

# RENEWABLE ENERGY CONSULTANTS, LLC

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MULTI-FUEL COMBUSTION SYSTEM



## FEATURES



REFRACTORY LINED WALLS FOR IMPROVED COMBUSTION



AUTOMATED-VFD CONTROLLED FUEL-FEED SYSTEM



FULLY MODULATING WITH 5:1 TURN DOWN RATIO



BACK-FIRE PREVENTION



HIGH COMBUSTION EFFICIENCY UP TO 89%



MULTI-FUEL COMBUSTION SYSTEM DESIGN

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Dear Customer,

The following is a detailed explanation of SIM Moving Grate Boiler:

The SIM Boiler has the Ash Augers below the Chain Grate, located on the floor of the Boiler. The Ash Augers are basically removing any additional dust and particles that drop off of the top of the Chain Grate as it revolves around, with the face positioned upside down at that point. (Please notice the Augers running the length of the Stoker in the "Stoker & Boiler Isometric" picture)

The plenums, located between the Chain Grate, are fed air from a pressure chamber, through an adjustable damper, which is located in the middle of each plenum. This distributes air equally to the full length of the plenum which gives a much more consistent air flow through the entire plenum, creating a very effective combustion across the width of the Moving Grate. The dampers are tightly sealed when closed and do not allow any air to leak out when closed. This is the only Boiler of this type that has this leak-tight feature.

The Grate moves consistently and is on VFD. The speed of the Moving Grate is determined by the rpm of the VFD Multiple Auger Infeed System, which allows the fuel to be fed on a consistent layer of fuel across the Chain Grate, and not a mound of fuel, such is the case with other types of Boilers, (especially Plate Grate Boilers). The hydraulics are eliminated and all drives are VFD, electric motor driven. The Chain Grate Drive has a built in clutch, preventing any breakage should there be a possible jamming of the Grate, for one reason or another. The Chain Grate has overlapping sections, eliminating any ash dropping through the grate.

The Ash Removal System is very quiet, being electrically activated, and is not noisy when activated. Our experience is that the hydraulics have a constant oil leakage, need filter change periodically, hose replacement and are noisy when operating.

The Stoker has 6 inches of sheet insulation and 7 inches of poured refractory, equaling a total of 13 inches of insulation.

The Multi-Clone has 3 Cyclones within the main Cyclone, and the separated particles are dropped directly into the Ash Auger System, through an airlock, which eliminates an extra motor to move the ash.

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The Control Panel has CSA and ENTECA (Worldwide) Standards.

The Soot Blasters are built into the door and swing away from the tube area when the doors are open. This eliminates having to remove the Soot Blaster, after opening the doors. The doors have special hinges that allow the doors to swing out to the side of the Boiler which allows easy and open access to the tubes.

There are 2 Over Air Blowers. The Over-fire Air Blower at the infeed end flows air over the fire, below the arches. The Over-Arch Blower at the outfeed end, combusts any particles moving above the arches, that are not combusted by the Over-fire Blower while still in the Stoker, (under the arches). This second blower also keeps the top of the arches clean from any ash collection.

The pictures show a 2 – Metering Box Infeed System, which is a special model for mixing dry and wet material in specific applications. We offer the standard Boiler with a Single Metering Box with a Multi-Auger Infeed System.

The Fire Retardant System has 5 or 6 nozzles in the Metering Box. If a fire backs up through the Multi-Screw area to the Metering Box, the sensors activate the water system and it floods the Multi-Auger Infeed System.

The Incline Infeed Auger stops and the Multi-Infeed Augers and Moving Grate increase in speed, moving the burning fuel to the end of the Grate to the Automatic Ash Removal Auger.

**The SIM Boiler can burn Coal, Wood Chips (50% moisture), Pellets, Sawdust, Shavings, Pellets, Corn Stover / Fodder, Wheat Flax, Poultry Litter, Horse Manure, Grasses, (Miscanthus, Switch Grass, Hay, Etc.), Paper, C & D Waste, and many other types of Solid Fuel.**

An Oil or Gas Burner can be supplied with the Boiler for backup, if requested.

I have attached the Boiler pictures for you to review and explained as follows:

Concerning the “**Moveable Grate**” picture, (Top Right of brochure):

- 1 - Show the Ash Removal System from the Cyclone, Under Air Fan and a Double Infeed System, 2 Over Air-Fans, at the top of the Stoker. The 2 Silver Motors, will not be included unless a customer special orders a Dual Infeed Style Boiler. This also shows the Chain Grate Drive Motor, which is yellow colored.

Concerning the “**Cyclone – Ash System**” pictures:

- 1 - The brochure shows the Multi-Clone and Ash Removal System as well as the Wrap-Around Flange that allows a much better flow of gasses from the Boiler Tubes to the Multi- Clone. This allows a highly efficient separation

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of the particles and gasses, thus producing a very clean emission.  
The Boiler Vessel in the top right hand picture is not a Boilersmith, but a special vessel required by this specific customer.

## **Specifications on Boilers:**

- 1 - 77 BHP to 310 BHP are shown on a chart on page #2.
- 2 – We offer Multi-Fuel, Hot Water or Steam 999999998Boilers from 50 BHP to 600 BHP.

## **Please note that REC also offers the following components:**

- Fuel Storage & Transfer Systems (Walking Floor / Traversing Auger - [Single & Dual Auger] / Silo`s / Grain Bins / Circular Flex Bottom Bins / Combined Self Contained Truck Unloading & Fuel Bin / Elevated Multi-Auger Fuel Storage Bins / Gravity Flow Fuel Bins)
- Eko-Tech 170,000 BTU to 982,000 BTU Pellet Boilers
- Eko-Tech 170,000 BTU to 682,000 BTU Wood Chips Boilers
- Fuzzy Logic 170,000 BTU to 340,000 BTU Multi-Fuel Boilers
- Vertical & Horizontal Low Speed Grinders / Shredders, Horizontal Chippers
- Magnets – [Wedge / Suspended / Overband / Roller / Pneumatic, Etc.]
- Screeners – [Vibratory / Star]
- Material Handling Equipment - [Pneumatic / Belt / Conveyor / Auger / Vibratory, etc.]
- Pelletizing Machines - [50 Lbs. to 2,000 Lbs / Hr.]
- Bagging Systems
- Steam Turbine Generator Systems [5KW to 1.5MW]
- All Components and Installation for these Systems when requested.

If there is anything else I can do for you, please let me know

I look forward to working with you.

Thank you, Bob Rice  
**REC,LLC**