

HALF-WAVE RECTIFIER

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

RG3-1250

This data should be read in conjunction with GENERAL OPERATIONAL
RECOMMENDATIONS - GAS-FILLED RECTIFIERS preceding 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.

*Max. peak inverse anode voltage	13	10	8.0	kV
*Condensed mercury temperature limits	25 to 55	25 to 60	25 to 65	°C
Max. cathode current				
Peak			5.0	A
Average (max. averaging time 15s)			1.25	A
Surge (fault protection max. duration 0.1s)			100	A
Max. operating frequency			150	c/s

*Max. condensed mercury temperature rating for intermediate
anode voltages may be determined by linear interpolation.

CHARACTERISTICS

Electrical

Filament voltage	4.0	V
Average filament current at 4.0V	7.0	A
Anode voltage drop	16	V

Mechanical

Equilibrium condensed mercury temperature rise above ambient		
At full load (approx.)	18	°C
At no load (approx.)	15	°C
Mounting position	Vertical, base down	
Max. net weight	{ 300	g
	{ 10	oz



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FULL LOAD OPERATING CONDITIONS (for peak inverse anode voltage ← of 13kV and peak cathode current of 5.0A)

Circuit	No. of valves	Full load d.c. output		Applied a.c. volts (kV _{r.m.s.})	Initial filter elements	
		(kV)	(A)		Lmin. (H)	Cmax. (μF)
Single phase full-wave	2	4.1	2.5	4.5 (per valve)	2.5	6.0
Single phase bridge	4	8.2	2.5	9.1 (total)	5.0	3.0
Three phase half-wave	3	5.3* (6.2)	3.75	4.5* (5.3) (per phase)	1.5	4.0
Three phase full-wave	6	12.4	3.75	5.3 (per phase)	3.0	2.0

*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 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 4. This shows how the condensed mercury temperature rises above the ambient temperature from the instant of switching on the filament supply.

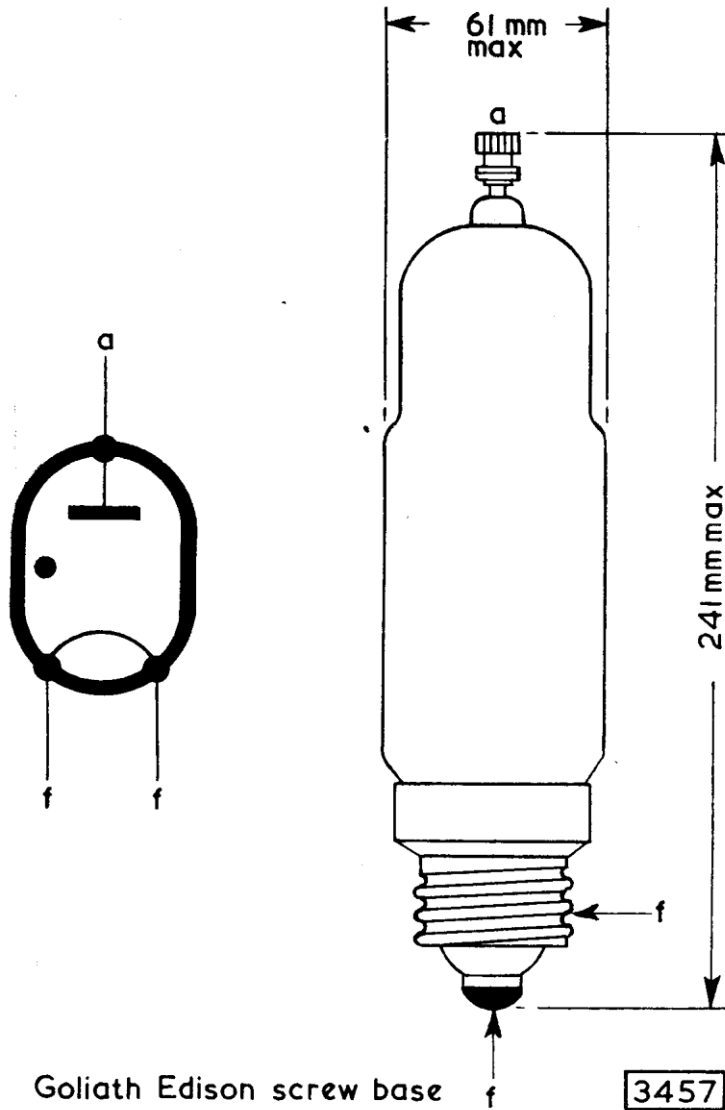
Under normal conditions, however, cathode current may be drawn when the condensed mercury temperature is approximately within 7°C of the minimum quoted value. (See page 5 and also appropriate section of 'General operational recommendations – gas-filled rectifiers').

Minimum cathode heating time 1 min

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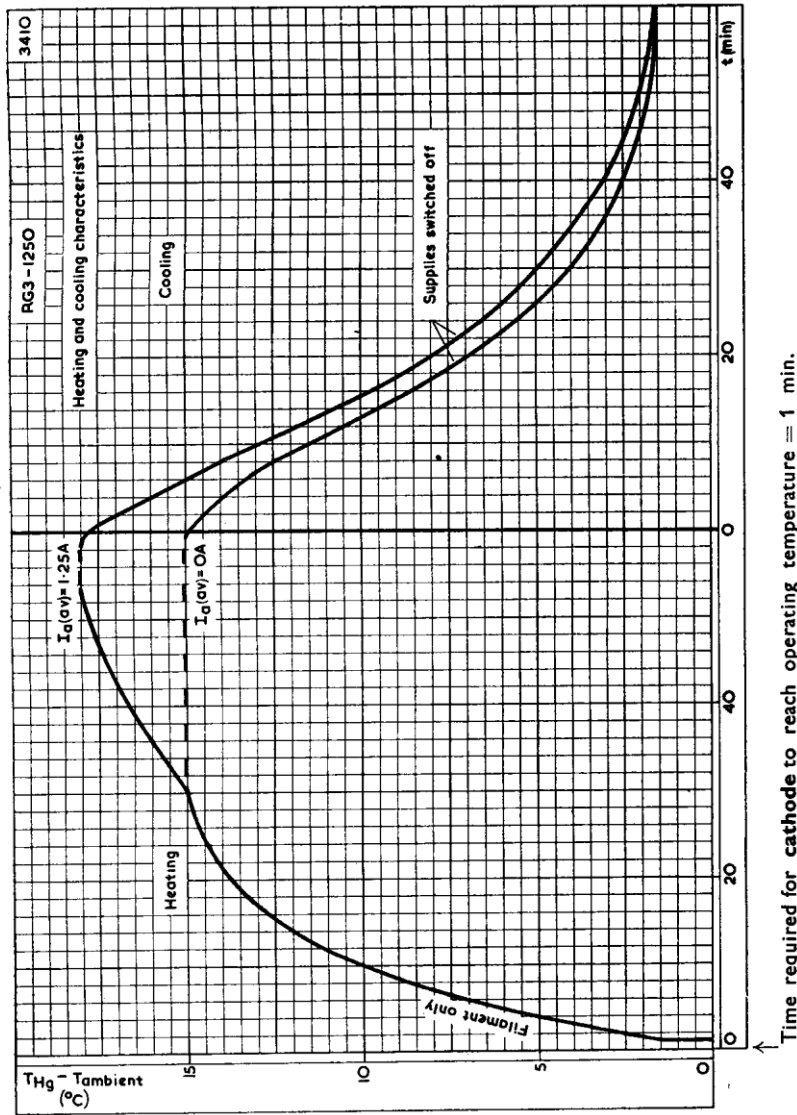
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Time required for cathode to reach operating temperature = 1 min.

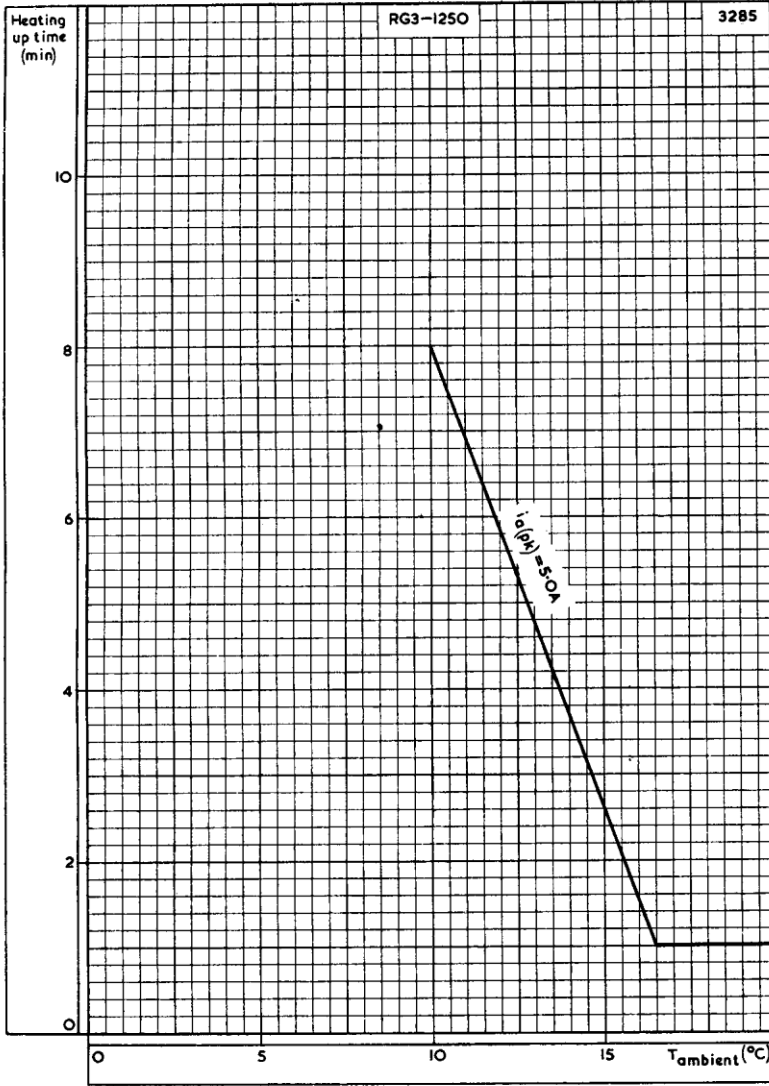
HEATING AND COOLING CHARACTERISTIC. EXCESS TEMPERATURE
OVER AMBIENT PLOTTED AGAINST TIME



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TOTAL HEATING-UP TIME PLOTTED AGAINST AMBIENT TEMPERATURE

