

Power+

Convenience in Power Management



Power Solutions

Ensuring Seamless Growth

Power Saver In Lighting System

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Need and Concept of Power Saver

The need for conservation of electrical energy has been highlighted from time to time in the context of reduction in the operating expenses of the Railways, PSUs, CSIR/ICAR Labs, Central & State Govt. buildings, Defense/ Paramilitary Forces establishments, Banks, Medical Institutes & Industries.

Lighting loads from a significant part of electrical load effectively contributing large sums in electricity

bills. This sector has been identified for implementation of energy conservation.

The voltage required to initiate discharge in gas filled lamps/tubes is higher than the voltage required for its continuous operation. These lamps/tubes can be operated at lower voltage within its normal operating range, therefore consuming less energy. An electric device employing this concept to save energy, henceforth shall be called power saver.

Working Principle:

At start up, gas discharge lamps/tubes require sufficient voltage to activate the phosphorus, mercury and sodium enabling lamps/tubes to emit light. The normal working voltage range of different types of discharge lamps is given below:-

Type of discharge lamp	Nominal pressure (volts)	Min. supply voltage for stable operation (volts)
FTL	200-240	200
CFL	200-240	200
HPSV	220-240	200
HPMV	200-240	200
HPMH	220-240	220

A power factor corrector shall be microprocessor based circuit which will sense the power factor from time to time and correct the same by adding or removing the capacitor bank. A suitable static switch / relay / contactor shall be provided for switching the capacitor bank.

The optimal input power shall be achieved by optimization of voltage, current & power factor depending upon the load, resulting in substantial power savings. Presently the luminaries are connected to a fixed voltage distribution line. Therefore an electrical device which provides sufficient voltage to initiate ignition in discharge lamps/tubes and lower voltage for its continuous

operation is intended to be provided in lighting circuits to save energy.

Power saver shall normally be installed at the sub-distribution board or as near as possible to the load point for maximum power saving.

The Energy Saver shall be micro processor based controller employing low-loss impedance in the circuit to reduce the running current & voltage to an optimum level in the load circuit without affecting the other parameters.

It known that the electricity that comes to our homes is not stable in nature. There are many fluctuations raise and fall and falls, and surge/spikes in this current. This

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unstable current can't be used by any of the appliances. Moreover, the fluctuating current wastes the electric current from the circuit by converting electrical energy into heat energy. This heat energy not only gets wasted to the atmosphere, but also harms the appliances and wiring circuit.

Power Saver stores the electricity inside of it using a system of capacitors and they release it in a smoother way to normal without the spikes. The system also automatically remove carbon from the circuit which also encourages an smoother electrical flow. This

means that we will have less power spikes. More of the electricity flowing around circuit can be used to power appliances than before.

A well-calculated inductor/capacitor network and switching shall be made automatically and appropriately to correct these fluctuations. A Power Saver unit is designed exactly for this purpose. This correction is able to bring the level of PF very close to unity, thus improving the apparent power to a great extent. An improved apparent power would mean less current consumption by all the appliances.

POWER PACKED FEATURES:

- Robust design
- Long life (minimum 15 years)
- Minimum 15% energy saving
- Pure sine wave control that ensures no lamp flickering & other related problems
- Optimum Power Factor improvement (upto 0.95)
- Capable to sustain on frequent power supply interruptions.
- The power saver shall safeguard circuits from high voltages.
- No major modification in the present lighting distribution system/re-wiring shall be required.
- There shall be no discernable loss of lighting quality with fluorescent & other lights.

APPLICATIONS:

- The power saver shall be suitable for all types of discharge lamps such as fluorescent tube lights, mercury vapour & sodium vapour lamps, metal halide lamps etc.

TECHNICAL SPECIFICATIONS:

S. No.	Parameter	Specification
1.	Equipment Life	15 Years
2.	Minimum Energy Saving	15%
3.	Input	180 V to 280 V (Single Phase) & 380 V to 480 V (Three Phase, 4 wire)
4.	Frequency	50 ± 3% Hz
5.	Output	Output voltage shall be programmable in the range of 190-240 V using the software provided and fixed as per the requirement of the load.
6.	Efficiency	More than 95%
7.	Power Factor improvement	Up to 0.95

TECHNICAL SPECIFICATIONS:

S. No.	Parameter	Specification
8.	Distortion of wave form & harmonics	Within the range/limit of 5%
9.	Power Factor Correction Method	<ul style="list-style-type: none"> • Microprocessor Based • Static switch / relay / contactor are used for switching the capacitor bank. • Improvement in PF is 0.95 to 0.99
10.	Overload Capacity	Withstand 25% overload for duration of 5 Minutes
11.	Protections	<ul style="list-style-type: none"> • High Voltage Protection: In case of failure of control circuit, the output voltage shall not exceed the upper limit of 270V & 450V for single phase and 3-Phase systems respectively. • Over Voltage and Under Voltage Protection: To protect the equipment against over voltage and under voltage, facility for automatic tripping and disconnecting within 5 seconds shall be provided in case the input goes beyond the 180 V to 280 V (Single phase) and 380 to 480 V (Three phase 4 wire) • Overload Protection: To protect the equipment against over load, facility for automatic tripping and disconnecting within 5 seconds shall be provided in case the load current goes beyond 125% of the rated capacity. • Provision of MCCBs /MCBs of appropriate ratings shall be provided along with HRC fuses of suitable capacity, to isolate internal/external faults. • Thermal Protection: Provision of cooling fan. • Earth Fault Protection: Provision of ELCBs.
12.	Mounting	Floor Mounting
13.	Enclosures	Conforms to IP54, suitable for indoor and outdoor application.
14.	Meters and indications	<ul style="list-style-type: none"> • Digital meters to indicate phase voltage, current, power factor, active power & energy (KWH). • LED indication for "Normal Mode" or "Saver Mode" or "By Pass Mode".
15.	Data logger	Provision for attachment of data logger with RS232 port for logging voltage, current, power factor, KVA, KW & KWH readings.
16.	Construction	The power saver shall be of robust construction. It shall be housed in cubicle fabricated with angle iron frame-works fitted with cold rolled annealed mild steel panel of thickness not less than 1.6 mm. The cubicle shall be adequately ventilated. Hooks shall be provided for lifting purposes.
17.	Environmental Working Conditions	<ul style="list-style-type: none"> • Surrounding temperature 0° - 55° C • Relative humidity up to 95% • Corrosive atmosphere in coastal areas. • Atmosphere: Extremely dusty & desert weather in certain areas, corrosive atmosphere in coastal areas. • Electrical supply is subjected to surges from time to time resulting in spikes

*In the interest of continuous product improvement, all specifications are subject to change without notice.

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