

UNIVERSAL MOTOR DRIVE

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ABSTRACT

AC, DC and BLDC motors are the foremost extensively used motors in most power-driven home appliances, agricultural and industrial applications. This paper describes the planning, construction and performance analysis of a universal motor drive for several of the appliance, we've worked on AC, DC and BLDC motors thanks to its significant advantages over other sorts of machine drives. In many applications AC, DC and BLDC motor are widely uses for speed control and cargo characteristics, it is easy to controllability provide effective and precise output so the application of AC, DC and BLDC motor is large for commercial purposes. Speed control of AC, DC and BLDC motor is extremely crucial in the application where required speed is precision and correcting signal representing and to work motor at a constant speed, so we used TRIAC, MOSFET to hurry control of AC, DC and BLDC motor.

Keyword : - TRIAC, MOSFET, AC, DC and BLDC motor, ATmega 328, Display, Keyboard.

1. INTRODUCTION

Till now, you want to have seen an AC motor that runs on AC drive and DC motor which runs on DC drive. If a fault occurs within the motor the whole if the drive has got to be changed. DC motors are widely utilized in industrial applications, robot manipulators and residential appliances, due to their high reliability, flexibility, and low cost, where speed and position control of the motor is required. This paper deals with the performance evaluation of various sorts of conventional controllers and intelligent controller implemented with a transparent objective to regulate the speed of separately excited DC motor.

Due to the advancement in permanent magnetic materials, solid-state devices and microelectronics have resulted in new energy-efficient drives like Brushless Dc motor. Energy-saving, as been one of the important issues in home appliances hence tons of efforts, are made to scale back the energy consumed by the house appliances like refrigerators, air conditioners, cloth washers, vacuum cleaners, etc .these appliances typically believe motor technologies like DC motor, AC Motors.

Now a day's AC motors are the worked horses of the many industries which also replaced DC machines with their various advantages like lack of commutated, lower cost, reduced maintenance cost, robust, less weight and rugged structure. due to their complex characteristics, it's not easier to regulate the speed of AC motor like DC motor, how we are getting to be solving this problem in it. The drive is employed within the industry system its function is to convert electricity into energy. This is often a mechanical device, Can the motion of the motor be controlled by the drive. Now we are getting to make an equivalent universal drive-by combing the control unit of AC & DC both drive in it. during which all the three motor AC, DC & BLDC motor will run on an equivalent drive.

2. Block Diagram

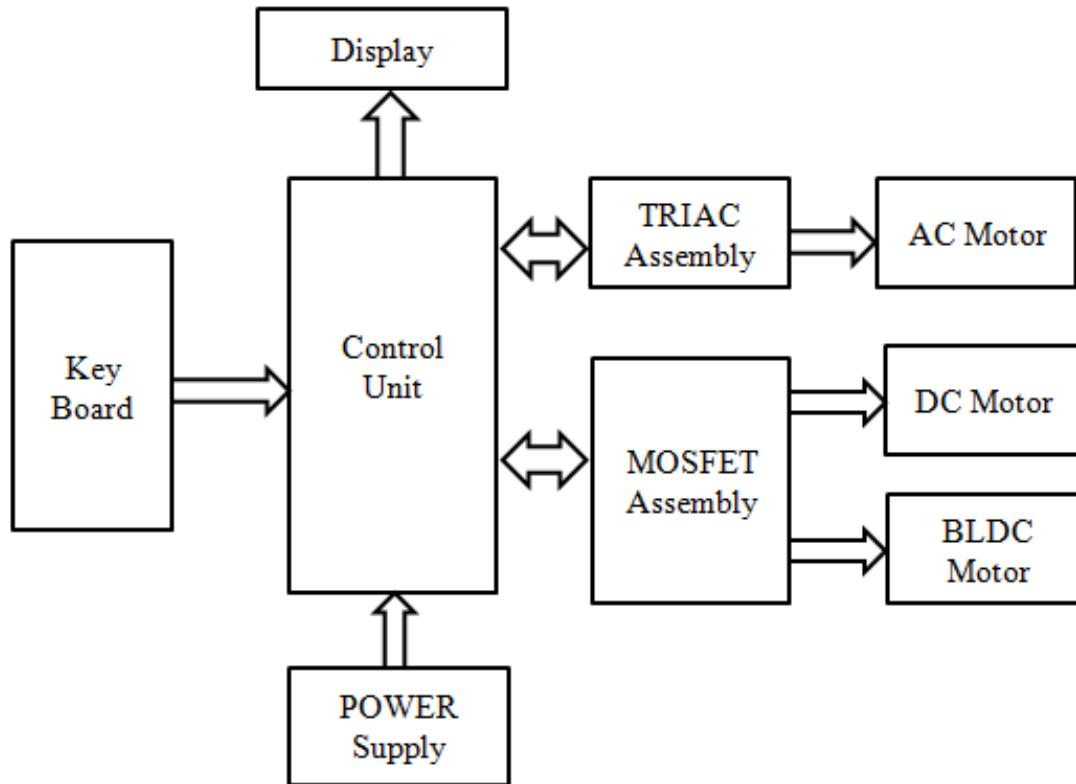


Fig -1: Block diagram of universal motor drive

3. Working

- We have used a rectifier to convert AC to DC power supply.
- Using an IC7805 we convert accurate 5V power supply.
- After converting a 5V power supply, 5V applied to an ATmega328 controlled unit.
- ATmega328 received the command of the keyboard and transfer the command of Driver for rotating the motor.
- TRIAC and MOSFET used for motor driving purposes.
- LCD display used for monitoring the running command.

4. Future Scope

- We completed our project with success with the offered sources. However the results and modifications don't seem to be up to the expectations. In future, system can be monitor or control through IoT.
- In future, system can be monitor or control through Computer.

5. Components

- AC motor
- DC motor
- BLDC motor
- ATmega328
- TRIAC
- MOSFET
- Keyboard
- LCD (16x2)
- Step-down transformer

6. Application

- It is used in electric car.
- It is used in home application.
- It is used Agricultural.
- It's also used in robots.
- Cloth washers
- Vacuum cleaners
- Air conditioners

7. Advantages

- In this smart universal motor drive can be used in any type of motor.
- It is easy to operate.
- In case of if damage of any motor we can use Smart universal motor drive.
- Non skill person also operate.
- It can be started at any time without delay.
- Facility for keyboard control.

8. Result

- The work done on a motor speed controlled will meet the challenge of low-cost products to controlled motor speed.
- With the use of TRIAC and MOSFET, we controlled the motor speed.
- Through the use of a keyboard, we operate all motor drive circuits.

9. Conclusion

We have designed a speed control system for AC, DC and BLDC motor, which has reliability, precision, and adaptability for different system rating with the response. This designed system and implemented the speed control system of motor, it controls the speed of AC, DC and BLDC motor by using TRIAC and MOSFET. Microcontroller based system can be efficiently used for speed control of motors along with gates.

10. References

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