Hot-Cathode Mercury-Vapour Thyratron

Code: 4049GD

CATHODE

Oxide-coated, shielded filament

Filament voltage	4	V
Nominal current	11	A
Minimum cathode heating time	1	min←

DIRECT INTERELECTRODE CAPACITANCES

Anode to grid	2.0	pF
Grid to cathode	15.0	pF

MECHANICAL DATA

Maximum overall length	279.4	mm
Maximum bulb diameter	63	mm
Base	Large 4-pin bayonet	
Socket	4009C or 4039A	
Net weight	250	g
Mounting position	Vertical, base down←	

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MAXIMUM RATINGS

Maximum peak inverse voltage	20	kV
Maximum peak anode current	5	A
Maximum average anode current	1.25	A
Maximum fault anode current	25	A
Maximum duration of fault anode current	0.1	sec
Maximum peak grid current	1.0	A
Maximum average grid current	0.25	A
Recommended maximum grid circuit resistance	50	kΩ
Maximum volt drop	16	V
Maximum condensed mercury temperature range (with forced ventilation)	20 to 65	°C

The above ratings apply to operation with a choke input filter and a supply frequency of 50 c/s.

CATHODE HEATING TIME

Ambient Temperature	10 to 20°C	20°C and above
Minimum pre-heating period	2 minutes	1 minute

After shipment or transit the valve must be pre-heated for not less than 30 minutes before any anode voltage is applied, so that the mercury may be distributed correctly.

Before putting a valve of this type into service, it is recommended that reference be made to General Information Section K in the front of this handbook.

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MAXIMUM PEAK INVERSE VOLTAGE RATINGS AND CONDENSED MERCURY TEMPERATURE.

Natural Ventilation ...	20 to 55°C	20 to 40°C
Forced Ventilation ...	20 to 65°C	20 to 55°C
Peak Inverse Voltage ...	Up to 10 kV	Up to 20 kV

The temperature limits given under "Natural Ventilation" are only valid for unrestricted natural ventilation. Forced air cooling is recommended, and is required for operation up to the limit of condensed mercury temperature.

THYRATRON OPERATION.

With a condensed mercury temperature of 35°C the minimum values of grid blocking voltage to prevent ignition are :

Anode Voltage	*Grid Voltage*
15000 V	−4.5 V
10000 V	−3.0 V
5000 V	−1.5 V
1000 V	+1 V

For positive operation it is recommended that for a given anode voltage the grid should be biased back beyond the value required to prevent ignition and a positive firing pulse of 20 to 30 volts peak applied.

The pulse should have a leading edge as near vertical as possible and the grid circuit should be of high enough impedance to limit the grid current to the safe value.

Control of the output may be affected by varying the phase of the grid voltage with respect to the applied anode voltage.

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TYPICAL OPERATING CONDITIONS.

Circuit	No. of Valves	Maximum A.C. Input Voltage (r.m.s.)	Maximum D.C. Output Voltage (Volts)	Maximum D.C. Output Current (Amperes)
Single-Phase Full Wave Circuit No. 1	2	7000	6300	2.5
Single-Phase Full Wave Bridge Circuit No. 2	4	14000	12600	2.5
Three-Phase Half Wave Circuit No. 3	3	8150	9550	3.75
Three-Phase Double Y Parallel Circuit No. 4	6	8150	9550	7.5
Three-Phase Full Wave Circuit No. 5	6	8150	19100	3.75

The above tables suitable circuits for this thyratron and shows the safe maximum input and output conditions. The values are based on sine wave input and the use of a suitable choke input filter.

This thyratron being directly heated, it is recommended that the output circuit be taken from the mid-point of the filament supply transformer secondary winding.

For details of the circuits referred to see sheet K—8 in the introduction to this handbook.

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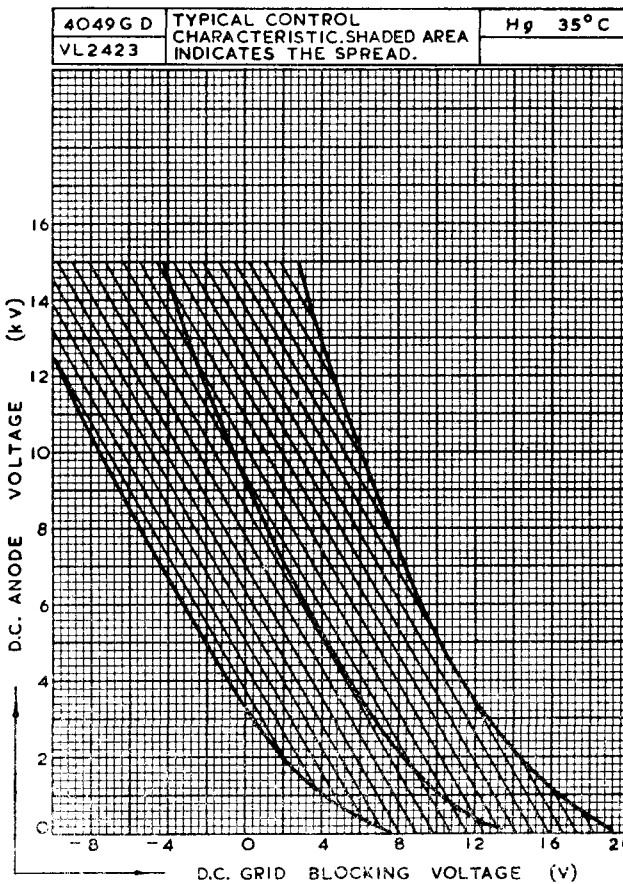

Ref.: 3V/500A

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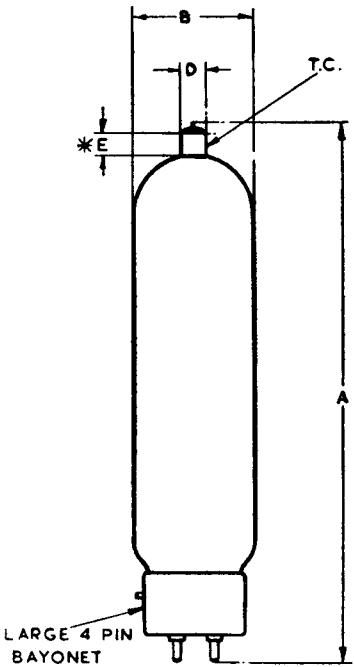

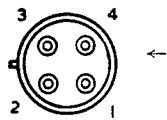

BASING

1. GRID
2. FILAMENT
3. NO CONNEXION
4. FILAMENT

T.C. ANODE

DIM	MILLIMETRES	INCHES
A	279·4 MAX	11 MAX.
B	63 MAX. 55 MIN.	2 15/32 MAX. 2 5/32 MIN.
E*	10·3 MIN	13/32 MIN
D	14·30 ± 0·25	0·562 ± 0·010

NOTE:– BASIC FIGURES ARE INCHES.
* DENOTES:– CONTACT LENGTH.