A REVIEW PAPER ON AUTOMATIC POWER FACTOR CORRECTOR

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Abstract：Automatic power factor corrector is designed to improve power factor automatically whenever power factor falls below a certain level. As we know demand of electrical energy is increasing day by day. Now a days many inductive loads are used in industry and small scale applications. This Inductive loads causes the decline in power factor and are one of the main reason for power factor reduction in industrial applications. Therefore there is an urge to increase the degraded power factor. Automatic power corrector provides solution to this problem. Because of low power factor there is burden on power system and transmission lines which is unnecessary. By correcting power factor of power system , efficiency of power system can be improved. In this methodology, power factor correction prototype is developed using pic microcontroller,relays ,potential transformer,current transformer and zero crossing circuit.

1.INTRODUCTION

In the present scenario of technological revolution power is very precious. The industrialization is primarily increasing the inductive loading, the Inductive loads affect the power factor so the power system losses its efficiency. There are certain organizations developing products and caring R&D work on this field to improve or compensate the power factor. In the present days the size of design is reducing and to make this possible and to make it into a product , programmable device can be used . Whenever we are thinking about any programmable devices then the embedded technology comes into forefront. Inspite of its reliability ease and its relatively lower cost, it has certain disadvantages The relays that are to be used are quite bulky and needs regular maintenance. The multifunctional is out of question.The Power factor Correction is a very useful for improving the active power transmitted towards the industrial plant. If inductive load is connected anywhere in the industrial applications then the power factor lags, when the power factor goes below the certain low level (0.97 lag) then the Electric supply company charges penalty to the respective consumer . So it becomes very essential to regulate the Power factor with in a limit. Automatic Power factor correction device is design in such a way that, it reads the power factor from line voltage and line current, calculates the required adjustment required for achieving desired power factor, by switching capacitor banks connected across the load.

2. LITERATURE SURVEY

The paper “Power factor correction unit using 89C52” published in 2014 contains the use of 89C52 to measure and correct the power factor. The advantage of this research was that it shows the best method to measure power factor of systems but the drawback was the increase in response time of microcontroller [1].

The paper “Power factor correction unit using active series of filters” contains the use of active filters for the purpose of power factor correction which is unique method for power factor correction. The advantage of this method was the use of active filters to improve power factor but the drawback was the use of active filters as the filters don’t have sharp cut off frequencies and also there was no use of controller the circuit was not automatic [2].

The paper “Automatic Power Factor Improvement of Induction Motor using Arduino” contains practical realization and correction of power factor across the induction motor . The advantage of this paper was it solved the problem of low power factor practically at induction motor using it as inductive load. The drawback was that the use of Arduino UNO board increased the cost of the circuitary as it should be further connected to the controller [3]

The paper “Automatic power factor correction unit” published in 2016 contains the use of precision rectifier a EXOR gate and use of Arduino board along with inductive and capacitive loads for the purpose of power factor improvement and correction.The advantage of this paper is that it measures the value of voltage and current and solves the problem of power factor and displays the corrected value but its drawback is the measurement of voltage and current value by using rectified sine wave and also use of precision rectifier which increases the size and complexity of circuit. [4]

3. CONCLUSION

Thus by using automatic power factor corrector concept the problem of low power factor can be eliminated, and can be very useful for industries using inductive load .As the power factor is directly related with power consumption ,it should be as high as possible and ideally 1 to reduce the power consumption and to avoid the penalty from Maharashtra State Of Electric Board which is caused when the Industries uses large power then the rated due to low power factor. Hence by using Capacitor load in parallel with inductive load power factor can be increased. And also power factor correction techniques can be applied to the industries, power systems and also households to make them stable and due to that the system becomes stable and efficiency of the system increases. The use of PIC microcontroller reduces the costs and response time. Care should be taken for overcorrection otherwise the voltage and current becomes more due to which the power system or machine becomes unstable and the life of capacitor banks reduces.

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