

HALF-WAVE RECTIFIER

Mercury vapour half-wave rectifier for use
in high voltage rectifier circuits.

RG3-250
RG3-250A

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

LIMITING VALUES (absolute ratings, not design centre)

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

Maximum peak inverse anode voltage	10	kV
Condensed mercury temperature limits	25 to 65	°C
Maximum cathode current		
Peak	1.0	A
Average (max. averaging time = 15s)	250	mA
Surge (fault protection max. duration = 0.1s)	100	A
Maximum operating frequency	150	c/s

CHARACTERISTICS

Electrical

Filament voltage	2.5	V
Average filament current at 2.5V	5.0	A
Anode voltage drop (approx.)	16	V
Typical ignition voltage	30	V

Mechanical

Equilibrium condensed mercury temperature rise above ambient		
At full load (approx.)	25	°C
At no load (approx.)	22.6	°C
Mounting position	Vertical, base down	
Maximum net weight	{ 90 3.0	{ g oz



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FULL LOAD OPERATING CONDITIONS (for peak inverse anode voltage of 10kV and peak cathode current of 1.0A)

Circuit	No. of valves	Full load d.c. output		Applied a.c. volts	Initial filter elements	
		(kV)	(mA)	(kV _{r.m.s.})	Lmin. (H)	Cmax. (μF)
Single phase full-wave	2	3.1	500	3.5 (per valve)	10	2.0
Single phase bridge	4	6.3	500	7.0 (total)	20	1.0
Three phase half-wave	3	4.1* (4.7)	750	3.5* (4.1) (per phase)	6.0	1.0
Three phase full-wave	6	9.5	750	4.1 (per phase)	10	0.5

*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 voltages may be increased to the value shown in brackets.

HEATING UP TIME

The preferred minimum value of the total valve heating up time can be obtained from the heating and cooling curve on page C2. This shows how the condensed mercury temperature rises above the ambient temperature from the instant of switching on the filament supply.

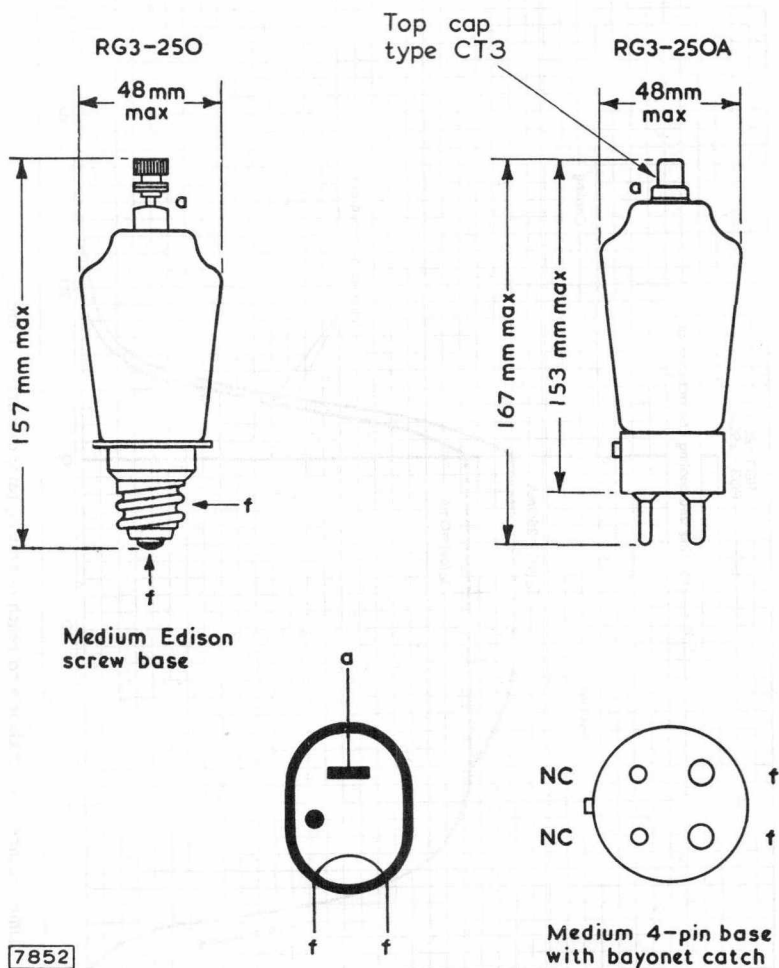
Under normal conditions, however, cathode current may be drawn when the condensed mercury temperature is approximately within 7°C of the minimum quoted value. (See page C3 and also appropriate section of 'General operational recommendations—gas-filled rectifiers'.)

Minimum cathode heating time 1.0 min



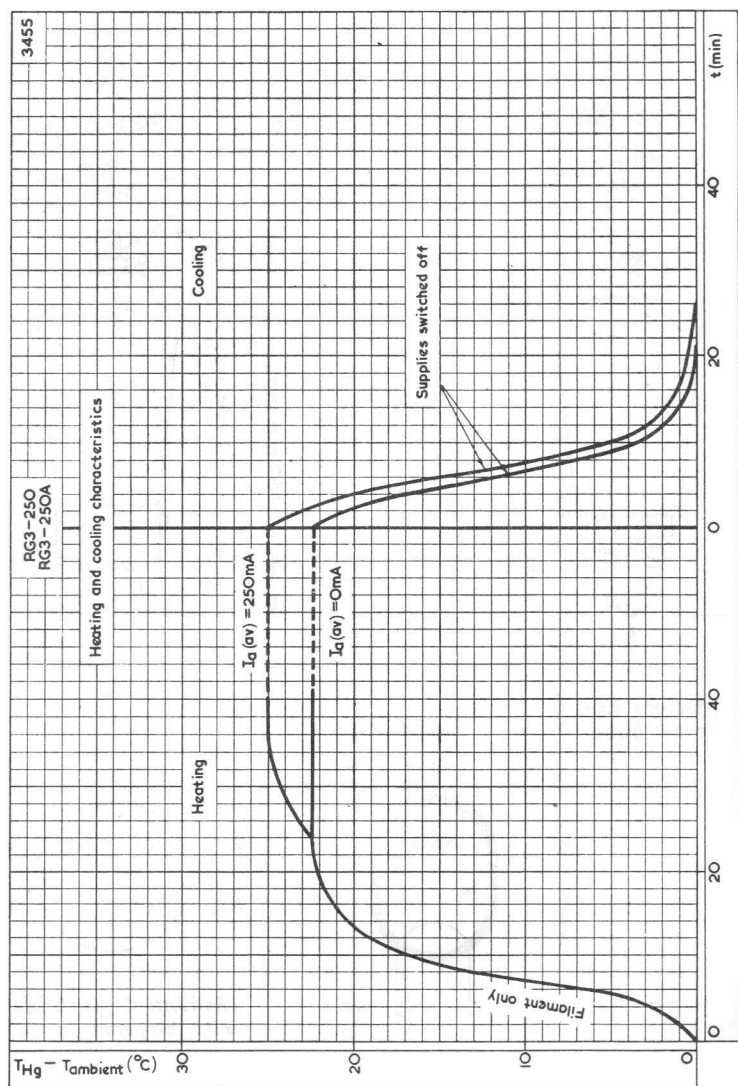
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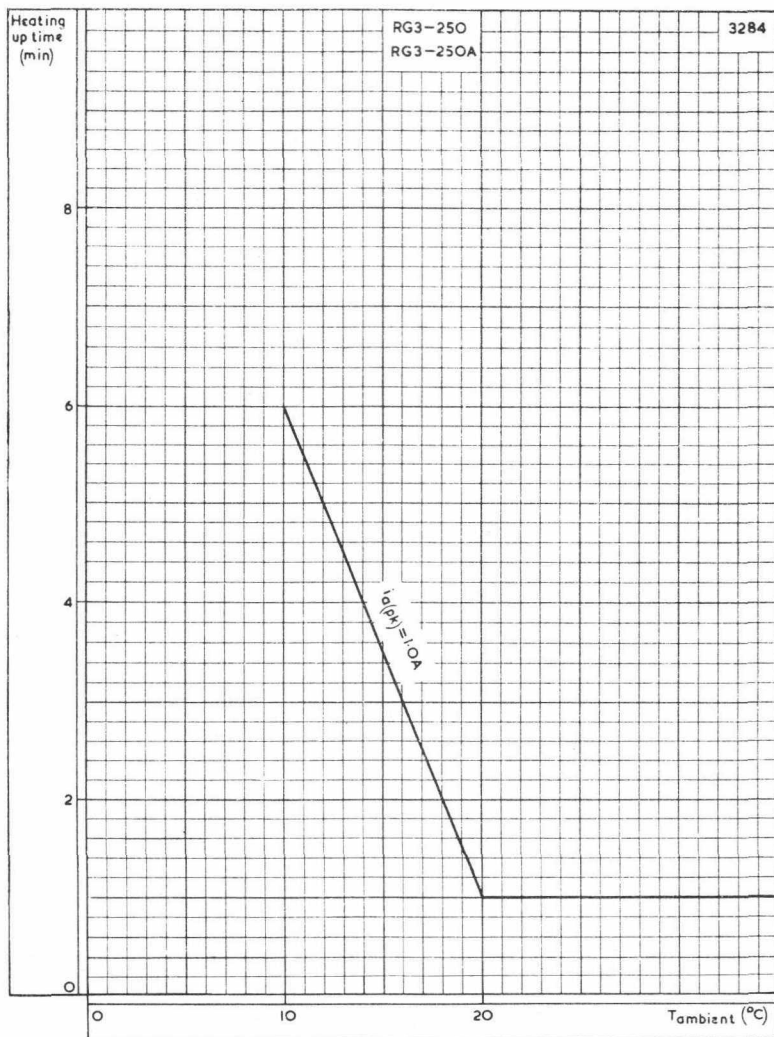
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Time required for cathode to reach operating temperature = 1 min.

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





TOTAL HEATING UP TIME PLOTTED AGAINST AMBIENT TEMPERATURE

500-10
RG-500A

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