

FILTER TECHNOLOGY LTD

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APPLICATION NOTES

While it is not the purpose of this manual to describe the possible applications and uses of Filter Technology Ltd's *RM* series collectors, *these units should never be used in hazardous areas or for the collection of explosive materials without prior written consent of Filter Technology Ltd.*

Maximum temperature of the incoming air should be limited to 250 degrees F, maximum pressure rating for standard shell is approximately 1 PSI or 30 inches of water. Should you have any questions regarding the use of a unit for a specific application, please don't hesitate to call us.

Safety Warnings

Warning: Read and understand this manual completely before attempting service or maintenance of the unit.

Warning: Cleaning system contains air at high pressure. Never attempt to service the unit until air supply piping is removed from the inlet side of the filter / regulator and the regulator is rotated to the complete counter clockwise position to allow air to bleed from the system.

Warning: Never attempt to perform maintenance while the unit is in operation.

Warning: Unit may contain hazardous materials as collected dust. Plant material safety data sheets (MSDS sheets) should be consulted before attempting service of the unit that involves contact with collected material.

HOW FILTER TECHNOLOGY LTD RM SERIS COLLECTORS WORK

We have designed the collector to be a simple, reliable and economical filtration system.

Filter Technology, Ltd *RM* collectors remove solids or dusts from an air stream. Dirty air enters the bottom of the lower section and is forced or drawn through the pleated bag filters where the dust is deposited on the exterior of the filter elements. The clean air continues through the center of the filter to the clean air plenum where it exits to atmosphere.

Cleaning system

The *RM* series dust collectors are designed for continuous operation. They are capable of cleaning the filter elements while the air passes through the unit. This is accomplished by directing a blast of compressed air into the top of each filter element. The compressed air blast both reverses the airflow and mechanically expands the filter dislodging the dust, which falls out of the bottom of the unit.

The cleaning system is composed of both mechanical and electrical components.

Mechanical System

The mechanical or compressed air portion of the cleaning systems starts with the supply of plant compressed air (by others) to the filter / regulator supplied with the *RM* unit. The filter / regulator removes any water and oil is automatically drained from the filter by the auto drain on the base of the unit. The regulator portion of the filter / regulator reduces the incoming air pressure (maximum input pressure is 140 PSI) to 85 PSI approximate which is the required pressure for cleaning the filters without damage.

The header stores a volume of air sufficient to allow the diaphragm valve to pulse when actuated. The diaphragm valves are controlled by the solenoid valves, which act as a pilot in that they hold compressed air on the diaphragm preventing them from opening. The diaphragm valves are actuated by the release of pressure from the solenoid valves. From the diaphragm valves the pulse of air travels through the Flexcouple to the blowpipes, exiting through holes in the bottom of the pipes and into the top of the individual filters. One row of filters is pulsed or cleaned at a time allowing the remaining units to continue to filter the air flowing through the collector.

Electric System

BIN VENTS: The electrical portion of the cleaning system consists of a timer and pressure switch, which senses the pressure differential across the filters and starts and times the cleaning cycle as necessary.

The purpose of the timer board is to provide a signal to the solenoid valves, which translate the electrical signal into the release of air pressure, which actuates the diaphragm valves.

The duration of the cleaning pulse and the interval between pulses can be adjusted to meet the cleaning demands of the application.

COMPONENTS OF THE RM BIN VENT COLLECTOR

Below is a list of the components of the collector. Please note that not every component of the unit is listed, but rather the major components are identified and a brief explanation of their function is provided.

Filter Technology Ltd reserves the right to and may from time to time substitute different components as part of the supplied equipment. Should your unit have components that differ from those described below, contact Filter Technology Ltd for additional information on your specific unit.

PLEASE REFER TO DRAWING SUPPLIED WITH THIS MANUAL.

Upper section — Clean Air Plenum

The upper section of the unit is that portion of the unit above the tubesheet flange that joins the two portions of the unit when assembled.

Clean Air Plenum

This is the basic upper half of the shell of polyethylene construction, which has an outlet for air discharge.

Blowpipe assembly

Metal pipes with holes located directly over the filters and are inserted at the opposite end in the Flexcouples.

Flexcouples

Specially designed cast urethane fittings that penetrate the housing and connect the blowpipes to the diaphragm valves to the blowpipes are held in place by two urethane nuts which provides a seal to keep air from escaping from the clean air plenum. These units are designed to accept misalignment between the location of the diaphragm valves and the housing and may be deflected somewhat. This is normal and not cause for concern.

Diaphragm valves

Right angle aluminum diaphragm valves are mounted on the header and to the Flexcouples on their discharge side. The diaphragm valves release a pulse of compressed air to the blowpipes for cleaning of the filters and are controlled by the solenoid valves (pilot valves — see operation explanation below).

Hoses and fittings to control box

Hose and fittings connect the diaphragm valve control port to the solenoid valves.

Header

The header acts as a reservoir for compressed air for the cleaning system. It is powder coated and has the diaphragm valves and a nipple on the input side for the filter regulator.

Warning: Header contains compressed air at 85 pounds per square inch or greater. Never drill, weld to, or attempt to otherwise modify this unit. Should leakage occur, remove unit from service immediately and contact factory for replacement.

Filter / Regulator

The *RM* series dust collectors are supplied with a filter / regulator to provide clean air at the proper pressure (85 PSI for internal operation) to the cleaning system of the unit. A single unit, the filter / regulator has a pressure adjusting knob on the top and a filter housing with auto drain on the bottom.

Filter enclosure

The filter / drain enclosure is accessed by pushing down on the large square metal tab located on the filter bowl and then rotating the bowl a quarter turn.

Auto drain

The filter / regulator is equipped with an automatic drain which allows continuous draining of water or other liquids captured by the filter. Discharge is through the port at the bottom.

Control box

Steel enclosure (NEMA 12), which encloses the timer control board and solenoids, unit is powder coated and need not repainting.

Control board

BIN VENTS: Solid-state sequential timer is specially designed for the *BV* series collectors. Installed on the timer board is a pressure sensor, which measures the pressure at the tubesheet. When the pressure reaches a factory preset value (approximately two inches WG) it signals the system to clean, and sequentially fires until the pressure sensor no longer calls for cleaning.

Solenoids

Solenoids are provided in the control box, which release the air pressure on the diaphragm valves when the control board provides an electrical signal. The exhaust of the solenoid is through the exterior portion of the solenoid, which extends outside of the control box.

Lower Section — Dirty Air Plenum

Tubesheet

Metal plate sandwiched between the flanged of the upper and lower plastic shell separating the clean from the dirty air. It supports the pleated bag filters in the proper position below the blowpipes. Tubesheet is bolted to lower housing at factory. Do not remove tubesheet unless gasket leaks.

Tubesheet gasket

The ¼" x 2" open cell gasket is adhered to tubesheet. This gasket provides the seal between the tubesheet and the flanges of the upper and lower housings.

Pleated bag filters

The pleated bags are spun-bound polyester that is non-shedding and have superior release characteristics.

Bag Attachment

The pleated bag filter elements are currently supplied are attached to the tubesheet by the use of a snap band collar. After snapping he collar in place, drop the filter in and press it into the collar.

Pleated Bag Installation Instructions Top Load Design

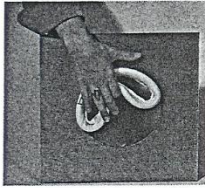


FIGURE 1

- Install snapband (arrow up) by forming the band into a kidney shape and fitting the snapband groove into the tubesheet.

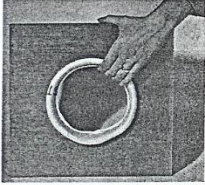


FIGURE 2

- Expand the snapband.
- Make sure that the tubesheet edge fits perfectly in the snapband groove all around the opening so that there are no bumps or creases in the band.

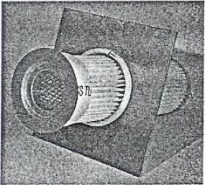
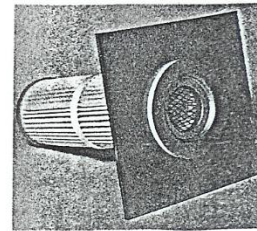


FIGURE 3

- Insert the pleated bag filter through the snapband from the top side of the tubesheet. Press down on the filter until the inner seal is aligned with the snapband.

FIGURE 4

- The pleated bag filter is properly installed when the flange is in contact with the top of the snapband. The flange will not touch the tubesheet. Airtight seal is formed by our DSS design.



Warranty

The *RM* series bin vent / dust collectors are covered by Filter Technologies Standard Warranty, Terms & Conditions. One year on the total unit when operated within the parameters and application data provided to Filter Technology. Ltd. .

NEVER CONTRACT OR COMMENCE ANY WORK, WHICH YOU BELIEVE TO BE COVERED UNDER WARRANTY UNTIL YOU HAVE RECEIVED IN WRITING FILTER TECHNOLOGY LTD'S EXPRESS WRITTEN CONSENT TO PERFORM SUCH WORK.

Installation

Inspection

Carefully inspect the unit immediately upon receipt. Any damage should be reported to the delivering carrier immediately and noted on the bill of lading prior to the departure of the carrier. If carrier has left, contact them immediately to amend the bill of receipt for damage not noted on delivery. Please note that report and making of claim for in-transit damage is the responsibility of the recipient.

Utility requirements

The *RM* series bin vent / dust collectors require the following utilities for operation:

Compressed Air

Plant type compressed air at pressure of not less than 85 PSI and not more than 140 PSI at the inlet to the supplied filter / regulator is required. Air should be clean and water or oil free (even though unit is equipped with filter, primary separation should be provided as part of the air supply). Line size should be a minimum of 3/4-inch diameter.

Electrical

Basic unit requires only 115 volts 60 cycle 1 phase electrical power for the control. We would suggest the use of a watertight plug and matching receptacle to allow the unit to be disconnected for service and maintenance.

Physical installation

BIN VENT

Attach the companion flange to the silo, then bolt and gasket the bin vent to the flange. Connect airline and 115V power.

The BV250 Mk II (*RM*) may be disassembled for transport to the installation site if necessary by removing the top (clean air plenum) from the unit. Remove the connection from the dirty air plenum (lower housing) to the control box by pushing in on the colored flange on the fitting and pulling out on the tubing. Match mark the location of the upper and lower housing, and then remove the ring clamp, which secures the two halves of the unit. If transporting the unit a considerable distance by hand, it may also be desirable to remove the filters and tubesheet from the lower unit. Once again, match mark the tubesheet to lower housing position to assure that it will be in the correct position during re-assembly. The filters are removed by removing the snap band from the inner collar of the top of the filter and then gently unseating the filter from the tubesheet (current units have a groove in the urethane collar which engages the tubesheet which must be disengaged from the tubesheet). Remove filters by lifting them straight up making sure not to damage the pleats by scraping against the edge of the tubesheet. (see filter replacement section under maintenance for re-installation instructions).

Operation

Once the *RM* collector is properly installed and settings are made normal operation is automatic and only a periodic check of the unit is required. Checking the unit involves verifying the cleaning system is operating (this should be done when dust laden air is passing through the unit which over time will cause the automatic system to operate) or alternately by placing the unit in the manual clean mode.

Setting of controls

PLEASE SEE ATTACHED TIMER SCHEMATIC

Timer & Delta P

The solid-state timer of the system is factory set to provide the proper starting point for normal unit cleaning. Should the unit experience insufficient cleaning or a noticeable decrease in air flowing through

the unit it is possible to decrease the time between pulses to make the unit clean faster. This is accomplished by adjusting the left control wheel, labeled “off time adjustment”.

Pressure / Filter Regulator

The pressure regulator / filter unit supplied can be adjusted by lifting on the black adjustment knob at the top of the filter /regulator. After lifting on the knob, it will click into the adjustable position and an orange strip will be visible just below the knob. Using the pressure gauge set the pressure at 85 PSI.

Maintenance

Maintenance for this unit consists of periodic visual inspections of the unit, periodic replacement of the filters and trouble-shooting based upon the findings of these inspections. During these inspections the following items should be checked or performed:

Inspect the mounting of the unit for tightness and leaks and adjust as necessary.

Inspect for any air leaks in the cleaning system, dislodged, or missing tubing. (see trouble-shooting section for remedies).

Inspect the discharge of the unit for presence of dust. If found see trouble –shooting section below).

Check autodrain for correct operation.

Filter replacement

Remove the connection from the dirty air plenum (lower housing) to the control box by pushing in on the colored flange on the fitting and pulling out on the tubing.

On Model 250 Units = Disconnect the pipe union above the diaphragm valve.

Remove filters by lifting them straight up out of the snap band collar.

Install new filters by carefully lowering them into the snap band collar in the tubesheet. Push down on the collar at the top of the filters to seat the units in the tubesheet.

Re-attach the tubing from the control box to the dirty side housing by pushing in the colored flange on the fitting and inserting the tube. Correct insertion can be verified by pulling on the tube. Re-insert as necessary.

On Model 250 tighten pipe union

Troubleshooting unit

Problem / cause	Action
<p>Dust in clean air plenum Loose or improperly installed filter</p> <p>Hole in filter</p>	<p>By tracing the location of the accumulated dust it may be possible to identify the filter, which is leaking. If loose or improperly installed correctly.</p> <p>If hole in filter replace filter or if a replacement is not immediately available, the hole in the tubesheet may be temporarily plugged.</p>
<p>Loss of airflow Note: loss of airflow may not be caused by filter but rather by other changes to the system.</p>	<p>Remove unit from service (turn off fan) and initiate cleaning cycle. Allow cleaning to go completely through cycle twice or three times.</p>
<p>Loss of airflow even after manual cleaning Cleaning system not operating</p> <p>Cleaning system operates</p>	<p>Trouble-shoot cleaning system (timer, diaphragm valves, solenoids, compressed air, etc. as below)</p> <p>Inspect filters for clogging. If cleaning system is correct and bags do not respond they may need to be replaced</p>
<p>Cleaning system does not operate No noise of valves pulsing</p> <p>Just clicking noise from solenoids</p>	<p>Verify that timer is on and power is reaching the terminals of timer. If powered small lights on timer should periodically illuminate. If no lights contact factory - may be defective timer. If lights on timer, verify connections to solenoids, solenoids should “click” when energized. Make sure to verify the “common line” returning to neutral side.</p> <p>Verify compressed air source. If air on header, verify tubing connections between solenoids and diaphragm valves. If connection is bad with air pressure a noticeable leakage will likely be present. Make sure to remove air supply and bleed system prior to attempting to correct any leaks.</p>
<p>Cleaning system operates but one or more rows of filters do not clean</p>	<p>Verify clicking noise when solenoid on that row is pulsed. If no clicking noise, check timer connections. If connections are correct, solenoid may need replacement</p> <p>If clicking noise on solenoid but diaphragm valve does not actuate, check plumbing between solenoid and diaphragm valve.</p> <p>If plumbing is correct, diaphragm valve may be clogged. Bleed air supply prior to attempting to correct. Remove cover and inspect. If dirty, remove and re-check. If diaphragm is damaged contract Filter Technology Ltd for replacement parts.</p>