

ENERGY SAVING CHOKE/LED LIGHTS

1. INTRODUCTION:

LED is semiconductor Technology that emits light at the junction of oppositely charged materials when voltage forces electron movement? Led based lighting systems are devices consisting of many LEDs chips embedded on the LED fixtures base and fitted with rectifier circuit that provides regulated current output at the low voltage that makes them to be operated on AC Circuit because LEDs requires DC to operate. The whole PCB circuit board is fitted inside a plastic enclosure along with the metallic cap and Smoky reflector. Electronic high-frequency ballasts is a device which controls the starting voltage and the operating currents of lighting devices built on the principle of electrical gas discharge. Electronic ballasts operate lamps using electronic switching power supply circuits. Electronic ballasts take incoming 50 Hz power (220 volts) and convert it to high-frequency AC (usually 20 to 40 kHz)

2. PRODUCT & ITS APPLICATION:

A choke is one of the vital components of a fluorescent lamp. It creates high voltage storage across the lamp electrodes during starting to initiate discharge through the low pressure gaseous medium between the electrodes. It also limits the current, during normal operation after the discharge has been established. In the beginning conventional coil wound choke were in use but with the change in technology this have been started replacing with electronic chokes. These chokes save about 35 to 40% of energy as compared to conventional chokes giving better luminescence. Beside this they ensure instant flicker free starting and high resistance to switching transient. They can even glow at lower voltage compared to conventional coil wound choke.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Graduate in any discipline.

4. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:

Conventional lighting systems represent mainly incandescent light bulbs and compact fluorescent lights (CFLs). LED lighting system provides advantages over conventional lighting systems in terms of better energy efficiency, better energy costs, longer lifetime, less temp. Sensitive, higher light output. This leads them to be better Lighting substitute and good market prospect. Therefore the market prospect for LED based Lighting system is good and booming. The market for electronic choke is increasing day by day and in future it seems it would completely replace the conventional coil wound choke because of its features like tremendous energy saving, instant flicker free starting and finally can glow at low voltage.

5. RAW MATERIAL REQUIREMENTS:

The raw materials required are Diodes (IN4007, IN4148 etc.) 2 High Voltage Switching Power Transistor 3 Resistors 4 Capacitors (Different types) 5 Printed Circuit Board (PCB) 6 Ferrite Cores 7 Copper winding wires 8 Enclosure, Screws, connector, Flexible wire etc.

6. MANUFACTURING PROCESS:

The whole manufacturing process can be categorized into the following steps

- PCB assembly
- Unit wiring and mounting in the cabinet.
- Testing for its performance.
- Quality control
- Finishing and packaging.

All the tested electronic components are mounted on the PCB as per the layout diagram/ B.O.M and then soldered. A visual check is carried to ensure that the orientation and position

of the component is as per the layout diagram and there are no dry solders. The soldered side of the PCB is then cleaned using solvents to remove solder flux. In next step the assembled unit is suitably neatly wired to avoid any loose connection and then mounted in the cabinet. Functional checks are performed to ensure that the basic functions of choke are working correctly. The choke is again tested for the quality and the units having the required quality are ultimately sealed, packed and dispatched.

2. Quality Specifications As per B.I.S. specification

7. MANPOWER REQUIREMENT:

The enterprise requires 4 employees as detailed below:

Sr. No.	Designation Of Employees	Salary PerPerson	Monthly Salary ₹	Number of employees required				
				Year-1	Year-2	Year-3	Year-4	Year-5
1	Operators	12000	24000	2	2	2	2	2
2	Helpers	10000	10000	1	1	1	1	1
3	Admin Manager	15000	15000	1	1	1	1	1
	Total		49000	4	4	4	4	4

8. IMPLEMENTATION SCHEDULE:

The project can be implemented in 2 months' time as detailed below

Sr. No.	Activity	Time Required (in months)
1	Acquisition of premises	1.00
2	Construction (if applicable)	1.00
3	Procurement & installation of Plant & Machinery	2.00
4	Arrangement of Finance	2.00
5	Recruitment of required manpower	1.00
	Total time required (some activities shall run concurrently)	2.00

9. COST OF PROJECT:

The project shall cost ₹ **7.37**lacs as detailed below:

Sr. No.	Particulars	₹ in Lacs
1	Land on rent	0.00
2	Building	0.00
3	Plant & Machinery	2.00
4	Furniture, Electrical Installations	1.00
5	Other Assets including Preliminary / Pre-operative expenses	0.20
6	Margin for Working Capital	4.17
	Total	7.37

10. MEANS OF FINANCE:

Bank term loans are assumed @ 75 % of fixed assets.

Sr. No.	Particulars	₹ in Lacs
1	Promoter's contribution	1.84
2	Bank Finance	5.53
	Total	7.37

11. WORKING CAPITAL CALCULATION:

Sr. No.	Particulars	Gross Amt	Margin %	Margin Amt	Bank Finance
1	Inventories	2.08	0.25	0.52	1.56
2	Receivables	1.04	0.25	0.26	0.78
3	Overheads	1.04	100%	1.04	0.00
4	Creditors	-		0.00	0.00
	Total	4.17		1.82	2.34

12. LIST OF MACHINERY REQUIRED:

Sr. No.	Particulars	UOM	Qty	Rate (₹)	Value
					(₹ in Lacs)
	Plant & Machinery / equipments				
a)	Main Machinery				
1	Oscilloscope	NO	1	0.50	0.50
2	Digital Multimeter	NO	1	0..25	0.25
3	Coil winding machine	NO	1	0.20	0.20
4	LCR & Q Meter	L.S.	1	0.30	0.30
5	Analog Dial Amps- Volts- Ohms meter Watt-meter Rheostat Small drilling machine	NO	1	0.50	0.50
6	Installation, Electrification, taxes and transportation.	L.S.	1	0.25	0.25
	<i>sub-total Plant & Machinery</i>				2.00
	Furniture / Electrical installations				
a)	Office furniture	LS	1	50000	0.50
b)	Stores CUPBOARDS	LS	1	0	0.00
c)	COMPUTER PRINTER	L. S.	5	50000	0.50
	<i>sub total</i>				1.00
	Other Assets				
a)	preliminary and preoperative				0.20
	<i>sub-total Other Assets</i>				0.20
	Total				3.20

13. PROFITABILITY CALCULATIONS:

Sr. No.	Particulars	UOM	Year-1	Year-2	Year-3	Year-4	Year-5
1	Capacity Utilization	%	60%	70%	80%	90%	100%
2	Sales	₹. In Lacs	15.00	17.50	20.00	22.50	25.00
3	Raw Materials & Other direct inputs	₹. In Lacs	10.28	11.99	13.70	15.42	17.13
4	Gross Margin	₹. In Lacs	4.72	5.51	6.30	7.08	7.87
5	Overheads except interest	₹. In Lacs	1.84	1.96	2.19	2.25	2.30
6	Interest	₹. In Lacs	0.55	0.55	0.37	0.28	0.22
7	Depreciation	₹. In Lacs	1.40	1.00	0.70	0.50	0.45
8	Net Profit before tax	₹. In Lacs	0.93	2.00	3.04	4.05	4.90

14. BREAKEVEN ANALYSIS:

The project shall reach cash break-even at 32.03 % of projected capacity as detailed below:

Sr. No.	Particulars	UOM	Value
1	Sales at full capacity	₹. In Lacs	25.00
2	Variable costs	₹. In Lacs	17.13
3	Fixed costs incl. interest	₹. In Lacs	2.52
4	$BEP = FC/(SR-VC) \times 100 =$	% of capacity	32.03%