

## TECHNICAL FACT SHEET/ CEILING FAN-SPEED CONTROL

# Reduce Speed of your Ceiling Fan Save Energy Upto 60%



### Highlights

- Energy reduction up to 61% between minimum to maximum speed by using an Electronic type regulator.
- Energy reduction up to 32% between minimum to maximum speed by using a conventional (Resistive) type regulator.
- An average of 27% reduction in energy consumption if the existing resistor type regulator is replaced with an Electronic type regulator.
- Reduce your annual electricity bill by Rs 260\*

*\* energy cost saving of one ceiling fan with electronic regulator operated for 12 hrs per day for 365 days @3 Rs/kwh*

### Summary

The Energy Management Centre, Kerala conducted a comparative study to evaluate the energy saving opportunities in a ceiling fan by using both electronic as well as conventional (resistance type) regulators. This study proved that power consumption is reduced by 61 % at the minimum speed while using an electronic type regulator. At the same time, the power consumption is reduced by 43% under similar conditions with a conventional (resistance type) regulator. An average saving of 27% can be achieved under reduced speed, if the fan is used along with an electronic type regulator against a conventional type regulator. Though the initial

cost of an electronic regulator is high, the higher savings will pay back the investor in less than 10 months.

### **Objective**

The main objective of this study is to practically prove the comparative advantage of using an electronic regulator as against a conventional (resistance type) regulator and to disprove the popular myth that the conventional (resistance type) regulators uses same power irrespective of the speed of the ceiling fan.

### **Methodology**

This study was conducted using the following instruments  
 Conventional resistance type regulator (5 step)  
 Electronic type regulator (5 step)  
 Ceiling Fan 1400 mm sweep  
 Fluke 41 B Power analyzer  
 Non-Contact Tachometer  
 Variable autotransformer

The ceiling fan was operated at different positions using the conventional type regulator and measured speed, power and voltage at the output terminal of the regulator at each step. This was again repeated using the electronic regulator by keeping same output voltage in each step - as in the earlier case , by using a variable auto transformer- to maintain same speed in each step position of both type of regulators. The results are tabulated below.

**Table for comparison**

Step Position	Output voltage of regulator	Conventional regulator (Resistive)		Electronic Regulator	
		Speed (Rpm)	Power (W)	Speed (Rpm)	Power (W)
<b>1</b>	<b>140 V</b>	<b>176</b>	<b>50</b>	<b>176</b>	<b>28.4</b>
<b>2</b>	<b>160 V</b>	<b>206</b>	<b>54</b>	<b>206</b>	<b>37.5</b>
<b>3</b>	<b>180 V</b>	<b>233</b>	<b>60.5</b>	<b>233</b>	<b>47.5</b>
<b>4</b>	<b>200 V</b>	<b>258</b>	<b>65.3</b>	<b>258</b>	<b>57.3</b>
<b>5</b>	<b>230 V</b>	<b>283</b>	<b>73.5</b>	<b>283</b>	<b>73.5</b>

The comparative performance of both types regulators are tabulated below

Position	Conventional Regulator		Electronic Regulator		Relative Energy saving %
	Power w	Energy Saving %	Power w	Energy Saving %	
1	50	32	28.4	61.4	43.2
2	54	26.5	37.5	49.0	30.5
3	60.5	17.7	47.5	35.4	21.5
4	65.3	11.1	57.3	22.0	12.2
5	73.5	0	73.5	0	0

### ***Economics***

There will be an average reduction in energy consumption by 27 % with an electronic type regulator as against a conventional type regulator. Assuming that this ceiling fan is operated for 12 hrs/day, 365 days per year, the energy cost saving for one ceiling fan will be  $73.5 \times 0.27 \times 12 \times 365 \times 3 / 1000 = \text{Rs } 260$  per year @Rs 3.00/kwh. The pay back period in this case will be less than 10 months with the purchase cost of a good quality electronic regulator assumed at Rs 200/-.

### ***Tips***

- Always Use electronic type regulators for controlling the speed of ceiling fans.
- Use step type electronic regulators of very good quality.
- Some people use fans to drive away mosquitoes. Use mosquito nets and other mosquito control devices to keep them away. This will help in reducing the usage of fan during night or cold season.
- Use energy efficient fans - energy efficient fans though priced higher will save your money.
- Keep open your windows to allow natural air circulation. This will enable you to reduce the fan usage or to operate the fan at reduced speed, to reduce your energy bill.

- If you put fan in full speed in a closed room, it will heat up the room. Always allow indoor warm air to circulate back outside.
- Select the right size of ceiling fan for your room.

<b>Select the right Ceiling fan size for your room</b>	
<b>Room Size</b>	<b>Sweep of Fan</b>
<b>For small shops &amp; Low ceilings</b>	<b>600 mm</b>
<b>Less than 7 Sq.m.</b>	<b>900 mm</b>
<b>7 - 10 Sq.m</b>	<b>1050 mm</b>
<b>10 - 12 Sq.m</b>	<b>1200 mm</b>
<b>12 - 14.5 Sq.m</b>	<b>1400 mm</b>
<b>For large halls, Offices, auditoriums etc *.</b>	<b>1500 mm</b>
<b>* For large size rooms, two or more fans can be used with a space of 2 - 3 sweep diameters between the fans.</b>	

***Published by Energy Management Centre- Kerala for creating awareness among general public:***



**For More Details Contact:**

**ENERGY MANAGEMENT CENTRE**

Department of Power, Govt. of Kerala

Thycaud Post

Thiruvananthapuram 695014

Phone: +91-471-2323363,2321820

Fax:0471-2323342

Email: [emck@keralaenergy.gov.in](mailto:emck@keralaenergy.gov.in)

[www.keralaenergy.gov.in](http://www.keralaenergy.gov.in)