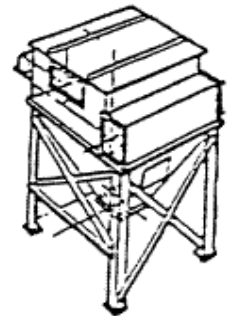
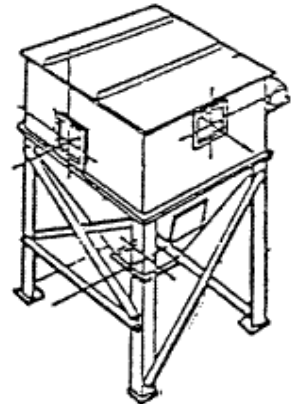
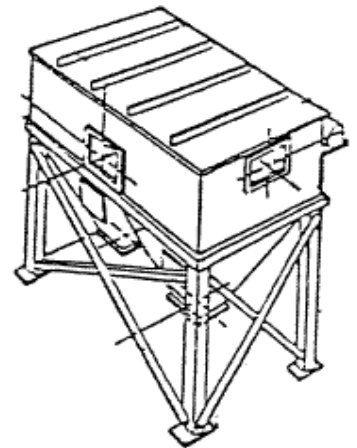


# MP / MPL SERIES CARTRIDGE COLLECTOR

## Installation, Operating & Maintenance Manual

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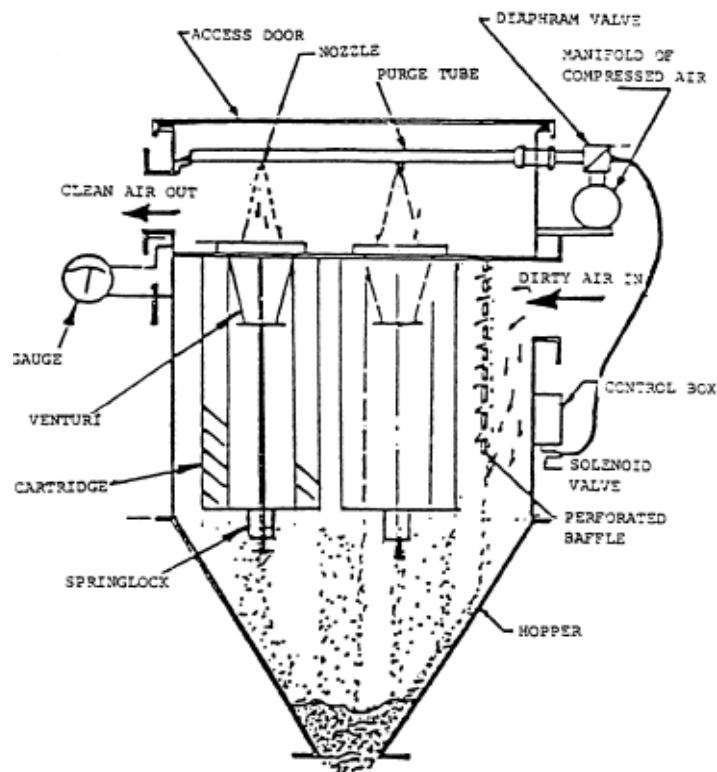
## CARTRIDGE TYPE DUST COLLECTOR

The cartridge type dust collector is a pulse-jet model. Cleaning is achieved by back-flushing the filters with short bursts of compressed air, repeated at timed intervals.

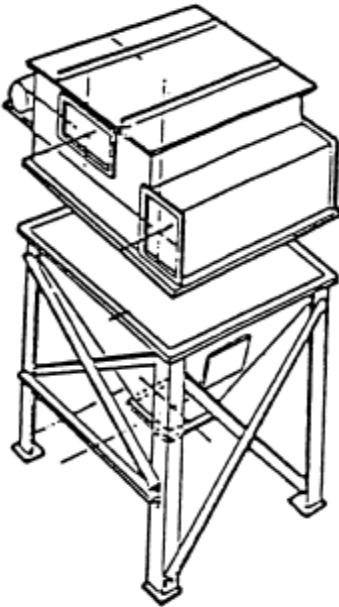
The timer signals the solenoid valves, which in turn trigger the diaphragm valves. The diaphragm valves deliver short bursts of compressed air to the purge pipe nozzles.

The nozzles are directed at the cartridge openings. The air jet is sufficient in volume to dislodge a portion of the "dust cake", permitting it to settle into the hopper.

The hopper is usually fitted with a slide gate, air lock, or conveyor, which disposes of the collected material without losing the collector's negative operating pressure.



RECEIVING



The collector will arrive in subassembled form. Normally the upper and lower sections will be separated.

When unloading, take care not to damage the mating flanges. The use of spreader bars with lift equipment is recommended.

Check foundation locations against collector supports.

In addition to the collector sections, separate packages will be shipped, either with the collector shipment or separately. Locate and identify contents.

Please Note: The actual number of collector sections may vary depending upon the size and style of the collector.

CARTRIDGES

CARTRIDGES – Count immediately for accuracy. Understand proper method of installation.

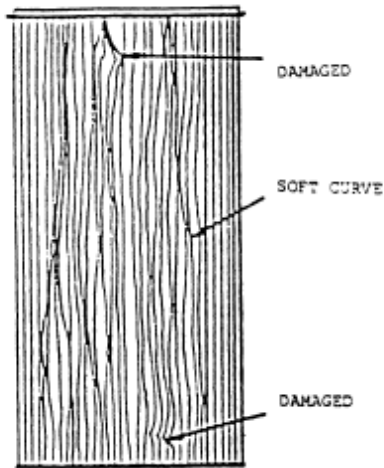
ARRANGEMENT DRAWING  
WIRING DIAGRAM  
INSTALLATION/OPERATING INSTRUCTIONS

INSTALLATION INSTRUCTIONS – Be sure to read all instructions carefully.

SEALANT  
COLLECTOR ASSEMBLY FASTENERS  
SPRING LOCKS  
DIFFERENTIAL PRESSURE GAUGE  
INLET & OUTLET COVERS

HARDWARE PACKAGE – Make sure all items are included with shipment.

## CARTRIDGE INSPECTION



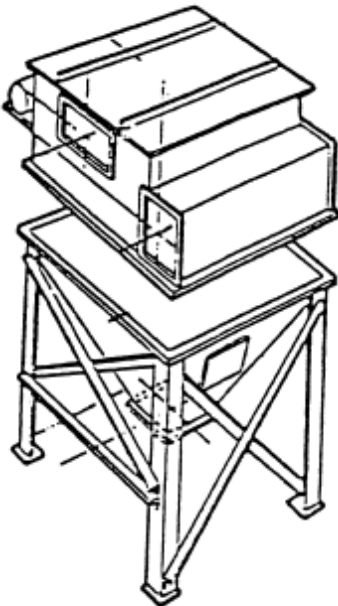
When removing cartridges from the carton, inspect the pleats for damage. The pleat ridges on the outside must be reasonably straight without sharp, angular creases. The inside surface must show no signs of buckling at the ends, or distortion from a blow to the side.

**HANDLE CAREFULLY! DO NOT RUB OR BUMP THE PLEATS.** Cartridge life can be shortened considerably by careless handling.

**DO NOT USE A DEFECTIVE CARTRIDGE!**

It will allow passage of dust to the clean air plenum and eventually to the inside of all the cartridges, plugging them from the inside.

## CARTRIDGE ASSEMBLY

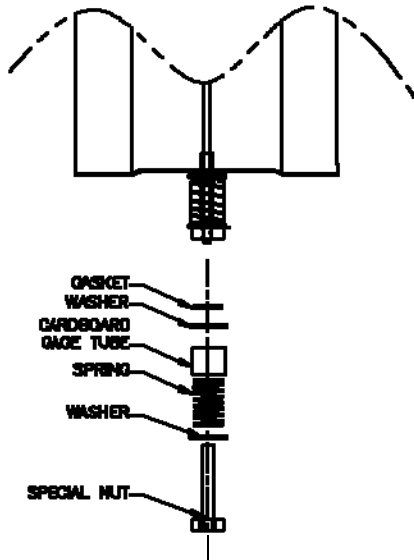


It is usually most convenient to assemble the cartridges to the collector unit before placing it on the hopper section.

This can be done by setting the unit on supports, approximately 3 feet off the ground.

The cartridges can be installed after setting the collector on the hopper, if preferred.

## CARTRIDGE ASSEMBLY



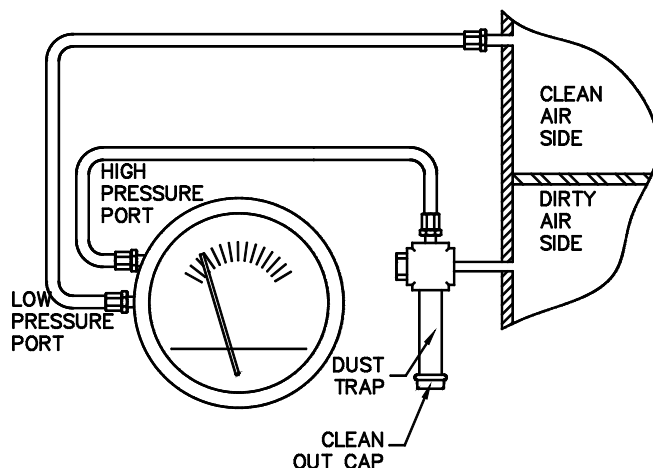
The cartridges are positioned on the threaded rods, seal side up, and held in position by special springlock assemblies.

The springlock assembly is designed to maintain constant pressure on the seal. They automatically compensate for seal relaxation. The amount of pressure on the seal is predetermined by using the paper gauge tube in the springlocks while tightening.

Clean cartridge seals and mating surfaces with a damp rag.

**DO NOT ASSEMBLE THE SPRINGLOCKS WITHOUT THE PAPER GAUGE TUBES.** Tighten the nuts until the tube contacts the washers. **DO NOT TIGHTEN BEYOND CONTACT!** In time, seal relaxation may cause a small space to show between the tube and washer. Up to a quarter of an inch is acceptable. It is not necessary to readjust the springlocks to compensate for this condition.

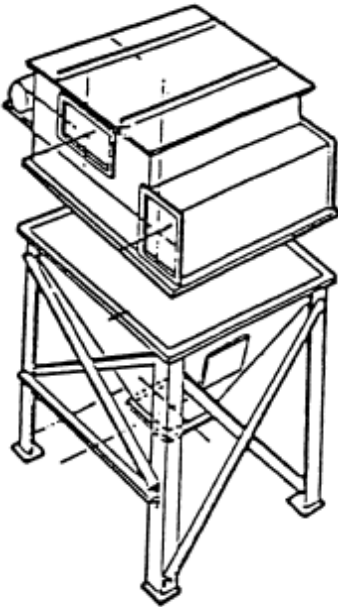
## DIFFERENTIAL PRESSURE GAUGE INSTALLATION



Provisions for line attachment have been made on the collector.

Mount the gauge in a convenient location for reading that is free from excessive vibration.

## COLLECTOR ASSEMBLY



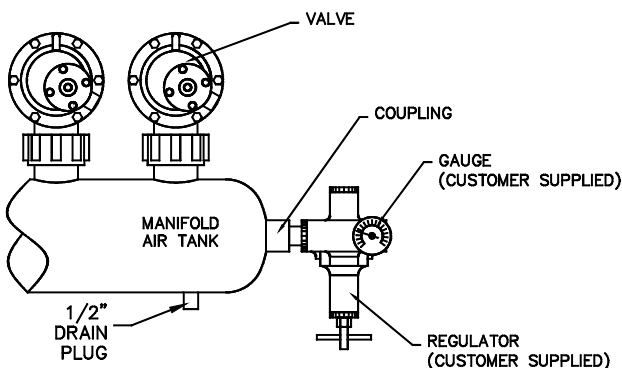
Apply sealant to the hopper section flange.

The collector and hopper units are match-marked. Orientation should be established before raising the collector to assembly position. The use of spreader bars with lift equipment is recommended.

If cartridges were not installed previously they must be added through the hopper access doors. Begin by adding the ones farthest from the doors first.

When replacing the access doors, do not over-tighten. Compress the seal approximately one-third.

## COMPRESSED AIR REQUIREMENTS



Compressed air requirements are listed on the assembly drawing in SCFM and pressure specifications.

The air supply must be clean, dry and oil free at 90-100 psig. An air filter regulator is recommended. The air supply line should be 1 inch minimum.

A pressure gauge should be added to the air line immediately before the manifold connector.

Recovery to 90-100 psig between pulses is required.

## ELECTRICAL REQUIREMENTS

The electrical supply is to be 110V-60 cycle, single phase. See wiring diagram.

The cleaning system must be operable without activating the filtering air fan. This enables the operator to do "off-line" cleaning, if required.

The cleaning system must be in operation at all times when the filtered air system fan is in use.

## OPERATING INSTRUCTIONS

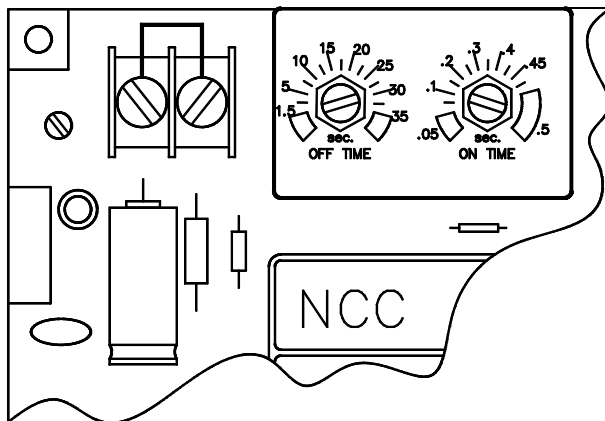
Automatic "off time" cleaning system control switches normally activated by pressure changes are not recommended.

The timer is of prime importance to efficient, trouble-free operation. The operator must see to it that the settings are properly adjusted. Failure to do so may severely limit the collector's ability to perform and/or cause frequent maintenance intervals. The factory has preset the timer for average conditions. Readjustment is normally a one time requirement, completed at installation start-up.

On outside installations, ice can form in lines and cause valve malfunction. Application of an air dryer or provisions for auxiliary heat may be made. If heat is used, do not exceed 180°F at the valves.

Maximum filtered air stream temperature is to be 170°F.

## THE TIMER



The timer has two functions. It regulates the cleaning jet bursts in time intervals between bursts. They are referred to as "on-time" and "off-time".

"On-time" determines the time lapse per burst. It is preset by the factory at 0.10 seconds. This is a standard setting for all Scientific Dust Collectors. This setting must remain unchanged. It is related to valve function, having nothing to do with dust characteristics.

"Off-time" regulates the amount of dust accumulation between bursts. The longer the off time interval, the thicker the dust cake becomes. The thicker the dust cake becomes, the greater the restriction of air flow through the media. The increased restriction registers on the differential pressure gauge as increased differential pressure between the clean and dirty air plenums. Building and maintaining a dust cake at optimum thickness is the objective in achieving dust collector efficiency.

## TIMER SETTING

"Off-time" timer settings vary, depending on the number of "off-time" positions provided and on the dust load being introduced to the media.

The timer signals each position, one at a time, beginning with number one. It continues to signal the balance of positions, in sequence, until all have been serviced. It then repeats the cycle, beginning with the number one position.

The time required to complete one full cycle depends on the total of time intervals between positions.

Example: The collector has 7 valves. The total time required per cleaning cycle has been selected at 5 minutes.

Timer settings are made in "seconds."

Convert minutes to seconds.

5 minute cycles = 300 seconds (5 x 60)

Each valve must be fired once every 300 seconds.

The total of the "off time" intervals must equal the time it takes to complete one full cycle (300 seconds).

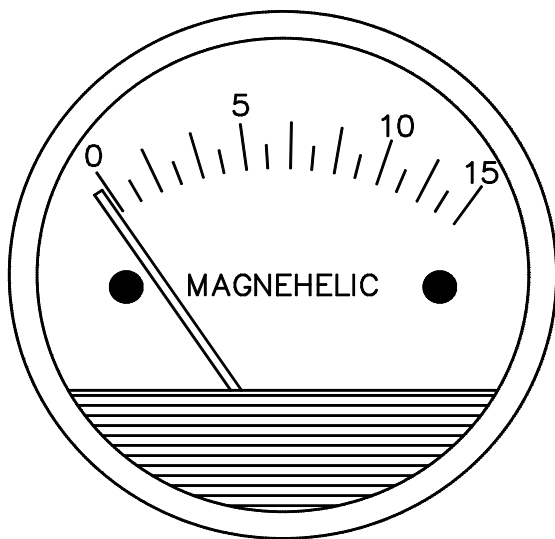
Off time setting:  $300 \text{ seconds} \div 7 \text{ valves} \approx 40 \text{ seconds}$ .

The following dust loads can be used as a guide for estimating total start-up cleaning cycle times.

| <u>OPERATION</u>                | <u>LOAD</u>            | <u>CLEANING CYCLE</u> |
|---------------------------------|------------------------|-----------------------|
| Welding Gen. Ventilation        | 0.01 to 0.02 gr/cu.ft. | 100 minutes           |
| Welding Hooded                  | 0.05 to 0.10gr/cu.ft.  | 20 minutes            |
| Shot Blast Venting              | 0.20 to 0.50 gr/cu.ft. | 5-7 minutes           |
| Transfer Points (After cyclone) | 0.80 to 1.20 gr/cu.ft. | 3 minutes             |
| Transfer Points (No cyclone)    | 5 to 10 gr/cu.ft.      | 30 seconds            |
| Dump Station                    | 10 to 20 gr/cu.ft.     | 15 seconds            |

Timer settings should be changed slowly, in small amounts. Check positions with a stop watch.

### THE DIFFERENTIAL PRESSURE GAUGE



The differential pressure gauge registers in units of measure called "inches of water gauge".

It registers the difference in pressure between the clean and dirty sides of the filtering media.

A record of the readings must be kept, beginning with a reading taken when the filtering media is new, before dust accumulates.

As dust accumulates, the readings will increase over the original "clean" reading between .25 and 1.50 inches water gauge.

If the increase goes beyond 1.50, the timer must be reset for shorter off time intervals.

If the increase is beyond 3.0, the collector is not functioning properly. See the Start Up and Trouble Shooting Sections.



## START-UP CHECKLIST

Check the following items in sequence:

- Check electrical supply and connections per wiring diagram.
- Apply caulk to inside and outside connectors on timer board/solenoid boxes installed outside to make sure no moisture can get inside box(es).
- Inspect ductwork and gates for proper positions.
- Check cartridges for proper assembly/paper gauge tube usage.
- Check housing joints assembly and foundation anchors.
- See if compressed air supply is regulated to 90-100 psig at the manifold.
- Activate the timer. Check sequence of valve operation.
- Check for air pressure recovery between pulses at the manifold (90-100 psig).
- Check for air pressure drop at the manifold, during the pulses. Not to drop below 45 psig.
- Close all access doors. Check for seal integrity.
- Check discharge configuration for seal integrity (conveyor/airlock).
- Adjust filtering air fan damper to approximately 3/4 open.
- Activate the filtering air fan, without introducing the dust load.
- Record the start-up differential pressure gauge reading, before introducing the dust load.
- Introduce the dust load. When the differential pressure gauge indicates a change, sufficient "cake" will have accumulated to resist media blinding. Readjust the fan damper to design specifications.
- Monitor the differential pressure gauge readings. Adjust their timer settings as required. See operating instructions.

**NOTE: TROUBLESHOOTING BEGINS WITH A REVIEW OF THE RECORDED DIFFERENTIAL PRESSURE GAUGE READINGS. IT IS IMPORTANT THAT CLEAN-START VALUES BE RECORDED AS WELL AS THE OPERATING DATA!**

## MAINTENANCE

Once properly adjusted, the collector requires little maintenance. The units should be inspected at 3 month intervals as follows:

Note the differential pressure gauge reading and add to your record. Severe applications may require more frequent checks (weekly or daily).

Check the cleaning air supply for cleanliness and moisture.

Note the operating air pressure gauge readings at the manifold. Must recover to 90-100 psig between pulses.

Check the air valves for sequential operation.

Check the door and cover seals for leaks.

Refer to Assembly and Start Up Sections for filter replacement.

## TROUBLESHOOTING

Problems with the collector usually appear soon after installation, often the result of improper assembly or operating techniques. Adhering to the instruction materials in this manual will pay dividends in trouble free operation and extend service intervals.

The collector has been sized for specific conditions, such as moisture and dust characteristics. Occasionally deviations from the original design parameters will be introduced. In some instances, the new conditions can be compensated for by substituting special media. This should only be considered after a thorough analysis of the problem has been made.

Troubleshooting should begin with a review of the start-up checklist. Normally, the cause of the problem will be within the scope of that list.

The following list is provided as a supplement to the start-up checklist. It covers a wider range of symptoms and their causes.

| <u>SYMPTOM</u>                  | <u>CAUSE</u>               | <u>ACTION</u>   |
|---------------------------------|----------------------------|---|
| Fan stopped                     | Overload Switch            | Electrical supply/rating<br>Drive sheaves reversed<br>Improperly adjusted sheaves<br>Improperly adjusted dampers<br>System differential pressure low<br>Discharge equipment failure |
| Poor hood control               | Fan Malfunction            | Sheaves reversed<br>Belts slipping<br>Defective fan wheels<br>Incorrect sizing – fan  |
|                                 | Duct System                | Incorrect sizing – ducts  |
|                                 | Pressure Differential High | See excessive pressure differential   |
| Excessive pressure differential | Cleaning System            | Gauge lines plugged<br>Insufficient cleaning air<br>Timer – fuse/board malfunction<br>Valve malfunction<br>Solenoid malfunction   |
|                                 | Plugged Media              | Free moisture in air stream<br>Liquid hydrocarbons<br>Overloading<br>Hygroscopic dust<br>Hopper bridging<br>Cleaning system malfunction   |

**CAUTION**

Damage from Fire or Explosion. To minimize the risk of fire and/or explosion, proper installation, operation, and maintenance of this equipment is critical. Since installation, operation, maintenance and cleaning are beyond our control, Scientific Dust Collectors disclaims any liability or responsibility for damage from fires and/or explosions regardless of origin. We recommend that all air pollution control and dust collection equipment and installation conform to any and all NFPA, state, federal, and local codes and regulations including the addition of appropriate fire protection systems or explosion venting when and where required. Installation of Scientific Dust Collectors' equipment should be by a licensed contractor that is experienced in potential fire and explosion hazards as well as all related laws, codes, and regulations.