



PT1551 Deuterium Thyratron



The PT1551 is a unipotential cathode, four element, deuterium gas filled thyatron designed for network discharge service. When used in a network discharge service environment, it is suitable for switching pulse outputs of 16.5 megawatts peak at average power levels of more than 20 kilowatts, at high pulse repetition rates or a long pulse duration, flange mounted with wire leads. The PT1551 is an exact replacement for the CX1551 both electrically and physically.

The special feature of the PT1551 includes a internally connected reservoir and a dual grid structure for low delay time, minimal delay drift, and long service life.

ELECTRICAL

Heater Voltage	6.3	Volts
Heater Current (at 6.3 Volts)	22.0	Amps
Tube Heating Time (Warm-up)	5.0	Minutes
Inter-Electrode Capacitances	See Note 9	

MECHANICAL

Mounting Position	Any	
Base	E.I.A. A5-98	
Anode Cap	See Outline Drawing	
Cooling	Natural Convection	
Net Weight	1.8	Lbs. max.
Dimensions	See Outline Drawing	

MAXIMUM RATINGS

Maximum Peak Anode Voltage, Forward	33	kV
Maximum Peak Anode Voltage, Inverse (See Note 3)	25	kV
Minimum Anode Supply Voltage	1.0	kV DC
Maximum Peak Anode Current (See Note 4)	2,000	Amps
Maximum Average Anode Current	1.25	Amps
Maximum RMS Anode Current (See Note 5)	35	Amps

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P E N T A L A B O R A T O R I E S

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ELECTRON TUBES FOR INDUSTRY



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Maximum Anode Heating Factor	14.0 x 10 ⁸	VApps
Maximum Anode Current Rate of Rise	5,000	Amps/lsec
Peak Trigger Voltage	See Note 6	
Auxiliary Electrode Characteristics	See Note 7	
Maximum Anode Delay Time (See Note 8)	0.250	µsec
Maximum Anode Delay Time Drift	0.050	µsec
Maximum Time Jitter (See Note 9)	0.005	µsec
Ambient Temperature	-50 to +90 °C	
Maximum Altitude	10,000	Feet

Note 1: Only base clamping is allowable.

Note 2: Cooling of the anode lead is permissible, but there shall be no air blast directly on the glass.

Note 3: During the first 25 microseconds after conduction, the peak inverse anode voltage should not exceed 20 kV.

Note 4: The peak anode current rating of 2000 amperes is limited to low repetition rate applications of 60 pps maximum. For higher repetition rates, the peak anode current rating is 1000 amperes.

Note 5: The root mean square anode current shall be computed as the square root of the product of peak current and the average current.

Note 6: Trigger pulse applied to the control grid. (Pin 3)
The pulse produced by the driver circuit shall have the following characteristics when viewed at the socket with the tube grid disconnect.

Amplitude	200-1,000	Volts
Duration	1.0	µsec, min
	2.0	µsec (at 70% points), nom
Rate of rise	1,000	Volts/lsec, Min
Impedance	50-800	Ohms
Peak Inverse	450	Volts, max
Negative Bias Voltage	-150	Volts, max

Negative bias of 50 to 150 Vac must be applied to the control grid when the auxiliary electrode is operated in the DC keep-alive mode to insure anode voltage hold-off.

Note 7: The auxiliary electrode (Pin 4) is normally supplied a DC keep-alive voltage at 20-100 mA DC. The unloaded supply voltage should be 75-200 DC. As an alternate to DC keep-alive voltage, the auxiliary electrode (Pin 4) can be coupled to the control grid (Pin 3) by a 1,000 Pico Farads capacitor shunted with a 100K ohm resistor. The unloaded pulse voltage should be 300 to 1,000 Volts peak, of 2 microseconds duration at the 70% points.

Note 8: The time of anode delay is measured between the 25% point on the rising portion of the unloaded grid voltage pulse and the point at which anode conduction first evidences itself on the loaded grid pulse.

Note 9: Time jitter is measured at the 50% point on the rising edge of the anode current pulse.



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Note 10: Inter-Electrode Capacitances.

- Anode-Control Grid 13 Pico Farads (Auxiliary Electrode and Cathode not Connected)
- Anode-Auxiliary Electrode 7 Pico Farads (Control Grid and Cathode not Connected)
- Anode-Cathode 26 Pico Farads (Auxiliary Electrode and Control Grid not Connected)

PIN #	PIN CONNECTIONS
1	HEATER (Filament & Res.)
2	CATHODE (CONNECTED TO HEATER MID-POINT INTERNALLY)
3	CONTROL GRID
4	AUXILIARY ELECTRODE
5	HEATER (Filament & Res.)

