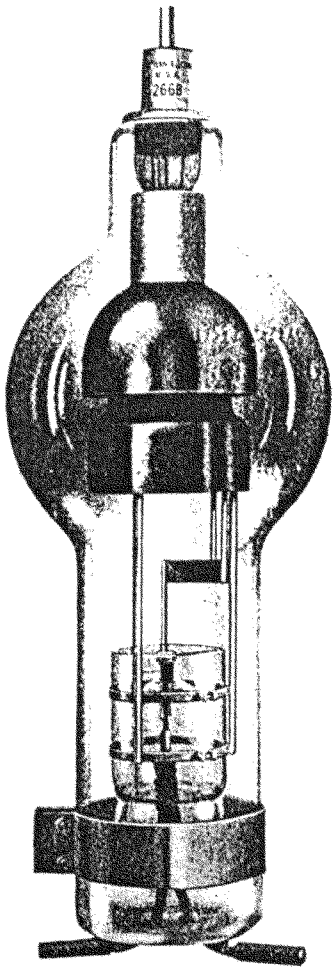
Western Electric

266B Vacuum Tube



Classification—Half-wave, thermionic, mercury vapor rectifier

The 266B vacuum tube is designed to supply direct high-voltage from an alternating supply.

Dimensions—The dimensions and outline diagrams of the tube are shown in Figure 1.

Mounting—Special mounting as shown in Figure 1, with the filament terminals at the bottom and the anode terminal at the top of the bulb. Flexible connectors should be used for each. Dimensions are given to enable the user to design a mounting suitable for his particular installation.

There should be a free circulation of air around the tube. Forced air circulation should be used at the lower end of the tube to maintain the mercury within the safe operating temperature range. No object should touch the glass bulb. The tube should be mounted only in a vertical position with the filament terminal end down. When tubes are mounted in a group, the distance between centers should not be less than 12 inches.

Filament Rating

Filament voltage	5 volts
Nominal filament current	42 amperes

The filament of this tube is designed to operate on a voltage basis from an alternating supply. The voltage should be maintained to within 5% of its rated value (5 volts). Operation of the filament at a voltage above the upper limit will definitely reduce the life of the tube while a decrease below the lower limit may cause immediate failure.

Sufficient time must always be allowed for the filament temperature to reach its normal operating value and for the mercury vapor pressure to become normal before the anode potential is applied. This will require about five minutes when filament transformers with good regulation are used. At low ambient temperatures or when the tube has been reinserted in the apparatus after having been removed, a longer period of time should be allowed. This time should always be sufficient to insure that all the mercury has evaporated from the upper parts of the envelope.

Characteristics and Operating Conditions

Approximate anode-cathode drop	15 volts
Maximum peak plate current	20 amperes
Maximum peak inverse potential	20,000 volts
Safe operating ambient temperature range with forced air	20° to 40° C.

(This is the temperature of the mercury condensate and is very nearly the same as the temperature of the forced air stream applied to the lower part of the bulb.)

The anode-cathode potential drop is substantially independent of the plate current. The exact value varies from tube to tube and in general increases during the life of a given tube. Within the specified ambient temperature range and plate current range, it may vary from 5 to 25 volts.

The anode-cathode potential drop, as a function of temperature, is shown on Figure 2 for a typical 266B tube when passing the rated space current. The recommended operating temperature range is also shown on this curve. The tube will operate satisfactorily at a mercury condensate temperature of 50° C. when the peak inverse potential is below 10,000 volts. In order to maintain the operating temperature condition, a forced ventilating system which maintains the mercury condensate temperature at approximately 35° C. should be used. The amount of air required will be approximately 8 cubic feet per minute but will depend upon the location of the blower and the shielding used to prevent cooler air streams striking the envelope. The circulating air maintained at 35° C. should strike the supporting collar or below it.

The maximum permissible peak plate current (20 amperes) is a limitation on the instantaneous value that the tube can carry safely in the direction in which it is designed to pass current and should not be exceeded. The maximum rectified load current is not fixed but will depend upon the wave-form required by the load and filter circuit.

The maximum permissible peak inverse potential (20,000 volts) is a limitation on the instantaneous value that the tube can stand safely in the opposite direction to that in which it is designed to conduct. If it is exceeded, an arc-back may result which may injure the tube. The maximum direct potential available is not fixed but will depend upon the type of circuit used.

266B vacuum tubes may be operated in parallel if some provision is made to insure a proper division of the load. Current dividing reactors or ballasting resistors in series with each anode may be used for this purpose. The size of the reactors or resistors depends upon the circuit design.

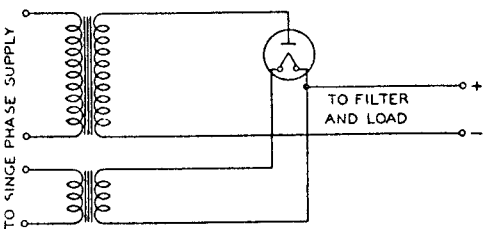
In most cases, the termination of the useful life of the 266B tube is due to the loss of filament activity. This may be predicted by a marked increase in the anode cathode potential drop. If not removed such tubes may fail by arcing back under the applied inverse potential. Failures of this kind should be safe-guarded by proper protection to prevent injury to other tubes in the set and to the auxiliary equipment. In most cases this requires a high voltage, quick acting fuse in each anode lead, or a quick acting circuit breaker in the supply.

Typical Rectifying Circuits

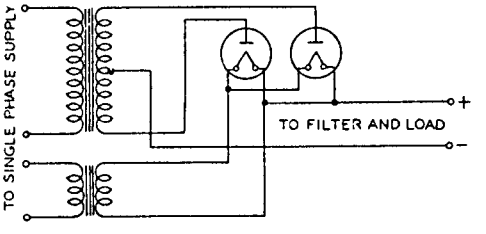
The 266B vacuum tube may be used in any standard high-vacuum rectifying circuit subject to its current, voltage and temperature limitations. Typical circuits are shown below. The approximate direct output current and voltage for each type of rectifying circuit where tubes are operated at maximum permissible plate current and inverse voltage are given in Table 1. The values listed are average values of the pulsating current and voltage for an unfiltered circuit.

TABLE 1

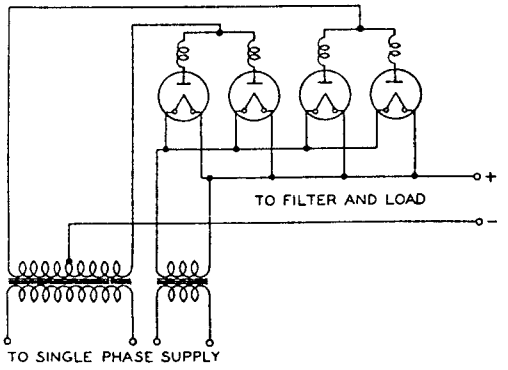
Circuit Designation	Number of Tubes	Load Potential in Volts	Load Current in Amperes
A	1	6000	7
B	2	6000	14
C	4	6000	28
D	4	12000	14
E	3	9000	17
F	6	18000	19
G	6	8000	34



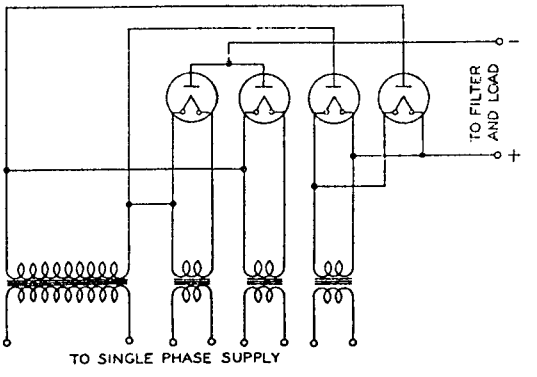
SINGLE PHASE, HALF-WAVE
CIRCUIT A



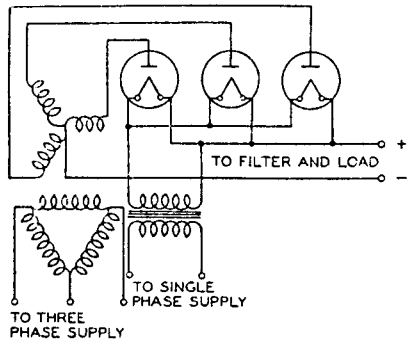
SINGLE PHASE, DOUBLE HALF-WAVE
CIRCUIT B



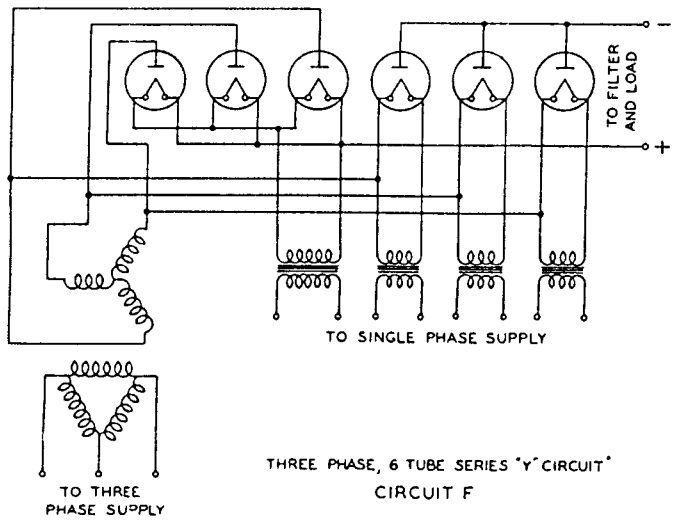
SINGLE PHASE, DOUBLE HALF-WAVE IN PARALLEL
CIRCUIT C



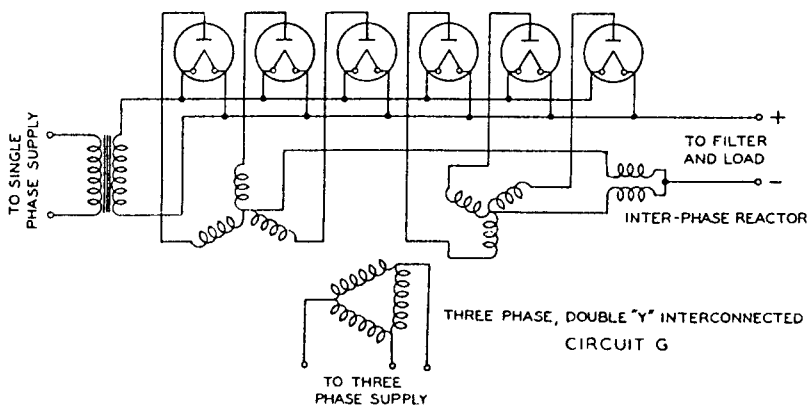
SINGLE PHASE, DOUBLE HALF-WAVE,
4 TUBE SERIES CIRCUIT
CIRCUIT D



THREE PHASE, "Y" CIRCUIT
CIRCUIT E



THREE PHASE, 6 TUBE SERIES "Y" CIRCUIT
CIRCUIT F



THREE PHASE, DOUBLE "Y" INTERCONNECTED
CIRCUIT G

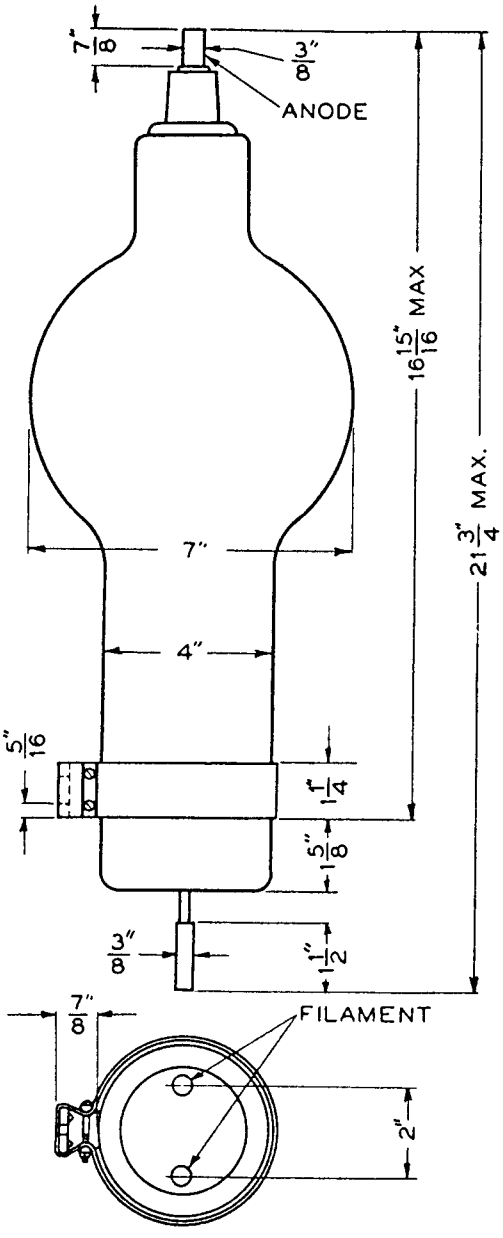


FIG. 1

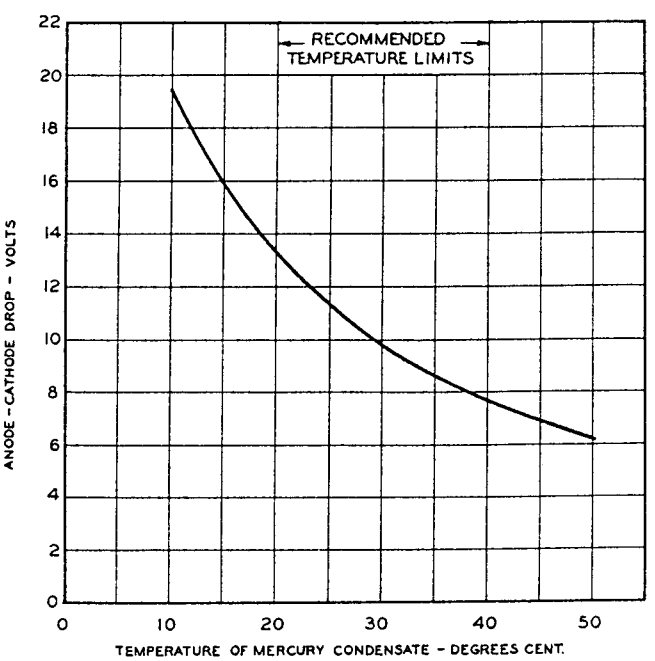


FIG. 2

1-D-36-53C
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V. T. DATA SHEET 266B
ISSUE 1