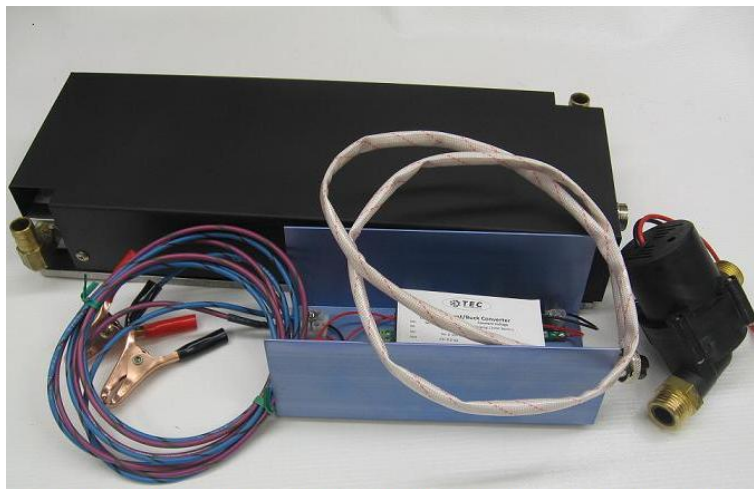


TEG12VDC- 24VLIQUID COOLED TEG Generator

The TEG12VDC or 24 VDC is a nominal *50 watt TEG Generator. The TEG Generator works up to a hot surface temperature of 400°C (750°F). A 12V DC Mag Drive high efficiency pump is supplied Free with the TEG GENERATOR which consumes 5 to 15 Watts depending on which model is selected. 1 pump can typically run up to 3 to 4 TEG Generators. The output is controlled by an adjustable constant voltage constant current DC to DC converter with a factory output of 13.8 to 14.4V. It is able to trickle charge a 5 to 12 VDC battery bank. Notify factory that you would like to charge 24V battery bank as a different DC to DC converter is required!

**There is an extra cost for a 24V DC to DC Converter.

(*OUTPUT BASED ON MAXIMUM HOT SIDE TEMPERATURE and DT)



DESIGNED & MANUFACTURED IN CANADA

PART NUMBER	TEG12VDC-24 LIQUID
OUTPUT POWER	50 watts nominal
OUTPUT VOLTAGE	Variable preset by Factory up to 14.2 Volts
DC to DC Converter Constant Volt & amps	Vin: 8-30V (80W 10-30V) Vo: 2-16V 6A(MAX) 80W(MAX)
Output voltage for charging circuit	adjustable charging voltage to 13.8 to 14.4V
Recommended Maximum Hot side temperature 400°C	
PUMP SPECIFICATIONS	TEG5-10-15 DC MAG DRIVE PUMP
Dimensions	13"(33cm) x 5" (12.7cm) x 2.55" (6.50cm)
Weight	10 lbs (4.5 Kgs.)
INLET & OUTLET OD	.5"(12mm) / .5"(12mm)

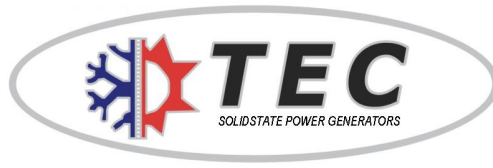
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Supplied w/ standard DC to DC constant current constant voltage Converter

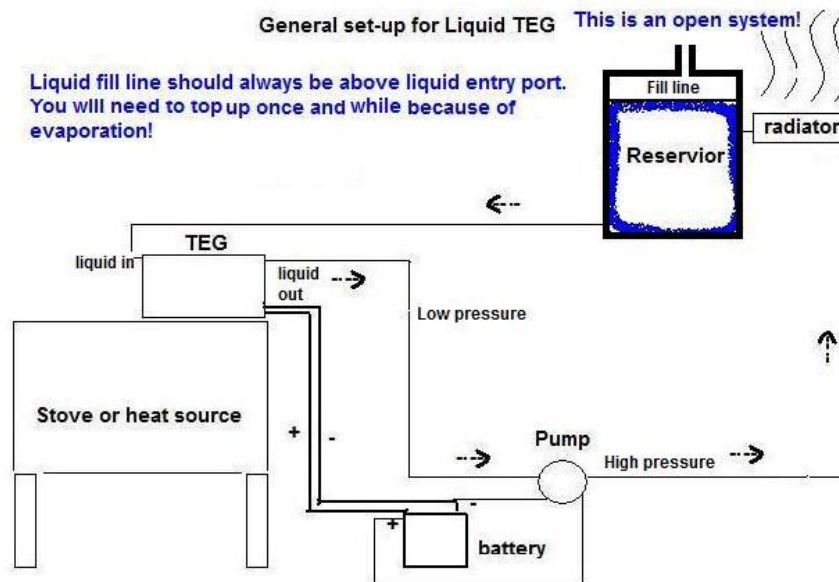
- Input Voltage: 18V open circuit or 8V loaded
- Output voltage: 8-16V (adjustable) Maximum 16 Volt output. **24VDC charging optional charger is available.**
- Output current range :0.5-6A (80W MAX) (continuously adjustable)
- Output Power: 80W maximum power
- Operating Temperature: Industrial (-40°C to +85°C) (if ambient temperature exceeds 40°C, please lower power use, or to enhance heat dissipation), case surface temperature should not exceed 50°C)
- Short circuit protection: No
- Under voltage protection: Yes
- Input Reverse Polarity Protection: diode included

CRITICAL NOTES FOR OPERATION:

If used for charging BATTERIES a diode is incorporated to prevent reverse voltage to TEG.

Liquid sink is design for maximum surface area and based on this design must be operated under low pressure of less than 10 PSI.

- It is imperative to:
 1. Maintain DT sustains optimum power generation.
 2. Protects pump from overheating. Maximum cold side of 90°C
- **Do not exceed 900°F temperature on the hot side** or you will damage the TEG modules.
- Second smaller board is a buck board which controls pump speed from 7-12V. (May not be included)
- **We always recommend charging a battery and drawing loads (lights, motors, etc...) from the battery NOT from the TEG output directly.**



1. Always set the system up to test water flow before engaging TEG on hot surface. This insures that the system is running properly.
2. Pump can be before or after TEG. Sucking my cause Cavitation (lack of water through pump head).
3. Battery should always be fully charged for new system.
4. Pump should always be attached directly to battery for power.
5. These are only suggestions ! Final set up are at discretion of end user.
6. Liquid sink TEG is designed for low pressure under 10 psi.
For reference city service pressure is 40 psi typical!

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For hose hook-up use ½"ID with 1/8" OD wall minimum silicone tubing in and around the stove. Most silicone tubing can withstand 550°F and is fire retardant.

Reservoir should be at least 5 to 6 ft in the air above pump to reduce possibility of cavitations (Lack of water to pump). In suction design only!

WHAT IS NOT COVERED: Any damage caused by misuse, abuse, accident (dropping or otherwise shocking the Generator) normal wear & tear, or physical damage. Also any incidental or consequential damage or loss is not covered. Improper installation will Null and void all warranty

There are no warranties of merchantability or of fitness expressed or implied, which extend beyond the description on the face hereof. In no event shall Thermal Electronics Corp. be liable for damages in excess of the purchase price. Thermal Electronics Corp. neither assumes nor authorizes any other person to assume for it any liability in connection with this product. Abuse, misuse or mistreatment (i.e. if you overheat or drop the Generator) VOIDS all warranties. We do our best to make all of our Generators as durable as possible. However there is no way for us to fully prevent all damage due to overheating, or dropping. Warranty is limited to replacement of parts at the full discretion of the manufacturer and is limited to 1 year from date of purchase. Failure to follow the above directs will result in the destruction of the modules. It is the responsibility to the purchaser of this product to follow all direction.

Set-up Procedure

The TEG12VDC-24 liquid has 2 ports. One (IN) port for cold liquid or returning cold loop and one (OUT) port for liquid that has been heated by the heat passing thru the TEG modules. Markings on the brass elbows will indicate which port to hook –up too. It is recommended that about 2 feet of Silicone tubing be used for hook-up on each (IN) and (OUT) ports. The silicone tubing is HIGH TEMPERATURE and will not catch fire or melt if it comes in contact with the wood stove or heat source. There are many suppliers on the net that can supply this tubing. We recommend using ½" ID and ¾" OD or 1/8" wall thickness.

Understand that the more surface area contact you can achieve with the direct heat source the better the TEG will perform. This means that if you are able to have the aluminum plate directly contact the flame (by cutting a window into the wood stove surface) you will achieve a much better and hotter hot side. **The plate steel of a stove is a poor conductor compared to aluminum or copper so it acts as a resistor to heat movement.** Therefore, if you are able to have direct contact with the flame in the stove, power output will increase. If direct contact is NOT an option we recommend welding or fastening fingers or fins to the inside surface of the stove to create a thermal pathway for the heat to travel directly to the surface of the stove where the TEG sits.

DO NOT PUT A LOAD (Battery, fans, motors) ON TEG OUTPUT UNTIL hot plate has reached maximum Temperature. IF you do the DC converter will not turn on and will not operate effectively. Once the open circuit Voltage of 18VDC output is reached you can hook the clamps to the Battery terminals. Use a multi meter to determine output voltage!

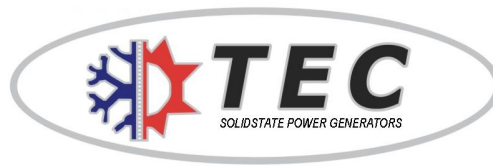
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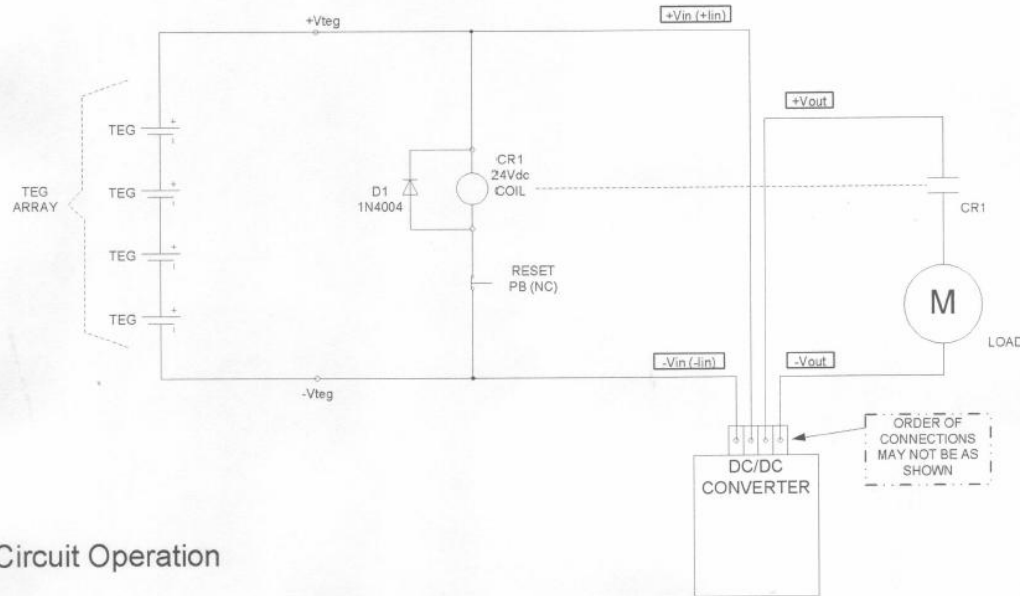
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Reliable DC/DC Converter start-up circuit removes the Load from the Output until TEGs produce enough Power to sustain continuous operation.



Circuit Operation

- When V_{teg} is less than 8 Vdc, DC/DC Converter Output is OFF.
- When V_{teg} is 8 ~ 19Vdc, DC/DC Conv. Output is ON but Load is not connected to Output.
- When V_{teg} is > approx. 19Vdc, Control Relay CR1 Energizes and Load is connected to DC/DC Converter Output.
 - When Load is Connected, V_{teg} will reduce due to voltage drop across TEG source resistance.
- While V_{teg} is 8 ~ 24Vdc, Load will run with DC/DC Converter Output voltage & current as set by the Converter.
- When V_{teg} drops below approx. 4Vdc, or if Reset PB is pressed, Control Relay CR1 will de-energize and Load will be disconnected from the DC/DC Conv. Output.
 - This will permit V_{teg} to rise to near Open Cct Voltage

If voltage goes below ~ 8 volts you must reset the DC to DC converter. This can be done by a switch located on the Blue aluminum case. The switch is designed to reset the DC converter so it will de-energize. Simply turn the switch off and then on again wait about 2 seconds between each maneuver. The DC to DC converter will only operate when there is a minimum of 8VDC loaded and approximately 18V open circuit. The relay protects the Dc to Dc converter from low voltage.

Design and specifications subject to change without notice

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