EDISWAN

ESU 75

MERCURY VAPOUR RECTIFIER

RATING.

Filament Voltage	2.0
Filament Current (Amps.)	10.0
*Maximum Peak Inverse Voltage	7,000
Maximum Peak Anode Current (Amps.)	0.9
Voltage Drop	12

*For Circumambient Air Temperature 10° to 50° C.

DIMENSIONS.

Maximum Overall Length (Approx.)	185 mm.
Maximum Diameter (Approx.)	78 mm.

GENERAL.

The ESU 75 is a half-wave mercury vapour rectifier suitable for supplying high tension current to output valves, such as in public address amplifiers, transmitters, etc., and has been designed particularly to work in conjunction with the ES 75 and ES 75 H power amplifiers. The valve is fitted with a Goliath Edison screw cap and the anode is connected to a terminal at the top of the bulb.

In mercury vapour rectifiers, as distinct from thermionic rectifiers, the current is carried by mercury ions produced by the collision of electrons with the molecules of mercury vapour present in the bulb. In operation the bulb of the rectifier is filled with a blue glow, which is characteristic of mercury vapour-filled bulbs. The ionisation of the vapour serves to neutralise the spacecharge round the cathode and thus reduces the internal resistance of the valve. It is this property which gives mercury vapour rectifiers their excellent regulation characteristics and enables large currents to pass between anode and cathode with low power loss. The voltage drop in the valve is of the order of 10–15, and remains constant under variation in load current up to the maximum rating of the valve.

As long as this low-voltage drop is maintained there is no danger of positive ion bombardment destroying the emissive properties of the cathode. To avoid this, it is essential that no attempt is made to exceed the maximum peak anode current for the particular size of cathode employed. When the cathode is first switched on, if the anode voltage is simultaneously applied, the cathode is unable to supply the full emission required by the output circuit. The voltage drop under these conditions is excessive, causing violent bombardment of the cathode and its ultimate destruction. It is advisable to employ a thermal delay switch in mercury vapour rectifier circuits, or arrange that the anode voltage is switched on after the cathode has attained its full temperature.

APPLICATION.

When a mercury vapour rectifier is first placed in service, its filament should be operated at normal voltage for approximately 15 minutes without anode voltage in order to distribute the mercury properly. This procedure need not be repeated unless, during subsequent handling, the mercury is spattered on to the filament and anode.

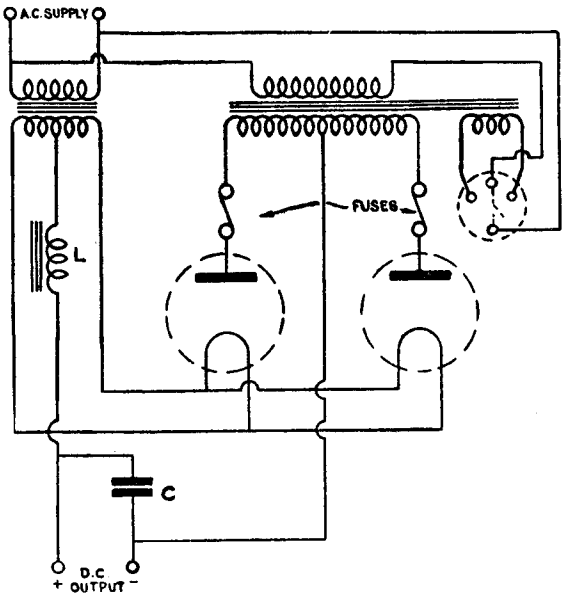
Mount the rectifier vertically in a well-ventilated position as the bulb becomes hot during continuous operation. To avoid the possibility of flash-back on reverse voltage, the temperature of the rectifier bulb should not be allowed to exceed 50° C. Where there is a possibility of the air temperature rising considerably, an air draught cooling should be used.

To prevent damage to rectifier and equipment in case of a short circuit, it is necessary to connect a fuse of suitable value in series with each rectifying valve anode.

Unless the valve is operated on very light loads, the filament must be allowed to attain its full operating temperature before the anode voltage is applied, and a delay of at least 10 seconds should elapse before the anode supply is switched on. A delay switch is recommended for full load operation (see DLS 10).

The filament supply should not be switched off before the H.T. supply.

SUGGESTED CIRCUIT DIAGRAM FOR USE WITH ESU 75.



A typical H.T. rectifier circuit using a thermal delay switch in the primary of the H.T. transformer.

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