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# PULSED TECHNOLOGIES LTD



## TPI1-1k/20 THYRATRON

Low-pressure hydrogen-filled thyatron TPI1-1k/20 with superdense glow 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 compact 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 3-4 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, ground grid modification, as well as tubes with electrode radiators and no-flanges tubes are available upon your request.

Environmentally safe product.

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

### Typical characteristics

Peak forward anode voltage, kV	18
Peak forward anode current (I <sub>b</sub> ), A	1000
Anode current pulse width, μs	0.35
Preionization current, mA	5÷30
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 <sub>heat</sub> = 6,6 V), A	1.0

The thyatron operating resource in terms of total switched charge (Typical Operating Conditions) - 1x10<sup>6</sup> C.

Maximum overall dimensions

(∅<sub>cathode flange</sub> x H<sub>max</sub>), mm - 38x105

Mass - not more than 0.1 kg.

Mounting position - any.

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

### Maximum and minimum ratings (Absolute values)

Peak forward anode voltage, kV (Notes 1, 2)	1,0÷22
Peak forward anode current, kA	3
Anode current pulse duration, μs	0.01÷5
Maximum anode current rise rate, A/s	5x10 <sup>11</sup>
Average anode current (I <sub>b</sub> ), A (Notes 3)	0.15
Anode Dissipation Factor (V <sub>x</sub> A <sub>x</sub> p <sub>s</sub> )	10 <sup>9</sup>
Root mean square current $RMS = \sqrt{I_b \times i_b}$	7
Pulse repetition rate, Hz	15000
Time Jitter, ns	<1.0
Preionization current, mA	5÷30
Rate of rise of trigger voltage pulse, kV/μs, not less	5.0
Peak open circuit trigger voltage, kV	1.0÷6
Peak trigger current, A, (not less/not more)	0.1/5
Trigger current pulse duration, μs	0.2÷2.0
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) 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 2) 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 3) Only with forced air cooling.

# TPI1-1k/20