



# Portable Test Rectifier

## For Testing Harmonic Restraint Characteristics

GE Protective Relays

For Relays STD, BDD and BFC

### DESCRIPTION

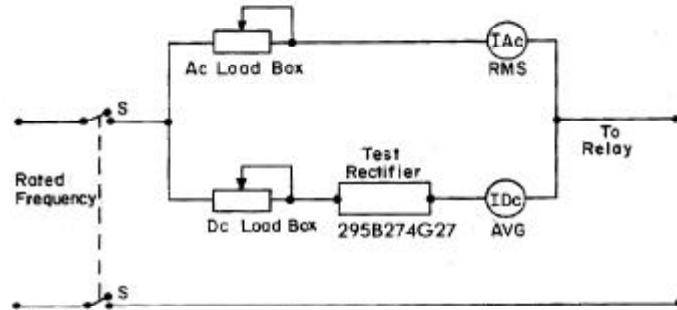
The test rectifier consists of a medium power silicon rectifier mounted on an appropriate heat sink in a small molded case. Connections to the terminals at each end of the case may be made by clamping leads or terminal under the molded thumb nuts, or by clipping the leads directly to the hexagonal portion of the terminal. A half wave rectifier symbol is shown on the nameplate of facilitate proper choice of DC meter connections.

### APPLICATION

The test rectifier is a compact, portable piece of test equipment designed for calibration testing of the second harmonic restraint feature of differential or over-current relays.

Magnetizing inrush current in a power transformer contains both second and third harmonics as well as components of higher frequency in addition to the dc and fundamental frequency components. Normally, a relay receives the difference in inrush magnetizing currents for two phases. Usually only one phase has a magnetizing inrush but occasionally two cores have simultaneous inrushes. This is the most severe condition because if these currents are equal, the third harmonic will be largely cancelled due to the 120-degree phase relationship of the two phases.

It is desirable to use a test method which will provide a good match with critical service conditions. Therefore, it is better to set the harmonic restraint adjustment on the relay using test currents containing second harmonic rather than third harmonic.



Second harmonic test connection using test rectifier

Fig.1

The test method, Fig. 1 adopted for transformer differential relays involves a test current made up of two parts. One part is a half-wave rectified current  $I_{DC}$  and the other is an ac current  $I_{AC}$  of the same phase relation.

The test rectifier is designed for second harmonic calibration testing of all Type BDD, HDD, and STD transformer differential relays and type BFC harmonic restraint overcurrent relays. Some of the older transformer differential relays, such as Type HDD, BDD15A, or BDD16A, may originally have been calibrated at the factory with third harmonic current by using a test reactor in the circuit. It is recommended that the second harmonic current and test rectifier method of

calibration testing be used for these relays since it will provide a higher degree of accuracy.

For specific information on how to use the test rectifier for testing any of the harmonic restraint relays, refer to the instruction book.

### SELECTION GUIDE 50/60 Hertz<sup>①</sup>

| AC Input Voltage |         | DC Output Amperes | Catalog Number | Approx Weight Pounds (Kg) |          |
|------------------|---------|-------------------|----------------|---------------------------|----------|
| Nominal          | Maximum | Maximum           |                | Net                       | Shipping |
| 115              | 260     | 8                 | 265B274G27     | 0.5(0.23)                 | 1(0.45)  |

① For Rectifier application in dc tripping or control circuits, refer to TRIPPING AND BLOCKING RECTIFIERS.