



PATENT PENDING RABBIT EARS THERMOELECTRIC GENERATOR

Introduction:

The Rabbit Ears CHP (Combined heat & power) is a Thermoelectric wood stove Generator Nominally rated at 100 watts. It has the ability to supply reliable solid-state BASE LOAD power. The ONLY moving device for this system is a 12VDC mag drive liquid pump. As long as the stove is operating the system will charge batteries. Its unique design coupled with a smart controller /PLC operated by direct inputs from wireless sensors (optional) automatically operates all functions of the generator. Once installed the unit has multiple fail safes that protect its function and the user*. Any part close to the flue is metal or high temperature materials. By generating reliable **BASE LOAD POWER**, it is ideal for winter use when solar and other power systems may not supply the required constant power output. It is a great compliment to other green power systems.

The Rabbit Ears generator can operate 24/7 providing constant power charging to a battery bank. An added feature of the product is that it also can distribute warm water for both supplementary hot water or for hydronic and or base board heating.

This novel thermoelectric TEG system will provide continuous power as long as a quality heat load is present on the hot side of the thermoelectric modules. There is no need to drill or cut into your wood stove, gas, or coal stoves. The Rabbit Ears system comes with a pump, DC to DC 100 Watt controller with a custom designed integrated PLC system. The unit comes semi assembled out of the box with the Generator already assembled to the 6" diameter stove pipe, 24" long (included). Just drop into place on the exhaust flue of your stove and plumb your water for circulation and cooling of cold side.

The RABBIT EARS TEG GENERATOR will run both 12V & 24V direct loads & or bulk, trickle charge functionality for battery charging up to 24 Volts DC with sufficient heat loads. The charger is a smart charger for bulk charging down to float charging automatically as the batteries are close to full charge. Heat exchangers are mounted inside the towers with PEX ends for easy hook up to a 1/2" circulating liquid system. Vent plugs equalize atmosphere pressure to tower pressure, no chance of high-pressure build - up. Two large heat absorbers penetrate the flue gas stream maximizing heat absorption which in turn produces maximum heat flux for optimal power output. This arrangement is much more efficient compared with other systems that are affixed to the outside surface of a wood stove, including the top. The metal to metal contact is much less efficient compared to direct flue stream penetration.

* Please note:

The water in the tower liquid reservoir is separate from liquid cooling circulating loop. This is often referred to as a tube-in-tube heat exchanger.

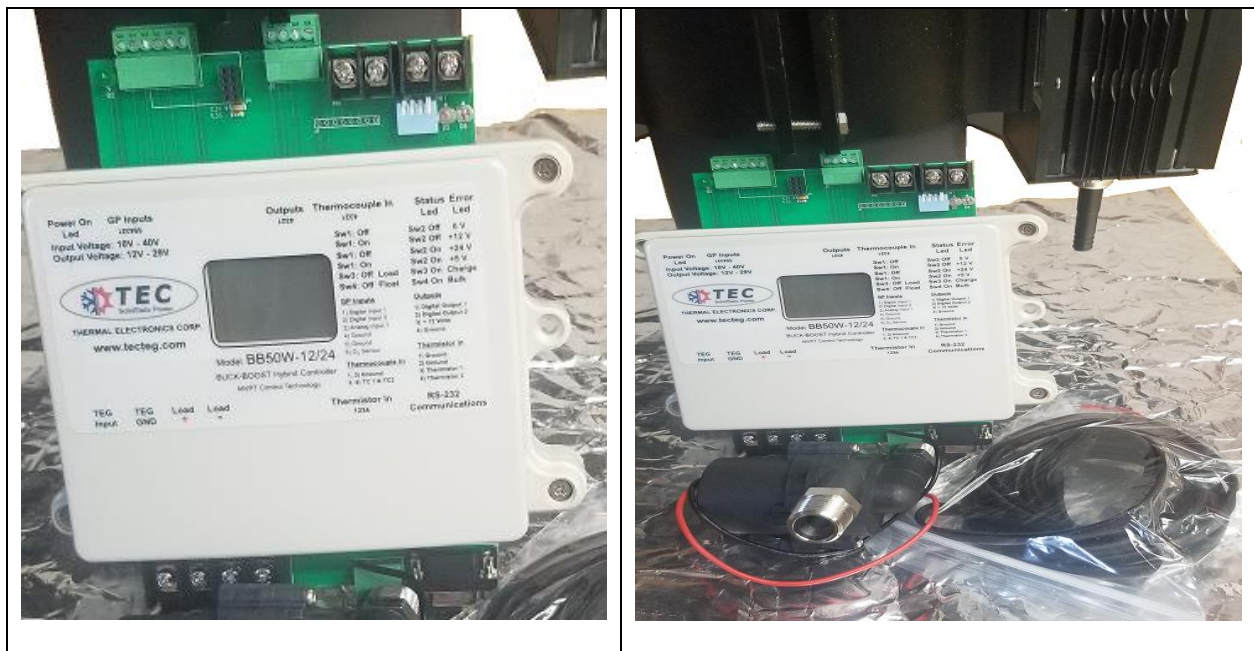


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The output from the thermoelectric generator modules in the Rabbit Ears system is Direct Current (D.C.) power that is not regulated or automatically adjusted to be compatible with load devices or external batteries. The BB50W-12/24 primarily performs the function of power conditioning and regulation. Also it serves as a charge controller for batteries to ensure that your battery is not overcharged. A typical storage battery for home energy needs is rated at 12V with a charging voltage of approximately 14.4V. The characteristic of this battery is that when the battery cannot absorb more charge, the current that is consumed will begin to reduce as it approaches the fully charged point.

The current consumption will fall to a low value compared to the charging current. When this occurs, the voltage delivered to the battery should be reduced to a value that simply maintains or “floats” the battery, so that it consumes almost no current, something like a standby mode. This is the recommended storage condition for a battery. This float voltage is approximately 13.8 volts and can be applied safely to the battery to keep it in standby mode, ready to deliver full charge at anytime.

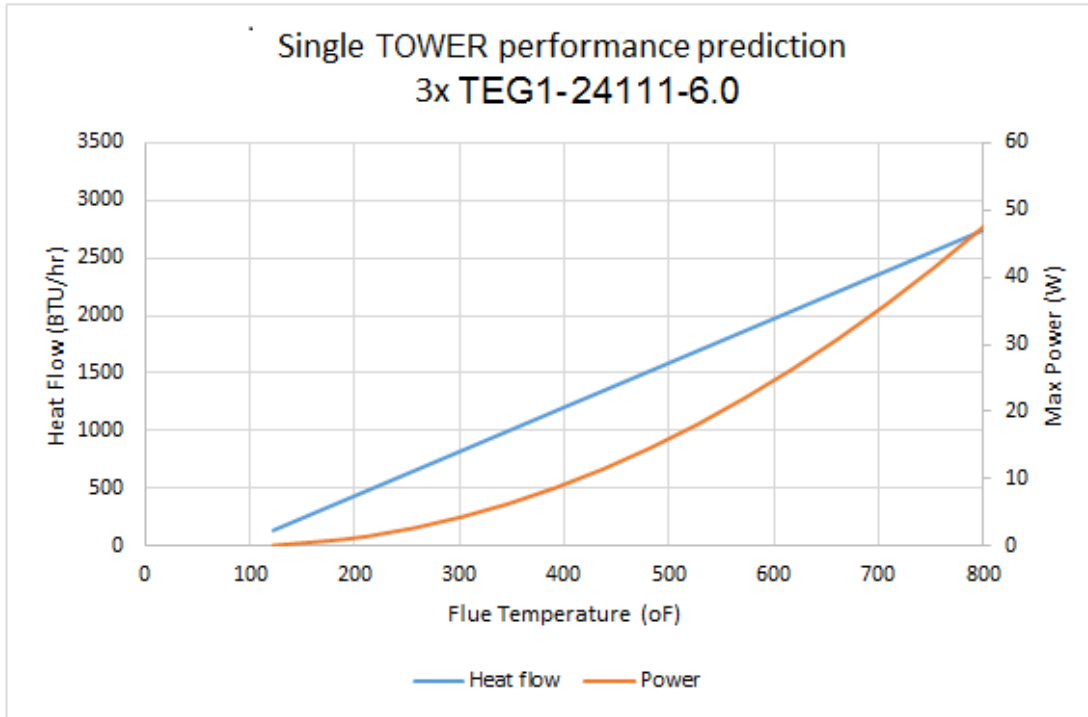
Using the blue switch on the rear side of the board, the BB50W-12/24 can be placed in a number of pre-set operating states to accommodate these charging modes. The controller features a bulk charge mode that monitors the current consumption at 14.4V and when it reaches a pre-set value, 200 milliamps for example, the controller will automatically switch to a float maintenance voltage of 13.8V and maintain that voltage for standby conditions. The LCD display will show the input voltage and output power state of the controller, as well as the temperature of each thermocouple and thermistor input set.



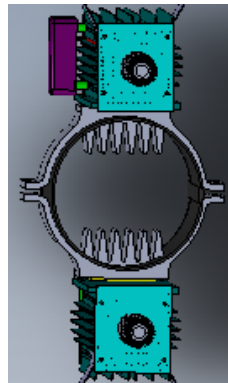
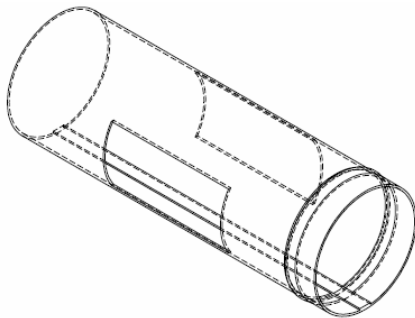
Control DC to DC Power Controller with pump and Power cord all included.



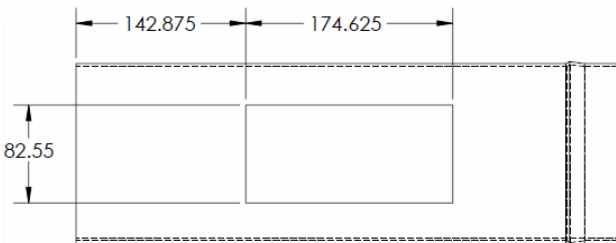
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Above graph based on 1 tower only. Rabbit ear system comes with 2 towers



Fins on heat sinks penetrate flue pipe to provide exceptional heat transfer which provides maximum power production.



Cut out for 6" stove pipe in mm /Imperial conversions to right
24" long also included with system!

Cut out for 6" stove pipe in mm:

82.55mm = 3 1/4"

174.625mm = 6 14/16"

142.875mm = 5 10/16"



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SMART MVPT/PLC Controller Specifications:

100W PEAK TEG Input Battery SMART MVPT Charging Board – Specifications

Number of inputs for TEG arrays:	1 (Terminal block for series-parallel connected arrays)
Output voltage ranges:	12V & 24V output charging voltages. Switch selectable direct load drive or battery charging.
Output power rating:	100W nominal charging at 24V.
External Fan voltage support:	2 outputs, individually adjustable. 12V nominal output, PWM output voltage adjustable with on-board Flash memory output voltage selection.
Relay Contact outputs:	2 relay driver outputs. Assignable via software. Transistor output to ground.
Opto-coupled inputs:	2 digital inputs, isolated optical inputs.
Analog Inputs:	1 Analog voltage inputs, 0V to 24V maximum.
Thermistor Inputs:	2 independent inputs, shown on the LCD display by software.
Thermocouple Inputs(optional) :	2 independent inputs, shown on the LCD display by software.
Communications options:	GSM modem, European or N. American frequency assignments as required. Software assigned as per user requirement for remote function activation or error reporting as desired via SMS text messaging to named cell phone number, bi-directional operation. RS-232 Serial port for local communication, configuration options including external data logging & monitoring.



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About the charger

- Use it as a fixed 12V or 24V supply, or a full featured 12V /24V battery charging controller with automatic microcontroller-based control for Constant Current/ Constant Voltage charging with float battery voltage charge termination.
- Built in support for widely available, low cost GSM wireless communication modems, allowing SMS text message capability. Receive a text message on your cell phone for high or low temperatures for example or send a text to the system to receive operational status. Optional
- Temperature sensors for reliable operation, with status LED error indication for low or high temperatures. Optional thermocouple input board available for hot side measurement.
- External analog and digital isolated inputs and transistor outputs for interfacing with off-board systems or control systems. Control a feedstock delivery unit for example based on operating temperatures.
- Expandable for additional functions or custom requirements with the additional of an expansion circuit board, where quantities are favorable to the addition of a custom designed hardware and firmware solution.
- Front panel switch selects operation modes for main operating conditions to quickly select various options. For more detailed setup and configuration a Windows compatible setup program will allow the user to set and change the parameters or view the system status. Can be used for remote data logging and collection if GSM modem is not used.
- Specifications can change without notice. We recommend before buying that you consult our qualified staff.





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Included in package:

- Rabbit Ears Thermoelectric generator with liquid cooling
- 100 watt 12/24V charging Dc to Dc charge controller with PLC operation.
- 12VDC MAG drive pump
- Ceramic Blanket to lower the ambient air temperature above the stovetop.
- 8ft High temperature power cord
- 24" high stove pipe with cut outs pre-assembled to generator
- 3 pcs Black silicone sleeves to cover exposed PEX tube



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Overall unit is 28" high

Liquid fill per cold side is 2.5 Liters. **Please allow 3" of air at top for fluid expansion!**

What is needed to install which is **NOT INCLUDED:**

- Reservoir tank
- 4 pieces ½" PEX Elbow fitting.
- Pex tubing

Recommended

- 55 gallons to 110 Gallons required,

Or

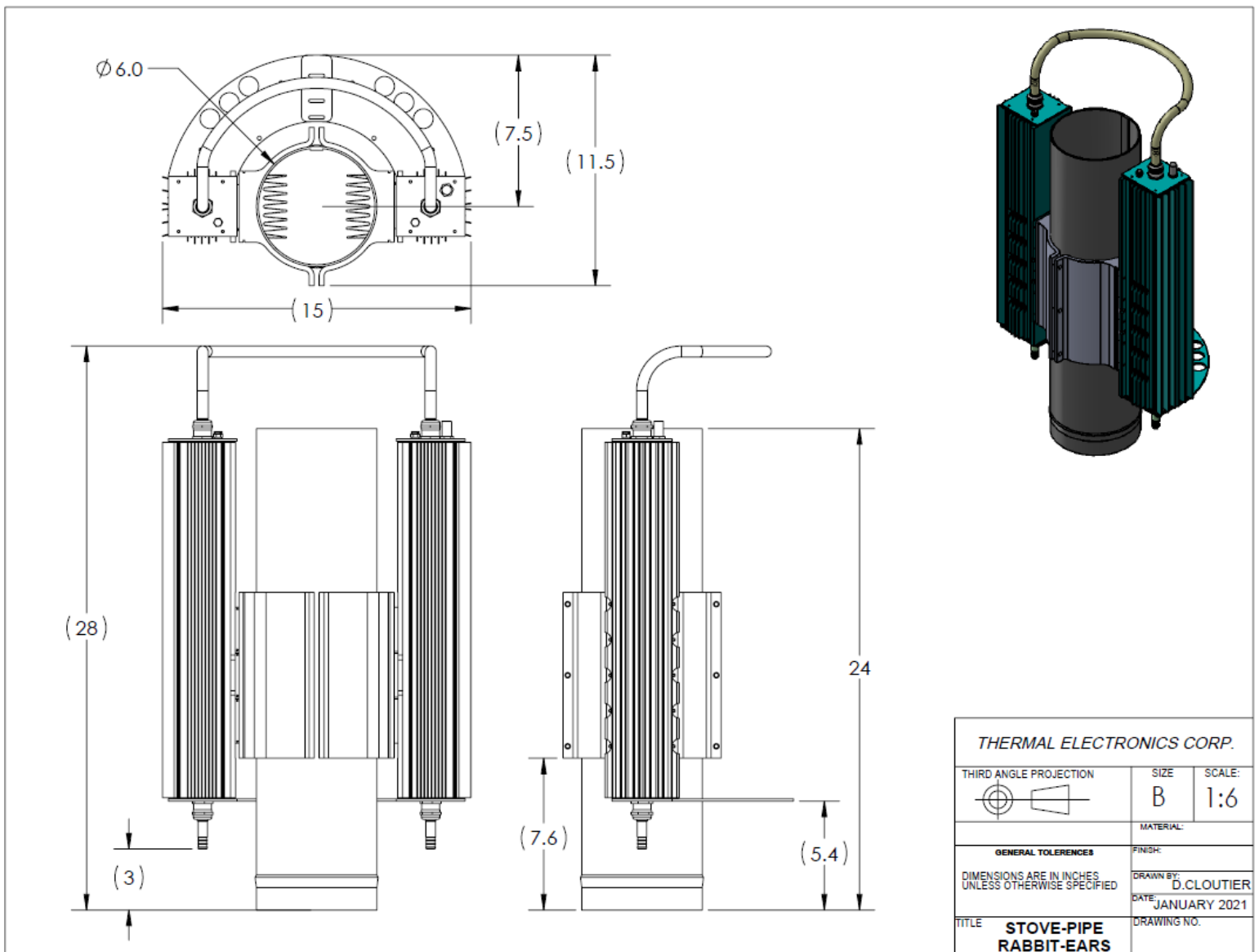
Radiant or baseboard loop to dissipate the heat collected from heat absorber side.

Optional closed loop set-up which would use less power from the pump or open loop which uses about 9 watts, which varies with pumping distance and head pressure.



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Mechanical Dimension of the 6" diameter Rabbit ears 100 W Generator





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