

NANO POWER GENERATION FROM RAIN DROPS AS WELL AS SOLAR

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ABSTRACT

Researches similar to nano power generation using renewable energy have been explored. A variety of renewable energy has been prologue. This project is modified at economical level. One piezoelectric can be generate in average of 1.5 to 12 volts for each mechanical action. This research has been improved for the purpose of saving the energy. Rising demand leads to new inventions. This project has been analysis at that surface. Using one or more piezoelectric sencers are connected in series connection to get additive voltage to the output from the piezoelectric generation. The output is in the form of alternating current, by use of rectifier units which convert alternating current into direct current.

INTRODUCTION

In now days, many types of renewable energy has been developed like solar, wind power, hydro power, biogas power etc power generation is available but some locations like Kolhapur, pune, Mumbai etc in that places heavy rains is noted mostly in a June so to generate power from rain drops is very useful. The utilization of rain energy is more conventional as demand variation. Conventionally rain water is harvested by using dams (collected in a dam) which is again passed through turbine that will produce electrical energy. In this project, it was replaced by piezoelectric sensor and solar panels conjunction. This is ensuring to maximum power generated with respect to the area covered by rain drop fall on the piezoelectric at the roof. Then the piezoelectric sensor will convert the kinetic energy of rain drop into electrical energy according to its property. The connection assemble of piezoelectric sensors is various as per its application either series or parallel in order to get the output required. The implementation of the hardware and assemble of a piezoelectric sensor is observed by testing in different climates in rainy season.

How do you generate current from rain? Raindrops are not pure water. They contain salts that split up into positive and negative ions. To manipulate that bit of chemistry, the Ocean University researchers turned to grapheme, the one-atom-thick sheets of carbon. Grapheme's electrons can attract the positively charged ions, such as sodium, calcium and ammonium. The result: separated layers of positive and negative ions that act much like a capacitor to store energy.

We are always in the search alternative sources of energy, mostly from renewable resources. In previous time generally we know only solar and wind power, when in the day time the sun is always available, it can be hidden for some hours in a rainy day. In Nowadays, renewable energy widely used. The rain water harvesting has been developed. This. The main objective of this paper is to show the different aspects of

grapheme material. Grapheme has many optical, electronic, magnetic, optoelectronic and chemical properties.

Using more piezoelectric in series connection will supply more power to the load. The output from the piezoelectric sensor is in the form of alternating current (AC), by using rectifier unit it is direct current (DC). This project also included a power bank for the power storage generated.

Keywords- Solar Cell; Solar Energy; Piezoelectric Material; Photovoltaic effect etc.

PROBLEM STATEMENT

The pizo sensor works properly at temperature of 17 degrees. At temperature above 20degrees pizo sensor get severely damaged. For optimizing damage thermal sensor units are used which signals to the stepper motor placed which cover the pizo sensors to protect from sun radiation.

PIEZOELECTRIC SENSOR WORKING

Piezoelectric transducer it is a device which is used to convert kinetic energy of rain drop into proportional electric energy. A piezoelectric sensor is made up of the silicon and oxygen arrangement. Generally the arrangement of any crystal is symmetrical in all views but in case of pizo sensor quartz crystal is used who have non uniform structure. The crystals are electrically neutralised.

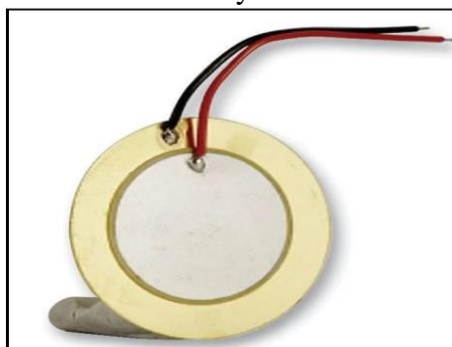


Figure 1: piezoelectric sensor

The structure of the crystal is not symmetrical in every dimension but its charges are electrically balanced it means it have positive charges which neutralise the negative charges. The quartz crystals have unique properties of generating electrical polarity. When mechanical stress is applied it produces polarities on its surface which is changing polarity as like the AC current. This is after converted into direct current by using rectifier units and stored into the battery.

THERMISTOR SENSOR WORKING

We know that the thermostat is an electrical device which changes their resistance value as per the variation in temperature. The most of the materials changes their resistance value. That is as the temperature increases they loss their conductance. But is case of thermostat it works negatively in such a way that its resistance get minimize as the temperature rises. The resistance of thermostat vary proportional to temperature applied.

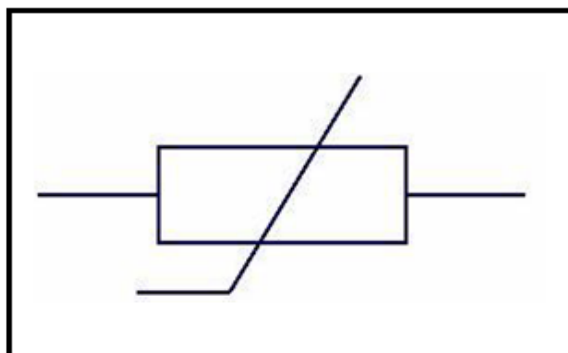


Figure 2: Thermistor

Thermostats are widely used as temperature sensors, inrush current limiters, self-resetting, over-current protectors and self-regulating heating elements. A thermostat is made up of semiconductor material. It is shaped like as a disk. Bead thermistors may be only a few millimetres in twist of radius. Some bead thermostat has been covered in a glass capsule

CIRCUIT ARRANGEMENTS

As shown in below figure the rectifier unit is mostly used for pizeoelectrical sensor related project. The arrangement of pizo is depending on rectifier unit. Rectifier arrangement is as follows. It is connected in series parallel connections.

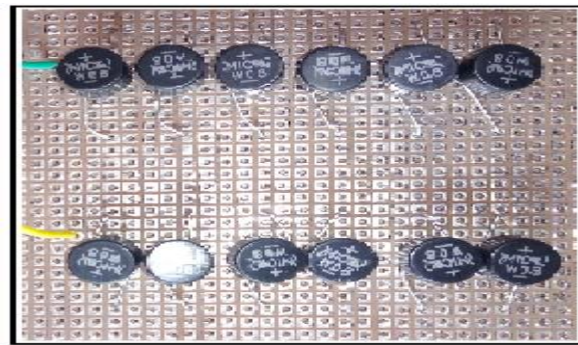
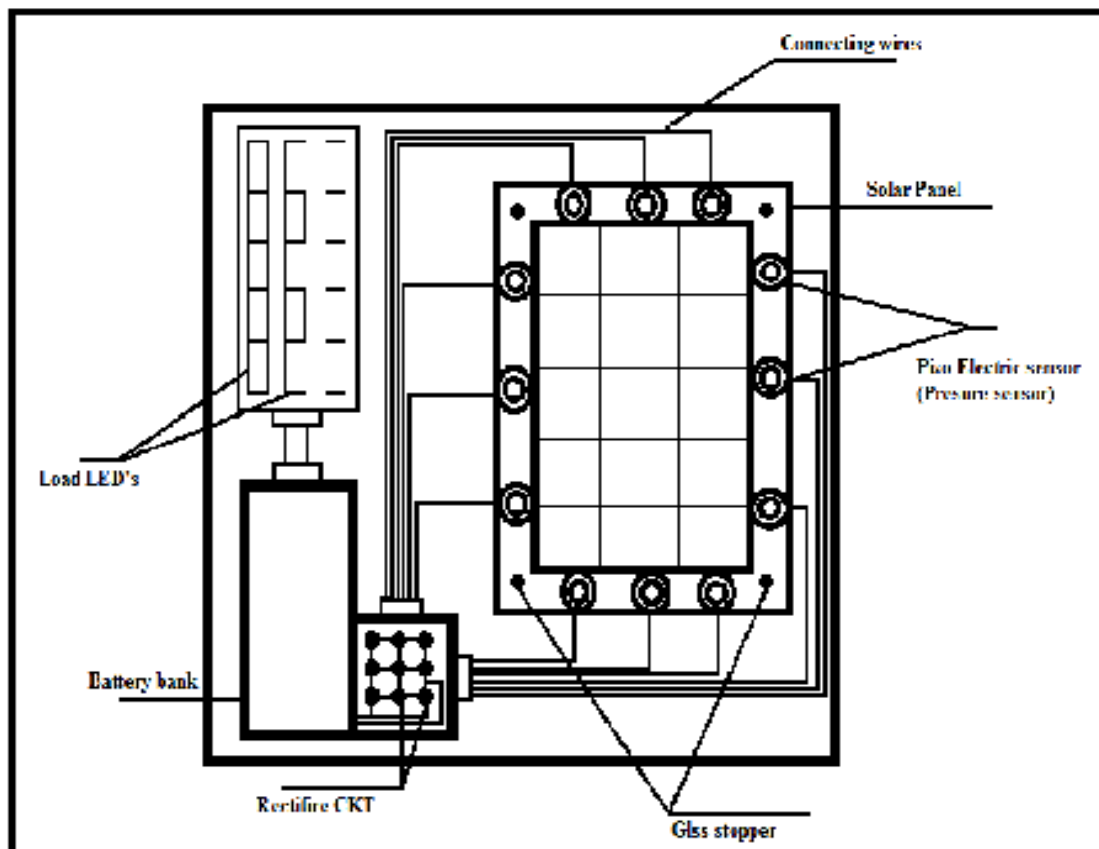


Figure 3: series parallel connection

Piezoelectric sensor circuit arrangement output

Connection	No. of sensor	Voltage (v)	Current(ma)
Series	8	8	0.02
Parallel	8	1	1
Series parallel	12	6	21.4285

BLOCK DIAGRAM



WORKING

Above shows the outline schematic of ‘nano power generation from rain drops and solar’ these are a concept which used to improve overall efficiency of the solar power production system. We know that solar will not generate power in rainy season efficiently the maximum efficiency of solar is only at sunny season at the lux level of 1500000 lux but in rainy season lux level decreases lower at only 25000 lux so by using pizo electric sensor (pressure sensors) kinetic energy of rain drop can easily converted into pressure energy by some improvement and particular arrangement of pizo sensor this energy directly converted into electric energy.

In the above block diagram of ‘nano power generation from rain drops and solar’ we can see that the piezoelectric sensors are mounted on the outer periphery of solar panel. Acrylic glass sheet is placed on the surface of pizo sensors which convert kinetic energy of rain drop into pressure energy and distribute the pressure energy on all pizo transducer. The output of pizo is in the form of Alternating current (AC). The AC output of pizo sensor is given to rectifier & filter CKT which convert Alternating output (AC) of the pizo sensors to the Direct current for individual pizo individual rectifier is used. Output of rectifiers is connected as per the arrangement of pizo sensors. The final output of rectifier is given to battery which store the charges produced and those charges are utilized for various applications.

ADVANTAGES

- It helps to increases the efficiency of the solar.
- Due to less space required for modification it easier to install.
- Combined generation give more efficiency.
- Modification in current arrangement is simple.
- Total overall construction is compacting similar to solar project.
- Environment friendly and renewable energy Generated in this project.
- No any errors happen due to this arrangement.

IMPLICATIONS

- To track rain drops it is more difficult in heavy rain.
- Solar efficiency is less in cloudy season.
- Initial investment for modification is costly.
- It required high altitude unidirectional rain drops.
- During fire stone bombardment it may damage arrangement of pizo.

APPLICATION

- At high intensity of light solar efficiency is more.
- At mid rainy area these project is more efficient.
- It is more efficient at the hills climate.
- Only pizo arrangement can also used in heavy rain area like area near to sea level.

CONCLUSION

This paper has focused on the power generation by using solar and rain drops. This paper is mainly aims that to get better efficiency of the solar in the rainy season we can use pressure sensors to convert kinetic energy of the rain drops into the electrical energy. By aliened arrangement of pressure sensor we improve efficiency of solar panel. This type of arrangement is also help full for the rain forest area. The final output of rectifier is given to battery which store the charges produced and those charges are utilized for various applications. This paper mainly aims to use renewable energy to overcome the problems related to the solar energy.

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