

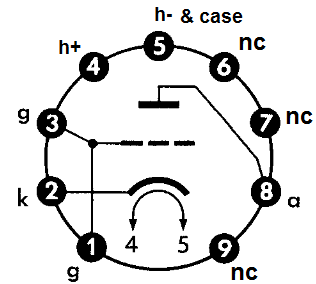


TYPE: EC8020-pH
B9A, HIGH g_m
AUDIO TRIODE

The last tube developed by the Telefunken team in the mid-1960s, the EC8020 was designed as a power triode for small UHF television repeaters. Today this rare device is appreciated for its extraordinary transconductance and low output impedance which make it suitable as the input device for high-end audio preamplifiers.

The Phædrus Audio EC8020-pH electronic Supertube™ is designed to fulfil this role as a low-noise preamplifier. To aid the circuit designer, the EC8020-pH achieves high transconductance at a much lower quiescent current compared with the original Telefunken device so low noise operation may be achieved with reduced anode dissipation. For example:

- $g_m = 30\text{mA/V}$ at I_a of 2.5mA and
- $g_m = 40\text{mA/V}$ at I_a of 10mA.



EC8020-pH pinout (from below)

EC8020-pH Supertube™ Technical Specifications

Recommended operating conditions

Heater voltage (current): 6.3V (700 μ A)

Anode load: 4.7k Ω to 10k Ω

HT Supply: 120V (nominal)

Grid circuit: $\approx 100\Omega - 100\text{k}\Omega$

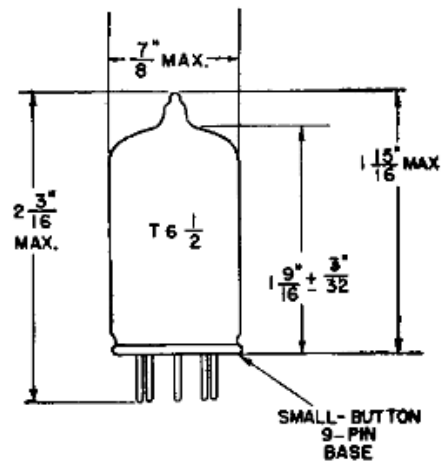
Cathode circuit: Typically, 62 Ω

Input voltage noise density: 1.2nV/ $\sqrt{\text{Hz}}$

Notes:

1. The heater current is reduced to keep device dissipation to a minimum. The heater voltage must be DC. Heater polarity must be observed.
2. Abs. Max. $P_a = 1\text{W}$, $V_a = 300\text{V}$
3. C_{gk} is 14pF but C_{ga} is $<0.1\text{pF}$. The grid is isolated from the anode, so Miller effect is minimised.
4. Flicker-noise corner-frequency is subsonic.

PHYSICAL DIMENSIONS



EIA 6-2



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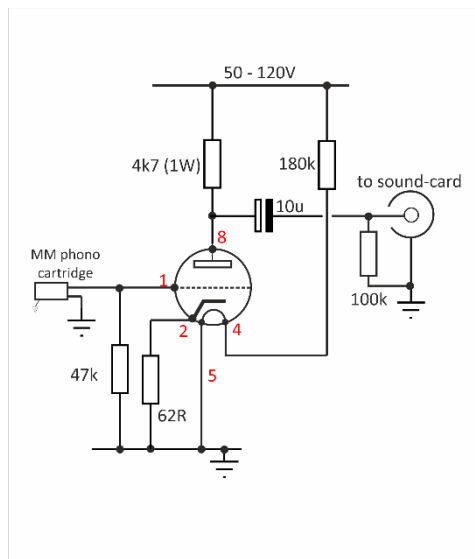


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Applications information



The recommended application circuit for the EC8020-pH as a non-equalising phono preamplifier for a moving-magnet cartridge is illustrated. Because of the low output impedance of this stage, the EC8020-pH can drive the following sound-card directly from its anode circuit. Similarly, it is suitable for driving passive RIAA networks without a cathode-follower buffer.

Gain is 34dB ($\times 50$); EIN is -131dBu or $0.2\mu V$ (A-weighted in 20kHz); THD = 0.005% at standard recording level input 120V HT or 0.01% on 50V HT. Note that the modest power for the 6.3V, 700 μA heater is derived from the HT rail. A dedicated 6V DC supply is an alternative.

Voltage gain may be raised to 44dB if the 62 Ω cathode resistor is bypassed by 1000 μF . This is sufficient gain to bring the signal from a moving-coil cartridge up to

sound-card input level. EIN = -136dBu or 120nV (A-weighted in 20kHz bandwidth). Alternatively, because of the very small grid-anode capacitance, step-up transformers may be employed with ease.

Dissipation in the 4k7 anode load is relatively high $> \frac{1}{2}W$. The EC8020-pH is not especially susceptible to high-frequency self-oscillation, however – as with any high-gain amplifier – normal layout precautions should be observed. Grid stoppers are rarely required.

IMPORTANT

The Phædrus Audio EC8020pH Gold Dot Supertube™ is NOT a general replacement for the EC8020 tube in applications other than audio preamplifiers. Specifically anode dissipation must be limited to 1W.

If in doubt contact: sales@phaedrus-audio.com



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