cartridges.

4. Slide the new cartridges, gasket-end first, onto the support mandrels, two per porthole (with exception of the 2RC4 and 3RC6). While installing, be careful that cartridges do not contact the housing or any other objects which might damage or puncture the cartridge surface.

5. Swing closed each door. Ensure the cam action door closure mechanism engages with its counterpart on the end of the mandrel. Close the clamping handle so that it is perpendicular to the door (as shown). This pulls the door closed and seals the cartridge by slightly compressing the gaskets.

NOTE: some adjustment is possible by re-setting the position of the tensioning nut which can be used to adjust the degree of compression of the cartridge gaskets.

9.2.8 Installation of accessories

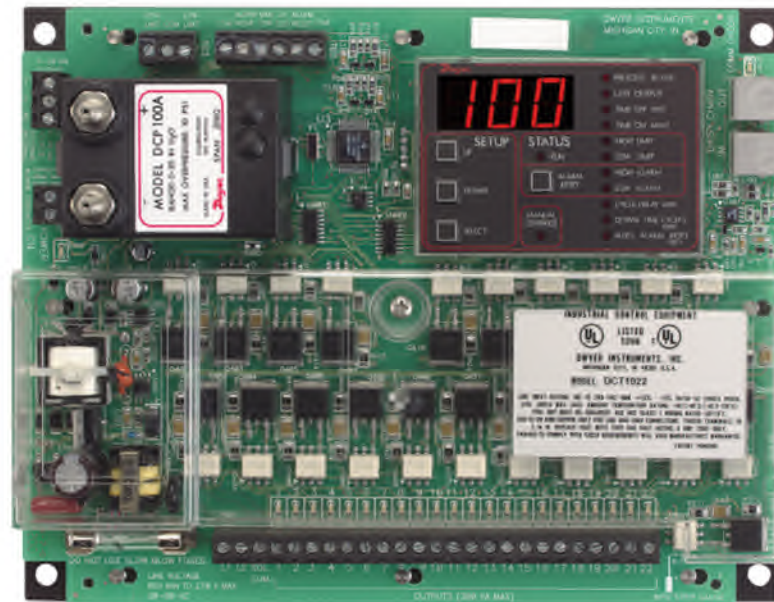
When accessories, such as sprinklers, abrasion resistant inlets, and airlocks, are ordered with the OptiFlo RC, separate installation instructions will be provided with the collector. For complete information, see the most current installation drawing or separate IOM.

9.2.9 Electrical connections

WARNING: Potential shock hazard. Disconnect power before servicing. Only qualified electrical personnel should work on this system.

The OptiFlo RC pulse-jet cartridge collector is supplied with electrical solenoids in a NEMA 4 enclosure and the standard pulse controller in a NEMA4X enclosure. Higher NEMA ratings are available as an option. Do not install in classified hazardous locations without an enclosure suitably rated for the application and location.

The standard pulse control supplied with the OptiFlo RC is the DCT-1010 (or 1022) Dust Collector Timer Controller. This pulse controller is used for on-demand or continuous cleaning applications.



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To power up the DCT controller, connect power line to L1 and L2. Control Wiring must be field installed between the solenoid valves and the pulse output terminals as shown on the electrical connection diagram that is supplied with the specific OptiFlo RC collector ordered.

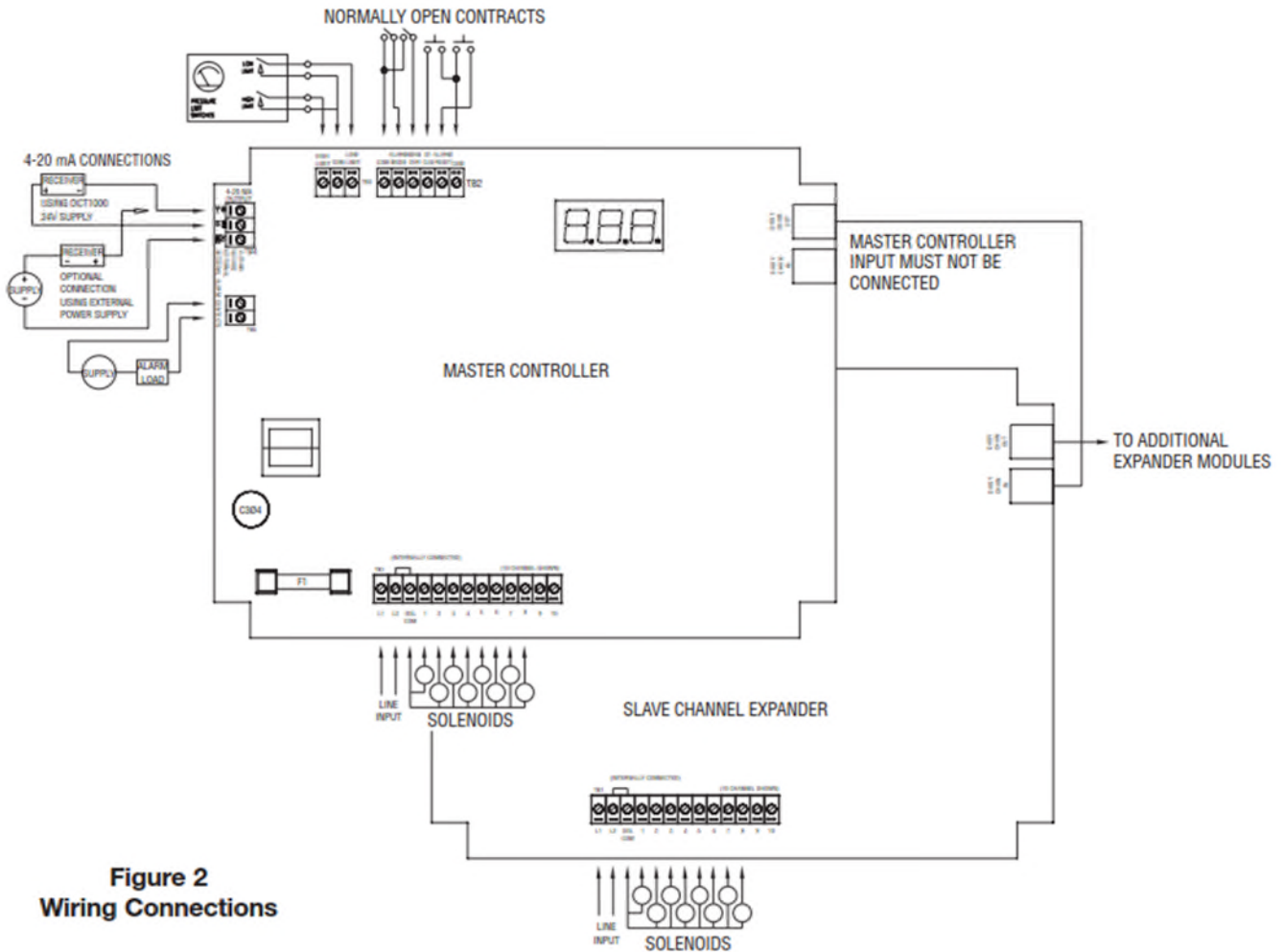


Figure 2
Wiring Connections

The power requirements are 85-270V/50-60Hz/1Ph. The operating temperature range is -40F to 140F.

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Continuous cleaning operations do not require external inputs and can be used for time based cleaning by placing a jumper wire across the manual override and common, or across the high limit input and common.

For on-demand applications, program the DCT controller by going through each selection available, setting up each step. For further information, see the IOM of the DCT controller.

When setting up the DCT, the "high limit" is normally set at 3" w.g. and the "low limit" is normally set up at 2" w.g. Different applications require different settings. Please contact AAF International for assistance.

For troubleshooting and for further information, see the Dwyer DCT controller IOM.

9.2.10 Compressed air connections

The OptiFlo RC dust collector requires dry compressed air (-40°F dew point, 90-100 psig) for cleaning. See product literature for the compressed air requirement for the nominal compressed air requirements. When the dust collector is set on a timer, the timer is factory set at a 30 second pulse interval.

Do not use over 100 psig of compressed air. Solenoid valves will not operate and can cause damage to collector components.

The compressed air connection should be made at the top of the air manifold on each module where a 1 ½" NPT pipe connection is supplied. There is also a connection at the bottom of the air manifold to attach a drain.

Noise levels during pulsing should be considered when the OptiFlo RC is operating. Hearing protection may be needed.

9.2.11 Ductwork Installation

Install the inlet ductwork to the front inlet above the access ports, or to the top inlet. Connect the clean air duct (or manifold) to outlet(s) located on the bottom and rear side of the clean air plenum. A bottom outlet is the only available option for units wider than two modules.

Ductwork should be of sufficient gauge to withstand the system design pressure and should be independently supported.

The OptiFlo RC is not designed to support ductwork.

10 EXPLOSION VENTS

The following only applies to AAF-supplied explosion vents. Additional and/or different steps, equipment, etc. may be needed for vents and other equipment not supplied by AAF. Further, the following is a non-exhaustive list of recommendations, and users must carefully read, among other things, the manufacturer's explosion vent guide for further instructions.

10.1 Installation of the explosion vent

If an explosion vent is ordered with the OptiFlo RC, the explosion vent is shipped separately from the collector. Ensure no damage has been done to the explosion vent during shipping or handling.

The OptiFlo RC will have a frame constructed as part of the unit where the explosion vent is mounted. The number of explosion vents and location of the explosion vent will be detailed on the collector drawing.

10.2 Assembly

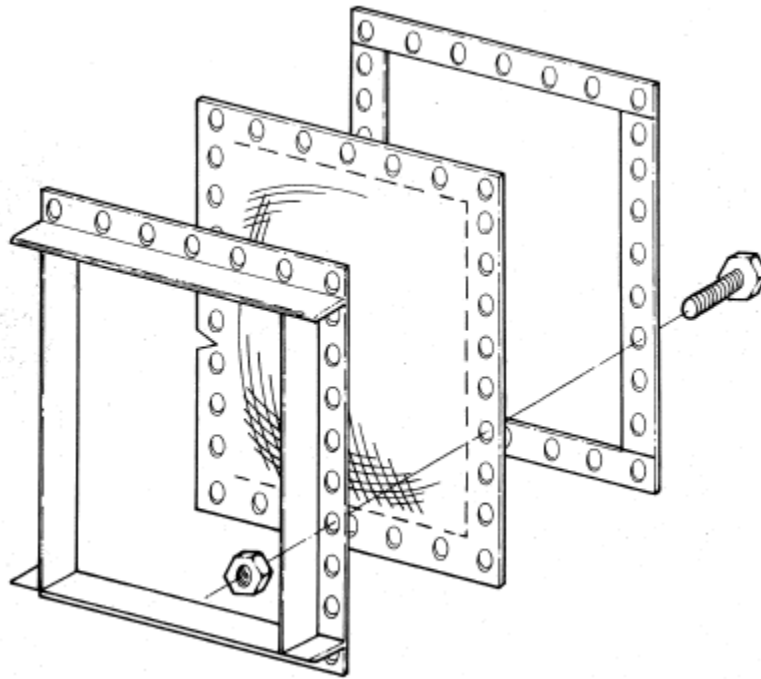
Gripping the opposite sides, carefully remove the explosion vent from the crate that it was shipped. Avoid excessive flexure of the explosion vent while handling.

CAUTION: The edges of the explosion vent can be sharp.

CAUTION: Incorrect installation of the explosion vent can cause the panel to not open at the rated burst pressure.

Place the explosion vent over the bolt holes of the frame. Make certain the dome is protruding outwards. Install the outlet frame.

Install bolts and washers (x2) and tighten hand tight.



Typical Explosion Vent Installation.

To ensure proper installation of your explosion vent, carefully read the separate manufacturer's explosion vent installation guide.

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

10.3 Explosion Vent Burst Sensor

All standard explosion vents come with a burst sensor. This can be connected to an AAF Control Center or to the customer's controls to shut down the unit when an event occurs.

The magnetic sensor is suitable for use in Class I and II, Division I, Groups A to G.

Under normal operation, when the disk is closed, the switch is closed. When the disk opens, the switch opens (no electrical flow).

The connection cable is two wire, 3 feet long and has a voltage of 30VDC and current of 10 mA. This cable will be wired on site.

10.4 Servicing

Explosion vents should be inspected regularly to confirm physical and operational condition. Reference the manufacture's recommendations and consult with the authorities with jurisdiction. Replace any damaged or worn parts immediately.

10.5 Safety distance

The material discharged during a vented explosion must be directed outdoors.

Locating equipment with explosion vents outdoors is always recommended.

Measures should be taken to reduce the risk to personnel and equipment from the effects of fireball temperature and pressure. In the event of a vented explosion, use the guidance detailed in NFPA 68 to determine the maximum width and height of the flame.

11 START-UP & OPERATION

11.1 Start-up checklist

Check the compressed air supply to the OptiFlo RC to ensure correct and safe connection to the compressed air manifold(s). Turn on the compressed air supply to the manifold(s). Pressure available should be 90-100 psig.

Check that cartridges are properly installed and that the red cam-lock handles on the port hole doors are all fully engaged (see Section 9.2.7).

Ensure the hopper discharge device(s) (if any) is operating properly. Follow the manufacturer's instructions.

Energize the pulse controller and ensure the correct mode and parameters are set (reference to the controller manual).

Listen for firing of the pilot solenoids and diaphragm valves to determine that they are all operational. Note that as each solenoid is activated, a "click" can

be heard and a small vibration can be felt on the cover of the solenoid valve enclosure. When the diaphragm valve is activated, a small jet of air vents from the hole at the solenoid valve base and there will be a sharp noise as the compressed air is allowed to escape from the compressed air manifold.

Before introducing any dust to the collector, turn the power off to the controller and reset the high and low set points to 3" w.g. and 2" w.g., respectively.

Start the fan with the fan damper or duct blast gates partially open. At the same time, observe the controller's differential pressure gauge. This gauge indicates the differential pressure across the filter elements and dust cake. Rising pressure on the gauge shows that dust is being collected. When the gauge shows 2-3 in W.G., the fan damper or blast gates may be adjusted to their normal position. At this time, the power to the timer should be turned on.

Check the controller again. It should read between 2 to 3" w.g. with slight fluctuations each time a pulse occurs. This indicates that the factory setting of the differential pressure, or timer, is correct. Excessive pulsing can cause premature cartridge wear. On demand pulse units do not change on time pulsing interval, but instead change the pressure settings.

11.2 Normal operation

The operation of the OptiFlo RC is fully automatic and does not require constant supervision.

The OptiFlo RC is assumed to be part of a system that will include a fan and possibly other components, supplied by AAF or other companies.

For successful operation of the OptiFlo RC, it must be ensured that:

1. A suitable, dry compressed air supply to the compressed air manifold(s) is available and connected to the collector at all times.
2. The power supply to the pulse controller is on.

3. There is awareness of the operation of the dust disposal equipment so that collected dust is not retained in the hopper(s).
4. The fan is operating at the specified conditions.

A record of operational data should be made and kept up to date. This is covered in the maintenance section of this manual.

12 RECOMMENDED MAINTENANCE

12.1 Record Keeping

It is suggested that a record is kept of operational data and that all servicing maintenance is recorded. A maintenance log is included in this IOM.

Operational data to be recorded could include measurements taken of the air flow rate and the pressure differential across the cartridges. This should be recorded weekly or monthly. This record can assist with maintenance schedules and show collector variances due to operations.

Maintenance data to be recorded should include details of inspections and any parts replaced.

See final page of IOM for Maintenance Interval Checklist.

The following maintenance intervals are recommendations by AAF, your dust collection system may need more or less frequent maintenance plans.

12.2 Initial Weekly Maintenance

This should be done during the first month of initial collector operation.

Record the differential pressure across the cartridges at start-up. Record the collector differential pressure regularly for at least the first 30 days of operation.

Adverse operating conditions can be detected by a change in differential pressure. The differential pressure can be read on the display of the pulse controller. After start-up, the dust collector's differential pressure should settle to approximately 2-3 inches w.g.

The filter cleaning cycle is automatically controlled from the pulse controller with either the differential pressure set points or the timed interval used to maintain a steady pressure differential across the filter.

Do not be alarmed if cleaning pulses cause momentary spikes in the differential pressure readings.

NOTE: The time interval between pulses is factory pre-set at 30 seconds. It may be changed and is dependent on the application. Effective cleaning is reliant upon pulse frequency, duration and pulse compressed air pressure. The pulse duration is pre-set at 100 milliseconds. DO NOT change the factory setting without contacting an AAF International representative.

Inspect the dust disposal equipment on a regular basis during the first month of operation to determine that the collected dust is being disposed at a rate consistent with the operation. Failure to ensure that the collected dust is taken away at the appropriate rate will result in material building up into the hopper and could cause malfunction. This is especially important if the dust is being collected into drums or other such container. Once the dust collection rate is understood, a maintenance schedule for emptying the containers should be set.

12.3 Six months

Examine the cartridges for any wear, damage, or excessive deposition of dust. Consult the records for differential pressure and flow to identify signs of rising differential pressure across the cartridges. If the cartridges can no longer maintain a consistent differential pressure, the cartridges need to be replaced. Replacement of the cartridges should occur as soon as possible.

Examine the porthole door seal and internal gasket for wear.

Examine the porthole door cam mechanism for wear.

Inspect all joints for evidence of air or dust leakage.

Check for evidence of moisture or dust build up within the collector. Moisture in the collector can cause plugging and premature cartridge failure.

Check all electrical apparatus for proper operation.

Check for correct operation of the solenoid valves and the diaphragm valves.

Check discharge air condition for signs of dust. See Troubleshooting if bypass occurs.

Check the dust disposal equipment for correct operation and comply with any lubrication or maintenance instructions in the relevant manufactures' instructions. If an AAF barrel top adapter is installed, check the condition of the flexible, or hard pipe, sleeve and replace if showing signs of wear or if torn.

Check all safety & warning labels are intact and legible and secure.

12.4 Annual Maintenance

Remove the diaphragms and inspect the valves for wear. Replace them with new items if required.

NOTE: a replacement diaphragm and valve are supplied in the diaphragm replacement kit.

Remove the used solenoids from within the solenoid box enclosure and replace them with new items if required.

NOTE: AAF recommends having a spare set of diaphragm and solenoid kits available at all times.

Inspect all gaskets and panels for possible leak points. Replace gaskets and re-caulk panels as necessary.

12.5 Cartridge removal and installation

Turn the pulse controller on so that at least one complete pulse cycle is initialized (i.e. every cartridge has been pulsed at least once). This will ensure optimum safety and ease for cartridge replacement.

Disconnect power and lock out any electrical power sources before servicing.

CAUTION: Dirty cartridges may be heavy, use caution when removing the cartridges from the dust collector.

Do not operate the dust collector with missing or damaged cartridges.

The working area requires good ventilation. Some applications involve hazardous gasses and dusts. Check with an authorized person before work commences to avoid exposure to hazardous substances. Appropriate PPE should be considered and worn.

In order to minimize escape of dust particles which have been deposited in the cartridges, it is recommended the used cartridges are placed into polyethylene sacks as they are withdrawn from the unit for ultimate safe disposal.

Replace the cartridges on the top row first, making your way down the collector. This will help dust from bypassing into the clean air plenum and reduce dust collecting on new cartridges.

Procedure:

1. Ensure that protective personal equipment (PPE) is worn, which may include, but not limited to, protective clothing, breathing masks or breathing apparatus, head, hand, eye and ear protection, approved footwear.
2. Ensure that a sufficient quantity of polyethylene sacks is available at the porthole access door level.
3. Turn off the compressed air and run the pulsing sequence allowing time for the compressed air in the manifold to be fully exhausted.
4. Lift the red handles on the porthole access door covers and swing open the doors on their hinges.
5. Slide the used cartridges out of the collector and dispose of in polyethylene sacks.

6. Clean the access doors internally and wipe clean the door gaskets. Inspect the door seals and gaskets for damage. Replace any worn seals or gaskets.
7. Inspect new cartridges for damage from shipping, storage or handling. DO NOT use damaged cartridges.
8. Slide the new cartridges onto the support mandrels (normally two cartridges per mandrel) gasket end first. While installing cartridges be careful that cartridges do not contact the housing etc. which might damage or puncture the cartridges.
9. Swing closed each porthole door. Ensure the cam action door closure mechanism engages with its counterpart on the end of the mandrel. Fully engage the clamping handle which pulls the door closed and seals the cartridge by slightly compressing the gaskets.
10. If necessary re-set the tensioning nut inside the door which adjusts the amount of gasket compression.
11. Re-open the compressed air to operating pressure (90 psi).

12.6 Accessories

AAF accessories should be inspected for wear or damage on the same interval as the cartridges.

Any accessory equipment should follow the maintenance schedule that is included in the manufacturer's IOM.

See final page of IOM for Maintenance Interval Checklist.

13 TROUBLESHOOTING

13.1 High differential pressure

Issue: Improper pulse cleaning

Solution: Investigate further, check the wiring, fuses, settings on the pulse controller, failure of the pulse controller

Issue: Lack of compressed air

Solution: Check compressed air supply, valves and gauges, any CA filters. Correct supply pressure should be 90-100 psig

Issue: Diaphragm valve failure – may be indicated by non-action or a continuous hissing from one valve

Solution: Replace diaphragm and spring if faulty

Issue: Solenoid “pilot” valve malfunction. Listen for clicking of each solenoid and momentary venting as solenoid is energized.

Solution: Replace solenoid

Issue: Air in leakage at hopper – at dust discharge device

Solution: In-leak of air at the hopper will lift collected dust back up onto the cartridges causing high differential pressure. Check integrity of the air seal at the dust disposal device (gate valve, barrel, rotary valve etc.) referring to the relevant IOM and taking all safety precautions

Issue: Moisture/Condensation

Solution: Free moisture on the cartridges will inhibit dust release and cause high differential pressure. Run the pulse cleaning in timer mode with the fan off for at least 15 minutes (“off line cleaning”) to release the sticky material. Investigate the cause of the excessive moisture and consider remedies such as elimination of rainwater in-leakage in the ductwork, process variations, water in the compressed air manifold.

Issue: Static Electric charge effects may occur with very highly electrically resistant dusts (e.g. polypropylene dust) and in very dry applications

Solution: Switch to AAF Anti-Static cartridges.

Issue: Inlet overload situation

Solution: Excess airflow and/or excessive dust loading will cause high differential pressure. Measure the airflow, and measure, or estimate the inlet dust loading. Compare with the original design criteria.

Issue: Non-standard cartridges fitted

Solution: Replace with AAF supplied replacement cartridges

Cause: Cartridge won't clean through pulsing

Solution: Cartridges have a finite life. Eventually the dust can become deeply embedded or adhere to the media so that even the most vigorous pulsing will not recover an acceptable permeability. Replace with a new set of AAF cartridges.

13.2 Visible Discharge (emission to atmosphere)

Issue: Damaged cartridges / damaged gaskets

Solution: Check gaskets on the cartridge and door to ensure good condition and no leak points. Check cartridge media for holes or damage for possible paths of bypass. Perform a leak test with dye if needed.

Issue: Cartridges not clamped at correct tension.

Solution: Ensure the cam action door mechanism is correctly set. There is an adjustment nut. Correct setting will compress the cartridge gaskets by approx. 25%.

Issue: Non-standard cartridges fitted

Solution: Replace with AAF supplied replacement cartridges

Issue: Over-temperature excursion has occurred

Solution: Investigate damage to cartridges and gaskets and replace as necessary. Investigate cause and consider replacement AAF cartridges with a higher temperature rating

13.3 Insufficient Extraction

Issue: Fan Problems

Solution: Consult Fan IOM

Issue: Duct / damper problems

Solution: Consult system supplier

Issue: High pressure differential at OptiFlo

Solution: See section 13.1

13.4 Other Problems

Issue: Dust build up in hoppers

Solution: Investigate for malfunction of dust disposal device – rotary valve, screw conveyor. Consult relevant IOM

Issue: Dust build up in hoppers

Solution: Failure to empty dust receptacle(s). Increase frequency of emptying. Consult maintenance log.

Issue: Dust build up in hoppers

Solution: Air in-leakage at dust disposal device. See item 13.1

Issue: Moisture in the collected material causes it to stick in the hopper.

Solution: Consider changing the process so that less moisture is drawn into the OptiFlo, or that some warm dry air is included in the extraction system to drive the combined flow further from the dew point. Consider application of thermal insulation to the hopper walls and electrical trace heating

14 RECOMMENDED SPARE PARTS LIST

Item	Description	Recommended On Hand Spares
1	Internal Door Gasket	10% of doors
2	External Door Gasket	10% of doors
3	Diaphragm Valve Repair Kit	10% of set
4	Solenoid Valve Repair Kit	10% of set
5	REDClean Cartridge	1 full set
6	Pulse Controller	1
7	Explosion Panel	1

AAF® INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Maintenance Log- OptiFlo RC							
Serial Number	Model Number						
Daily (first week)							
Date							
Differential Pressure							
Record compressed air pressure							
Are solenoids operating?							
Are diaphragm valves operating?							
Dust disposal level recorded?							
Weekly							
Date							
Differential Pressure							
Record compressed air pressure							
Check hopper is empty							
Dust disposal level maintained?							
Monthly							
Date							
Examine outer door gasket							
Examine door cam mechanism							
Is moisture present in collector?							
Six Month Check							
Date							
Examine cartridges							
Examine outer door gasket							
Examine inner door gasket							
Check correct electrical operation							
Examine dust disposal equipment							
Examine auxiliary equipment maintenance							
Annually							
Date							
Replace diaphragm valves as needed							
Replace solenoid valves as needed							
Examine inlet ductwork for dust accumulation							
Examine outlet ductwork for dust accumulation							
Examine and replace all air lines and DP tubing for cracks or clogging							

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