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## **DUST COLLECTOR (TOP REMOVAL – PLEATED BAG) INSTALLATION AND OPERATING INSTRUCTIONS**

### **GENERAL DESCRIPTION**

Frequent cleaning is the key to high air to cloth filter ratios, constant differential pressure and the ability to handle heavy particulate loads. A reduced collector housing interstitial velocity is another advantage. For these reasons the dust Collector is particularly well suited to process services such as dryer exhausts, kiln stacks, pneumatic conveyor receivers, grinding systems and other sensitive systems where constant air volume is critical.

Filter Technology Ltd collectors are custom designed for each application. Customer must refer to cover sheet and general arrangement drawings for proper orientation of equipment and accessories.

### **OPERATING PRINCIPLE** (Figure 1, 3, 6 & 7)

- A. Solids laden air or gasses enter unit at hopper of housing inlet.
- B. Air passes through filter media.
- C. Solids are retained on filter surface.
- D. Filtered air is exhausted through clean air plenum.
- E. Cleaning cycle consists of a momentary blast of 100 psig compressed air.
  - Momentarily taking row of bags off stream through pressure reversal;
  - Flexing filter media;
  - Solids are released to fall to hopper and through unload system.
- F. Cycle timer is adjusted to maintain approximately 4"  $\Delta$  P across filter media.

Equipment should be installed at site location by qualified contractor. Accessories, fans, unload systems and controls are appropriate to customer's requirement.

### **INSTALLATION OF TOP REMOVAL PLEATED BAG**

1. Insert the snap band ring in the tubesheet.
2. Position the snap band collar on the tubesheet such that the top bead of the cuff is above the tubesheet and the bottom bead is below the tubesheet (Figure 4A).
3. Roll the bag collar into the hole of the tubesheet allowing it to snap into place (Figure 4B & 4C). Smooth the collar by hand, making sure the beads are uniformly in place above

and below the tubesheet. **It is imperative that this step be closely followed to insure a good dust seal.**

4. Insert the cartridge into the snap band (Figure 4D).

5. After a complete row of filters have been installed, mount the blowpipe onto its supports (Figure 6). Fasten the blowpipe to the support angle at the far end of the collector, making sure the pulse pipe holes are directed downward. Attach and tighten the coupling on the opposite end of the blowpipe to complete the installation. Insert the blowpipe into the wall coupling far enough to clear the slotted support at the other end. Push into slot and then tighten wall coupling – hand tighten only (do not use a pipe wrench.)

## **DIFFERENTIAL GAUGE OPERATION AND INSTALLATION**

The differential pressure gauge or manometer provides the information which governs the setting of cleaning mechanism “off” time. Generally, the Dust Collector will operate at less than 4” W.G. differential pressure at a timer “off” time of 10-12 seconds.

The differential gauge is supplied complete with fittings and tubing for hook up between the clean and dirty side of the dust collector. A special air filter is supplied on the dirty side of the collector to prevent fouling and false readings on the differential gauge. Installation is illustrated in (Figure 5).

Upper Baghouse fitting should be connected to the lower part in the differential pressure gauge. Lower Baghouse fitting will connect to the upper part in the gauge.

## **CLEANING MECHANISM CONTROL AND WIRING**

See separated timer and/ or control panel for wiring information

Upon completion of the preceding and other system hook ups, etc. you are ready for startup.

## **START-UP CHECK LIST**

### **1. Compressed Air**

Depending on unit size, a one to two inch supply line carrying 85 psig minimum plant air should be connected. It is good practice to blow down piping and air header to remove pipe cuttings, welding rod tips and other debris. An automatic purge valve is supplied on every header for purging moisture from the header.

### **2. Filter Cartridges**

Are these installed as instructed on previous page?

### **3. Differential pressure gauge or manometer**

Is this properly installed as instructed on previous page?

### **4. Timer Mechanism**

Check to see if wired as shown in Diagram and that the fuse is ok.

### **5. Auxiliary Equipment**

Check to see that there are no foreign objects in rotation equipment. Check rotation of fan, screw conveyor, and airlock. Generally airlocks (rotary valves) are operable running in either direction.

### **6. Duct work**

Check to see that all connections are tight and all clean-outs are closed. Piping must be free of all debris.

## **START-UP DUST CONTROL SYSTEMS**

1. It is good practice to introduce the dust stream on a new bag set at a reduced rate. This is particularly true where either very fine solids (less than 2 microns) or heavy concentrations are present. Set the fan damper at about 60 to 70% of design flow. If uncertain, amperage on the fan motor can be checked to determine air flow. Pre coat the bags with a powder such as lime or use the fines being collected. Use 100 lbs. per 100 bags or 1,000 square feet of filter area. Inject the pre coat into the hopper section; with the pulse system off, run the fan for three minutes to obtain an even pre-coat.
2. Start the discharge system (rotary valve, screw conveyor, air slide, dump valve, etc.)
3. Start timer and be certain that the compressed air supply valve is open. Initial adjustment of time should be 6 seconds between pulses (off time). On time of pulse should be set at 100-110 milliseconds.
4. Start main fan.
5. After 20 minutes operation, open fan damper to desired setting. Observe differential pressure – if less than 2" W.G. increase valve "off" time 2 or 3 seconds at a time during the first 8 hours until the differential pressure is 3.5" to 4.0".

## **START-UP PROCESS SYSTEMS**

1. If water vapor or other condensables are present, it will be necessary to preheat the system so the temperatures of the piping and collector are above saturation temperature, dryers, coolers, and certain grinding systems are common examples.
2. Temperature must be controlled to within the thermal limit of the filter media in use.
3. On pneumatic conveying systems, watch the differential pressure gauge closely for the first hour or so. If unstable, the collector discharge system may be too small for the volume it is seeing. A quick fix is to reduce the material feed until the discharge rates can be increased.

## **ALL SYSTEMS**

You have purchased equipment to provide a clean stack. If there are visible stack losses, refer to the trouble shooting check list.

## **SHUT DOWN**

1. **Dust Control Systems** – Reverse start up procedure, shut down fan, then after 5 or 10 minutes delay, shutdown the timer and discharge system.
2. **Process Systems** – Dryers should have product run down and heat continued at a reduced rate to dry the metal surfaces and filter media.
3. **Pneumatic Systems** – As in Item 1.

*Wiring shown for 10 output timer – Wiring similar for 4, 6, and 22 position timers.*

## **WIRING NOTES**

1. Operating Logic: Input power is applied to L1 and L2 at all times upon closure of the isolated control contacts the present "Off" time is initiated. At the end of the "Off" time, the control will energize a solenoid to provide the cleaning pulse and then transfer to the next solenoid. The cycle continues until the control contacts are opened.
2. Reset – the control can be programmed for fewer than 10 outputs by jumping the program wire to the last output number used.
3. Input – 105 to 135 VAC 50/60 Hz.
4. Output – solid state switch maximum load 60 Watts per output (2 solenoids per output terminal.)

5. Off time adjustable, between 1.5 seconds minimum 60 seconds maximum.
6. Programming – Programming is accomplished by connecting the program wire to the pin corresponding to the number of outputs required.
7. On pulse time width 50 – 500 milliseconds, “On Time” has been preset at factory do not adjust.
8. Where two or more timers are employed solenoid valves should be divided equally between the timers.
9. Recommended wire size No. 16 AWG.
10. Recommended on-off switch by customer to be installed near timer.
11. Suggested off time setting: 6 seconds, refinements may be necessary after system becomes operational to maintain proper differential pressure.
12. Timer to be conveniently located on dust collector by customer.

### TROUBLESHOOTING CHECKLIST

<b>VISIBLE EXHAUST DUST LOST</b>	<b>SOLUTION</b>
Missing Bag – duct loss will be constant, not in synchronization with valve blasts.	Locate and replace missing bag.
Improperly installed bags. Loose fit snap band. Cartridge inner seal not aligned with snap band.	Inspect bag connections. Reinstall pleated bag.
Holes in bags. Can be from mechanical damage during installation, abrasion, thermal or corrosive attack, or worn out bags. This loss is generally cyclic and in synchronization with valve blasts.	Inspect for worn or damaged bags.
Failure to clean plenum are massive bag failure	Always check plenum, clean if necessary before installing new bag set. This will generally clear up.

\*\*Plugging the venturi with a surgical cork from the clean air side of the collector is a quick temporary measure to stop leakage until such time that the bag or cages can be replaced.

<b>LOSS OF COMPRESSED AIR</b>	<b>SOLUTION</b>
Piping Leaks	Retighten fittings
Debris in diaphragm valve	Remove cover and clean
Dirt in solenoid plunger	Remove cover and clean
Electrical short	Refer to wiring diagram and check for proper connections.
<b>HIGH DIFFERENTIAL PRESSURE</b>	<b>SOLUTION</b>
Over Volume	Cut back on fan damper at individual inlet pick-ups.
Compressed air pressure below 75 psig	Check for system leaks, new usage or as above. Check compressed air valve assembly

Timer skipping one or more valves	See Timer diagram
Reverse leakage through rotary valve	Check for wear or damage
Other air short circuits – piping leaks, door gaskets, etc.	Repair as required
Dust on clean side of bags from plenum	Clean plenum chamber and inside of bags after previous bag failure
Binding due to condensate	Change operations up stream so that liquids remain vaporized through unit. Usually operating cleaning mechanism with fan off or with fan on, but no solids flowing will permit recovery.
<b>SYSTEM VOLUME TOO LOW</b>	<b>SOLUTION</b>
Fan running backwards	Correct fan rotation
High differential pressure	Review Section C above
Fan belt slippage	Tighten or replace belts
Air short circuiting	Check piping, rotary valve and collector flanges for leaks.
System blockage	Check piping for build up or foreign blockage. Check bags for binding. Bags should be soft to the hand.
<b>TIMER PROBLEMS</b>	<b>SOLUTION</b>
Timer does not operate	Check for faulty wiring-refer to wiring diagram.
Power “ON” indicator not lighted	Check wiring diagram with input/output terminals for short circuit. Check for blown fuse.
Timer operates, solenoids do not operate	Check wiring diagram for valve common open.
Timer operates one or more	Check valve continuity for faulty solenoid circuit. Check output light and voltage at terminal for faulty output terminal. Check solenoid valve, clean, repair or replace if necessary.
Improper timer sequence	Check valve “on” and “off” times.

## **ROUTINE MAINTENANCE**

**A. INSPECTION** Frequency will vary as widely as there are operating conditions. In general proceed as follows:

1. Daily – Check unit differential pressure.
2. Weekly – Check timer and solenoid valves for function. This is usually only listening to check uniform time interval between blasts.
3. Monthly – Lube fan, rotary valve and screw conveyor. Check seals on latter two for dust loss.
4. Quarterly – Inspect bags for “soft to hand” condition and uniform tightness.

## **B. REPAIRS**

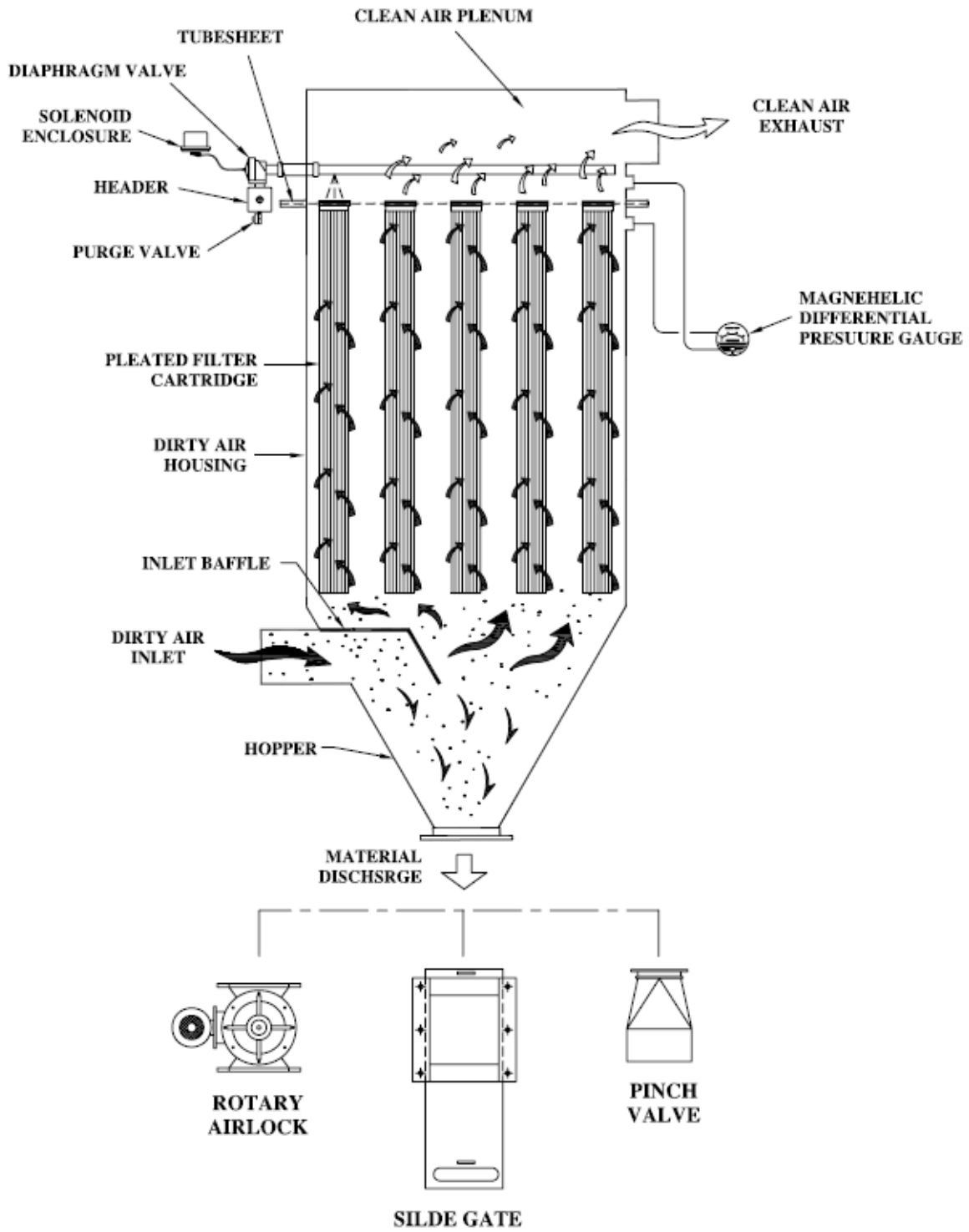
1. Filter bags – Generally replacement.
2. Solenoid Valves – Clean, repair or replace.
3. Diaphragm Valves – Clean, repair or replace.
4. Rotary Valves – Usually a matter of periodic seal and blade replacement. More detailed information supplied with the unit.
5. Screw Conveyors – Periodic replacement of “V” belts and shaft seals. Inspect hangar bearings during filter bag change. Failure will be deducted by the squeal.
6. Fans – “V” belt tension and replacement of bearings if running rough.

## **C. SAFETY**

Before entering any dust collector:

1. Run cleaning mechanism 20 minutes with the fan off to clean down filter bags.
2. Run solids out of hopper.
3. Lock out electrical power
4. On toxic operation purge collector housing and install blank in inlet duct.
5. Install catwalks and safety cables.
6. Secure access doors in open position or remove doors by lifting off of hinge pins.
7. Use buddy system.
8. Wear respirator.
9. Use common sense.

The preceding information has been compiled to assist the purchaser in successful installation and operation of the Dust Collection System. However, if a problem exists that cannot be rectified with this manual, **Filter Technology, Ltd.** and its representatives stand ready to assist in any way possible.



**Figure 1 Operating Principle**

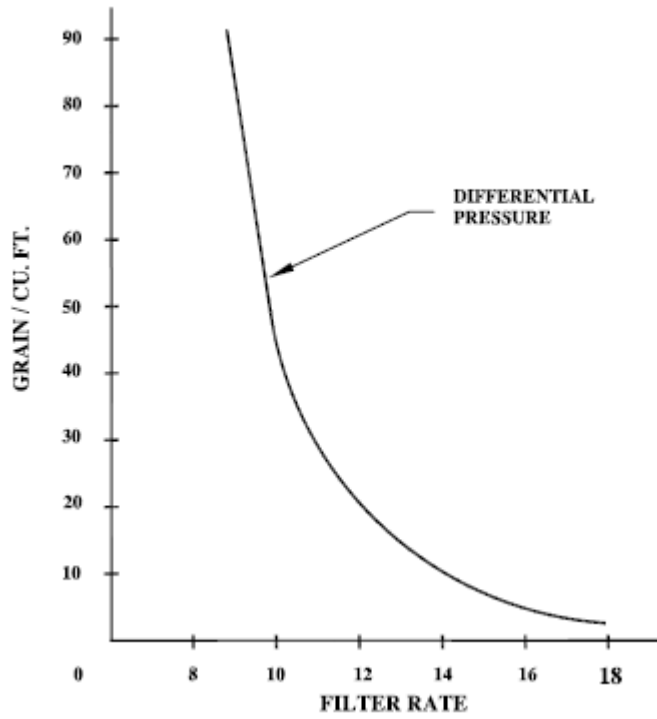


Figure 2 Filter Rate vs Grain/cu. ft.

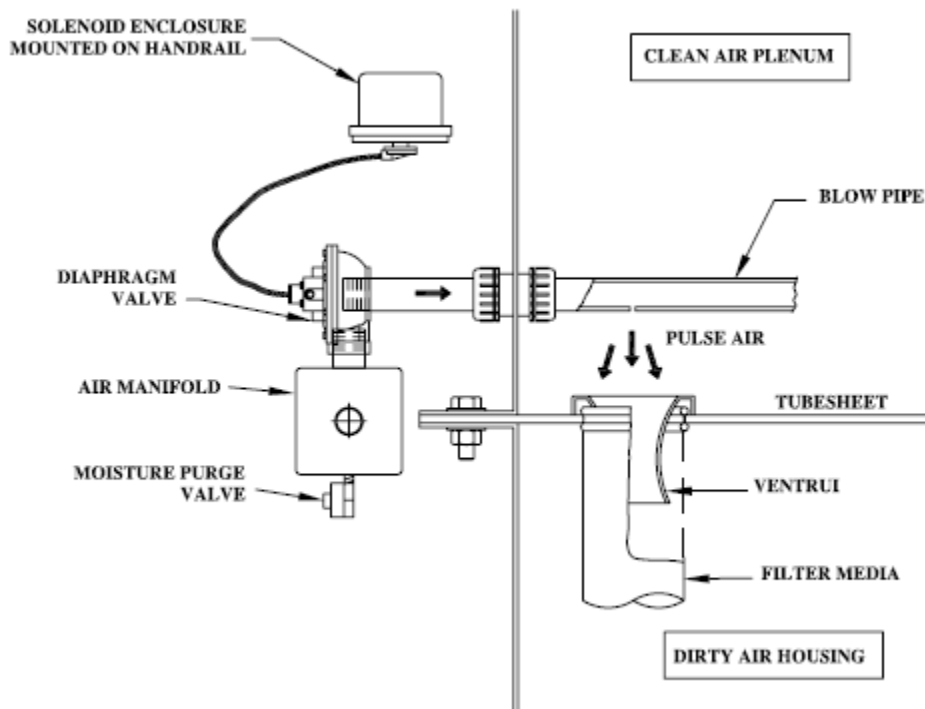
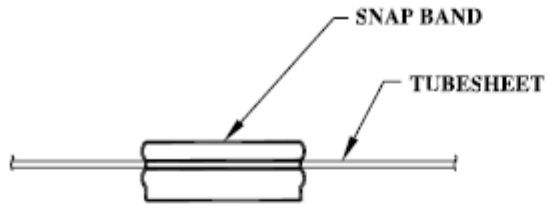
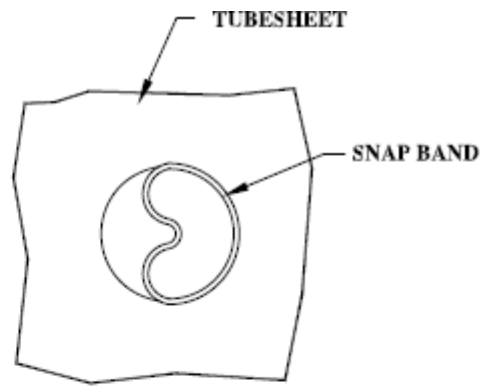


Figure 3 Operating Principle



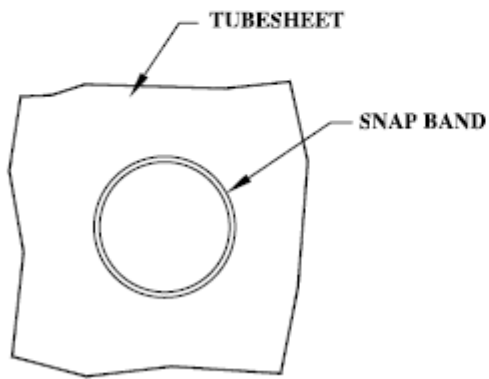


**FIG. 4A**

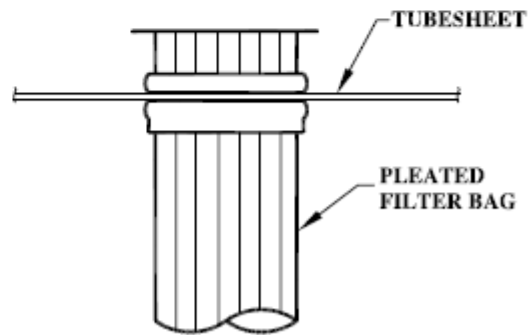


INSTALLATION POSITION

**FIG. 4B**

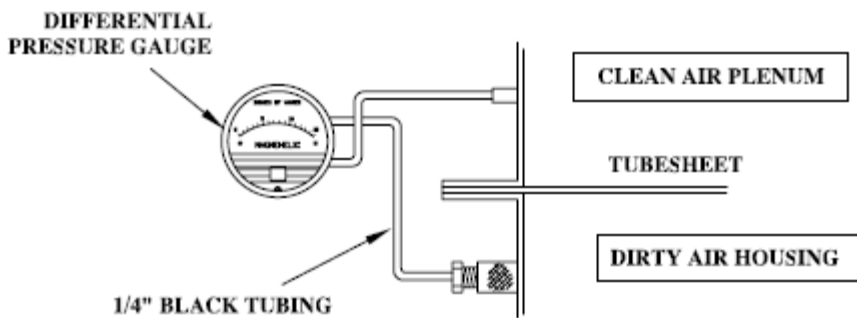


**FIG. 4C**



**FIG. 4D**

**Figure 4 Pleated Bag Installation**



**Figure 5 Magnehelic Pressure Gauge Installation**

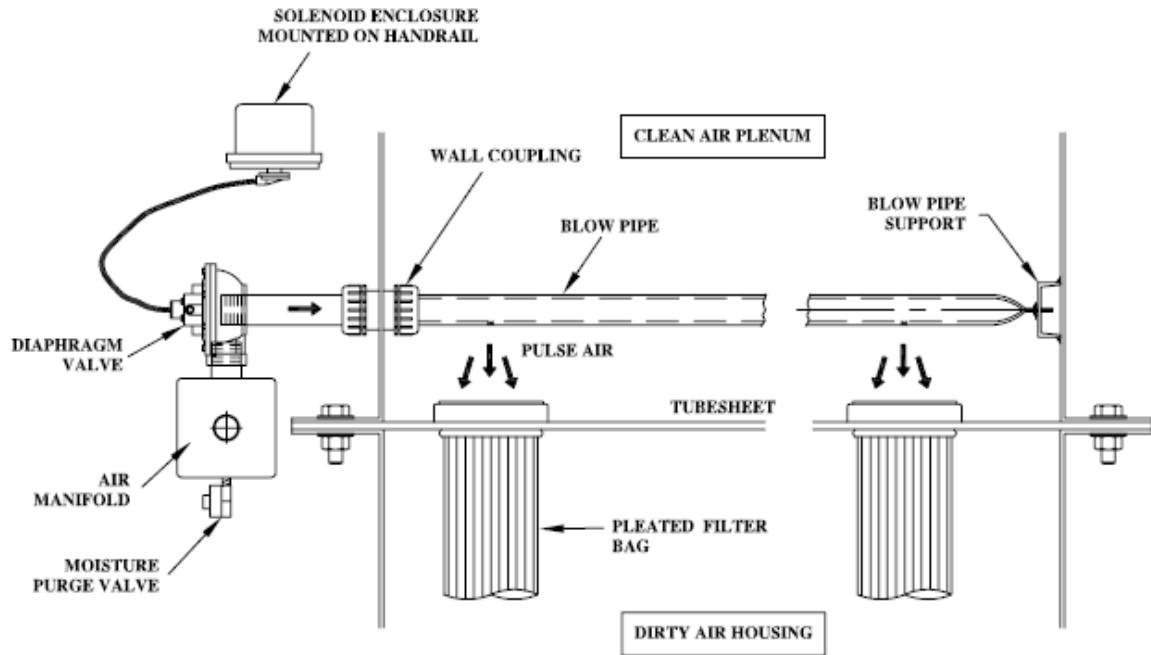


Figure 6 Pulse Cleaning Function

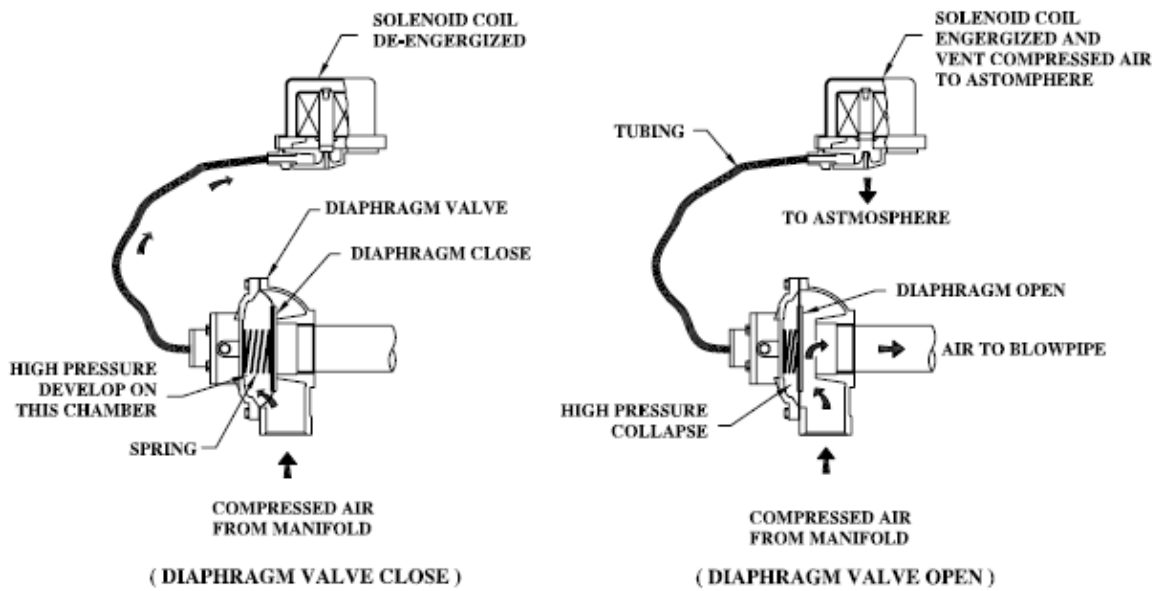


Figure 7 Solenoid Operational Diaphragm