

AS1010 AEG - Dual Power Triode

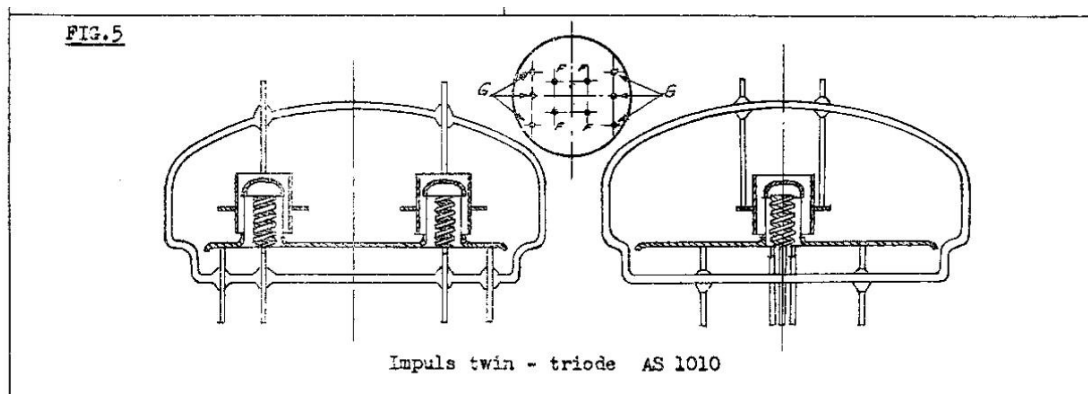


One of the rarest and most interesting tubes in the collection is the AEG AS1010. We have been able to find very little information on this double triode, presumably made between 1943 and 1945 for high-power pulse transmission.

Apparently it looks an evolution of the GEMA line started with the TS1/TS1a pair and continued with the TS6, inspired by the WE 316A doorknobs, but it was referred to as the "hedgehog" or porcupine, due to the many pins coming out like thorns from the flat bulb. Its very sturdy appearance suggests it was developed for naval use, capable of withstanding the mechanical stresses of a full broadside. This would support the idea that this tube was used in some GEMA early warning sets.

The emitters look very large, almost certainly made of thoriated-tungsten wire. Three bottom pins for each section are probably connected to their supporting rods and to the ends of the twin-helix wounded filament.

According to the BIOS report No. 102, the valve could generate 350 kW peak pulses, 1 μ s wide, at 55 cm. Peak anode voltage could be around 15 kV, emission could be as high as 25 A. Here a draft from the BIOS report.



This sample must be operated at 17.6 V (8.8 + 8.8 V) filament voltage for each section, as etched on the glass bulb. '296' is also etched, likely a serial number.

According to Google AI it could be used in some Seetakt variants (FuMG 39G / FuMO 22-23) and in the FuMO 201 "Flakleit" but this statement needs to be verified. The same source states that this tube is also listed in some GEMA 80 cm experimental sets, for powers around 200 kW peak.

Below, further information given by Google AI, all to be verified:

The Anode AS1010, developed by A.E.G. (Allgemeine Elektrizitäts-Gesellschaft), is a specialized component used in high-power vacuum tubes, particularly X-ray tubes and high-voltage rectifiers. Its design and manufacturing process are engineered to handle extreme thermal loads while maintaining structural integrity and high-vacuum stability.

1. Construction and Composition

Molybdenum Cylinder: The main body of the anode is a cylinder made of molybdenum, chosen for its high melting point and high thermal conductivity.

Molybdenum Ring: A flat ring, also made of molybdenum, is attached to the cylinder to form the complete assembly (often referred to as "Fig. 5" in technical documentation).

2. Manufacturing and Alloying Process

Zirconium Coating: The initial assembly is coated with Zirconium.

Vacuum Heat Treatment: The assembly is heated in a vacuum at 1800°C. At this temperature, the zirconium melts or diffuses into the molybdenum substrate to form a molybdenum-zirconium alloy surface layer.

Functional Purpose: This alloying process creates a robust interface that improves the adhesion of subsequent coatings and enhances the "getter" properties of the surface.

3. Secondary Coating

Zirconium Powder: After the initial alloying heat treatment, the anode is externally coated a second time with Zr powder.

Getter Function: This final layer of fine zirconium powder acts as a "getter." In a vacuum tube, zirconium is highly reactive with residual gases (like oxygen, nitrogen, and hydrogen) at high operating temperatures. It absorbs these gases to maintain the high-vacuum environment necessary for the tube's operation.

Thermal Radiation: The rough, powdered surface also increases the effective surface area for thermal radiation, allowing the anode to dissipate heat more efficiently during operation.

4. Application Context The AS1010 anode is typical of mid-20th-century European vacuum technology (specifically German A.E.G. designs) where durability under high-electron bombardment was critical. The use of zirconium-coated molybdenum allowed these tubes to operate at higher power densities without the anode melting or outgassing, which would otherwise lead to vacuum failure.

The AEG AS1010 Push-Pull Transmitter Tube is a specialized tube designed for use in high-frequency transmitter systems operating in the decimeter wave range. Manufactured by AEG, a renowned German electronics company, this tube offers reliable and efficient performance for wireless communication applications.

The AS1010 Transmitter Tube utilizes a push-pull configuration, employing two identical tubes in a symmetrical arrangement. This design enables higher output power and improved linearity compared to single-tube transmitter designs, resulting in enhanced signal quality and reduced distortion.

The AS1010 transmitter tube is characterized by its robustness and reliability. Designed for use in demanding environments, it offers a long service life. Furthermore, the tube boasts high efficiency, effectively converting incoming electrical power into amplified high-frequency signals.

Overall, the AEG AS1010 push-pull transmitter tube is a powerful and reliable component for decimeter-wave radio transmitter systems. Its ability to deliver high output power while maintaining good signal quality contributes to effective wireless communication in various applications.

Manufacturer: AEG

Type: AS1010

Function: DD-S-I

Socket: Spec.-10p

Version: Bigla

Experimental Type: ES23d