

GL1836A Specification

GL1836A is a high power metal-ceramic structure thyatron, which has the characteristics of high repeat frequency, fast ignition, low jitter, low drift, etc. It can be used as high power pulse switch in radar, high-energy laser, high-energy accelerator.

GL1836A has three grids. It can be mounted and used according to the actual conditions of different applications, such as there's a negative bias, one or multiple pulse triggers, etc.

Anode Parameters

Peak forward anode voltage:	50 kV max (note 1)
Peak inverse anode voltage:	10kV (note 2)
Peak current:	10kA max
Average anode current:	10A max
Rate of rise of anode current:	10kA/μs (note 3, 4)
Operating frequency:	50Hz~10k Hz(note 1, 5)

Gradient grid

Circuit connection: See picture (page 4)

Trigger Pulse

Unload grid pulse voltage:	1000V~2000V
Pulse duration:	1μs min
Rate of rise of pulse:	10kV/μs min
Peak inverse voltage:	450V max
Unload grid negative bias:	0~-200V
Peak inverse current	
Modulator connection:	5A~40A
Grid 3 serves as shield grid:	125A~175A(note 6)
Trigger delay:	0.5μs~3μs

Grid 1 (Pulse)

Unload grid pulse voltage:	600V~2000V
Pulse duration:	2μs min
Rate of rise of pulse:	1kV/μs min
Peak inverse voltage:	450V max
Current:	5A~100A

Grid 1 (DC)

Unload DC voltage:	75V~150V
Current:	0.25A~2.0A

Electrical Parameters

Cathode heater voltage:	6.3V ±5% Vac
Cathode heater current:	80A~100A



Reservoir heater voltage:	6.3V ±5% Vac
Reservoir heater current:	6.0A ~ 8.0A
Preheating time:	10min(min)
Capacity between anode and gradient grid:	40pF
Capacity between gradient grid and grid 3:	40pF

Mechanical Parameters

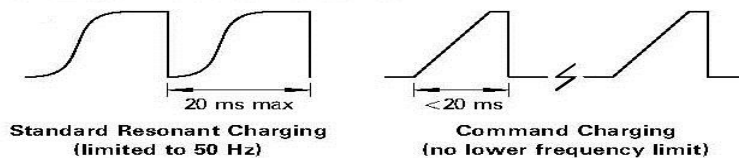
Mounting position:	Flange Mounted (note 7)
Weight:	About 11kg
Dimension:	See outline
Cooling way:	Forced-air (note 8)

Typical Parameters

Critical conduction anode voltage:	5000V max
Anode delay time:	350ns max
Anode delay time drift:	25 ns max
Time jitter:	10 ns max

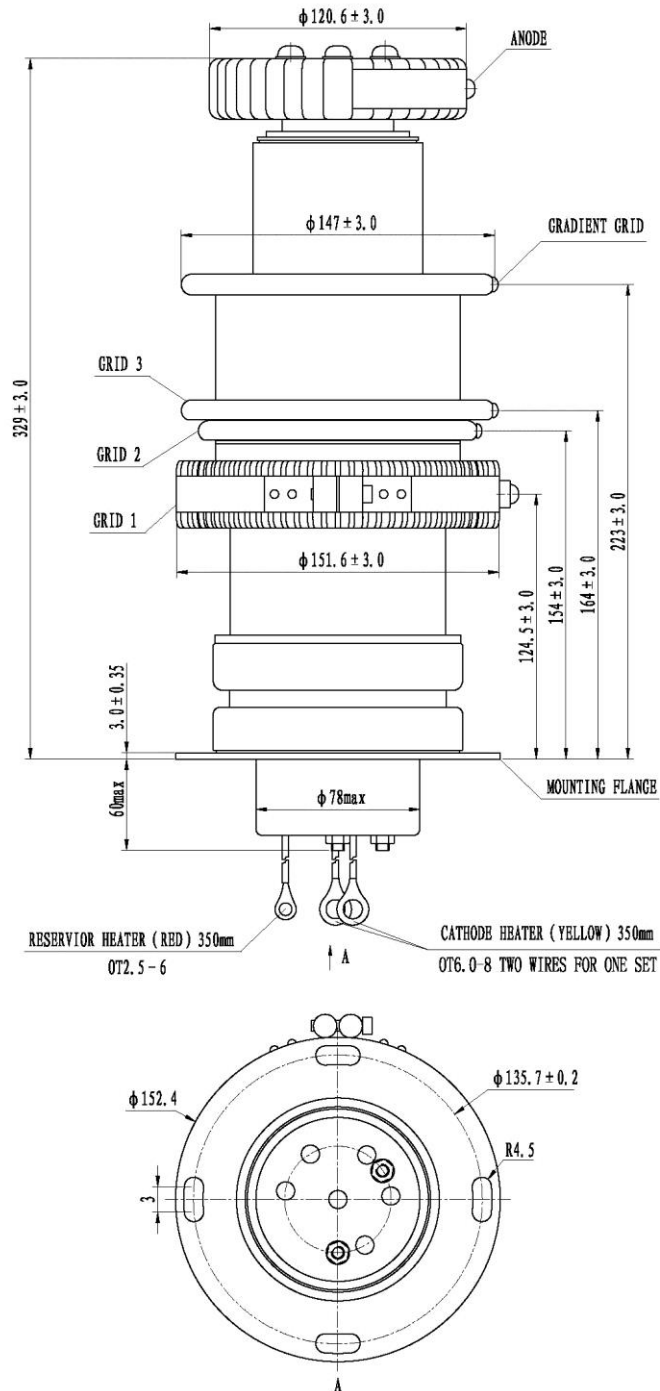
Notes:

1. GL1836A has a shorter recovery time, but on the base of obtaining the grid design of high peak current breaking capacity, thyratron's high pressure resistance ability at low working frequency is limited. In order to maximize thyratron's performance, it's recommended that applying command charging technique to limit the anode resistance time no more than 20ms.

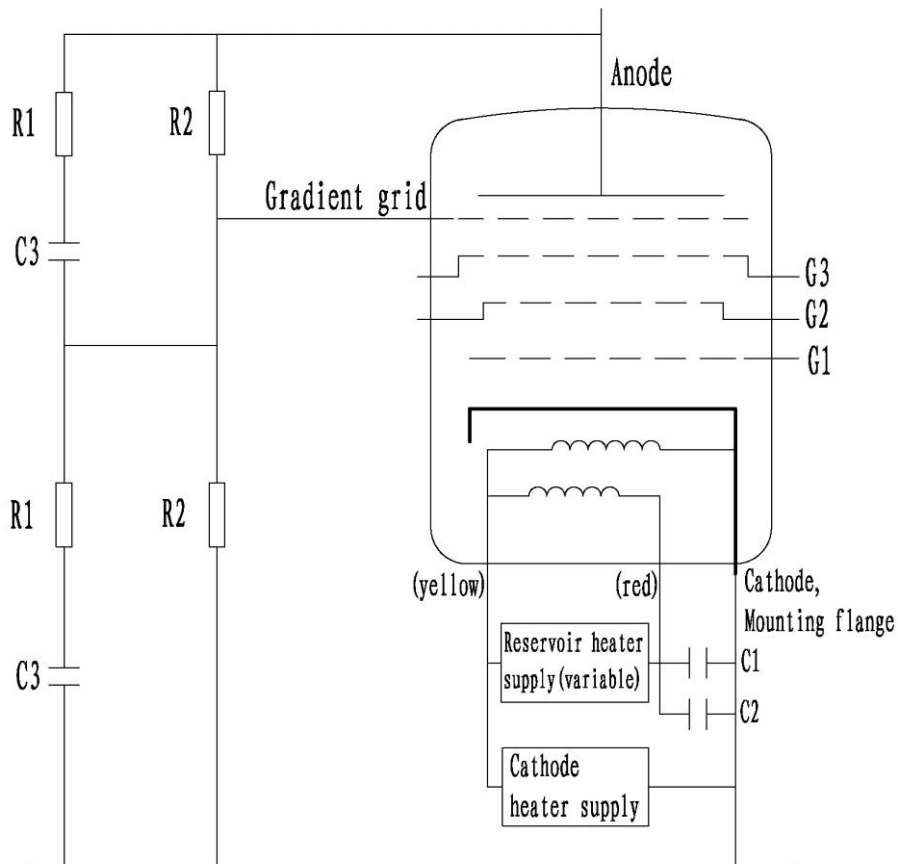


2. Peak inverse anode voltage (include peak) must not exceed 10KV within 25μs after impulse current discharge finished, otherwise it will damage the grid and cause spark inside the tube and shorten the working life.
3. This rate of rise refers to that part of the leading edge of the pulse between 26% and 70% of the pulse amplitude.
4. Under single narrow pulse working condition, rate of rise of the current can exceed 100kA/μs, finally value greatly depend on the external circuit.
5. Maximum operating frequency depends on the external charge and discharge circuit, generally operating frequency exceed 50Hz. Command charge circuit is recommended to ensure the thyratron is under favorable working voltage.
6. In the case of Grid 3 is used as shield grid, it needs bigger trigger current than common connection mode to conduct thyratron.
7. The tube must be mounted by means of its cathode mounting flange.
8. Air flow is no less than 7.1m³/min. The temperature of the envelope must not exceed the specified value:
 Ceramic, anode and grids.....150°C
 Cathode mounting flange and base.....120°C

Outline Drawing



Schematic Diagram



R1 = 470Ω–1kΩ12W wirewound resistance;

R2 = 10–25 MΩ high voltage resistance, rated power is the same with peak forward anode voltage;

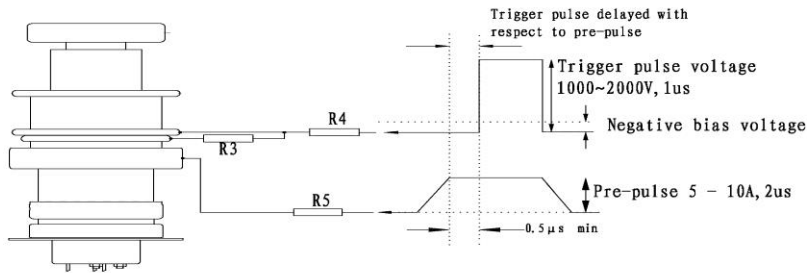
C1, Reservoir protection capacitor, 1000pF low inductance capacitor, voltage rating≥500V;

C2, Reservoir protection capacitor, 1μF, voltage rating≥500V;

C3 = 500–1000 pF capacitor, voltage level matches with peak forward anode voltage;

Trigger connection

1. The modulator has two trigger pulses with negative bias, which is recommended to use, it can maximize the performance of the cathode and effectively guarantee a long service life.

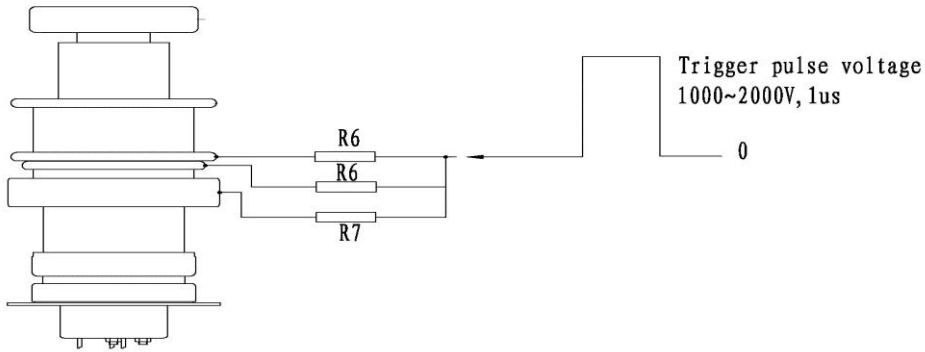


R3 = 100Ω12W wirewound resistance;

R4 = 12W wirewound resistance, matches with drive current;

R5 = 12W wirewound resistance, matches with drive current;

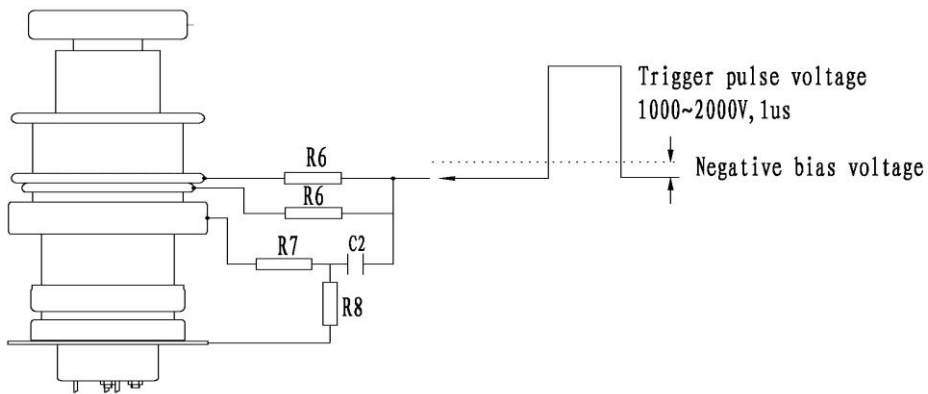
2. The modulator only has a single pulse triggering
 - a) Pulse triggering without negative bias



R6 = 1.8 k Ω 12W wirewound resistance;

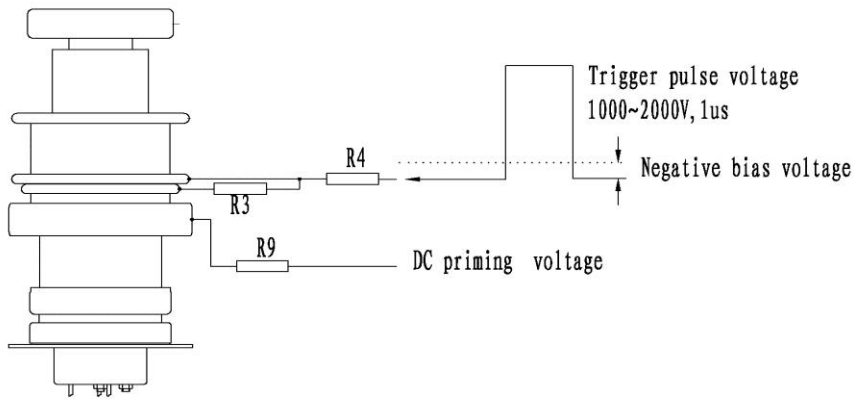
R7 = 47 Ω 12W wirewound resistance;

b) Pulse triggering with negative bias



R6 = 1.8 k Ω 12W wirewound resistance;
R7 = 47 Ω 12W wirewound resistance;
R8 = 10k Ω 12W wirewound resistance;
C2 = 0.01mF–0.1mF coupling capacitor;

3. The modulator has a single pulse triggering (with or without negative bias) and DC pretrigger
It applies only to the applications with rate of rise of anode current $\leq 10\text{kA}/\mu\text{s}$ and anode current under 40kV ;

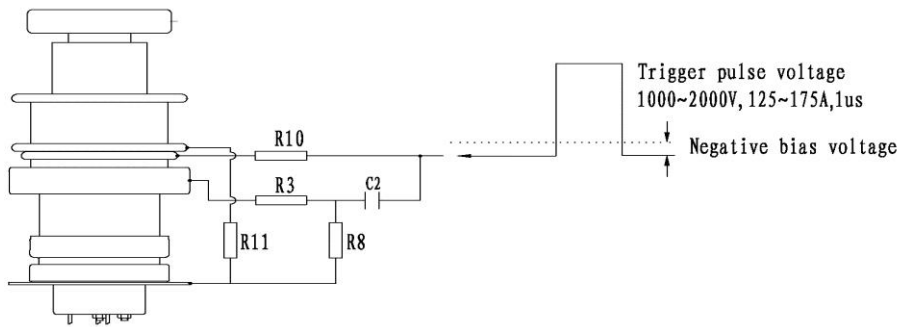


R3 = 100Ω 12W wirewound resistance;

R4 = 12W wirewound resistance, matches with drive current;

R9 = 12W wirewound resistance, matches with drive current of Grid 1;

4. Command charging, Grid 3 serves as shield grid



R3 = 100Ω12W wirewound resistance;

R8 = 10kΩ12W wirewound resistance;

C2 = 0.01mF–0.1mF coupling capacitor;

R10 = 12W wirewound resistance, matches with grid pulse current with a range of 5–16Ω;

R11= 1Ω–10Ω, depending on the extent to which the shield is needed; 12W wirewound resistance or resistance wire (> 10 W);