

RECTOX RECTIFIERS FOR CIRCUIT BREAKER OPERATION

Disc Type

GENERAL

This rectifier is designed to deliver direct-current at the amperage and voltage stamped on the name plate at any commercial frequency. The normal value of a-c. voltage at which the rated d-c. output may be obtained appears on the name plate.

The complete unit consists of a full wave rectifying element, adjustable series resistor in the a-c. line, a fuse in each a-c. line and suitable mounting plate or enclosing tank.

The rectifier units should not be immersed in oil.

See Fig. 1 for schematic diagram of the complete rectifier.

OPERATION

The rectifier is designed for intermittent operation only and must not be used to supply other loads than the breaker solenoid.

Unless otherwise indicated on the name plate the a-c. voltage must not be applied to the rectifier for longer than one second nor for more than 10 operations within a five minute period.

The rectifier rating must not be exceeded, as for instance by the operation of two solenoids at once.

MAINTENANCE AND ADJUSTMENT

a. Fuses

Use fuses having rating of approximately $1/3$ of the maximum d-c. load current drawn by the breaker solenoid. Fuses of this rating are used in order to protect the rectifying unit in case load should remain connected to the outfit for longer than the permissible time.

b. Resistor

The resistor is included as a means of compensating for variables such as line voltage, lead resistance, rectifier resistance, temperature, breaker mechanism variation, etc.

When the rectox is shipped from the factory it is set to give proper breaker operating speed at rated a-c. line voltage. Upon installation, the breaker closing time should be checked to see that correct operation is obtained, since line voltage conditions may be different from those at the factory. This should be done by means of a cycle counter after all mechanical and dashpot adjustments have been checked.

If closing time is incorrect, the series resistor in the rectox assembly must be adjusted. Generally to adjust the resistor it will not be necessary to remove the complete unit from the tank.

To obtain quicker breaker operation, reduce the series resistance.

To obtain slower breaker operation, increase the series resistance.

Note

No further adjustment of the series resistor should be necessary

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except as may be required by the normal aging of the rectifier unit. Approximately 30 days after the unit has been installed, the breaker closing time should be again checked under the same conditions of supply voltage as existed during installation. Adjustment to take care of any change during the first 30 days is made by means of the series resistor. Following this adjustment, no further attention should be necessary except at normal periods of breaker maintenance, say every 6 months.

c. Temperature Effects

Temperature changes cause the Rectox resistance to change in the opposite direction to the change in the coil resistance. Compensation is not complete, however, so the total circuit resistance will be found to increase in cold weather, decrease in hot. To take care of this it is recommended that Rectox be adjusted in the fall to close breaker about 10 per cent faster than normal, in the spring to close slightly slower than normal.

d. Current and Voltage Measurements

Considerable care is necessary in making measurements on account of the limited time available. It is preferable to check the Rectox performance by measuring the closing time of the breaker with a cycle counter, making Rectox adjustment according to whether the closing time is greater or less than normal.

If this method is not practicable, an ammeter reading may be taken of the current in the closing circuit. Adjustments of the Rectox can then be made to get correct closing current.

Under no conditions should voltage be applied to Rectox more than 3 seconds while taking a reading.

INVESTIGATION OF TROUBLES

If the unit fails to close the breaker, proceed as follows:

- a. Check the a-c. supply source to see that adequate voltage is available when the full-load is being drawn.
- b. Check the Rectox fuses to see that they are not blown.
- c. Inspect all connections to see that none are open.
- d. If all of the above appear to be satisfactory then probably a Rectox unit has failed unless the breaker mechanism is out of adjustment.

A. The failed unit may be detected as follows:

- a. Disconnect the Rectox from the a-c. and d-c. circuits.
- b. Apply 110 volts a-c. with a 100 watt lamp in series to the a-c. terminals of the rectifier for not more than one second.
- c. If the lamp lights, one or more of the individual stacks have failed.

B. By means of the same test the particular unit or units that have failed can be picked out.

- a. Disconnect all the units from each other.

- b. Apply to the a-c. terminals of each stack in turn the 110 volt a-c. with the 100 watt lamp in series as before.
- c. All units which light up the lamp should be removed.

EMERGENCY OPERATION

If an emergency exists, defective units can be removed and remaining units reconnected and put back into service temporarily. Some adjustment of the series resistor may be necessary to get the proper output. Replacement of failed units should be made as soon as possible.

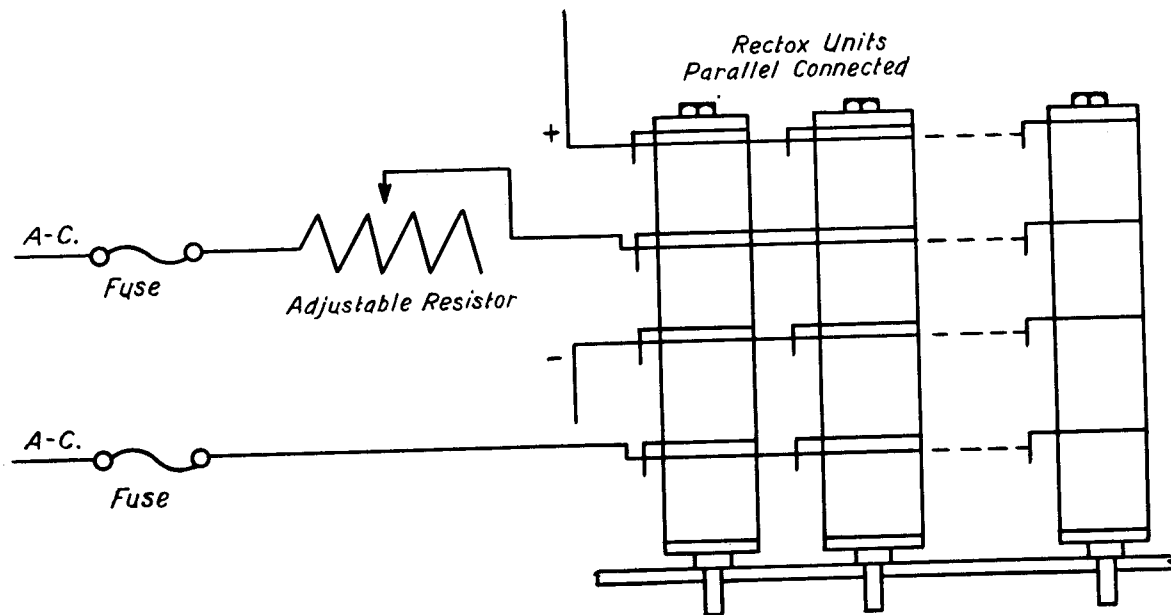


Figure 1

Test for Failed Unit

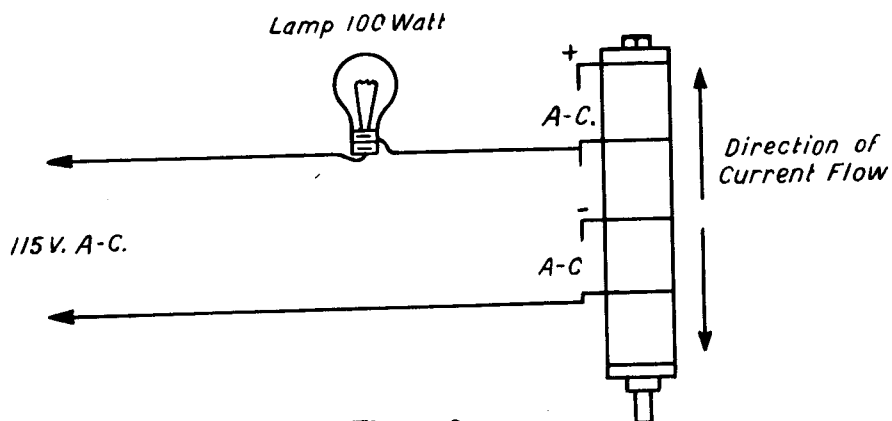


Figure 2

Schematic Diagram

