Reducing Lamp Surge

By G8MNY  
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(8 Bit ASCII graphics use code page 437 or 850, Terminal Font)

On an Over Head Projector I have used this surge limiter to greatly reduce the chance of 250W lamp failure at turn on. This circuit is suitable for most low voltage lamp systems.

The delay time is really nothing to do with Rstart value, Diode & the 100uF, but the lamp temperature, as that determines the lamp resistance & hence the voltage drop across the surge limiting 50W R. This means the turn on delay is reduced if the lamp is already hot.

The 1R5 is made from several wire wound resistors to give the short term power dissipation or resistance wire wound on an a large former. The value is chosen to let the lamp get to a good orange to yellow colour temperature before the relay applies full power. Care must be taken for the location of this resistor & near any fanned air flow is useful.

The value of Rstart (eg. 5-100R) determines the "turn lamp on voltage" for the relay, it may need to be a power resistor if the relay is not sensitive.

e.g. to find Rstart 24V = 33V Peak, so for 15V max across C + relay, is has to drop 18V @ 50Hz Pulse (1/4 time) as it the same current as the relay takes! So with no pulse currents, Rstart = 18/12 x relays (e.g. 1.5x relay) Ohms!
But with the pulse currents, Rstart = 1/4 of 18/12 x relays (0.3x relay) Ohms. This would be a good starting point, but the relay may operate at 8V, or less so select a higher Rstart!

Check the relay & cap get a suitable voltage when the lamp is on. The 100uF Cap stops the relay humming @ 50Hz by smoothing the applied voltage.

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73 De John, G8MNY @ GB7CIP