



**MED MODEL RPSC**



**Mueller  
Environmental  
Designs, Inc.**



**Air Filtration  
Evaporative Cooling  
Noise Control  
Mist Elimination  
Turnkey Projects**



# MED Model RPSC Design Concept

## DESIGN CONCEPT

The Mueller Environmental Designs RPSC combines inertial separation with reverse pulse barrier filter technology resulting in a high efficiency self cleaning air filter system

## APPLICATION

The Mueller Environmental Designs RPSC provides inlet air filtration for gas turbines, fans, compressors, reciprocating engines and other rotating machines requiring a high degree of inlet air filtration.

## OPERATION

As dust laden air enters the filter system via the weather hoods, it is cleaned as it passes through the high efficiency extended surface area filter elements. The clean filtered air exits the filter elements into the clean air plenum to the turbine inlet. However, about 70% of the dust, by weight, is removed from the incoming air by an inertial separator circuit before it reaches the high efficiency filter elements. Subsequently, the dust burden that has to be retained by and ultimately removed from the filter elements by the reverse air cleaning cycle is minimized, allowing longer periods between pulse cleaning cycles extending the life of the filter elements.

The inertially separated dust and a small volume of secondary bleed-air, is pneumatically conveyed into the secondary air circuit where it is exhausted to atmosphere.

The reverse pulse air cleaning cycle is controlled by a solid state sequence timer. The timer receives a start signal from a photohelic pressure differential switch. The timer starts blowers and energizes solenoid valves that in turn activate diaphragm air valves to create short sharp bursts of high energy compressed air through strategically placed orifices located in blowpipes positioned in the clean air plenum. This high energy air burst is in reverse flow to the normally flowing incoming dust laden air. This momentary pressurization and reversal of airflow, dislodges the accumulated dust particles, cleaning the filter elements, for continued machinery operation.

The dislodged dust particles are pulled into the secondary air circuit and pneumatically conveyed to atmosphere.

The inertial separator system is integral to the filter elements, and is comprised of high velocity bleed air slits strategically located at the center of two adjoining filter elements. The secondary bleed air slits lead to secondary air ducts that convey inertially separated and dislodged dust particulate to a common dust chute and are exhausted by blower to atmosphere.

## CONSTRUCTION

The Mueller Model RPSC System includes a housing with filter maintenance area and clean air plenum, extended surface barrier filters, inertial separator bleed air circuit, filter element support fingers, and reverse air pulse mechanism. The housing is all welded, hot rolled carbon steel construction, consisting of weather hood subassemblies, filter maintenance area, clean air plenum, and secondary air discharge duct all bolted with angle mating flanges.

The extended surface barrier filter elements are made of uniformly pleated cellulose blend media packs. The media is formed into round shaped filter elements. The elements have galvanized cell top, bottom end plates. The filter element to clean air plenum connection is complete with closed cell neoprene gasket.

The dust chutes of the inertial separator circuit are all welded electrolytic zinc coated sheets securely attached internally to the clean air plenum subassembly. The secondary air duct is all welded, formed plate carbon steel construction, bolted externally to clean air plenum subassembly. The bleed air exhaust fan bolts to the discharge end of the horizontal secondary air duct.

The filter holding finger assemblies are all welded stainless steel construction. Each finger assembly is rigidly attached to the vertical dust chute assembly.

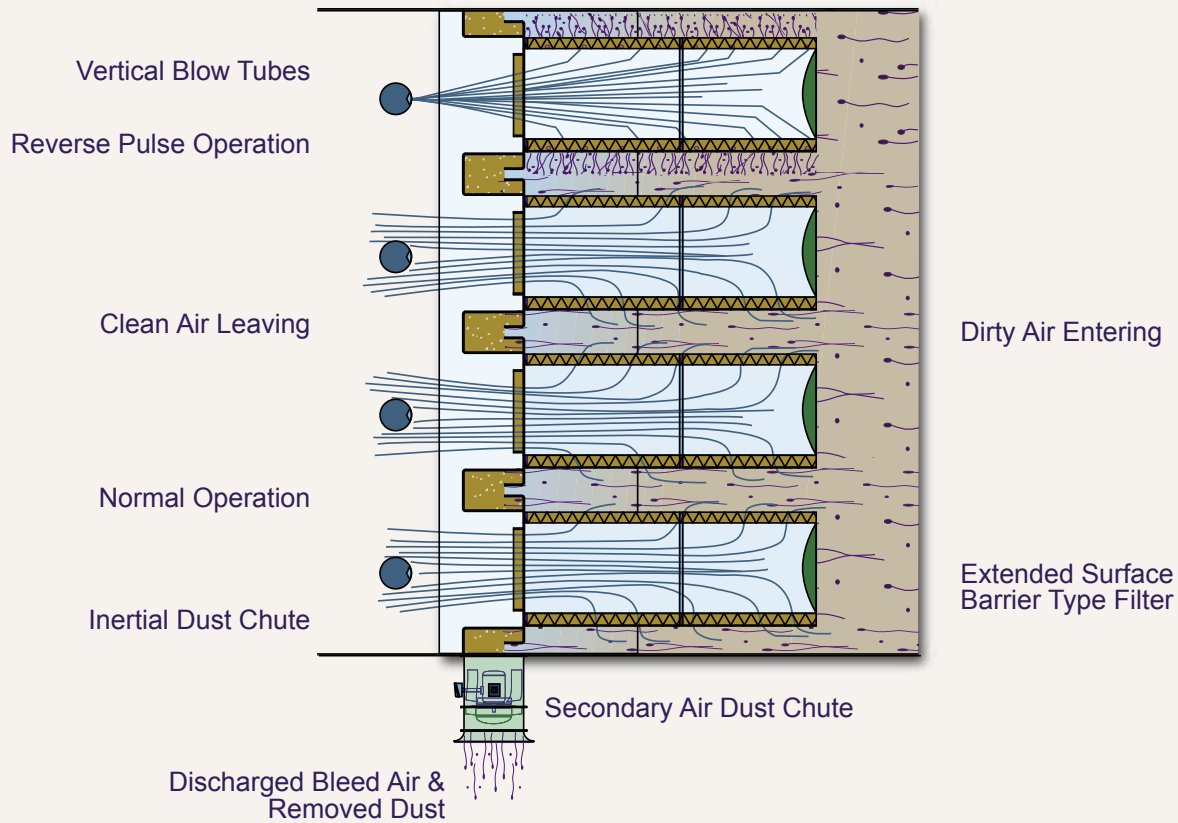
The reverse pulse mechanism is comprised of an external compressed air manifold with diaphragm air valves and 1 ½" NPT connection at each end. The manifold is externally bolted to clean air plenum subassembly roof. The timing circuit controls are factory installed and tested prior to shipment.

## PERFORMANCE

The high efficiency extended surface area filter elements achieve a 99.6% on AC fine test dust when tested in accordance with ASHRAE 52-76 test method.



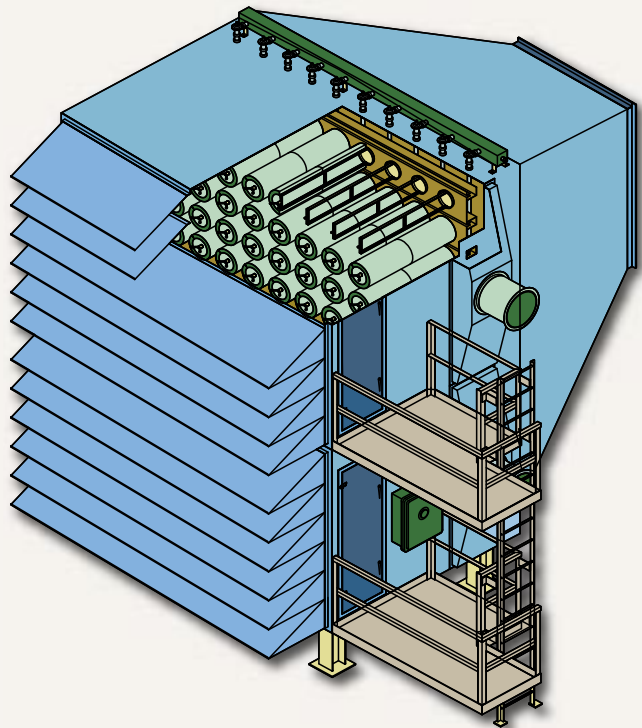
*General Electric Frame 5 Self Clean Inlet Air Filter*



## INERTIAL SEPARATION

The Mueller RPSC relies on the principle of inertial separation to remove the majority (by weight) of incoming dust, and other contaminants.

As the combination of inlet air, dust, and other contaminants enter the RPSC, velocity is increased due to the bleed air circuit blowers sequencing on. The air flow is deflected through the filter media, setting up centrifugal forces. The contaminants having mass and kinetic energy, are unable to follow the airstream path. Subsequently, contaminants proceed in a straight line along with 10 % of the incoming air (know as "Bleed Air") into the dust slit. A secondary blower pneumatically conveys the contaminant along the dust chute, discharging it to atmosphere.



# Mueller Environmental Designs, Inc.

7607 Wright Road  
Houston, Texas 77041

713-465-0995

Fax 713-465-0997

E-Mail: [sales@muellerenvironmental.com](mailto:sales@muellerenvironmental.com)

[www.muellerenvironmental.com](http://www.muellerenvironmental.com)