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274B Data Sheet

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Description

This tube is a full wave rectifier, electrically equivalent to the original Western Electric historical tube.

274A is electrically equivalent to 274B, but we stopped making 274A. The difference between 274A and 274B is only the socket. 274A has a UX4 socket, 274B has an Octal socket.

In case you need to use still 274A, it can be replaced by the [EML 80A](#). This tube, can directly replace 274A. (Historic type 80 can NOT replace the 274A)



The EML tubes feature a series connected filament for both diodes together, which has certain advantages.

This tube can supply 140mA with a normal C-L-C filter. AT these conditions, the 274B is designed to be used with a small size first capacitor of 4uF only.

At lower voltage, lower current, it is possible to use a first capacitor of 20uF.

[High Resolution](#)

[Anode Detail](#)

Guarantee program for first owner

The first owner can register the tube within 4 weeks after receival, at the Emission Labs web site, to participate in the 5 years guarantee program, which is additional to the legal obligations of the seller.

[Our Guarantee conditions](#)

[Register here for the 5years guarantee](#)

Features

- Soft rubber suspended tube base
- Hard metal Construction ([Note1](#))
- Extra large getters
- Hand blown Glass bulb
- These tubes are shipped in a [high quality dual box](#)
- Tube printing with real gold (metal), red color is glass burned into the glass
- Gold Plated, black ceramic socket

Did you know this?

Emission Labs was the first company to re-introduce the 274 tube again, in the year 2001.

EML Rectifier tubes



[AZ4-Mesh](#)

[5U4G-Mesh](#)

[5Z3-Mesh](#)

[80-R Mesh](#)

[81-Monodiode](#)

[274A-Mesh](#)

[274B-Mesh](#)

Sound Character of the 274B

It is the most asked question, and behavior of a power supply depends a lot on the type of tube rectifier used, and the way it is used.

With 274A, 274B, the intention is to have only small current peaks through the capacitor, and mains transformer. This will result in less mechanical hum of the transformer, less electrical and magnetitic hum radiation into of the preamplifier, an improved sound compared to lower impedance rectifier tubes such as 5U4G, or even solid state rectifiers.

For ultra low ripple, it is recommended to use the Lundahl [LL1673](#) dual coil choke in low CMR configuration. In this configuration, there is virtually no field radiation from the choke. (See link to circuit diagram, at the bottom of this page).

Filament Ratings	
Filament Voltage	5 Volt (AC or DC)
Tolerance on filament voltage	5%
Filament Current	2 Ampere

Maximum ratings if transformer above 350V AC Capacitor Input	
NOT possible simultaneously Take one maximum number, you must reduce another READ all notes at the bottom of this Data sheet	
AC input voltage	550Volts
First capacitor	4uF
DC output current	150mA

Maximum ratings if transformer below 350V AC Capacitor Input	
Possible simultaneously	
DC output current	125mA
Rtr = Transformer Raa minimum value. (Add normal resistor, if your Raa too low)	Rtr= 200 Ohms
First capacitor, connected to Anodes	20uF max

Maximum ratings Choke Input	
NOT possible simultaneously Take one maximum number, you must reduce another READ all notes at the bottom of this Data sheet	
AC input voltage	660Volts
DC output current	200mA

Typical Conditions Capacitor Input, C-L-C. See also: Note 2	
DC output voltage	450Volt
Total rectified current	140mA
First capacitor, connected to Anodes	4uF

Choke	10 Henry
Second capacitor	max 20uF
<p>For a total (C1 + C2) capacitance above 24uF, a limiting series resistor must be used, so the peak in-rush current through the choke is limited to the saturation current of the choke, or max 600mA, whatever comes first. Otherwise tube damage can result. MUST MEASURE. Can not be calculated in a reliable way. For lowest hum, this resistor is in series with the choke. So you get a C-LR-C filter. In this way 200uF is possible.</p>	

<p>Typical conditions Choke Input, L-C. See also: Note 2 X = Not possible</p>			
AC input	DC 120ma	DC 160mA	DC 200mA
200	165V	145V	130V
250	230V	200V	180V
300	290V	270V	240V
350	360V	330V	300V
400	420V	400V	X
450	480V	460V	X
500	550V	X	X

274B Mechanical Data	
 <p>LOGO IS ON THIS SIDE</p> <p>BOTTOM VIEW</p>	<p>Tube Size including Socket: 147 x 55 mm Connections: Filaments: 8 + 2 Anodes: 4 + 6</p> 
Single Tube weight	125 Gram
Shipment weight	400 Gram

Some Design Notes for Tube Power Supply

- [Old Design Info- Still valid!](#)
- [Application Note AN-01](#)
- [Application Note AN-02](#)
- [More Technical Notes](#)

Notes

1. Good care should be taken when making the design of any DHT rectifier. It must be prevented to have strong current peaks, through the first capacitor, because consequently this flows through the tube anode, and transformer windings as well. The transformer will produce mechanical hum by this, most specially if there is no such thing as windings symmetry by design, or if the windings copper resistance is chosen too low. (Which two things, very unfortunately, are ignored often by today's transformer builders, who regard tubes and silicon diodes the same) Such transformers are noisy over time, and also the tube will suffer. Particularly at very high voltage, the magnetic peak load with

be too high for the transformer core, creating difficult (or impossible) to locate sources of hum. For this reason, the first capacitor (C1) should never be larger than stated in this data sheet. Read also the next note:

2. Mechanical transformer hum, and also tube current peaks are greatly reduced by a smaller capacitor value. In order to achieve the same amount of filtering, simply increase the choke value accordingly. Although it is clear, higher capacitor values come at lower cost than high value chokes, working with a smaller capacitor and larger choke, is always better. The result will be: Lower mechanical transformer hum, less electrical field radiation into the pre-amp, and significant more lifetime from the rectifier tube. This is why we recommend using largest chokes, and actually today these are not overly expensive. From Lundahl, high value chokes are achievable at the same price as HiFi capacitors, like from a Mundorf or Black gate. So we have to go back to the roots, and use high quality, large value chokes, like in the old days of radio design.
3. For best ripple suppression, increase the choke to any value you need, or even use an C-L-C-L-C circuit, as also advised in the historical RCA data sheet. So we are advising this, same as it was advised almost 100 years ago already.
4. Higher capacitor values as the data sheet maximum limit may sometimes be used, yet only at very special conditions. This can be the case, if the rectifier is used at significant lower voltage and lower current than maximum. Though we advise against it, you may see this occasionally. This is however often wrong, if not done without careful measurements, proving peak current is within range. Moreover there is no real need for this. As a rule of thumb, high voltage power supplies are work best with large size chokes, specially at high output current, whereas low voltage power supplies are more conveniently build with larger capacitors.
5. Windings symmetry is needed with HV transformers to prevent hum. A HV winding with Cathode Tap, requires most of the time FOUR separated HV windings inside the transformer, which are arranged for the end user as one winding with a Cathode Tap. It is remarkable to see, how transformer manufacturers have forgotten this today. If simply two windings are laid over each other, the inner winding has smaller copper resistance than the outer. With load being not identical this way, a small DC current results, which pre-magnetises the transformer core, and mechanical hum is the result. However we have a tube data sheet here, no transformer construction manual, so we can not explain this in more detail.
6. Each tube is numbered from the inside, with a metal [Tag](#).
7. Some of our competitors claims to be the only one with a Center Tapped filament, but at EML we build since many years all tubes Cathode Tapped. With rectifiers, the series connection makes the middle of the filaments virtually grounded, when using a heater supply winding with a grounded Cathode Tap.
8. Do not experiment with lower filament voltage, to expect better lifetime. We already specify filament voltage for the best lifetime.