

## HALF-WAVE RECTIFIER

# RG4-3000

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

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	2.5	10	15	kV
*Condensed mercury temperature limits	25 to 75	25 to 60	25 to 55	°C
Max. cathode current				
Peak	20	12	12	A
Average (max. averaging time 10s)	5.0	3.0	3.0	A
Surge (fault protection max. duration 0.1s)	200	120	120	A
Max. operating frequency	150	150	150	c/s

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

### CHARACTERISTICS

#### Electrical

Filament voltage	5.0	V
Average filament current at 5.0V	11.5	A
Anode voltage drop	12	V

#### Mechanical

Equilibrium condensed mercury temperature rise above ambient		
At full load (approx.)	21	°C
At no load (approx.)	19	°C
Mounting position	Vertical, base down	
Max. net weight	{ 450 g 15.5 oz	
Weight of rectifier in packing	{ 1.8 kg 63 oz	
Dimensions of packing	{ 8.5 × 8.5 × 17.25 in 216 × 216 × 438 mm	

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### FULL LOAD OPERATING CONDITIONS

For peak inverse anode voltage of 15kV and a peak cathode current of 12A.

Circuit	No. of valves	Full load d.c. output		Applied a.c. voltage (kV <sub>r.m.s.</sub> )	Initial filter elements	
		(kV)	(A)		L min. (H)	C max. (μF)
Single phase full-wave	2	4.8	6.0	5.3 (per valve)	1.5	16
Single phase bridge	4	9.6	6.0	10.6 (total)	3	8
Three phase half-wave	3	6.2* (7.2)	9.0	5.3* (6.1) (per phase)	1	8
Three phase full-wave	6	14.4	9.0	6.1 (per phase)	2	4

For peak inverse anode voltage of 2.5kV and a peak cathode current of 20A.

Circuit	No. of valves	Full load d.c. output		Applied a.c. voltage (kV <sub>r.m.s.</sub> )	Initial filter elements	
		(kV)	(A)		L min. (H)	C max. (μF)
Single phase full-wave	2	0.79	10	0.88 (per valve)	0.2	100
Single phase bridge	4	1.58	10	1.76 (total)	0.4	50
Three phase half-wave	3	1.03* (1.19)	15	0.88* (1.02) (per phase)	0.1	50
Three phase full-wave	6	2.38	15	1.02 (per phase)	0.2	25

\*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

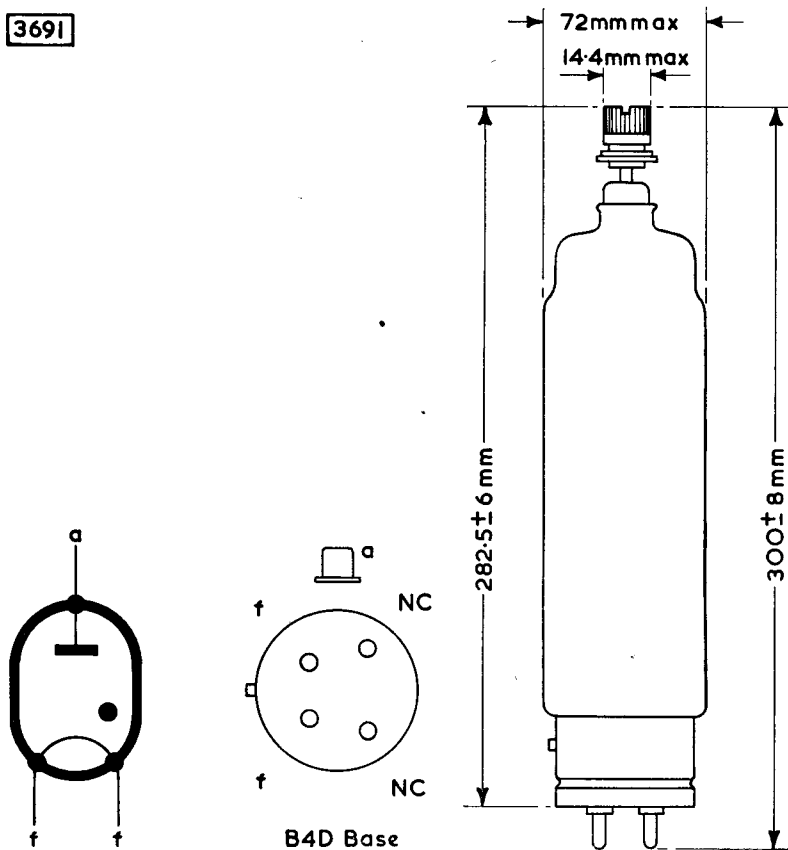
The preferred minimum value of the total valve heating up time can be obtained from the curve on page C2. This shows how the condensed mercury temperature rises above the ambient temperature from the instant of switching on the filament supply.

Minimum cathode heating time 1 min

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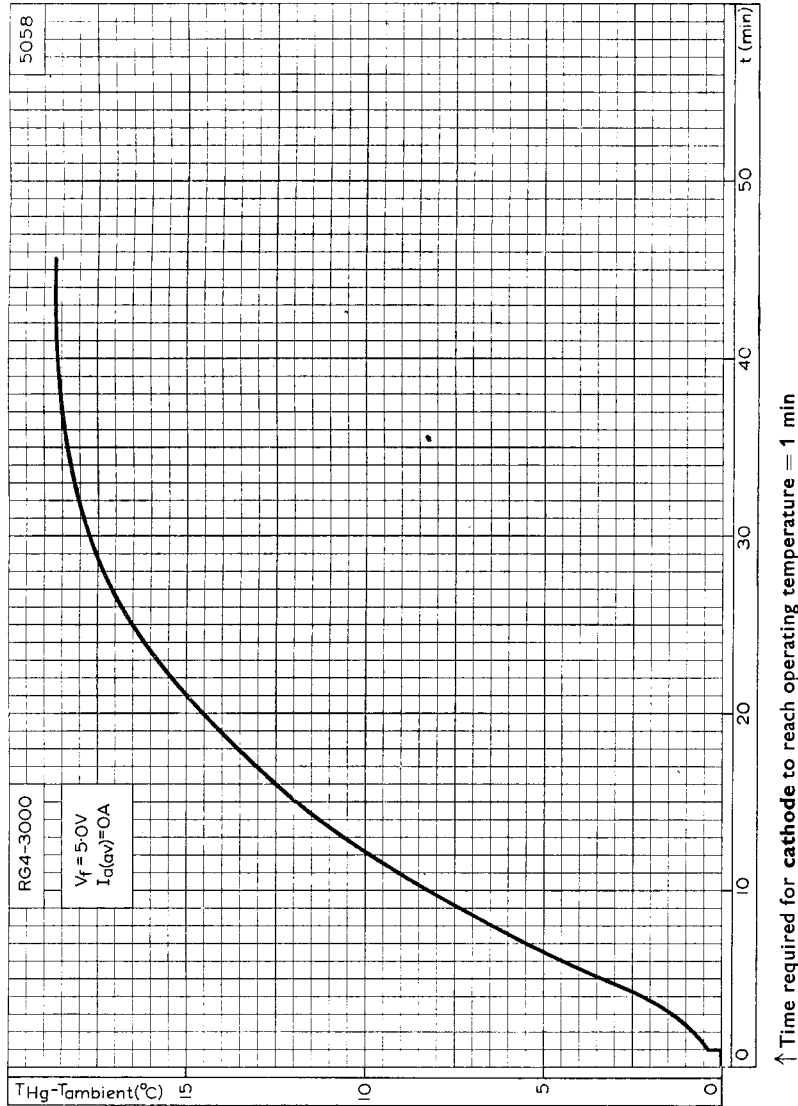
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HEATING CHARACTERISTICS. EXCESS TEMPERATURE OVER AMBIENT PLOTTED AGAINST TIME