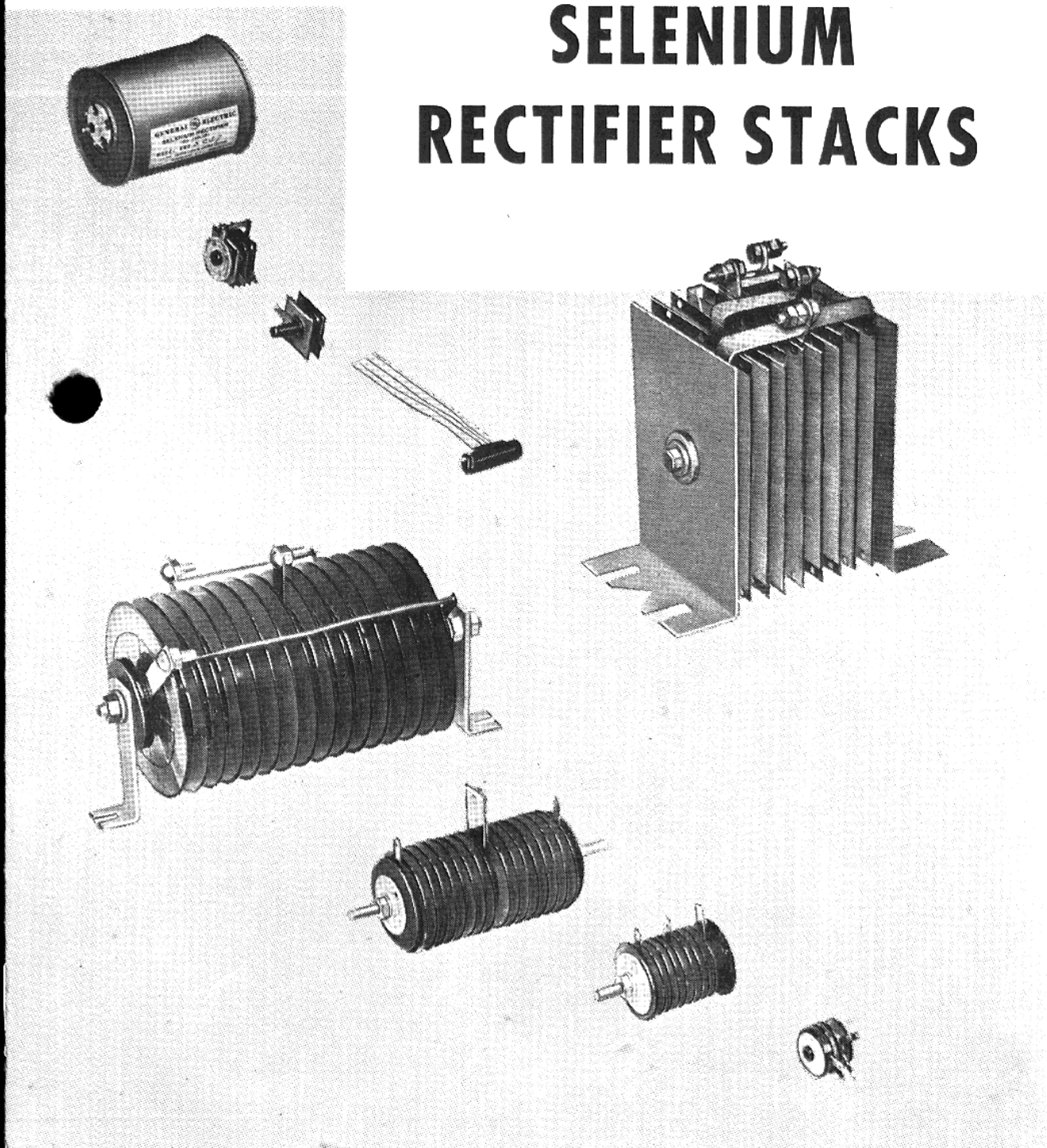


GEJ-1238A
Supersedes GEJ-1238

INSTRUCTIONS

SELENIUM RECTIFIER STACKS



GENERAL  ELECTRIC

SELENIUM RECTIFIER STACKS

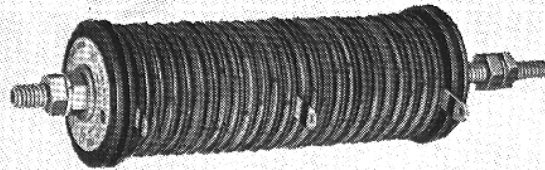


Fig. 1. Model 6RS124A1
with 1½ inch cells, floating nut, and
center tap; for a half-wave circuit

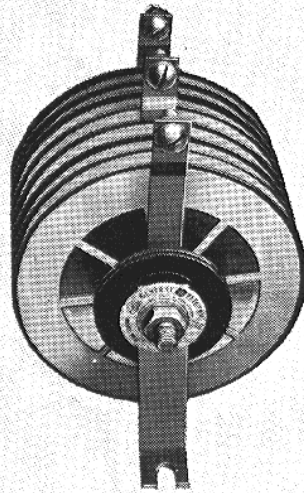


Fig. 2. Model 6RS18JB1
with 4¾ inch cells, and center tap;
for a half-wave circuit

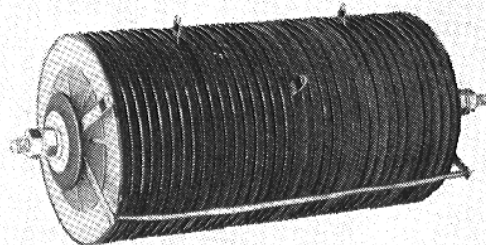


Fig. 3. Model 6RS49H1
with 4¾ inch cells and floating nut;
for a single-phase bridge circuit

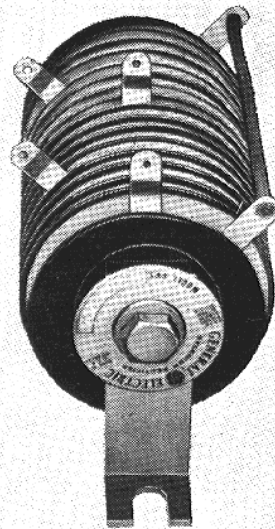


Fig. 4. Model 6RS44CB1
for a single-phase bridge circuit

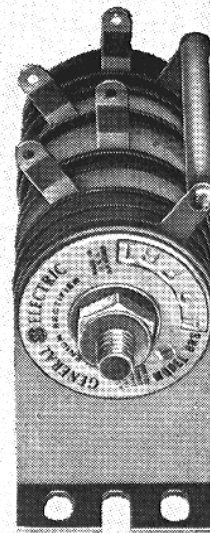


Fig. 5. Model 6RS42FB1
with 1-inch cells;
for a single-phase bridge circuit

SELENIUM RECTIFIER STACKS

DESCRIPTION

A selenium rectifier stack consists of a number of selenium disk- or plate-type cells assembled on an insulated stud* with appropriate terminals exposed for external connection. Varied current demands are supplied by cells that are proportionally larger for more current and smaller for less. (See Fig. 1 to 5.)

POLARITY

The polarity of the terminals is indicated by the color painted thereon. Yellow indicates alternating current; red, positive; and black, negative. As a rule, the positive terminal is at the nameplate end. Figs. 6 to 10 show typical schematic circuits for some of the common kinds of stacks. The arrows in the illustrations indicate the direction of the current flow.

SCHEMATIC DIAGRAMS — SELENIUM RECTIFIER STACKS

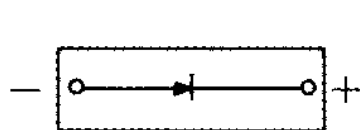


Fig. 6. Half-wave stack

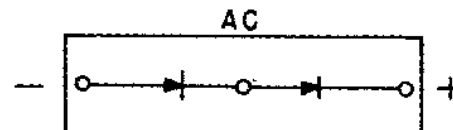


Fig. 7. Half-wave stack with center tap

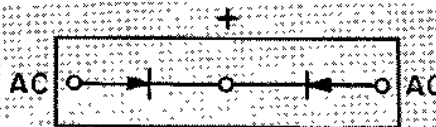


Fig. 8. Full-wave stack with center-tap secondary

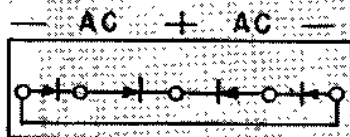


Fig. 9. Single-phase bridge stack

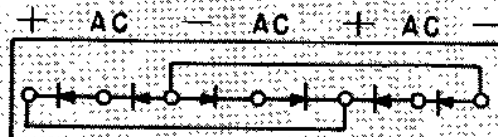


Fig. 10. Three-phase bridge stack

*An exception to this is low-current cells ($\frac{3}{8}$ and $\frac{9}{32}$ inch in diameter) which have no center hole and are mounted in a tubular insulated housing.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

GEJ-1238A Selenium Rectifier Stacks

CONNECTION DIAGRAMS

SELENIUM RECTIFIER STACK CIRCUITS

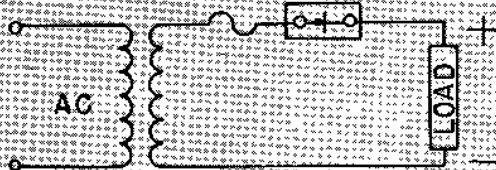


Fig. 11. Half-wave circuit.

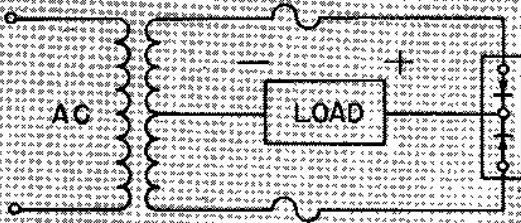


Fig. 12. Full-wave circuit with center tap.

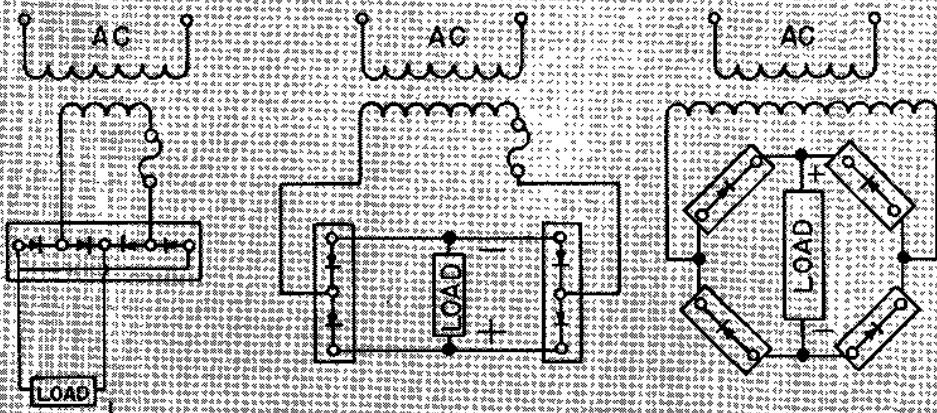


Fig. 13. Single-phase bridge circuits.

INSTALLATION

Mount the rectifier stacks with the cells vertical, so that the convection of air is unimpeded. To make minor variations in mounting possible, stacks that are longer than six inches usually have a floating nut construction and those with brackets have slots in the feet.

Install the stacks, whenever possible, at the coolest point of the assembly; conversely, do not mount them adjacent to heat-dissipating equipment such as resistors, tubes, transformers, and radiators. If the surrounding temperature is continuously above 96 F (35 C), stacks should be properly derated to accommodate the temperature.

The stacks are protected by a finish that effectively seals them from mildly corrosive or humid atmospheres, but if the atmosphere is excessively corrosive or humid, and this condition is unavoidable, it is advisable to use General Electric oil-immersed selenium rectifiers.

Fusing the a-c circuit that is applied to the stack is recommended as a protective measure. Figs. 11 to 15 illustrate typical connections for a number of common rectifier circuits employing one or more stacks.

CONNECTION DIAGRAM SELENIUM RECTIFIER STACK CIRCUIT

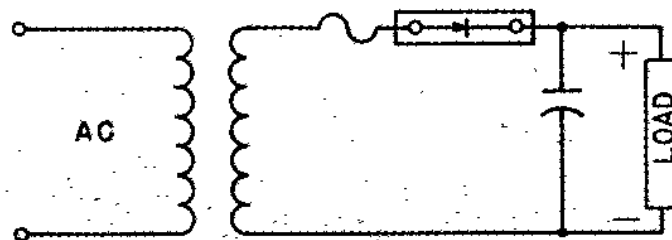


Fig. 14. Half-wave circuit with capacitor filter

OPERATION

Before leaving the factory, all stacks are inspected, given a test for proper performance at their respective ratings, and flash-tested for insulation with at least 1500 volts rms to ground. Some stacks are insulated for 2000 volts to ground; the amount of insulation depends on the voltage rating.

To obtain suitable output and reduce the possibility of trouble, operate the stacks within their ratings. Stacks can be overloaded for their current output for momentary or cyclic loading. The rating of a stack is affected by whether the load is inductive or capacitive. For further information, consult the Rectifier Section of the Apparatus Handbook or publication GET-2350. For copies contact the nearest Apparatus Sales Office of the General Electric Company.

If an overvoltage condition occurs on the cells, a miniature flash may be discerned. If the short is slight and brief, the "self-healing" action of selenium insulates the small area but the output of the rectifier is still adequate. If the short is severe and sustained, the line fuse opens and an odor of selenium may be detected. In this event, shut off the power and ascertain and correct the trouble.

With a constant a-c voltage input, the rectifier d-c output voltage is higher when the rectifier is first installed than it is after the rectifier has aged. This additional voltage is necessary to compensate for the increase in the resistance of the selenium stacks that occurs as the rectifier ages. The equipment used with the stacks should have a sufficient range of operation to accommodate the range of output value, or a method should be provided for reducing the a-c voltage when the stacks are new.

If you desire further information consult the Rectifier Department, General Electric Company, Lynchburg, Va.

CAUTIONS

1. Do not connect two separate single-phase bridge stacks to the same phase line with outputs in series to double the voltage. This procedure results in a line short.
2. Do not "trouble shoot" by means of an ohmmeter; the non-linearity of resistance for selenium gives erroneous results.
3. Take care to keep solder, solder flux, and solder irons from contacting the cells.
4. Do not loosen the nuts that hold the stack pile together.
5. Although stacks can withstand considerable abuse, a severe shock, such as results from dropping the stack to the floor, may irreparably harm the d-c valve action and cause excessively high leakage.
6. Do not install a standard selenium rectifier in an explosive atmosphere. Use an hermetically sealed oil-immersed selenium stack assembly.
7. Mercury vapors are harmful to selenium.

CONNECTION DIAGRAMS SELENIUM RECTIFIER STACK CIRCUITS

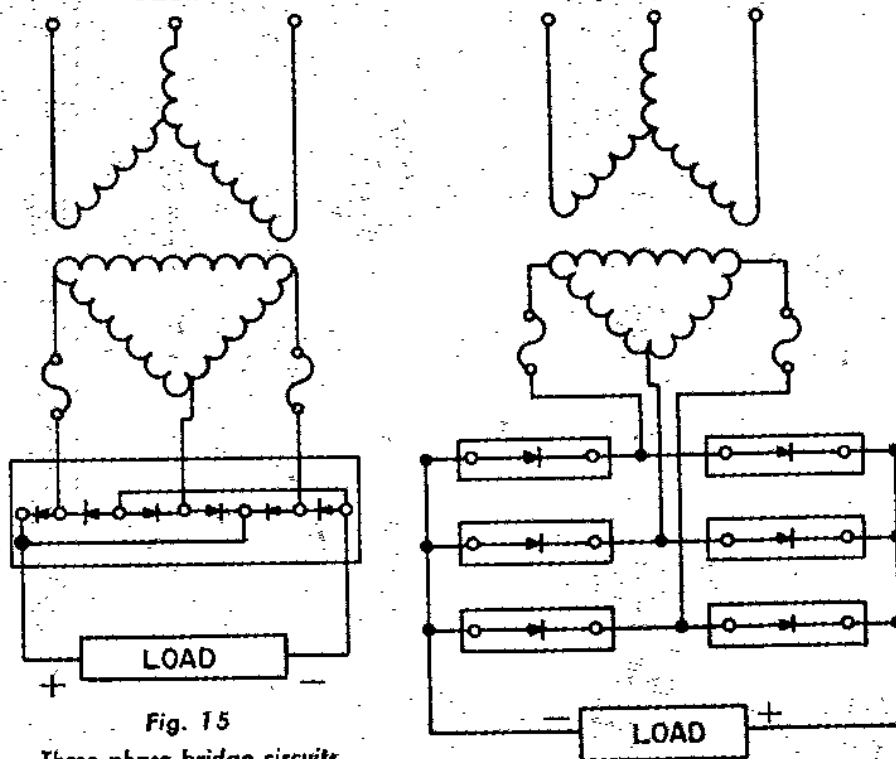


Fig. 15
Three-phase bridge circuits

SWITCHGEAR DEPARTMENT

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