

Fabrication Of A Wind Power Refrigeration System Using Wind Energy

Shaik Sameer¹, G. Md. Javeed Basha², H. Ranganna³

¹Dept of ME

²Assistant Professor, Dept of ME

³Associate Professor, Dept of ME

^{1, 2, 3} St. Johns Engineering College, Yemmiganur, India

Abstract- *The project is to fabricate thermo electric refrigerator using wind energy. It is pollution less project, made by using thermoelectric module. It supports for cooling. Hence it proves to be very helpful. Exhaust fan is attached to the system to spread the cooling to the surroundings. Micro controller reads the temperature sensor values which are connected to the thermoelectric plate. It has no moving parts and thus maintenance free. It supports for both heating and cooling. Hence it proves to be very helpful. The research focused on simulation of a thermoelectric refrigerator maintained at 4°C. The wind thermoelectric avoids any unnecessary electrical hazards and provides a very environment friendly product and also the thermoelectric refrigerator does not produce chlorofluorocarbon (CFC). It is pollutant free-contains no liquids or gases, portable, compact, creates no vibration or noise because of the difference in the mechanics of the system. The project has various applications like military or aerospace, refrigeration purpose, medical and pharmaceutical equipment etc.*

Keywords- Rechargeable Battery, Wind turbine, Exhaust fan, Thermo electric plate, SMPS.

I. INTRODUCTION

Thermoelectric fridge additionally called as thermoelectric cooler module. Warmth will moved from one side to other, by applying low voltage DC control source to the thermoelectric module. Thus, one face of module gets warmed and other face will be cooled. Thermoelectric refrigerators and standard coolers are addressed by the laws of thermodynamics and both refrigeration structures are handles same measures yet unique in shapes. Till now experts have found, different laws influence are one of them. A Thermoelectric module is a strong state notewortiness converter made out of two earth substrates that fill in as an establishment from disparate semiconductor material (P-N shape). Which on obliging, they will show up thermally in parallel and electrical in game plan. This module can be utilized for cooling and warming. The cooling influence

conveyed by TEM has unmistakable applications in warm affiliation and control of microelectronic contraptions.

Wind importance based temperature controlled chamber is exhibited in this undertaking. This procedure is essentially amassed in the remedial field. Using the Peltier module, the temperature controlled chamber is used for the twofold purposes i.e. cooling and warming.

II. LITERATURE SURVEY

Jincan Chenaetal.,[1]:-According to non equilibrium thermodynamics ,cycle models of single stage and two stage semiconductor thermoelectric refrigeration were experimentally investigated. By using the three important

Parameters which governs performance of thermoelectric refrigerator i.e. coefficient of performance (COP), the rate of refrigeration, and the power input, development of general expressions performances of the two stage thermoelectric refrigeration system took placed. It was concluded that performance of thermoelectric refrigerator depends on temperature ratio of heat sink to cooled space. When this ratio is small, the maximum value of COP of a two stage.

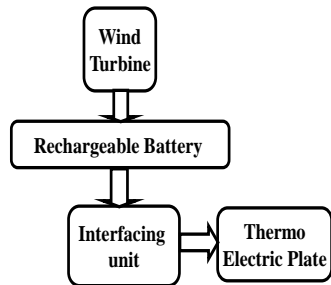
Thermoelectric refrigeration system is larger than COP of a single stage thermoelectric refrigeration system; however maximum rate of refrigeration is smaller than that of a single stage thermoelectric refrigeration system. Hence it is convenient to use single stage thermoelectric refrigerator when ratio is small. When temperature ratio is large two stage thermoelectric refrigerators is observed to be superior to single stage by both parameters i.e. maximum value of COP and maximum rate of refrigeration.

In early 1800's the modern thermoelectric coolers are invented which are based on the physical principles of thermoelectric cooling and heating. Thermoelectric modules were made available in late 60's. A German scientist, Thomas seebeck , found that continuous

flow of electric current in a closed circuit which is made up of two dissimilar metals where as at two different temperatures junction of metals were maintained. In 1834, A French physicist, Jean Peltier, investigated the seebeck effect and found out the opposite phenomenon in which, the electric current flow within the closed circuit whereby thermal energy is absorbed at one dissimilar metal junction and discharged at other junction. This is the basic fundamental principle of thermoelectric systems

III. IMPLEMENTATION

Wind power based Refrigerator



Thermoelectric plate, exhaust fan is interfaced to the system. Energy from the wind turbine stored in battery, this energy used to power up the thermo electric plate, exhaust fan. Thermoelectric plate works with Peltier effect, on applying DC using battery, the array of pellet having positive and negative charge carriers absorb heat energy from one substrate and eventually release it to the substrate at opposite side. In this process, cold surface appeared due to absorption of heat energy. This absorbed heat This ingested warm essentialness is being released unexpectedly surface, ends up hot. Vapor fan is secured to the system to spread the cooling to nature.

IV. RELATED WORK

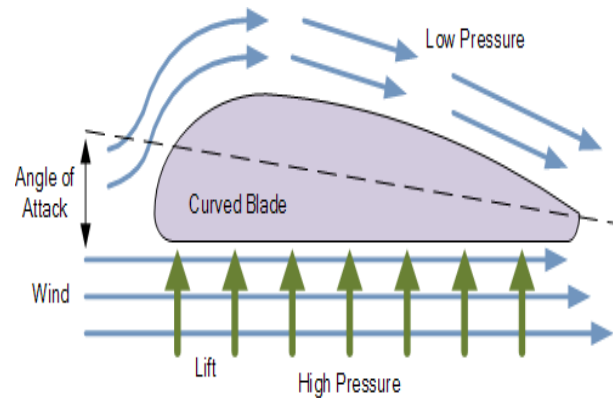
The brief introduction of different modules used in this project is discussed below:

Wind turbine:

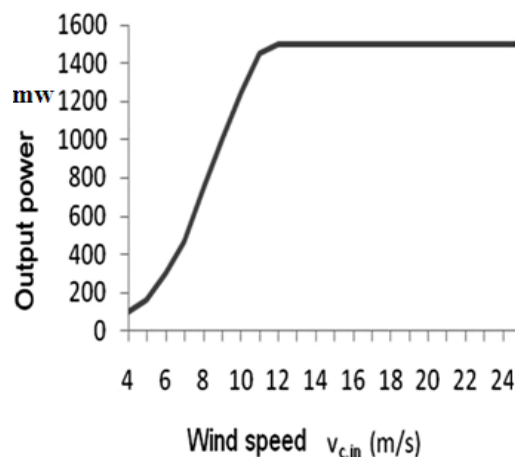
A breeze turbine is a device that converts engine essentialness from the breeze, similarly called breeze imperativeness, into mechanical imperativeness; a system known as wind control. If the mechanical essentialness is used

to make control, the contraption may be known as a breeze turbine or wind control plant. If the mechanical essentialness is used to drive equipment, for instance, for pulverizing grain or pumping water, the contraption is known as a windmill or wind pump. In this way, it may be insinuated as a breeze charger when used for charging batteries. The outcome of over a thousand years of windmill change and present day constructing, the present breeze turbines are manufactured in a broad assortment of vertical and level rotate composes. The tiniest turbines are used for applications, for instance, battery charging or partner control on boats; while sweeping system related assortments of turbines are transforming into an unquestionably basic wellspring of wind control conveyed business control.

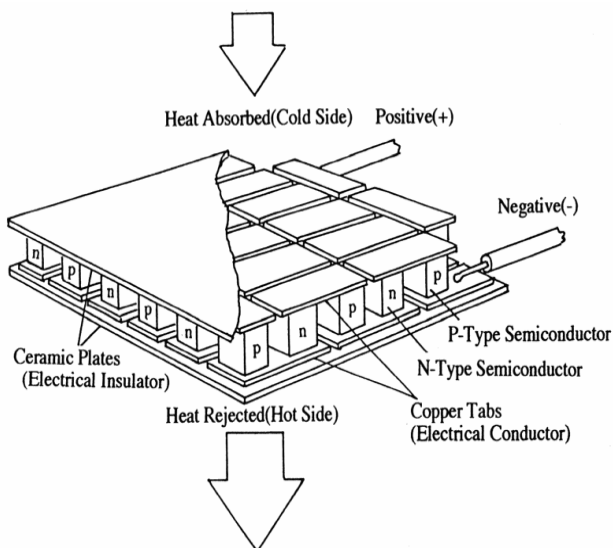
1. Curved Blade Air Flow and Performance:



As this approach winds up bigger, more lift is made yet as the edge turns out to be considerably bigger, more prominent than around 200; the sharp edge will start to diminish lift. To meet the technical requirement of -35 degree Centigrade for the minimum ambient temperature in winter, the ethylene glycol aqueous solution with the concentration of 50% and a freezing point of -38 degree centigrade is picked according to Cao-15 and Tan-16.



THERMOELECTRIC PLATE:



PRINCIPLES OF OPERATION

Peltier effect is the basis of thermoelectric module operating principle. In peltier effect, on applying the voltage between two electrodes connected to sample of semiconductor material, temperature difference is created. A thermoelectric cooling (TEC) module is a semiconductor-based electronic part that breaking points as a little warmth pump. By applying DC control source to a TEC, warmth will be exchanged beginning with one side of the module then onto the following. It makes a cool and hot side.

They are comprehensively used as a piece of mechanical zones, for example, PC CPU, CCDs, flexible refrigerators, therapeutic instruments, and so forth.

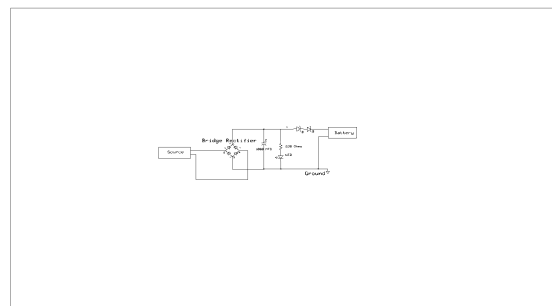
Rechargeable battery:



A rechargeable battery, stockpiling battery, or aggregator is a kind of electrical battery. It involves at least one electrochemical cells, and is a kind of vitality collector. It is known as an optional cell since its electrochemical responses are electrically reversible. Rechargeable batteries

come in various shapes and sizes, running from catch cells to megawatt frameworks associated with balance out an electrical dispersion network. Several distinctive blends of chemicals are generally utilized, including: lead– corrosive, nickel cadmium (NiCd), nickel metal hydride (NiMH), lithium particle (Li-particle), and lithium particle polymer (Li-particle polymer).

Charging circuit:



From the above circuit diagram, we can see that the 18v AC is being converted to 18V pulsating DC which is in turn converted to smooth DC with the help of the Capacitor. This 18V Smooth DC is converted to 12V DC by the Voltage Regulator 7812. At the output of the regulator, we get some spikes which are not desirable. These spikes are removed with the help of another capacitor used. We can get 12V Steady DC at the output terminal which can be indicated if the LED glows.

SMPS:

The AC to DC converter **SMPS** has an AC input. It is converted into DC by rectification process using a rectifier and filter. ... Then, the output of this transformer is rectified and smoothed by using the output rectifier and filter.



V. CONCLUSION

A supportive Heating and cooling framework can be manufactured by utilizing thermoelectric module and electric control unit for the cooling and warming reason. The framework is self-controls and can be utilized as a bit of

isolated and a remote piece of the nation where stack shading is a basic issue. Thusly task can be thought about that breeze hugeness structures must be executed to overcome expanding power Crisis. With a specific genuine goal to use sensible power source, wind criticalness is made to control the thermoelectric module to drive the structure. Coming about to think the models, we can accept that breeze thermoelectric cooling is an impelled improvement. It's an eco satisfying activity; subsequently it drives green advancement for what's to come. This progression has not been widely perceived because of its concealed cost, yet by utilizing the waste warmth, the framework winds up being to an incredible degree gainful showed up distinctively in connection to its consistent associate.

VI. FUTURE SCOPE

In this undertaking we are creating wind worked cooler. Non-standard importance frameworks to an incredible degree significant beginning at now to our country. Non-standard vitality utilizing is changing over warm criticalness into the electrical noteworthiness. Here in this meander a warm course of action is made.

In this task we are utilizing TEP Transducer. Transducer is a gadget which changes in excess of one kind of centrality in to another sort of criticalness. This solidifies electrical, warm, light and warmth centrality too. while the term transducer generally translates the utilization of sensors/marker any contraption which changes over criticalness considered as Transducer. The task can be reached out by including palter plates, with the target that we can develop quite far.

VII. ACKNOWLEDGEMENT

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