

Jim's Handy-Dandy Guide to Over and Under Nominal Voltage Operation

Using a starting point (center of chart) 120V-60 Hz, 3200 degrees Kelvin– typical rating, the following chart provides some guidelines for determining values of the lamp/light used.

See important notes below.

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Voltage	Change in Kelvin	% of Wattage	% of Light	% of Life
80V	-500°	50%	25%	10,000%
85V	-400°	57%	32%	7500%
90V	-300°	64%	39%	5000%
95V	-250°	70%	46%	2000%
100V	-200°	76%	55%	1100%
105V	-140°	82%	65%	550%
110V	-100°	88%	75%	320%
115V	-50°	93%	87%	200%
120V	0°	100%	100%	100%
125V	+50°	107%	114%	62%
130V	+100°	112%	130%	37%
135V	+140°	122%	146%	24%
140V	+200°	128%	165%	15%
145V	+250°	133%	180%	9%
150V	+300°	142%	207%	6%
155V	+400°	150%	236%	3%
160V	+500°	162%	275%	>2%
Voltage	Change in Kelvin	% of Wattage	% of Light	% of Life

NOTES: (Important! Please read!)

1. The life rating of a lamp is actually the MEDIAN life obtained by testing many lamps over a long period of production. At rated voltage more than one-half (½) of the lamps will burn beyond rated life. Of course, being an average, *some* will fail almost immediately, but many will definitely exceed rated life.

2. Operation of a lamp on voltages higher than that for which it was designed **will significantly** shorten life or cause (depending on voltage) almost immediate failure. 120V Lamps should not normally be operated beyond 110% (approx. 135V) of their rated voltage for *any* length of time since fire/explosion as well as burn hazards exist. The fixture should be carefully inspected before and after use since small parts may melt or deform. Use caution and avoid situations where harm or damage may occur at all times. If you are unsure, DO NOT over-volt lamps. Most manufacturers recommend that exposure to unshielded over-voltage quartz-halogen globes be minimized with the globes being shielded by clear glass or plastic (for example: the fixture's lens or UV gels) or excessive ultraviolet irritation may occur including sunburn *and/or* damage to eyes. **Extreme HEAT will result and gloves can be easily burned through.**

3. With most lamps, life at reduced voltage levels is predictably increased because burnout usually occurs due to filament evaporation. Quartz-halogen lamps *may* not follow predictions because of other factors unique to them. CAUTION: lamps will **STILL** be **HOT** - **burn hazards may be more intense than normal usage** .

4. Gradual blackening of the inside of the bulb is *normal* for incandescent lamps. Quartz-halogen lamps often do not exhibit this blackening (which may also change color temp and light output). Quartz lamps, however, will often devitrify (turn "frosty") and this is a cause for concern. Bulb blistering is often normal with some lamps towards end of life. If forced cooling (fan) is used in equipment, it should be checked to make sure the air stream is unblocked. Even partial loss of cooling can cause excessive blistering or deformation of the lamp with premature and/or violent failure.

5. Change in apparent color temperature of Dichroic (daylight) PAR lamps when voltage is different from specified may often be off the chart. ALWAYS use a *color meter* to determine the correct Kelvin rating.

6. Due to variations in lamp types and differences between manufacturers, the results shown are close, but **NOT** exact for **any** specific lamp. Indicated values are reasonably reliable between 110 to 130 volts with reliability *decreasing* outside of this range.

Author assumes NO responsibility for misuse, injury, liability or damage. Thanks to GE Lighting and Lamps, GTE-Sylvania, Osram/Phillips Ushio and others for their kind and generous help and much literature documenting this. Thanks to my Local 728 IATSE Brothers & Sisters for their help and support. Always use with caution -

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