

Re: Selenium rectifier question

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- *From:* EricM <ew_morr@xxxxxxxxxxxx>
 - *Date:* Sun, 13 Apr 2008 17:34:42 -0700 (PDT)
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On Apr 13, 3:48 pm, "Jimmie D" <GFEN...@xxxxxxxxxxxxxxxx> wrote:

"Arfa Daily" <arfa.da...@xxxxxxxxxxxx> wrote in message

[news:Hh8Mj.54775\\$Ge4.33926@xxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:Hh8Mj.54775$Ge4.33926@xxxxxxxxxxxxxxxxxxxxxxxxxxxx)

"Jerry G." <jerry...@xxxxxxxxxxxxxxxx> wrote in message
news:WoydnU8t2MHTYp3VnZ2dnUVZ_vWtnZ2d@xxxxxxxxxxxxxxxxxxxxxxxxxxxx

The diodes are probably breaking down. You need to have them rated at 2.8X of the voltage for the peak to peak from the AC. I would use diodes rated to at least 3000 V to 4000 V minimum in this case because the no load voltage is over 900 V. You can use 4 of 600 V in series to get the proper voltage rating. I would also put caps at about 0.005 uF / 5 kV rated across each diode. This would be for HF noise suppression.

You should find out the required current needed for the supply load. The diodes should be rated to at least 3X the required current at minimum. This will allow for the inrush when the power supply is started up. The electrolytic filter caps have to get charged up.

Re: Selenium rectifier question

In series with each leg of diodes in series, I would put a 10 ohm 5 Watt resistor in an average tube power amp supply.

If you use 1 Amp rated diodes, you can easily find diodes rated to 1000 Volts. This would allow for 900 Watts maximum load at 1000 Volts. Using 3 in series on each leg of the rectification path would be very adequate for a 1000 Volt no load source.

I would not re-use the present diodes at this time. Most likely they may be damaged even if they read okay.

Before going to all this trouble, make sure you find the cause of the original rectifier failure. It may be age, but a short or something pulling too much current should not be ruled out.

If you want to go more authentic and you have the space, get an 8 pin octal socket, and a 5U4-GT tube. Knock out the holes in the chassis and install the tube rectifier assembly. You will need a high voltage isolated floating 5 Volt 2 Amp supply just for the heater. The heater is tied hot to the cathode of this tube. You can then feed the AC 900 Volts plate to plate, and the rectified plus source would be on the cathode.

Jerry G.

Re: Selenium rectifier question

I'm not sure that 10 ohms is going to do too much to limit the inrush current at these sorts of voltages, and will produce little useable running voltage drop to compensate for the higher DC that will be produced by the replacement silicon diodes over the original selenium stack.

I agree, 100 ohms is probably a more reasonable value.

When working on old equipment like this I try to add enough resistance to keep the B+ at least 10% below the rating of the filter caps

If the filter caps were rated at 450 I would add enough resistors after replacing selenium diodes to keep the voltage around 410 or so.

This is just kind of a best guess way of doing things when a minimum amount of information is available.

Jimmie

First; thanks for all the insight on this. There just wasn't ANY info out there on the original Federal parts at all. I did find a rectifier listing on an old catalog page on a website, but these weren't listed at all. As mentioned, the one side of the circuit works fine. The part of the circuit in question is the 600V plate supply for two 7027A output tubes. I'm assuming since the tube plate current is rated from about 65ma to 450 ma there isn't a whole lot of amperage involved here, so I do agree that the 10 amp jobs I used is probably overkill. From the responses I'm assuming that the voltage rating isn't enough and replacing it with a 1-4kV unit should do the trick, along with a dropping resistor that after doing some circuit analysis seems necessary since there is a 15K 10W resistor in series with this part of the circuit, that is shunted by a relay switch once a time-delay tube relay times out and powers the coil of the switching relay - I think to enable output once the filaments of the preamp and voltage control circuits in the amplifier are heated. It sounds like I need a 1KV or greater diode with anywhere from 1-6 amp rating (I found some that are 1kV 6A in the shop) and just add a dropping resistor to get the voltage down to within spec under load.