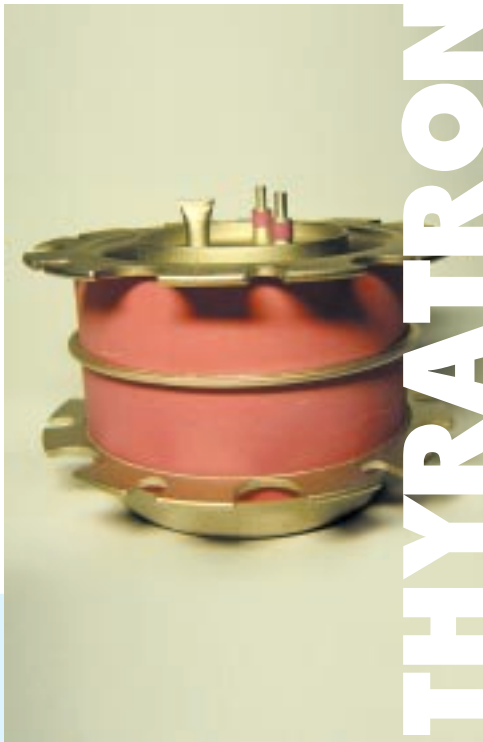




Address: 5, Yablochkova Lane, Ryazan, 390023, Russia
 Telephone: +7 (0912) 24-9217
 Telephone/Fax: +7(0912) 24-9238
 E-mail: info@pulsetech.ru
 Internet: <http://www.pulsetech.ru>

PULSED TECHNOLOGIES LTD



THYRATRON

TD11-50k/45 THYRATRON

Low-pressure hydrogen-filled thyatron TD11-50k/45 (grounded-grid thyatron) with self-maintained arc discharge in copper vapours is designed to switch energy stored in a capacitor bank or pulse-forming network with pulse width from tens of nanoseconds to hundred of microseconds.

Description. General Data

The thyatron is enclosed into a brazed metal/ceramic envelope, features 2 HV gaps and patented sandwich-like cathode. Cathode (trigger) assembly is fitted with specially developed semiconductor discharge initiator (igniter). Patented dielectric coating protects ceramic insulator from destruction in cases when inverse anode voltage reaches 100% of direct value. Mercury-free and environmentally safe product. The tube with zero warm-up time (TD11-50k/45SN without cathode and permanent reservoir heating) is 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÷35
Peak forward anode current, kA	100
Pulse repetition rate, pps	0,5
Anode current pulse 1-st half-wave duration, μs^*	2÷3
Switching capacitance, μF	5
Heating voltage, V (min/max)	3,5/6,5
Heating current at $U_{h.v.} = 6.0 \text{ V}$, A (max)	2,5
Warm-up time, minutes (max)	5,0

* - oscillation mode with six half-waves max.

Maximum and minimum ratings (Absolute values)

Peak forward anode voltage, ($U_a \text{ max}$), kV ^(1,2,3)	2÷45
Peak inverse anode voltage, kV ⁽⁴⁾	40
Peak forward anode current (I_b), kA	150
Peak inverse anode current, kA	0,9 I_b
Rate of rise of anode current, A/s ⁽⁵⁾	$5 \cdot 10^{11}$
Anode current pulse duration, μs	0,1÷100,0
Pulse repetition rate (f), pps ⁽⁶⁾	100
Energy per shot, J	20 000
Anode heating factor $P_b = (U_a \times I_b \times f)$, $\text{V} \cdot \text{A} \cdot \text{pps}$ ^(7,8)	$50 \cdot 10^9$
RMS current $\text{rms} \sqrt{I_b \times i_b}$ ($i_b = \text{CUF}$) ^(7,8)	500
Jitter, ns ⁽⁶⁾	3
Trigger pulse width, μs	2÷5
Rate of rise of trigger voltage pulse, kV/ μs	>5

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

^(Note 1) Operation of the thyatron when anode voltage is over 35-40 kV it is recommended to immerse the tube into gases (SF_6), N_2 or oil.

^(Note 2) The dwell time at the peak anode voltage should be minimised in order to minimise 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.

^(Note 3) At the end of the current pulse and before voltage is reapplied to anode, the anode voltage must stay at -100 to -500 Volts for at least 250 ms for thyatron recovery.

^(Note 4) Inverse anode voltage applies for a previously non-conducting tube. Exclusive only of a spike not longer than 25 nanoseconds, the peak inverse anode voltage must not exceed 8 kV during the first 50 microseconds after conduction.

^(Note 5) Maximum value, subject to external circuit parameters.

^(Note 6) For circuits, based on low-energy, high trigger pulse rise rate cable generator

^(Note 7) At values $P_b > 10^9$ and $\text{RMS} > 50$ thyratrons can be used only in a burst-pulse mode. Duration of pulse packet and the pause should be submitted to the Manufacturers approval.

^(Note 8) The maximum-allowed temperature of cathode, anode and grid flanges is +150. Use forced air or oil cooling if exceeded.

Life in terms of cumulative charge transfer, C (min) - 1×10^5
 Maximum overall dimensions ($\varnothing_{\text{cathode flange}} \times H_{\text{max}}$), mm - 150x116.
 Net weight - not more than 3,0kg.

For reliable operation in compliance with the ratings listed we recommend to use specially designed high performance thyatron driver (thyatron trigger system) TU-2D.

TD11-50k/45