

Multi Energy Source Uninterruptible Power Supply (UPS)

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Abstract:- Many sample circuits have been studied to optimize the existing circuit. Assistance has also been taken from design engineers of existing UPSs in the market to see possible alternatives in case of any components' failure or unavailability. The paper provides study of possibilities of design and functionality of a solar and electric powered UPS. Economic globalization is prevalent across the globe, however the economic development of Southeast Asia in particular is attracting much attention. This region was formerly a world production base, but population growth and industrial development has given way to an increase in middle-class, resulting in the region maturing into a major market. In such way UPS is an electrical apparatus that provides emergency power to a load when the input power source (from main utility) fails to deliver electric power. The purpose of this paper is to show development of an on-line mode single phase UPS .Which has a local 3 pin UK socket which uses 230/240 VAC (UK Single phase) to supply power. Most small power hardware including rack mounted servers, telecoms, network switches, computer systems or any device running from a standard 3 pin UK plug, operate from a single phase supply.

Keywords : Rack mounted servers, telecoms, network switches, computer systems, local 3 pin UK socket, 230/240 VAC (UK Single phase).

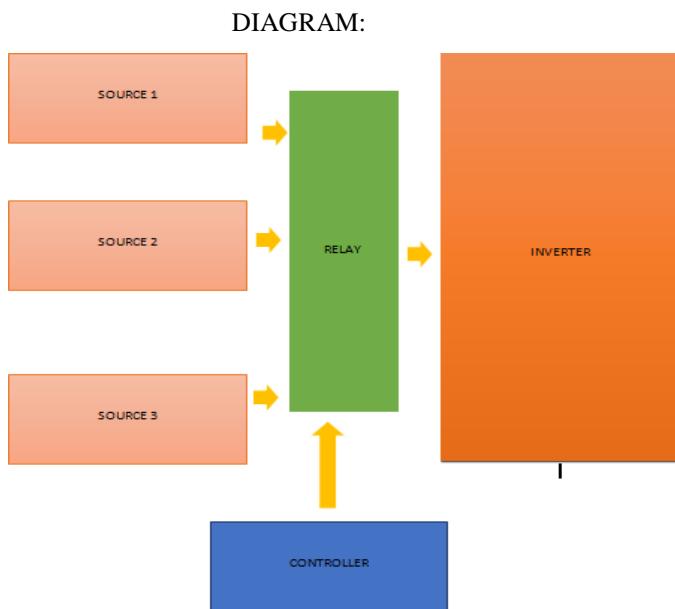
INTRODUCTION

The improvements in solar thermal storage power technology in recent years has made this task achievable as the cheaper solar power need not depend on costly and polluting coal/gas/nuclear based power generation for ensuring stable grid operation. Most of the rural area still face the problem of electricity which force them to be reliable on kerosene lamp. This major problem can be overcome by usage of solar energy. I have studied the model through which this major problem can be eliminated. India's initiative of 100 GW of solar energy

by 2022 is an ambitious target, since the world's installed solar-power capacity in 2017 is expected to be 303 GW. As of December 2017 the country's solar power had 17.05 GW total capacity. India expanded its solar-generation capacity 8 times from 2,650 MW on 26 May 2014 to over 20 GW as on 31 January 2018. The 20 GW capacity was initially targeted for 2022 but the government achieved the target four years ahead of schedule.

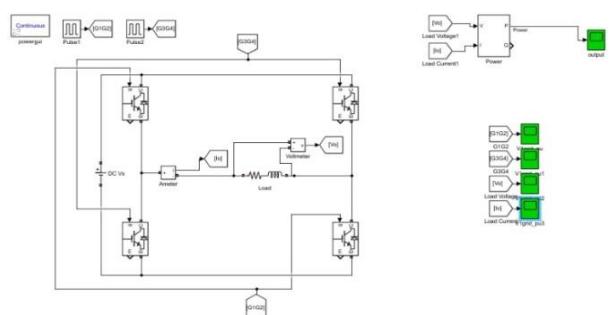
BACKGROUND OF THE DEVELOPMENT:

In general, AC power of 15 kVA or more adopts the three-phase method of power supply. In Japan, most three-phase AC systems use the three-phase, three-wire system to supply power along three power wires. This is an economical method and has a large power supply capacity per wire. However, most indoor three-phase AC systems used in overseas adopt the three-phase, four-wire method. Power receiving equipment of buildings, etc., receive high voltage three-phase, three-wire power, then connect a secondary winding of a transformer in a Y connection and draw a neutral wire from a neutral point to become a three-phase, four-wire method. The three-phase, four-wire line voltage becomes magnified by $\sqrt{3}$, and has the advantage of being able to use both the interline (three-phase) and inter phase (single phase) voltages. In Southeast Asia, voltage such of both three-phase power and single-phase lights.2 as 380 V / 220 V (three- phase/single-phase) are used for power distribution



The circuit configuration adopts the double-conversion method that puts the power supply quality first, and it achieves high efficiency while using the CVCF (Constant) Voltage Constant Frequency) method that is not affected by input voltage or input frequency. By selecting I/O voltage from phase voltages of 220 V, 230 V and 240 V, it is possible to set line voltage at 380 V, 398 V or 415 V, thus supporting the power source environments of Asia and Europe. Also, the operation panel uses an LCD display, providing the device with an easy-to-use user interface.

SIMULATION DAIGRAM



WORKING EXPLANATION:

The inverter module of the new model is comprised of a rectifier, inverter, and charger, and it includes the following improvements.

- (1) By using high input power factor chopper in the rectifier, the UPS input power factor can be improved and it can support a wide range. In the case of the chopper method, it is possible to jointly use as a booster circuit of the battery voltage, thereby the number of components can be reduced.
- (2) Conversion efficiency of the inverter has been improved by adopting a three-level method. The

three level method has the following features.

- a) The switching frequency is halved compared to the half-bridge method.
- b) A low-voltage switching device can be used.
- c) The ripple current through the AC filter is halved compared to the half-bridge method.

It is now possible to control and change the charging current of the charger with the CPU. This means that there is sufficient charging ability even if specifications call for prolonged periods of backup and it is possible to flexibly respond to charging currents which differ depending on battery configuration (capacity), therefore eliminating the need to install more chargers or change specifications.

ADVANTAGES OF SOLAR POWER:

The main advantage of using solar power energy is it's a renewable energy and viable for long term, the maximum efficiency of solar power can be attain by proper orientation within right location. The actual beauty of solar powered supply lies in its ability to capture light energy and generate electrical energy, that can be used both as online energy source (on-grid) in case of power failure and also as Independent/alternate energy source (off-grid). There is no pollution in atmosphere due to nitrogen oxide, carbon dioxide or any other pollutants. It is an unlimited source of power which is free, unlike deleterious fossil fuels which are expensive as well.

CONCLUSION:

In the past, when customers performing system integration (SI) ordered UPS, it was restricted due to the UPS output capacity of each individual order. Due to this, if changes in output capacity (increases/decreases) occurred immediately before shipment there were problems such as wasted time and expense related to specification changes and impact on lead time, which all resulted in increased costs. With this unit, by adjusting the number of inverter modules installed on the inverter unit, it is possible to construct 15 k / 30 k and 45 kVA UPS systems. This means there is no need for orders to be constrained by UPS output capacity, making low-risk procurement possible.

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