



Sunnytek Solar Sweden

Microgen Stirling wood burner with hot water and electricity output

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Microgen Engine Corporation

# Wood based Power and Heat solutions

The solution for staying powered and warm in remote places using local available wood



## BENEFITS



Power and Heat



Based on a local available energy source: wood logs !



For On and Off Grid situations



Autarkic living style possible in combination with Photovoltaic



For normal and extreme situations (emergency / back up power)



Multi voltages and output currents possible (DC/AC)



Simple operation with very little maintenance. And no maintenance for the Stirling Power Unit

Microgen is the company that has brought Stirling Technology from a R&D environment to practical applications and use in real life situations. Since 2011 thousands of Microgen Stirling Power Units have been used in gasfired Combined Heat and Power heating appliances in urban domestic environments.

Based on this accomplishment Microgen worked with several other specialist on the realization of the ultimate solution for power and heat: electrical and thermal energy from the oldest form of power mankind knows: **burning woodlogs !**

Numerous are the places in the world where people get **heat** from burning such fuel. Now you simultaneously can get **power**. Irrespective if you are located in New England, Canada, Scandinavia, the Alps, Siberia, on or off grid the Microgen Woodlog Power & Heat unit is **the solution** for providing local, renewable Power and Heat to your Cabin, House, Farm or Dacha.

External Combustion; one of the key characteristics of a Stirling Power Unit makes simple woodlogs the source for your remote power and heat problem. And makes the transport of complicated and expensive diesel unnecessary.

The base solution provides between 700 – 900 Watts electric with a maximum of 1050 Watts from the Microgen Biomass Free Piston Stirling Unit. Parallel 15-20 kW of thermal energy of the integrated heat unit is available. Other power ranges are available on demand.

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# Wood based Power and Heat solutions

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<b>Power</b>	On - Off grid Electrical Output (a) (b)  Electrical power unit Own power use appliance Stirling type	various options available between 700-900 Watts, max 1.050 Watts, 50 – 60 Hz, 230 Volt AC Microgen Biomass Stirling Power Unit max 100 Watts Free Piston Beta type
<b>Heater</b>	Thermal Output Water Heater capacity Water temperature	max 20 kW 100 liters max 90 degrees Celsius
<b>Dimensions</b>	Dimensions total appliance	Height: 180 cm, Width: 60 cm, Depth: 85 cm
<b>Weight</b>	Weight Appliance	including Stirling unit aprox. 450 Kg
<b>Firebox</b>	Opening Filling Time (max filling)	Width: 35 cm, Height: 20 cm 110 liters between 3 and 4 hours depending on type of wood
<b>Maintenance</b>	Cleaning interval Stirling Power Unit	once a week maintenance free
<b>Other</b>	Emissions Noise level Fuel  Overall efficiency	Following EN 303 class 3 max 48 +- 2 (A), one meter distance woodlogs, diameter max 15 -25 cm, max length 50 cm 85%

- (a) depending on combustion chamber filling, water temperature and water flow
- (b) different alternative output modes, on and off grid options available



**Engineered for robustness**

Microgen's Free Piston Stirling Power Unit is the result of the meticulous engineering and development of a high tech, game changing technology with a focus on carefree and lifelong use.



**Set up for ease of use**

Even the best engineered and tested product can sometimes have an issue. In remote rural areas, especially when the conditions are harsh it is essential that you can do most of the work yourself. By means of a simple lift / leverage system the Microgen Biomass Stirling Power Unit can be easily taken out or put into the secondary firebox.

This system also enables simple and practical cleaning and maintenance. A robust and simple controls system not only assures it proper and safe functioning, it also minimises electrical disturbances.

## How it works



The Microgen Woodlog Power and Heat unit is based on the successful combination of two principles: wood gasification and Microgen Free Piston power generation. Small scale wood gasification was a technology widely known and used in the past. During the second World War even cars were powered through this process. With this use already long gone the process is still widely used for heating up houses, cabins and dachas in especially remote and rural areas.

Wood is put to fire in a primary firebox under low oxygen circumstances. The heat "drives" the woodgas out of the logs which is "sucked" into a secondary firebox. With ample oxygen available the woodgas is fully combusted in this secondary firebox. The head of the Microgen Biomass Stirling Power Unit is located in this secondary firebox and gets heated up. The standard Microgen Engine electronics assure that at a certain temperature the Microgen Biomass Stirling Power Unit gets started and will produce power.

The heat of the primary and the secondary firebox is absorbed by water / cooling fluid through heat exchangers mounted in the walls of the unit. The cooling water / fluid of the Microgen Biomass Piston Unit is connected to the heater cooling fluid system.

A dedicated Woodlog Combined Heat and Power controls system assures that everything functions properly and safely. Different power connection options for on or off grid, with or without other energy sources such as PV are available.