



Your Clean Air, Product and Heat Recovery Solutions Partner

Series 7000/8000

Gas Atomized Venturi Scrubbers

Overview

The extremely efficient gas atomized Series 7000 and 8000 Venturi Scrubbers are the best choice for applications requiring the removal of smaller micron and submicron size particulate down to 0.2 microns and meeting EPA classified PM 10 and PM 2.5 standards.

Soluble or chemically reactive gaseous contaminants are easily removed with these highly efficient devices. Both

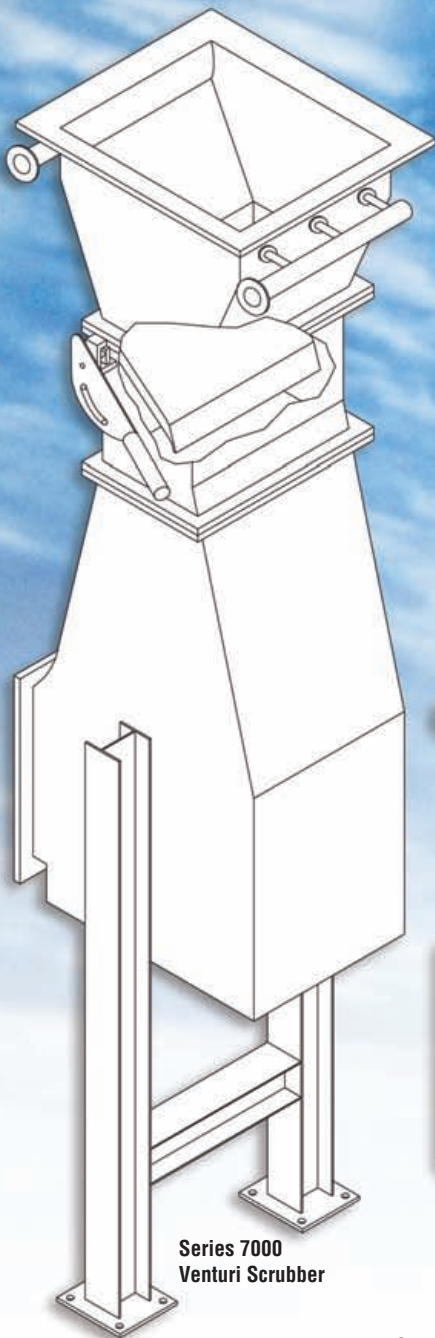
Series 7000 Rectangular and Series 8000 Annular throat units feature Bionomic proprietary

Maxi-Impact optimized long liquid-gas contact throat sections offering reduced pressure drop and superior collection of smaller micron sized particles than conventional venturi, rod deck or cylinder element throat configurations.

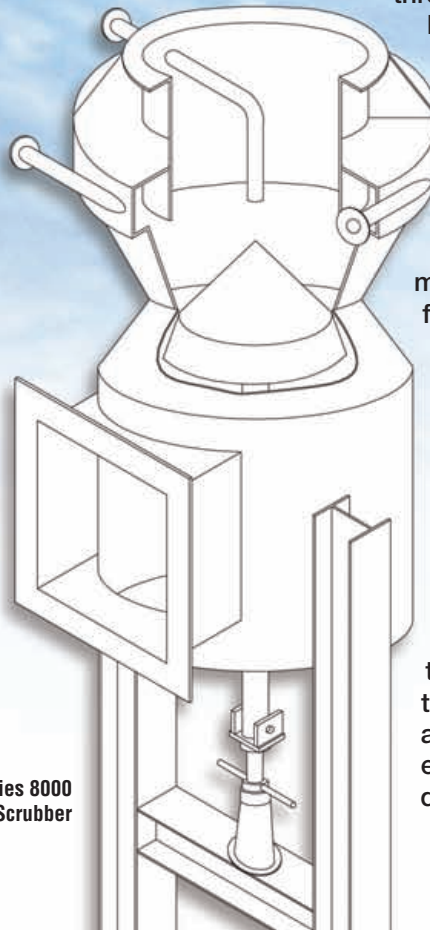
Throat sections are offered as standard with an adjustment mechanism with manual or automatic actuators for maximum flexibility in meeting the needed operating conditions, collection efficiency, and gas volume range.

To further the energy savings, the Series 7000 and 8000 Venturi Scrubbers include long taper static pressure regain sections to achieve particle growth and droplet agglomeration to reduce fan horsepower.

Choose the Series 7000 Rectangular Venturi for the majority of applications as the most cost effective solution, and the Series 8000 Annular Venturi for troublesome scale forming and surface adhering particulate. Both designs are engineered for rugged simplicity for reduced downtime and maintenance.



Series 7000
Venturi Scrubber



Series 8000
Venturi Scrubber



Series 7000 Venturi with Adjustable Throat and Flooded Elbow

Series Features

Series 7000 Rectangular Venturi Scrubber - Scrubbing liquid is introduced into the converging section through large fully open pipe distributors. Specially designed inlet shields ensure even distribution of the liquid eliminating the need for spray nozzles, orifices or other narrow passages that can plug. Slurries with 10% solids are easily handled with this plug free design.

Standard fixed or optional adjustable area throat assemblies with single or double blade configurations are available. Choose the fixed type for constant gas volume and pressure drop, and for varying volumes, the adjustable option to maintain constant pressure drop and collection efficiency. Throat adjustment mechanisms include manual with lever handle or wheel and automatic for differential pressure control signal feedback employing elector-pneumatic actuators. Adjustable throat designs feature extra large diameter blade support shaft with heavy-duty outboard bearings and protective shaft sleeve eliminating shaft deflection while assuring smooth operation and added protection from corrosion and erosion.

Regain diverging sections are available with a choice of sweep elbow for normal non-abrasive solids handling or flooded type with liquid impaction bottom for abrasive services.

A horizontal version of the Series 7000 is also available to meet layout arrangements favoring a lower height inline duct connection.

Series 8000 Aerodynamic Venturi Scrubber - Designed for those services where troublesome slurry liquids or scaling dusts exist, scrubbing liquid is circulated to the scrubber through tangential open pipe headers and spins down the converging section to the throat. Liquid is also fed through a central pipe header to ensure thorough washing of the center cone. This extremely effective washing action permits the recirculation of slurries greater than 20%.

Any potential buildup of solids on the scrubber interior surfaces is completely eliminated by projecting the gas inlet neck into the scrubber beyond the liquid distributors.

The Series 8000 incorporates our exclusive aerodynamic boat tail cone adjustable throat to generate maximum gas shear of the scrubbing liquid for smaller size droplet production and combined with vortex mixing results in superior collection of particulate at reduced energy requirements. This adjustable cone assembly utilizes a large diameter shaft as the only moving part with protective sleeve to isolate the shaft from the liquid-gas stream designed to withstand the most severe service conditions. Heavy-duty intermediate shaft support spiders guide the shaft. Up and down adjustment of the cone is accomplished manually via a screw jack actuator or hydraulic assist, or automatically with an hydraulic cylinder with positioner and feedback loop control from a differential pressure controller analog signal.

A diverging section allows for static pressure regain and flooded elbow enables recovery of energy and pre-removal of entrained droplets.

Typical Applications

- High efficiency collection in all industry applications of both PM 10 and PM 2.5 particulate and mists from process operations including reactors, dryers, calciners, furnaces, kilns, boilers, and incinerators
- Particulate and mists generated from metal cleaning/de-scaling operations
- Iron briquetting and pelletizing emissions
- Cleanup of Syngas tars and particulate from reformers, gasifiers, and reactors
- Abrasive dusts including taconite ores, catalysts, metal carbides, and oxides
- Explosive, radioactive and other hazardous particulate and gaseous emissions
- Dusts from material conveying, unloading, and silo filling
- Particulate in humidified gas streams that can plug fabric filter collectors or as a final polishing step due to broken bags
- Heavy scale forming dusts and scrubbing solutions
- Chemical and metal deposition generated nano particles



Entrainment Separators and Further Gas Treatment Components

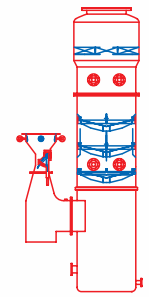
The Series 7000 and 8000 Venturi Scrubbers are complemented with a full line of entrainment separators with volumetric capacities to match all venturi sizes. These entrainment separators are designed to remove the fine liquid droplets generated by the venturi gas induced liquid atomization.

A variety of separator types are available to meet the demands of any application need. Vertical cyclonic with tangential gas inlet standard for low gas turndown applications. When extremely large gas volumes are encountered or large gas turndowns are needed, the optional Bionomic exclusive radial element secondary fine mist removal stage or chevron and filament mist eliminators with radial gas inlets are offered in both horizontal and vertical vessel configurations. To minimize fouling, mist eliminator elements are fitted with wash down cleaning sprays.

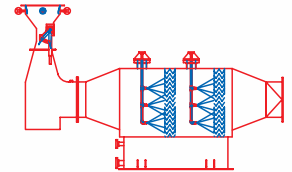
When further gas treatment for odor control, gas sub-cooling or absorption is needed, entrainment separators can be fitted with a packed bed stage, tray or patented RotaBed™ components to meet the performance requirements.

For forced draft high temperature gas applications, separators can include integrally mounted stacks complete with service platforms, access ladders, and analytical gas sampling instrumentation.

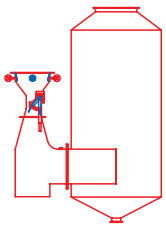
All separator sizes are available with choice of top central or side tangential gas discharge configurations to meet specific height limitations or layout configurations.



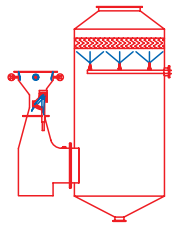
RotaBed™ Scrubber



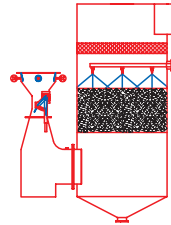
Horizontal Dual Chevron Mist Eliminator



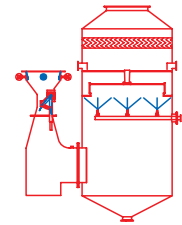
Cyclonic Separator



Chevron Mist Eliminator



Packed Bed Scrubber



Impingement Trays

Available Materials of Construction

- Mild Steel, 304, 316, 317L and AL6XN Stainless Steels, Duplex Alloys, High Nickel Alloys, Titanium, Monel, FRP, FRP-Dual Laminate, Silicon Oxide/Carbide Lined FRP, All Thermoplastics, Abrasion Resistant Ceramic/Castable and Corrosion Resistant Linings.

Capacity Size Range (Gas Handling Capacity)

- 500 through 460,000 cfm

Pressure Drop Range

- 6" through 100" w.c.

Contaminant Removal Efficiencies

- Particulate removal: PM 10, PM 2.5 down to 0.2 microns from 90 through 99.99%
- Water-soluble chemical reactive gases up to 95% alone and greater than 99.99% with separator fitted with packing, trays or RotaBed™ components

Series 7000/8000 Venturi Gas Scrubber

Size Chart

CFM	A	B	C	D	E	F
1,000	10"	4'-6"	2'-6"	2'-6"	8"	6'-5"
2,000	1'-0"	5'-0"	2'-9"	3'-0"	10"	7'-4"
3,000	1'-2"	5'-0"	3'-0"	3'-6"	1'-2"	8'-2"
5,000	1'-4"	5'-4"	3'-5"	4'-0"	1'-4"	9'-7"
6,000	1'-5"	5'-8"	3'-9"	4'-6"	1'-6"	10'-2"
8,000	1'-8"	6'-6"	4'-1"	5'-0"	1'-8"	11'-7"
10,000	1'-10"	6'-11"	4'-5"	5'-6"	2'-0"	12'-9"
12,000	2'-0"	7'-6"	4'-9"	6'-0"	2'-6"	13'-6"
16,000	2'-4"	8'-2"	5'-2"	6'-6"	2'-6"	15'-1"
20,000	2'-8"	9'-8"	5'-10"	7'-0"	3'-0"	16'-2"
25,000	2'-10"	10'-3"	6'-2"	7'-6"	3'-0"	17'-4"
30,000	3'-2"	11'-3"	6'-7"	8'-0"	3'-6"	18'-6"
35,000	3'-6"	12'-5"	7'-0"	8'-6"	4'-0"	19'-6"
40,000	3'-8"	13'-0"	7'-4"	9'-0"	4'-0"	21'-3"
45,000	3'-10"	13'-4"	7'-8"	9'-6"	4'-0"	22'-1"
50,000	4'-0"	14'-0"	7'-11"	10'-0"	4'-6"	22'-6"
55,000	4'-3"	14'-10"	8'-2"	10'-6"	4'-6"	23'-3"
60,000	4'-6"	15'-1"	8'-6"	11'-0"	5'-0"	24'-3"
65,000	4'-8"	15'-8"	8'-8"	11'-6"	5'-0"	24'-9"
70,000	4'-10"	16'-3"	8'-11"	12'-0"	5'-0"	25'-7"
80,000	5'-2"	17'-7"	10'-1"	12'-6"	5'-6"	29'-0"
90,000	5'-6"	18'-9"	10'-9"	13'-6"	5'-9"	31'-0"
100,000	5'-9"	19'-8"	11'-3"	14'-3"	6'-0"	32'-4"

Note:

1. Consult factory for dimension on sizes not listed.
2. Dimensions furnished based on standard cyclonic entrainment separator.
3. Drawing not to be used for construction purposes.

