



Tripping and Blocking Rectifiers

For DC Control Circuits
Up to 250 Volts DC (Nominal)

GE Protective Relays

Rectifiers for Tripping Duty or Blocking in Control Circuits in Place of Auxiliary Relays

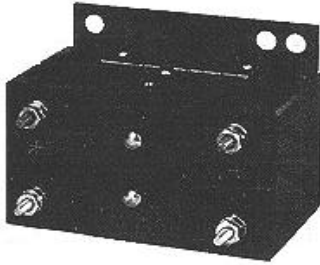


Fig. 1. Medium current double rectifiers, front view with case and mounting bracket.

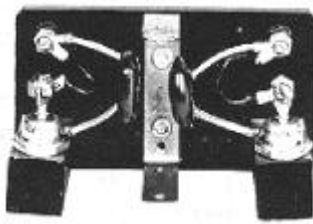


Fig. 2. Medium current double rectifiers back view, removed from case.

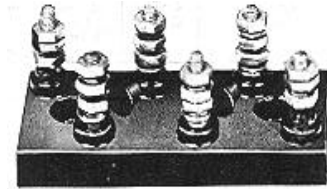


Fig. 3. Low-current double rectifier board assembly (with cover plate removed).

DESCRIPTION

Medium Current Rectifiers

The **medium-current** rectifiers with necessary "heat sinks" (for heat dissipation) and surge capacitors, are mounted in a molded case with provision for surface mounting or mounting on the back of any GE drawout relay case for switchgear applications. It is available with a single rectifier or with double rectifiers (Fig. 1 and 2). Both sides include mounting plate (Fig. 1).

Low Current Rectifiers

The **low-current** rectifiers are mounted on a simple insulated base to provide ease of mounting and have a protective plate for mechanical protection of the individual rectifiers.

It is available with a single rectifier or with double rectifiers, Fig. 3.

No surge protection is included with this unit since application and circumstances will vary considerably. However, if for tripping duty it is suggested that user provide suitable protection.

APPLICATION

These Silicon Junction rectifiers are proven components with no moving parts for isolating or tripping duty in control circuits. They reduce fault clearing time and serve in place of auxiliary relays.

The application of these rectifiers may:

1. Reduce tripping time when tripping two breakers from one set of relays. (Auxiliary trip relay requires from 1/2 to 1 cycle.)
2. Reduced circuit complexity in isolating

protective relay trip circuits and transfer trip-keying circuits.

3. Simplify circuitry for many protective relay schemes.

Tripping Duty

A pair of tripping rectifiers provides protective-relay tripping of two circuit breakers in a ring bus, 1^{1/2}- breaker or double-breaker arrangement while maintaining the necessary separation of the two trip circuits in case of adjacent circuits, (Fig. 4). This is limited to cases where the total trip current of the two breakers is within the relay contact rating, usually 30 amperes.

In cases where circuit breakers require less than 15 amperes for normal trip but more than 15 amperes each for trip-free operation, the rectifier scheme may still be used safely if only one breaker is closed or reclosed for testing a circuit, with the other breaker following after a few seconds.

Blocking

A single rectifier capable of handling trip current at each line terminal, can maintain isolation between the protective relay trip circuit, (Fig. 5), and the transfer-trip-receiver trip circuit in a two-way transfer-trip installation, thus avoiding locking in of both channels for a mid-line fault that actuates the protective relays at both ends.

The low-current rectifiers are used primarily for control circuit applications such as across an auxiliary relay coil to give time-delay dropout.

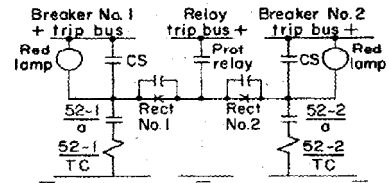


Fig. 4. Tripping rectifiers for double-bus or 1^{1/2} breaker scheme

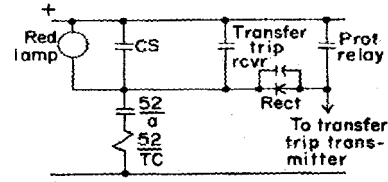


Fig. 5. Tripping rectifiers for two-way transfer tripping of a transmission line

Surge Protection

An internally mounted capacitor is connected across each rectifier unit of the **medium-current** rectifier to provide protection for minor surges which may occur in control wiring. **Severe surge** conditions may require corrective measures in the control circuit design.



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SELECTION GUIDE

Typical Applications	No. Rectifier Circuits	Nominal Station Battery Voltage	Dc Amps Continuous 55c Ambient per Circuit	Dc Amps per Circuit 30-Second Rating	Dc Volts Forward Drop Max.	Dc MA Leakage Max.	PIV	Catalog Number	Approx Weight lb (kg.)	
									Net	Shipping
MEDIUM CURRENT RECTIFIERS										
Tripping two breakers	2	24-125	10	30	1.2 V at 30 amp	4 MA at 140V 4 MA at 280V	400V 600V	102L218G8 G9	21/2(1.13)	31/2(1.59)
Blocking or re-ally trip circuits	1	24-250								
	1	24-125				4 MA at 140V 4 MA at 280V	400V 600V	G11 G12	11/2(0.68)	21/2(1.13)
	1	24-250								
LOW CURRENT RECTIFIERS										
Circuit	2	24-250	0.72	See Fig. 6	1.2 V at 0.72 amp	0.3 MA at 280V 0.3 MA at 140V 0.3 MA at 280V	600V 400V 600V	295b133G15 G12 G13	1/2(0.23)	1(0.45)
Control Circuit	1	24-125								
	1	24-250							3/8(0.17)	1/4(0.14)

SELECTION CONSIDERATIONS

The selection of the proper rectifier unit depends upon the control-circuit voltage, current required, and whether one or two breakers are to be tripped. See Fig. 6 for a curve of trip current plotted against duration in cycles for the low-current units.

Assume an application, such as shown in Fig. 4 using breakers with rated interrupting time of eight cycles and trip current of 6 amperes each at 125 volts. Assume that it is used with an NLR recloser giving one instantaneous and two 15-second reclosures, on a permanent fault.

Total number of trippings4
Assume trip current duration same as listed interrupting time.....8 cycles
Total duration of trip current32 cycles

From Fig. 6 or table for 125V nominal,
140V max., Cat. No. 102L218
or use 3 units of....Cat., No. 295B233
in parallel

Order either 1 Cat. No. 102L218G8 or 3 Cat. No. 293B233G14 (User to provide suitable surge protection for the Cat. No. 295B233G.....units).

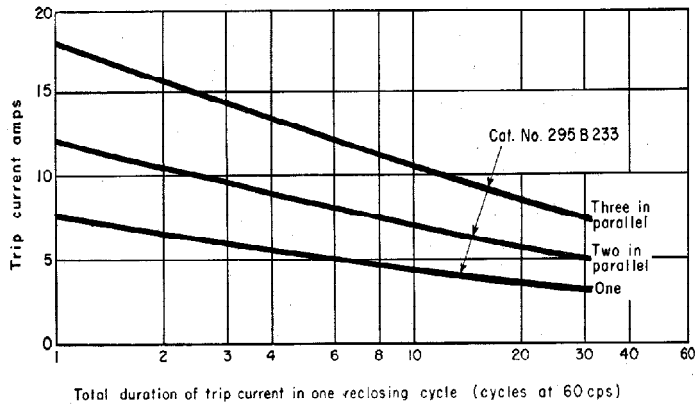


Fig. 6. Short-time rating of silicon rectifier (for each trip circuit)