

Wireless Charged Inverter

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Abstract - Now-a-days inverter became a basic need in human life. Inverter is a power electronics based device which converts direct current power into alternating supply. Due to industrialization & used of modern technology, there is huge demand of the pure sine wave inverters. Whenever it comes to utilization of dc power sources for high and low power appliances, the inverter play a major role. It not only increases the efficiency of power system but also it work as protection system. Hence this paper will help the other research scholar for the cost effective and efficient pure sine wave inverter.

Keywords — AC Power, Pure Sine Wave, Cost Effective

1. INTRODUCTION

We all know, India Grid system i.e. One nation One Grid System. The main aim of the one nation one grid system is to maintain reliability of the system. As In India the industrial sector is rapidly increasing, proportionally the rate of used of electrical energy also increases. As the demand of electrical energy increases the quality of power increases. Hence industries are facing a problem of poor power quality. According to the report, the shortage of electricity in India reduces annual plant revenue and average productivity of manufacturing plant by 5-10%.

And due to the power interruption industry faces huge economic loss. And not only industrial sector affects but also commercial and residential too. The power interruption is huge problem faces by the all sectors. To cater the entire power quality problem, most of the industries and other sectors used the backup system, diesel generators. PV plant etc. The back bone of such system is inverters. Without inverters we cannot imagine the working of such system. We know that the inverters are the devices which convert the dc power into ac power by using power electronic devices. Because all such system likes battery operation or PV system generates dc and to operate the daily appliances we need AC Supply. So to convert such power we need inverters. Now day's inverters are also used in power industry in DC Transmission system. We have study one case study of telecom sector and we have analyzed that unreability of electric supply is biggest challenged for telecom industry. So telecom towers are operated on backup system. This result that around 25% of cost increases than normal operating cost.

So our team member is deciding to work on inverters and developed pure sine wave inverter which is cost effective. While studying we have also analyzed that while transferring the power by using the conductor huge power loss occurred due to the resistance of conductor. To cope up with the issue we have proposed the new innovative idea of wireless power transmission system. Firstly the wireless power transmission system was proposed by Nikola Tesla. From these we proposed a model of wireless inverter battery charger. This paper motivates the young researcher to work on such innovative idea which is beneficial for society.

2. LITERATURE REVIEW

For work on our ideology we have studied various research papers. Firstly we have studied regulated square wave which is not beneficial for the applications, hence for proper working of application, Pure Sine Wave Invertors are used

In A.Ali Qazalbash, Awais Amin, Abdul Manan, & Mahveen Khalid, 2009 a cost efficient microcontroller based inverter is design. At the output of the Pulse Width Modulation (PWM) generated by the microcontroller & a filter has been connected to make the square wave a sinusoid & to reduce harmonics from the system.[1] In these paper PWM topology is used to generate the pure sine wave. This paper includes mathematical analysis of PWM topology and the corresponding filter design.[1]

The above topology is not beneficial for low rated appliances.

In Meraj Hasan, Junaid Maqsood, Mirza Qutab Baig, Syed Murtaza Ali Shah Bukhari, & Salman Ahmed, 2015 paper the new technique is describe by using H- Bridge Circuit, timer circuit and filter to generate the pure sine wave.[2] The simulation result of paper shows that the output of MOSFET Bridge is filtered & sine wave obtained. The triangular wave is obtained at bridge output and then later it can be converted into sine wave by using filter. Here filter is also used to reduce the harmonic content.[2]

3. METHODOLOGY

The figure 1 shows basic block diagram of Proposed Model. Here we have made an Electric Power transmission circuit which consists of AC Source and power transmission coil.

Then there is power receiving circuit which consist of Coil, rectifier, voltage regulator which is connected to inverter battery.

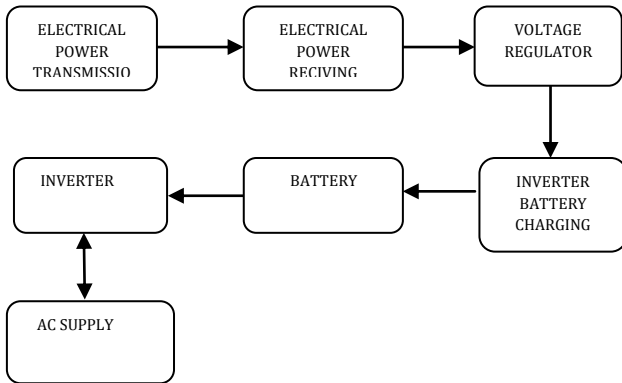


Fig-1 Block Diagram of Inverter

4. WORKING OF POWER TRANSMISSION CIRCUIT

The Electric power transmission circuit works on principle of mutual induction. Here Ac Supply is given to the coil. According to faraday law, the coil will induced an EMF and generate the magnetic flux. The contact less coil is kept at a particular distance so that the flux can link with the secondary side. As the flux link with second coil, as similar the second coil induced EMF. This then converted into dc power by using rectifier. This dc power can be stored in battery of inverter for backup system.

5. WORKING OF POWER TRANSMISSION CIRCUIT

The basics function of inverter is to convert DC power into AC power, while at the same time regulating the voltage, current and frequency of the signal. Basically, Inverter is a kind of oscillator

Transistors are the key components of inverter, which convert DC supply to AC supply. Metal Oxide Field Effect Semiconductor power electronic device are the most commonly used switches in inverter. The transistor is used to change the steady voltage and one-way current flow of DC to the constantly changing voltage and oscillating current of AC. Here we see in the circuit diagram here we use 24V battery, one transformer (Primary winding of transformer is Center tapped), one two-way switch and 50 Hz oscillator. Here 24V battery generates DC supply and inverter will change it into, AC supply of 220V, 50Hz to use to operate any appliances. The 12V DC supply from the positive terminal of the battery comes to the primary winding of transformer which is center tapped. Here, 2 ways switch is controlled with the square wave oscillator it generates a frequency of 50 Hz.

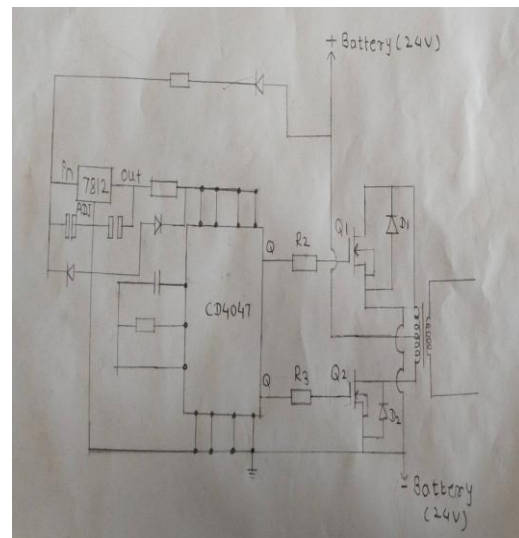


Fig-2 Circuit Diagram of Inverter

5. ADVANTAGES

- Efficient way to reduces losses in transmission.
- Inverter and wireless power transfer circuits are easy to operate.
- Non-radioactive energy transfer is safe for people and animals.
- Wastage of power is less.
- Highly reasonable strong coupling provides high efficiency over distance.
- Does not interfere with radio waves.

6. FUTURE SCOPE

Not in present but in future also need of wireless technology is essential.

- [1] Solar power satellite.
- [2] Wirelessly powered home appliances.
- [3] Universal power source in emergency.
- [4] Wirelessly powered train.
- [5] Wirelessly power supply to house from power station.
- [6] Wirelessly controlling drone to extinguish the fire.
- [7] Wirelessly power applies to medical device.
- [8] Wirelessly powered smart city.

7.CONCLUSION

In this paper we proposed a pure sine wave inverter with wireless power transfer system. This is new innovative technology for the power industry to reduce losses and to overcome with power interruption problem.

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