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PULSED TECHNOLOGIES LTD

TPII-10k/50 THYRATRON

Low-pressure hydrogen-filled thyatron TPII-10k/50 with superdense glow and arc discharge is designed to switch energy stored in a capacitor bank or pulse-forming network with pulse width from tens of nanoseconds to some microseconds.

Description. General Data

The tetrode 2-sections thyatron is enclosed into a brazed metal/ceramic envelope. The tube is fitted with hollow cathode without additional heating serving as an effective charge emitter providing reduced commutation time 4-5 ns. Patented dielectric coating protects ceramic insulator from destruction in cases when inverse anode voltage reaches 100% of direct value. Hollow anode modification, capable of conducting high inverse current with capability to be handled from the side of positive electrode, as well as tubes with electrode radiators are available. **Environmentally safe product.** The tube with zero warm-up time (TPII-10k/50SN without cathode and permanent reservoir heating) is also available upon your special request.

The design of the thyatron is protected by RF patents NN 1792207, 1807798, 20201, 28283.

Typical characteristics

Peak forward anode voltage, kV	5÷40
Peak forward anode current (Ib), A	5000
Anode current pulse width, μs	0.3
Pulse repetition rate, Hz	125
Preionization current, mA	5÷50
Grid bias voltage, V	-150
Tube warm-up time (Readiness time), minutes	5.0
Reservoir heater voltage, V, (not less/not more)	3.0/6.6
Reservoir heater current (at $U_{heat} = 6,6 V$), A	< 2.5

Maximum and minimum ratings (Absolute values)

Peak forward anode voltage, kV ^(Notes 1, 2, 3, 4)	5÷50
Peak forward anode current (Ib), kA	10
Anode current pulse duration, μs	0.01÷5
Maximum anode current rise rate, A/s	1×10^{12}
Average anode current (ib), A	0.3
Anode Dissipation Factor (VxAxpps)	5×10^{10}
Root mean square current $RMS = \sqrt{I_b \times i_b}$	50
Pulse repetition rate, Hz	3000
Preionization current, mA	5÷50
Time Jitter, ns	< 1.0
Rate of rise of trigger voltage pulse, kV/μs, not less	5.0
Peak open circuit trigger voltage, kV	1.0/6.0
Peak trigger current, A, (not less/not more)	0.1/50
Trigger current pulse duration, μs	0.2÷4.0
Readiness time, min	2.0
Driver circuit output impedance, not more, kΩ	5

Operation of the thyatron when two or more parameters are exceeded simultaneously may be permitted only upon agreement with the Manufacturer

^(Notes 1) Operation of the thyatron when the voltage is more than 40 kV is recommended when immersed into the gas (SF₆) or oil only.

^(Notes 2) The dwell time at the peak anode voltage should be minimized in order to minimize pre-firing. For operation at the rated peak forward anode current, the dwell time less 0.5 of pulse period, but must not exceed 1 millisecond.

^(Notes 3) After thyatron anode current stops flowing and before voltage is reapplied to the anode, the anode voltage must stay between 0 and -500 Volts for at least 250 ms to allow the gas to deionize.

^(Notes 4) Reverse anode voltage with amplitude of up to 50 kV may be impressed on in non-conducting phase only.

Exclusive only of a spike not longer than 25 nanoseconds, the peak reverse anode voltage must not exceed 8 kV during the first 50 microseconds after conduction.

The thyatron operating resource in terms of total switched charge (Typical Operating Conditions) - 1×10^6 C.

Maximum overall dimensions

($\varnothing_{cathode\ flange} \times H_{max}$), mm - 125x190.

Mass - not more than 2.0 kg.

Mounting position - any.

For reliable operation in compliance with the above ratings the trigger unit (driver) TU-4P is recommended

TPII-10K/50