Hot-Cathode Mercury-Vapour Thyratrons

Codes: 57 (CV5027) ←
3V/390B (CV5028) ←

Type 57 is a three-electrode mercury-vapour thyratron developed mainly for use in Industrial Control applications. It is equivalent to the U.S.A. type FG-57. The 3V/390B is an electrically identical thyratron on a British 4-pin base.

CATHODE

Indirectly-heated, oxide-coated		
Heater voltage	5	V
Nominal current	4.5	A
Minimum cathode heating time	5	min

DIRECT INTERELECTRODE CAPACITANCES

Anode to grid	3.5	pF
Grid to cathode	8.5	pF

DIMENSIONS

Maximum overall length	190.4	mm
Maximum seated height	168.3	mm
Maximum bulb diameter	82.5	mm
Base	American 4-pin medium	
Net weight	150	g

MAXIMUM RATINGS

Maximum peak inverse voltage	1.5	kV
Maximum peak anode current at 25 c/s and above	15	A
Maximum average anode current	3	A
Maximum fault anode current	200	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	0.25	MΩ
Maximum voltage drop	16	V
Maximum condensed mercury temperature range	35 to 75	°C

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

Ref.:
3V/390A
3V/390B

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MAXIMUM PEAK INVERSE VOLTAGE RATINGS AND CONDENSED MERCURY-VAPOUR TEMPERATURES

Condensed mercury temperature range	Up to 60 °C	60 to 75 °C
Peak inverse voltage	Up to 2000 V	Up to 1500 V

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

CATHODE HEATING TIME

The minimum cathode heating time is 5 minutes. After shipment or transit the valve must be pre-heated for at least 30 minutes before any anode voltage is applied so that the mercury may be distributed correctly.

THYRATRON OPERATION

With a condensed mercury temperature of 40°C the minimum values of negative grid voltage required to prevent ignition are :

Anode Voltage	*Grid Voltage*
100 V	−1.75 V
1000 V	−6.5 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 pulse circuit should be of high impedance in order to limit the grid current to the safe maximum value.

The control of the output may be affected by varying the phase of the grid pulse relative to the phase of the applied anode voltage.

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TYPICAL OPERATING CONDITIONS

Circuit	No. of Valves	Maximum A.C. Input Voltage ($V_{r.m.s.}$)	Maximum D.C. Output Voltage (V)	Maximum D.C. Output Current (A)
Single Phase Full Wave Circuit No. 1	2	525	475	6
Single Phase Full Wave Bridge Circuit No. 2	4	1050	945	6
Three Phase Half Wave Circuit No. 3	3	610	715	9
Three Phase Double Y Parallel Circuit No. 4	6	610	715	18
Three Phase Full Wave Circuit No. 5	6	610	1430	9

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

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

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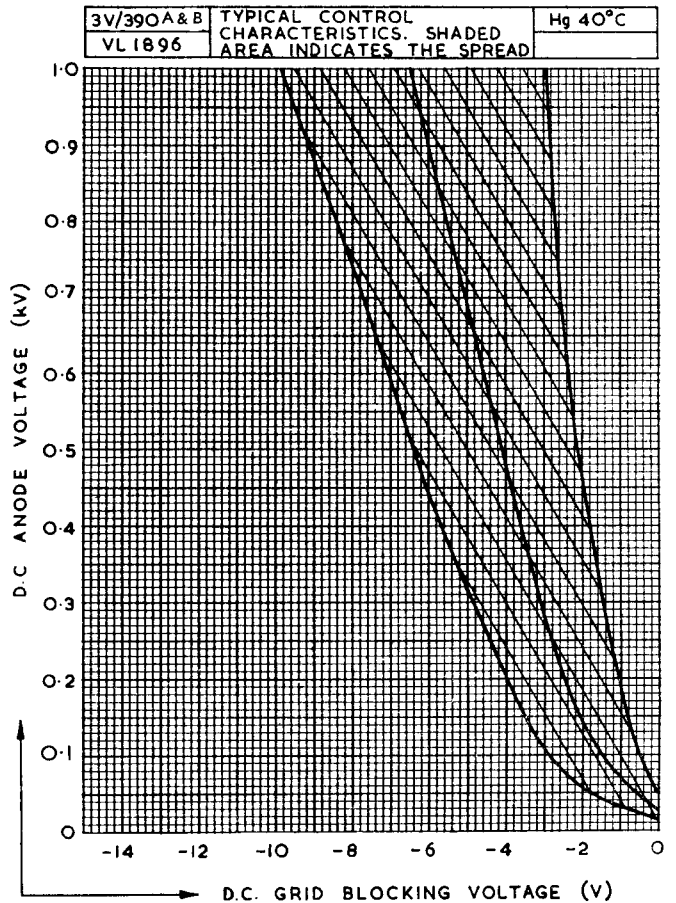

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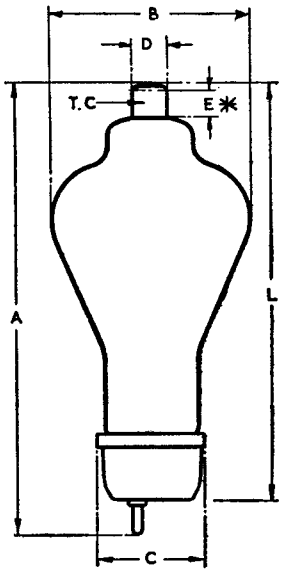
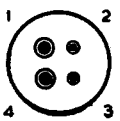


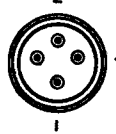


BASING

1. HEATER
2. HEATER - CATHODE
3 GRID
4 HEATER - CATHODE
T.C ANODE

TYPE 57

MEDIUM 4-PIN



BASING

1 HEATER-CATHODE
2 GRID
3 HEATER - CATHODE
4 HEATER
T.C ANODE

3V/390B

BRITISH 4 - PIN

DIM	MILLIMETRES	INCHES
A	184·1 ± 6·3	7 1/4 ± 1/4
B	82·5 MAX	3 1/4 MAX
D	14·30 ± 0·25	0·562 ± 0·010
E ✱	10·3 MIN	13/32 MIN
L	168·3 NOM	6 5/8 NOM.
C	42·9 MAX:	1 11/16 MAX:

NOTE.- BASIC FIGURES ARE INCHES.

✱ DENOTES:- CONTACT LENGTH.