

HALF-WAVE RECTIFIER

RG4-I250

QUICK REFERENCE DATA (maximum values)

Mercury vapour half-wave rectifier for power rectification.

P.I.V. max.	20	kV
$I_{k(av)}$ max.	1.25	A

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS—GAS-FILLED RECTIFIERS which precede this section of the handbook.

ABSOLUTE MAXIMUM RATINGS

It is important that these ratings are never exceeded and such variations as mains fluctuations, component tolerances and switching surges must be taken into consideration in arriving at the actual operating conditions.

Maximum peak inverse anode voltage (see note 1)	20	10	kV
Condensed mercury temperature (see note 1)			
Maximum	40	55	°C
Minimum	20	20	°C
Maximum cathode current			
Average (maximum averaging time = 15s)		1.25	A
Peak		5.0	A
Surge (fault protection, maximum duration = 0.1s)		25	A
Filament voltage			
Maximum		4.1	V
Minimum		3.9	V
Maximum operating frequency		150	c/s
Valve heating time	See note 3		
Minimum cathode heating time (see note 4)		1	min

CHARACTERISTICS

Filament voltage	4.0	V
Nominal filament current at 4.0V	11	A
Nominal anode voltage drop	12	V
Nominal ignition voltage	See note 2	
Equilibrium condensed mercury temperature rise above ambient		
At full load (approx.)	16	°C
At no load (approx.)	14	°C
Net weight (approx.)	{ 10.5	oz
	{ 300	g
Weight of valve in carton (approx.)	{ 28	oz
	{ 800	g
Nominal dimensions of carton	{ 12 × 5.5 × 5.5	in
	{ 300 × 140 × 140	mm

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FULL LOAD OPERATING CONDITIONS

These figures are based upon the absolute maximum ratings of the valve and no account has been taken of mains variations or transformer, valve and choke losses. In practice, due consideration must be given to these factors. See, also, appropriate sections of 'General Operational Recommendations—Gas-Filled Rectifiers'.

Circuit	No. of valves	Full load d.c. output		Applied a.c. voltage ($kV_{r.m.s.}$) (per valve)	Initial filter elements	
		(kV)	(A)		(H)	(μF)
Single phase full-wave	2	6.3	2.5	7.0	4.0	5.0
Single phase bridge	4	12.6	2.5	14	8.0	2.5
Three phase half-wave	3	8.2* (9.5)	3.75	7.0* (8.1) (per phase)	3.0	2.0
Three phase full-wave	6	19.1	3.75	8.1 (per phase)	4.0	1.0

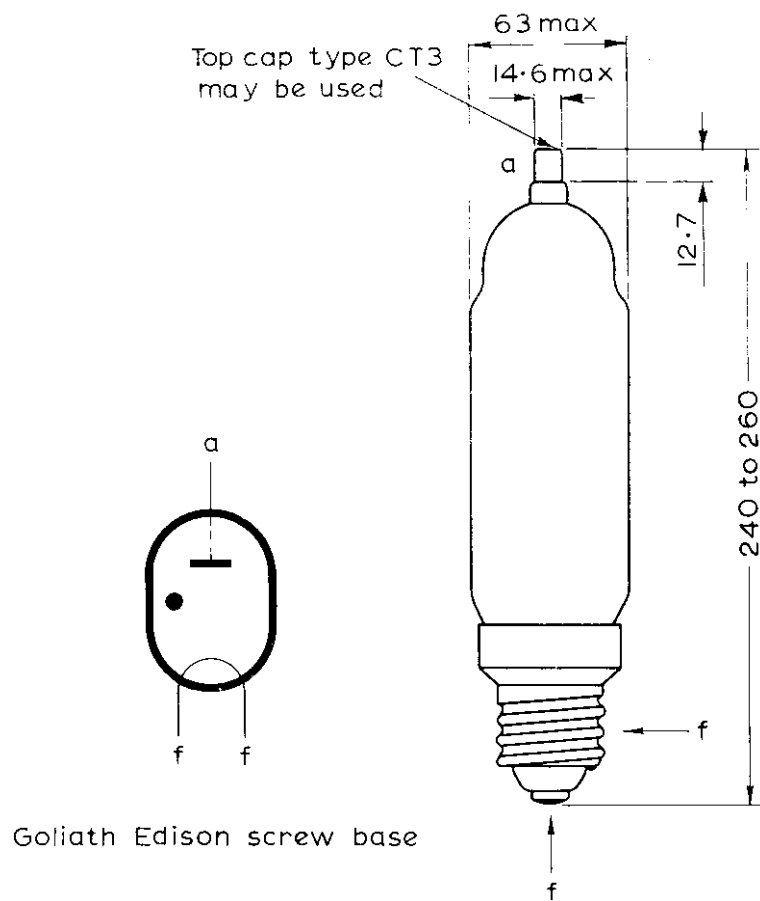
*These figures take into account the increase in peak inverse voltage which occurs if the power supply is lightly loaded. For operation with a constant load the maximum voltages are the values shown in brackets.

OPERATING NOTES

1. The maximum condensed-mercury temperature rating for intermediate anode voltages may be determined by linear interpolation.
2. In order to obtain an ignition delay time of approximately $10\mu s$, an anode voltage of at least 50V is required.
3. The preferred minimum value of the total valve heating-up time can be obtained from the heating and cooling curve on page C1. This shows how the condensed-mercury temperature rises above the ambient temperature from the instant of switching on the filament supply. Under normal conditions cathode current may be drawn when the condensed-mercury temperature is approximately within $7^{\circ}C$ of the minimum value given. (See page C2 and appropriate section of 'General Operational Recommendations—Gas-Filled Rectifiers').
4. Under no circumstances should the anode voltage be applied until at least one minute after the application of the filament voltage.

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All dimensions in mm

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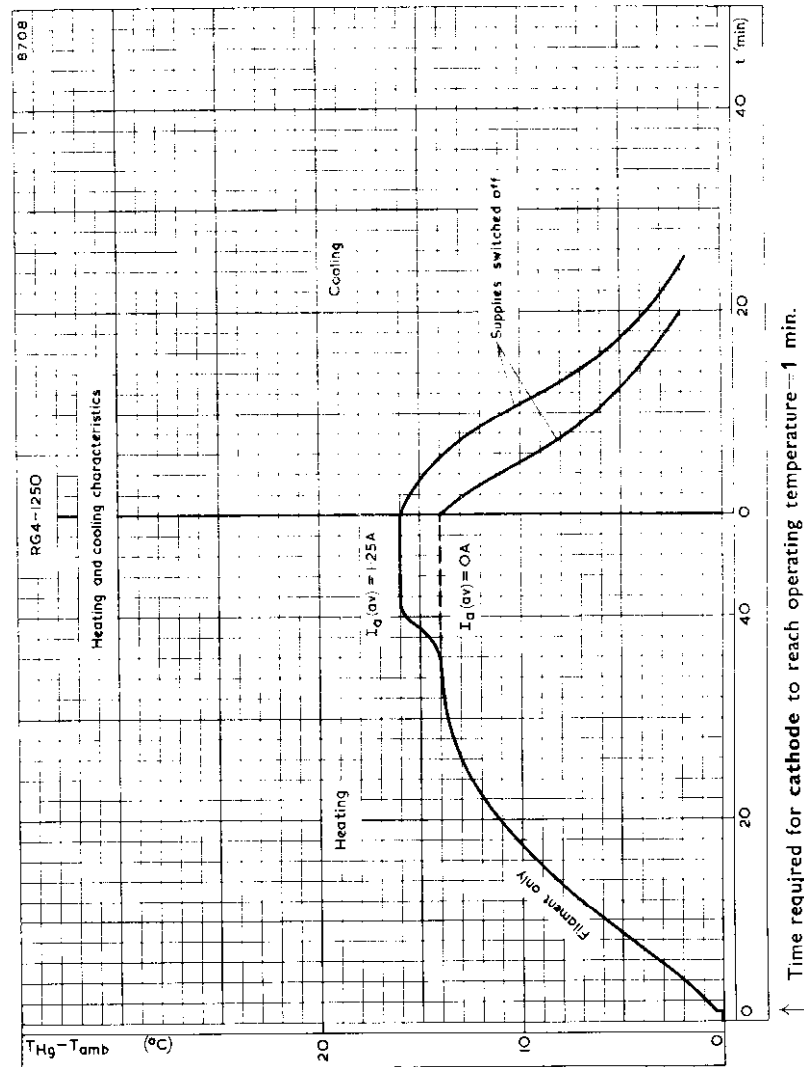
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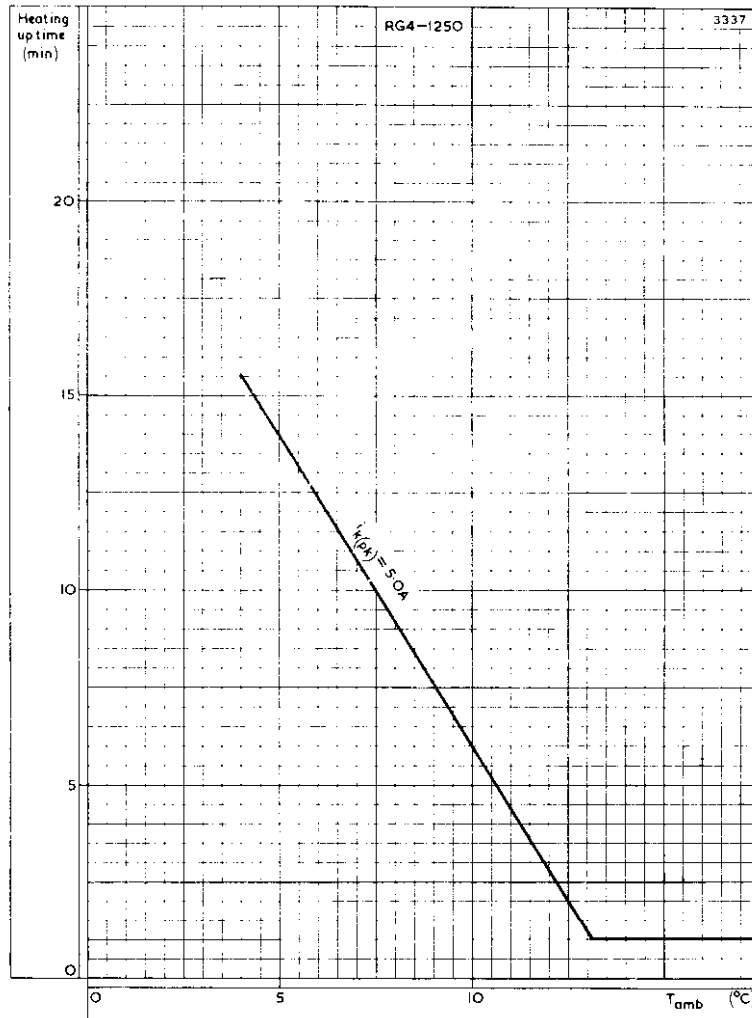
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HEATING AND COOLING CHARACTERISTIC. EXCESS TEMPERATURE OVER AMBIENT PLOTTED AGAINST TIME

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TOTAL HEATING-UP TIME PLOTTED AGAINST AMBIENT TEMPERATURE