



Made in England.



**GASFILLED RELAY  
TYPE GT1  
HOT-CATHODE GRID-CONTROLLED  
MERCURY VAPOUR RECTIFIER  
(Indirectly Heated Cathode).**

The OSRAM GT1 Gasfilled Relay is a trigger device. It comprises an indirectly heated cathode, an anode and a control grid, and is enclosed in a bulb containing mercury vapour. Current is carried through the Relay by the passage of electrons from the cathode to the anode, under the influence of a positive potential applied to the latter. If, however, a sufficiently negative grid bias is applied before the anode is made positive, the flow of current between anode and cathode will be withheld. If the anode voltage is now increased, or the negative grid bias reduced, to a critical ratio (see characteristic curve opposite) a discharge will strike in the mercury vapour and anode current will flow. Under this condition the bulb is filled with the blue glow due to the ionisation of the mercury vapour, and the internal voltage drop between anode and cathode is about 15 volts, irrespective of the value of the anode current. Once ionisation has been produced, the grid has normally no longer any power to control the discharge.

It is essential that the impedance of the external circuit shall of itself be sufficient to limit the anode current to the rating given below.

Maximum Dimensions :  
Overall length (including pins)  
115 m/m.  
Diameter of bulb 50 m/m.

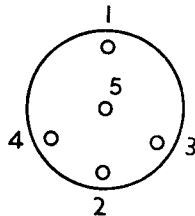
For prices see  
pages 126-129.

**CHARACTERISTICS.**

Heater Voltage	.. .. .	4.0 volts minimum.
Heater Current	.. .. .	1.3 amps. approx.
Maximum Safe Anode Voltage	.. .. .	1,000 volts (peak value).
Maximum Safe Anode Current	.. .. .	1.0 amp. (peak value).
		.5 amp. (R.M.S. value).
		.3 amp. (average value measured on moving coil meter).
Cathode-Anode Voltage Drop	.. .. .	12 to 18 volts.*
Grid Control Ratio	.. .. .	20 to 25.*
Cathode heating time	.. .. .	1 minute.**

\* According to temperature.

\*\*After transit, or after a long period of disuse, it is recommended that 5 minutes heating time be allowed.



View looking on  
underside of base.

**BASE: 5-pin.**

- 1: Anode
- 2: Grid
- 3: Heater
- 4: Heater
- 5: Cathode

## TYPE GT1 OPERATING CONDITIONS.

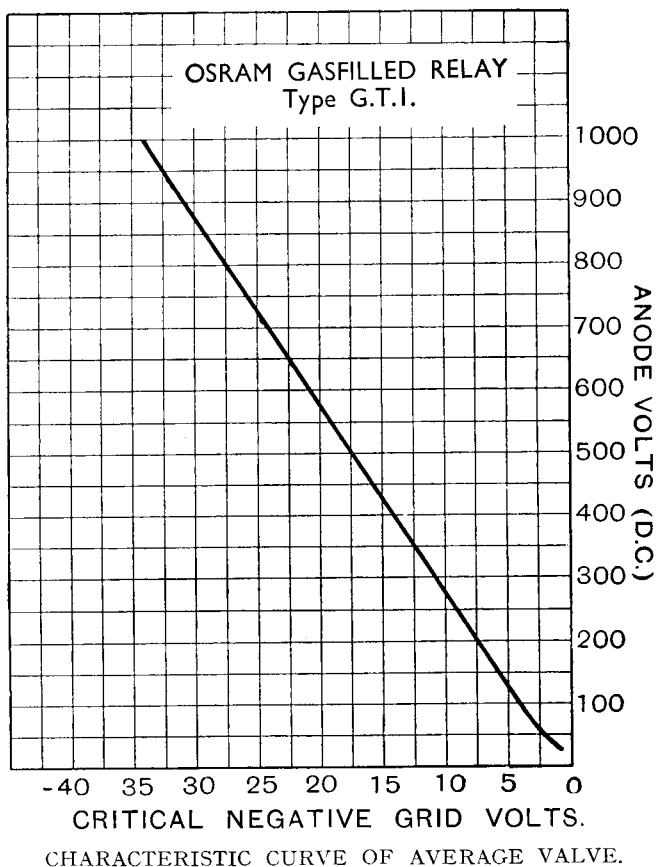
*It is essential that the cathode should be allowed at least one minute to reach full operating temperature before any anode current is permitted to flow. Disregard of this precaution will cause cumulative destruction of the cathode.*

It is also essential that the anode current shall never, even momentarily, exceed the rated peak value of 1 amp. This point requires particular attention in circuits where there are condensers which may charge or discharge through the Gasfilled Relay. In circuits where an accidental overload may be liable to occur, it is wise to protect the Gasfilled Relay with an instantaneous overload circuit breaker set to operate at about 1 amp.—a fuse is not sufficiently rapid to afford protection.

A resistance of at least 1,000 ohms should be included in the grid circuit in order to limit the grid current, otherwise the grid circuit impedance should be kept as low as practicable, and at any rate should not exceed 1 megohm.

A large voltage difference between heater and cathode must be avoided; whenever possible, the heater circuit should be connected to the cathode through a resistance of 10 to 1,000 ohms. A floating heater circuit tends to cause irregularity of control.

*If the Gasfilled Relay is not in occasional use, it is advisable to heat the cathode to operating temperature for five minutes once every two months, in order to keep the cathode free from mercury.*



The GT1 can be employed to control currents up to 1 amp. (peak value) in either A.C. or D.C. circuits, and is capable of a variety of applications. In D.C. circuits the anode current can only be stopped by breaking the circuit, or by removing the applied anode voltage for a time long enough to allow of the decay of the ionisation. This may require anything from 10 to 1,000 microseconds, according to circumstances. In A.C. circuits the anode current falls to zero once per cycle; the grid can therefore be made to control the flow of anode current during each cycle and hence the average output power.