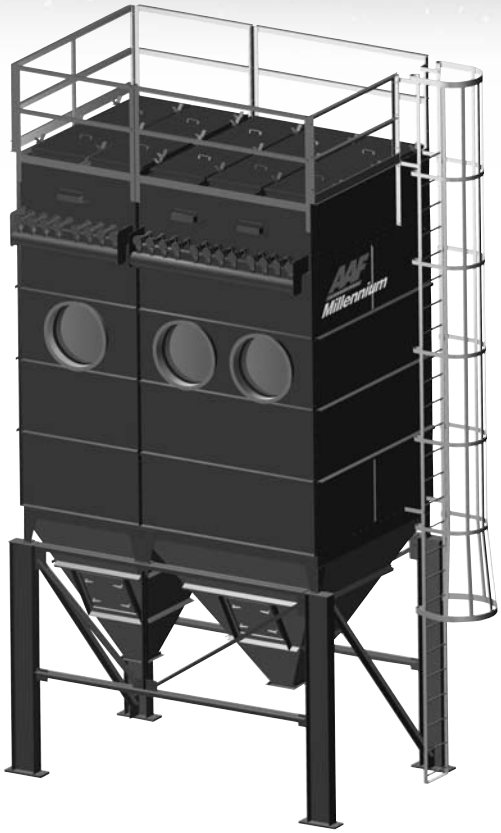
AAF INTERNATIONAL *Better Air is Our Business®*

AmericanAirFilter® Millennium®

Pulse-Jet Fabric Dust Collectors

Installation, Operation, and Maintenance Instructions



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1.0 Introduction

1.1 About This Document

This document contains the information necessary to properly receive, assemble, install, operate, and maintain the Millennium dust collector. The purchaser, installer, and operator of the Millennium MUST read this document in its entirety prior to receipt and operation of the equipment.

CAUTION: These instructions are specific to the Millennium dust collector. 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 and federal codes.

1.2 Shipping and Receiving

The Millennium modules are packaged for domestic transit and shipped FOB factory.

Obtain the original purchase order, the product drawing that was submitted for the order, and a copy of the Bill of Lading along with any other shipping papers. Upon receipt of the Millennium, these documents should be used to ensure the correct modules/assemblies have been received.

Complete the following steps upon receipt of the Millennium:

- Inspect the shipment and all associated documentation. Notify the carrier immediately if there is any damage to the shipment, or a discrepancy in the shipping papers.

- Confirm that the equipment received agrees with the shipping documents.
- Confirm that the shipping documents agree with the Purchase Order (P.O.). Refer to the product drawing submitted for the order, as necessary.
- Confirm that the document package, consisting of a copy of the IOM, the handrail, ladder, leg and brace installation drawings, and the electrical connection diagram, has been received with the shipment.
- If it is determined that modules/assemblies or any other equipment specified on the P.O. has not been delivered, and is not accounted for in the shipping documentation, contact AAF International immediately at 800.477.1214.

The shipment will consist of assembled modules and some loose parts for attachment at the jobsite, and will include the following components:

1. Fully assembled plenum, housing and hopper modules.
2. Support structures including leg and bracing assemblies. See drawings included with shipment for the proper number of parts.
3. Compressed air manifold connection kits for multiple modules.
4. One pulse control assembly for each unit.
5. Filter bags and cages. These filter elements may be shipped and received separate from the other listed components.
6. Safety hand rails for standard plenum style units.
7. Safety ladder and cage assembly
8. Hardware kit
9. Caulk

NOTE: Anchor bolts for bolting the equipment to the foundations and hardware for connecting the inlet and outlet ducts are not included with the Millennium and must be supplied by others.

Optional components such as hopper discharge devices, gauges and other ancillary equipment may also be included in the shipment. Consult the P.O. and shipping documents to confirm.

1.3 Assembly

The Millennium has been designed specifically to minimize the amount of jobsite assembly required. Consult with an experienced rigger for an accurate estimate of the time and equipment that will be required. All jobsite assembly will be limited to bolting components together. NO WELDING WILL BE REQUIRED. Following is an outline of the assembly required for a standard Millennium. See Figure 1 for details of the Millennium:

1. Assemble Leg & Brace structure.
2. Seal with caulk and bolt together each adjoining module (if multiple modules have been supplied).
3. Raise each module/assembly, and then attach and anchor to the support legs and bracing structure.
4. Install the safety ladder.
5. Install the safety railing.
6. Install compressed air manifold interconnection kit(s) (if multiple modules have been supplied).
7. Install compressed air manifold customer supplied condensate drain(s).
8. Connect compressed air supply to the compressed air manifold.
9. Mount and wire the pulse control.
10. Attach inlet and outlet air ducts.
11. Install the filter elements.
12. Install optional components.

Detailed instructions regarding each of these operations are provided in subsequent sections of this manual.

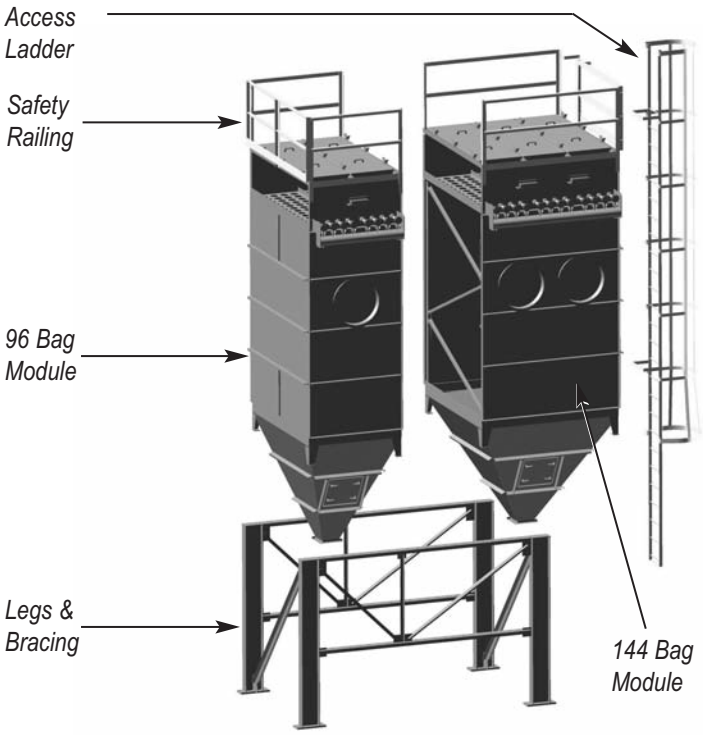


Figure 1. Millennium Components

NOTE: The modules will normally be bolted together prior to attaching the legs, handrailing, and ladder.

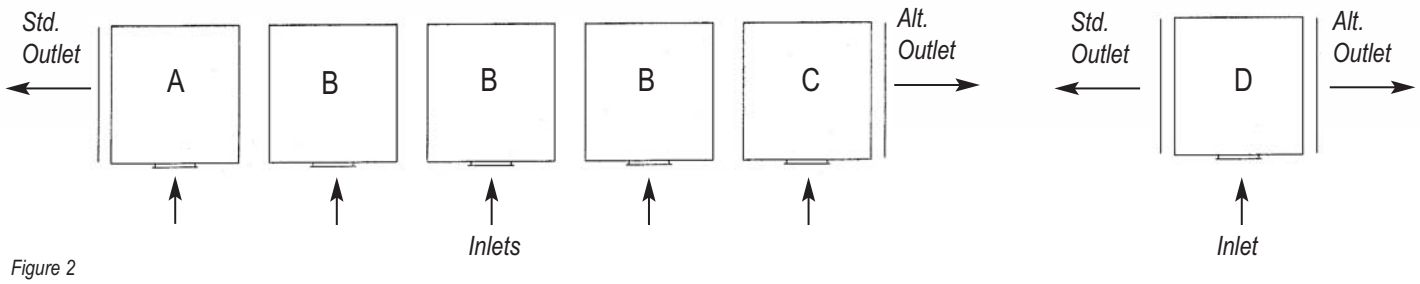


Figure 2

1.4 The Millennium - A Description

The standard Millennium collector comes in 14 basic sizes. The size variations are composed of combinations of either 96 bag or 144 bag modules, with one to five modules per unit. The Millennium will use 5 1/4" diameter bags in a 7" x 7" spacing pattern. Bag lengths of 8, 10, 12, and 14 ft. are available.

Standard module combinations are listed below. The 96 bag modules are indicated as “96” and the 144 bag modules as “144”. The letter designation refers to the diagram shown above in Figure 2.

Size	Module Arrangement
96	D96
144	D144
192	A96 + C96
240	A96 + C144
288	A144 + C144
336	A96 + B96 + C144
384	A96 + B144 + C144
432	A144 + B144 + C144
480	A96 + B96 + B144 + C144
528	A96 + B144 + B144 + C144
576	A144 + B144 + B144 + C144
624	A96 + B96 + B144 + B144 + C144
672	A96 + B144 + B144 + B144 + C144
720	A144 + B144 + B144 + B144 + C144

There is no limit to the size collector that can be supplied. However, any arrangements exceeding the combinations listed above will require intermediate support legs and additional outlets in order to maintain acceptable airflow velocities. See contract drawings for details.

The modular design will permit an existing Millennium system to be expanded with no significant disruption to the operating unit(s).

Housings, hoppers, plenums, and tube sheets are made of 10 ga. carbon steel. Modules are available for -20" and -30" w.g. plenum pressure, and for temperatures of 180, 270, and 400 degrees Fahrenheit. Consult the P.O. and submittal documents to verify which version you have.

Support legs are designed for 130 mph wind or Universal Building Code seismic zone 4 loading, and are available for hopper clearances of 4, 6, 8, and 10 ft. Up to five modules may be bolted together and supported by one set of 4 legs. Standard design is for 4 ft. hopper clearance.

The standard Millennium is supplied with a pyramid style hopper. A trough style hopper is available as an option. Pyramid hoppers have a minimum side slope of 60 degrees and a flanged outlet of 12" x 12" with a drilling that matches an optional Rotary Lock. The trough hoppers have a 10" wide opening with drilled flanges for conveyor mounting. Both types of hoppers have quick release lift-off access doors.

The outlet plenum can be either open to roof top access or walk-in style. Outlets may be located at either end of the plenum, and have a 2'-1" x 8'-4" opening with a standard drilling as shown on the drawings.

2.0 General Description

The Millennium is a modular, continuous, automatic, self-cleaning, fabric pulse-jet dust collector. The standard module is an open top design. Flanges inside the roof top doors prevent water from leaking into the housing. The access doors are lift-off type. Each size 96 module has two doors; while the size 144 module has three doors. The walk-in plenum design will have one 20” x 60” access door opening at one end of the unit, opposite the air discharge opening. Handrails and ladders are supplied with both plenum types. An optional air and solenoid valve service platform is available. The access ladder is selected to accommodate both bag length and hopper clearance. On a standard roof top access unit, using a 12 ft. bag with a 10 ft. hopper clearance, or a 14 ft. bag with either an 8 or 10 ft. hopper clearance, the access ladder is supplied in two sections with an intermediate platform, to comply with OSHA regulations.

The cleaning cycle is controlled by a solid-state timer located in a NEMA 4 enclosure. The timer control can be field adjusted for proper operation. (See Bulletin E-97)

All modules are constructed with a 6" diameter surge tank (compressed air manifold) which is fitted with 1 1/2" diaphragm pulse valves. Pulse valves are connected to solenoid pilot valves with plastic tubing on standard units, and with metal tubing on high temperature units. See figure 3 for details of the compressed air surge

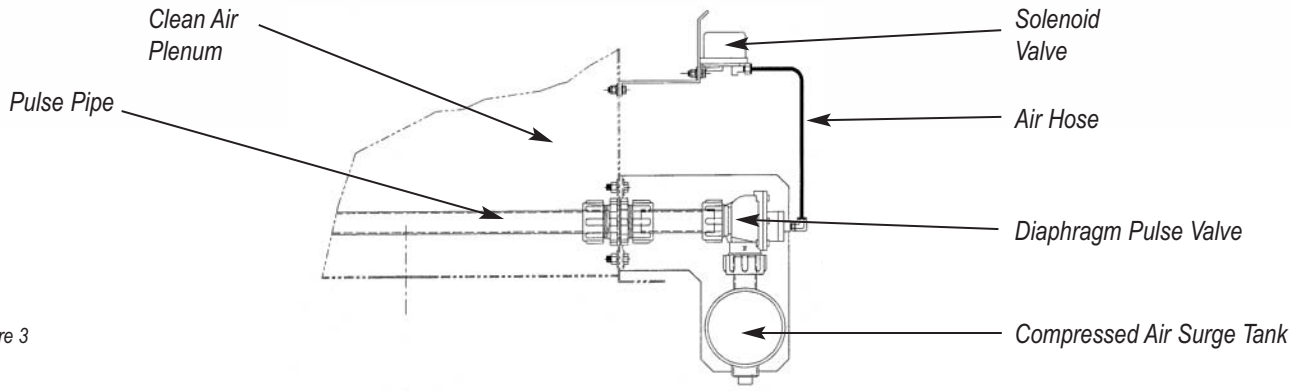


Figure 3

tank/pulse pipe assembly. Each pulse valve serves twelve bags. Pulse pipes are 1 1/2", schedule 40 pipe and have a quick disconnect coupling and a pinned end.

Standard collectors are primed and finish painted on the exterior with high solids alkyd enamel. Interior surfaces have a prime coat. High temperature collectors have one coat of zinc rich primer. Special paint coatings are available as an option.

Some of the more common optional features available with the Millennium include pressure demand cleaning, explosion vents, inlet adapter plates, an arrangement to permit installation of up to 4" thickness insulation at the destination job site, walk-in plenum, trough hopper, high temperature features, and various ancillary components. Consult the P.O. and submittal documents for what is included with the specific order.

3.0 Installation Instructions

Consult the product drawing that was submitted for this order before proceeding.

3.1 Space Requirements

A minimum of 24" clear space must be allowed on all sides of the collector that do not include the access ladder or ductwork. The side where the access ladder is located requires a minimum clear space of 46". For Walk-in Plenum units a minimum of 48" must be allowed on the manifold side. More space may be required where inlet or outlet ductwork and the explosion vent is located. For standard plenum top access units, be sure to allow adequate height for removal of bags and cages.

3.2 Foundations and Anchoring

The foundation must be designed to be adequate to support the collector's operating weight (see Section 9), seismic, wind and snow loads (if any), collected dust, and any optional equipment, in accordance with appropriate codes. Secure all anchor bolts to ensure that the collector is firmly attached to the foundation. Base plates on columns may require grouting after leveling. Multiple module units, operating at elevated temperatures, may require expansion provisions in the structural supports (see erection drawings for details).

3.3 General Erection Procedure

1. Spreader bars must be used at all times when handling the Millennium to prevent any possibility of damage. These shall be connected to the lifting lugs provided on the Millennium for this purpose. Only personnel experienced in rigging and handling heavy equipment shall be employed to erect the Millennium. Refer to proper drawings for specific lifting instructions for module configuration.
2. All modules shall be separately positioned on the structure and adjacent to one another in the order in which they will be joined together. (See Section 1.4)
3. All joints between one of the end modules and adjacent modules shall be prepared for connection to one another. This applies to all perimeter and internal connecting flanges. Ensure the following:
   - All flanges are flat and planar. Correct any bending, warping, or denting that may have occurred when the modules were being transported or handled.
   - All flanges are clean and free from debris, contamination and discontinuities of any kind, such as weld or paint splatter, mud, rust, oil, or grease.
   - All bolt holes are correctly aligned.
4. Caulk all connecting surfaces using the caulking compound supplied. On standard units, this is a butyl caulk. Silicone caulk is supplied on units rated to 400°F. See Figure 4 for the method of applying caulk to a housing flange.

CAUTION: Particular caution must be exercised when sealing the internal connection between the tube sheets in adjacent modules. The tube sheet is the horizontal plate through which the filters are inserted and which forms the barrier between the clean and dirty air sides of the collector. The flange of the tube sheet between modules is provided with a double row of bolt holes. Each row of holes shall be caulked as shown in Figure 4. It is only necessary to apply caulk to one face of each joint. Apply the caulk liberally to ensure an effective seal.

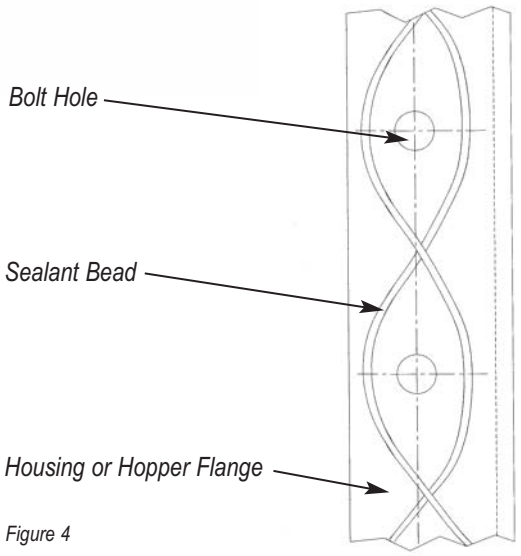


Figure 4

5. When the caulking has been applied, and before it dries, join the modules and bolt them together, placing the bolts and washers in every hole provided. Tighten the bolts fully.
6. Repeat the procedure described in Section 3.3, steps 3 through 5, until all of the modules have been connected.

NOTE: Depending on the availability of space, the ability to maneuver equipment, and the size of the collector, it may be necessary to modify this erection procedure. This may be done at the discretion of the rigging contractor after thoughtful consideration and consultation with an AAF representative.

3.4 Ductwork

Connect the inlet duct to the drilled and flanged inlet(s) of the collector. Connect the clean air duct to the drilled collector outlet. Ductwork should be of sufficient gauge to withstand the system design pressure and should be independently supported. **The Millennium is not designed to support ductwork.** Hot gas ducts may require expansion joints to prevent expansion loads on collector inlets and outlets.

Close coupling a duct elbow to the collector inlet will result in an uneven velocity profile. This condition may result in less than optimum collector performance. A straight run of duct with a length equal to three to four duct diameters immediately before the inlet will provide an adequate airflow distribution to the inlet.

When attaching inlet and outlet ducts, caulk the flanges appropriately to ensure that no leakage will occur during operation.

3.5 Ladder and Handrail Assembly

It is necessary to install the access ladder and handrails after assembling the collector. The first step is to position the handrails into place and secure them with bolts at the posts. The kick plates are integral to the handrail sections. Refer to the installation drawings supplied with the equipment for details.

The access ladder assembly is complete with a safety cage and mounting brackets. Bolt (or weld) the ladder to the collector housing, as shown in the installation drawing. The ladder assembly has mounting brackets which attach to the housing and to the hopper/housing flange. Ladder mounting brackets may be bolted (or field welded) to the collector.

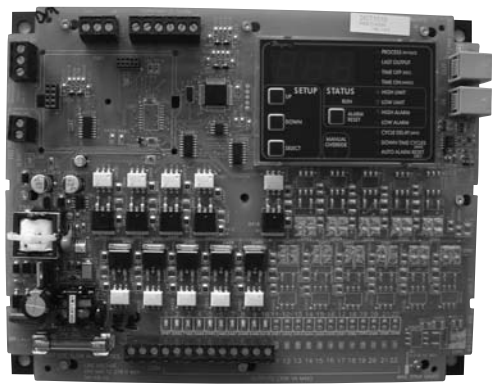
3.6 Electrical Controls and Wiring

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

The standard Millennium dust collector is supplied with electrical solenoid valves mounted in a NEMA 4 enclosure installed adjacent to the pressure manifold, and a pulse/timer control (normally one control system is supplied for a complete unit). As previously mentioned, a number of control and wiring options are available with the Millennium. In lieu of the standard offering, your Millennium may be supplied with a pressure demand control, or NEMA 9 rated solenoid enclosures. Consult the contract drawings for details.

Always mount the control enclosure in an accessible location. Control wiring must then be field installed between the solenoid valves in the enclosure adjacent to the pressure manifold and the timer output terminals in the control enclosure, as shown on the electrical connection diagram. Refer to the drawing supplied with the equipment for details. All electrical wiring material and labor will be supplied by others.

Control Board without module



Control Board with module

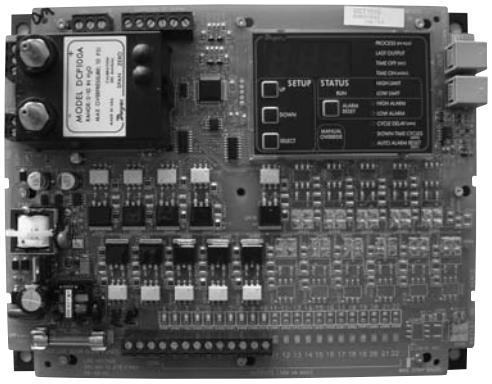


Figure 5.

CAUTION: To avoid permanent damage to the solid state control:

1. DO NOT connect 120V to the “PS” terminals.
2. DO NOT connect 120V to any of the “Output” terminals.
3. DO NOT connect an “Output” terminal to ground. The fuse on the panel does not protect from a direct short.

Power should be supplied to the solid state timer board across terminals L1 and L2 as shown on the connection diagram. When the power is energized, the “Power On” light should illuminate. The collector should not be permitted to pulse for an extended time without compressed air supplied.

CAUTION: Operation without compressed air can damage the solenoid valves.

The pulse interval and duration is controlled by the solid state timer. The pulse interval (Time Off) is factory set at 10 seconds and should be reset to 30 seconds, which is satisfactory for most applications. However, since dust loads, media velocity, and other factors vary, it may be necessary to readjust (field adjustable to 255 seconds) the pulse interval to meet individual requirements. Contact your AAF representative for assistance. The duration (Time On) is preset at 100 milliseconds.

CAUTION: The duration (Time On) should not be adjusted without consulting your AAF representative.

SEE BULLETIN E-97 FOR COMPLETE INFORMATION ON SETTING THE DCT CONTROL.

3.7 Compressed Air Connections

Compressed air must be clean, dry, and pressure regulated to avoid failure or plugging of the pulse valves. Compressed air filters are recommended for removal and automatic discharge of minute particulate contaminants and coalesced liquids. A pressure regulator is needed to ensure that the compressed air supply does not exceed 100 psig. If the dust collector is located outdoors, care must be taken in choosing these devices and their locations to ensure that their temperature limits are not exceeded.

A pressure gauge is supplied by AAF and should be installed in the compressed air supply line near the compressed air manifold. The pressure gauge should be positioned so that it can be easily read.

3.8 Bag, Cage and Venturi Assembly, and Pulse Pipe Installation

The bag, cage and venturi assembly, and pulse pipe assembly are illustrated in Figure 6. Ensure the inlet and outlet ductwork is connected and that the clean air plenum has been cleaned, before installing the bags.

Always handle the filter bags with care and keep them dry. Pleated bags are installed in a similar manner to standard bags; however, no cage is required.

CAUTION: During reinstallation of pulse pipes, ensure the holes in the pipe align over the center of the venturi and point downward.

3.9 Roof Doors

After the bags, cage and venturi assemblies, and pulse pipes have been installed, replace and secure the roof doors. Two men are required to handle these doors, as each door weighs approximately 100 pounds. Rotate the clips between adjacent doors, and tighten wing knobs. Ensure that all doors are fully sealed.

3.10 Gauge Installation

It is recommended that a suitable pressure gauge be installed before initial startup, for measuring collector pressure drop (AAF offers an optional Magnehelic pressure gauge or a Photohelic gauge/switch). Using appropriate tubing and connectors (copper or aluminum tubing is recommended), connect the gauge high-pressure port to the static tap in the housing side (lower pressure tap) and connect the gauge low-pressure port to the static tap on the side of the clean air plenum (upper pressure tap).

3.11 Explosion Vent Installation

The optional explosion vents are factory installed. The guard to contain and prevent damage from a rapidly opening vent is supplied separately and must be field installed. Refer to the installation drawing supplied with this option for details. Explosion vents should be installed in accordance with local, national, and all other applicable codes.

3.12 Hopper Discharge Device

If supplied, attach the hopper discharge device in accordance with manufacturer’s instructions.

The collector is now ready to be started. Review the instructions thus far in this bulletin and inspect the collector to ensure that everything is assembled correctly. Ensure that bolted joints and connections are properly tightened.

For Initial Installation or Service

1. Open roof doors for access to bags (see Section 3.9).
2. Remove pulse pipes as follows:
   a. Loosen the bulkhead coupling to allow the pipe to slide out.
   b. Remove hairpin from the opposite end of the pipe.
   c. Lift the pulse pipe assembly to clear support pin and slide the pulse pipe away from the supply pipe until it has disengaged. Lift and remove.
3. If performing service:
   a. Remove cage/venturi assembly.
   b. Remove the bag by collapsing the bag cuff into a half moon shape as shown and lifting out.

NOTE: On the initial installation, cage/venture assemblies and bags are shipped loose.

4. Install new bag as follows:
   a. Insert the closed end of the bag through the tube sheet hole until the bag cuff is near the tube sheet.
   b. Collapse the bag into a half moon shape and insert into the tube sheet as shown.
   c. Snap the bag cuff into position making sure the center groove of the cuff seals properly at the tube sheet.
5. Insert the cage/venturi assembly into the installed bag. The cage top should fit snugly on top of the bag cuff.
6. Repeat steps 4 and 5 until all of the bags and cage/venturi assemblies have been installed.
7. Re-install the pulse pipe assemblies by reversing step 2 and verify that the pulse holes are pointed down and centered over the bags.
8. Close the roof doors and secure the latches.

NOTE: If installing pleated bags, do not deform the bag cuff since this may result in damage to the bag. Instead, the lower flange of the cuff should be lightly lubricated with a liquid soap solution and the cuff should be firmly pressed into the tube sheet until it snaps into position.

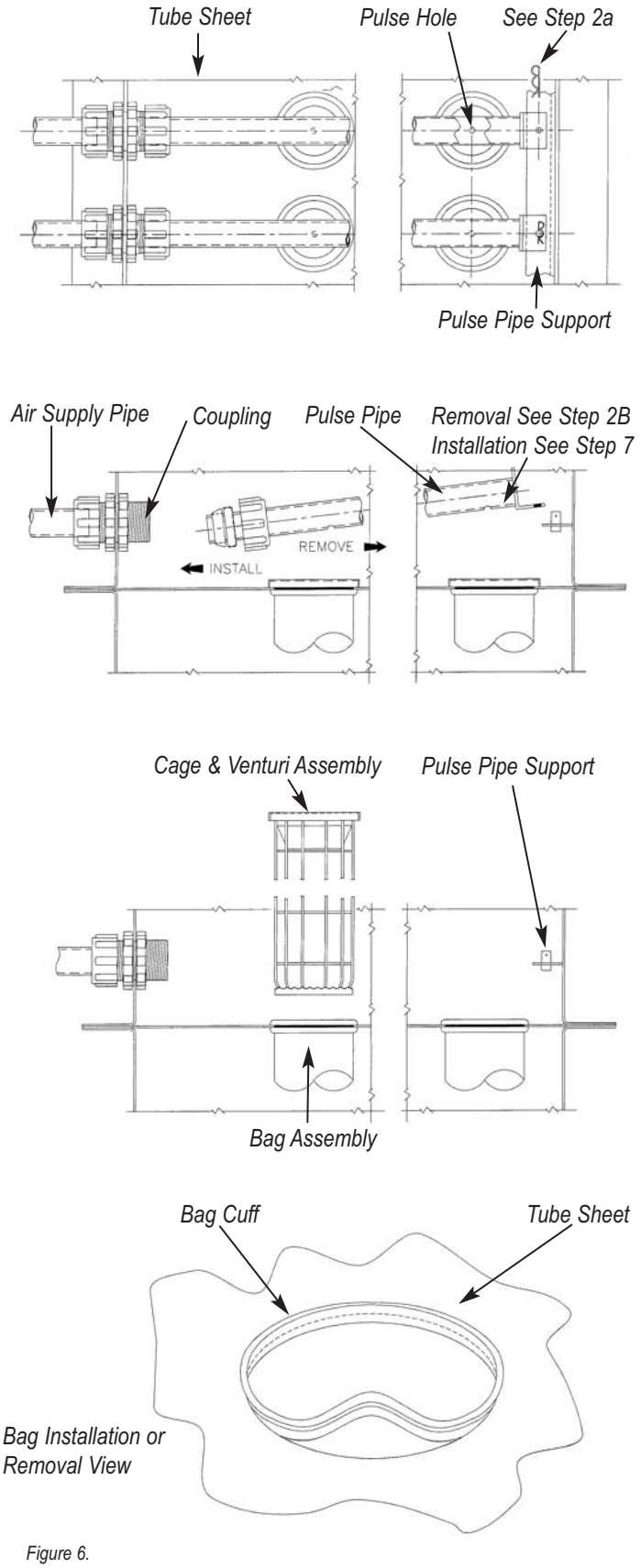


Figure 6.

4.0 Initial Startup Instructions

4.1 Preparation for Startup

1. Check the compressed air lines to ensure they are properly connected to the manifold. Turn on the compressed air supply and adjust the pressure to 80 to 100 psig. BEFORE PULSING, CONDENSATE BLEED VALVES SHOULD BE FULLY OPENED TO PURGE AIR LINES AND MANIFOLDS OF DIRT AND WATER. GOOD PRACTICE DICTATES THAT ALL PIPING BE BLOWN DOWN TO REMOVE ANY SCALE, RUST OR OTHER DEBRIS PRIOR TO PULSING THE UNIT. This can be done by removing the plug in the manifold furthest from the air supply connection and supplying compressed air to the manifold.
2. Check the bags to ensure they are in sealed position in the collector. Verify doors are closed and tightly secured.
3. Ensure the hopper discharge device is operating properly. Efficient fan sizing includes an allowance for pressure drop across filter media with a thin residual cake as the normal operating condition. During the initial dust caking period for new media, unit airflow may have to be restricted to avoid fan motor overload. This may be achieved by partial blank off of the inlet or outlet. Fan motor amperage will indicate need and adequacy.

4.2 DCT-1000 Series Timer Control

1. Energize the solid state timer control panel. The “POWER ON” and the “PROCESS” light inside the enclosure will illuminate. At this time the digital inputs on the control panel must be set. Refer to the AAF connection diagram for initial settings on control. SEE BULLETIN E-97 FOR FURTHER INSTRUCTIONS.

2 Listen for diaphragm valve and pilot solenoid firing, to determine that they are working properly.

WARNING: Before introducing any dust to the collector, turn off the power to the timer panel.

3. Start the fan with the fan damper or duct blast gates partially open. At the same time, observe the differential pressure indication on the board, which indicates the pressure drop across the dust cake and fabric. Rising pressure on the gauge shows that dust is being collected on the bag. When the gauge shows 2" to 5" w.g., the fan damper or duct blast gates may be opened to the full normal position.
4. Check the pressure gauge again. It should read a minimum of 2" to 5" w.g. with slight fluctuations each time a pulse occurs. If the pressure drop is not 2" to 5" w.g., the pulse interval (Time Off) of 30 seconds must be changed. Decrease the interval for high pressure readings and increase the interval for low pressure readings. If it is not possible to maintain the nominal 2" to 5" w.g., contact your AAF representative.

CAUTION: Do not adjust the pulse (Time On) duration before consulting an AAF representative.

CAUTION: Any decrease in “Time Off” will significantly increase compressed air requirements.

5. Follow Section 4.1, steps 1 through 3 and Section 4.2, steps 1 through 4 after installing new filter bags in the unit.

4.3 Pressure Demand Control Option

1. Energize the solid state panel. The “POWER ON” and the “PROCESS” light and digital LED will illuminate to indicate an initial 0.0” w.g. reading for the differential pressure. At this time, the digital inputs on the control panel must be set. Refer to the AAF connection diagram for initial settings on the control. SEE BULLETIN E-97 FOR FURTHER INSTRUCTIONS.
2. Momentarily set the pressure switch settings to zero to check pulsing. Listen for the diaphragm valve and pilot solenoid firing, to determine that they are working properly.
3. Reset the pressure switch with a low limit point of 2" w.g. and a high limit point of 5" w.g. and start the fan with the fan damper or duct blast gates partially open. At the same time, observe the pressure gauge, which indicates the pressure drop across the dust cake and fabric. Rising pressure on the gauge shows that dust is being collected on the bag. When the gauge shows 2" to 5" w.g., the fan damper or duct blast gates may be opened to the full normal position. Power to the control panel may be turned on from startup.
4. When the pressure gauge reaches 5" w.g., the unit will begin to pulse and will continue to do so until the pressure indicates 2" w.g.
5. Repeat Section 4.1, steps 1 through 3, and 4.3, steps 1 through 4, after installing new filter bags in the unit.

5.0 Principles of Operation

An understanding of the design and operating principle of the Millennium is essential for effective operation and maintenance. Knowledge of the collector nomenclature is necessary so that parts may be easily identified and located.

The Millennium is a modular, continuous, automatic, self-cleaning, cloth pulse-jet dust collector. The dirty air enters the collector through one or more circular inlets. A baffle is located at the inlet to deflect the dust into the hopper, provide uniform air stream distribution, and to protect the bags from direct impingement. After the dust laden air leaves the baffle area, it passes through the filter media, depositing

the dust on the outside surface of the individual filter bags. The cleaned air leaves the filter bags and discharges into the plenum at the top of the collector, where it is then exhausted through the outlet.

The filter bags are periodically cleaned by bursts of compressed air that are directed down the inside of the bags. A venturi located in the top of the bag cage induces additional air to the inside of the bags being cleaned. This reverses the flow of air through the bags and dislodges the dust cake from the surface of the bag, allowing it to settle into the hopper. Since only a small percentage of the bags are cleaned at one time, the unit remains in continuous operation.

Hoppers are designed to receive the dust and are not for storage. The recommended practice is to continuously empty the hopper by means of a rotary lock and/or screw conveyor, or by some other discharge device.

6.0 Maintenance

6.1 Daily

Record the collector pressure drop daily for at least the first 30 days of operation. Adverse operating conditions can be detected by a change in pressure drop. An optional pressure gauge is available from AAF to provide the pressure drop reading across the dust cake and fabric. After startup, the pressure drop will gradually rise to its normal operating level of approximately 2" to 5" w.g.

6.2 Monthly

A regular inspection of the filter bags should be made within 30 days of start up. Any faulty or worn bags/tubes must be replaced to prevent damage to the collector. The compressed air line regulator, dryer, and filter should be checked for proper operation. Also inspect the dust discharge device on the hopper outlet for proper operation.

6.3 Six Months

Ducts leading to and from the collector should be inspected for dust accumulation at a minimum of every six months. In addition, the following inspections should be made:

1. Examine the bags for wear with special attention to seams and stitching.
2. Examine the internal components for wear.
3. Inspect all joints for evidence of air or dust leakage.
4. Check for evidence of moisture or dust accumulation within the collector.
5. Check all electrical apparatus for proper operation.
6. Ensure the diaphragm and solenoid valves are pulsing when energized by the timer.
7. Check discharge gas condition for signs of dust.
8. Check explosion vents.

7.0 Troubleshooting

7.1 High Pressure Drop Reading

1. **Improper Timer Operation**
   Check the wiring, fuses, and setting of pulse duration and interval.

CAUTION: Do not adjust the pulse duration without consulting an AAF representative.

2. **Insufficient Compressed Air**
   Check the air supply to ensure the compressor is providing 80 to 100 psig. Check for a plugged filter in the compressed air line.
3. **Solenoid Pilot Valve Malfunction**
   Listen to verify the solenoid valves are firing. Check for momentary air venting each time they fire. Clean or replace, if necessary.
4. **Pulse Valve Malfunction**
   Pulse pipe jets should be checked to verify operation of the pulse valves. Pulse valves can be easily disassembled and rebuilt in place.
5. **Leaking Dust Discharge Device**
   A leaking rotary lock, screw conveyor, slide gate, etc. can overload the Millennium by preventing dust discharge after pulsing. This causes high pressure drop, excessive bag wear, and reduced air volume. Seal any such leaks.
6. **Condensation**
   High humidity may cause blinding of bags, which results in excessive pressure drop. Run the cleaning mechanism with the fan off and the program timer on, or with the pressure switch set to zero, to release the dust cake. If condensation is a recurring problem, pre-processing warm-up and post-processing purge periods of 15 to 30 minutes each may help. Exterior insulation may also be necessary. Sources of moisture may come from leaking process ductwork, moisture in the process gas stream, or moisture in the compressed air system.
7. **Static Electricity**
   Static buildup can cause a high pressure drop. If possible, increase the humidity using discretion to avoid creating condensation. Grounded bags may also be required in situations where a spark may result in ignition of an explosive dust.
8. **Collector Overloads**
   Too much air or dust will create high pressure drops across the collector. Check the fan speed, system design, pre-cleaners, and the damper position. Also ensure the dust load and air volume is within the system design parameters.

7.2 Visible Discharge

1. **Improperly Installed or Damaged Bags**
   Check for holes or tears in bags. Replace damaged bags. Reseal bags as necessary.
2. **Insufficient Dust Cake**
   The unit could be pulsing too often, resulting in over cleaning. Verify the pressure drop is at least 2" w.g. Increase the pulse interval until the unit is operating stably at 2" pressure drop minimum.

CAUTION: Do not adjust the pulse duration without consulting an AAF representative.

7.3 Insufficient Hood Control

1. **Incorrect Fan Rotation**
   Incorrect rotation of the fan will result in a failure to provide the required system static pressure or air volume.
2. **Fan V-Belt Slippage**
   Tighten the V-belts if necessary. Replace broken or stretched belts.
3. **Leaks**
   Leaking ductwork, access doors, explosion vents, dust discharge devices, or housing will cause insufficient suction at the pickup point. Seal any leaks.
4. **Closed Air Passages**
   Clogged ducts, closed dampers, or closed gates will shut off the airflow.
5. **Undersized Ducts**
   Undersized ducts will create excessive pressure losses for which the fan may not have been sized. Duct size should be reviewed considering the design specifications and fan selection.

7.4 Fabric Bag Problems

1. **Excessive Temperatures**
   Operating temperature should not exceed the specified maximum.
2. **Humidity**
   Humidity can blind bags. The moisture results in a denser dust cake accumulation, or cements dust to the bag. Drawing dry air through the collector may dry the dust enough to allow the collector to clean with the fan off. If this method does not work, the bags must be dry cleaned or new bags installed.
3. **Dust Characteristics**
   Each bag material is selected for specific physical and chemical characteristics which are compatible with the gas stream composition and temperature.
4. **Dust Buildup In Hoppers**
   Dust buildup in the hopper may generate a problem in the bag area and cause excessive abrasion of the bags. The buildup may be caused by a malfunctioning discharge device, or by condensation in the hopper. It may be necessary to add a vibrator to the hopper, or add hopper heaters and insulation.
5. **Bag Wear On The Inside**
   Dirt on the clean side of the bags will cause the bags to wear from the inside. This could be the result of a broken bag, incorrect bag installation, or an improper tube sheet seal. Vacuum the clean air side of the plenum, replace the bag, correct and reseal the bag in the tube sheet. Do not blow dirt inside the bags. Any dirt contained in the bags should be vacuumed out.

8.0 Spare Parts

It is recommended that the following spare parts be stored at the installation site for routine maintenance purposes. Consult with your AAF representative to determine actual quantities required.

Part No.	Description	Recommended Spares
2341881-1	Diaphragm Valve Repair Kit, Low Temperature (180°F)	10% Number Required
	Or	
2341881-2	Diaphragm Valve Repair Kit, High Temperature (400°F)	10% Number Required
2338481-1	Solenoid Valve Repair Kit (NEMA 4)	10% Number Required
5235700	10 Point Printed Circuit Board	1 Timer
5235718	22 Point Printed Circuit Board	
5235726	DCP100 Pressure Module	
2204493	Fuse	1
5232830	Pulse Pipe Connector Seal, Low Temperature (to 180°F)	Set (one for each pulse valve)
	Or	
5232848	Pulse Pipe Connector Seal, High Temperature (to 400°F)	Set (one for each pulse valve)
5232194	Pulse Pipe Hairpin (SST)	10% Number Required

When ordering replacement parts, the customer must identify the serial number of the unit, which can be found on the equipment nameplate located adjacent to the access ladder. To order replacement parts call: 800-477-1214

9.0 Equipment Characteristics, Operating Weights, and Shipping Weights for 4 Ft. Hopper Clearance

Millennium Media Area (Sq. Ft.)						
No. of Bags	Number of Modules Module Size		Standard Bags Bag Length			
	96	144	8 ft.	10 ft.	12 ft.	14 ft.
96	1	0	1015	1277	1539	1801
144	0	1	1523	1916	2309	2702
192	2	0	2030	2554	3078	3602
240	1	1	2538	3193	3848	4503
288	0	2	3046	3832	4618	5404
336	2	1	3553	4470	5387	6304
384	1	2	4061	5109	6157	7205
432	0	3	4569	5748	6927	8106
480	2	2	5076	6386	7696	9006
528	1	3	5584	7024	8465	9906
576	0	4	6092	7663	9235	10807
624	2	3	6599	8302	10005	11708
672	1	4	7106	8940	10774	12608
720	0	5	7615	9580	11545	13510

Standard Plenum Millennium w/ Pyramid Hoppers Operating Weight (Pounds)				
No. of Bags	Bag Length			
	8 ft.	10 ft.	12 ft.	14 ft.
96	7300	7830	8435	9045
144	8830	9480	10230	10975
192	11780	12640	13635	14575
240	13565	14545	15670	16760
288	15150	16255	17515	18750
336	18190	19510	21020	22445
384	19795	21230	22875	24450
432	21390	22945	24730	26445
480	24610	26385	28415	30325
528	26100	27985	30155	32210
576	27805	29815	32120	34320
624	30895	33120	35675	38065
672	32550	34890	37580	40120
720	34150	36610	39440	42120

Standard Plenum Millennium w/ Pyramid Hoppers Shipping Weight (Pounds)								
	96 Module Bag Length				144 Module Bag Length			
	8 ft.	10 ft.	12 ft.	14 ft.	8 ft.	10 ft.	12 ft.	14 ft.
Stand Alone Module	4345	4675	5050	5435	5525	5920	6360	6810
End Module	3920	4150	4415	4685	5100	5395	5725	6060
Internal & Outlet End Modules	3495	3625	3780	3935	4675	4870	5090	5310
Add for Trough Hopper	170	170	170	170	480	480	480	480
Bags & Cages	580	700	820	940	865	1045	1225	1405

	Size													
	96	144	192	240	288	336	384	432	480	528	576	624	672	720
Leg & Brace Kit: 4 ft hopper clearance	1560	1630	2055	2185	2310	2650	2790	2925	3450	3585	3720	4110	4305	4445
Leg & Brace Kit: 6 ft hopper clearance	1860	1930	2360	2515	2625	2965	3040	3195	3745	3950	4085	4520	4650	4790
Leg & Brace Kit: 8 ft hopper clearance	2260	2330	2760	2885	3010	3350	3445	3655	4185	4340	4475	4860	5030	5185
Leg & Brace Kit: 10 ft hopper clearance	2520	2590	3040	3170	3275	3615	3775	3925	4450	4605	4765	5150	5370	5795
Ladders	**4 ft hopper clearance: 480 / 6 ft hopper clearance: 570 8 & 10 ft hopper clearance: Varies with Bag length**													
Handrail Kit	445	505	665	720	780	925	985	1045	1185	1235	1305	1450	1505	1565

Notes:

1. Operating weights and shipping weights do not include options such as manifold access platforms or auxiliary equipment.
2. Operating weights do not account for dust load, wind load, or snow load.

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Walk-In Plenum Millennium w/ Pyramid Hoppers Operating Weight (Pounds)				
No. of Bags	**Bag Length**			
	8 ft.	**10 ft.**	**12 ft.**	**14 ft.**
96	9220	9735	10355	10955
144	10970	11605	12370	13105
192	14720	15565	16575	17505
240	16540	17505	18645	19725
288	18345	19435	20710	21935
336	22000	23305	25830	26245
384	23825	25245	26905	27470
432	25640	27180	29890	30685
480	29480	31240	33285	35185
528	31300	33170	35355	37400
576	33115	35110	37430	39620
624	36825	39035	41605	43985
672	38705	41030	43735	46265
720	40525	42970	45815	48485

Walk-In Plenum Millennium w/ Pyramid Hoppers Shipping Weight (Pounds)								
	96 Module				**44 Module**			
	Bag Length				**Bag Length**			
	8 ft.	**10 ft.**	**12 ft.**	**14 ft.**	**8 ft.**	**10 ft.**	**12 ft.**	**14 ft.**
Stand Alone Module	5260	5615	6065	6505	6555	6965	7500	8015
Outlet End Module	4565	4845	5205	5530	5850	6200	6630	7045
Internal Module	3995	4210	4475	4690	5290	5560	5905	6205
End Module	4700	4980	5340	5665	5990	6335	6765	7180
Add for Trough Hopper	170	170	170	170	480	480	480	480
Bags & Cages	580	700	820	940	865	1045	1225	1405

	Size													
	96	**144**	**192**	**240**	**288**	**336**	**384**	**432**	**480**	**528**	**576**	**624**	**672**	**720**
Leg & Brace Kit: 4 ft hopper clearance	1560	1630	2055	2185	2310	2650	2790	2925	3450	3585	3720	4110	4305	4445
Leg & Brace Kit: 6 ft hopper clearance	1860	1930	2360	2515	2625	2965	3040	3195	3745	3950	4085	4520	4650	4790
Leg & Brace Kit: 8 ft hopper clearance	2260	2330	2760	2885	3010	3350	3445	3655	4185	4340	4475	4860	5030	5185
Leg & Brace Kit: 10 ft hopper clearance	2520	2590	3040	3170	3275	3615	3775	3925	4450	4605	4765	5150	5370	5795
Ladders	**4 ft hopper clearance: 505 / 6 ft hopper clearance: 545 8 ft hopper clearance: 595 / 10 ft hopper clearance: 635**													
Access Platform Kit	1310	1410	1735	1840	1940	2265	2365	2465	2790	2890	2990	3320	3420	3520

Notes:
1. Operating weights and shipping weights do not include options such as trough hoppers or auxiliary equipment.
2. Operating weights do not account for dust load, wind load, or snow load.

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