Rectifier *Type GU 11*

General. A hot-cathode mercury-vapour rectifier incorporating a domed anode and a shrouded cathode in a hard glass bulb. It is suitable for operation up to 6 A at 15 kV, depending upon the circuit.

For most applications it is recommended that air blast is used on the GU 11 valve. Care should be taken not to cool the anode portion of the valve as the GU 11, in common with other Marconi glass mercury vapour valves, operates best with the anode portion of the bulb hot.

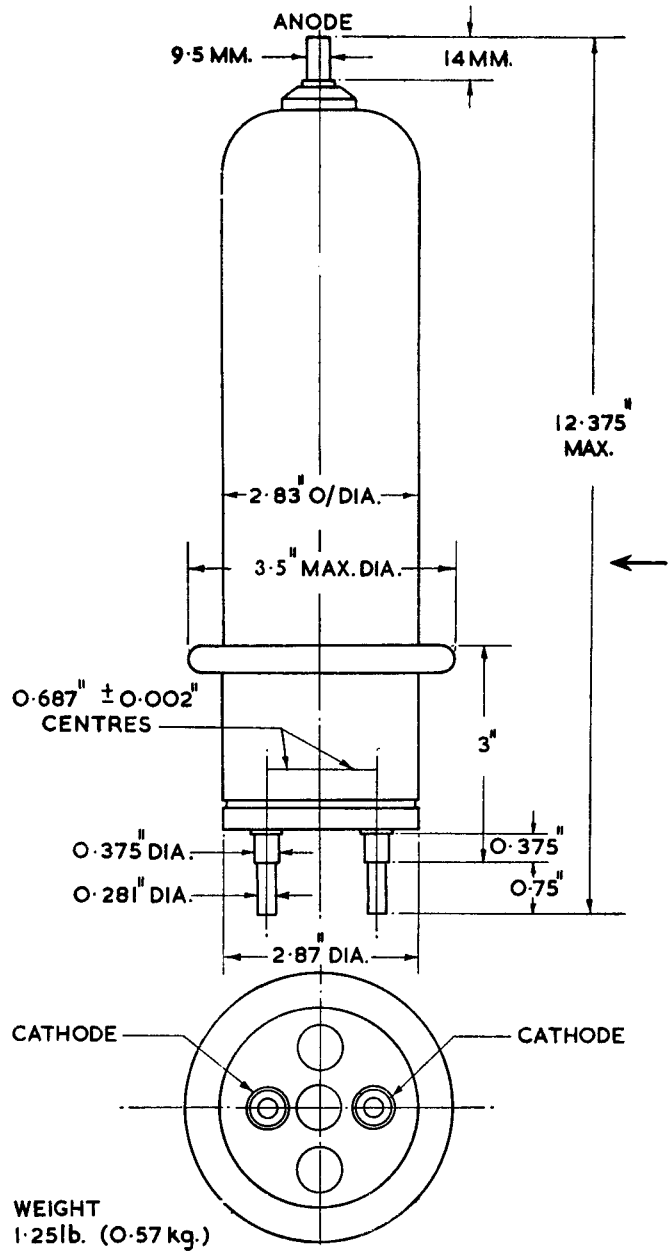
Seasoning. The cathode may be switched on in one operation. The ageing schedule (to be applied after transit or storage) is two hours at normal filament voltage but with no anode voltage or air blast. The valve must always be shielded from draughts, though no close-fitting tube of any sort may be used.

APPROXIMATE DATA

V_f	2·5 V	(+0·2, —0)
I_f	30	A
$I_{k\text{-}a(pk)\ (max)}$	8	A
PIV $_{(max)}$	16	kV
$I_{a\ (mean)}$ per valve	2	A
T_{Hg}	25 to 50°C	

Maximum Outputs :

3-phase full-wave	6 A at 15 kV DC
3-phase half-wave	6 A at 7·5 kV DC



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Conditions of Operation

(*a*) *In still air.* The ambient air temperature should be measured with an alcohol thermometer, the bulb of which should be placed level with the filament cap, and at a distance of 6 in. (152 mm.) from it. Full output may be taken from the GU 11 rectifier if the ambient temperature is between 7° and 30°C, provided that the heating times specified below are adhered to. Failure to do this will cause erratic operation and shortened life.

(*b*) *With forced air-blast, at ambient temperature, on base of valve.*

With forced air-cooling at ambient temperature the limits of air-blast temperatures are 25° to 50°C. This temperature should be measured with a thermometer in the air-blast.

(*c*) *Thermostatic forced air-blast at ambient temperature.*

The air-blast is best controlled thermostatically, so that the blower is switched on at an ambient temperature of 25°C, i.e. between 7° and 25°C the valve runs in still air, and between 25° and 50°C the valve operates with forced air-blast at ambient temperature. Air-blast applied in this way will enable the valve to operate between 7° and 50°C. If the temperature falls below 7°C, then heating must be applied to the air.

Recommended method of applying air-blast

A horizontal tube $\frac{1}{4}$ in. diameter placed with its end $\frac{1}{2}$ in. from the envelope and 1 in. above the level of the top of the filament cap, delivering air at a pressure of $\frac{1}{2}$ in. water gauge, will give the necessary temperature control. The air tube should have at least a 3 in. length of insulating material included in it to avoid danger of a flashover between the filament cap and earth.

The valve must under no circumstances be shrouded by a tube, or any other obstruction which would impede free air circulation round it, unless a heated air-blast is used; in which case advice will be given as to the best arrangement.

Pre-heating of filament.

The mercury condensation temperature is raised approximately 20°C above the ambient temperature by the power dissipated in the cathode.

The pre-heating time required before the condensation temperature rises to its working value is set out in the following tables. No anode potential must be applied before this time has elapsed.

TABLE I

To be used when the valve is operated under conditions (a) or (c).

Ambient temperature (°C)	Pre-heating time (minutes)
25	1
22	6
19	10
16	14
13	18
10	22
7	28

TABLE II

When conditions are as in (b).

Ambient temperature (°C)	Pre-heating time (minutes)
25–50	1

NOTES

(1) With conditions of operation as in (b) or (c) the power supply to the blowers must be switched simultaneously with the filaments.

(2) The valves must be screened against HF fields.

(3) If a large smoothing capacitor is used, care should be taken not to exceed the peak anode current.

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