

Grid-controlled gas thyatron for controlled rectification and switching. Published ratings support substantial electronic power-control service.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	2.5 V / 5 A	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1	Thyatron
No fixed ratings recorded.	
Radiation-cooled mercury-vapor low-voltage thyatron, similar in structure to type 866-A.	

1701 — Radiation-Cooled Mercury-Vapor Thyatron

The **1701** (also designated as **5557/1701**) is a radiation-cooled, mercury-vapor, low-voltage thyatron designed for control and switching applications. Classified as a grid-controlled mercury-vapor triode or tetrode, the device is structurally similar to the 866-A mercury-vapor rectifier but incorporates grid control to regulate the onset of conduction.

Filament and Thermal Characteristics

The 1701 utilizes a high-current filament designed for low-voltage operation. The thermal and filament specifications are highly specific, requiring a brief preheating period before anode voltage is applied to

ensure proper mercury vaporization and prevent damage to the cathode structure.

Parameter	Value
Filament Voltage	2.5 V
Filament Current	5.0 A
Minimum Filament Heating Time	5 seconds
Operating Condensed Mercury Temperature Range	+30°C to +80°C

The 5-second filament heating time is notably brief compared to larger mercury-vapor thyratrons, allowing for rapid readiness in control circuits. Safe operation requires maintaining the condensed mercury temperature strictly within the range of +30°C to +80°C to ensure stable ionization characteristics and prevent arc-back or failure to control.

Electrical Ratings and Operating Parameters

The 1701 is rated for moderate power switching and control tasks. It features a high peak inverse voltage capability relative to its forward voltage rating, which is characteristic of mercury-vapor devices.

Voltage and Current Limits

- **Maximum Peak Forward Anode Voltage:** 2500 V
- **Maximum Peak Inverse Anode Voltage:** 5000 V
- **Maximum Peak Anode Current:** 1.0 A
- **Maximum Average Anode Current:** 0.5 A
- **Maximum Grid Voltage:** -500 V

Switching and Conduction Characteristics

During conduction, the tube exhibits a constant voltage drop, known as the tube drop, which is independent of the current through the device. The switching speed is governed by the ionization and deionization times of the mercury vapor.

- **Tube Drop:** 16 V
- **Ionization Time:** 10 microseconds (μs)
- **Deionization Time:** 1000 microseconds (μs)

The 16 V tube drop represents the typical potential difference across the tube during active conduction. The deionization time of 1000 μs dictates the minimum time required for the grid to regain control after anode current is interrupted, which limits the maximum operating frequency of the circuit.

Structural Design and Applications

The 1701 is a radiation-cooled tube, meaning it relies on natural convection and radiation to dissipate heat generated during operation. Its structural design is closely related to the 866-A half-wave mercury-vapor rectifier, sharing a similar envelope and thermal profile but adding a control grid. This grid allows the tube to function as a controlled rectifier, electronic switch, or sensitive relay driver, where conduction is initiated by a small grid signal and continues until the anode voltage drops below the ionization threshold.

Technical Summary

The **1701** (5557/1701) is a specialized **mercury-vapor thyatron** featuring a **2.5 V, 5.0 A filament** with a rapid **5-second heating time**. It is rated for a **maximum peak forward voltage of 2500 V**, a **maximum peak inverse voltage of 5000 V**, and can handle a **peak anode current of 1.0 A** (0.5 A average). With a characteristic **tube drop of 16 V**, an **ionization time of 10 μ s**, and a **deionization time of 1000 μ s**, this radiation-cooled device provides reliable low-voltage switching and control within a condensed mercury temperature range of **+30°C to +80°C**.



SOURCE OPERATING CONDITIONS

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1958 Amperex Industrial

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1958 AMPEREX INDUSTRIAL

Section 1 · Thyatron

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater or filament heating time	5 s	—
Tube drop	16 V	Conducting
Ionization time	10 us	Approximate
Deionization time	1000 us	Approximate

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak forward anode voltage	2500 V	—
Peak inverse anode voltage	5000 V	—
Peak anode current	1 A	—
Average anode current	500 mA	—
Maximum grid voltage	-500 V	—
Mercury condensed temperature range minimum	30 degC	—
Mercury condensed temperature range maximum	80 degC	—



SOURCE OPERATING CONDITIONS

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1963 Amperex Condensed

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1963 AMPEREX CONDENSED

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Filament voltage	2.5 V	ThyratronService
Filament current	5 A	ThyratronService
Filament heating time	5 s	ThyratronService
Tube voltage drop	16 V	ThyratronService
Deionization time	10 us	ThyratronService

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum peak forward voltage	2500 V	ThyratronService
Maximum peak inverse voltage	5000 V	ThyratronService
Maximum peak anode current	1 A	ThyratronService
Maximum average anode current	500 mA	ThyratronService
Maximum grid voltage	-500 V	ThyratronService

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